Monograph of *Gastrolobium* (Fabaceae: Mirbelieae)

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**Abstract.** A taxonomic revision with full descriptions and key are presented for the 109 known species of *Gastrolobium*, including 29 new species described here for the first time. *Brachysema*, *Jansonia* and *Nemcia* are formally placed into *Gastrolobium* and new combinations have been made where necessary. Included in the revision are full taxonomic descriptions for all species, full synonymies, literature references for original publications, typification, including selection of lectotypes where necessary, distributions complete with maps, and taxonomic and nomenclatural notes. New taxa described herein are *G. acrocaroli*, *G. aculeatum*, *G. alternifolium*, *G. congestum*, *G. crispatum*, *G. cruciatum*, *G. cyanophyllum*, *G. diabolophyllum*, *G. discolor*, *G. elegans*, *G. euryphyllum*, *G. ferrugineum*, *G. glabratum*, *G. hians*, *G. humile*, *G. involutum*, *G. melanopetalum*, *G. mondurup*, *G. musaceum*, *G. nudum*, *G. nutans*, *G. reflexum*, *G. rhombifolium*, *G. semiteres*, *G. tenue*, *G. tergiversum*, *G. venulosum*, *G. whicherensis* and *G. wonganensis*.

**Introduction**

The tribe Mirbelieae (Fabaceae) is endemic to Australia and comprises a major component of the flora in many temperate ecosystems. The 109 species of *Gastrolobium* R.Br. belong to this tribe and are all native to the south-west of Western Australia, except for two species that occur in northern and central Australia (*G. brevipes* and *G. grandiflorum*; Fig. 1). Furthermore, it is one of the largest legume genera in the south-west of Western Australia, where it forms a major component of the understorey in many areas, such as sandplains with their accompanying vegetation, which is usually heath or mallee (shrubby eucalypt woodland).

Species of *Gastrolobium*, as circumscribed prior to this revision, are simple-leaved shrubs that have terminal, racemose inflorescences with yellow, orange and red flowers. The coloration of the flower is typical of the tribe Mirbelieae, with the standard petal generally orange or yellow, with a central red ring surrounding the yellow centre. These orange and yellow standard petals indicate insect-pollination, while a red standard (present in only one species, *G. grandiflorum*) indicates bird-pollination (e.g. Keighery 1982).

*Gastrolobium* accumulates monofluoroacetic acid (the sodium salt of which is also known as the commercial poison, Compound 1080; herein referred to just as fluoroacetate), which makes it highly toxic. *Gastrolobium* was first discovered to be poisonous by trials carried out in what was then the Swan River Colony (now Western Australia) by Preiss and James Drummond in the late 1830s and early 1840s, at the request of colonists suffering disastrous stock losses, and several species were identified as toxic (most notably *G. calycinum* and *G. oxyloboides*; Erickson 1969), although it was not until the 1960s that the toxin present in *Gastrolobium* was identified (Aplin 1971). Severe stock losses have occurred in the past due to fluoroacetate poisoning, which led to an eradication program, particularly in the wheat-belt region of south-western Western Australia. As a consequence, many species are now rare or threatened with extinction, making *Gastrolobium* both ecologically and economically important. Work is continuing on the toxicity of *Gastrolobium*, with more details becoming available, such as that the toxic component of the seeds of *Gastrolobium* is the endoderm, not the seed testa, perhaps as a toxic store for the
seedlings to draw on in their early, vulnerable stages (D. Peacock, unpubl. data), and the toxic compound itself could turn out to be a fluorinated fatty acid, such as is found in *Dichapetalum toxicarium* Baill. (*Dichapetalaceae*; Peters and Hall 1960), although this is currently speculative. However, the work is still in its early stages and further work is required before drawing any major conclusions.

As *Gastrolobium* evolved the ability to synthesise monofluoroacetate acid, native herbivores apparently co-evolved a tolerance to this toxin. This tolerance is most pronounced in species native to Western Australia, but it is likely to depend very much on diet (Twigg and King 1991). For example, the emu (*Dromaius novohollandiae*) had the highest tolerance of any birds tested (Twigg and King 1991), as it is a seed-eater, although the seeds of *Gastrolobium* are known to have particularly high fluoroacetate levels. Likewise, seed weevils also have a high tolerance for the same reasons (Twigg and King 1991). Obviously, this varying tolerance regulates how much a particular diet can consist of *Gastrolobium*. Up to 25% of the diet of *Macropus fuliginosus* (desmarest), the western grey kangaroo, consists of *Gastrolobium*, but these animals tend to discriminate between the plants and eat more of the less-toxic species to avoid being poisoned (Twigg and King 1991).

Modern agricultural approaches, such as pest control and fertilisers, have added to the problems of *Gastrolobium*. In particular, fertilisers are toxic to these plants, which are adapted to low-nutrient soils, and herbicides such as pre-emergents, which stop the germination of weeds, also prevent the germination of native seed. A possible example of this, *G. tenue* G.Chandler & Crisp, occurs along a narrow, remnant roadside strip surrounded by wheat fields. No recruitment was noted for this species (over several years of monitoring the same population, G. T. Chandler, pers. obs) and the adult plants appeared to be in severe decline.

Despite these problems, *Gastrolobium* still flourishes in some areas, particularly in National Parks (e.g. the Stirling Range, Fitzgerald River Biosphere Reserve, Cape Arid and the Ravensthorpe Ranges), so at least some areas are currently free from the land degradation seen in many other areas of Western Australia.

**Taxonomic history and problems**

Throughout its taxonomic history, the circumscriptions of *Gastrolobium* and its allied genera, particularly *Oxylobium* Jackson, have changed considerably. As a result, species have been transferred from one genus to another on several occasions. A major component of the problem of the circumscription of *Gastrolobium* is due to the fact that morphological data has failed to fully resolve the relationships within the tribes Mirbeliae and Bossiaeae (see Crisp and Weston 1987, 1995), especially the *Gastrolobium–Oxylobium* generic group.

*Gastrolobium* was described by Brown (1811) as a monotypic genus, diagnosed by a stipitate ovary with two ovules, which distinguished it from *Oxylobium* (below), although Brown (1811) did not mention this fact explicitly. De Candolle (1825) also recognised a monotypic *Gastrolobium*, along with several other genera, including *Brachysema*, *Callistachys*, *Oxylobium* and *Podolobium*. Lindley (1834) described one species and Bentham (1837a, 1837b) provided generic descriptions as part of a revision of legumes of the world. However, it was not until 1839, when Bentham (in Lindley 1839) published a number of new species of *Gastrolobium*, that the genus began to grow in numbers significantly. Subsequently, a number of authors published species of *Gastrolobium*, most notably Turczaninow (1853) who published a major work on the Australian flora, describing many new species, in many genera, including *Gastrolobium*. Bentham (1864), in *Flora Australiensis*, provided the first major treatment of *Gastrolobium*, including a number of new species. Once again, it was primarily ovule number that separated *Gastrolobium* from *Oxylobium*, with *Gastrolobium* having two ovules and *Oxylobium* four or more ovules (Bentham 1864). Both genera contained species that produced fluoroacetate and *Oxylobium* contained species from both eastern and western Australia.

Kuntze (1891) subsumed *Oxylobium* into the earlier genus, *Callistachys* Vent., although *Oxylobium* was later conserved against *Callistachys*. *Nemcia* was described by Domin (1923a), including 12 species characterised by four to six ovules, trifid bracts and condensed racemose inflorescences. This work was largely ignored and the concepts of *Gastrolobium* and *Oxylobium* remained as they had been since Bentham (1864). Gardner and Bennett (1956) published a guide to the toxic plants of Western Australia, which included a number of species of *Gastrolobium* and *Oxylobium*. However, this was not a revision of the group, since it did not include the non-toxic species of either genus and did not make formal taxonomic changes. Furthermore, the toxic species of both genera were interleaved in the key provided in the guide, the authors apparently being unable to distinguish easily between the genera. Again, the concept of Bentham (1864) was used as the division between *Gastrolobium* and *Oxylobium*, relying on ovule number as the main character. Sands (1975) recognised a number of informal groups within the Mirbeliae (formerly Podalyrieae *pro parte*). She proposed three groups, which roughly correspond as follows: Group I (the ‘Pultenaea’ group of Crisp and Weston 1987), Group II (the ‘Oxylobium’ group of Crisp and Weston 1987) and Group III (the ‘Gompholobium’ and ‘Daviesia’ groups of Crisp and Weston 1987). These groups were primarily based on base chromosome numbers, but also used inflorescence structure and bract morphology as secondary characters. *Gastrolobium*, as well as *Brachysema,*
Jansonia, Mirbelia, Nemcia, Oxylobium and Podolobium, are among the genera that were part of Group II (Sands 1975). It is interesting to note that the informal classification by Sands (1975) of the Australian members of the Podalyrieae corresponds to the topology of the phylogeny of the Mirbelieae produced by Crisp and Weston (1987, 1995).

Introduction to morphology in Gastrolobium

As Gastrolobium sens. lat. contains three other genera (Brachysema, Jansonia and Nemcia), a brief introduction to morphology is provided to highlight similarities and differences of taxa in these genera. Many of the characters below have been shown to be homoplastic by the analyses presented by Chandler et al. (2001), but are still important for identification at species level. In this section, for the purpose of comparison, taxa are often referred to under their old generic names (Brachysema, Jansonia and Nemcia), but it should be borne in mind that they are all transferred to Gastrolobium in the taxonomic section of this paper.

Habit: nearly all species of Gastrolobium and Nemcia are erect, bushy shrubs and only a few are prostrate or scrambling. Most species formerly in Brachysema are scrambling to tangled shrubs and the one species formerly in Jansonia is a twining to tangled shrub. Many of these are adventitious colonisers of disturbed sites, particularly road verges and roadside gravel pits.

Chromosome numbers: Sands (1975) counted 28 of 109 species of Gastrolobium sens. lat., which were all 2n = 16.

Seedling stages: seedling leaves nearly always resemble the adult leaves, but tend to be larger and somewhat broader, grading into the adult leaf shapes.

Adult stages: Gastrolobium has simple leaves, in common with all but one genus in the tribe Mirbelieae. Stipules are mostly present. Leaf arrangement is generally opposite or whorled, rarely alternate or scattered.

Inflorescence structure: this is perhaps the most diverse feature, distinguishing the four genera in traditional morphological treatments. Gastrolobium sens. str. nearly always has a long, open raceme with conspicuous internodes and flowers in pairs or whorls of three, or rarely four. Only in the G. bilobum group is floral internode suppression evident. However, inflorescence structure in Nemcia is variable. (The G. obovatum group, which is apparently intermediate in morphology between Gastrolobium and Nemcia, has short racemes with minor internode suppression. Others have condensed inflorescences as a result of the combination of short internodes and large flowers (the G. pyramidale group). The majority of species from Nemcia have racemes reduced to one or few flowers in the axils. Brachysema has inflorescences ranging from well-developed racemes to solitary flowers in the axils (Crisp 1994), while Jansonia has a 4-flowered head.

Within the inflorescence, the floral bract shape is an important distinguishing character, particularly between Gastrolobium and Nemcia, although this study has shown this character to be homoplastic. In nearly all species of Gastrolobium sens. lat., the bracts are caducous at early bud stage. Most species of Gastrolobium sens. str. have entire bracts, some of which are quite prominent, but these are generally lost before the flower opens (particularly in the G. floribundum group). All species of Nemcia have bracts with trifid apices, but several species of Gastrolobium sens. str. have entire bracts grading into trifid bracts on one inflorescence. Brachysema has large, trifid bracts, while Jansonia has an involucre of four entire bracts.

Floral structure: species of Gastrolobium sens. lat. have a typical papilionoid flower. Some species, notably all those from Brachysema and Jansonia and the red-flowered species of Nemcia and Gastrolobium grandiflorum, have flowers apparently modified for bird-pollination (see review in Crisp 1994), with large red flowers, often with a reduced standard and the keel enlarged. The G. pyramidale group (formerly in Nemcia) has intermediate morphology with numerous, large, deep-orange flowers, but the pollinators are unknown. The majority of species are bee-pollinated, typically with yellow, yellow-orange or orange flowers, with a central, red ring around a yellow centre. In the putatively bird-pollinated species (Crisp 1994), this central red ring on the standard petal (typical in the tribe Mirbelieae) is still present. Crisp and Weston (1987) cited recurved calyx lobes as a synapomorphy for Gastrolobium and Podolobium, but many species, especially those formerly in Nemcia, have erect lobes.

Gynoecium: all species in Gastrolobium sens. lat. have a unilocular ovary. The ovary is typically covered in long, antrorse, simple hairs, which often go partway up the style. The style mostly tapers from the base to the apex, although occasionally it is uniform in width to the apex. Gastrolobium sens. lat. belongs to a clade within the tribe Mirbelieae that has multiple 5-nucleate embryo sacs (Crisp and Weston 1995; Crisp et al. 2000).

Ovule number: this feature has often been used to separate genera in the Oxylobium–Gastrolobium complex, but has been shown to be homoplastic (Chandler et al. 2001). Many species of both Gastrolobium and Nemcia sensu Crisp and Weston (1987), as well as the single species of Jansonia and Nemcia, have strictly two ovules. However, a number of other species in the first two genera have more than two, as do nearly all species of Brachysema. Importantly, some species have two or three ovules (and another, G. subcordatum, has 2–6), which shows that these states overlap and hence are cladistically uninformative.

Fruit: all species of Gastrolobium produce dry, dehiscent legumes, mostly with two or more seeds. Some species have numerous seeds, which are arranged in two rows. The fruits are generally ovoid to ellipsoid and often stipitate, particularly in Gastrolobium sens. str. and a number of
species of *Nemcia*. The seeds are generally free, rarely enclosed in pith. Aril present.

**Ecology of Gastrolobium**

Species of *Gastrolobium* occur in a wide variety of habitats and only a very brief overview is provided here. For specific ecologies, refer to the individual species descriptions. *Gastrolobium* occurs mainly on sandy, well-drained soils, although a few species, such as *G. formosum*, *G. tomentosum* and *G. brownii* occur on heavier soils with a higher loam and/or clay content in the wetter, south-western corner of the region. Many species are found on broad sandplains or around granite outcrops and grow mostly in heath (‘kwongan’), mallee (shrubby eucalypt woodland) or open woodland, with very few species occurring in forest areas.

Many species of *Gastrolobium* are colonisers of disturbed areas, with a number of species in roadside gravel pits and similarly disturbed areas. The frequency of occurrence is reduced in adjacent, less-disturbed areas, but when present, the species are relatively common. Other genera in the Mirbelieae, such as *Daviesia*, are also known to prosper in more-disturbed areas (e.g. Chandler and Crisp 1997).

**Phylogenetic analysis**

Crisp and Weston (1987) published the first major review of generic delimitation in *Gastrolobium* since Bentham (1864). They presented a phylogeny of the tribe Mirbelieae based on morphology and reinstated and expanded both *Nemcia* and *Podolobium* F.Muell., the latter being an eastern Australian genus closely aligned with *Oxylobium*. *Gastrolobium* fell into the ‘Callistachys’ group, which consisted of *Brachysema* R.Br., *Callistachys*, *Jansonia* Kipp., *Gastrolobium*, *Nemcia*, *Podolobium* and *Oxylobium lineare*. The analysis of Crisp and Weston (1987), however, was done at a higher level to resolve tribal relationships within the Mirbelieae, using mostly genera and species groups as terminal taxa. Crisp and Weston (1987) changed the circumscription of *Gastrolobium* to include all toxic species of *Gastrolobium* and *Oxylobium* (see Aplin 1971), so that for the first time, species with more than two ovules were included within *Gastrolobium*. This left only one species of *Oxylobium* occurring in Western Australia (*O. lineare*), which required further work to determine its generic affinities. Their reduced concept of *Oxylobium* comprises five species endemic to eastern Australia, mostly along the central and southern coast plain and the adjacent Great Dividing Range, as well as Tasmania. The non-toxic species of *Gastrolobium* and *Oxylobium* were mostly removed into *Nemcia*.

*Nemcia*, as defined by Crisp and Weston (1987), contained species with axillary racemes often reduced to one or two flowers (although some had condensed, terminal racemes with many flowers) and included the non-toxic species transferred from *Gastrolobium* and *Oxylobium*, thereby using secondary metabolites as an aid in the resolution of this taxonomically difficult group (but see Twigg et al. 1996a). Other characters used to distinguish *Nemcia* included the presence of trifid bracts, although the authors acknowledged that some species of *Gastrolobium* also possess them and non-stipitate fruits.

Genera such as *Brachysema*, *Jansonia* and *Leptosema* Benth. were distinguished by floral characteristics that have been interpreted by later authors as indicative of bird-pollination (e.g. Keighery 1982). These characters include red petals, a reduced standard petal and enlarged keel petals and copious nectar. *Gastrolobium* and *Oxylobium* are primarily bee-pollinated, except *G. grandiflorum*, which has large, red flowers, but lacks the ‘bird-flower’ modifications of genera such as *Brachysema*, such as a reduced standard petal. However, most of the assumptions of bee- or bird-pollination are largely inference based on floral structure, which often came from empirical data, such as sightings of birds visiting flowers (e.g. Keighery 1980, 1982, 1984).

The evolution of bird-pollination in this group was discussed by Crisp (1994, 1996), using a phylogeny of *Brachysema*, *Jansonia* and *Oxylobium lineare* derived from morphology, but not including *Gastrolobium*. Crisp (1994) also tested the monophyly of these genera by using a species-level phylogeny with morphology. *Nemcia* was shown to be paraphyletic, while *Brachysema* was demonstrated to be monophyletic.

**Phylogenetic basis of classification**

Crisp et al. (2000) provided a molecular phylogeny of the genistoid legume tribes, although only two species of the ‘Callistachys’ group were used in this tribal phylogeny. A sound, well-resolved phylogeny of *Gastrolobium* and its close relatives was therefore derived in order to resolve the taxonomic dilemmas surrounding this group and bring stability to these genera. That study, involving two data sets and utilising a total of five molecular regions (Chandler 2001; Chandler et al. 2001), showed that *Gastrolobium* is paraphyletic, including within it *Brachysema*, *Nemcia*, *Jansonia* and *Oxylobium lineare*. Figure 2 reproduces the phylogenies of Chandler et al. (2001) and Chandler (2001), and is a result of the combination of the two molecular trees and the outgroups are condensed to a single node, so that it is a classification tree rather than a phylogeny. The overall support along the backbone of the original phylogenetic trees is poor, so the resolution of some groups and their relationships to other groups are still not clear, even though many of the individual groups have strong support (Chandler et al. 2001). However, the classification presented here is informal.
**Gastrolobium** is hereby expanded to include all of these genera, expanding the number of species to 109, including 29 new species, and making *Gastrolobium* one of the most diverse genera of pea-flowered legumes in Australia and the third largest in the tribe Mirbelieae, behind *Daviesia* (126 species) and *Pultenaea* (c. 110–120 species).

The taxonomy is presented here in phylogenetic order (where possible), starting with groups towards the base of the tree [which include species from *Gastrolobium* sensu Crisp and Weston (1987)] and ending with the putatively bird-pollinated lineage, which includes species formerly in *Brachysema*, *Jansonia* and *Nemcia*. Each group is numbered in the text and on the classification tree (Fig. 2), although not all groups are present on the tree because the phylogenies on which the tree is based do not include all species. Also, some groups are still not clearly defined, so only informal groups are presented here. The groups not present are the *G. ilicifolium* group (Group IX) and the *G. cruciatum* group (Group X). Species not included in the analysis are placed into their most likely groups, or if relationships are unclear, they are presented at the end in an artificial group (Group XIII).

A key to all species is provided, along with descriptions for all species. This treatment should enable the correct identification and nomenclature of any species of *Gastrolobium* and is the first complete, descriptive account of the genus since Bentham (1864).

**Materials and methods**

Specimens from the Australian National Herbarium (CANB), the State Herbarium of Western Australia (PERTH), together with a small number from the Royal Botanic Gardens, Melbourne (MEL) were measured and scored for the descriptions. All length by breadth measurements are given with the length from base to apex (not necessarily the longest axis) first, followed by the breadth at the widest point. Vernacular names are given immediately following the description where available. Floral measurements were taken from fully opened flowers preserved in an ethanol–water–glycerol mix (70:20:10) where available and for about 20 species, flowers were reconstituted from dried material. Branchlet descriptions refer to mature leaves only, unless otherwise stated. The inflorescences terminal or axillary racemes or more rarely umbels, rarely branched or 1 or 2 flowers in the axils or a capitulum, 1 to more than 30-flowered; subtending bracts generally caducous, occasionally somewhat persistent, nearly always scale-like, rarely leaf-like, entire, bilobed or prominently trilobed; margins may be lacerate. Flowers: generally upright, occasionally resupinate or nutant; papilionaceous, sometimes with the standard reduced; usually pedicellate, sometimes shortly so, alternate, scattered or in whorls of 3 or 4, venation generally prominently reticulate. *Stipules* usually present (except *G. cruciatum*, *G. epacroidoides*, *G. ferrugineum* and *G. punctatum*). Inflorescences terminal or axillary racemes or more rarely umbels, rarely branched or 1 or 2 flowers in the axils or a capitulum, 1 to more than 30-flowered; subtending bracts generally caducous, occasionally somewhat persistent, nearly always scale-like, rarely leaf-like, entire, bilobed or prominently trilobed; margins may be lacerate. Flowers: generally upright, occasionally resupinate or nutant; papilionaceous, sometimes with the standard reduced; usually pedicellate, sometimes shortly so, rarely sessile; *bracteoles* absent. *Calyx* nearly always campanulate, upper 2 lobes usually united higher than the lower 3, occasionally ± equal to the lower 3 lobes, rarely united lower; upper two lobes valvate in bud, lower 3 lobes imbricate, with the upper two often folded across the apices of the lower 3, rarely all imbricate. *Corolla*: clawed, mostly yellow or orange, sometimes red, cream, pale green or almost black, usually with a red central ring surrounding a yellow centre; *standard* lamina usually broader than long, apex usually emarginate, occasionally entire or acute; *wings* auriculate on the upper margin, sometimes also auriculate (if slightly so) on the lower margin, rarely auriculate on the lower margin only, often slightly saccate; *keel* petals lightly to strongly united, base auriculate, saccate. *Stamens* 10, free to base; *filaments* subequal to strongly different in length; *anthers* generally uniform, sometimes differing in size and shape, versatile. *Style* filiform to compressed, terete to compressed in the vertical plane, usually incurved to slightly hooked, rarely ± straight, often with some hairs present in the lower third; *ovary* stipitate to sessile, densely pubescent; *ovules* 2–20, rarely more. *Pod* usually not or sometimes almost wholly enclosed in the calyx, stipitate to ± sessile, dehiscent, usually ± ovoid, pubescent. *Seed* reniform to ellipsoid, arillate.
**Key to species of *Gastrolobium***

1. Standard petal reduced to less than 1/3 the length of the keel petal .......................................................... 2
2. Standard petal at least as long or longer than the keel petal, or rarely slightly shorter. ................................. 13
3. Flowers sessile in a 4-flowered head sheathed by an involucre of large bracts; petals obscured by the lower calyx lobes ........................ 98. *G. formosum*
4. Flowers in racemes, umbils or solitary, pedicellate; petals not obscured by the calyx lobes .......................... 3
5. Leaves strictly opposite and decussate .......................................................... 4
6. Leaves all alternate, or some opposite and some alternate .......................................................... 7
7. Leaf base always cordate; keel petal <14 mm long; petals burgundy .......................................................... 96. *G. subcordatum*
8. Leaf base not or slightly cordate; keel petal >18 mm long; petals red or pale greenish ................................. 5
9. Leaves ovate to linear; lower three calyx lobes ± equal to the tube .......................................................... 97. *G. celsianum*
10. Leaves obcordate, obtriangular, obovate or obclavate; lower three calyx lobes 2–4 times longer than the tube ...... 6
11. Flowers aggregat into condensed racemes or umbels .......................................................... 21
12. Leaves patent to retrorse .......................................................... 80. *G. epacridoides*
13. Leaves strictly opposite and decussate ................................. 3
14. Inflorescence strictly axillary .......................................................... 15
15. Prostrate, not stoloniferous; inflorescences 1-flowered, axillary; petals bright red with a yellow marking on the standard ........................ 93. *G. minus*
16. Prostrate, stoloniferous and with aerial stems; inflorescences paniculate, borne on the stolons, with only the flowers visible above the litter; petals pale green with pink infusion .......................................................... 94. *G. modestum*
17. At least some leaves opposite, narrow (length:breath <2:1), mostly elliptic to orbicular; flowers pale yellow-green ...... 92. *G. sericeum*
18. At least some leaves opposite; stems procumbent or ascending up to 1 m or more; wings half the length of the keel .......................................................... 92. *G. sericeum*
19. Leaves all alternate; stems prostrate or <0.5 m high; wings ± equal to the keel .......................................................... 11
20. Keel petal >35 mm long; calyx lobes long-acute; margins of standard petal recurved at apex; stipules ± angular, minutely denticulate .......................................................... 12
21. Prostrate, not stoloniferous; inflorescences 1-flowered, axillary; petals bright red with a yellow marking on the standard .......................................................... 93. *G. minus*
22. Prostrate, stoloniferous and with aerial stems; inflorescences paniculate, borne on the stolons, with only the flowers visible above the litter; petals pale green with pink infusion .......................................................... 94. *G. modestum*
23. Leaves with 1 pungent point .......................................................... 24
24. Leaf margins recurved; lamina tending to undulate between depressed main veins .......................................................... 76. *G. ilicifolium*
25. Leaf margins not recurved; lamina somewhat folded up lengthwise but otherwise flat .......................................................... 78. *G. tricuspisatum*
26. Inflorescence rachis elongate (30–160 mm long) .......................................................... 31. *G. propinquum*
27. Inflorescence rachis not elongate (0–18 mm long) .......................................................... 25
28. Leaves crowded along stem, linear, 1–3 mm broad .......................................................... 75. *G. stipulare*
29. Leaves not crowded, oblong, cuneate, rhombic or strongly obovate, 4–24 mm broad .......................................................... 26
30. Young branchlets terete; leaf apex rounded, obtuse or truncate; stipules <1.5 mm long .......................................................... 45. *G. brownii*
31. Flowers smaller (calyx <8 mm long); petals yellow or orange with red markings .......................................................... 28
32. Calyx indumentum 2-toned, with silver hairs at the base and golden or rust-coloured hairs towards the apex .......................................................... 29
33. Calyx indumentum uniform in colour, usually silvery but sometimes buff-coloured .......................................................... 31
34. Leaves cuneate, obovate or obclavate to narrowly so .......................................................... 64. *G. dorrienii*
35. Leaves orbicular, ovate, elliptic, oblong or narrowly so .......................................................... 30
36. Inflorescences, young stems and sometimes young leaves densely hirsute with rust-coloured hairs .......................................................... 85. *G. pyramidalae*
37. Inflorescences and young stems sericeous to villous with silvery hairs .......................................................... 84. *G. crenulatum*
38. Leaf margins longitudinally folded up (plicate) .......................................................... 32
39. Leaf margins flat, incurved or recurved but not longitudinally folded up .......................................................... 34
<table>
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<th>Monograph of Gastrolobium</th>
<th>625</th>
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<td>32. Leaves recurved</td>
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<td>Leaves straight</td>
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<tr>
<td>33. Leaves generally opposite (rarely whorled or alternate), obtrullate or rhombic; standard 8–11 × 8–12 mm</td>
<td>7. G. obovatum</td>
</tr>
<tr>
<td>Leaves in whorls of 3, spatulate; standard 7.5–10 × 7–7.5 mm</td>
<td>49. G. spathulatum</td>
</tr>
<tr>
<td>34. Venation on lower leaf surface very thick, with areoles reduced to pin-pricks; flowers mostly in summer</td>
<td>74. G. effusum</td>
</tr>
<tr>
<td>35. Mature leaves sericeous beneath</td>
<td>35</td>
</tr>
<tr>
<td>Mature leaves glabrate.</td>
<td></td>
</tr>
<tr>
<td>36. Calyx indumentum 2-toned (silver hairs at the base, with golden or rust-coloured hairs towards the apex)</td>
<td>37</td>
</tr>
<tr>
<td>Calyx indumentum uniform in colour</td>
<td></td>
</tr>
<tr>
<td>37. Leaves cuneate or obtrullate, or narrowly so.</td>
<td>38</td>
</tr>
<tr>
<td>Leaves orbicular, ovate, elliptic, oblong, or narrowly so.</td>
<td></td>
</tr>
<tr>
<td>38. Leaves with margins recurved, especially towards the bilobed apex; upper leaf surface rugose with obscure venation; lower leaf surface sericeous and scarcely glabrescent.</td>
<td>64. G. dorrinii</td>
</tr>
<tr>
<td>Leaves with margins not recurved, sometimes undulate or crisped; apex not bilobed (may be slightly emarginate); upper surface venation conspicuously finely reticulate; lower surface glabrous or on glabrescent.</td>
<td></td>
</tr>
<tr>
<td>39. Leaves oblong, but may be slightly ovate or slightly obovate; stipules with a thickened, grey-tomentose base; peduncle 10–25 mm long</td>
<td>83. G. coriaceum</td>
</tr>
<tr>
<td>40. Leaf apex emarginate, sometimes bilobed.</td>
<td></td>
</tr>
<tr>
<td>Leaf apex entire</td>
<td></td>
</tr>
<tr>
<td>41. Leaves ± spatulate; stipules lacking a thickened, grey-tomentose base; peduncle 2–10 mm long</td>
<td>65. G. retusum</td>
</tr>
<tr>
<td>Leaves ± oblong, but may be slightly ovate or slightly obovate; stipules with a thickened, grey-tomentose base; peduncle 10–25 mm long</td>
<td>66. G. whicherensis</td>
</tr>
<tr>
<td>42. Inflorescences, young stems and sometimes young leaves densely hirsute with rust-coloured hairs.</td>
<td>85. G. pyramidal</td>
</tr>
<tr>
<td>Inflorescences and young stems sericeous to villous, hairs silvery.</td>
<td></td>
</tr>
<tr>
<td>43. Leaves with margins recurved, especially towards the bilobed apex; upper leaf surface rugose with obscure venation; lower leaf surface sericeous and scarcely glabrescent.</td>
<td>83. G. coriaceum</td>
</tr>
<tr>
<td>Leaves glabrate below; peduncle 2–10 mm long; subtending bracts trilobate.</td>
<td>65. G. retusum</td>
</tr>
<tr>
<td>44. Leaf apex emarginate, sometimes bilobed.</td>
<td></td>
</tr>
<tr>
<td>Leaf apex entire</td>
<td></td>
</tr>
<tr>
<td>45. Base of peduncle with an involucre of scale-like bracts</td>
<td>103. G. venulosum</td>
</tr>
<tr>
<td>Base of peduncle lacking an involucre of bracts, though some apparently aborted buds may be scattered along the peduncle</td>
<td></td>
</tr>
<tr>
<td>46. Inflorescence rachis &lt;10 mm long; floral internodes &lt;3 mm long</td>
<td></td>
</tr>
<tr>
<td>Inflorescence rachis &gt;15 mm long; floral internodes generally &gt;4 mm long.</td>
<td></td>
</tr>
<tr>
<td>47. Keel petal scarcely auriculate, not saccate, c. 9–10 × 1.5 mm; style barely incurved; leaves light green and concolorous; flowers orange</td>
<td></td>
</tr>
<tr>
<td>Keel petal strongly auriculate and saccate, c. 6.5–8.5 × 2 mm; style strongly incurved to hooked; leaves dark green above and often below; flowers typically yellow with red markings, almost never orange.</td>
<td>14. G. bilobatum</td>
</tr>
<tr>
<td>48. Leaves &gt;15 mm broad, not recurved; flowers predominantly red; occurs in the northern parts of WA, plus NT, Qld, ?SA.</td>
<td>16. G. grandiflorum</td>
</tr>
<tr>
<td>Leaves &lt;10 mm broad, rarely flat, usually recurved to revolute; flowers yellow to orange with red markings; occurs in the SW corner of WA</td>
<td></td>
</tr>
<tr>
<td>49. Inflorescence rachis &gt;70 mm long; leaves &gt;20 mm long</td>
<td></td>
</tr>
<tr>
<td>Inflorescence rachis &lt;50 mm long; leaves &lt;20 mm long</td>
<td></td>
</tr>
<tr>
<td>50. Leaves widely spreading to deflexed, often recurved longitudinally, oblong to linear or almost square; margins strongly recurved to revolute; ovules 4; stipules 1.5–3 mm long</td>
<td></td>
</tr>
<tr>
<td>Leaves spreading to ascending, not recurved longitudinally, cuneiform to oblong; margins flat to recurved, never revolute; ovules strictly 2; stipules 0.5–1.5 mm long</td>
<td>23. G. tetragonophyllum</td>
</tr>
<tr>
<td>51. Leaves evert and ± appressed to the branchlet, crowded along the stem</td>
<td></td>
</tr>
<tr>
<td>52. Leaves spreading to erect, but never appressed to the branchlet, not crowded</td>
<td></td>
</tr>
<tr>
<td>53. Leaves ovate; leaf apex acute; leaves 4–7.5 × 1.5–2.5 mm</td>
<td>55. G. appressum</td>
</tr>
<tr>
<td>Leaves obovate to narrowly so; leaf apex ± truncate; leaves 4–15 × 2–5 mm</td>
<td>40. G. parvisiliqua</td>
</tr>
<tr>
<td>54. Leaves strongly incurved to involute</td>
<td></td>
</tr>
<tr>
<td>Leaves flat, recurved, revolute, slightly incurved (appearing concave) or longitudinally folded up.</td>
<td></td>
</tr>
<tr>
<td>54. Leaves canalicate, not crowded along the stems, upper surface visible; calyx 7–9 mm long; standard c. 12 mm broad; ovules 4 or 5</td>
<td></td>
</tr>
<tr>
<td>Leaves involute, crowded along the stems, upper surface not visible; calyx 4.5–5.5 mm long; standard 8–9 mm broad; ovules 2</td>
<td></td>
</tr>
<tr>
<td>7. G. semiteres</td>
<td></td>
</tr>
<tr>
<td>55. Leaves longitudinally folded up (conduplicate)</td>
<td></td>
</tr>
<tr>
<td>56. Leaves flat, recurved or revolute, or rarely concave</td>
<td></td>
</tr>
<tr>
<td>57. Calyx 6–7.5 mm long; inflorescence 5–10-flowered</td>
<td></td>
</tr>
<tr>
<td>Calyx &lt;5 mm long; inflorescence &gt;15-flowered</td>
<td></td>
</tr>
<tr>
<td>58. G. oxyloboides</td>
<td></td>
</tr>
<tr>
<td>59. G. scorpioides</td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>58.</td>
<td>Petiole decurrent with the branchlet; stipules 3–5 mm long; peduncle 5–10 mm long; standard 5–6 mm long; occurs north of Geraldton, around Northampton, WA.</td>
</tr>
<tr>
<td>59.</td>
<td>Petioles continuous but not decurrent with the branchlet; stipules 1–2.5 mm long; peduncle 2–4 mm long; standard c. 8 mm long; occurs in the Darling escarpment around Perth, WA.</td>
</tr>
<tr>
<td>60.</td>
<td>Leaf apex recurved.</td>
</tr>
<tr>
<td>61.</td>
<td>Leaves &lt;5 mm broad; petiole articulate with the branchlet; young branchlets angular and somewhat pubescent; pedicels very short (0.5–1 mm long).</td>
</tr>
<tr>
<td>62.</td>
<td>Leaves strongly recurved to revolute, often longitudinally incurved</td>
</tr>
<tr>
<td>63.</td>
<td>Leaves concave, unarmured.</td>
</tr>
<tr>
<td>64.</td>
<td>Inflorescences &lt;12-flowered; standard c. 14 mm broad</td>
</tr>
<tr>
<td>65.</td>
<td>Leaf margins not recurved, often crenulate or undulate; lower leaf surface glabrous; leaves &gt;7 mm broad</td>
</tr>
<tr>
<td>66.</td>
<td>Leaves pungent-pointed.</td>
</tr>
<tr>
<td>67.</td>
<td>Leaves with 3 or more pungent angles</td>
</tr>
<tr>
<td>68.</td>
<td>Inflorescences in terminal, 2- or 3-flowered umbels</td>
</tr>
<tr>
<td>69.</td>
<td>Inflorescences in terminal or axillary racemes</td>
</tr>
<tr>
<td>70.</td>
<td>Leaves oblongicular, margins recurved to revolute, apex strongly recurved.</td>
</tr>
<tr>
<td>71.</td>
<td>Spines per leaf 7–10; inflorescence rachis 35–50 mm long and moderately to densely pubescent; calyx 4.5–5.5 mm long; standard 5.5–6.5 mm broad.</td>
</tr>
<tr>
<td>72.</td>
<td>Leaf-subtending bracts about twice as long as the bud, c. 6 mm long; inflorescences strictly terminal</td>
</tr>
<tr>
<td>73.</td>
<td>Leaves obtrullate.</td>
</tr>
<tr>
<td>74.</td>
<td>Leaves very broadly to depressed triangular, not trilobed, all 3 pungent angles pointing in different directions</td>
</tr>
<tr>
<td>75.</td>
<td>Inflorescence 2–7-flowered, generally axillary (rarely terminal); calyx 4–5 mm long; standard 6.5–8.5 mm broad; pod c. 5 mm long.</td>
</tr>
<tr>
<td>76.</td>
<td>At least some leaves becoming trilobed (which is often indicated by a slight bulge to either side of the apex)</td>
</tr>
<tr>
<td>77.</td>
<td>No leaves becoming trilobed.</td>
</tr>
<tr>
<td>78.</td>
<td>Inflorescences in terminal, 2- or 3-flowered umbels</td>
</tr>
<tr>
<td>79.</td>
<td>Leaves flat, recurved or longitudinally folded up, never canaliculate.</td>
</tr>
<tr>
<td>80.</td>
<td>Inflorescences strictly terminal</td>
</tr>
<tr>
<td>81.</td>
<td>Leaf shape ovate to triangular; leaf margins flat</td>
</tr>
<tr>
<td>82.</td>
<td>Leaf shape ovate to triangular; leaf margins somewhat undulate</td>
</tr>
<tr>
<td>83.</td>
<td>Leaf shape elliptic to orbicular; leaf margins somewhat undulate</td>
</tr>
<tr>
<td>84.</td>
<td>Leaf shape obovate to rarely oblong.</td>
</tr>
<tr>
<td>85.</td>
<td>Young branchlets terete; leaf shape ovate to rarely oblone.</td>
</tr>
<tr>
<td>86.</td>
<td>Young branchlets angular; leaf shape ovate, triangular, elliptic or orbicular.</td>
</tr>
<tr>
<td>87.</td>
<td>Leaves not glaucous, obovate to rhombic, apex acute.</td>
</tr>
<tr>
<td>88.</td>
<td>Leaves glaucous, obtrullate to oblong, apex truncate</td>
</tr>
<tr>
<td>89.</td>
<td>Leaves obtrullate; standard &gt;11 mm long.</td>
</tr>
<tr>
<td>90.</td>
<td>Leaves oblongicular, margins recurved to revolute, apex strongly recurved.</td>
</tr>
<tr>
<td>91.</td>
<td>Leaves oblongicular, margins recurved to revolute, apex strongly recurved.</td>
</tr>
<tr>
<td>92.</td>
<td>Leaves obtrullate.</td>
</tr>
<tr>
<td>93.</td>
<td>Leaves very broadly to depressed triangular, not trilobed, all 3 pungent angles pointing in different directions</td>
</tr>
<tr>
<td>94.</td>
<td>Inflorescence 2–7-flowered, generally axillary (rarely terminal); calyx 4–5 mm long; standard 6.5–8.5 mm broad; pod c. 5 mm long.</td>
</tr>
<tr>
<td>95.</td>
<td>At least some leaves becoming trilobed (which is often indicated by a slight bulge to either side of the apex)</td>
</tr>
<tr>
<td>96.</td>
<td>No leaves becoming trilobed.</td>
</tr>
<tr>
<td>97.</td>
<td>Inflorescences in terminal, 2- or 3-flowered umbels</td>
</tr>
<tr>
<td>98.</td>
<td>Leaves flat, recurved or longitudinally folded up, never canaliculate.</td>
</tr>
<tr>
<td>99.</td>
<td>Leaves strongly involute, appearing almost terete; never glaucous; flowers quite large (calyx c. 6 mm long, standard 11 mm broad)</td>
</tr>
<tr>
<td>100.</td>
<td>Inflorescences strictly terminal</td>
</tr>
<tr>
<td>101.</td>
<td>Inflorescences axillary or both axillary and terminal</td>
</tr>
<tr>
<td>102.</td>
<td>Leaves strictly alternate; flowers solitary or paired in the axils</td>
</tr>
<tr>
<td>103.</td>
<td>Leaves opposite (rarely appearing alternate); inflorescences with more than 2 flowers.</td>
</tr>
<tr>
<td>104.</td>
<td>Leaves longitudinally recurved, conduplicate (folded up longitudinally)</td>
</tr>
<tr>
<td>105.</td>
<td>Leaves straight, not conduplicate.</td>
</tr>
<tr>
<td>106.</td>
<td>Leaves not glaucous, obovate to rhombic, apex acute.</td>
</tr>
<tr>
<td>107.</td>
<td>Leaves glaucous, obtrullate to oblong, apex truncate</td>
</tr>
<tr>
<td>108.</td>
<td>Young branchlets terete; leaf shape ovate to rarely oblong.</td>
</tr>
<tr>
<td>109.</td>
<td>Young branchlets angular; leaf shape ovate, triangular, elliptic or orbicular.</td>
</tr>
<tr>
<td>110.</td>
<td>Leaf shape elliptic to orbicular; leaf margins somewhat undulate</td>
</tr>
<tr>
<td>111.</td>
<td>Leaf shape ovate to triangular; leaf margins flat</td>
</tr>
</tbody>
</table>
627

**Monograph of Gastrolobium**

86. Stipules absent or minute (<0.3 mm long); leaf shape triangular; inflorescence rachis pubescent with rust-coloured hairs ................................................. 101. *G. ferrugineum*

| Stipules prominent (1–3.5 mm long); leaf shape ovate; inflorescence rachis glabrous | 1. *G. spinosum* |

87. Stipules strongly recurved to reflexed .................................................. 88

| Stipules ascending to erect | .................................................. |

88. Leaves glaucous, fiercely pungent-pointed; ovules 2 ............................................. 60. *G. reflexum*

| Leaves not glaucous, semi-pungent; ovules 10–12 | ............................................. |

89. Leaves canaliculate ...................................................................................... 90

| Leaves flat or conduplicate, never canaliculate | ............................................. |

90. Leaf shape trullate, obturrate or rhombic ................................................ 35. *G. laytonii*

| Leaf shape ovate, elliptic, obovate or linear | ................................................ |

91. Stipules scarious, very long (>6 mm), sometimes fused at the base ............................................. 92

| Stipules rigid to hyaline, <5 mm long, never fused | ................................................ |

92. Stipules somewhat fused behind the leaf; leaves 10–16 × 3–4 mm; leaf base cuneate; leaves longitudinally recurved ............................................. 25. *G. densifolium*

| Stipules free; leaves 18–32 × 8–18 mm; leaf base rounded; leaves straight | ............................................. |

93. Leaf apex recurved; leaves <17 mm long .................................................. 34. *G. glaucum*

| Leaf apex straight; leaves >20 mm long | ................................................ |

94. Ovules 4–5; peduncle >15 mm long; rachis >20 mm long; inflorescence axes glabrous; stipules rigid ............................................. 61. *G. rigidum*

| Ovules 2; peduncle <10 mm long; rachis >25 mm long; inflorescence axes pubescent; stipules hyaline | ............................................. |

95. Petiole deciduous with the branchlet; leaves not crenulate; stipules >2.5 mm long; wing petals equal in length to the keel petals ............................................. 95

| Petiole not deciduous with the branchlet; leaves crenulate; stipules <2.5 mm long; wing petals longer than the keel petals | ............................................. |

96. Inflorescences axillary, or both axillary and terminal .................................. 97

| Inflorescences strictly terminal | ................................................ |

97. Calyx >8 mm long; petals all predominantly red ........................................ 98

| Calyx <8 mm long (or if >8 mm, then petals predominantly yellow to orange); standard yellow to orange with red markings | ........................................ |

98. Leaf margins recurved .................................................................................. 89. *G. vestitum*

| Leaf margins not or very scarcely recurved | ................................................ |

99. Calyx prominently zygomorphic; calyx hairs unicoloured; petiole not deciduous with the branchlet; wing petals auriculate on both margins; occurs in northern WA, NT, Qld and ?SA ............................................. 16. *G. grandiflorum*

| Calyx apparently actinomorphic; calyx hairs bicoloured (rarely unicoloured); petiole deciduous with the branchlet; wing petals auriculate only on the upper margin; occurs in south-western WA, specifically in the Stirling Range | ........................................ |

100. Flowers not resupinate, nutant; leaves narrowly oblong ................................ 90. *G. rubrum*

| Flowers resupinate, spreading to erect; leaves elliptic, rarely obovate or somewhat oblong | ........................................ |

101. Stipules <4 mm long; leaf apex truncate, rarely very slightly emarginate; subtending bracts >12 mm long .................................................. 88. *G. latifolium*

| Stipules >7 mm long; leaf apex prominently emarginate; subtending bracts <7 mm long | ................................................ |

102. Wing petals <16 mm long; inflorescence umbellate; leaves 50–65 × 20–40 mm; standard petal fully reflexed ............................................. 86. *G. leakeanum*

| Wing petals >20 mm long; inflorescence usually racemose, rarely umbellate; leaves 25–58 × 11–24 mm; standard petal not fully reflexed | ........................................ |

103. Calyx glabrous; standard petal c. 9 × 11 mm ............................................ 33. *G. floribundum*

| Calyx glabrous; standard petal c. 7 × 10 mm | ............................................ |

104. Leaves canaliculate ...................................................................................... 104

| Leaves flat, recurved or longitudinally folded up, never canaliculate | ........................................ |

105. Calyx moderately pubescent; standard petal c. 9 × 11 mm ................................ 33. *G. floribundum*

| Calyx glabrous; standard petal c. 7 × 10 mm | ............................................ |

106. Leaf apex strongly emarginate to bilobed, or ± tricuspidate, generally strongly recurved .............................................................................................. 107

| Leaf apex entire, without any lateral axes, not recurved | ........................................ |

107. Rachis >15 mm long; petiole not deciduous with the branchlet ............................................. 30. *G. polyestachyum*

| Rachis <4 mm long; petiole deciduous with the branchlet | ........................................ |

108. Leaves recurved, not undulate, oblong to cuneiform ................................ 50. *G. stowarii*

| Leaves flat; undulate, elliptic | ........................................ |

109. Leaves >10 mm broad; ovules 2 .................................................. 109. *G. lehmannii*

| Leaves <7 mm broad; ovules 4–8 | ................................................ |

110. Leaves <5 mm broad; pediole not deciduous with the branchlet; rachis >8 mm long (generally >20 mm long); usually with leaves of different sizes present along one branchlet ............................................. 42. *G. heterophyllum*

| Leaves >5 mm broad; petiole deciduous with the branchlet; rachis <8 mm long, usually in size along one branchlet | ........................................ |

111. Stipules absent or rarely minute (<0.3 mm long) ........................................ 108. *G. elegans*

| Stipules prominent | ................................................ |

112. Leaves erect and appressed to the branchlet; leaf shape elliptic ............................................. 79. *G. cruciatum*

| Leaves patent to broadly spreading; leaf shape triangular or ovate | ........................................ |

113. Leaves glaucous; leaf shape ovate to orbicular .................................................................. 105. *G. nudum*

| Leaves not glaucous; leaf shape elliptic, oblong or obovate | ........................................ |

114. Rachis >5 mm long .................................................. 115

| Rachis <1 mm long | ................................................ |

115.
I. The G. spinosum group

This group of Gastrolobium species all have spines, often dentate leaves with three or more pungent points per leaf and have terminal and/or axillary racemes, often with relatively large flowers.


Gastrolobium spinosum Bentham var. subinermefolium Domin, Vestn. Královské České Společnosti Nauk Třída Matematicko-Přírodovědecké 1921–22, 2 (1923b, p. 36). Type citation: ‘Bridgetown to Kojonup and Slab Hut Gully, A.A. Dorrien-Smith.’ Type specimen: holotype; K.


Low and bushy to erect and open shrubs, 0.3–3.5 m high. Branchlets spreading to ascending, angular, glabrous, often glaucous. Petioles <2 mm long, somewhat swollen, continuous and slightly decurrent with the branchlet. Leaves patent to spreading, very robust, opposite, narrowly to very broadly ovate, 6–40 × 7–32(–45) mm, glabrous, often glaucous, venation prominently reticulate; apex usually acute, rarely obtuse, often long and tapering, fiercely pungent-pointed; margins flat to irregularly incurved, dentate, with numerous spines particularly towards the base (commonly 4–9); base truncate to cordate. Stipules erect, triangular, hyaline, 1–3.5 mm long. Inflorescences terminal or axillary racemes, often with both on one plant, 1–3 per terminus or axil, 6- to more than 30-flowered; peduncle (0–8)–15 mm long; rachis 5–25 mm long; subtending bracts caducous, scale-like, ovate, lacerate, shorter than bud; 2.4–5.5 mm long. Pedicels terete, 1.1–1.5 mm long. Calyx campanulate, 6–7 mm long including the 1.1–1.5 mm receptacle, glabrous, lobes all recurved; upper 2 lobes united higher than the lower 3, rounded, 2.3–3.5 mm long; lower 3...
lobes triangular, acute, 2–3 mm long. Corolla: standard transversely elliptic, 9–13 × 9.5–13 mm including the 2.5–5.5-mm claw, yellow to orange with a red ring surrounding the yellow centre, apex emarginate, base truncate; wings ovate to obovate, 8–12 × 2.5–3.5 mm including the 2.4–5.5 mm claws, yellow to orange and red, apex rounded, not incurved to somewhat incurved, not enclosing keel, base auriculate on both margins, saccate; keel half transversely elliptic, margins not incurved, 8.5–11 × 3.5 mm including the 2.5–4-mm claws, pink and maroon, apex broadly rounded to subacute, base auriculate, saccate. Style long, incurved to slightly hooked, lower third pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, ellipsoid, 6–10 × 4–6 mm, glabrous. Seed reniform to ellipsoid, c. 3 mm long, arillate.

Notes on variation: Gastrolobium spinosum is an extremely variable species, in both leaf shape and size and flower size and has had several forms and varieties named in the past. However, these all intergrade at all stages, such that it is very difficult to identify any specimen falling into the middle of this morphological range. Also, some of these ‘forms’ were found to exist on one specimen (e.g. a specimen from Tarin Rock, west of Lake Grace, G. T. Chandler 281, contained G. spinosum forma inerme, forma angustum as well as forma spinosum). None of these subspecific taxa are being recognised in this treatment.

Vernacular name: prickly poison.

Flowering period: September–December. Fruiting period: from October in the north of its range to January in the south.

Distribution: south-western Western Australia. Occurs throughout the south-western region. (Fig. 31)

Habitat: grows in a wide range of habitats, from sandplains to mountain escarpment, on sandy soils to clay-loam soils in forest, woodland, mallee and heathland.


Toxicity: fluoracetate 0–400 μg g⁻¹ (McKewan 1964; Twigg et al. 1996b).

Affinity: this species resembles G. aculeatum, G. euryphyllum, G. triangulare, G. trilobum and G. wonganensis. Gastrolobium aculeatum differs by having light green leaves with 1 or 3 spines and umbellate inflorescences with 2 or 3 flowers. Gastrolobium euryphyllum can be distinguished by the large, glaucous leaves (although this character is shared by some specimens of G. spinosum), but mostly by the subtending bracts, which are longer than the bud that they subtend. Gastrolobium triangulare can be distinguished by the leaves, which have a strict triangular shape with 3 angles pointing at about 120° from each other and by the generally smaller flowers and fruits (e.g. calyx 4–6 mm long, standard 8.5–10 × 9–11.5 mm, pod 5–6 mm long). Gastrolobium trilobum differs by having 1 or 3 spines only (although some specimens of G. spinosum also have this feature), but the inflorescence can then distinguish these variants, as they are fewer-flowered (2–7-flowered) and have smaller flowers and fruits (e.g. calyx 4.5–5 mm long, standard 7–10 × 6.5–8.5 mm, pod c. 5 mm long). Gastrolobium wonganensis differs by having long, open, pubescent racemes with smaller flowers (rachis 35–50 mm long, calyx 4.5–5.5 mm long, standard 6.5–7.5 × 5.5–6.5 mm).


Frutices tenui erecti glauci, bracteis flores subtenentibus quam alabastris duplo longioribus; species ceterae spinosae Gastrolobii bracteis alabastris brevioribus.

Slender, erect, glaucous shrubs. The subtending floral bracts distinguish G. euryphyllum from all other spinose species of Gastrolobium, as they are about twice as long as the buds that they subtend.

Etymology: the specific epithet comes from the Greek (eury = broad and phyllum = leaf), referring to the particularly broad leaves of this species.

Slender, erect, glaucous shrubs, up to 2.5 m high. Branchlets ascending to erect, angular, glabrous, glaucous. Petioles terete, continuous and scarcely decurrent with the branchlet, c. 0.5 mm long. Leaves spreading, very robust, opposite, very broadly to transversely ovate, 14–28 × 19–41 mm, glabrous, venation somewhat obscured, pinnate; apex acute, fiercely pungent-pointed; margins not recurved, dentate, with 5 or 6 fiercely spinescent angles; base
cordate. Stipules erect, rigid, triangular, 2–2.5 mm long.

Inflorescences terminal racemes, 6–20-flowered; peduncle 4–6 mm long, glabrous; rachis 2–15 mm long; subtending bracts caducous, scale-like, entire, linear-lanceolate, longer than bud, c. 6 mm long, glabrous to sparsely pubescent. Pedicels terete, c. 1.5 mm long. Calyx campanulate, 8–9 mm long including the 1–1.5-mm receptacle, glabrous, lobes all recurved; upper 2 lobes united higher than the lower 3, rounded, 3–4 mm long; lower 3 lobes triangular, acute, 2.5–3.5 mm long. Corolla: standard transversely elliptic, 8.5–9 × 9–9.5 mm including the c. 2-mm claw, orange-yellow with a red ring surrounding the yellow centre, apex slightly emarginate, base truncate; wings oblong, 8.5–9 × 2.5–3 mm including the 2.5-mm claws, orange-yellow, red towards the base, apex rounded, not incurved, not enclosing keel, base auriculate on both margins, saccate; keel half very broadly obovate, very robust, margins not incurved, c. 9 × 3.5 mm including the 2.5-mm claws, deep maroon, apex rounded, base auriculate saccate. Style long, slightly hooked, lower third slightly pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, ellipsoid, 7–8 × 4–5 mm, glabrous. Seed ellipsoid, c. 4 mm long, arillate. (Fig. 3)


Distribution (Fig. 32): south-western Western Australia. Occurs around the Newdegate area.

Habitat: grows on rolling sand dunes in sand over laterite, in mallee or Allocasuarina shrubland.

Specimens examined: WESTERN AUSTRALIA, Roe District: near Lake Biddy, between Lake Grace and Newdegate, c. 33°00′S, 118°56′E, W.E. Blackall, 1388, 19.xi.1931 (PERTH); 46 km E of Pingaring along road to Varley, 32°44′S, 119°03′E, B. Barnsley 982, 29.i.1979 (CANB, PERTH).

Toxicity: unknown, but as it is related to G. spinosum, it is probably toxic.

Affinity: similar to the broader-leaved forms of G. spinosum, except that G. wonganensis is not always glaucous, has much smaller bracts and most specimens have some axillary inflorescences, whereas in G. euryphylhum the inflorescence is always terminal. It is also somewhat similar to G. wonganensis, except that this is a much smaller and bushier shrub (<1 m high), has smaller leaves (7–16–20 × 13–21–28 mm) with more spines (c. 10), the stipules are hyaline, the subtending bracts are trifid and smaller (3–4 mm long), the flowers are smaller (ca 4.5–5.5 mm long, standard 6.5–7.5 × 5.5–6.5 mm) and the inflorescence is longer (rachis 35–50 mm long) and pubescent.

3. Gastrolobium wonganensis G.Chandler & Crisp, sp. nov.


A speciminibus G. spinosum foliis parvis rotundis distincta foliorum spinis plus (7–10), inflorescentiae rachidibus pubescentibus et floribus parvioribus (e.g. vexillum 6.5–7.5 × 5.5–6.5 mm).

The greater number of spines (7–10), the pubescent inflorescence axes and the smaller flowers (e.g. standard 6.5–7.5 × 5.5–6.5 mm) distinguish G. wonganensis from the specimens of G. spinosum with small, round leaves.

Etymology: this species is named after the area where it occurs, Wongan Hills.

Low, dense, spreading shrubs, up to 0.7 m high. Branchlets spreading to ascending, somewhat angular, densely pubescent. Petioles terete, continuous but not decurrent with the branchlet, <0.5 mm long. Leaves spreading, opposite, with bases overlapping, transversely ovate, almost appearing semi-circular, 7–16(–20) × 13–21(–28) mm, glabrous, venation prominently reticulate; apex broadly rounded, fiercely pungent-pointed; margins not recurved, dentate, with 7–10 angles, each fiercely pungent-pointed; base slightly cordate. Stipules erect, hyaline, 1.5–2.5 mm long. Inflorescences terminal racemes, 14–21-flowered, peduncle and rachis moderately to densely pubescent; peduncle 9–15 mm long; rachis 35–50 mm long; subtending bracts caducous, scale-like, trifid, narrowly rhombic, 3–4 mm long, pubescent. Pedicels terete, 1–2.5 mm long. Calyx campanulate, 4.5–5.5 mm long including the 1-mm receptacle, moderately to densely pubescent, lobes all recurved to reflexed; upper 2 lobes united higher than the lower 3, acute, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard very broadly ovate, 6.5–7.5 × 5.5–6.5 mm including the 1.5–2–mm claw, yellow to yellow-orange with a red ring surrounding the yellow centre, apex emarginate, base truncate; wings obliquely elliptic, c. 7 × 2 mm including the 2-mm claws, yellow, apex rounded, not incurred, not enclosing keel, base auriculate on both margins, saccate; keel half transversely elliptic, margins not incurred, c. 7 × 3 mm including the 2-mm claws, maroon, apex rounded, base auriculate, saccate. Style long, incurved, lower third slightly pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, ellipsoid, 5.5–7.5 × 3–4 mm, glabrous. Seed not seen. (Fig. 4)

Flowering period: September and October. Fruiting period: unknown.

Distribution (Fig. 33): south-western Western Australia. Occurs only around the Wongan Hills area.

Habitat: grows on lateritic rises on clay-loam over laterite in open mallee woodland.

Specimens examined: WESTERN AUSTRALIA, Avon District: 0.5 km from the summit of Mt O’Brien, NW of Wongan Hills on Piawaning Rd, 30°51′S, 116°33′E, J.H. Ross 3589, 7.x.1992 (MEL); summit of Mt O’Brien, W of Wongan Hills, 30°50′16″S, 116°38′16″E, G.T. Chandler 548 et al., 21.ii.1998 (CANB); Wongan Hills, c. 1.5 km N of Wongan Hills (township) to Piawaning Rd and c. 13 km (by road) NW of the

Toxicity: unknown, but given its relationship to G. spinosum, it is likely to be toxic.

Affinity: very similar to the more typical forms of G. wonganensis, which can be distinguished from G. wonganensis by the fewer spines on the leaf (1–9), the glabrous inflorescence and the larger flowers (calyx 6–7 mm long, standard 9–13 × 9.5–13 mm). It is also similar to G. euryphyllum, which is a much larger and more-spindly shrub (up to 2.5 m high), has much larger leaves (14–28 × 19–41 mm) with fewer spines (5 or 6), the stipules are triangular and rigid, the subtending bracts are entire and larger (c. 6 mm long), the flowers are larger (calyx 8–9 mm long, standard 9–13 × 9–9.5 mm) and the inflorescence is shorter (rachis 2–15 mm long) and glabrous.

Type specimens: lectotype (here chosen): K (Port Gregory, Oldfield); iso: MEL, P

Low, spreading, dense, glabrous shrubs, 0.3–1.5 m high. Branchlets spreading to ascending, mostly terete, sometimes slightly angular, glabrous. Petiole very short, somewhat swollen at the base of the leaf, continuous but not decurrent with the branchlet, c. 0.5 mm long. Leaves broadly spreading, opposite, very broadly to depressed-triangular, 8–25 × 12–28 mm, older leaves sometimes glaucous, otherwise a light green colour, venation prominently reticulate, raised, intramarginal vein usually present; apex obtuse, all 3 angles with pungent points; margins entire or reticulate, raised, intramarginal vein usually present; apex otherwise a light green colour, venation prominently.

Fruit in August, but mostly in September–December.

Distribution (Fig. 34): this species occurs in an area north of Geraldton, from White Peak to around Northampton and Port Gregory and inland to Howatharra Hill.

Habitat: grows in sandy or sandy clay soils on rocky slopes and ridges, in low shrubland or heathland.

Selected specimens (19 examined): WESTERN AUSTRALIA, Irwin District: 36 km along the North West Coastal Hwy from Geraldton towards Northampton, 28°28′58″S, 114°38′04″E, G.T. Chandler 222 & W. Keys, 11.ix.1997 (CANB, MEL, PERTH); Howatharra Nature Reserve, 3.5 km towards Nanson from the turnoff on the North West Coastal Hwy (c. 30 km N of Geraldton), 28°32′52″S, 114°39′45″E, G.T. Chandler 224 & W. Keys, 11.ix.1997 (CANB, K); 36 km along the North West Coastal Hwy from Geraldton towards Northampton, 28°28′58″S, 114°38′04″E, G.T. Chandler 655 & S. Donaldson, 24.x.1998 (CANB, MEL); Woggrakine, H.W. Hawthorne s.n., 19.xi.1953 (PERTH); low sandstone hill close to North West Coastal Hwy, 10 mls [16 km] S of Northampton and 21 mls [33.5 km] N of Geraldton, 28°28′S, 114°38′E, R.J. Smith 66/391, 9.ix.1966 (CANB, MEL, PERTH).

Toxicity: unknown.

Affinity: Gastrolobium triangulare is similar to both G. spinosum and G. trilobum. Gastrolobium spinosum differs by having ovate leaves generally with numerous spines and the flowers and fruits are generally larger (e.g. calyx 6–7 mm long, standard 9–13 × 9.5–13 mm, pod 6–10 mm long). Gastrolobium trilobum differs in having ovate to triangular leaves and although it has three spines, they all generally point upwards, rather than having the lower two spines pointing either downwards or straight out.


Rigid, bushy, spreading shrubs, occasionally more slender and erect, 0.6–1.8 m high, glabrous, occasionally glaucous. Branchlets spreading to ascending, terete, sometimes with a decurrent rib from the petiole, glabrous. Petiole terete, continuous but not decurrent with the branchlet, 1–2 mm long. Leaves patent to spreading, opposite, ovate to subtriangular, rarely trullate, trilobed (rarely not and if not, at
least some leaves becoming trifolobed on the plant), 11–36 × 10–20 mm, glabrous, often glaucous, venation reticulate, with a major vein going from the prominent midrib to the lateral lobes, light to olive green; apex broadly triangular to quite long and lanceolate, pungent-pointed, lateral lobes broad and short or lanceolate, pungent-pointed; margins often somewhat conduplicate; base obtusely rounded to cuneate, rarely cordate (mostly in the Wongan Hills–Wyalkatchem area). Stipules erect, linear-triangular, c. 3 mm long. Inflorescences axillary, occasionally terminal, racemes (terminal particularly in the Wongan Hills–Wyalkatchem area), 2–7-flowered; peduncle 3–12 mm long; rachis 1–13 mm long; subtending bracts caducous, scale-like, trifid with somewhat fimbriate margins, triangular, c. 1.5 mm long, pubescent to glabrous. Pedicels terete, straight to curved to 90°, 2–3 mm long. Calyx tapered to the base, c. 4.5–5 mm long including the. 0.75–1.5-mm receptacle, pubescent to glabrous; lobes slightly recurved to reflexed; upper 2 lobes more or less united into an emarginate, truncate lip, c. 2 mm long; lower 3 lobes triangular, sometimes rounded, c. 1.5 mm long. Corolla: standard very broadly ovate to transversely broadly elliptic, 7–10 × 6.5–8.5 including the 2–3-mm claw, orange or yellow, with a central red ring surrounding the orange or yellow centre, apex emarginate, base cordate; wings obvate to nearly oblong, 6.5–10 × 2–2.5 mm including the 2–3-mm claw, orange or yellow, red towards the base, apex rounded, not incurved, not enclosing the keel, auriculate on both margins, slightly saccate; keel half obliquely elliptical, 7–10 × 2.5–3.5 mm including the 3–4-mm claw, deep maroon, apex almost black or rarely yellow, apex obtuse, base auriculate, saccate. Style long, incurved, lower half pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, ellipsoidal, c. 5 × 3 mm. Seed ellipsoid, c. 2 mm long, arillate.

Vernacular name: bullock poison.

Chromosome number: 2n = 16 (Sands 1975).

Flowering period: July–November. Fruiting period: from October.

Distribution (Fig. 35): occurs in the central to mid-western wheatbelt of Western Australia, from Brookton and Narrogin in the west, to Marvel Loch in the east and from Bindi Bindi in the north to Katanning in the south.

Habitat: grows on sandy soils in open woodland and mallee woodland.


Toxicity: purported to be toxic, but does not appear to have been tested. According to Gardner and Bennetts (1956), it has only rarely been implicated in stock loss.

Notes on variation: Gastrolobium trifolobum generally has three pungent points per leaf, but occasionally has only one. These leaves are often found on plants that have mostly three spines, but for some reason a particular branchlet produces leaves with only one spine, so it is important to examine the whole plant for the purposes of identification. Also, the leaves of G. trifolobum with only one spine often show signs of bulging out to either side of the apex, indicating an affinity to becoming trifolobed.

Affinity: Gastrolobium trifolobum is similar in appearance to G. triangularare and G. spinosum. Gastrolobium triangularare is easily distinguished by the strictly triangular leaves with the lower two spines pointing downwards or straight out, where G. trifolobum has a more ovate leaf with the lower two spines pointing upwards. Gastrolobium spinosum can be distinguished by usually having a greater number of spines (typically four to nine) per leaf, though some specimens have one or three spines, however, G. spinosum also has a greater number of flowers per inflorescence (6- to more than 30-flowered) and larger flowers and fruits (e.g. calyx 6–7 mm long, standard 9–13 × 9.5–13 mm, pod 6–10 mm long).


A speciebiss Gastrolobii foliis acipicibus 1–3 pungentibus distincta foliis glaucis, foliorum acipicibus maxime pungentibus, umbellis terminalibus 2–3-floribus.

The glaucous leaves and particularly sharp pungent apices of this species, together with the terminal, 2–3-flowered umbels, distinguish this species from the other spinose-leaved species of Gastrolobium that have 1–3 pungent apices.

Etymology: this specific epithet comes from Latin (aculeus = a prickle or very sharp point) and is named after the particularly needle-like apices of the leaves.

Erect, bushy shrubs, 1–2.5 m high. Branchlets ascending, terete to slightly angular, glabrous. Petioles terete, continuous but not decurrent with the branchlet, 1–1.5 mm
long. Leaves spreading, opposite, ovate, 10–20 × 6–13 mm, somewhat glaucous, venation prominently reticulate; apex acute, fiercely pungent-pointed, all three angles pungent-pointed when trilobed; margins slightly conduplicate, entire or trilobed (often both present on one specimen); base cordate to rarely truncate. Stipules erect, hyaline, 0.5–1 mm long. Inflorescences terminal umbels, 2-flowered (rarely 3-flowered); peduncle angular, 5–9 mm long; rachis absent; subtending bracts caducous, entire, obovate, c. 1 mm long. Pedicels tapering to the base, 3–4 mm long. Calyx campanulate, 6–7 mm long including the c. 0.5-mm receptacle, glabrous to sparsely pubescent, lobes all recurved; upper 2 lobes united higher than the lower 3, rounded, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard transversely elliptic, c. 11 × 11 mm including the 3-mm claw, orange-yellow with a red ring surrounding the yellow apex, apex entire, base truncate; wings significantly smaller than the keel, oblong, c. 11 × 3 mm including the 2-mm claw, orange-yellow, apex rounded, not enclosing the keel, base auriculate on both margins, saccate; keel half very broadly elliptic, 12–13 × 4 mm including the 3-mm claw, light yellow, apex obtuse, slightly spout-like, base auriculate, saccate. Style long, hooked, pubescent towards the base; ovary stipitate, densely pubescent; ovules 2. Pod prominently stipitate, ellipsoid, 8 × 4.5 mm, glabrous. Seed not seen. (Fig. 5)

Flowering period: September–November. Fruiting period: unknown.

Distribution (Fig. 36): south-western Western Australia. Occurs SE of Southern Cross, near Marvel Loch and Moorine Rock and east to Streich Mound, which is on the western edge of the Great Victoria Desert.

Habitat: grows on deep white or grey sand dunes, in mallee woodland or shrubland.

Specimens examined: WESTERN AUSTRALIA, Coolgardie District: along State Vermin Fence no. 7, 105 km SE of Southern Cross, 80 km S of Great Eastern Hwy, 31°51′S, 120°01′E, J. Dodd 207, 4.xi.1985 (CANB, PERTH); 29.4 miles [47 km] from Marvel Loch on mallee woodland or shrubland.

Type: Western Australia: Coolgardie District: Boorabbin Rock, 300 m to the NE (Boorabbin Rock is between Southern Cross and Coolgardie), 31°11′48″S, 120°17′16″E, G.T. Chandler 694 & S. Donaldson, 27 Oct. 1998 (holo: CANB; iso K!, MEL!, NSW!, PERTH!)

Frutices glauces foliis semi-teretibus et floribus magnis dense pubescentibus. G. involutum a hac species foliis non-glaucis, folii pagina omnino occultis, floribus parvioribus (e.g. calyx 7 mm longus, vexillum c. 11 mm longum), alis carinam excedentibus lobo solum in margine adaxialii et inflorescentia minime pubescenti superna differt.

Bushy, glaucous shrubs with semi-terete leaves and large, densely pubescent flowers. Gastrolobium involutum differs by the non-glaucous leaves, the upper leaf surface is completely obscured, the flowers are smaller (e.g. calyx 7 mm long, standard c. 11 mm long), the wings overlap the keel and are auriculate on the upper margin only and the inflorescence is much less pubescent.

Etymology: named after the semi-terete leaf shape of this species.

Open, multi-stemmed shrubs, 0.5–1.5 m high. Branchlets ascending, angular to almost terete, moderately pubescent. Petioles terete, continuous but not decurrent with the branchlet, 1.5–2.5 mm long. Leaves ascending, in whorls of 3, linear-oblong, 20–40 × 1–2 mm, sparsely pubescent along mid-vein, glabrous, often glaucous, venation prominently reticulate; apex oblong to rounded, slightly mucronate; margins thickened and canaliculate, forming a groove along the leaf such that the upper margin is barely visible; base tapering to the petiole. Stipules erect, vestigial, c. 0.2 mm long. Inflorescences terminal racemes, 7–20-flowered; peduncle angular, with or without apparently aborted buds at the base, 10–20 mm long; rachis angular, 25–50 mm long; subtending bracts caducous, scale-like, entire, narrowly triangular, 4–5 mm long, densely pubescent, especially at the base. Pedicels terete, 3–4.5 mm long. Calyx campanulate, 7–9 mm long including the c. 1-mm receptacle, densely pubescent, lobes may be slightly recurved; upper 2 lobes united higher than the lower 3, obtuse, sometimes united into an emarginate truncate lip, 2.5–3 mm long; lower 3 lobes

II. The G. bilobum group

This group of Gastrolobium species are often found on or around granite outcrops, or on sandy soils over granite. This group includes the type of the genus Gastrolobium, G. bilobum and also contains the G. parviflorum group, a common suite of species found throughout the central and southern wheatbelt of south-western Western Australia.

7. Gastrolobium semiteres G.Chandler & Crisp, sp. nov. Type: Western Australia: Coolgardie District: Moorine Rock Railway Bridge on Great Eastern Hwy, 31°20′19″S, 119°51′02″E, G.T. Chandler 901 et al., 16.ix.1999 (CANB, PERTH); ibid, G.T. Chandler 902 et al., 16.ix.1999 (CANB, PERTH); 6 km W of Moorine Rock Railway Bridge on Great Eastern Hwy, 31°20′S, 119°02′E, R.A. McKenzie 93/17, 7.ix.1993 (PERTH); 13 km SE of PNC Officer Base camp, 53 km NNE Streich Mound, 30°01′S, 123°52′E, D.J. Pearson 570, 23.i.1989 (PERTH).

Toxicity: unknown.

Affinity: this species resembles G. spinosum and G. trilobum. It can be distinguished from these two species, as G. trilobum has mostly axillary racemes that are 2–7-flowered and generally a darker leaf, compared with the 2- or 3-flowered umbels and the light green leaves of G. aculeatum. Gastrolobium spinosum is easily distinguished, having generally darker leaves with more spines per leaf (typically 4–9) and racemose inflorescences with a greater numbers of flowers (6- to more than 30-flowered).
triangular, acute, 2–2.5 mm long. Corolla: standard transversely elliptic, c. 13 × 12 mm including the 4-mm claw, yellow-orange with a red ring surrounding the yellow centre, apex emarginate, base truncate, slightly auriculate; wings oblong, c. 12 × 3.5 mm including the 4-mm claw, orange to orange-red, apex rounded, not incurved, not enclosing the keel, base auriculate on both margins, not saccate; keel half transversely broadly obovate, margins not incurved, c. 12 × 4 mm including the 4-mm claws, maroon, apex rounded, base auriculate, saccate. Style long, incurved to slightly hooked, lower half pubescent along inner margin; ovary shortly stipitate, densely pubescent; ovules 4 or 5. Pod stipitate, obliquely elliptic, 7–9 × 3–4.5 mm, densely villous. Seed not seen. (Fig. 6)

Flowering period: August–October. Fruiting period: November and December.

Distribution (Fig. 37): has a narrow distribution in the sandplains around Boorabbin Rock (E of Southern Cross) and south to Disappointment Rock (SE of Southern Cross).

Habitat: grows on broad sand dunes or deep yellow sand over granite in open mallee and Acacia heath.

Specimens examined: WESTERN AUSTRALIA, Coolgardie District: Kooraraswalyee, 0.5 km along Yilgarn Barrier Fence, c. 35 km E of Yellowdine, 31°16′44″S, 120°00′08″E, G.T. Chandler 880 et al., 15.ix.1999 (CANB, MEL, PERTH); Boorabbin, 31°12′30″S, 120°15′36″E, G.T. Chandler 878 et al., 15.ix.1999 (CANB, PERTH); Disappointment Rock, 32°07′36″S, 120°53′37″E, R. Davis 8969, 22.xi.1999 (CANB, PERTH); 300 m NE of Boorabbin Rock, 31°11′48″S, 120°17′16″E, G.T. Chandler 695 & S. Donaldson, 27.x.1998 (CANB); ibid, G.T. Chandler 696 & S. Donaldson, 27.x.1998 (CANB, MEL); Boorabbin, 31°11′S, 120°17′E, C.A. Gardner 13870, 15.xii.1961 (CANB, PERTH); Boorabbin Rock and near vicinity, 31°12′S, 120°17′E, T. Houston 408-32, 4-9.x.1981 (PERTH); 67 miles [109 km] E of Southern Cross, 31°11′S, 120°17′E, J.R. Knox 65x087, viii.1965 (PERTH); 24 km W of Boorabbin, 31°17′S, 120°00′E, K. Newhey 8385, 28.vii.1981 (PERTH).

Toxicity: unknown.

Affinity: Gastrolobium semiteres is similar in appearance to G. involutum, but G. involutum does not have glaucous leaves, the upper leaf surface is completely obscured, the flowers are smaller (e.g. calyx 7 mm long, standard c. 11 mm long), the wings overlap the keel and are auriculate on the upper margin only and the inflorescence is not very hairy.


Bushy, erect shrubs, up to 3 m high. Branchlets ascending, angular to almost terete, moderately pubescent. Petioles terete, continuous and partly decurrent with the branchlet, 1.5–3 mm long. Leaves broadly spreading, crowded along stem, internodes very short, generally opposite, but may be scattered, whorled or alternate, linear or linear-obovate, 14–45 × 2–4 mm, glabrous, venation prominently reticulate; apex subacute to broadly rounded, unarmed, slightly recurved; may have a tiny, blunt mucro; margins conduplicate so that upper surface is often not visible; base cuneate. Stipules inconspicuous, erect, hyaline, <1 mm long. Inflorescences terminal racemes, 10- to more than 30-flowered, flowers very crowded along rachis; peduncle 1–4 mm long; rachis 10–50 mm long; subtending bracts caducous, scale-like, entire, lanceolate, keeled, c. 2 mm long, moderately pubescent. Pedicels 2–3 mm long. Calyx campanulate, 4.5–5.5 mm long including the c. 1-mm receptacle, moderately to densely sericeous, lobes not or scarcely recurved; upper 2 lobes united higher into an almost truncate lip, rounded, c. 2 mm long; lower 3 lobes triangular, acute, 1.5–2 mm long. Corolla: standard transversely ovate, c. 8.5 × 8.5 mm including the 3-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base cordate, slightly auriculate; wings obovate, c. 9 × 3 mm including the 3-mm claws, orange, apex rounded, incurved and slightly overlapping to partly enclose the keel, base auriculate on both margins, saccate; keel half very broadly elliptic, margins incurved, c. 8.5 × 2.5 mm including the 3-mm claw, pink and maroon, apex rounded, slightly spout-like, base auriculate, saccate. Style long, incurved to slightly hooked, lower third pubescent; ovary shortly stipitate, densely pubescent; ovules 2. Pod shortly stipitate, ovoid, 6–7 × 2.5–3 mm, moderately pubescent. Seed ellipsoid, c. 2.5 mm long, arillate.

Vernacular names: Phillips River poison; narrow-leaved poison.


Distribution (Fig. 38): south-western Western Australia. Occurs along the rivers of Fitzgerald River National Park, extending north to near Ravensthorne and west to near Jeramungup, where it grows around granite outcrops away from rivers.

Habitat: this species prefers sandy soils over granite, often found at the base of granite outcrops or along rivers with granite rocks, in woodland, shrubland or heath.

Conservation status: ROTAP: 3KC-. CALM: P3. This species is poorly known and may in fact occur quite widely throughout the south coast of SW Western Australia on small granite outcrops on farm properties. Further survey work is needed to determine its conservation status.


Toxicity: fluoroacetate 90 µg g–1 (Aplin 1971).

Affinity: the crowded leaves make this species difficult to confuse with any other Gastrolobium, especially when combined with the crowded racemes. The inflorescence and
fruits are somewhat similar to those of *G. bilobum*, but the leaves of *G. bilobum* are not linear and do not have recurved margins and the rachis is much shorter (2–10 mm long). The foliage of *G. stenophyllum* is similar to that of *G. tenue*, but *G. tenue* is finely pungent-pointed, the inflorescence is not crowded and has fewer flowers (4–10-flowered) and the subtending bracts are persistent and trifid.


*Gastrolobium forrestii* Ewart in Ewart, White & Tovey, *J. Proc. R. Soc. New South Wales* 42: 188 (1908). Type citation: ‘Blackwood River, W.A., Sir John Forrest; W. Aust. 1889; Gordon River in forest land 1877’. *Type specimens: lectotype (here chosen): MEL (624683); isolectotype, BM, K (2 sheets), MEL (624682), PERTH*

**Erect shrubs**, 1–2 m high. **Branchlets** ascending, angular, sparsely to moderately pubescent. *Petioles* terete, continuous and sometimes decurrent with the branchlet, 1.5–3 mm long. **Leaves** spreading to ascending, whorled or rarely opposite, elliptic or linear to cuneate (juvenile leaves in particular are often cuneate), 20–33(–61) × (2.5–)5–10 mm, upper surface glabrous, lower surface sparingly to densely pubescent, venation prominently reticulate, raised on the upper surface; apex usually retuse, rarely truncate, mucromate, recurved or straight; margins entire, recurved, revolute or occasionally flat; base rounded. **Stipules** erect, hyaline, 2–3.5 mm long. **Inflorescences** terminal racemes, 20–40-flowered; **peduncle** (5–)11–58 mm long; **rachis** 75–116 mm long; **subtending bracts** caducous, scale-like, entire, subulate, 2–4 mm long. **Pedicels** terete, 1–2 mm long. **Calyx** campanulate, 4–6 mm long including the c. 1-mm receptacle, sparsely to moderately pubescent, lobes not recurved; upper 2 lobes united higher than the lower 3, triangular, acute, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2 mm long. **Corolla**: standard transversely obovate, c. 9 × 10 mm including the c. 4-mm claw, yellow to yellow-orange, apex emarginate, base cordate, auriculate; wings obovate, lower margin reflexed to expose the keel, c. 8.5 × 2.5 mm including the c. 2-mm claw, yellow to orange, apex rounded, not incurved, not enclosing the keel, base auriculate on the upper margin only; keel half transversely elliptic, turgid, margins not incurved, c. 4 × 2 mm including the c. 2-mm claws, orange-red, red or pink, apex with an acicular beak, base auriculate, saccate, with a circular opening near the claws to expose the stamens from below. **Style** short, straight but at 45 degrees to the ovary, lower third pubescent; **ovary** stipitate, densely pubescent; **ovules** 2. **Pod** stipitate, ellipsoid, 6.5–8 × 3.5–4 mm, moderately pubescent. **Seed** reniform, c. 2.5 mm long, arillate.

**Vernacular name**: river poison.

**Flowering period**: September–February. **Fruiting period**: November–February.

**Distribution** (Fig. 39): south-western Western Australia. Distributed throughout the Darling escarpment, from Pinjarra south to Margaret River, east to Albany and the Porongurup Range.

**Habitat**: grows in fairly moist areas usually on loam or clay soils in eucalypt forest or woodland, or swampy areas.


**Notes on nomenclature**: the name commonly used for this species is *Gastrolobium forrestii*. However, a search of the literature uncovered the earlier name *G. cuneatum* that matches the description of *G. forrestii*. The type is a plate, which is unambiguously the same as *G. forrestii*.

**Toxicity**: highly toxic; fluoroacetate 1200 µg g⁻¹ (*Aplin 1971*, as *G. forrestii*).

**Affinity**: some specimens seen have foliage superficially similar to *G. bilobum*, but the inflorescence structure of *G. bilobum* is different, having quite a short rachis (2–10 mm long) with the flowers crowded along its length (internodes 1–2 mm long), compared with *G. cuneatum* (>5, often >10 mm long).


Open, often weeping shrubs, 1–3 m high. **Branchlets** ascending, angular, moderately sericeous. **Petioles** terete, continuous and sometimes decurrent with the branchlet, 2–3 mm long. **Leaves** spreading to ascending, opposite or whorled, linear-elliptic or linear-ovobate (30–)38–56 × 2–2.5 mm, upper surface glabrous but with raised venation, lower surface sparingly to moderately sericeous, venation prominently reticulate; apex rounded, unarmed; margins entire, usually recurved; base cuneate. **Stipules** erect, hyaline, 0.5–1.5 mm long. **Inflorescences** terminal racemes, 6–24(–32)-flowered; **peduncle** (5–)17–35 mm long; **rachis** 33–80(–200) mm long; **subtending bracts** caducous, scale-like, entire, linear-lanceolate, 3–4 mm long. **Pedicels** terete, 2.5–4 mm long. **Calyx** campanulate, 6–8 mm long including the 1–1.5-mm receptacle, moderately sericeous, lower 3 lobes sometimes recurved; upper 2 lobes united
higher than the lower 3, broadly triangular, apex rounded, 3–3.5 mm long; lower 3 lobes triangular, acute, 2–3 mm long. **Corolla**: standard transversely elliptic, 11–12.5 × 11–12 mm including the 3.5–4-mm claw, yellow or orange, with a red ring surrounding the yellow centre, apex emarginate, base obtuse; **wings** obovate, c. 11 × 3–3.5 mm including the c. 3-mm claw, yellow or orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, slightly saccate; **keel** half circular, margins slightly incurved, c. 11 × 3.5–4 mm including the 3–3.5-mm claw, pink or maroon, sometimes appearing brown when old, apex rounded, base auriculate, saccate. **Style** long, incurved or hooked, glabrous or with hairs in the lower third; **ovary** stipitate, densely pubescent; **ovules** 2. **Pod** stipitate, ellipsoid, 8–9 × 4–6 mm, sparsely to moderately pubescent. **Seed** reniform, c. 2.5 mm long, arillate.

**Vernacular name**: rock poison.

**Flowering period**: September–November. **Fruiting period**: from late October to December.

**Distribution** (Fig. 40): south-western Western Australia. Occurs on the northern sandplains and mallee regions, from Jurien Bay and Moora in the north to Wongan Hills and Goomalling in the south.

**Habitat**: usually found on the margins of granite outcrops, more rarely on siltstone, on sandy soils, in woodland dominated by *Eucalyptus* or *Allocasuarina*.

**Conservation status**: IUCN: R (rare). ROTAP: 3RCi. CALM: P4. This species is rare, though it is well surveyed and not considered to be at risk.

**Selected specimens** (36 examined): due to the conservation status of this species, detailed localities are not given. WESTERN AUSTRALIA, Avon District: Dingo Rock, B.H. Smith 991, 2.x.1987 (CANB, DAV, HO, LEN, MEL, NSM); Mt Caroline Granite area, F.H. & M.P. Mollemans 3523, 3.x.1990 (PERTH); Wongan Hills area, M.J. Fitzgerald 11, 12.ix.1993 (PERTH); Mt Stirling, K. Newby 1568, 22.x.1964 (PERTH; Irwin District: N of Watheroo, M.G. Corrick 10689, 24.x.1991 (MEL, PERTH); Dandaragan, R.D. Royce 5126, 20.ix.1955 (PERTH; Carnamah, A. Morrison 16347, 7.xi.1906 (CANB, K); SE of Jurien Bay, F.C. Vasek 681008-83, 8.x.1968 (CANB).

**Toxicity**: very toxic; fluoroacetate 100–1000 µg g⁻¹ (Aplin 1971).

**Affinity**: the weeping habit and flat leaves of *G. callistachys*, combined with the long racemes, make this species difficult to confuse with any other species of *Gastrolobium*. The irregularly grouped leaves, which are evident upon close inspection, distinguish it from *G. bilobum* and *G. stenophyllum*, which also differ by having a raceme with very short internodes (<1.5 mm long), whereas *G. callistachys* has long, open racemes (up to 10 mm long).


**Haece species non nisi in colibus duobus graniticis habitat, speciei ulla altera difficili confundere, foliis magnis oblongis [45–80(–110) × (2–)3–6(–8) mm] et floribus magnis (e.g. vexillum 10–12.5 × 13.5–14 mm) distinguenda.**

The large, oblong leaves [45–80(–110) × (2–)3–6(–8) mm] and the large flowers (e.g. vexillum 10–12.5 × 13.5–14 mm) of this narrowly endemic granite outcrop species make it difficult to confuse with any other.

**Etymology**: this specific epithet comes from the Greek *(acro = hill or peak and Carolus = Charles)* is named after Peak Charles, where it is endemic.

Erect, open shrubs, 1–2.7 m high. Branchlets ascending, angular, glabrous to sparsely pubescent. **Petiole** terete, slightly swollen at base, continuous and sometimes slightly decurrent with the branchlet, 5–7 mm long. **Leaves** ascending, opposite, linear-oblong to linear-elliptic, 45–80(–110) × (2–)3–6(–8) mm, glabrous or very slightly pubescent on the abaxial surface, venation prominently reticulate; apex rounded to truncate, usually mucronate, occasionally emarginate; margins entire, recurved to slightly so; base cuneate or slightly rounded. **Stipules** erect, narrowly triangular, 0.5–1.5 mm long. **Inflorescences** terminal racemes (5–)7–16-flowered; **peduncle** (5–)8–15(–23) mm long; **rachis** 17–30(–45) mm long; **subtending bracts** caducous, scale-like, minutely triobed (often appearing entire), c. 2 mm long, slightly pubescent. **Pedicels** terete, 3–5.5 mm long. **Calyx** campanulate, 7–9 mm long including the 1–1.25-mm receptacle, glabrous to sparsely pubescent, lobes not recurved; upper 2 lobes united higher than the lower 3, triangular, obtuse, 3–3.5 mm long; lower 3 lobes triangular, acute or slightly obtuse, 2.5–2.75 mm long. **Corolla**: standard transversely elliptic, 10–12.5 × 13.5–14 mm including the 3–4-mm claw, orange, rarely yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate; **wings** oblong, 10.5–12 × 3.5–4.5 mm including the 3–3.5-mm claw, orange, rarely yellow, apex rounded, incurved and touching, not overlapping, mostly enclosing the keel, base auriculate on both, slightly saccate; **keel** half very broadly elliptic, margins rolled inwards, 10–12 × c. 4 mm including the 3–4-mm claw, white with a pink apex, very rarely yellow, apex obtuse, base auriculate, saccate. **Style** long, incurved, lower half pubescent; **ovary** stipitate, densely pubescent; **ovules** 5 or 6. **Pod** stipitate, fusiform or ellipsoid, 12–15 × 22–30(–35) mm, glabrous. **Seed** not seen. (Fig. 7)

**Flowering period**: September–November, with some flowers present on one collection made in April. **Fruiting period**: from November.

**Distribution** (Fig. 41): south-western Western Australia. This species has a very narrow distribution, being endemic to Peak Charles and a nearby granite outcrop.
Habitat: grows on granite outcrops in well-drained areas with skeletal soils, in open shrubland or dense heath with Acacia, Callothamnus and Labichea.


Toxicity: unknown.

Affinity: it is difficult to confuse G. acrocaroli with any other species of Gastrolobium, due to the size and shape of the leaves and the large flowers, although some specimens have been identified as G. parviflorum in the past. It is easy to tell the difference between these species, as G. parviflorum has shorter leaves (10–35 × 3–11 mm) and much smaller flowers (e.g. calyx 4–6 mm long, standard 6.5–8 × 8–10 mm).


Ob folia linearia valde involuta et habitacionem circa colles graniticos facile distinguenda. G. semitereti similis, quae folis glauces, folii superficie superna omnino vel partim visibile, floribus majoribus (calyx ad 9 mm longus, vexillum c. 13 mm latum), aliis carinam non excedentibus et lobis in ambo marginibus, inflorosentia valde villosa differt.

This species is distinctive by its strongly involute, linear leaves and its occurrence around granite outcrops in the far east of south-western Western Australia. It is similar in appearance to G. semiteres, which differs in having glaucous leaves, with the upper leaf surface wholly or partially visible, larger flowers (calyx up to 9 mm long, standard c. 13 mm broad), the wings not overlapping the keel and auriculate on both margins and the inflorosence strongly villous.

Etymology: this species is named after the involute leaves.

Erect, spreading shrubs, 1.2–3 m high. Branchlets ascending, angular, sparsely pubescent. Petioles terete, continuous and decurrent with the branchlet, c. 1 mm long. Leaves ascending, opposite to scattered, linear, 18–40 × 0.5–1 mm, ± glabrous, venation reticulate; apex truncate, slightly mucronate, slightly recurved; margins involute, with upper surface completely obscured making the leaves appear terete; base tapering into the petiole. Stipules erect, minute, <0.5 mm long. Inflorescences terminal racemes, 6–14-flowered; peduncle angular, 10–20 mm long; rachis angular, 13–45 mm long; subtending bracts caducous, somewhat trifid, narrowly triangular, <1 mm long. Pedicels terete, 1–1.5 mm long. Calyx campanulate, 6–7 mm long, ± glabrous, lobes not recurved; upper 2 lobes united into an almost truncate lip, rounded, c. 2 mm long; lower 3 lobes triangular, obtuse, c. 1.5 mm long. Corolla: standard transversely ovate, c. 12 × 11 mm including the 4-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base cordate; wings obovate, c. 8 × 3 mm including the 3-mm claw, orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on upper margin only, saccate; keel half transversely elliptic, turgid, margins not incurved, c. 6 × 2 mm including the 3-mm claw, pink to maroon, apex rounded, base auriculate, saccate. Style long, straight, only the apex is incurved to hooked, scarcely sericeous at base; ovary shortly stipitate, shortly sericeous; ovules 4–6. Pod and seed not seen. (Fig. 8)

Flowering period: June–November. Fruiting period: unknown.

Distribution (Fig. 42): south-western Western Australia. Grows in a restricted region on granite outcrops in the area around Mt Buraminya, SE of Norseman.

Habitat: grows at the base of granite outcrops on sandy soils, in woodland or tall shrubland.

Specimens examined: WESTERN AUSTRALIA, Roe District: Mt Andrew, c. 118 km SE of Norseman, 32°40'S, 122°56'E, K. Newbey 7784, 23.ix.1980 (CANB, PERTH); 33.5 km N of Mt Buraminya, c. 28 km NW of Mt Coobaninya, 32°55'S, 123°06'E, W. Archer 22099014, 22.ix.1990 (CANB, NSW, PERTH); c. 40 km NW of Mt Ragged, lower slopes of Mt Buraminya, 33°14'S, 123°07'E, W. Archer 809908, 8.xi.1990 (CANB, MEL, NSW!); ibid, W. Archer 1606906, 16.vi.1990 (CANB, HO, PERTH).

Toxicity: unknown.

Affinity: Gastrolobium involutum is similar in appearance to G. semiteres, which differs in having glaucous leaves, the upper leaf surface wholly or partially visible, larger flowers (e.g. calyx up to 9 mm long, standard c. 13 mm broad), the wings not overlapping the keel and auriculate on both margins and the plant is generally more pubescent, particularly the villosineflorescence.


Erect, open, shrubs, 1–2.5 m high. Branchlets ascending, angular, sparsely to moderately pubescent. Petioles terete, continuous but not decurrent with the branchlet, 5–7 mm
long. Leaves spreading, opposite, elliptic to rarely obovate, 48–62 × 19–32 mm, glabrous to sparsely pubescent, venation prominently reticulate, raised; apex rounded, unarced or slightly mucronate; margins slightly undulate, not recurved; base cuneate. Stipules erect, narrowly triangular to hyaline, 2–3 mm long. Inflorescences terminal racemes, more than 30-flowered; peduncle 5–12 mm long; rachis 30–75 mm long; subtending bracts caducous, scale-like, entire, lanceolate, 2–3 mm long. Pedicels terete, 2.5–4 mm long. Calyx campanulate, 6–8 mm long, lobes usually recurved, upper lobes sometimes straight, sparsely to densely pubescent; upper 2 lobes united higher than the lower 3, acute to rounded, 2–4 mm long; lower 3 lobes triangular, acute, c. 3 mm long. Corolla: standard transversely ovate, reflexed, 13–15 × 15.5–16.5 mm including the 4–5-mm claw, yellow-orange with a red ring surrounding the yellow centre, apex shallowly emarginate, base slightly cordate, auriculate; wings ovate to obovate, 13–14 × 3.5–5 mm including the 4–5-mm claw, yellow-orange to red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, slightly saccate; keel half circular or very broadly elliptic, margins not incurved, 12–13.5 × 4–4.5 mm including the 4–5-mm claw, pink or red, apex obtuse, base auriculate, saccate. Style long, incurved, lower half pubescent; ovary stipitate, densely pubescent; ovules 6 or 7. Pod stipitate, ovate to elliptic, 9–14 × 4.5–7 mm, glabrous. Seed reniform, 4–4.5 mm long, arillate.

Vernacular name: granite poison.

Flowering period: August and September. Fruiting period: from October.

Distribution (Fig. 43): south-western Western Australia. Restricted in distribution, occurring only around the Coolgardie area, with an outlier in a little-explored region south of Merredin.

Habitat: grows around the margins of granite outcrops, particularly along the drainage lines, on sandy soils in open woodland.

Conservation status: IUCN: E. ROTAP: 2ECl. CALM: R. This species is quite rare, though fairly widespread and is considered to be endangered. Two populations were observed during this study that were in reserves, of which one was recovering after what appeared to be a disease affecting the population.

Selected specimens (18 examined): due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA, Coolgardie District: Queen Victoria Rocks, S of Coolgardie, G.T. Chandler 874 et al., 14.ix.1999 (CANB, NSW, UWA); Bullabulling, C.A. Gardner s.n., xi.1948 (CANB, PERTH); Gnamma Hill, S.D. Hopper 4582, 14.ix.1985 (PERTH).

Toxicity: highly toxic; fluoroacetate 1240 µg g⁻¹ (Aplin 1971). Gardner and Bennetts (1956) reported that G. graniticum is highly toxic at all growth stages.

Affinity: similar to G. racemosum, which differs in having a relatively narrower leaf and shorter petiole {leaf size [(20–)25–46 (–60) × (5–)8–13 (–35) mm], petiole 4–6 mm long}, a shorter inflorescence with fewer flowers (rachis 25–50 mm long, which is 15–30-flowered), a glabrous inflorescence, standard petal with a distinctive apricot colour and the style equal in length to the ovary, whereas in G. graniticum it is longer than the ovary.


Bushy, erect shrubs or rarely a small tree, up to 4 m high. Branchlets ascending, angular with decurrent ribs, moderately to densely sericeous. Petaloes terete, continuous and decurrent with the branchlet, 1–5 mm long. Leaves spreading to ascending, in whorls of 3 or 4, rarely opposite, cuneiform, obovate or elliptic, sometimes narrowly so (particularly the Stirling Range form), 10–40(–50) × 5–15(–20) mm, upper surface glabrous, lower surface glabrous to sparsely sericeous, venation prominently reticulate; apex emarginate, often appearing bilobed, occasionally almost truncate, unarced or with a tiny mucro; margins not or scarcely recurved; base cuneate, obtuse or slightly rounded. Stipules erect or slightly recurved, hyaline, 2–6 mm long. Inflorescences terminal racemes, sometimes terminal on short axillary shoots, flowers very crowded with floral internodes very short (<1.5 mm long), >20-flowered; peduncle angular, 1–15 mm long; rachis angular, crowded with pedicels, 2–10 mm long; subtending bracts caducous, scale-like, entire, linear-lanceolate, 2–3.5 mm long, margins lacerate. Pedicels longer than calyx, terete, 5–7 mm long. Calyx campanulate, 4–5 mm long including the 0.75–1 mm receptacle, glabrous to sparsely pubescent, upper 2 lobes straight or recurved, lower 3 lobes recurved; upper 2 lobes united higher than the lower 3, triangular, acute, 2–3 mm long; lower 3 lobes triangular, acute, 1.5–2.5 mm long. Corolla: standard transversely elliptic to transversely ovate, 6–7 × 7–9.5 mm including the 2.25–5.5 mm claw, yellow or yellow-orange with a red ring surrounding the yellow centre, apex emarginate, base truncate to slightly cordate; wings obovate, 6.5–9 × 2–3 mm including the c. 2-mm claws, yellow and orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on upper margin only, rarely auriculate on both, saccate; keel half elliptic to transversely elliptic, boat-shaped, margins not incurved, 6.5–8.5 × c. 2 mm including the 2–3-mm claw, maroon, apex rounded, base auriculate, saccate. Style long, strongly incurved to slightly hooked, pubescent in the lower third; ovary stipitate, densely pubescent; ovules 2. Pod stipitate,
ovoid, often obliquely so, apex beaked, 7–8 × 3–4 mm, glabrous to moderately pubescent. Seed ellipsoid, c. 3–3.5 mm long, arillate.

Vernacular name: heart-leaved poison.

Flowering period: August (in the north) to December in the far south. Fruiting period: October–January.

Distribution (Fig. 44): south-western Western Australia. This species is found in the Darling Escarpment, east of Perth, south to the Bunbury and Margaret River districts and east through the Albany region and Cape Riche; then there is a curious disjunction to the east, where no collections have been made, until the Esperance area, where it then extends to Cape Arid and inland as far as Mt Beaumont, Mt Heywood and Mt Ridley (all granite outcrops).

Habitat: grows around granite peaks and outcrops and along rivers. Occurs on a variety of soils, but mostly over granite. Vegetation types include karri and marri forest, mallee and heath.


Toxicity: highly toxic; fluorocacetate 730–2650 (seeds up to 6200) µg g⁻¹ (Aplin 1971; Twigg et al. 1996b), probably making G. bilobum the most toxic of all species of Gastrolobium, although seeds for many species have not been tested.

Affinity: this species bears a close resemblance to G. tergiversum and the narrow-leaved Stirling Range form is vegetatively similar to G. cuneatum, though the long, open racemes of G. cuneatum (75–116 mm long) immediately identify this species, as do the narrower leaves (2.5–10 mm broad) and relatively shorter pedicels (which are shorter than the calyx). Gastrolobium tergiversum has light green leaves and orange flowers, as opposed to the dark green leaves and yellow flowers of G. bilobum. The most-striking differences, however, occur in the floral structures. Gastrolobium tergiversum has an unusual keel, which is barely auriculate and not at all saccate at the base and is long and tapering (c. 9.5 × 1.5 mm), the wings do not enclose the keel and the style is not or barely incurved.

15. Gastrolobium tergiversum G.Chandler & Crisp, sp. nov.

Type: Western Australia: Roe District: Base of Mt Ragged, NW side, along track to summit, 33°26′45″S, 123°27′56″E, G.T. Chandler 812 & S. Donaldson, 12 Nov. 1998 (holo: CANB; iso: AD!, BR!, K!, MEL!, NSW!, PERTH!)

G. bilobum similis sed foliis dilutis viridibus, floribus aurantiacis, carina vix auriculata non saccata et stylo fere recto differt.

Similar to G. bilobum, but differing in the light green foliage, orange flowers, the keel petal, scarcely auriculate and not saccate and the almost straight style.

Etymology: the specific epithet comes from the Latin (terg = back and versum = turned about) and refers to the fact that the leaf is concave and paler above, the reverse to most leaves, especially by comparison with the closely related G. bilobum, which is paler below and flat to slightly convex.

Slender to open, erect shrubs, 1.5–2 m high. Branchlets ascending, angular, moderately to densely pubescent. Petioles terete, continuous and decurrent with the branchlet, 2–3 mm long. Leaves ascending, generally in whorls of 3, occasionally appearing opposite with the third leaf slightly further along the stem and appearing as a separate node, obovate or rarely elliptic, 15–24 × 5–7 mm, glabrous, venation thick on the upper surface and difficult to see, prominently reticulate on the lower surface; apex deeply emarginate, often almost bilobed, unarmed; margins slightly conduplicate or almost flat; base cuneate. Stipules inconspicuous, erect, <0.5 mm long. Inflorescences terminal racemes, 10–25-flowered, flowers crowded along rachis; peduncle angular, 1–3 mm long; rachis angular, 5–8 mm long; subtending bracts caducous, scale-like, entire, ± ovate, keeled, <1 mm long, moderately pubescent. Pedicels terete, 2–3 mm long. Calyx tapering to the base, 7–8 mm long including the c. 1.5-mm receptacle, moderately sericeous, lobes not recurved; upper 2 lobes united higher than the lower 3, rounded, 2.5–3 mm long; lower 3 lobes triangular, acute, 2–2.5 mm long. Corolla: standard transversely ovate, c. 11 × 9.5 mm including the 3-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; wings obliquely obovate, 11 × 3 mm including the 2.5-mm claws, orange-yellow, red towards the base, apex rounded, not incurved, keel exposed, base barely auriculate on upper surface only, not saccate; keel half elliptic, boat-shaped, margins not incurved, 9.5 × 1.5 mm including the 2-mm claws, pink and red, apex acute, base barely auriculate, not saccate. Style long, barely incurved, base slightly pubescent; ovary stipitate, moderately pubescent; ovules 2. Pod and seed not seen. (Fig. 9)

Flowering period: October–February. Fruiting period: unknown.
**Distribution** (Fig. 45): south-western Western Australia. This species is restricted to Mt Ragged and nearby Gora Hill, in Cape Arid National Park.

**Habitat:** grows towards the base of outcrops, on sandy soils over granite and quartzite, in mallee heath.

**Specimens examined:** WESTERN AUSTRALIA, Roe District: Mt Ragged. Cape Arid NR, 33°27’S, 123°28’E, R.D. Rowe 10106, 5.xii.1971 (PERTH); Mt Ragged, 33°27’S, 123°28’E, R.A. Kilgour 490, 31.xi.1984 (MEL, PERTH); ibid., M. Hislop 1955, 15.xii.1999 (CANB, PERTH); ibid., S. Barrett 463, 26.ix.1995 (PERTH); ibid., L. Sweedman 3093, 20.xi.1993 (PERTH); ibid., A.S. George 2108, 7.xii.1990 (PERTH); ibid., L. Cyzer 437 et al., 10.xi.1998 (CANB); ibid, G.T. Chandler 344 et al., 10.xi.1998 (CANB, UIWA); 10 miles [16 km] SW of Mt Ragged, 33°33’S, 123°22’E, A.S. George 2051, 6.xii.1990 (PERTH).

**Toxicity:** unknown, but as it is related to *G. bilobum*, it is likely to be toxic.

**Affinity:** *Gastrolobium tergiversum* is similar to *G. bilobum*, but *G. bilobum* has dark green foliage and yellow flowers, as opposed to the light green leaves and orange flowers of *G. tergiversum*. The most obvious differences are in the flower, however, particularly the keel petal, which is much more broadly in *G. bilobum* (6.5–8.5 × 2–3 mm) and is strongly auriculate and saccate at the base, the wings do not close the keel and the style is strongly incurved to slightly hooked, whereas in *G. tergiversum* it is ± straight.


**Erect shrubs**, 0.5–3 m high. **Branchlets** ascending, angular, moderately to densely pubescent. **Petioles** terete, continuous but not decurrent with the branchlet, 3–8 mm long. **Leaves** spreading to ascending, usually opposite, sometimes alternate or whorled, ovate, elliptic or obovate, occasionally narrowly so (34–94 × 15–31–32 mm), glabrous to moderately sericeous on both surfaces, venation prominently reticulate, raised; apex retuse, rounded or truncate; margins entire, not recurved; base cuneate. **Stipules** erect, hyaline, somewhat rigid, 2–4 mm long. **Infoliorescences** terminal racemes, occasionally axillary or on short axillary shoots, 8–20-flowered; **peduncle** (1–)7–10 mm long; **rachis** 14–30 mm long; **subtending bracts** caducous, scale-like, entire, narrowly triangular, c. 5 mm long. **Pedicels** terete, 6–8 mm long. **Calyx** tapering gradually to the base (5–)8–12 mm long, moderately to densely pubescent, lobes not recurved; upper 2 lobes united higher than the lower 3, triangular, obtuse to rounded, 3–4 mm long; lower 3 lobes triangular, acute, 2–3 mm long. **Corolla:** standard transversely broadly elliptic, may be longitudinally folded up, 18–19.5 × 17–18 mm including the c. 4.5-mm claw, red, rarely orange, apex emarginate, base coriaceous; wings obliquely narrowly elliptic, 18.5–19.5 × 4.5–5 mm including the 4.5–5-mm claw, red, rarely orange, apex rounded, incurved and overlapping to enclose keel, base auriculate on both margins, not saccate; **keel** half broadly elliptic, 17–19 × c. 5 mm including the 4.5–5-mm claw, red, apex obtuse, base auriculate, slightly saccate. **Style** long, slightly incurved, bent at 45° to the ovary, hairs present sparsely at the base, tapering to the apex; **ovary** stipitate, densely pubescent; **ovules** 2. **Pod** stipitate, ellipsoid, c. 10 × 5.5–6 mm, sparsely to densely pubescent. **Seed** ellipsoid, 4–5 mm long, arillate.

**Vernacular name:** wallflower poison.

**Flowering period:** February–August. **Fruiting period:** April–September.

**Distribution** (Fig. 46): occurs throughout northern and central Australia, in Western Australia, Northern Territory and Queensland.

**Habitat:** sandy or gravelly soils, sometimes loamy, in open eucalypt or *Acacia* woodland. Often found along drainage lines in the drier parts of its range.


**Toxicity:** fluoroacetate 0–185 µg g⁻¹ (McEwan 1964).
Affinity: *Gastrolobium grandiflorum* is similar in appearance to *G. brevipes*. There is a clear difference between the two, as *G. brevipes* has smaller flowers (standard c. 9–14 × 10–15 mm) and deep orange flowers versus the larger, red flowers of *G. grandiflorum*. The gynophore of *G. brevipes* is shorter than the ovary and enclosed within the calyx tube (2–2.5 mm long), whereas *G. grandiflorum* has a gynophore that is longer than the ovary (7–10 mm long) and is exserted from the calyx tube.


**Type citation**: Western Australia, Entrance to Glen Cumming, Rawlinson Range, 25°00′S, 128°24′E, A.S. George 12150, 24 July 1974. **Type specimens**: holo: K; iso: CANB, NSW, PERTH.

Erect shrubs up to 2.5 m high. Branchlets ascending, angular, moderately to densely sericeous. *Petoioles* terete, continuous but not decurrent with the branchlet, 2–5 mm long. Leaves alternate, opposite or rarely subternate, ovate to elliptic, usually narrowly so, 20–60 × 6–20 mm, sericeous to glabrous, venation prominently reticulate; apex obtuse to retuse, unarced; margins flat; base obtuse. *Stipules* erect, hyaline, 2–5 mm long. Inflorescences usually terminal racemes, occasionally axillary or on short axillary shoots, 2–3 mm long. Flowering period: April–August, occasionally into September. Fruiting period: August–November.

**Distribution** (Fig. 47): occurs in central Australia in the state of Western Australia and the Northern Territory, chiefly in the George Gill and MacDonnell Ranges and around Uluru. There is also one old record from Port Hedland, Western Australia, which is quite out of the range of the rest of the specimens.

Habitat: dunefields, dry watercourses and mountain slopes, in sandy gravelly or rocky soils.


Toxicity: fluoroacetate 17–99 µg g⁻¹ in the leaves and 56–301 µg g⁻¹ in the pods (Twigg et al. 1999).

Affinity: *Gastrolobium brevipes* is similar in appearance to *G. grandiflorum*. There is a clear difference between the two by the larger (standard c. 20 × 18 mm), bright red flowers of *G. grandiflorum* versus the smaller, deep orange of *G. brevipes*. The gynophore in *G. brevipes* is shorter than the ovary and enclosed within the calyx tube, whereas *G. grandiflorum* has a gynophore that is longer than the ovary (7–10 mm long) and is exserted from the calyx tube.

18. *Gastrolobium congestum* Chandler & Crisp, sp. nov.

**Type**: Western Australia: Eyre District: SW slope of East Mount Barren, Hamersley Drive, Fitzgerald River National Park, 33°53′58″S, 119°56′46″E, G.T. Chandler 765 & S. Donaldson, 5 Nov. 1998 (holo: CANB; iso: AD!, B!, BRI, K!, MEL!, MO!, NSW!, NY!, PERTH!)

Oxylobium retatum R.Br. var. minus Bentham., Fl. Austral. 2: 22 (1864). *Nemcia coriacea* (Sm.) Domin var. minor (Benth.) Domin, *Preslia* 2: 29 (1923a). Type citation: ‘Drummond, n. 95 and 4th Coll. n. 20.’ *Type specimens*: lectotype (here chosen): K (Drummond, 4th Coll. n. 20); isotype: BM, K (2 sheets), W.

A. *G. pyramidalis* indumentum villosa albo differt. *G. coriaceum* vegetative similis est sed rachide breviore (usque ad 10 mm longa) et inflorescentia floribus tantum 10–20 differt.

The foliage of *G. congestum* is similar to that of *G. pyramidalis*, but has villous white hairs, where *G. pyramidalis* has villous, rust-coloured hairs on the stems, underside of the leaves and inflorescence axes. *Gastrolobium coriaceum* is also vegetatively similar to *G. congestum*, but differs in having a shorter rachis (up to 10 mm long) and only 10–20 flowers per inflorescence.

Etymology: this species is named after the densely clustered inflorescence.

Erect shrubs, 0.5–2.5 m high. Branchlets ascending, angular, moderately to densely villous. *Petoioles* terete, continuous but not decurrent with the branchlet, 2–4 mm long. Leaves spreading to ascending, opposite, ovate to elliptic or
transversely so to orbicular (14–)18–41 × 20–48 mm, upper surface glabrous or sparsely pubescent, lower surface glabrous to densely sericeous, venation prominently reticulate; apex retuse or rounded, unarmed; margins entire, not recurved; base cordate to rounded. **Stipules** erect, very narrowly triangular to hynaline, 4–7 mm long. **Inflorescences** terminal racemes, somewhat condensed with the flowers crowded to give a head-like appearance, 30– to more than 50-flowered; **peduncle** 4–11(–23) mm long; **rachis** (5–)13–80 mm long; **subtending bracts** caducous, entire, linear-lanceolate, 4–5 mm long. **Pedicels** angular, 4–5 mm long. **Calyx** campanulate, 6–8 mm long including the 3–3.5-mm claw, orange-red to red, apex emarginate, base cuneate on both margins or on the upper margin only, not saccate; **keel** half transversely broadly elliptic, margins incurved, 8–9.5 × c. 3 mm including the 3–3.5-mm claw, orange-red to red, apex rounded, base auriculate, saccate. **Style** long, incurved, hairs present in the lower third, tapering to the apex; **ovary** shortly stipitate, densely pubescent; **ovules** 3–5. **Pod** stipitate, ellipsoid to ovoid, 8–11 × 5–9 mm, moderately to densely sericeous, venation prominently reticulate; apex **half** retuse or rounded, unarmed; margins entire, not recurved; base cordate to rounded. **Seed** ellipsoid to ovoid, 30- to more than 50-flowered; **pedicules** 4–11(–23) mm long; **ovaria** 5–20 mm long and smaller flowers (calyx 4–5 mm long, standard 6–7 × 7–9.5 mm) and strictly two ovules. **Gastrolobium pyramids** and **G. coriaceum** also look superficially like **G. congestum**, particularly in the vegetative stage. However, **G. pyramids** has long, rust-coloured hairs on the stems, underside of the leaves and inflorescence axes, whereas **G. congestum** has shorter, white hairs. **Gastrolobium coriaceum** differs in having a shorter rachis (up to 10 mm long) and fewer flowers per inflorescence (10–20).

### The *G. parviflorum* subgroup

This group of *Gastrolobium* species belongs with the ‘*G. bilobum*’ group, but forms quite a strong clade within this group and is worthy of recognition as it is a very common and distinctive group. This group is characterised by the opposite, usually oblong leaves with recurved to revolute margins and long, terminal racemes with many flowers.


Erect, bushy *shrubs* 0.5–2.5 m high. **Branchlets** ascending, angular, moderately sericeous. **Petioles** terete, continuous and slightly decurrent with the branchlet, 2–3 mm long. **Leaves** opposite to subopposite, spreading to ascending, oblong, elliptic or obovate to narrowly or linear, 10–35 × 3–11 mm, upper surface glabrous, lower surface glabrous to densely sericeous, venation openly to thickly reticulate; apex rounded to truncate, emarginate, may be recurved; margins ± flat to slightly undulate, often recurved; base cuneate to rounded. **Stipules** erect, narrowly triangular, 1.5–3 mm long. **Inflorescences** terminal racemes (13–) generally more than 25-flowered; **pedicules** (4–)8–22 mm long; **rachis** 30–65 mm long; **subtending bracts** caducous, scale-like, entire, lanceolate, 2–3 mm long, densely pubescent. **Pedicels** terete, 1.5–2.5 mm long. **Calyx** campanulate, 4–6 mm long including the 1–1.5-mm receptacle, glabrous to moderately pubescent, lobes not or slightly recurved; upper 2 lobes united higher than the lower 3, acute, c. 2 mm long; lower 3 lobes triangular, acute, c. 2 mm long. **Corolla**: standard...
transversely ovate, 6.5–8 × 8–10 mm including the 2–2.5-mm claws, orange to orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; wings: obovate, 6–7.5 × 2–2.5 mm including the 2–2.5-mm claws, orange and red, apex rounded, incurved and overlapping the keel, base auriculate on the upper margin only, saccate; keel half transversely elliptic, margins not incurved, 5.5–6.5 × 2–2.5 mm including the 2–2.5-mm claws, maroon, apex rounded to slightly spout-like, base auriculate, saccate. Style about as long as the ovary, lower half pubescent; ovary stipitate, densely pubescent; ovules 3 or 4. Pod stipitate, obliquely ellipsoid, 7–10 × 3–4.5 mm, glabrous to sparsely pubescent. Seed teniform, 2–3 mm long, arillate.

Vernacular name: box poison.

Flowering period: August–October. Fruiting period: October–December.

Distribution (Fig. 49): south-western Western Australia. Occurs very commonly throughout the central wheatbelt districts of this region, from around Kalannie in the north to near Hopetoun in the south, with an outlier near Mt Ragged, Cape Arid.

Habitat: grows in a variety of habitats, generally on sandy soils, in heathland, shrubland, mallee woodland or woodland.


Toxicity: highly toxic; fluoroacetate 150–2500 µg g⁻¹ (Aplin 1971; Twigg et al. 1996b; herb specimen T. Higgs s.n., 30 Nov. 1987, CANB 495609 & PERTH), making G. parviflorum one of the most toxic species of Gastrolobium.

Affinity: similar to G. discolor, G. melanocarpum and G. musaceum. Gastrolobium discolor differs by the generally larger leaves (25–50 × 5–10 mm), the longer inflorescence (peduncle 15–45 mm long, rachis 70–110 mm long) and the larger flowers (e.g. standard 10–11 mm broad), as well as the highly discolorous leaves that often have the margins recurved at different levels along the leaf, often causing the basal half to be much broader than the apical half. Gastrolobium melanocarpum differs in the highly revolute leaf margins that leave only the mid-rib visible on the lower surface, the strictly linear leaves (only 1–2 mm broad) and the ovoid pods which are often black in colour. Gastrolobium musaceum differs by the generally fewer number of flowers (10–25-flowered) and the much larger flowers (e.g. calyx 6–7 mm long, standard 10–13.5 × 11–13 mm).

20. Gastrolobium musaceum G.Chandler & Crisp, sp. nov.

Type: Western Australia: Eyre District: Cascades Road, 23 km towards Lake King from West Point Road, 33°13′03″S, 120°41′28″E, G.T. Chandler 937, A. Monro & S. Donaldson, 19 Sep. 1999 (holo: CANB!, iso: AD!, NSW!, PERTH!)

Oxylobium parviflorum Benth. var. stenocarpum C.A.Gardner in Gardner & Bennetts (1956, p. 54), nom. nud.

G. parvifloro affinis sed inflorescentia floribus paucioribus (10–25), floribus multo majoribus (calyx 6–7 mm longus, vexillum 10–13.5 × 11–13 mm) differt.

Busby shrubs related to G. parviflorum, but differing by having fewer flowers per inflorescence (10–25) and much larger flowers (calyx 6–7 mm long, standard 10–13.5 × 11–13 mm).

Etymology: from the Latin, Musa, which is banana. This species is named after the distinctive fruits, which are banana-shaped.

Erect, bushy shrubs, 0.5–2 m high. Branchlets ascending, ± angular, moderately sericeous. Petioles terete, continuous and slightly decurrent with the branchlet, 2–3 mm long. Leaves opposite or subopposite, spreading to ascending, linear-oblong to ± narrowly elliptic, 20–45 × 2–4.5 mm, upper surface glabrous, lower surface moderately to densely sericeous, venation openly reticulate; apex unarmed or slightly mucronate, recurved, rounded, ± emarginate; margins recurved; base rounded to truncate. Stipules erect, narrowly triangular, c. 2 mm long. Inflorescences terminal racemes, 10–25-flowered; peduncle 7–20 mm long; rachis 25–60 mm long; subtending bracts caducous, scale-like, entire, lanceolate, 1–2 mm long, densely pubescent. Pedicels terete, 1–2 mm long. Calyx campanulate, 6–7 mm long including the 1–1.5-mm receptacle, lobes not or scarcely recurved, sparsely to moderately pubescent; upper 2 lobes united higher than the lower 3, acute, c. 2 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard transversely ovate, 10–13.5 × 11–13 mm including the 3–4.5-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; wings obovate, 10–12.5 × 3–4 mm including the 2.5–4-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half transversely elliptic, margins not incurved, 9–12 × 3–3.5 mm including the 3–4-mm claws, maroon, apex rounded, base auriculate, saccate. Style about as long as the ovary, lower half pubescent; ovary stipitate, densely pubescent; ovules 4–9. Pod stipitate, obliquely
ellipsoidal, 7–11 × 3–4 mm, moderately pubescent. Seed reniform, c. 3 mm long, arillate. (Fig. 11)

Flowering period: August–October. Fruiting period: October–December.

Distribution (Fig. 50): south-western Western Australia. Occurs along the south coast of this region, from Jerramungup east to Cape Arid, with a few collections inland around Peak Charles and Moorine Rock.

Habitat: grows on the southern sandplains on undulating dunes and around rivers on sandy soils in shrubland or mallee woodland.

Selected specimens (47 examined): WESTERN AUSTRALIA, Roe District: 4 km along Kumarl Rd from Lake King–Norseman road, c. 80 km from Norseman to Lake King, 32°45′09″S, 121°21′54″E, G.T. Chandler 913 et al., 17.ix.1999 (CANB, PERTH). Eyre District: 0.5 km on Elverdton Rd from Hopetoun Rd, 33°37′20″S, 120°08′47″E, G.T. Chandler 772 & S. Donaldson, 6.xi.1998 (CANB, MEL); 12 km E of Jerramungup, 33°54′29″S, 119°02′55″E, M. Hislop 1139, 27.ix.1998 (CANB, PERTH). 29 km N of Hopetoun towards Ravensthorpe, at intersection with Jerdacuttup Rd, 33°42′09″S, 120°11′18″E, G.T. Chandler 273 & W. Keys, 18.ix.1997 (CANB, NSW); c. 5–10 km inland from Point Malcolm, 33°47′S, 123°45′E, R.J. Hnatiuk 761135, 20.ix.1976 (PERTH).

Toxicity: unknown, but given its affinity to G. parviflorum, it is presumed to be toxic.

Affinity: similar to G. discolor, G. melanocarpum and G. parviflorum. Gastrolobium discolor differs in the highly discolorous leaves which are much broader (5–10 mm broad), the greater number of flowers per inflorescence (>25-flowered), the longer racemes (peduncle 15–45 mm long, rachis 70–110 mm long) and the smaller flowers (e.g. calyx 4.5–5.5 mm long, standard 7–9 × 10–11 mm). Gastrolobium melanocarpum is easily distinguished, as it has highly revolute, linear leaves (1–2 mm broad) and much smaller flowers (e.g. calyx 4.5–5.5 mm long, standard 7–8 × 9.5–10.5 mm). Gastrolobium parviflorum generally has broader leaves (3–11 mm broad), more flowers per inflorescence (generally >25-flowered) and much smaller flowers (e.g. calyx 4–6 mm long, standard 6.5–8 × 8–10 mm).


Frutices foliis valde discoloribus, saepe super medium angustatis marginibus abrupte recurvis plu quam in dimidio inferno folii, racemis terminalibus longisissimis (pedunculus 15–45 mm longus, rachis 70–110 mm longa), G. musaceo et G. parviflora arte affinis sed indumento villoso albo conspicuo distinguenda.

Bushy shrubs with highly discolorous leaves that are often constricted midway along the lamina by the margins suddenly becoming more recurved than the basal half and very long terminal racemes of flowers (peduncle 15–45 mm long, rachis 70–110 mm long) that have prominent bright white villous hairs, serving to distinguish it from its close relatives G. musaceum and G. parviflorum.

Etymology: this species is named after the discolorous leaves, with the glabrous upper surface olive green and the densely sericeous lower surface white.

Low, bushy shrubs, 0.4–1.5 m high. Branchlets ascending, terete to somewhat angular, densely sericeous. Pedioles terete, continuous and slightly decurrent with the branchlet, 2–3 mm long. Leaves spreading to ascending, opposite to subopposite, narrowly oblong, elliptic to narrowly so, or somewhat ovate when the upper margins are more revolute than the lower margins, 25–50 × 5–10 mm, upper surface glabrous, lower surface densely sericeous, venation prominently reticulate; apex marginate, occasionally almost bilobed, unarumed or slightly mucronate, recurved to revolute; margins recurved to strongly revolute; base rounded to truncate. Stipules ± erect to strongly recurved, linear-triangular, 2–3 mm long. Inflorescences terminal racemes, more than 25-flowered; peduncle 15–45 mm long; rachis 70–110 mm long; subtending bracts caducous, scale-like, entire, lanceolate, 2–3 mm long, densely pubescent. Pedicels terete, 1–3 mm long, densely pubescent. Calyx campanulate, 4.5–5.5 mm long including the 0.75–1.25 mm receptacle, moderately to densely pubescent, lobes not or scarcely recurved; upper 2 lobes united higher than the lower 3, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard transversely ovate, 7–9 × 10–11 mm including the c. 2.5 mm claw, deep orange, sometimes with a pinkish tinge, with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; wings obovate, 7–7.5 × 2.5–3.5 mm including the c. 2.5 mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, ciliate; keel half transversely elliptic, margins incurved, 5.5–6 × 2.5–3.5 mm including the c. 2.5 mm claws, pink and maroon, apex acute, base auriculate, ciliate. Style long, strongly incurved, base pubescent; ovary stipitate, densely pubescent; ovules 4. Pod stipitate, obliquely ovoid to obliquely ellipsoid, rarely broadly so, 5–8 × 3–3.5 mm, moderately pubescent. Seed rarely reniform, 2.5–3 mm long, arillate. (Fig. 12)

Flowering period: August–October. Fruiting period: November and December.

Distribution (Fig. 51): south-western Western Australia. Occurs mainly in the far east of this region, from the Oldfield River, W of Esperance, east to Mt Buraminya and north to near Norseman, with one outlier near Two Peoples Bay, in the Albany region. This is an old collection and the reliability of the data is unknown.

Habitat: grows near rivers, on undulating dunes or around granite outcrops on sandy or sandy-loam soils, in mallee woodland or mallee heathland.
Selected specimens (27 examined): WESTERN AUSTRALIA, Roe District: near NW base of Mt Buraminya, 33°15′25″S, 123°07′19″E, G.T. Chandler 806 & S. Donaldson, 11.xi.1998 (CANB, PERTH); Wittenoom Hills, c. 3 km west of Mt Burdett, 33°27′S, 122°06′E, A.E. Orchard 1360, 4.x.1968 (AD, CANB); base of Mt Heywood, 82 km NE of Esperance, 33°19′54″S, 122°32′01″E, W.R. Archer 210953, 2.x.1995 (MEL, PERTH); Eyre District: between Two Peoples Bay and Nanarup, 34°57′S, 118°05′E, W. Dennis 864/64, viii.1964 (PERTH); Lort River area, c. 33°40′S, 121°15′E, O.I.C. Esperance (R.A. Rose) s.n., x.1963 (PERTH); 27 km E of the Oldfield River crossing on the South Coast Hwy, towards Esperance, G.T. Chandler 265 & W Keys, 17.ix.1997 (CANB, MO, PERTH).

Toxicity: unknown, but given the relationship to G. parviflorum, it is presumed to be toxic.

Affinity: very similar to G. musaceum and G. parviflorum. Gastrolobium musaceum has narrower leaves (2.4–5.5 mm broad) that are not strongly discolorous, shorter inflorescence axes (peduncle 7–20 mm long), rachis 25–60 mm long) and larger flowers (e.g. calyx 6–7 mm long, standard 10–13.5 × 11–13 mm). Gastrolobium parviflorum generally does not have strongly discolorous leaves (although occasionally there are collections that are strongly discolorous, but these lack other features common to G. discolor), shorter inflorescence axes (peduncle 4–22 mm long, rachis 30–65 mm long), a slightly smaller flower (e.g. standard 6.5–8 × 10–11 mm) and lacks the prominent bright white villous hairs on the inflorescence axis that G. discolor possesses.


Oxylobium parviflorum Benth. var. revolutum C.A.Gardner, in Gardner and Bennett (1956, p. 54), nom. nud.

Fructes foliis valde revolutis lineari-obtusis, solum costa in superficie adaxiali visibili, racemis longis multifloris (>20 floribus, rachidi 40–100 mm longis). G. discolori, G. musaceo et G. parvifloro arte affinis sed floribus minoribus (calyx 4–5.5 mm longis, vexillum 7–8 × 9.5–10.5 mm longum) differt.

Bushy shrubs with strongly revolute linear leaves with only the midrib visible on the abaxial surface, with long, many-flowered racemes (>20-flowered, rachis 40–100 mm long) and quite small flowers (e.g. calyx 4–5.5 mm long, standard 7–8 × 9.5–10.5 mm), which serves to distinguish it from its close relatives G. discolor, G. musaceum and G. parviflorum.

Etymology: from the Greek, melano = black and carpos = fruit. This species is named after the fruits, which are all black.

Bushy, erect shrubs, 0.4–1.8 m high. Branchlets ascending, angular, densely sericeous. Petioles terete, continuous but not decurrent with the branchlet, 2–3 mm long. Leaves spreading to ascending, opposite, linear-oblong, 15–60 × 1–2 mm, upper surface glabrous, lower surface densely sericeous, venation openly reticulate; apex truncate, slightly emarginate, strongly recurved, unarmed or slightly mucronate; margins revolute so that only the midrib is visible on the lower surface; base tapering to petiole. Stipules erect, triangular, 1–2 mm long. Inflorescences terminal racemes, more than 20-flowered; peduncle 11–25 mm long; rachis 40–100 mm long; subtending bracts caducous, scale-like, entire, lanceolate, c. 2 mm long, densely sericeous. Pedicels terete, 1–4 mm long. Calyx campanulate, 4–5.5 mm long including the c. 1-mm receptacle, moderately to densely pubescent, lobes not to slightly recurved; upper 2 lobes united higher than the lower 3, acute, c. 2 mm long; lower 3 lobes triangular, acute, c. 1.5 mm long. Corolla: standard transversely ovate, 7–8 × 9.5–10.5 mm including the 2.5–3-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; wings obovate, 6–7.5 × 2–3 mm including the c. 2.5-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half elliptic, margins not incurved, c. 5.5 × 2.5 mm including the 2–2.5-mm claws, pink and maroon, apex somewhat rounded, base auriculate, saccate. Style about the same length as the ovary, strongly incurved, lower half pubescent; ovary stipitate, densely pubescent; ovules 4. Pod stipitate, ovoid, 6–7 × 3–4 mm, moderately pubescent. Seed slightly reniform, c. 2 mm long, arillate. (Fig. 13)

Flowering period: August–October. Fruiting period: October–December.

Distribution (Fig. 52): south-western Western Australia. Occurs in the eastern portion of the southern sandplains, from around Newdegate east to the Norseman area. There are also populations at Moorine Rock and around Bodallin, slightly north of the main range.

Habitat: grows on undulating dunes or around granite outcrops on sand over laterite or granite in open shrubland, dense heathland or mallee woodland.

Selected specimens (40 examined): WESTERN AUSTRALIA, Avon District: 3.8 km S along Stephen Rd from the intersection of a track parallelling the Great Eastern Hwy 5.5 km W of Bodallin, 31°25′04″S, 118°48′08″E, G.T. Chandler 214 & W Keys, 16.ix.1997 (CANB, DNA); 3 km along Ivey Rd from Dulyabin Rd, S of Bodallin, 31°36′01″S, 118°51′11″E, G.T. Chandler 859 et al., 12.ix.1999 (AD, CANB, MEL, NSW, PERTH); Roe District: 6 km NW of Anna Peak, Eyre Range, 33°49′50″S, 119°53′37″E, K.R. Newbey 11350, 2.xi.1986 (PERTH); 25 km from Newdegate towards Hyden, 32°30′55″S, 119°03′10″E, G.T. Chandler 947 et al., 19.ix.1999 (CANB, PERTH); 31 km W of main crossroads at Lake King towards Newdegate, 33°05′40″S, 119°21′04″E, G.T. Chandler 279 & W Keys, 18.ix.1997 (CANB, MEL, PERTH); Lake King area, 63 km towards Norseman, 32°58′46″S, 120°16′35″E, G.T. Chandler 908 et al., 17.ix.1999 (AD, CANB, PERTH); Salmon Gums, 32°59′S, 121°39′E, C.A. Gardner s.s., 15.ix.1934 (AD, BRI, CANB, MEL, NSW, PERTH).
Toxicity: unknown, but given its affinity to *G. parviflorum*, it is presumed to be quite toxic.

Affinity: similar to *G. musaceum* and *G. parviflorum*. *Gastrolobium musaceum* has broader leaves (2.5–4 mm broad) that are not highly revolute, with at least half of the lower surface visible at all times, shorter inflorescence axes (peduncle 7–20 mm long, rachis 25–60 mm long) with fewer flowers (10–25-flowered) and much larger flowers (e.g. calyx 6–7 mm long, standard 10–13.5 × 11–13 mm). *Gastrolobium parviflorum* has broader leaves (3–11 mm broad) that are generally only slightly recurved rather than revolute, the rachis is often shorter (30–65 mm long) and the pod is relatively narrower (7–10 × 3–4.5 mm).


Bushy, often rounded *shrubs*, 0.3–1.5 m high. *Branchlets* ascending, terete, moderately to densely pubescent. *Petioles* very short, continuous but not decurrent with the branchlet, <0.5 mm long. *Leaves* broadly spreading to strongly deflexed, opposite or in whorls of 3, narrowly oblong to almost square, sometimes slightly incurved, 8–15(–20) × 2–9 mm, upper surface glabrous, lower surface densely pubescent, venation prominently reticulate; apex emarginate, often with a small, blunt mucro; margins strongly recurved to reflexed; base truncate to slightly cordate. *Stipules* erect, hyaline, 1.5–3 mm long. *Inflorpeces* terminal racemes, 18–24-flowered, flowering period: August–October. *Fruiting period*: October–November.

**Distribution** (Fig. 53): south-western Western Australia. Occurs mainly from the Lake King area south to the Ravensthorpe Ranges, with one old collection from Esperance.

**Habitat**: grows on sandplains or hillslopes, in sand or gravelly laterite in heathland or mallee shrubland.

Selected specimens (28 examined): WESTERN AUSTRALIA, Esperance District: Esperance, 33°05'05"S, 121°53’52”E, O.L. Esperance s.n., iii.1963 (PERTH); Young River crossing on West Point Rd, 8 km SW of intersection with Cascades Rd, 33°09’09”S, 120°13’23”E, G.T. Chandler 943 et al., 19.ix.1999 (AD, CANB, MEL, PERTH). Roe District: Lake King area, corner of Norseman Rd and Hogans Rd, 14 km E of Lake King, 33°04’59”S, 119°41’24”E, G.T. Chandler 700 & S. Donaldson, 28.x.1998 (CANB, MEL).

**Toxicity**: highly toxic; fluoroacetate 750 µg g⁻¹ (Aplin 1971).

**Affinity**: this species is similar to *G. parviflorum* and *G. nutans*. *Gastrolobium parviflorum* differs by not having deflexed leaves, the overall leaf shape is generally narrower (10–35 × 3–11 mm) and the racemes have a longer internode between flowers (up to 15 mm). *Gastrolobium nutans* differs in having recurved leaves and strictly two ovules.

III. *The G. villosum* group

Most species within this group have more or less round leaves (except *G. densifolium*, which shares other features with this group), a more or less tomentose inflorescence and large, often membranous stipules (up to 15 mm long).


Low, spreading, rarely trailing *shrubs*, up to 0.3–0.6(–1) m high. *Branchlets* ascending, terete, densely pubescent. *Petioles* terete, continuous but not decurrent with the branchlet, 3–6 mm long, densely pubescent. *Leaves* spreading, opposite, broadly ovate, ovate or ± oblong, 20–45(–60) × 7–25(–35) mm, mature leaf upper surface glabrous, lower surface moderately to densely pubescent, venation openly reticulate; apex broadly rounded, slightly emarginate, often with a small, blunt micro; margins strongly

**Distribution** (Fig. 53): south-western Western Australia. Occurs mainly from the Lake King area south to the Ravensthorpe Ranges, with one old collection from Esperance.

**Habitat**: grows on sandplains or hillslopes, in sand or gravelly laterite in heathland or mallee shrubland.

Selected specimens (28 examined): WESTERN AUSTRALIA, Esperance District: Esperance, 33°05’05"S, 121°53’52”E, O.L. Esperance s.n., iii.1963 (PERTH); Young River crossing on West Point Rd, 8 km SW of intersection with Cascades Rd, 33°09’09”S, 120°13’23”E, G.T. Chandler 943 et al., 19.ix.1999 (AD, CANB, MEL, PERTH). Roe District: Lake King area, corner of Norseman Rd and Hogans Rd, 14 km E of Lake King, 33°04’59”S, 119°41’24”E, G.T. Chandler 700 & S. Donaldson, 28.x.1998 (CANB, MEL).

**Toxicity**: highly toxic; fluoroacetate 750 µg g⁻¹ (Aplin 1971).

**Affinity**: this species is similar to *G. parviflorum* and *G. nutans*. *Gastrolobium parviflorum* differs by not having deflexed leaves, the overall leaf shape is generally narrower (10–35 × 3–11 mm) and the racemes have a longer internode between flowers (up to 15 mm). *Gastrolobium nutans* differs in having recurved leaves and strictly two ovules.
undulate; base truncate or slightly cordate. Stipules erect, entire, narrowly triangular, membranous, 8–15 mm long, glabrous to sparsely pubescent. Inflorescences terminal racemes, more than 30-flowered, sparsely to densely pubescent; peduncle usually with a sheath of persistent barren bracts at the base, 15–90 mm long; rachis 80–150 mm long; subtending bracts caducous, scale-like, entire, lanceolate, keeled, 8–10 mm long, moderately pubescent. Pedicels terete, 1–2 mm long, pubescent. Calyx campanulate, 6–7 mm long including the c. 1.5-mm receptacle, moderately pubescent, lobes all reflexed; upper 2 lobes united higher than the lower 3, triangular, acute, c. 3 mm long; lower 3 lobes triangular, acute, c. 3 mm long. Corolla: standard transversely ovate, 11–12 × 13–14 mm including the 3–4-mm claw, deep orange to pale red with a red to pink ring around the yellow centre, apex emarginate, base cordate; wings obovate, c. 8–3 mm including the 2-mm claws, deep orange to pale red, apex rounded, incurved and overlapping to ± enclose the keel, base auriculate on both margins, saccate; keel half transversely elliptic, c. 5 × 2 mm including the 2-mm claw, pink, apex acute, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. Style very short, incurved, lower third pubescent; ovary stipitate, densely pubescent; ovules 2. Pod shortly stipitate, obliquely ellipsoid, 8–9 × 6–6.5 mm, sparsely to moderately pubescent. Seed reniform, 4–5 mm long, arillate.

Vernacular name: crinkle-leaved poison.

Flowering period: August–October. 
Fruiting period: October to early December.

Distribution (Fig. 54): south-western Western Australia. Occurs in the Darling escarpment around Perth, north as far as the New Norcia area and inland as far as the area near Dandaragan.

Habitat: grows in the Darling escarpment on gravely clay, soils, sometimes with a loam component, in woodland or forest.


Toxicity: fluoroacetate 10–50 µg g⁻¹ (Aplin 1971; Twigg et al. 1996b).

Affinity: this species is most closely related to G. tomentosum, sharing an undulate leaf with a densely tomentose lower surface when mature, but G. tomentosum can easily be distinguished by the short racemes (peduncle up to 10 mm long; rachis 25–45 mm long) which have smaller flowers (e.g. standard 7.5 × 8 mm) lacking the distinctive keel of G. villosum (shared with the G. floribundum group). Additionally the leaf shape of G. tomentosum is circular or nearly so, whereas G. villosum has leaves that are prominently longer than broad.


Type specimens: holotype: PERTH; iso: PERTH (2 sheets)

Low, dense shrubs up to 0.7 m high. Branchlets ascending to erect, angular, glabrous. Petiole extremely short, continuous and deciduous with the branchlet, c. 0.5 mm long. Leaves ascending, opposite, recurved towards the apex, ovate, elliptic or rarely obovate, 10–16 × 3–4 mm, glabrous, venation prominent or slightly obscured with only the secondary venation showing; apex acute, recurved to hooked, pungent-pointed; margins usually recurved, sometimes flat; base cuneate. Stipules erect, prominent, very narrowly triangular to hyaline, partly fused behind the axillary bud, 6–10 mm long, red or sometimes black in colour. Inflorescences terminal racemes, 10–15-flowered; peduncle 4–7 mm long; rachis 12–20 mm long; subtending bracts caducous, scale-like, entire, lanceolate, margins strongly recurved to reflexed, moderately pubescent, 7–9 mm long. Pedicels terete, 1.5–2.5 mm long. Calyx campanulate, 6–7 mm long including the 1–1.5-mm receptacle, densely villous, lobes not recurved; upper 2 lobes united scarcely higher than the lower 3, 2–3 mm long, triangular, acute; lower 3 lobes triangular, acute, 2.5–3 mm long. Corolla: standard transversely elliptic, 8–9 × 10–11 mm including the 3–3.5-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base cordate; wings obovate or oblong, 8–9 × c. 3 mm including the c. 3-mm claw, orange, apex rounded, not incurved, not enclosing the keel, base auriculate on both margins, not saccate; keel half transversely broadly elliptic, c. 8 × 3 mm including the c. 3-mm claw, maroon, apex obtuse, base auriculate, saccate. Style long, incurved, lower half pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, broadly ellipsoid to almost spherical, 4.5–5.5 × 3–3.5 mm, moderately to densely pubescent. Seed ellipsoid, 2.5–2.5 mm long, arillate.

Vernacular name: mallet poison.

Flowering period: September and October. 
Fruiting period: November and December.
**Distribution** (Fig. 55): south-western Western Australia. A rare species, occurring around the Kukerin, Dudinin, Tarin Rock and Dragon Rocks areas.

**Habitat:** grows on undulating dune areas or sandy soils in mallee heath or mixed shrubland.

**Conservation status:** ROTAP: 2K+. CALM: P4. This species is rare and poorly known in its distribution, but is not considered to be at risk.

**Specimens examined:** WESTERN AUSTRALIA, Roe District: Dudinin, 32°52'S, 117°54'E, C.A. Gardner s.n., 4.xi.1934 (CANB, PERTH); Dragon Rocks Nature Reserve, 2 km S of Mouritz Rd on Buetners Rd, 32°39'S, 118°59'E, R.M. Buehrig 93.12.99(4), 9.xii.1993 (PERTH); Kukerin, 33°11′S, 118°05′E, A.K. Joyce s.n., 3.x.1952 (PERTH); E from Kukerin, C.A. Gardner s.n., 3.x.1959 (PERTH); Dragon Rocks Nature Reserve, S of Mouritz Rd, 32°38′S, 119°02′E, A.M. Coates 3366, 26.x.1991 (CANB, PERTH); opposite Tarin Rock siding, 33°06′27″S, 118°13′53″E, G.T. Chandler 532 et al., 19.ii.1998 (CANB, NSW); Tarin Rock, 33°06′29″S, 118°13′56″E, G.T. Chandler 716 & S. Donaldson, 29.x.1998 (CANB).

**Toxicity:** fluoracetate not detected (Aplin 1971).

**Affinity:** this species is very difficult to confuse with any other *Gastrolobium* because of the distinctive recurved leaves with a ± triangular apex and large stipules, which leave a persistent base when the hyaline apex is worn away. The only other species sharing this stipule character is *G. rotundifolium*, which has broader (8–18 mm) undulate leaves.


Weak, decumbent, often clumped shrubs, up to 1 m high. Branchlets trailing, angular, densely villous. *Petioles* terete, continuous but not recurrent with the branchlet, 2–4 mm long, densely villous. *Leaves* spreading, opposite, circular to elliptic, 13–30 × 8–20 mm, mature upper surface glabrous, lower surface densely tomentose, venation reticulate; apex broadly rounded, rarely slightly emarginate, unarmed or with a small, blunt mucro; margins undulate; base obtuse to broadly rounded. *Stipules* erect, membranous, entire, narrowly triangular, 5–8 mm long, more prominent on younger leaves. *Inflorescences* terminal racemes, 10–18-flowered, densely tomentose; *peduncle* often with a sheath of persistent barren bracts at the base, up to 10 mm long; *rachis* 25–45 mm long; *subtending bracts* caducous, scale-like, entire, lanceolate, densely pubescent, 7–8 mm long. *Pedicels* terete, densely pubescent, 1–2 mm long. *Calyx* campanulate, c. 5 mm long including the c. 0.75-mm receptacle, densely tomentose, lobes all reflexed; lobes subequal, upper 2 lobes united scarcely higher than the lower 3, all triangular, acute, c. 3 mm long. *Corolla:* standard transversely ovate, c. 7.5 × 8 mm including the 2-mm claw, deep orange-maroon on the back, orange-yellow on the front with a red ring surrounding the yellow centre, apex emarginate, base auriculate; wings oblong, c. 7.5 × 2.5 mm including the 2-mm claws, orange-yellow and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; *keel* half transversely broadly elliptic, margins not incurved, c. 7 × 3 mm including the 2.5-mm claws, deep maroon to almost black, apex rounded, base auriculate, saccate. *Style* long, strongly incurved, lower half densely pubescent; *ovary* shortly stipitate, densely pubescent; *ovules* 2. *Pod* stipitate, elliptoid, 6–7 × 4–5 mm, moderately to densely villous. *Seed* reniform, c. 2.5–3 mm long, arillate.

**Vernacular name:** woolly poison.

**Flowering period:** August–November. **Fruiting period:** October–December.

**Distribution** (Fig. 56): south-western Western Australia. Occurs in the areas around Williams and Narrogin, south-east of Perth.

**Habitat:** grows in woodland or forest, preferring the heavier clay and loam soils of this region, though it sometimes occurs on sandier substrates.

**Conservation status:** IUCN: V. ROTAP: 2V. CALM: P4. This species is rare and considered to be vulnerable. Much of the region that *G. tomentosum* occurs in has been cleared for logging and farming, leaving little of the native habitat undisturbed. All populations observed in this study were along roadsides, with the populations in some danger of becoming extinct.

**Selected specimens** (15 examined): due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA, Darling District: between Williams and the Albany Hwy, G.T. Chandler 756 & S. Donaldson, 2.x.1998 (CANB, MEL, NSW, PERTH); Williams towards Culbin, T.D. Macfarlane 1235, 27.x.1983 (PERTH); Dardadine towards Williams, G.T. Chandler 755 & S. Donaldson, 2.x.1998 (CANB, PERTH); NW of Kojonup, C. Lewis s.n., viii.1993 (PERTH).

**Toxicity:** unknown, but according to Gardner and Bennetts (1956), *G. tomentosum* has been reported to cause some stock losses.

**Affinity:** this species is similar to *G. villosum*, but the stipules are much larger in the latter (8–15 mm long), as is the raceme (peduncle 15–90 mm long and rachis 80–150 mm long). *Gastrolobium ovalifolium* and *G. glabratum* also resemble *G. tomentosum*, but the mature leaves of both species are glabrous and those of *G. ovalifolium* are not undulate and have thick venation, such that the areoles are reduced to pin pricks.

**27. Gastrolobium glabratum** G.Chandler & Crisp, sp. nov. **Type:** Western Australia: Qualen Road, West York, 1.52 km E of Catchment Road at Ref Tree BA 93/1, 32°05′39″S, 116°36′08″E, F. Hort 235, 16 Sep. 1998 (holo: PERTH; iso: CANB)
G. tomentosum similissima sed foliis maturis glabris, rhachis paulo longiori differt. G. ovalifolium nonnihil similis sed foliis multo tenuioribus venatione aperte reticulata differt.

Very similar to G. tomentosum, but G. tomentosum has mature leaves that are densely tomentose on the lower surface and a slightly shorter rachis (25–45 mm long). There is also some resemblance to G. ovalifolium, but this species has thick, flat leaves with dense venation, such that the areoles are reduced to pin-pricks.

**Etymology:** named after the nearly glabrous mature leaves.

Weak, decumbent, often clumped shrubs, up to 0.8 m high. *Branchlets* trailing, angular, densely villous. *Petioles* terete, continuous but not decurrent with the branchlet, 2–4 mm long, densely villous. *Leaves* spreading, opposite, circular to elliptic, 10–27×(42) mm, mature leaf glabrous, venation openly reticulate; apex broadly rounded, rarely slightly emarginate, unarmed or with a small, blunt mucro; margins undulate or sometimes almost flat, not recurved; base obtuse to broadly rounded. *Stipules* erect, membranous, triangular, 5–8(–11) mm long, more prevalent on younger leaves. *Inflorescences* terminal racemes, 10–18-flowered, densely tomentose; *peduncle* often with a sheath of persistent barren bracts at the base, up to 5–25 mm long; *rachis* 35–70 mm long; *subtending bracts* caducous, scale-like, entire, lanceolate, 7–9 mm long, glabrous. *Pedicels* terete, densely pubescent, 1–2 mm long. *Calyx* campanulate, 5–6 mm long including the 0.75–1 mm receptacle, densely tomentose; lobes all reflexed, subequal, upper 2 united slightly higher than the lower 3, all triangular, acute, c. 3 mm long. *Corolla:* *standard* transversely ovate, c. 7–9×8–10 mm including the 2-mm claw, deep orange-maron on the back, orange-yellow on the front with a red ring surrounding the yellow centre, apex emarginate, base auriculate; *wings* oblong, c. 7.5–8×2.5 mm including the 2-mm claws, orange-yellow and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; *keel* half transversely broadly elliptic, margins not incurved, 7–8×3–4 mm including the 2.5-mm claws, deep maroon to almost black, apex rounded, base auriculate, saccate. *Style* very long, strongly incurved, lower half pubescent; *ovary* shortly stipitate, densely pubescent; *ovules* 2. *Pod* stipitate, ellipsoid, 6–7×4–5 mm, moderately to densely villous. *Seed* reniform, c. 2.5–3 mm long, arillate. (Fig. 14)

**Flowering period:** August–October. **Fruiting period:** from October.

**Distribution** (Fig. 57): south-western Western Australia. Occurs south of Perth, from West York south to the Williams district and further south to Bridgetown and Manjimup.

**Habitat:** prefers the heavier clay and loam soils of this region. Occurs in woodland or forest.

**Conservation status:** IUCN: R. ROTAP: 3R. This species is rare, though it is not considered to be at risk.

**Selected specimens** (28 examined): WESTERN AUSTRALIA, Darling District: near Quindanning, 33°02’S, 116°34’E, M.E. Phillips s.n., 16.x.1962 (CANB); 39.4 miles [63 km] from Collie towards Williams, E.M. Canning w.r.n., 1.x.1968 (CANB); Manjimup, 34°15’S, 116°09’E, R.D. Royce 2730, 28.x.1948 (PERTH); 30 km SW of Williams towards Collie, 33°12’S, 116°36’E, K.J. Atkins 89010, 25.x.1989 (PERTH); 12 miles [19 km] from Williams towards Perth, J.W. Wrigley s.n., 8.x.1968 (CANB); North Muradup Rd, 30 km W of Kojonup, 33°49’S, 116°57’E, C. Lewis CML 128, 8.x.1995 (PERTH); 88.5 mile peg, Albany Hwy, T.E.H. Aplin 2822, 16.x.1964 (PERTH).

**Toxicity:** unknown.

**Affinity:** this species is very similar to G. tomentosum, but G. tomentosum has mature leaves that are densely tomentose on the lower surface and a slightly shorter rachis (25–45 mm long). There is also some resemblance to G. ovalifolium, but this species has thick, flat leaves with dense venation, such that the areoles are reduced to pin-pricks.

28. **Gastrolobium ovalifolium** Henfry, Gard. Companion Florists’ Guide 1: 41 (1852). Type citation: ‘New Holland shrub was bloomed … by Messers. Henderson, of the Pine Apple Nursery,’. **Type:** the plate

Prostrate, spreading shrubs, 0.1 m high. *Branchlets* spreading, terete, densely pubescent. *Petioles* terete, continuous but not decurrent with the branchlet, 2–4 mm long, densely pubescent. *Leaves* spreading, opposite, obovate to ± circular, rarely transversely elliptic, 12–32×13–20 mm, mature leaves glabrous, venation reticulate, punctate, much paler on the lower surface; apex usually emarginate, sometimes strongly so, occasionally broadly rounded with a short, blunt mucro; margins entire, not recurved; base obtuse to broadly rounded. *Stipules* erect, triangular, membranous, keeled, 5–8 mm long, moderately villous, more prevalent on younger leaves. *Inflorescences* terminal racemes, 6–18-flowered, densely pubescent; *peduncle* often with a sheath of persistent barren bracts at the base, 10–20 mm long; *rachis* 40–70 mm long; *subtending bracts* caducous, scale-like, entire, lanceolate, densely pubescent, 7–8 mm long. *Pedicels* terete, densely pubescent, 1–2 mm long. *Calyx* campanulate, 5–6 mm long including the c. 1-mm receptacle, densely pubescent, lobes all reflexed; upper 2 lobes united slightly higher than the lower 3, triangular, acute, c. 3 mm long; lower 3 lobes triangular, acute, c. 3 mm long. *Corolla:* *standard* transversely ovate, c. 7.5×8 mm including the 2-mm claw, deep orange-purple on the back, orange-yellow on the front with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; *wings* oblong, c. 7.5×2.5 mm including the 2-mm claws, orange-yellow and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; *keel* half transversely broadly elliptic, margins not incurved, c. 7×3 mm including the
2.5-mm claws, deep maroon to almost black, apex rounded, base auriculate, saccate. *Style* very long, strongly incurved, lower half densely pubescent; *ovary* shortly stipitate, densely pubescent; *ovules* 2. *Pod* shortly stipitate, broadly ellipsoid, 6–7 × 4–5 mm, moderately to densely villous. *Seed* reniform, c. 3 mm long, arillate.

**Vernacular name:** runner poison.

**Flowering period:** August and probably September. **Fruiting period:** October.

**Distribution** (Fig. 58): south-western Western Australia. Occurs mainly in the Narrogin and Williams districts, but there is one record from Kojonup, further to the south. **Habitat:** grows on sandy clay soils in wandoo woodland. **Conservation status**: IUCN: R. ROTAP: 2RCa. CALM: P4. This species is rare, but is not considered to be at risk.

**Specimens examined:** due to the conservation status of this species, precise localities are not given. **Western Australia,** Darling District: E of Williams, R.D. Royce s.n., x.1958 (PERTH); Narrogin, C.A. Gardner s.n., 31.viii.1934 (CANB, PERTH); Dryandra NP. T.R. Lally 938 & B.J. Lepshch, 15.i.1996 (PERTH); Narrogin area, P. Batt PRB 5-8-93/2, 4.viii.1993 (PERTH); Kojonup, J.M. Flanagan s.n. (PERTH).

**Toxicity:** unknown.

**Affinity:** *Gastrolobium ovalifolium* is similar to *G. glabratum* and *G. tomentosum*. *Gastrolobium glabratum* differs in having generally undulate leaves with open reticulate venation on the lower surface, while *G. tomentosum* has densely tomentose mature leaves on the lower surface and has ± glabrous stipules.

29. *Gastrolobium rotundifolium* Meisn., in Lehm., Pl. Preiss 2: 216 (1848). **Type citation:** 'Swan River, Drummond coll.: II. No. 99'. **Type specimens:** holotype (here chosen): BM; iso: G, K × 2, LD


Erect, bushy shrubs, up to 0.8 m high. **Branchlets** ascending, angular to almost terete, moderately to densely pubescent. **Petiole** terete, continuous and may be slightly decurrent with the branchlet, 1–3 mm long. **Leaves** spreading to ascending, opposite, broadly elliptic, rarely elliptic or linear, 18–26(–32) × 8–18 mm, moderately to densely pubescent when young, moderately pubescent to ± glabrous when older, much paler on the lower surface, venation prominently reticulate; apex obtuse to acute, with a very long and needle-like pungent point; margins crinkled, rarely recurved or reflexed; base obtuse, rarely acute. **Stipules** erect, fused for at least part of their length, membranous, somewhat lacerate, narrowly triangular, 10–15 mm long. **Inflorescences** axillary or terminal racemes, 10–20-flowered, inflorescence axis densely pubescent; **peduncle** 3–7 mm long; **rachis** 10–25 mm long; **subtending bracts** caducous, but persisting until after anthesis, scale-like, lanceolate, 7–8 mm long, moderately pubescent. **Pedicels** terete, 1–2 mm long, densely pubescent. **Calyx** campanulate, c. 5 mm long including the 0.75-mm receptacle, densely villous, lobes not or slightly recurved; upper 2 lobes united higher than the lower 3, triangular, acute, c. 2 mm long; lower 3 lobes narrowly triangular, acute, c. 2 mm long. **Corolla**; standard transversely elliptic, c. 9 × 8 mm including the 3-mm claw, orange-yellow with a red ring surrounding the yellow apex, apex emarginate, base slightly cordinate, slightly auriculate; **wings** obovate to oblong, c. 8 × 3 mm including the 3-mm claws, orange-yellow to orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; **keel** half transversely broadly elliptic, c. 8 × 3 mm including the 3-mm claw, deep maroon, apex obtuse, base auriculate, saccate. **Style** long, hooked, lower half slightly pubescent; **ovary** stipitate, densely pubescent; **ovules** 2. *Pod* stipitate, obliquely ellipsoid, 6–7 × 3–4 mm, moderately to densely villous. *Seed* reniform, c. 3 mm long, arillate.

**Vernacular name:** gilbernine poison.

**Flowering period:** August and September. **Fruiting period:** from October.

**Distribution** (Fig. 59): south-western Western Australia. Occurs around Mingenew in the north, south through Watheroo and Calingiri to the areas around Wagin and Narrogin. **Habitat:** grows in more open positions on heavier clay or loam soils in wandoo woodland. **Conservation status:** ROTAP: 3K. CALM: P1. This species is rare and considered to be at some risk. The population examined in this study was along a local farm access track, in somewhat disturbed woodland surrounded by farms and is probably at some risk in the future.


**Notes on variation:** there is a form of this species, which Gardner, in Gardner and Bennets (1956), called *G. rotundifolium* var. *angustifolium* (although this is an invalid name), which has very narrow leaves with revolute margins, so that only the midrib and a very small portion of the abaxial surface is visible (e.g. the cited collection above, from Tootra, near Moora). There is an intermediate specimen (Aplin, 2801, cited above), which has somewhat narrow leaves with a slightly recurved margin that is not as undulate as the more typical form. Further work is required on this species, as it could not be located in the field for this study, to determine whether there are one or two species present.
Toxicity: fluoroacetate 150 µg g⁻¹ (Aplin 1971).

Affinity: this species is difficult to confuse with any other of Gastrolobium due to the particularly large stipules, which only G. densifolium shares. These two are easily separated, because G. densifolium has narrow, non-undulate, non-recurved leaves that are glabrous and are recurved along their length, whereas those of G. rotundifolium are straight.

IV. The G. floribundum group

This is a group of species with generally broad distributions throughout the central sandplains of south-western Western Australia. They share a distinctive keel shape (found in only two other species related to this group), in which the apex is quite acute and slightly beaked and the lower margin is not entire, having a large hole towards the base through which the stamens are visible and exposed. Also, they have strictly two ovules.


Oxylobium batillatum Hook., Icones Pl. 7: t. 612 (1844). Type citation: Swan River settlement. Jas. Drummond (suppl. coll. n. 32)’. Type specimen: holo: K.


Erect, spreading shrubs, up to 1 m high. Branchlets spreading to ascending, angular to almost terete, densely pubescent. Petioles terete, continuous but not decurrent with the branchlet, c. 0.5–1 mm long. Leaves spreading, opposite, oblong to linear, cuneiform, elliptic or oblong-elliptic, 5–35 × 7–25 mm, upper surface glabrous, lower surface moderately to densely pubescent, venation prominently reticulate; apex mucronate, recurved, often bilobed, the other angles usually mucronate; margins recurved to reflexed, may or may not be undulate; base obtuse, rounded or almost truncate. Stipules erect, hyaline, 3–5 mm long. Inflorescences terminal or axillary racemes, 10–30-flowered, flowers closely spaced along rachis; peduncle 2–5(–10) mm long; rachis 15–50 mm long; subtending bracts caducous, scale-like, entire, ovate, 4–6 mm long. Pedicels terete, 1–2 mm long. Calyx campanulate, 3–3.5 mm long, lobes all reflexed, moderately pubescent; upper 2 lobes united slightly higher than the lower 3, triangular, acute, c. 1.5 mm long; lower 3 lobes triangular, acute, c. 1.5 mm long. Corolla: standard transversely elliptic, 5–6 × 7–8.5 mm including the c. 2-mm claw, orange to orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate; wings obovate, 5–5.5 × 1.5–2 mm including the c. 1.5-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half transversely elliptic, 3.5–4 × 1.5–2 mm including the c. 1.5-mm claws, pink and maroon, apex acute, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. Style very short, incurved to slightly hooked, lower half pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, ellipsoid to ovoid, 5–7 × 4–5 mm, moderately pubescent. Seed not seen.

Vernacular names: horned poison; Hill River poison.


Distribution (Fig. 60): south-western Western Australia. Occurs in the northern sandplains to the north of Perth, from Eneabba south through Jurien Bay and Badgingarra to Mogumber and inland as far as Dandaragan.

Habitat: grows on undulating white sand dunes over laterite, or on sandy or gravelly clay over granite, in wandoo woodland, shrubland or heath.

Selected specimens (70 examined): WESTERN AUSTRALIA, Irwin District: 12 km from Three Springs along road to Eneabba, 29°35′S, 115°40′E; M.D. Cox 6318 et al., 2.x.1979 (CANB, PERTH); Moore River, Mogumber, 31°02′S, 116°02′E; C.A. Gardner s.n., vii.1936 (CANB, PERTH); 6 miles [9.5 km] from Three Springs towards Arrino, M.E. Phillips WA/68 942, 14.ix.1968 (CANB); 10.7 km along Badgingarra Rd from North West Rd, towards Dandaragan, 30°29′55″S, 115°36′35″E, G.T. Chandler 239 & W. Keys, 13.ix.1997 (BRI, CANB, NSW); 14.5 km on Toolbrudie Rd from Brand Hwy, S of Eneabba, 30°07′45″S, 115°30′04″E, G.T. Chandler 829 et al., 8.ix.1999 (CANB); 2.5 km along Toolbrudie Rd, N of Badgingarra, 30°08′59″S, 115°23′40″E, G.T. Chandler 629 & S. Donaldson, 23.x.1998 (CANB, MEL, PERTH); ibid, G.T. Chandler 635 & S. Donaldson, 23.x.1998 (CANB). Avon District: 2 km S of New Norcia, 31°00′0″S, 116°14′E, M. Fagg 1041, 26.viii.1979 (CANB).

Notes on variation: the leaves of this species vary considerably and in the past has led to the recognition of two varieties (var. revolutum and var. polystachyum), with notes made on intermediates in Gardner and Bennetts (1956). The two varieties appear distinct in their extremes, with var. revolutum being linear-oblong with a bilobed apex and var. polystachyum having more broadly oblong to cuneiform leaves with a somewhat less bilobed apex, often appearing truncate. However, there are a number of intermediates that grade from one form into the other and in fact may be found in one population, even on one plant (e.g. collections made by the senior author along Toolbrudie Road, S of Eneabba). Hence, these varieties are not being recognised here.

Toxicity: fluoroacetate 0–10 µg g⁻¹ (Aplin 1971).

Affinity: this species is difficult to confuse with any other Gastrolobium, due to the almost unique shape of the leaf combined with the often prominently bilobed apex. However, a population of a particularly long-leaved form of G. stowardii (Chandler 828 et al.) was found to occur sympatrically with a population of G. polystachyum along Toolbrudie Road, between Eneabba and Badgingarra. This
population has plants resembling *G. polystachyum* in leaf shape, but the leaves are small. However, *G. stowardii* is easily distinguished from *G. polystachyum*, with inflorescences that are paired in the axils and the flowers have bracts with enlarged middle lobes.

Some specimens with what appear to be juvenile foliage (broadly cuneiform leaves) vaguely resemble the more juvenile forms of *G. diabolophyllum*. However, *G. diabolophyllum* has more robust leaves and has pungent-pointed apices and angles, whereas these juvenile forms of *G. polystachyum* are unarmed. The foliage of *G. polystachyum* also somewhat resembles that of *G. stowardii*, particularly the more narrowly leaved form, but *G. stowardii* is easily distinguished by the smaller leaves and clustered, axillary inflorescences as opposed to the long racemes of *G. polystachyum*.


Low, bushy shrubs, 0.5–1(–1.8) m high. Branchlets ascending, angular, glabrous. *Petiole* terete, continuous and slightly decurrent with the branchlet, 3–4 mm long. Leaves spreading to ascending, in whorls of 3, ovate to elliptic, 17–40(–65) × 6–11(–14) mm, glabrous to slightly glaucous, spreading to ascending, in whorls of 3, ovate to elliptic, slightly decurrent with the branchlet, 3–4 mm long. *Inflorescences* racemes, terminal or in the upper axils, 1–3 per terminus or axil, 15- to more than 30-flowered; *peduncle* 5–10 mm long; *rachis* 20–120 mm long; *subtending bracts* caducous, scale-like, entire or slightly rachetate, ovate, 4–5 mm long. *Pedicles* terete, 2–3 mm long, becoming nutant at the onset of fruiting. *Calyx* campanulate, 3.5–4.5 mm long including the c. 1-mm receptacle, glabrous to sparsely pubescent, upper 2 lobes straight, lower 3 lobes recurved; upper two lobes united into an almost truncate lip, obtuse, c. 1.5 mm long; lower 3 lobes triangular, acute, 1–1.5 mm long. *Corolla*: *standard* transversely elliptic, c. 5–6 × 6 mm including the 2-mm claw, orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; *wings* obovate, c. 5–5.5 × 2 mm including the 2-mm claw, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; *keel* half transversely elliptic, c. 4.5 × 2 mm including the 1.5-mm claws, maroon, apex acute, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. Style very short, incurved, pubescent in the lower half; *ovary* stipitate, densely pubescent; *ovules* 2. *Pod* stipitate, nutant, obliquely ellipsoid, 5–7 × 3–3.5 mm, sparsely to moderately pubescent. *Seed* ellipsoid or somewhat cuboid, c. 3 mm long, arillate.

**Vernacular name**: Hutt River poison.

**Flowering period**: June–September. **Fruiting period**: October and November.

**Distribution** (Fig. 61): south-western Western Australia. Grows mainly in the Northampton and Port Gregory districts, with occasional collections around Mullewa and Issek.

**Habitat**: grows on clay, clay-loam or sandy clay soils in mixed shrubland.

**Conservation status**: ROTAP: 3K, CALM: P1. This species is rare and considered to be in danger. The population examined in this study was found on a highly disturbed roadside.

**Selected specimens** (24 examined): due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA: Irwin District: between Port Gregory and Northampton, G.T. Chandler 652 & S. Donaldson, 24.x.1998 (CANB, PERTH); Mullewa, R.D. Royce 7511, 11.ix.1962 (CANB, PERTH); Yerina Springs Rd, from Port Gregory Rd S. Patrick 1975, 9.viii.1994 (PERTH); Northampton area, J. Dodd s.n., 12.viii.1994 (PERTH); Issek, H.W. Jones s.n., 20.vi.1953 (PERTH); NW of Northampton, H.P. Dolling 2, 9.viii.1989 (CANB, PERTH); NW of Northampton, Dr Bellairs DRB1, 29.vii.1989 (PERTH).

**Toxicity**: unknown.

**Affinity**: this species has been confused with *G. oxylobioides* in the past, but *G. oxylobioides* has fewer flowers per inflorescence (5–10), the flowers are much larger (e.g. standard c. 10 × 14 mm), the keel shape is different, most noticeably lacking a spout-like apex and the lower margin is entire, lacking the hole where the stamens are visible and the calyx is generally more pubescent.

32. *Gastrolobium diabolophyllum* G.Chandler, Crisp & R.J.Bayer, sp. nov. Type: Western Australia: Avon District: Bodallin, 21 km along Hocking Road, at corner of Dulyabin Road and road to Bodallin, 31°37′29″S, 118°51′12″E, G.T. Chandler 856, A. Monro & S. Donaldson, 12 Sep. 1999 (holo: CANB; is0: AD!, BR!, CANB!, K!, MEL!, NSW!, NY!, PERTH!)

A *Gastrolobii* specibus ceteris foliis obtriangularibus robustis, apice recurvo spinis 3 ferocibus, marginibus recurvis vel revolutis, raceme floribus magnitudine moderata (e.g. rachis 3–7 mm longa, vexillum 7–8 × 10.5–12 mm) distinguenda.

The robust, obtriangular leaves with 3 fiercely pungent points, recurved to revolute margins and a recurved apex distinguishes this species from all others.

**Etymology**: from the Greek, *diabolos* = devil and *phyllon* = leaf. Named after the leaves, which have three fiercely pungent-pointed apices.

Erect, open, robust shrubs, 0.5–1.5 m high. Branchlets ascending, terete, moderately to densely sericeous. *Petioles* terete, continuous but not decurrent with the branchlet,
2–3 mm long. Leaves spreading to ascending, opposite, oblong to broadly so, rarely shallowly oblongangular, 12–26 × 10–32 mm, glabrous, occasionally somewhat glaucous; venation prominently reticulate, particularly on the upper surface; apex acute, rarely obtuse, recurved, all three angles with pungent points; margins entire, recurved to revolute; base rounded to cuneate. Stipules erect, triangular to hyaline, 1.5–2 mm long. Inflorescences terminal racemes, 5–10-flowered; peduncle 2–11 mm long; rachis 3–7 mm long; subtending bracts caducous, scale-like, entire to slightly trilobed, ovate, keeled, 3.5–4 mm long, moderately pubescent. Pedicels densely pubescent, 1.5–2 mm long. Calyx slightly campanulate, c. 5 mm long including the 0.75–1-mm receptacle, moderately to densely pubescent, lobes all reflexed; upper 3 lobes united higher than the lower 3, triangular, rounded, 2–3 mm long. Lower 3 lobes triangular, acute, 1.5 mm long. Standard: Style short, recurved, lower half pubescent; ovary stipitate, densely pubescent; ovules 2. Pedicel stipitate, ovoid, 5–6 × c. 3.5 mm, moderately to densely pubescent. Seed ellipsoid, c. 3 mm long, arillate. (Fig. 15)

Flowering period: September. Fruiting period: October. Distribution (Fig. 62): south-western Western Australia. Known only from one population near Bodallin, along the Great Eastern Highway. Habitat: Grows on broadly undulating dunes in yellow-brown sand over laterite in open mallee shrubland. Conservation status: CALM: P1. This taxon is rare, being known only from the type locality, which is located on a roadside reserve in a farming area and is considered to be at risk.


Toxicity: unknown.

Affinity: it is almost impossible to confuse this species with any other species of Gastrolobium. Superficially, it vegetatively resembles some juvenile forms of G. polystachyum, but G. diabolophyllum is distinguished by the more robust leaves that are strongly recurved and have three pungent points, whereas the juvenile forms of G. polystachyum have weak leaves that are not recurved and are unarmed.


Erect shrubs, 0.5–2 m high. Branchlets ascending, terete or angular, sparsely to densely pubescent. Petioles terete, continuous but not decurrent with the branchlet, 0.5–1.5 mm long. Leaves ascending, opposite, elliptic to obovate, may be straight, incurved or recurved, canaliculate (20–)28–41(–83) × 5–10 mm, glabrous, sometimes glaucous, venation prominently reticulate; apex rounded to acute, occasionally retuse, slightly mucronate; margins occasionally recurved; base cuneate. Stipules erect, hyaline, 3–4 mm long. Inflorescences terminal racemes, rarely axillary, 8–20-flowered; peduncle may have what appear to be aborted buds towards the base (3–)9–20(–33) mm long; rachis (22–)60–82 mm long; subtending bracts caducous, scale-like, entire, triangular, 3–4 mm long. Pedicels terete, 1.5–2 mm long. Calyx campanulate, 3.5–6 mm long including the c. 0.5-mm receptacle, moderately to densely pubescent, lower lobes only recurved; upper 2 lobes united higher than the lower 3, triangular, rounded, c. 2 mm long; lower 3 lobes triangular, acute, 1.5 mm long. Corolla: standard transversely obovate, 9–9.5 × 11 mm including the 3-mm claw, yellow to orange with a red ring surrounding the yellow centre, apex emarginate, base cordate; wings obovate, 6.5–7.5 × 3–3.5 mm including the 2–2.5-mm claw, orange, becoming darker towards the base, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half transversely broadly elliptic, turgid, margins incurved, 5.5–6 × 2.25 mm including the 2–2.5-mm claw, pink, apex obtuse, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. Style short, incurved, lower half pubescent; ovary stipitate, densely pubescent; ovules 2. Pedicel stipitate, ovoid, 5–6 × c. 3.5 mm, moderately to densely pubescent. Seed ellipsoid, c. 3 mm long, arillate. (Fig. 15)

Flowering period: August–November. Fruiting period: from late October. Distribution (Fig. 63): south-western Western Australia. Widespread in the central sandplain regions, from Caron in the west to Hyden and Marvel Loch in the east.
Habitat: grows on undulating dunes on sandy soils in mallee woodland, shrubland or heath.


Toxicity: highly toxic; fluoroacetate 1350 μg g⁻¹ (Aplin 1971).

Affinity: Gastrolobium floribundum is very similar to G. hians. The flowers of G. hians are smaller (7 × 10 mm) and have a glabrous calyx, which in G. floribundum is pubescent. Overall, G. hians is less hairy than G. floribundum.


Low shrubs, 0.2–1.2 m high. Branchlets ascending, terete, densely pubescent. Petioles terete, continuous but not decurrent with the branchlet, 1–3 mm long. Leaves ascending, opposite or whorled, elliptic to obovate (10–)13–17 × (6–)8–11(–13) mm, glaucous, venation prominently reticulate, raised on both surfaces; apex rounded, recurved, with or without a pungent point; margins entire, not recurved; base rounded to broadly cuneate. Stipules erect, hyaline, 3–4 mm long. Inflorescences terminal racemes, 8–16-flowered; peduncle with a number of apparently aborted buds (5–8–10 mm long; rachis 25–35–(40) mm long; subtending bracts caducous, scale-like, entire, ovate 5–7 mm long. Pedicels terete, 2–2.5 mm long. Calyx campanulate, c. 6 mm long including the 1-mm receptacle, moderately to densely villous, lobes all recurved to reflexed, rarely not recurved; upper 2 lobes united higher than the lower 3, rounded, 2–3 mm long; lower 3 lobes triangular, acute, 1.5–3 mm long. Corolla: standard transversely elliptic, 10–11 × 13–14 mm including the c. 3-mm claw, yellow-orange to orange with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; wings broadly obovate, 6.5–8 × c. 3.5 mm including the 2–3-mm claw, orange-yellow to red at the base, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, not saccate; keel half transversely ovate, 6–6.5 × c. 3 mm including the c. 2-mm claw, red to maroon, apex acute, spout-like, base auriculate, saccate, with a circular opening near the claws to expose the stamens from below. Style very short, incurved, hairs present in the lower half, ovary stipitate, densely pubescent; ovules 2. Pod stipitate, very broadly transversely elliptic to circular, 4.4 × 4.5 mm, moderately to densely villous. Seed not seen.

Vernacular name: spike poison.

Flowering period: August and September, possibly into October. Fruiting period: October and November.

Distribution (Fig. 64): south-western Western Australia. Very rare, occurring only in the Wongan Hills area.

Habitat: grows in sandy, often gravely soils over laterite in mixed low heath dominated by Proteaceae and Acacia.

Conservation status: IUCN: E, ROTAP: 2E, CALM: R. This species is rare and is considered to be endangered, although at least one population that was surveyed in this study is well reserved.


Toxicity: fluoroacetate 200 μg g⁻¹ (Aplin 1971).

Affinity: this species may be confused with G. hamulatum and G. rotundifolium, although these are easily distinguished, as the leaves of G. hamulatum are smaller (6–11.5 × 3–4.5 mm) and have a hooked point, which G. glaucum lacks and G. rotundifolium has a very long, needle-like, pungent point on the leaf (c. 5 mm long) and much larger stipules (10–15 mm long).


Erect shrubs, up to 3 m high. Branchlets ascending, angular to almost terete, moderately pubescent. Petioles terete, continuous and slightly decurrent with the branchlet, 2–5 mm long. Leaves (note that there is considerable variation in leaf size and shape according to developmental

Monograph of Gastrolobium 655
stages; see notes on variation below; only adult leaves are described here) spreading to ascending, opposite, trullate to rarely obtrullate or rhombic to broadly so or rarely elliptic or obovate, often conduplicate, 29–50 × 10–22 mm, glabrous, rarely glaucous, venation prominently reticulate; apex obtuse to acute, rarely retuse, rounded or truncate, often trilobed, pungent-pointed, mucronate or unarmored; margins flat; base cuneate. Stipules erect to recurved, hyaline, 2–8 mm long. Inflorescences terminal racemes, 1–3 per terminus, 10–30-flowered; peduncle angular, 3–10 mm long; rachis 25–55 mm long; subtending bracts caducous, scale-like, entire, lacerate or prominently trilobed, narrowly lanceolate, 1.5–3 mm long. Pedicels terete, 1.5–3 mm long. Calyx campanulate, 3–4 mm long including the c. 0.5-mm receptacle, moderately pubescent, upper 2 lobes straight to slightly recurved, united higher than the lower 3, rounded, c. 1.25 mm long; lower 3 lobes recurved to reflexed, acute, c. 1.1 mm long. Corolla: standard transversely elliptic, 6–7 × c. 8 mm including the 2.5-mm claw, orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; wings obovate, 5–6 × 2 mm including the 2-mm claw, orange and maroon, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half transversely elliptic, c. 5.5 × 2 mm including the 2-mm claw, maroon, lighter towards the base, apex acute, spout-like, base auriculate, saccate, with a circular opening at the base to expose the stamens from below. Style short, incurved to slightly hooked, ± glabrous; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, ellipsoid to globose, 4.5–8 × 3–4 mm, moderately sericeous. Seed scarcely reniform to ellipsoid, c. 3.5 mm long, arillate.

Notes on variation: the leaves of G. laytonii show considerable variation between different developmental stages. The juvenile leaves are mainly rhombic or obtrullate, with three prominent angles and are generally quite large, with a dimensional range of 50–75 × 25–30 mm, plus a 5–10-mm petiole. The bracts on adult specimen are also quite variable, with entire and prominently trilobated bracts found on one inflorescence.

Vernacular names: breelya; kite-leaved poison.
Flowering period: June–September. Fruiting period: from October.

distribution (Fig. 65): south-western Western Australia. Occurs throughout the northern sandplains and the goldfields and is often associated with ironstone, from the Wubin area east to the goldfield region around Kalgoorlie.

Habitat: occurs on sand over granite or ironstone in mallee woodland or scrub, or shrubland.

Selected specimens (58 examined). WESTERN AUSTRALIA, Avon District: 30 km W of Cue on W side of Big Bill slime dump, A.A. Mitchell 1458, 12.ix.1985 (PERTH); Mt Gibson, 29°34′38″S, 117°09′32″E, G.T. Chandler 831 et al., 9.ix.1999 (CANB, MEL, PERTH, UWA); 8 km W of Great Northern Hwy on Paynes Find–Fields Find road, 29°12′S, 117°40′E, J.W. Green 5248, 10.ix.1987 (CANB, PERTH); 6.4 km ENE of Anniversary Bore, Jingemarra Station, 27°48′S, 116°44′E, R.J. Crandall 6079, 15.ix.1987 (PERTH); Latham, 29°45′S, 116°27′E, D.A. Herbert s.n., x.1919, juvenile foliage only (PERTH); 3 m [5 km] N of Latham, 29°42′S, 116°27′E, J.S. Beard 7372, 5.ix.1974 (PERTH); 3.5 km along Wanarra East Rd from Mt Gibson towards Perenjori, G.T. Chandler 838 et al., 9.ix.1999, with adult and juvenile foliage (CANB, NSW, PERTH). Coolgardie District: Boulder, 30°47′S, 121°29′E, W.D. Campbell s.n., viii.1900 (PERTH); Kathleen Valley, F. Lullfitz 2379, 7.ix.1963 (PERTH).

toxicity: fluoroacetate 500 µg g⁻¹ (Aplin 1971).

Affinity: the distinctive kite-shaped leaves of G. laytonii makes it difficult to confuse with any other Gastrolobium, although some entire-leaved specimens of G. laytonii have been misidentified as G. graniticum. However, the leaves of G. graniticum are much larger (48–62 × 19–32 mm), as are the flowers (e.g. standard 11–13 mm long).


Erect, bushy shrubs, 1–2.5 m high. Branchlets ascending, angular, moderately to densely pubescent. Petioles grooved on the upper surface, continuous but not decurrent with the branchlet, 2–4 mm long. Leaves spreading to ascending, in whorls of 3 or 4, elliptic, occasionally conduplicate, occasionally recurved (16–)25–36 × 7–16 mm, glabrous to slightly glaucous, venation prominently reticulate; apex acute, pungent-pointed, rarely mucronate; margins entire, often crenulate, not recurved; base obtuse to cuneate. Stipules erect, hyaline, 1–3.5 mm long. Inflorescences terminal racemes, rarely branched, 15- to more than 30-flowered; peduncle 2–5 mm long; rachis 25–60 mm long; subtending bracts caducous, scale-like, entire or minutely lacerate, linear-lanceolate, 4.5–5 mm long, moderately pubescent. Pedicels 1–2 mm long. Calyx campanulate, 3.5–4.5 mm long including the c. 1-mm receptacle, sparsely to moderately pubescent, lobes all straight or lower 3 lobes recurved; upper 2 lobes united higher than the lower 3, acute, c. 1.5 mm long; lower 3 lobes triangular, acute, c. 1 mm long. Corolla: standard transversely elliptic, 8 × 7–8 mm including the 3–3.5-mm claw; orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, occasionally auriculate; wings obovate, 6–7 × 2–2.5 mm including the c. 2.5-mm claw, red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half transversely elliptic, 4.5 × 2–2.5 mm including the 1.5–2.5-mm claws, deep red to almost pale white, apex acute, spout-like, base auriculate, saccate, with a circular opening at the base near the claws to expose the stamens from below. Style very short, incurved to hooked, pubescent in the lower half; ovary stipitate, densely
pubescent; **ovules** 2. **Pod** stipitate, obliquely ellipsoid, 5–7 × 3–4 mm, sparsely to moderately pubescent. **Seed** reniform, c. 3–4 mm long, arillate.

**Vernacular name:** sandplain poison.

**Flowering period:** August–October. **Fruiting period:** from November.

**Distribution** (Fig. 66): south-western Western Australia. Occurs throughout the Darling escarpment, from Bindoon 32°45′E, 20.ix.1988 (PERTH); Dryandra State Forest, NE of Congelin, turnoff, 33°08′S, 116°03′E, F. Dewar s.n., 15.ix.1950 (CANB, PERTH); Clackline Nature Reserve, 15 km W of Northam, 31°42′S, 116°29′E, G.J. Keighery 10920, 20.ix.1988 (PERTH); Dryandra Forest, NE of Congelin, c. 32°45′S, 117°00′E, W. Greater 23189, 24.x.1991 (PERTH); S of Walebing, c. 30°42′S, 116°13′E, R.D. Royce 6026, 14.ix.1959 (PERTH); Clackline, property of H. L. Adams, c. 31°42′S, 116°29′E, M.E. Carslake s.n., 12.ix.1969 (K, MEL, PERTH).

**Toxicity:** fluoroacetate 0–600 µg g⁻¹ (Aplin 1971).

**Affinity:** this species has been confused with *G. oxyspathos*, which has fewer flowers per inflorescence (5–10-flowered), larger flowers (calyx 6–7.5 mm long, standard c. 10 × 14 mm) and lacks the distinctive keel-petal of *G. microcarpum*, which has a spot-like apex and a hole towards the base of the lower margin, through which the stamens are visible.

37. *Gastrolobium crassifolium* Benth., *Fl. Austral.* 2: 105 (1864). **Type citation:** ‘W. Australia. Drummond, n. 32’. **Type specimens:** holo: K; iso: K, MEL.

Erect, bushy shrubs, 0.3–1.5 m high. **Branchlets** ascending, angular, moderately sericeous. **Petioles** terete, continuous but not decurrent with the branchlet, 1–2 mm long. **Leaves** ascending, in whorls of 3, occasionally 4, rarely opposite, elliptic, occasionally narrowly obovate, concave, 12–25 × 4–14 mm, glabrous, often glaucous, venation partially obscure, pinnate; apex acute, usually mucronate; margins entire, not recurved; base cuneate or rounded. **Stipules** erect, hyaline, 1–4 mm long. **Inflorescences** terminal racemes, sometimes on short, axillary shoots, 8–30-flowered; **peduncle** 2–10 mm long; **rachis** 20–50 mm long; **subtending bracts** caducous, scale-like, entire, elliptic, 5–6 mm long. **Pedicels** terete, 1–2 mm long. **Calyx** campanulate, 4–6 mm long including the c. 1-mm receptacle, glabrous to sparsely pubescent, lobes not or scarcely recurved; upper 2 lobes united into an almost truncate lip, c. 2 mm long; lower 3 lobes triangular, acute, 1–1.5 mm long. **Corolla:** **standard** transversely ovate, 7–9 × 9–11 mm including the 3–4-mm claw, orange-yellow to yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; **wings** obovate, 5–8 × 2–3 mm including the 2–3-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; **keel** half transversely elliptic, 4.5–7 × 1.5–2.5 mm including the 2–3-mm claws, maroon, apex acute, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. **Style** short, incurved, lower half pubescent; ovary stipitate, densely pubescent; **ovules** 2. **Pod** stipitate, ± spherical, 4–5 × 4–5 mm, sparsely to moderately pubescent. **Seed** ellipsoid to reniform, c. 3 mm long, arillate.

**Vernacular name:** thick-leaved poison.

**Flowering period:** July–December. **Fruiting period:** from late October to December.

**Distribution** (Fig. 67): south-western Western Australia. Common in the southern-central sandplain and salt-lake areas, from Lake Grace south to Ongerup and Pingrup and east to Frank Hann National Park and Cascade.

**Habitat:** grows on undulating dunes or flat plains on brown or yellow sand, sandy clay or sandy loam, in *Eucalyptus* or * Allocasuarina* shrubland or heath.


**Toxicity:** fluoroacetate 150 µg g⁻¹ (Aplin 1971).

**Affinity:** this species resembles *G. velutinum* and *G. floribundum*. *G. floribundum* can easily be distinguished by the leaf size [(20–)28–41(–83) × 5–10 mm], while *G. velutinum* generally has a notch in the leaf apex, which *G. crassifolium* lacks. Also, *G. floribundum* is distinguished by the open, coarse venation, whereas *G. crassifolium* has fine and obscure venation. *Gastrolobium venulosum* can also be confused with *G. crassifolium*, but *G. venulosum* has a relatively broader leaf (20–27 × 4–7 mm) with prominently open, reticulate venation, whereas *G. crassifolium* has somewhat obscured venation. Also, *G. venulosum* lacks the distinctive keel shape of *G. crassifolium* and the rest of the *G. floribundum* group, because its spout-like apex is not as acute and the lower margin is entire.
38. Gastrolobium hians G.Chandler & Crisp, sp. nov. Type: Western Australia: Roe District: 25.5 km along New Norseman–Hyden Road (turn 10 km N of Norseman), 32°11′06″S, 121°27′57″E, G.T. Chandler 868, A. Monro & S. Donaldson, 14 Sep. 1999 (holo: CANB; iso: AD!, B!, BRI!, K!, MEL!, NSW!, NY!, PERTH!)

G. floribundo similissima sed facie glabratra, calyce glabro et floribus minoribus ( vexillum 7 × 10 mm) differt.

Very similar to G. floribundum, but differing in the generally less pubescent appearance, glabrous calyx and smaller flowers (standard 7 × 10 mm).

Etymology: this specific epithet means open-mouthed or gaping and refers to the fruits of this species, which appear to be gaping when fully open.

Erect, ± glaucous shrubs, 0.7–1.7 m high. Branchlets ascending, angular, glabrous. Petioles terete, continuous and sometimes decurrent with the branchlet, 3–5 mm long. Leaves ascending, opposite, linear very narrowly elliptic to lanceolate, 4–10 mm long; rachis (20–)35–65 mm long; subtending bracts caducous, scale-like, entire, triangular, 3–4 mm long. Pedicels terete, 2–3 mm long. Calyx campanulate, 4.5–5 mm long including the c. 1-mm receptacle, glabrous; upper 2 lobes not recurved, united higher than the lower 3, triangular, acute, c. 2 mm long; lower lobes recurved, triangular, acute, c. 1.5 mm long. Corolla: standard transversely elliptic, c. 7 × 10 mm including the 3-mm claw, orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate; wings obovate, 6.5–7 × c. 3 mm including the 2-mm claw, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, slightly saccate; keel half transversely elliptic to circular, upper margins slightly incurved, 6–6.5 × c. 2 mm including the 2-mm claw, maroon, apex rounded, lipped, base auriculate, saccate, with a circular opening at the base to expose the stamens. Style short, incurved, glabrous or slightly pubescent in the lower quarter; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, elliptic, 5–7 × 3.4 mm, glabrous. Seed not seen. (Fig. 16)

Flowering period: September. Fruiting period: October and November.

Distribution (Fig. 68): south-western Western Australia. Little is known about this species and it is only known from just west of Norseman, along the New Norseman–Hyden track.

Habitat: grows on sandplains on sandy loam or clay soils in Acacia or Allocasuarina shrubland.

Specimens examined: WESTERN AUSTRALIA, Coolgardie District: 25.5 km along New Norseman–Hyden road (turn 10 km N of Norseman), 32°11′06″S, 121°27′57″E, G.T. Chandler 869–871 et al., 14.ix.1999 (CANB, MEL, MO, NSW, PERTH, UWA); 31 km W of Norseman, K. Newhey 6501, 6.xi.1979 (PERTH).

Toxicity: unknown, but as it is closely related to G. floribundum, it is probably toxic.

Affinity: this species is very similar to G. floribundum, which has larger flowers (standard 9 × 11 mm) and a pubescent calyx, whereas the calyx of G. hians is glabrous. The general lack of hairs on G. hians compared with G. floribundum, helps to distinguish these two species.


Low shrubs, up to 1 m high. Branchlets ascending, angular, moderately sericeous. Petioles terete, continuous but not decurrent with the branchlet, 2–3 mm long. Leaves spreading to ascending, opposite to rarely scattered, obovate, elliptic to almost oblong to broadly so, partially conduplicate, 11–22 × 11–14 mm, glabrous, venation prominently reticulate; apex rounded to truncate, emarginate; margins entire, not recurved; base obtuse, truncate, or slightly cordate. Stipules erect, narrowly triangular to hyaline, 2–3 mm long. Inflorescences terminal racemes, 15–30-flowered; peduncle 3–7 mm long; rachis 7–12 mm long; subtending bracts caducous, scale-like, entire or minutely lacerate, ovate, 5–6 mm long. Pedicels terete, 2–3 mm long. Calyx campanulate, 3.5–4 mm long including the c. 1-mm receptacle, moderately pubescent, all lobes recurved; upper 2 lobes united higher than the lower 3, acute, c. 1.5 mm long; lower 3 lobes triangular, acute, 1–1.5 mm long. Corolla: standard transversely elliptic, 6 × 7 mm including the 2-mm claw, orange or orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate; wings obovate, 6 × 2.5 mm including the 2-mm claw; orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half transversely elliptic to circular, upper margins slightly incurved, 6–6.5 × c. 2 mm including the 2-mm claw, maroon, apex rounded, lipped, base auriculate, saccate, with a circular opening at the base to expose the stamens. Style short, incurved, glabrous or slightly pubescent in the lower quarter; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, ovoid to ellipsoid, 6–7 × 3–4 mm, moderately to densely pubescent. Seed reniform, 2–3 mm long, arillate.

Vernacular name: mount ragged poison; round-leaved poison.

Flowering period: August–October, with a rare, probably opportunistic, flowering event in January. Fruiting period: from late October.

Distribution (Fig. 69): south-western Western Australia. Restricted to the area around Mount Ragged, in Cape Arid National Park, east of Esperance.
**Habitat:** grows on rocky outcrops or the sandplain immediately around them, on shallow sand over sandstone or red clay in mallee woodland or mixed low heath.

**Selected specimens** (13 examined): WESTERN AUSTRALIA, Roe District: base of Mt Ragged, NW side, along track to summit, 33°26′45″S, 123°27′56″E, G.T. Chandler 811 & S. Donaldson, 12.xi.1998 (CANB); base of Mt Ragged, T.E.H. Aplin 4310, 19.x.1970 (CANB, PERTH); Cape Arid NP, near Tower Peak, 33°27′S, 123°26′E, R. Borough 2, 1.x.1978 (CANB, PERTH); Mt Ragged NP, 33°27′S, 123°27′E, J. Taylor 1544 & P. Oliverenshaw, 8.x.1983 (AD, CANB, MEL, MO, PERTH); Mt Ragged Range, 2.5 km S of Tower Peak, 33°28′S, 123°28′E, M.D. Crisp 4811, 6.i.1979 (CANB).

**Toxicity:** fluoracetate 175 µg g⁻¹ (Aplin 1971).

**Affinity:** the low habit and restricted distribution of this species makes it difficult to confuse with any other species of *Gastrolobium*. The leaves resemble those of *G. crassifolium*, as they are somewhat conduplicate, but those of *G. crassifolium* are generally narrower (4–14 mm broad) and glaucous and the rachis is longer (20–50 mm long).


Low, bushy to spreading shrubs, 0.4–0.8 m high. Branchlets ascending or terete, moderately pubescent. Petioles very small, continuous and slightly decurrent with the branchlet, <0.5 mm long. Leaves ascending to erect, in whorls of 3, crowded along stems such that the leaf base is obscured by the apex of the leaf below, obovate to narrowly so, 4–15 × 2–5 mm, glabrous, glaucous, venation reticulate; apex ± truncate, may be slightly recurved, mucronate; margins not recurved, flat or slightly conduplicate; base rounded. Stipules erect or slightly recurved, hyaline, 1–2.5 mm long. Inflorescences terminal racemes, 21–33-flowered; peduncle 2–10 mm long; rachis 20–45 mm long; subtending bracts caducous, scale-like, entire, boat-shaped, 6–10 mm long, glabrous, except the margin which has curly hairs. Pedicels terete, mutant as flower ages, 1–2 mm long. Calyx campanulate, 4.5–5.5 mm long including the 0.5–0.75-mm receptacle, glabrous; upper 2 lobes not recurved, united into an emarginate, truncate lip, obtuse, c. 2 mm long; lower 3 lobes strongly recurved, triangular, acute, c. 1.5 mm long. Corolla: standard transversely ovate, c. 8.5 × 10.5 mm including the 3-mm claw, orange to orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, slightly auriculate; wings obovate, c. 7 × 3 mm including the 2.5-mm claws, orange to pink, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half transversely elliptic, c. 5.5 × 2.5 mm including the 2-mm claws, pink or maroon, apex acute, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. Style short, incurved, lower half pubescent; ovary shortly stipitate, densely pubescent; ovules 2. Pod shortly stipitate, globose, c. 5 × 5 mm, glabrous. Seed reniform, c. 4 mm long, arillate.

**Vernacular name:** berry poison.

**Flowering period:** August–October. **Fruiting period:** October and November.

**Distribution** (Fig. 70): south-western Western Australia. Occurs from Tammin and Kellerberrin in the west, to Hyden in the east and south to the Brookton area.

**Habitat:** grows on sand or gravel in mallee shrubland and heathland.


**Toxicity:** fluoracetate 300 µg g⁻¹ (Aplin 1971).

**Affinity:** this species most closely resembles *G. hamulosum*, but can be distinguished by *G. hamulosum* having a pungent, hooked apex on the leaf and the leaves not crowded along the stem.


Low, bushy shrubs, up to c. 1 m high. Branchlets ascending, angular, moderately pubescent. Petioles terete, continuous and somewhat decurrent with the branchlet, 1–2 mm long. Leaves spreading to ascending, in whorls of 3, cuneate to oblong, 7–18 × 2.5–8 mm, upper surface ± glabrous, lower surface glabrous to densely pubescent, venation prominently reticulate; apex emarginate, unarmured, may be scarcely recurved; margins scarcely to strongly recurved; base rounded to truncate. Stipules erect, hyaline, 0.5–1.5 mm long. Inflorescences terminal racemes, 15–30-flowered; peduncle with or without apparently aborted buds, 5–20 mm long; rachis 15–25 mm long; subtending bracts caducous, scale-like, entire, boat-shaped, 6–7 mm long, moderately pubescent. Pedicels terete, 1.5–2 mm long. Calyx campanulate, 4–4.5 mm long including the c. 0.75-mm receptacle, moderately to densely pubescent; upper 2 lobes scarcely to strongly recurved, united higher than the lower 3, rounded, c. 2.5 mm long; lower 3 lobes reflexed, triangular, acute, c. 2 mm long. Corolla: standard transversely ovate, 7.5–9 × 9–11 mm
including the 2.5–3-mm claw, orange to orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, may be auriculate; wings obliquely elliptic, c. 6 × 2.5 mm including the 2-mm claws, pink, apex rounded, incurved and overlapping to enclose the keel, base strongly auriculate on both margins, saccate; keel half very broadly elliptic, 4.5–5 × 2 mm including the 1.5-mm claws, pink to maroon, apex acute, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. Style very short, hooked, lower half pubescent; ovary stipitate, densely pubescent; ovules. Pod stipitate, ovoid, 5.5–6.5 × 3.5–4 mm, moderately pubescent. Seed not seen.

**Vernacular name:** white gum poison; Stirling Range poison.

**Flowering period:** August–October. **Fruiting period:** October and November.

**Distribution** (Fig. 71): south-western Western Australia. Occurs mainly in and around the Stirling Range, extending south and west to the Albany region.

**Habitat:** grows on slight mountain slopes, flats or periodically inundated depressions on clay-loam or sandy clay, in marri woodland or mallee woodland.


**Toxicity:** fluorocacetate 300 µg g⁻¹ (Aplin 1971).

**Affinity:** this species may be confused with *G. cuneatum*, which has a similar leaf shape to the form of *G. velutinum* that has oblong leaves with strongly recurved margins. They are easily distinguished by *G. cuneatum* having a longer leaf [20–33 (–61) mm long] and the inflorescence is longer [peduncle (5–)11–58 mm long, rachis 75–116 mm long], mainly due to the longer internodes between flowers (>10 mm), whereas *G. velutinum* has relatively short internodes (3–8 mm). This species has occasionally been confused with *G. parviflorum* in the past, but *G. parviflorum* has elliptic leaves and much longer racemes (rachis >50 mm long).

### V. The *G. heterophyllum* group

This group of three morphologically disparate species share little in common with each other, but form a strongly supported group. *Gastrolobium heterophyllum* has both entire and trifid subtending floral bracts, *G. nutans* has entire bracts and *G. pusillum* has trifid bracts only. Ovule number ranges from two in *G. nutans* to 4–10 in *G. heterophyllum* and *G. pusillum*. It could be that this small group of species are simply well differentiated from each other, yet quite closely related.


Weak, almost prostrate shrubs, 0.05–0.3 (–1.8) m high. *Branchlets* ascending or trailing, angular, moderately pubescent. *Petioles* terete, continuous but not decurrent with the branchlet, 0.5–1.5 mm long. *Leaves* spreading, opposite, ovate to elliptic (8–)16–29 × (1.5–)3–5 mm, glabrous to moderately pubescent, venation prominently reticulate; apex rounded, recurved, unarmèd; margins entire, recurved; base rounded; leaves of different sizes present on each specimen. *Stipules* erect, hyaline, linear-triangular, 2–4 mm long. *Inflorescences* terminal racemes, occasionally terminal on a short axillary shoot, 4–18-flowered; *peduncle* (0–)4–8 mm long; *rachis* (8–)21–58 mm long; *subtending bracts* caducous or persistent, scale-like, entire or trifid, narrowly triangular, 3–5 mm long. *Pedicels* terete, 1.5–2 mm long. *Calyx* campanulate, 4–5 mm long including the 0.5–1 mm receptacle, moderately to densely villous, lobes not recurved or lower lobes only recurved; upper 2 lobes united higher than the lower 3, triangular, acute, 2.5–3 mm long; lower 3 lobes triangular, acute, 2.5–3 mm long. *Corolla:* standard transversely elliptic, c. 7 × 7 mm including the 2.5-mm claw, golden yellow with a red ring surrounding the yellow centre, apex emarginate, base truncate; wings oblong, c. 6 × 1.5–2 mm including the 2-mm claw, golden yellow, apex rounded, incurved but not enclosing the keel, base auriculate on the upper margin only, slightly saccate; keel half transversely broadly obovate, c. 7 × 3 mm including the 2-mm claw, black or deep maroon, apex almost truncate, sometimes with a small spur, base auriculate, saccate. *Style* long, incurved to hooked, lower half pubescent; ovary shortly stipitate, densely pubescent; ovules. *Pod* stipitate, oblong to elliptic, 6.5–9 × 3–4 mm, moderately to densely pubescent. Seed not seen.

**Vernacular name:** slender poison.

**Flowering period:** August–October. **Fruiting period:** October and November.

**Distribution** (Fig. 72): south-western Western Australia. Occurs along the south coast between Hopetoun and Esperance.

**Habitat:** generally grows beside or near rivers or drainage lines, on white sand to heavy red clay soils in mixed shrubland to mallee woodland.
Monograph of Gastrolobium

Conservation status: ROTAP: 3KC-. This species is rare and poorly known, but this is possibly due to the habit of this species, which is often prostrate or climbing through other plants, making it difficult to see and therefore difficult to collect and it may in fact be quite common throughout the rivers along the south coast of SW Western Australia.

Selected specimens (11 examined): due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA, Eyre District: Fitzgerald River NP, K. Newbey 11300, 24.x.1986 (CANB, PERTH); Young River, G.F. Craig 2872, 9.ix.1993 (PERTH); Munglinup, N.S. Lander 1064, 22.x.1979 (PERTH); Esperance, E.N. Fitzpatrick s.n., 5.ix.1969 (PERTH).

Toxicity: unknown.

Affinity: the unusual growth habit of this plant combined with the ovate leaves of different sizes along the stem make this plant difficult to confuse with other species of Gastrolobium. Gastrolobium parviflorum most closely resembles G. heterophyllum vegetatively, though G. parviflorum is an erect, bushy shrub, generally has oblong or elliptic leaves that are broader (3–11 mm broad), the inflorescence axis is generally longer (peduncle 4–22 mm long, rachis 30–65 mm long) and there are fewer ovules per ovary (three or four).

43. **Gastrolobium nutans** G.Chandler & Crisp, sp. nov. Type: Western Australia: Roe District: Lake King area, 46 km towards Norseman from Lake King, 33°04′37″S, 120°10′08″E, G.T. Chandler 906, S. Donaldson & A. Monro, 17 Sep. 1999 (holo: CANB!; iso: AD!, BI!, BRI!, CANB!, K!, MEL!, NSW!, NY!, PERTH!)

*G. tetragonophyllum* vegetative simili sed foliis longitudinaliter recurvis et ovulis duobus differt.

**Gastrolobium nutans** has longitudinally recurved leaves and strictly two ovules, which serves to distinguish this species from the vegetatively similar *G. tetragonophyllum*.

Etymology: from Latin, *nuto* = to nod with the head; refers to the nodding flowers and fruits of this species.

Erect, bushy shrubs, 0.5–1.5 m high. Branchlets ascending, terete, moderately to densely pubescent. Petioles terete, continuous but not decurrent with the branchlet, c. 1–1.5 mm long, densely pubescent. Leaves ascending, in whors of 3, rarely opposite, ± oblong, though juvenile leaves are somewhat elliptic, recurved longitudinally, 12–25 × 2–3.5(-5) mm, upper surface glabrous, lower surface densely pubescent, venation prominently reticulate; apex broadly rounded to almost truncate, slightly mucronate; margins recurved to revolute (less so in juvenile foliage), often only the midrib and a small portion of the abaxial surface is visible; base rounded to truncate. *Stipules* erect, hyaline, 1.5–2 mm long. Inflorescences terminal racemes, 15–30-flowered; peduncle often with a sheath of persistent barren bracts at the base, 3–6 mm long; rachis 15–40 mm long; subtending bracts caducous, scale-like, entire, triangular, c. 2 mm long. Pedicels terete, c. 1–1.5 mm long, pubescent. Calyx campanulate, c. 4 mm long including the 1-mm receptacle, moderately pubescent, lobes all strongly recurved; upper 2 lobes united higher than the lower 3, rounded, 1.5 mm long; lower 3 lobes triangular, acute, 1.5 mm long. Corolla: standard transversely elliptic, c. 5 × 6 mm including the 2-mm claw, orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, slightly auriculate; wings obliquely obovate, c. 6 × 2.5 mm including the 2-mm claws, orange-yellow, red towards the base, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half transversely elliptic, c. 4.5 × 1.5 mm including the 1.5-mm claws, pink and maroon, apex acute, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. Style long, strongly incurved, pubescent in the lower third; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, nutant, obliquely ellipsoid, 4.5–6 × 2.5–3 mm, moderately pubescent. Seed ellipsoid, c. 2 mm long, arillate. (Fig. 17)

Flowering period: August–October. Fruiting period: October and November.

Distribution (Fig. 73): south-western Western Australia. Occurs in the central-eastern sandplains, from Bullfinch south to Lake King and east to the Peak Charles area.

Habitat: grows on undulating dunes in deep white or grey sand in mallee shrubland or heathland.

Selected specimens (25 examined): WESTERN AUSTRALIA, Roe District: Mt Hampton, S of Southern Cross, 31°46′S, 119°04′E, R.D. Royce 9056, 6.x.1970 (CANB, PERTH); Pallarp, 33°13′S, 119°44′E, C.A. Gardner 13645, 20.x.1961 (PERTH); Mt Sturt, C.A. Gardner 14839, 17.x.1964 (PERTH); Burkett Rocks, Lake King, 33°04′S, 119°49′E, Mrs Edwards s.n., ix.1934 (PERTH); c. 300 m SE of Hatter Hill trig, 32°49′24″S, 119°59′08″E, G.F. Craig 2391, 27.x.1992 (PERTH); Cascades Rd, 11.3 km towards Lake King from West Point Rd, 33°16′22″S, 120°47′58″E, G.T. Chandler 930 et al., 19.ix.1999 (CANB, NSW, PERTH); 11.5 km WSW along track just N of God Rock (from turnoff to Lake Sharpe), 33°00′53″S, 120°56′34″E, G.T. Chandler 789 & S. Donaldson, 10.xi.1998 (CANB, NSW).

Toxicity: unknown.

Affinity: superficially, this species is somewhat similar in leaf shape to the *G. parviflorum* group (*G. parviflorum*, *G. revolutum* and *G. stenocarpum*) and *G. tetragonophyllum*, but the leaves of the *G. parviflorum* group and *G. tetragonophyllum* are not recurved longitudinally and these species have more than two ovules, where *G. nutans* has strictly two ovules.

Prostrate, mat-forming shrubs. Branchlets spreading, angular, glabrous. *Petioles* terete, continuous and slightly decurrent with the branchlet, 1–1.5 mm long. *Leaves* spreading, opposite, cuneate to obovate, 7–12 × 5.5–8 mm, glabrous, venation prominently reticulate; apex triscuspidate, each angle with a long, weak micro; margins not recurved; base rounded to almost truncate. *Stipules* erect, hyaline, c. 2 mm long. *Inflorescences* short axillary racemes, 2–4-flowered; *peduncle* very short, up to 2 mm long; *rachis* almost non-existent, up to 0.25 mm long; *subtending bracts* caducous, scale-like, trifid, c. 1.5 mm long. *Pedicels* terete, c. 2 mm long. *Calyx* campanulate, c. 6 mm long including the 1-mm receptacle, sparsely pubescent, lobes scarcely recurved; upper 2 lobes united higher than the lower 3, triangular, acute, 2.5–3 mm long; lower 3 lobes triangular, acuminate, 2.5–3 mm long. *Corolla*: standard transversely elliptic, c. 6.5 × 7 mm including the 2.5-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base truncate; *wings* obliquely oblong, c. 7.5 × 2 mm including the 2.5-mm claws, orange to yellow, red towards base, apex rounded, not incurved, not enclosing the keel, base auriculate on both margins, saccate; *keel* half transversely obovate, margins not incurved, c. 7 × 3 mm including the 2.5-mm claws, deep maroon, apex rounded, base shortly stipitate, densely pubescent; *ovules* 4–10. *Pod* shortly stipitate, ovoid, 5–5.5 × 3–3.5 mm, moderately pubescent. *Seed* not seen.

**Flowering period**: August–October. **Fruiting period**: from November.

**Distribution** (Fig. 74): south-western Western Australia. Occurs south of Perth around Mount Barker and east to Ongerup.

**Habitat**: grows in wetter areas, including floodplains and swamp margins, in generally loamy soils or in sand along rivers, in shrubland and heathland, often in clearings amongst eucalypt woodland.


**Toxicity**: unknown.

**Affinity**: this species is difficult to confuse with any other species of *Gastrolobium* because of its diminutive size, the cuneate leaves that bear three slender cusps at the apexes and reduced, axillary racemes of 2–4 flowers.

VI. The *G. obovatum* group

This group of species includes a number of taxa formerly included in *Nemcia*. Many of these species share a number of characters intermediate between those of *Gastrolobium* sens. str. and *Nemcia* as defined by Crisp and Weston (1987), such as short, axillary racemes, trifid bracts (except *G. bennetssianum*, which has entire bracts and *G. brownii* and *G. truncatum* which have both entire and trifid bracts) and strictly two ovules, except for *G. latifolium*, which has 18–21.


Tall, bushy shrubs, 1.5–3 m high. *Branchlets* ascending, terete, moderately to densely pubescent. *Petioles* terete, continuous and slightly decurrent with the branchlet, 1–2 mm long. *Leaves* ascending, opposite or rarely whorled, oblong, obovate or cuneate, 8–30 × 4–9 mm, glabrous or very sparsely pubescent on the lower surface around the venation, venation prominently reticulate; apex rounded, obtuse or truncate, generally pungent-pointed; margins entire, flat or recurved; base rounded. *Pedicels* free, hyaline, 0.5–1.5 mm long. *Inflorescences* axillary racemes, sometimes on short axillary shoots (2–)4–9-flowered; *peduncle* (1–)3–6 mm long; *rachis* 2–8(–20) mm long; *subtending bracts* scale-like or herbaceous; if scale-like: caducous, entire, lobed or trifid, generally lanceolate, c. 4 mm long; if herbaceous: 4–7 mm long, obovate, mostly caducous, occasionally persistent. *Pedicels* terete, 1–2.5 mm long. *Calyx* campanulate, 3.5–4.5 mm long including the 0.5–1 mm receptacle, two-toned, green at base, very dark brown above, sparsely to moderately sericeous; upper 2 lobes not recurved, united higher than the lower 3, sometimes into a truncate lip, obtuse, 1.5–2 mm long; lower 3 lobes may be recurved, triangular, acute, 1.5–2 mm long. *Corolla*: standard transversely broadly elliptic, 8–8.5 × c. 8.5 mm including the c. 2.5-mm claw, yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; *wings* obovate, 8–8.5 × c. 2.5 mm including the c. 2-mm claw, yellow, apex rounded, incurved and partially enclosing the keel, base auriculate on the upper margin only, slightly saccate; *keel* half circular to transversely very broadly elliptic, margins not incurved, 7.5–8 × c. 2.5 mm including the c. 2.5-mm claw, red, apex rounded, base auriculate, saccate. *Style* long, incurred to slightly hooked, lower third pubescent; *ovary* stipitate, densely pubescent; *ovules* 2. *Pod* stipitate, ellipsoid, 5–7 × 2–3.5 mm, sparsely to moderately pubescent. *Seed* reniform, 2–2.5 mm long, arillate.
Flowering period: September–November. Fruiting period: from late November onwards.

Distribution (Fig. 75): south-western Western Australia. Occurs along the western portion of the south coast, from Denmark east to the Albany region and north to the Porongurup Range.

Habitat: usually grows in moister areas, which is unusual for Gastrolobium, on loamy, occasionally sandy soils, in forest, open woodland or more rarely shrubland usually dominated by Eucalyptus calophylla, *E. diversicolor*, *E. marginata* or *E. megacarpa*.

Conservation status: ROTAP: 2K. This species is fairly rare and poorly known, with further survey work required to determine its conservation status.

Selected specimens (26 examined): WESTERN AUSTRALIA, Eyre District: Mt Wilyung, 34°57'S, 117°51'E, T.E.H. Aplin 6038, 26.ix.1974 (CANB, PERTH); 35 km W of Denmark, 0.2 km along Tindale Rd from South Coast Hwy, 34°57′S, 117°01′02″E, G.T. Chandler 726 & S. Donaldson, 31.x.1998 (CANB, PERTH); Porongurup Range, Castle Rock, 34°42′E, M.D. Crisp 8509 & W. Keys, 26.ix.1993 (CANB, PERTH); Albany, c. 35°00′S, 117°53′E, C.E. Lane-Poole 326, 21.i.1919 (PERTH); Darling District: intersection Mountain and Boronia roads, 34°20′12″S, 115°35′29″E, A.R. Annels 4618 & R.W. Hearn, 13.x.1994 (CANB, MJP, PERTH).

Toxicity: fluoroacetate 80–260 µg g⁻¹ (Aplin 1971).

Affinity: the distinctive leaf shape and short, axillary racemes of this species make *G. brownii* difficult to confuse with any other species of Gastrolobium.


Bushy shrubs up to 0.5 m high. Branchlets ascending, terete, moderately villous. Petioles terete, continuous but not decurrent with the branchlet, 1–2 mm long. Leaves spreading, ± opposite, stem clasping, oblong, elliptic or obovate, c. 13–15 × 5–7 mm, sparsely to moderately pubescent, venation prominently reticulate; apex semi-pungent, unevenly recurved; margins slightly crenulate; base rounded. Stipules erect, hyaline, 3–4 mm long. Inflorescences solitary or paired flowers in the axils; peduncle nil; rachis nil; subtending bracts trifid with the middle lobe elongated. Pedicels 2–4 mm long. Calyx campanulate, 4–5 mm long including the c. 1-mm receptacle, moderately villous, lobes not recurved; upper 2 lobes united higher than the lower 3, acute, c. 2 mm long; lower 3 lobes triangular, acuminate, c. 2 mm long. Corolla: standard very broadly elliptic, c. 7–8 × 6–7.5 mm including the 3-mm claw, orange and maroon with a small yellow centre, apex emarginate, base ± truncate, slightly auriculate; wings obovate, c. 6.5–7 × 2 mm including the 2-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half transversely elliptic, margins slightly incurved, c. 6 × 4 mm including the 2.5-mm claws, maroon, apex rounded, base auriculate, saccate. Style slightly longer than the ovary, hooked, lower third pubescent; ovary stipitate, densely pubescent; ovules 2. Pod ovoid, 5–6 × 2–3 mm long. Seed not seen.

Flowering period: October. Fruiting period: November.

Distribution (Fig. 76): south-western Western Australia. Occurs on the eastern edge of the Darling escarpment and into the wheatbelt, from Toodyay south to Pinjellga.

Habitat: grows on sand, sandy loam or gravelly clay in open forest and woodland.

Selected specimens (10 examined): WESTERN AUSTRALIA, Darling district: between Toodyay and Bindoon, 31°33′S, 116°27′E, C.E. & D.T. Woolcock W638, 24.viii.1982 (CANB); 3 km WSW of Quairading, 32°01′S, 117°22′E, M.D. Crisp 6183 et al. 27.ix.1979 (CANB, PERTH); 0.2 km E along Helena Rd from West Talbot Rd towards York, 31°57′45″S, 116°32′14″E, M.D. Crisp 8907 & W. Keys, 8.x.1996 (CANB, PERTH); Beverley 32°07′S, 116°56′E, R.D. Royce 3852, 6.x.1952 (CANB, PERTH).

Toxicity: unknown.

Affinity: *Gastrolobium hookeri* has been confused with a number of morphologically similar species in the past, but is fairly easily distinguished by the terete branchlets, the non-decurrent petioles and the distinctive trilobed subtending bracts, with the middle lobe being much longer than the other two.


Bushy, erect shrubs 0.3–0.6 m high. Branchlets spreading to ascending, angular, densely tomentose. Petioles terete, continuous and decurrent with the branchlet, <1 mm long. Leaves spreading, scattered to ternoate, ± rhombic or slightly trullate to narrowly so, 18–30 × 12–24 mm, glabrous, venation prominently reticulate; apex acute, pungent-pointed; margins conduplicate; base truncate. Stipules erect, hyaline, 3–5 mm long. Inflorescences short axillary racemes or umbels (when 2-flowered), 2–4-flowered; peduncles 2–18 mm long; rachis 0–2 mm long; subtending bracts trilobed with lobes much longer than trunk, about equal
in length, rusty brown tomentose. Pedicels terete, 1–3 mm long. Calyx 4–6 mm long including the c. 0.5-mm receptacle, moderately to densely pubescent, lobes all recurved; upper 2 lobes united higher than the lower 3, acute, 2–2.5 mm long; lower 3 lobes triangular, acute, 1.5–2 mm long. Corolla: standard transversely elliptic, 8–11 × 8–12 mm including the 2.5–4 mm claw, orange yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; wings ± oblong to obovate, 7.5–10 × 2–3 mm including the 2–3 mm claws, orange becoming red at base, apex rounded, incurved but not overlapping, not enclosing the keel, base auriculate on both margins, saccate; keel half very broadly elliptic, margins not incurved, 7–10.5 × 3–3.5 mm including the 2.54-mm claws, red, apex broadly rounded to obtuse, base pubescent; ovules 2. Pod stipitate, ovoid to ellipsoidal, 6–7 × 2–3 mm, moderately pubescent. Seed ellipsoidal, 2–3 mm long, covered in blunt ridges, arillate.

Flowering period: August–October. Fruiting period: from October.

Distribution (Fig. 77): south-western Western Australia. This species is widely distributed, occurring from Eneabba south to Wagin and inland as far as Doodlakine.

Habitat: grows on undulating hills in sandy soils in heath and open woodland.

Selected specimens (38 examined): WESTERN AUSTRALIA, Avon district: 19 km from Goomalling towards Wongan Hills, 31°08′S, 116°48′E, J. Taylor 2144 & P. Ollerenshaw (CANB, MEL, PERTH); c. 100 m N of the northerly entrance to the Wongan Hills Research Station, 30°50′40″S, 116°44′35″E, G.T. Chandler 192 & W. Keys, 9.ix.1997 (CANB, PERTH); Mount Hardy, 11 km from York on road to Quairading, 31°54′S, 115°40′E, S.J. Forbes 2605 (CANB, MEL, PERTH); 1 km W of Karrellock on Wyalkatchem–Merredin road, 9 km E of Wyalkatchem, 31°12′S, 117°28′E, S. J. Forbes 1814, 25.x.1983 (CANB, MEL, PERTH); Yilimning, 300 m W of siding, 32°54′10″S, 117°22′00″E, G.T. Chandler 763 S. Donaldson, 3.xi.1998 (CANB, PERTH); 2.3 km along Belka Rd West from Doodlaking–Bruce Rock road, 31°45′00″S, 118°04′55″E, G.T. Chandler 689 & S. Donaldson, 26.x.1998 (CANB, PERTH). Darling District, Jurien Bay Rd, from Brand Hwy, C.E. & D.T. Woolcock W619, 19.viii.1982 (CANB). Irwin District: 10 km WSW of Eneabba, 29°52′S, 115°11′E, A. Kantis 1539, 7.viii.1973 (CANB); 2.5 km on Old Geraldton Rd, from Merewara Rd, E of Watheroo on Miling Rd, 30°17′59″S, 116°05′55″E, G.T. Chandler 656 & S. Donaldson, 25.x.1998 (CANB, MEL).

Notes: There is a somewhat narrower-leaved form of G. obovatum in the Wongan Hills area that needs further study. The leaves of this form tend to be broadest above the middle and blue-green in colour.

Toxicity: unknown.

Affinity: Gastrolobium obovatum is very similar to G. spathulatum, which differs in having leaves that tend to be ± flat with an unarmed apex, prominently spathulate and yellow-green, whereas G. obovatum has leaves that are broadest towards the middle.


Semi-prostrate to erect shrubs up to 1.5 m high. Branchlets ascending, compressed to angular, glabrous. Petioles terete, continuous and slightly decurrent with the branchlet, c. 3 mm long. Leaves spreading, opposite, obovate to cuneate, 25–40 × 10–12 mm, glabrous, venation prominently reticulate, yellow-green; apex recurved, strongly mucronate; margins often slightly undulate, mostly conduplicate or becoming so; base cuneate. Stipules erect, halyline, 3–4 mm long. Inflorescences loose axillary clusters, 2–4-flowered; peduncle 0–2 mm long; rachis nil; subtending bracts trilobed with lobes about the same length as tube, except for the elongated middle lobe. Pedicels terete, <2 mm long. Calyx campanulate, c. 6 mm long, densely villous, lobes all recurved to slightly reflexed; upper 2 lobes united higher than the lower 3, acute, c. 2 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard very broadly elliptic, 8–10 × 8 mm including the 2-mm claw, yellow with a red centre apex emarginate, base cordate, not auriculate; wings obovate, c. 8–8.5 × 2.5 mm including the 2.5-mm claws, yellow but red at base, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half very broadly ovate, c. 7.5–8 × 2.5 mm including the 3-mm claws, red, apex obtuse, base auriculate, saccate. Style long, strongly incurved to hooked, lower third pubescent; ovary very shortly stipitate, densely pubescent; ovules 2. Pod very shortly stipitate, broadly ovoid, c. 6 × 3 mm, densely villous. Seed with blunt ridges, c. 2 mm long, arillate.

Flowering period: September and October. Fruiting period: November and December.

Distribution (Fig. 78): south-western Western Australia. Occurs north of Perth, around the Eneabba and Three Springs area, including Tathra National Park.

Habitat: grows on the northern sandplains on sandy soil in heath and open woodland.


Toxicity: unknown.
**Affinity:** This species slightly resembles *G. obovatum*, but the latter species is easily distinguished, as the leaves are longer and significantly narrower (18–30 × 12–24 mm), the peduncle is longer (2–18 mm long) and there is often a rachis (0–2 mm long).


Erect, bushy, shrubs up to 1.5 m high. **Branchlets** ascending, densely pubescent. **Petioles** terete, continuous and decurrent with the branchlet, <1 mm long. **Leaves** spreading to ascending, mostly ternate, spatulate, 8–22 × 4–10 mm, glabrous, venation prominently reticulate; apex truncate, emarginate or sometimes almost bilobed, mucronate; margins slightly crenulate, becoming conduplicate; base rounded to cuneate. **Stipules** erect to recurved, triangular to hyaline, 1–2 mm long. **Inflorescences** axillary, solitary or paired to 3–5-flowered, condensed racemes; **peduncle** 0–1.5 mm long; **rachis** 0–4 mm long; **subtending bracts** caducous, scale-like, trilobed, with lobes much longer than the tube, c. 1–3 mm long. **Pedicels** terete, 2–3 mm long. **Calyx** campanulate, up to 6 mm long including the c. 1-mm receptacle, moderately pubescent, lobes recurved to slightly reflexed; upper 2 lobes united, much higher than the lower 3, acute, c. 2 mm long; lower 3 lobes triangular, acute, c. 1.5 mm long. **Corolla:** standard very broadly elliptic, c. 7.5–10 × 7–7.5 mm including the 3-mm claw, orange with a dark red centre, apex emarginate, base cordate; **wings** obovate, c. 7 × 2 mm including the 2.5-mm claws, orange, apex rounded, incurved, may or may not enclose the keel, base auriculate on the upper margin only, slightly saccate; **keel** half very broadly elliptic, c. 7 × 2–2.5 mm including the 3-mm claws, dark red, apex subacute, base auriculate, saccate. **Style** long, strongly incurved to hooked, lower third pubescent; **ovary** prominently stipitate, densely pubescent; **ovules** 2. **Pod** stipitate, obliquely ovoid, c. 5–6 × 3 mm, moderately pubescent. **Seed** ellipsoid, c. 3 mm long, arillate.

**Flowering period:** August–October, but also recorded for March. **Fruiting period:** from October.

**Distribution** (Fig. 79): south-western Western Australia. Occurs throughout the Darling escarpment near Perth, from Bindoon south to Dwellingup.

**Habitat:** grows on granite outcrops or ridges on clay-loam soils, in open forest and heathland.

Selected specimens (12 examined): WESTERN AUSTRALIA, Darling District: Flat Rocks Rd, c. 4 km SE of Bindoon, Red Hill, 31°25'S, 116°08'E, M.D. Crisp 8448 & W. Keys (CANB, GAUBA, PERTH, UWA); Toodyay Rd, c. 10 km from Midland, on the Darling escarp, 31°51'S, 116°04'E, T.B. Lally 57 (AD, BRI, CANB, PERTH), Kalamunda, 19 km E of Perth, 31°58'S, 116°03'E, R & M. Hamilton 160 (CANB, CHR, MEL, NSW).

**Toxicity:** This species is not known to be toxic, but trace levels (40–80 µg g⁻¹) have been recorded (Twigg et al. 1996a).

**Affinity:** This species is often confused with relatives with plicate leaves, but *G. spathulatum* has spatulate leaves with narrow bases that gradually increase in width until the upper third of the leaf, where the breadth increases considerably and often abruptly. The leaf apices are basically obtuse with a small macro, recurving slightly and the leaves are noticeably yellow-green, particularly when fresh.

50. **Gastrolobium stowardii** S.Moore, J Linn. Soc. London, Bot. 45: 169 (1920). **Type citation:** ‘Dumbleyung; Stoward, 106.’ **Type specimens:** holotype: BM; iso: K

Small, twiggy shrubs, up to 0.5 m high. **Branchlets** spreading to ascending, angular, moderately pubescent. **Petioles** almost nil, continuous and partially decurrent with the branchlet, c.0.5 mm long. **Leaves** often restricted to the upper part of the branchlets, spreading to ascending, opposite, oblong to cuneiform, 10–18 × 5–7 mm, upper surface glabrous with thickened venation, lower surface moderately pubescent with appressed hairs; **style** obtuse to almost truncate, often almost horned, strongly recurved, pungent-pointed or strongly mucronate; margins recurved; base rounded. **Stipules** hyaline, 3–4 mm long. **Inflorescences** single or paired flowers in the axis or small axillary racemes with up to 4 flowers; **peduncle** 0–3 mm long; **rachis** 0–3 mm long; **subtending bracts** caducous, scale-like, trilobed, with lobes shorter than tube, the middle lobe longest, up to 3 mm long. **Pedicels** 2–3 mm long. **Calyx** campanulate, 4–5 mm long including the <1-mm receptacle, densely sericeous, lobes recurved to strongly so; upper 2 lobes united higher than the lower 3, rounded to acute, c. 2–2.5 mm long; lower 3 lobes triangular, acute, c. 2–2.5 mm long. **Corolla:** standard transversely to very broadly ovate, 6–9 × 6–8 mm including the 3-mm claw, orange with maroon markings, with a yellow centre, apex emarginate, base obtuse to slightly cordate; **wings** obovate, 5–7 × 2–3 mm including the 2-mm claws, orange and red, apex rounded, incurved and partly overlapping to enclose the keel, base auriculate on the upper margin only, saccate; **keel** half broadly elliptic, margins not incurved, c. 6–7 × 2–2.5 mm including the 2-mm claws, maroon, apex obtuse, base auriculate, saccate. **Style** long, strongly incurved, base pubescent; **ovary** stipitate, densely pubescent; **ovules** 2. **Pod** reddish, 5–6 mm long, softly pubescent.

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**Notes:**

- Twigg et al. (1996a) report trace levels of toxicity (40–80 µg g⁻¹).
- Gastrolobium spathulatum is often confused with other species, particularly those with plicate leaves.
- Distribution includes the Darling escarpment near Perth, with a notable range from Flat Rocks Rd, Bindoon, to Dwellingup.
- The flowers of *G. spathulatum* are typically found from August to October.
- Habitat preferences include open forest and heathland.

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**Selected specimens:**

- WESTERN AUSTRALIA, Darling District: Flat Rocks Rd, c. 4 km SE of Bindoon, Red Hill, 31°25'S, 116°08'E, M.D. Crisp 8448 & W. Keys (CANB, GAUBA, PERTH, UWA).
- Toodyay Rd, c. 10 km from Midland, on the Darling escarp, 31°51'S, 116°04'E, T.B. Lally 57 (AD, BRI, CANB, PERTH).
- Kalamunda, 19 km E of Perth, 31°58'S, 116°03'E, R & M. Hamilton 160 (CANB, CHR, MEL, NSW).

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**Type citation:**


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**Affinity:**

- This species is often confused with other species having plicate leaves, but *G. spathulatum* has distinct spatulate leaves with narrow bases that increase in width towards the upper third of the leaf.

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**Distribution:**

- South-western Western Australia, particularly along the Darling escarpment near Perth.

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**Habitat:**

- Grows on granite outcrops or near ridges on clay-loam soils, in open forest and heathland.

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**Flowering period:**

- August–October, but also recorded for March.

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**Fruiting period:**

- From October.
Flowering period: September and October. Fruiting period: November.

Distribution (Fig. 80): south-western Western Australia. Occurs from Eneabba south to Susetta Creek (south-east of Lake Grace) and is particularly common in the Wongan Hills area.

Habitat: grows mainly on sandy soils in heath and mallee woodland.


Notes: specimens have been previously identified as Nemia sp. A.Crisp, ined. and Gastrolobium sp. F (aff. hookeri).

Toxicity: unknown.

Affinity: previously in synonymy and confused with Gastrolobium hookeri, G. stowardii actually shows greater morphological similarity to G. dorrrienti, with which it shares a twiggly habit and bilobed leaves which tend to recurve both apically and at the margins. Gastrolobium stowardii, with opposite leaves, is fairly readily distinguished from G. dorrrienti, which has thicker, patent leaves in whorls of three. Gastrolobium stowardii differs from G. hookeri in the flattened or angular stems, the noticeably deciduous petiole bases, the median lobe in the floral bracts being scarcely longer than the other lobes, rather than noticeably longer and the general habit differs with most leaves in the upper branches. A population located in the Irwin district between Eneabba and Badgingarra (Chandler 828 et al.) may extend the known range. This population was growing with Gastrolobium polystachyum and these two species may also have been confused previously, because both have a narrow, bilobed leaf. However, the leaves of G. polystachyum are much larger (5–35 mm long and the leaves in this population were all above 25 mm long) and the inflorescence is a long, open raceme.


Erect, bushy shrubs, up to 2 m high. Branchlets ascending, angular to almost terete, often a pale yellow in colour, moderately to densely pubescent. Petioles terete, swollen at base, continuous and slightly decurrent with the branchlet, 1–3 mm long. Leaves spreading to ascending, in whorls of 3, obovate to narrowly so, 6–30 × 4–12 mm, glabrous to rarely glaucous, venation prominently reticulate; apex obtuse to broadly rounded, recurved, usually pungent-pointed, rarely mucronate; margins conduplicate, often strongly so, entire, recurved; base cuneate. Stipules erect, bristle-like, 2–3 mm long. Inflorescences terminal racemes, very rarely branched, 10–30-flowered; peduncle scattered with what appear to be aborted buds, 5–10 mm long; rachis 15–45 mm long; subtending bracts caducous, scale-like, minutely fimbriate, ovate, keeled, 3–4 mm long. Pedicels terete, 2–3 mm long. Calyx campanulate, c. 5 mm long including the 1-mm receptacle, glabrous to sparingly pubescent, upper 2 lobes straight, united into an almost truncate lip, rounded, c. 2 mm long; lower 3 lobes recurved to reflexed, triangular acute, c. 1.5 mm long. Corolla: standard transversely ovate to elliptic, 7.5–8.5 × 8–10 mm including the 3–4-mm claws, orange-yellow to orange with a red ring surrounding the yellow centre, apex emarginate, base strongly corollate; wings obovate, 5.5–7 × 2.5–3 mm including the 1.5–2.5-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, usually saccate; keel half transversely elliptic, c. 5.5 × 2–2.5 mm including the 2.5-mm claws, maroon, apex acute, spout-like, base auriculate, saccate, with a circular opening near claws to expose the stamens from below. Style short, incurved, lower half pubescent; ovary stipitate, densely pubescent, ovules 2. Pod stipitate, obliquely ellipsoid, 6–7 × 3–4 mm, moderately pubescent. Seed reniform, c. 3 mm long, arillate.

Vernacular name: cluster poison.

Flowering period: August–October. Fruiting period: October–December.

Distribution (Fig. 81): south-western Western Australia. Occurs in a band from the Gutha and Wubin areas in the north almost directly south-east through the central wheatbelt area to the Peak Charles area (near Norseman).

Habitat: grows on the broader sandplain regions of the central wheatbelt on sand or gravelly sand, sometimes with a clay content, in mallee woodland and Allocasuarina heath and shrubland.

Therefore, no infraspecific taxa are here recognised within
Gastrolobium crassifolium (BERTH); 13 miles [21 km] W of Gutha, 29°00′S, 115°45′E, A. Cox s.n., viii.1958 (PERTH). Roe District: South Yilgarn, Skeleton Rock area, 31°51′S, 119°28′E, J.F. Brennard & M.M. Brennard s.n., 5.xi.1989 (PERTH); Tarin Rock, on Tarin Rock Rd North, 33°06′29″S, 118°13′56″E, G.T. Chandler 714 & S. Donaldson, 29.x.1998 (BRI, CANB, MEL); 4 km along Kumarl Rd from Lake King–Norseman road, c. 80 km from Norseman to Lake King, 32°45′09″S, 121°21′54″E, G.T. Chandler 914 et al., 17.ix.1999 (CANB, NSW, PERTH).

Notes on variation: this species has an extremely variable leaf shape and size, from quite small (around the Corregin, Tarin Rock and Lake Grace areas), through a long narrow-leaved form around Bungulla, Cadoux and Mann Manning, to a long broad-leaved form in the north, from around Wubin, Ballidu and Gutha to the far-east around Norseman. However, there are intergrading specimens between all forms. In particular, two specimens (Ballidu, C.A. Gardner s.n., PERTH 2798689 and 13 miles [21 km] west of Gutha, A. Cox s.n., PERTH 2798085) show two of these forms on one specimen. The Cox specimen has the long narrow-leaved form and the long broad-leaved form together on one specimen and the Gardner specimen has the long broad-leaved form with the short-leaved form. Therefore, no infraspecific taxa are here recognised within this species.

Toxicity: highly toxic; fluoroacetate 1300 μg g⁻¹ (Aplin 1971).

Affinity: the smaller-leaved forms of G. bennettsianum may resemble the smaller leaved forms of G. crassifolium, though the leaves of G. crassifolium are not recurved, are glaucous and lack a pungent-point, having only a very small (if present at all), blunt mucro.


Bushy shrubs up to 1.5 m high. Branchlets ascending, angular, densely tomentose. Petioles terete, continuous and decurrent with the branchlet, c. 1 mm long. Leaves spreading to ascending, ternate, elliptic, 8–25 × 4–12 mm, glabrous, venation prominently reticulate; apex bilobed to emarginate; margins undulate; base rounded. Stipules erect to recurved, hyaline, 4–5 mm long. Inflorescences short axillary umbels or paired flowers in the axils; peduncle 0–10 mm long; rachis nil; subtending bracts caducous, scale-like, trilobed, lobes as long as tube, outer lobes hyaline, 3–4 mm long. Pedicels 1–2 mm long. Calyx campanulate, c. 5 mm long including the c. 0.5-mm receptacle, densely pubescent, lobes not recurved; upper 2 lobes united higher than the lower 3, acute, c. 2.5 mm long; lower 3 lobes triangular, acuminate, c. 2.5 mm long. Corolla: standard transversely ovate, 9–10 × 8–9 mm including the 3.5-mm claw, yellow apricot, with a red ring surrounding the yellow centre, apex emarginate, base strongly cordate; wings ovate, c. 8 × 3 mm including the 3-mm claws, orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on upper margin only or also very slightly auriculate on the lower margin; keel half circular, margins slightly incurved in the lower half, c. 7 × 2 mm including the 3-mm claws, reddish, apex acute, slightly incurved, base auriculate, saccate. Style long, strongly incurved, lower third pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, globose, c. 5 × 5 mm, red. Seed ellipsoid, 1–2 mm long, arilliate.

Flowering period: September and October. Fruiting period: November.

Distribution (Fig. 82), south-western Western Australia. Endemic in the Stirling Range.

Habitat: grows on mountain slopes on skeletal soils in Proteaceae-dominated heath.

Specimens examined: WESTERN AUSTRALIA, Eyre District: Stirling Range, 1.8 km due N of Ellen Peak, 34°22′14″S, 118°19′49″E, M.D. Crisp 8945 & W. Keys, 15.x.1996 (CANB, MEL, PERTH); Stirling Range, Bluff Knoll, 34°22′2″S, 118°15′E, N. Ollerenshaw 271 & N. Carriage, 13.x.1975 (CANB); Stirling Range, base of path to Bluff Knoll, near carpark, 34°22′S, 118°14′E, M.D. Crisp 8480 & W. Keys, 24.x.1993 (CANB, GAUBA, PERTH); Stirling Range NP, Stirling Range Drive, 24 km from Chester Pass Rd, 34°25′S, 117°56′E; J. Taylor 1842 & P. Ollerenshaw, 15.x.1983 (CANB); Stirling Range NP, track to Bluff Knoll, 34°22′S, 118°15′E, J. Taylor 1855 & P. Ollerenshaw, 16.x.1983 (CANB, PERTH).

Toxicity: unknown.

Affinity: the leaves of G. pulchellum looks similar to the smaller-leaved specimens of G. crenulatum, but G. crenulatum has a more pronounced peduncle, the inflorescence parts are covered in rust-coloured hairs and the flowers are more orange, whereas the hairs of G. pulchellum are a very bright silver in colour and the flowers are more yellow.


Prostrate to weak, bushy shrubs, up to 0.5 m high. Branchlets spreading, angular to almost terete, moderately pubescent. Petioles terete, continuous but not decurrent with the branchlet, 1–3 mm long. Leaves spreading, opposite, broadly oblong, 5–12 × 5–9 mm, sparingly to moderately villous, venation prominently reticulate; apex truncate to slightly bilobed, unarmed or with a weak micro; margins undulate, recurved; base truncate, rarely slightly cordate. Stipules erect, narrowly triangular, 4–6 mm long.
Inflorescences axillary racemes, 4–8-flowered; peduncle 0.5–2 mm long; rachis 5–15 mm long; subtending bracts caducous, scale-like, trifid to entire, 1.5–2 mm long. Pedicels terete, 2–3 mm long. Calyx campanulate, c. 4 mm long including the 0.5-mm receptacle, moderately pubescent, upper 2 lobes slightly recurved, lower 3 lobes reflexed; upper 2 lobes united higher than the lower 3, triangular, acute, c. 2 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard transversely elliptic, c. 6 × 7 mm including the 2-mm claw, orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, wings obovate, c. 6.5 × 2 mm including the 2-mm claws, orange-yellow, apex rounded, not incurved, not enclosing the keel, base auriculate on the upper margin only, slightly saccate; keel half transversely elliptic, upper margins incurved, c. 6.5 × 2.5 mm including the 2-mm claws, maroon, apex rounded, base auriculate, saccate. Style long, hooked, lower third pubescent on the inner margin; ovary shortly stipitate, densely pubescent; ovules 2. Pod shortly stipitate, obliquely obovate, c. 4 × 3 mm, moderately pubescent. Seed not seen.

Flowering period: May–October. Fruiting period: unknown (only old fruits seen).

Distribution (Fig. 83): south-western Western Australia. Occurs in a narrow range in the Bokal and Wagin areas.

Habitat: grows in the escarpment region south-east of Perth in the heavy loam and clay soils, in eucalypt woodland.

Selected specimens (8 examined): WESTERN AUSTRALIA, Darling District: Bokal, Beaufort River, 21 km along Boyup Brook Rd from Albany Hwy at Arthur River, 33°29′38″S, 116°53′50″E, M.D. Crisp 8918 & W. Keys, 10.x.1996 (CANB, MEL, PERTH); Bokal District, P.W. Draper s.n., ix.1962 (PERTH); Kojonoop–Boyup Brook road, L. Dodd (J.) s.n., vi.1972 (PERTH).

Toxicity: unknown.

Affinity: Gastrolobium truncatum is difficult to confuse with any other species of Gastrolobium because of its unusual leaf shape. Some juvenile forms of G. polystachyum have truncate, horned leaves, though these are much larger and are strongly bilobed and the inflorescences are terminal racemes.


Prostrate, trailing shrubs, 0.05 m high. Branchlets spreading, trailing, terete, densely sericeous. Petioles terete, continuous but not decurrent with the branchlet, 2–8 mm long. Leaves ascending, alternate, ovate, elliptic or orbicular, 15–65 × 10–55 mm, upper surface glabrous, lower surface densely sericeous, venation prominently reticulate; apex obtuse or rounded, mucronate; margins ± undulate, not recurved; base rounded or slightly cordate. Stipules erect, filiform, 3–8 mm long. Inflorescences reduced axillary or lateral racemes, 1–2-flowered with an aborted, terminal bud, rarely subpaniculate with several flowers; peduncle 2–(6–11) mm long; rachis 0–5(–33) mm long; subtending bracts caducous, scale-like, trifid, 4–6 mm long. Flowers: not resupinate; pedicels terete, 2–4 mm long. Calyx campanulate, slightly ventricose, 10–12 mm long including the 2–3-mm receptacle, densely sericeous, lobes not recurved; upper 2 lobes united higher than the lower 3, acute, c. 6 mm long; lower 3 lobes triangular, acuminate, c. 6 mm long. Corolla: standard broadly spatulate, 7–14 × 8–10 mm including the c. 10-mm claw, yellow infused with red towards the margins, with red veins and a rich greenish-yellow marking at the centre, apex emarginate, base rounded, not auriculate; wings narrowly oblong, c. 38–42 × 4–5 mm including the c. 8-mm claws, red, apex semi-acute, not incurved, not enclosing the keel, base auriculate, saccate; keel half obliquely narrowly elliptic, 41–43 × 8–9 mm including the 7-mm claws, red, apex acute, broadly beaked, base auriculate, saccate. Style long, incurved, base pubescent; ovary stipitate, with a disc at the base, densely pubescent; ovules 18–21. Pod exserted from the persistent calyx, obloid, 10–13 × 6–8 mm, moderately villous. Seed ellipsoid, c. 2.5 mm long, arillate.

Chromosome number: 2n = 16 (Sands 1975).

Flowering period: August–October, rarely into November. Fruiting period: October and November.

Distribution (Fig. 84): south-western Western Australia. Occurs mainly near the south coast, from Cape Arid west to Kalgan River, near Albany, with an outlier between Boyup Brook and Kojonup.

Habitat: often found growing at or near watercourses or wetter areas, on white or grey sand with a clay or gravel component, in mallee or mallee-heath.

Selected specimens (35 examined): WESTERN AUSTRALIA, Eyre District: Hwy 1, between Esperance and Ravensthorpe, 1 km W of the Young River, 33°45′53″S, 121°09′56″E, M.G. Corrick 9552, 26.ix.1985 (CANB, MEL); along No. 2 Rabbit Fence, c. 35 km SSE of the Jerramungup–Ravensthorpe road, c. 30 km N of Bremer Bay, P.G. Wilson 4388, 2.x.1966 (CANB, PERTH); Jerramungup–Ravensthorpe road, 14 km E of the Gairdner River bridge, 33°53′53″S, 119°06′06″E, M.D. Crisp 6073 et al., 22.ix.1979 (CANB, NSW, PERTH); 94 km E of Esperance towards Cape Arid, 33°49′53″S, 122°53′53″E, J.M. Taylor 3229 & P. Ollerenshaw, 27.ix.1983 (AD, CANB, MEL, PERTH); E side of the Lort River crossing, South Coast Hwy, 62.5 km from Esperance towards Ravensthorpe, 33°44′40″S, 121°16′02″E, G.T. Chandler 365 et al., 12.ii.1998 (CANB, MEL); 20 km SW of Chilinup, 34°27′5′S, 118°28′E, T.R. Lily 862, 2.xi.1995 (CANB, PERTH).

Toxicity: unknown.

Affinity: this species is not easily confused with any other species of Gastrolobium, except for G. minus, which is very similar in the vegetative stage. However, G. minus has non-terete stipules that are distinctly concave on the lower surface, smaller flowers (c. 15 mm long), the calyx lobes are...
subulate and have a broader zone of overlap (0.8–1 mm as opposed to the 0.3-mm overlap in *G. latifolium*) and a sericeous pod.

VII. The *G. calycinum* group

This group of core *Gastrolobium* species share glaucous leaves with strongly reticulate venation and a prominent intramarginal vein and occur on the central to northern sandplains of south-western Western Australia, with some species being quite widespread (e.g. *G. calycinum* and *G. rigidum*).


Low shrubs, 0.2–0.3 m high. Branchlets ascending, terete, moderately to densely pubescent. *Petiole* almost non-existent, continuous and sometimes decurrent with the branchlet, 0.5 mm long. *Leaves* erect and appressed to the branchlet, in whors of 3, ovate, 4–7.5 × 1.5–2.5 mm, glabrous or occasionally with scattered hairs along the veins of the abaxial surface, venation prominently reticulate; apex acute, unarmed; margins entire, not recurved; base obtuse. *Stipules* absent. *Inflorescences* terminal racemes, 5–15-flowered; *peduncle* (4–)8–14 mm long; *rachis* (10–)12–19(–45) mm long; *subtending bracts* caducous, entire, linear-lanceolate, c. 3 mm long. *Pedicels* terete, 1–2 mm long. *Calyx* strongly campanulate, 5–6 mm long including the c. 1-mm receptacle, glabrous, lobes not recurved; upper 2 lobes united higher than the lower 3, triangular, acute to obtuse, c. 4 mm long; lower 3 lobes triangular, acute, c. 4 mm long. *Corolla*: *standard* transversely elliptic, 10–10.5 × c. 10 mm including the c. 3-mm claw, deep orange with a red ring surrounding the orange-yellow centre, apex emarginate, base obtuse, slightly auriculate; *wings* oblong, c. 9.5 × 2.5 mm including the c. 3.5-mm claw, orange-red, apex rounded, incurred and overlapping to enclose the keel, base auriculate on both sides, not saccate; *keel* half transversely broadly ovate, margins inrolled, c. 9.5 × 3.5 mm including the c. 3.5-mm claw, maroon, darker at apex, apex barely acute to rounded, base auriculate, saccate. *Style* long, incurred to hooked, lower half pubescent on the inner margin; *ovary* stipitate, densely pubescent; *ovules* 2 or 3. *Pod* stipitate, very broadly ellipsoid, almost spherical, 4.5–5 × 5–5.5 mm, moderately to densely pubescent. *Seed* ellipsoid, c. 3 mm long.


*Distribution* (Fig. 85): south-western Western Australia. This species has a narrow distribution north of Perth in the Gunyidi, Watheroo and Miling areas.

*Habitat*: grows on the northern sandplains on deep sand in dense heath or shrubland.

*Conservation status*: IUCN: V. ROTAP: 2V CALM: R. This species is very rare and is considered to be vulnerable and is at risk of becoming endangered.

*Selected specimens* (20 examined): due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA, Irwin District: Gunyidi, B. Carlin s.n., x.1957 (PERTH); Miling, A. Cameron s.n., 21.xi.1973 (PERTH); Marchagee, M. Burgman 102, 12.xi.1982 (PERTH); N of Watheroo, C.A. Gardner s.n., ix.1957 (PERTH); N of Watheroo, J.D. Briggs 584, 21.ix.1980 (CANB, K, MEL, PERTH); near Gunyidi, G.T. Chandler 208 & W. Keys, 10.ix.1997 (CANB, UWA).

*Toxicity*: unknown.

*Affinity*: it is difficult to confuse this with any other species of *Gastrolobium*, although vegetatively it could resemble *Pultenaea reticulata*. However, *G. appressum* has many-flowered, terminal racemes and grows on the northern sandplains, whereas *Pultenaea reticulata* has 1- or 2-flowered, axillary inflorescences and occurs on the southern sandplains.


Erect, bushy shrubs, 0.5–1.5 m high. Branchlets ascending, angular, moderately sericeous. *Petioles* terete, continuous with and sometimes decurrent with the branchlet, 3–4 mm long. *Leaves* spreading to ascending, opposite, ovate to elliptical, conduplicate or rarely flat, straight or recurved, 17–40(–70) × 12–24 mm, glabrous, often glaucous, venation prominently reticulate, sometimes raised on the lower surface; apex acute or rarely rounded, pungent-pointed or rarely unarmed; margins entire, not recurved; base rounded. *Stipules* erect, narrowly triangular to hyaline, 3–6 mm long. *Inflorescences* terminal racemes, 4–14-flowered; *peduncle* 12–50(–78) mm long; *rachis* 25–40 mm long; *subtending bracts* caducous or rarely persistent, scale-like, entire or lacerate, 3–5 mm long. *Pedicels* terete (1.5–3)–4 mm long. *Calyx* campanulate, 8–14 mm long including the 1–2-mm receptacle, usually glabrous, occasionally sparsely pubescent, lobes not recurved; upper 2 lobes united higher than the lower 3, diverging, broadly triangular, rounded to acuminate, 5–7.5 mm long; lower 3 lobes triangular, acuminate to acute, 4.5–8 mm long. *Corolla*: *standard* transversely ovate, 11–16 × 14–21 mm including the 3.5–5.5-mm claw, deep orange, apex emarginate, base cordate to truncate; *wings* obovate, 12–15 × 3.5–5 mm including the 3.5–4-mm claw, orange to red, apex rounded, not incurred, not enclosing the keel, base auriculate on both
margins; keel half circular to transversely broadly elliptic, margins not incurved, 11.5–15 × 4–5 mm including the 3.5–4.5-mm claw, pink to red, apex rounded, base auriculate, saccate. Style long, hooked, lower third pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, ellipsoid to spherical, 5–8 × 5–6 mm, sparsely to moderately pubescent. Seed ellipsoid, 3–5 mm long, arillate.

Vernacular name: York Road poison.

Flowering period: late August–November. Fruiting period: from December.

Distribution (Fig. 86): south-western Western Australia. A common species distributed throughout the Darling Range around Perth north to Moora and south to the Collie area.

Habitat: this species grows in a wide range of habitats, on low hills, slopes or flats on clay, loam or sand soils over ironstone or laterite in Eucalyptus forest, woodland or mallee, or shrubland or heath dominated by Allocasuarina, often with a mixed understorey of Fabaceae and Proteaceae.


Toxicity: highly toxic; fluoroacetate 400–1400 μg g⁻¹ (Aplin 1971; Twigg et al. 1996b).

Affinity: Gastrolobium calycinum somewhat resembles G. oxylobioides and G. propinquum vegetatively. It can easily be distinguished from G. propinquum when in flower, because the flowers of G. propinquum are much smaller (standard 5–6 × 6 mm), the rachis is much larger (20–120 mm long) and there are more flowers per inflorescence (15 to more than 30 flowers) and the leaves of G. propinquum are narrower [6–11 (–14) mm broad], with a cuneate base. The leaves of G. oxylobioides are much narrower (5–10 mm broad) and are not usually glaucous and the flowers are smaller (calyx 6–7.5 mm long, standard c. 10 × 14 mm).


Low shrubs, 0.2–0.4 m high. Branchlets ascending, angular, moderately to densely pubescent. Petioles terete, articulate with the branchlet, c. 0.5 mm long. Leaves ascending, in whorls of 3, occasionally opposite, obovate to elliptic, 6–11.5 × 3–4.5 mm, sparsely to moderately pubescent, venation prominently reticulate; apex rounded, mucronate; margins entire, may be recurved; base rounded.

Stipules erect, hyaline, 1.5–3 mm long. Inflorescences terminal racemes (3–)6–15–flowered; peduncle 8–16 mm long; rachis (0–)8–25 (–60) mm long; subtending bracts caducous, scale-like, entire, narrowly triangular, 3–4 mm long. Pedicels terete, 0.5–1 mm long. Calyx campanulate, c. 6 mm long including the 0.75-mm receptacle, densely villous, lobes not recurved, not strongly zygomorphic; upper 2 lobes united slightly higher than the lower 3, triangular, acute, c. 3 mm long; lower 3 lobes triangular, acute, c. 3 mm long. Corolla: standard transversely ovate, 9–9.5 × c. 11 mm including the c. 2-mm claw, yellow or orange with a red ring surrounding the yellow centre, apex emarginate, base auriculate, c. 1.5-mm claw, orange, red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, slightly saccate; keel half transversely broadly elliptic, 7.5–8 × 3–4 mm including the 1.5–2-mm claw, red, apex rounded, base auriculate, saccate. Style long, incurved to hooked, lower two-thirds pubescent along inner margin; ovary shortly stipitate, densely pubescent; ovules 2. Pod shortly stipitate, ellipsoid to globose, 4–5 × 2.5–4 mm, moderately to densely villous. Seed reniform, 1.5–2 mm long, arillate.

Vernacular name: hook-point poison.

Flowering period: August–October. Fruiting period: from October.

Distribution (Fig. 87): south-western Western Australia. A rare species, occurring in the Watheroo and Wongan Hills region.

Habitat: grows in sandy, often gravelly soils in mixed shrubland or wandoon.

Conservation status: IUCN: E. ROTAP: 2E. CALM: R. This species is rare and is considered to be endangered.


Toxicity: fluoroacetate 100 μg g⁻¹ (Aplin 1971).

Affinity: this species most closely resembles G. parvifolium, though the latter lacks the pungent, hooked point on the leaf present in G. hamulosum and the leaves are crowded along the stem, so that the apex of one leaf overlaps the base of the next leaf, whereas in G. hamulosum they occur at well-spaced intervals.


Monograph of Gastrolobium

Low, bushy shrubs, up to 0.8 m high. Branchlets ascending, angular, densely sericeous. Petioles terete, continuous and decurrent with the branchlet, 2–3 mm long. Leaves spreading to ascending, in whorls of 3, elliptic to ovate, recurved or straight, 12–37 × 5–10 mm, glabrous, occasionally glaucous, venation prominently reticulate; apex acute or rounded, pungent-pointed; margins usually slightly conduplicate, occasionally flat, minutely crenulate, not recurved; base cuneate to obtuse. Stipules erect, hyaline, 3–7 mm long.

Inflorescences terminal racemes, 5–10-flowered; peduncle angular, 10–25 mm long; rachis angular, 10–67 mm long; subtending bracts caducous, scale-like, entire (though the abruptly acuminate apex may give the appearance of being slightly trifid), narrowly rhombic, 2–3 mm long. Pedicels terete, 1–2 mm long. Calyx campanulate, 5–7.5 mm long including the c. 1.5-mm receptacle, moderately pubescent, lobes not or scarcely recurved; upper 2 lobes united higher than the lower 3, rounded, c. 3 mm long; lower 3 lobes triangular, acute, 2–5 mm long. Corolla: standard transversely ovate, c. 10 × 14 mm including the 3.5-mm claw, orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base truncate or cordate, occasionally auriculate; wings obovate, c. 11 × 4.5 mm including the 4-mm claws, orange and red, apex rounded, incurved and at least partially overlapping to ± enclose the keel, base auriculate on both margins, slightly saccate; keel half transversely elliptic, margins not incurved, c. 9 × 3.5 mm including the 4-mm claw, pink and maroon, apex rounded, base auriculate, saccate. Style long, incurved to hooked, lower half pubescent; ovary shortly stipitate, densely pubescent; ovules 2. Pod stipitate, often shortly so, obliquely ellipsoid, 6–7 × 3–3.5 mm, moderately to densely villous. Seed ellipsoid, 2.5–3.5 mm long, arillate.

Notes on juvenile foliage: the juvenile foliage of G. oxylobioides is relatively broader than the adult foliage (28–32 × 18–25 mm) and the leaves are flat. This foliage does not appear to persist longer than the first 8–10 nodes and may bear flowers from 3 or 4 nodes.

Vernacular name: Champion Bay poison.

Flowering period: August–October. Fruiting period: October–December.

Distribution (Fig. 88): south-western Western Australia. Occurs along the west coast from around the Murchison River at Kalbarri National Park, south through the Geraldton and Gingin areas, to the Darling Range east of Perth.

Habitat: grows on gravelly or sandy gravelly soils in heath or shrubland.

Selected specimens (90 examined): WESTERN AUSTRALIA, Irwin District: 36 km from Geraldton towards Northampton, along Great Northern Hwy, 28°29′48″S, 114°38′07″E; G.T. Chandler 654 & S. Donaldson, 24.x.1998 (BRI, CANB); Western Australia, C.E. Carter s.n., l.xii.1935 (CANB); near Howatharra, 28°32′S, 114°38′E, A. Kanis 1571, 8.viii.1973 (CANB); 6 miles [9.5 km] N from Dandaragan, 30°37′S, 115°45′E, C.A. Gardner 11873, 1951 (CANB, PERTH); 17 miles [27 km] E of Murchison River mouth, M.E. Phillips 1428, 27.ix.1962 (CANB); 2 km N along Eneabba S road from Green Head Rd, 30°04′S, 115°12′E, M.D. Crisp 6221 et al., 29.ix.1979 (CANB, MEL, NSW, PERTH); Badgingarra, 30°24′S, 115°33′E, A. Hayes A, x.1969, juvenile (PERTH). Darling District: near Pingelly, 32°32′S, 117°05′E, A. Despassis s.n., 2.x.1987, juvenile (PERTH).

Toxicity: often highly toxic; fluorooacetate 0–1050 μg g⁻¹ (Aplin 1971).

Affinity: this species has been confused with G. propinquum and G. calycinum in the past. Gastrolobium propinquum has many more flowers per inflorescence (15 or more), the flowers are much smaller (e.g. standard c. 5 × 6 mm), the keel-petal shape is different, noticeably with a spout-like apex and the lower margin is not entire, having a hole towards the base where the stamens are visible and the calyx is generally less pubescent. Gastrolobium calycinum has broader leaves (12–24 mm) that are generally more robust, are usually glaucous and are cordate at the base.


Distribution: more widely distributed than the previous species, occurring from the Great Northern Hwy, Great Sandy Desert, Murchison River at Kalbarri National Park, south through the Geraldton region and The Murchison River to near Green Head Rd, 30°04′S, 115°12′E, progressing to the Darling Range east of Perth, with the northern limit near Eaglehawk Neck.

Toxicity: often highly toxic; fluorooacetate 0–1050 μg g⁻¹ (Aplin 1971).

Notes on juvenile foliage: the juvenile foliage of G. oxylobioides is generally more robust, are usually glaucous and are cordate at the base.


Tall, erect shrubs, up to 2.5 m high. Branchlets ascending, angular, glabrous. Petiole terete, broader and flatter towards base, continuous and slightly decurrent with the branchlet, 4–6 mm long. Leaves spreading to ascending, opposite, ovate to elliptic (20–25 × 46–60) × (5–8)–13–35 mm, glabrous, venation prominently reticulate, with a prominent intramarginal vein, raised; apex rounded or slightly emarginate, unarmed or with a tiny mucro; margins not or scarcely recurved, minutely crenulate; base rounded to truncate. Stipules erect, rigid, triangular, 2–4 mm long.

Inflorescences terminal racemes, 15–30-flowered; peduncle 10–20 mm long; rachis 25–50 mm long; subtending bracts caducous, scale-like, entire, lanceolate, c. 2 mm long, glabrous. Pedicels terete, 4–6 mm long. Calyx campanulate, 6–7 mm including the c. 1-mm receptacle, ± glabrous, lobes not or scarcely recurved; upper 2 lobes united higher than the lower 3, rounded, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard transversely elliptic, c. 12 × 15–16 mm including the 3–4.5-mm claw, orange-apricot with a red ring surrounding the yellow centre, apex emarginate, base cordate; wings obliquely obovate, 9–10 mm long; ovary and standard transversely ovate, 12–16 mm including the 4.5-mm claw, orange with a red ring surrounding the yellow centre, apex slightly emarginate, base cordate.
\[3\]–3.5 mm including the 2.5–3-mm claw, red and pink, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only or on both margins, saccate; keel half transversely elliptic, margins not incurved, 6.5–7.5 \times 3 \text{ mm} including the 2.5–3-mm claws, pink and maroon, apex acute, almost beaked, base auriculate, saccate. Style very short, slightly hooked, lower half pubescent; ovary stipitate, moderately pubescent; ovules 4–6. Ped spadix, ellipsoid to ovoid, 10–11 \times 5–6.5 mm, glabrous. Seed ellipsoid, c. 3–3.5 mm long, arillate.

Vernacular name: net-leaved poison.

Flowering period: September–November. Fruiting period: October and November.

Distribution (Fig. 89): south-western Western Australia. Occurs in the south-coast region, chiefly in Fitzgerald River National Park and the Ravensthorpe Ranges, but east as far as the Lort River.

Habitat: grows on sandplains or hillslopes on sand or shaly clay-loam in mallee shrubland.


Toxicity: among the most toxic Gastrolobium species; fluoroxacetate 1500 \mu g g\(^{-1}\) (Apin 1971).

Affinity: Gastrolobium racemosum is similar to G. grandiflorum, but the latter differs in the relatively broader leaf with a long petiole (leaf range 48–62 \times 19–32 mm, petiole 5–7 mm long), a longer inflorescence with more flowers (rachis 30–75 mm long, more than 30 flowers) and a more hairy inflorescence structure. Furthermore, G. racemosum has a standard petal that is a distinctive apricot colour, whereas G. grandiflorum has a yellow-orange standard petal.


A Gastrolobii speciebus ceteris stipulis reflexis et foliis valde cordatis pleurumque distincta; a G. spectabilis folii robustioribus et ovulis duobus differt.

The reflexed stipules and strongly cordate leaf shape distinguish this species from most other species of Gastrolobium. Similar to G. spectabile, which differs in the non-glaucescent leaves that are not fiercely pungent-pointed.

Etymology: this species derives its name from the reflexed stipules.

Tall and open to spreading and dense, glaucous shrubs, 0.6–2.5 m high. Branchlets ascending, angular, glabrous. Petioles very short, terete, continuous and partly decurrent with the branchlet, <0.5 mm long. Leaves broadly spreading to ± divaricate, opposite, transversely to very broadly ovate, 10–23 \times 15–30 mm, glabrous, glaucous, venation sometimes obscured, reticulate; apex obtuse to acute, fiercely pungent-pointed (pungent point up to 6 mm long); margins entire, flat; bases overlapping, strongly cordate. Stipules reflexed to almost appressed to the branchlet below the subtended leaves, rigid, 3.5–6 mm long. Inflorescences terminal racemes, 6–15-flowered, axis glabrous; peduncle angular, 5–13 mm long; rachis angular, 15–40 mm long; subtending bracts caducous, scale-like, entire, spatheform (constructed at the base, broadly elliptic in the middle and cupping the bud and acute to acuminate at the apex), 12–13 mm long. Pedicels terete, c. 2 mm long. Calyx tapering to the base, 11–13 mm long including the c. 1.5-mm receptacle, glabrous, lobes not recurved or upper 2 lobes slightly recurved; upper 2 lobes united higher than the lower 3, strongly diverging, obtuse, 6.5–7.5 mm long; lower 3 lobes triangular, acute, 5.5–6.5 mm long. Corolla: standard transversely ovate to transversely elliptic, 12–13 \times 13.5–17.5 mm including the 3–3.5-mm claw, deep orange to orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; wings oblong, 12.5–13 \times 4–4.5 mm including the c. 3-mm claws, deep orange, often red towards the base, apex rounded, not incurved, not enclosing the keel, base auriculate on both margins, saccate; keel half transversely obovate, margins incurved, 12.5–13 \times 4.5–5 mm including the c. 4-mm claws, pink, mauve or red, darker towards the apex, apex rounded, base auriculate, saccate. Style long, incurved to hooked, pubescent in the lower half on the upper margin; ovary strongly stipitate, densely pubescent; ovules 2. Pod and seed not seen. (Fig. 18)

Flowering period: September–December. Fruiting period: not known precisely, but early fruit forming in December.

Distribution (Fig. 90): south-western Western Australia. Occurs in the central northern part of this region, particularly around the Arrino and Wubin areas and east to the Kalannie region.

Habitat: grows on undulating dunes on yellow sand or sandy loam, often gravely, in mallee shrubland or mixed Allocasuarina and Melaleuca shrubland.

Selected specimens (20 examined): WESTERN AUSTRALIA, Avon District: Kalannie, 30°21’S, 117°07’E, W.E. Blackall s.n., 1938
(PERTH); Ballidu, 30°35'S, 116°46'E, D.C. White 3893/65 (PERTH); c. 20 km W of Dalwallinu, 3.4 km along Sanders Rd from Bell Rd, 30°13'12"S, 116°28'48"E, G.T. Chandler 661 & S. Donaldson, 25.x.1998 (AD, CANB, HO, K, MEL, MO, NSW, PERTH); 29.4 km NE of Three Springs towards Morawa, 29°20'00"E, J.D. Briggs 629, 24.x.1980 (CANB, MEL).

Toxicity: fluoroacetate 400 µg g⁻¹ (Aplin 1971). Gardner and Bennetts (1956) report that it was responsible for heavy stock losses in the Latham and Dalwallinu areas.

Affinity: this species is difficult to confuse with many species of *Gastrolobium*, although there are similarities to *G. spectabile*, particularly in leaf shape, stipule orientation and the presence of a prominent intramarginal vein. However, *G. spectabile* has non-glaucous leaves that are not fiercely spinescant and are generally more herbaceous than the robust leaves of *G. reflexum*. The bracts of *G. spectabile* are quite small (up to 4.5 mm long) and ± linear-lanceolate, the pedicels are relatively long (4–5 mm long), the upper margins of the keel are not incurved and there are 10–12 ovules, whereas *G. reflexum* has large, broad, spatiform bracts, relatively short pedicels (c. 1 mm long), the upper margins of the keel are incurved and there are strictly two ovules.


Low, bushy shrubs, up to 1 m high. Branchlets ascending, angular, glabrous. *Petiolo* terete, continuous and slightly decurrent with the branchlet, 2–3 mm long. Leaves ascending, opposite, elliptic to ovate, 20–40 × 10–20 mm, glabrous, glaucous, venation prominently reticulate to slightly obscured; apex obtuse, slightly pungent-pointed or mucronate; margins flat; base truncate to broadly rounded. *Stipules* erect, rigid, 2–3 mm long. *Inflorescences* terminal racemes, 4–6-flowered; *peduncle* angular, 15–20 mm long; *rachis* angular, 12–18 mm long; *subtending bracts* caducous, scale-like, slightly trilobed, ± rhombic, 2–3 mm long. *Pedicels* terete, 3–5 mm long. *Calyx* campanulate, 6–8 mm long including the c. 0.75-mm receptacle, ± glabrous, lobes not recurved; upper 2 lobes united higher than the lower 3, obtuse, c. 3–3.5 mm long; lower 3 lobes triangular, subacute, 3–3.5 mm long. *Corolla*: *standard* transversely ovate, c. 7 × 7.5 mm including the 2-mm claw, orange to orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate; *wings* oblong, c. 7 × 2 mm including the 2-mm claws, orange and red, apex rounded, not incurved, not enclosing the keel, base auriculate on both margins, saccate; *keel* half transversely obovate, margins not incurved, c. 7 × 3 mm including the 2-mm claws, maroon, apex rounded, base auriculate, saccate. Style long, strongly incurved to hooked, pubescent in the lower half on the inner margin; *ovary* stipitate, densely pubescent; *ovules* 4 or 5. *Pod* stipitate, broadly ellipsoid to ± globose, 6–8 × 3.5–7.5 mm, moderately pubescent. *Seed* not seen.

Flowering period: September–October. Fruiting period: November and December.

Distribution (Fig. 91): south-western Western Australia. Occurs mainly in the central eastern part of this region, in the sandplains east of Lake King (Frank Hann National Park), although it does occur east as far as Tarin Rock and south to the Ravensthorpe Ranges.

Habitat: grows on undulating sandplains in white, grey or yellow sand over laterite, in mallee-heath, heathland or shrubland.

Conservation status: ROTAP: 3KC-. CALM: P2. This species is considered to be poorly known, but not at risk. This study found numerous, very healthy populations of this species, many of which were in reserves, so this species should not be considered rare in any way.


Toxicity: fluoroacetate 10 µg g⁻¹ (Aplin 1971).

Affinity: some specimens of *G. rigidum* have been confused with *G. spectabile* in the past, although *G. spectabile* is easily distinguished by its prominently cordate leaves, many-flowered racemes (18–24-flowered) and larger flowers (e.g. standard 10 × 15 mm).


Tall, erect, spreading, tangled shrubs up to small trees, 0.8–4 m high. Branchlets ascending, angular, glabrous. *Petiolo* very short, terete, continuous and partly decurrent with the branchlet, <1 mm long. *Leaves* spreading, opposite, ovate to broadly or transversely so, 25–45 × 23–45 mm, glabrous, venation prominently reticulate, intramarginal vein prominent; apex obtuse, may be pungent-pointed or
mucronate; margins flat or slightly undulate; bases overlapping, prominently cordate. *Stipules* reflexed, often also slightly curling up, hyaline, rigid, 5–7 mm long. *Inflorescences* terminal racemes, 18–24-flowered; *peduncle* angular, 10–20 mm long; *rachis* angular, 40–60 mm long; *subtending bracts* caducous, scale-like, entire, ± narrowly lanceolate, 2.4–5.5 mm long. *Pedicels* terete, 3–5 mm long. *Calyx* campanulate, 7–9 mm long including the c. 1.5-mm receptacle, glabrous or rarely slightly pubescent, lobes all recurved; upper 2 lobes united higher than the lower 3, obtuse to rounded, c. 5 mm long; lower 3 lobes triangular, acute, c. 4 mm long. *Corolla: standard* transversely elliptic, c. 10 × 15 mm including the 3-mm claw, rich yellow to light orange with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; *wings* obovate, c. 11.5 × 3 mm including the 2.2-mm claws, yellow to yellow-orange, apex rounded, not incurved, not enclosing the keel, base auriculate on both margins, saccate; *keel* half transversely obovate, margins not incurved, c. 11.5 × 5 mm including the 3.5-mm claws, creamy green, apex rounded, base auriculate, saccate. *Style* long, incurred to slightly hooked, lower half pubescent on the inner margin; *ovary* strongly stipitate, densely pubescent; *ovules* 10–12. *Pod* stipitate, obliquely ellipsoid, 10–12 × 5–6 mm, glabrous. *Seed* not seen.

**Vernacular name**: Roe’s poison.

**Flowering period**: September–November. **Fruiting period**: from November.

**Distribution** (Fig. 92): south-western Western Australia. Occurs in a relatively small area, from Kununupung south to Lake Grace (though it is unlikely that this population is extant) and from Trayning east to Muntadgin.

**Habitat**: this species grows around the margins of granite outcrops, in coarse sand, in eucalypt woodland.

**Conservation status**: CALM: P3. *Gastrolobium spectabile* is rare, possibly because of its restricted habitat: it prefers to grow around the base of granite outcrops, but far enough out from such an outcrop that land clearing for farmland may have vastly reduced the number of populations of this species. This species may in fact be classed as Vulnerable or Rare sometime in the near future.

**Selected specimens** (19 examined): due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA, Avon District: Cunderdin, J. Pasenjak 1143/64, viii.1964, probably a juvenile specimen with large leaves (PERTH); Billyacatting Hill, NE of Kununupung, G.T. Chandler 820 & S. Donaldson, 15.xi.1998 (CANB, MEL, PERTH); near Muntadgin, C.A. Gardner s.n., 10.xi.1947 (CANB, PERTH); Roe District: Lake Grace, D.R. Taylor s.n., ix.1945 (CANB, PERTH).

**Toxicity**: fluoroacetate 400 µg g⁻¹ (Aplin 1971).

**Affinity**: it is difficult to confuse *G. spectabile* with any species of *Gastrolobium*, although there are similarities to *G. reflexum*, particularly in leaf shape, stipule orientation and the presence of a prominent intramarginal vein. However, *G. reflexum* has glaucous leaves that are fiercely spinescent and are generally more robust than those of *G. spectabile*. The bracts of *G. reflexum* are large, broadly spathe-like (12–13 mm long and about as broad), the pedicels are very short (c. 1 mm long), the upper margins of the keel are incurred and there are strictly two ovules, whereas *G. spectabile* has small, linear-lanceolate bracts, relatively long pedicels, the upper margins of the keel are not incurred and there are 10–12 ovules.

63. *Gastrolobium tenue* G.Chandler & Crisp, sp. nov. **Type**: Western Australia: Avon District: Between Bruce Rock and Doodlakine, c. 31°45′S, 118°05′E, G.T. Chandler 252 & W. Keys, 15 Sep. 1997 (holo: CANB; iso: PERTH). The precise locality has been withheld due to the rarity of this species.

Frutices humiles foliis involutis tenue pungentibus; petala persistenta fructum omnino includentia. A *G. stenophylo* inflorescentia florisbus minus quam 10, internodiis inter flores plomerque >10 mm et bracteis subtententibus persistentibus trifidis distinguenda.

Low, bushy shrubs, with involute leaves that are finely pungent-pointed and the petals persistent in fruit, completely enclosing the fruit, the subtending floral bracts are persistent and trifid and there are less than 10 flowers per inflorescence with c. 10-mm floral internodes.

**Etymology**: this specific epithet means slender and this species is named after the slender leaves.

Bushy, rounded *shrubs*, 0.2–0.6 m high. *Branchlets* ascending, angular, sparsely to moderately pubescent. *Petioles* terete, slightly swollen at base, continuous and slightly decurrent with the branchlet, 1–2 mm long. *Leaves* ascending, opposite, linear, 15–25 × c. 1 mm, glabrous, venation obscurely reticulate; apex slightly rounded, finely pungent-pointed; margins strongly involute, appearing ± terete; base cuneate. *Stipules* erect, hyaline, 1.5–3 mm long. *Inflorescences* terminal racemes, 4–10-flowered; *peduncle* angular, 13–25 mm long; *rachis* angular, 15–50 mm long; *subtending bracts* persistent, usually scale-like, rarely with the middle lobe elongated and leaf-like, prominently trifid on the lower flowers, almost entire on the upper-most flowers on the rachis, 2–4 mm long. *Pedicels* terete, 2–3 mm long. *Calyx* campanulate, c. 6 mm long including the c. 0.5-mm receptacle, sparsely to moderately, shortly pubescent, lobes not recurved; upper 2 lobes united higher than the lower 3, triangular, obtuse, c. 3 mm long; lower 3 lobes triangular, acute, c. 2.5 mm long. *Corolla: standard* transversely ovate, c. 8 × 11 mm including the 1.5-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base cordate, auriculate; *wings* obovate, c. 8.5 × 3.5 mm including the 1.5-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; *keel* half broadly elliptic, upper
margins incurved, c. 8 × 3 mm including the 1.5-mm claws, red and maroon, apex rounded, base auriculate, saccate. Style long, slightly hooked, lower third pubescent on the inner margin; ovary shortly stipitate, densely pubescent; ovules 2. Pod shortly stipitate, floral parts persistent, completely obscuring pod, ellipsoid, 5.5–6 × 3–3.5 mm, moderately pubescent. Seed ellipsoid, c. 2.5 mm long, arillate. (Fig. 19)

Flowering period: September and October. Fruiting period: November and December.

Distribution (Fig. 93): south-western Western Australia. Occurs in a restricted range on the sandplains around Bruce Rock and Doodlakine.

Habitat: undulating dunes in yellow sand or sandy clay in Eucalyptus or Allocasuarina heath.

Conservation status: CALM: P1. This species is known only to be extant at the type locality, which is on a disturbed road verge and very much in danger of becoming extinct. The population has been steadily in decline during the course of this study, with no seedling recruitment and old plants dying and in need of urgent measures to ensure its survival. Numerous searches in the area have failed to turn up new populations of this species.

Selected specimens (12 examined): due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA, Avon District: Shackleton, J. Salter s.n., 18.xi.1939 (PERTH); W of Belka, B.H. Smith 931, 8.ix.1987 (CANB, HO, MEL, PERTH); between Bruce Rock and Doodlakine, G.T. Chandler 819 & S. Donaldson, 15.xi.1998 (CANB).

Toxicity: unknown.

Affinity: the only species of Gastrolobium that G. tenue may be confused with is G. stenophyllum, which has somewhat similar foliage. However, Gastrolobium stenophyllum is a large, erect shrub, the leaves are unarmed, the inflorescence is many-flowered (10- to more than 30-flowered), with very short internodes between flowers (<1 mm) and the subtending bracts are caducous and entire, whereas G. tenue has relatively few flowers per inflorescence and relatively long internodes between flowers (generally >10 mm).

VIII. The G. retusem group

The species in this group all have strongly tomentose calyces that are often bicoloured, they generally have inflorescences that are reduced to a few flowers in the leaf axils (except G. ebracteolosum) and they all have triffid bracts.


Small, twiggy shrubs, up to 0.5 m high. Branchlets ascending, slightly angular, moderately pubescent. Petioles terete, continuous and decurrent with the branchlet, 1–2 mm long. Leaves patent, ternate, obovate to oblongangular, recurved, 10–17 × 8–12 mm, upper surface glabrous, lower surface moderately pubescent, venation; apex recurved, almost bilobed, mucronate; margins recurved; base rounded. Stirpes erect, hyaline, 2–3 mm long. Inflorescences terminal, sessile clusters of 10 or more flowers; peduncle c. 1 mm long; rachis c. 1–3 mm long; subdactylating bracts trifid with lobes much shorter than tube. Pedicels 1–3 mm long. Calyx campanulate, 6–7 mm long including the c. 1-mm receptacle, bicoloured with dense basal white hairs becoming golden brown apically, lobes not recurved; upper 2 lobes united higher than the lower 3, acute to obtuse, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2.5 mm long. Corolla standard transversely ovate, 9–10 × 9–10 mm including the c. 3-mm claw, rich yellow with a dark red centre, apex emarginate, base truncate; wings obovate, 8–9 × 3 mm including the 3-mm claws, base red with yellow tips, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half broadly elliptic, margins incurved, c. 8 × 2 mm including the 2.5-mm claws, dark red, apex obtuse, base auriculate, saccate. Style long, strongly incurved to hooked, lower third pubescent; ovary ± sessile, densely pubescent; ovules 2. Pod shortly stipitate, ovoid, enclosed in calyx, c. 6–7 × 2–3 mm, densely pubescent. Seed not seen.

Flowering period: October. Fruiting period: November.

Distribution (Fig. 94): south-western Western Australia. Occurs around Kojonup, between Perth and Albany and further south in the Stirling Range.

Habitat: grows on sandy loam over laterite in mallee heath.


Toxicity: unknown.

Typification: as the name Gastrolobium emarginatum is already occupied (see Gastrolobium velutinum), this species requires a new name.

Affinity: morphologically similar to Gastrolobium stowardii, but this latter species has angular stems, opposite leaves with decurrent petioles and bracts with an elongated middle lobe.

**Callistachys retusa** (Lindl.) Kuntze, *Revisio Generum Pl.* 1: 168 (1891). *Nemia retusa* (Lindl.) Domin, *Preslia* 2: 29 (1923). **Type citation:** ‘A native of the south coast of New Holland, whence it was received from Mr. Knight, of the King’s Road, in whose Nursery our figure was made in May last.’ **Type specimen:** holo (here chosen): CGE.


*Oxylobium melinocaulae* E. Pritz. in Diels & Pritzel, *Jahrb. Brys.* 35: 253, Fig. 29-D (1904). **Type citation:** ‘Hab. in distr. Stirling pr. Cranbrook in fruticetis lapi dosis fl. m. Sept. (D. 4452).’ **Type:** the plate.

Bushy *shrubs,* up to 2 m high. **Branchlets** ascending, angular, densely villous. *Petioles* terete, continuous and decurrent with the branchlet, 1–2 mm long. *Leaves* ternate, ± bilobed to spathulate, 11–40 × 6–10 mm, upper surface glabrous, lower surface sparsely to moderately pubescent, glabrescent, venation prominently reticulate; apex often bilobed, mucronate; margins crenulate, becoming plicate; base cuneate. *Inflorescences* condensed terminal racemes, 8–12-flowered; *peduncle* erect, hyaline, 5–6 mm long. *Corolla* campanulate, 5–6 mm long including the 2-mm claws, orange and dark red at the centre, 7–10 × 2.5–3 mm including the 2-mm claws, orange and grey-tomentose base and the peduncles are longer than the lower 3 and much narrower, acute, 2.5 mm long; lower 3 lobes triangular, acute, 2.5 mm long. **Corolla:** standard transversely elliptic, c. 7.5–10 × 10–11 mm including the 1.5–2-mm claw, orange, dark red at the centre, the apex emarginate, base cordate, auriculate; wings ± obovate, c. 7–10 × 2.5–3 mm including the 2-mm claws, orange and purple red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half very broadly elliptic, c. 7–10 × 3 mm including the 2-mm claws, maroon, apex ± obtuse, base auriculate, saccate. **Style** long, strongly incurved to hooked, base pubescent; ovary very slightly stipitate, densely pubescent; **ovules** 4. **Pod** ± sessile, ovoid, c. 6 × 3 mm, moderately to densely pubescent. **Seed** not seen.

**Flowering period:** October. **Fruiting period:** October–December.

**Distribution** (Fig. 95): south-western Western Australia. This species has a disjunct distribution, occurring around Bindoon, near Perth and then around the Stirling Range, Bremer Bay and Cape Riche area, but not in between.

**Habitat:** occurs on the northern and southern sandplains of south-western Western Australia on sandy soils in heath, woodland or mallee woodland.


**Toxicity:** unknown.

**Notes:** this is quite a variable species, which requires a detailed study to resolve some complex issues. DNA sequencing of Chandler 427 (Bremer Bay) and Chandler 188 (Bindoon), done as a species replicate, found that these two forms did not fall together on the phylogeny. In fact, they are in quite different groups. However, there was not time to delve into this species to fully resolve this issue.

**Affinity:** similar to *Gastrolobium whicherensis,* which differs in the leaves being basically oblong, ranging from slightly oovate to slightly obovate, the stipules have a thickened, grey-tomentose base, there are more flowers per inflorescence (greater than 15) and it has longer peduncles (15–33 mm long).

66. *Gastrolobium whicherensis* G. Chandler & Crisp, sp. nov. **Type:** Western Australia: Dardanup Forest Block, E of Dardanup, 33°24′00″S, 115°49′00″E, *G.J. Keighery 14932 (holo: PERTH!)*

*G. retusum* similis sed foliis praecipue oblongis (variantebus a vix ovatis ad vix obovatis), stipulis ad basim incrassatis canis tomentosis et pedunculis longioribus (10–25 mm longis) distincta.

Similar to *Gastrolobium retusum* but differing in that the leaves are basically oblong, ranging from slightly oovate to slightly obovate, the stipules have a thickened, grey-tomentose base and the peduncles are longer (15–33 mm long).

**Etymology:** named after the hills in which this species is endemic, the Whicher Range.

Slender, open *shrubs* up to 1.6 m high. **Branchlets** ascending, angular to trigonous, moderately to densely sericeous. *Petioles* terete, continuous and may be slightly continuous with the branchlet, 2–4 mm long. **Leaves** ascending, in whors of three or four, ± obovate, cuneiform or slightly oovate, 20–25 × 3–5 mm, upper surface glabrous, lower
surface glabrous to moderately sericeous, venation openly reticulate; apex rounded, often slightly emarginate, slightly mucronate; margins flat slightly recurved; base cuneate to rounded. **Stipules** erect to recurved, narrowly triangular, hyaline, 3–7 mm long, densely pubescent. **Inflorescences** condensed axillary and terminal racemes, more than 15-flowered, peduncle and rachis densely sericeous; **peduncle** 15–33 mm long, angular; **rachis** 3–10 mm long, angular; **subtending bracts** caducous, scale-like, prominently trifid, 4–6 mm long, densely pubescent. **Pedicels** terete, 2–3 mm long, densely pubescent. **Calyx** campanulate, 5–7 mm long including the c. 0.75-mm receptacle, lobes not recurved, densely pubescent, hairs bicoloured, with white hairs becoming golden towards the lobe apices; upper 2 lobes united into a truncate, emarginate lip, c. 2.5–3 mm long; lower 3 lobes triangular, acute, c. 2.5–3 mm long. **Corolla**: standard transversely elliptic, c. 9 × 8 mm including the 3-mm claw, orange-yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; **wings** obovate, c. 8 × 3 mm including the 2-mm claws, red with a yellow edge, apex rounded, incurved and overlapping the keel, base auriculate on the upper margin only, not or slightly saccate; **keel**: half broadly elliptic, c. 8 × 2 mm including the 3-mm claws, red, apex rounded, base auriculate, saccate. **Style** very long, hooked, lower third slightly pubescent; ovary very shortly stipitate, densely pubescent; **ovules** c. 4. **Pod** and **seed** not seen.

**Flowering period**: October. **Fruiting period**: unknown. **Distribution** (Fig. 96): south-western Western Australia. **Gastrolobium whicherensis** is currently known only from the Whicher Range area, south of Perth. **Habitat**: grows on steep westerly slopes on red-grey sandy clay over quartzite, in *Eucalyptus haematoxylon* woodland.

Specimens examined: only the type specimen was seen for this species.

**Toxicity**: unknown.

**Affinity**: similar to *Gastrolobium retusum*, which differs by having ± spathulate leaves and the stipules do not have a thickened, grey-tomentose base, fewer flowers per inflorescence (8–12) and shorter peduncles (2–10 mm long).

67. **Gastrolobium ebracteolatum** G.Chandler & Crisp, nom. nov. **Base name**: *Callistachys linearis* Benth., *Enum. Pl. Huegel*: 28 (1837a). *Oxylobium lineare* (Benth.) Benth., *Fl. Austral.* 2: 17 (1864). *Chorizema lineare* (Benth.) F.Muell., *Frag. Phyli. Austral.* 4: 17 (1863), published as ‘*Chorozema*’. **Type citation**: none cited. **Lectotype** (here chosen): W (Swan River, Hügel); **isolatec** K. **Notes**: a new specific epithet was required, as the name *G. lineare* was already taken

**Eymology**: this species has often been confused with *Callistachys lanceolata*, which has bracteoles, so the specific epithet refers to the lack of bracteoles on *G. ebracteolatum*.

Slender, erect shrubs, 1.5–4 m high. **Branchlets** slightly angular, ascending, sparsely to moderately pubescent. **Petioles** terete, continuous and slightly decurrent with the branchlet, 2–3 mm long. **Leaves** spreading to ascending, scattered along the branchlet, linear-ovate to linear-elliptic, 50–115 × 3.5–10 mm, upper surface glabrous, lower surface glabrous to moderately sericeous, venation prominently reticulate; apex rounded, weakly mucronate; margins slightly recurved; base rounded to slightly cuneate. **Stipules** erect, hyaline, 2.5–4 mm long. **Inflorescences** terminal racemes, 20- to more than 30-flowered, moderately sericeous; **peduncle** 5–20 mm long; **rachis** 60–180 mm long; **subtending bracts** ultimately caducous but persisting until well after anthesis, scale-like, trilobed (although this may be obscured by the pubescence of the bract), middle lobe longer than the outer two, 4–5 mm long, densely villous. **Pedicels** terete, 1–3 mm long, densely villous. **Calyx** broadly campanulate, 9–10 mm long including the c. 1.5-mm receptacle, densely villous, bicoloured, with silvery hairs at the base becoming golden brown at the lobes, or occasionally unicoloured with all hairs golden brown, lobes not recurved, lower 3 lobes may be slightly incurved; upper 2 lobes united higher than the lower 3, obtuse, 6–7 mm long; lower 3 lobes triangular, acute, 5–6 mm long. **Corolla**: standard transversely ovate, c. 12 × 13 mm including the 3-mm claw, pale yellow to maroon with a small yellow centre, apex emarginate, base cordate, not auriculate; **wings** ovate to oblong, c. 11 × 3.5 mm including the 2-mm claws, red, apex rounded, not incurred but with apices touching to slightly enclose the keel, base strongly auriculate on both margins, saccate; **keel**: half broadly oblong, margins not incurred, c. 11 × 3.5 mm including the 2-mm claws, pale yellow to cream or red, apex rounded, base auriculate, saccate. **Style** long, slightly hooked, base pubescent; ovary stipitate, densely pubescent; **ovules** c. 18. **Pod** stipitate, ovoid, 11–12 × 5–6 mm, moderately to densely pubescent. **Seed** not seen.

**Flowering period**: October–December. **Fruiting period**: November and December. **Distribution** (Fig. 97): south-western Western Australia. Occurs throughout the Darling escarpment, mostly east and south of Perth from Helena Valley south to Tonebridge, but with one outlier near Gingin, north of Perth. **Habitat**: occurs in riverine habitats or in swampy woodlands on loam or sandy loam soils, in open woodland or Jarrah (*Eucalyptus marginata*) forest.

Toxicity: unknown.

Affinity: the long, linear leaves and long racemes do not resemble those of any other species of Gastrolobium, but this species has been confused with the linear-leaved form of Callistachys lanceolata in the past. In this case, flowers are required for a positive identification, preferably buds, as C. lanceolata has caducous bracteoles on the calyx, whereas G. ebracteolatum lacks bracteoles. A further aid to identification is the distribution, with C. lanceolata generally confined to the south coast, while G. ebracteolatum occurs further north and east, mainly along the Darling Range escarpment.


Bushy shrubs, up to 1.5 m high. Branchlets ascending, angular, white tomentose. Petioles terete, continuous and slightly decurrent with the branchlet, 1–2 mm long. Leaves patent or retrorse, ternate, rigid, narrowly elliptic to ovate, 12–22 × 4–6 mm, glabrous, venation prominently patent or retrorse, ternate, rigid, narrowly elliptic to ovate, outer surface, glabrous inner.

Inflorescences solitary or paired flowers in the axils; peduncle nil; rachis nil; subtending bracts caducous, scale-like, trilobed with a much longer middle lobe, lobes shorter than tube, 4–5 mm long, moderately pubescent outer surface, glabrous inner. Pedicels terete, 2–3 mm long, densely pubescent. Calyx campanulate, 6–8 mm long including the c. 1-mm receptacle, moderately pubescent, lobes not to slightly recurved; upper 2 lobes united higher than the lower 3, acute, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard transversely elliptic, 8–9.5 × 9–9.5 mm including the 3.5–4.5-mm claw, yellow with a thick red area surrounding the yellow centre, apex emarginate, base shortly stipitate, densely pubescent; ovary shortly stipitate, densely pubescent; ovules 2. Pod shortly stipitate, ovoid, 7–9 mm long, densely pubescent. Seed not seen.

Flowering period: August and September. Fruiting period: from October.

Distribution (Fig. 98): south-western Western Australia. Occurs from the Port Gregory region, near Northampton, south to Armadale, in the Perth region.

Habitat: grows in gravel pits and shrubland with species such as Dryandra sessilis, Boronia cymosa and Gelezinowia verrucosa.

Conversion status: ROTAP: 3KC-. CALM: P3. This taxon is rare, though not considered to be at risk and further survey work is required to further determine its conservation status.

Selected specimens (9 examined): WESTERN AUSTRALIA, Irwin District: Gravel pit, 15 km from Northampton on Port Gregory Rd, 28°17′58″S, 114°30′37″E. R. Davis 3590, 8.vii.1997 (CANB, PERTH). Darling District: Greenmount, 31°54′S, 116°03′E, ex Herb. W.K. Fitzgerald s.n., ix.1900 (CANB, NSW); Darlington, Darling Range, 31°55′S, 116°04′E, A. Morrison s.n., 11.x.1906 (CANB, PERTH).

Toxicity: unknown.

Affinity: similar to G. epacridoides, which is easily differentiated by the lack of stipules and also has shorter, broader leaves (11–14 × 8 mm). Gastrolobium capitatum is also similar to G. acutum, but the former species can most easily be distinguished by the condensed terminal and axillary racemes, but also by the longer, relatively much narrower leaves (35–55 × 3–10 mm).


Prostrate to low, bushy shrubs, up to 1 m high. Branchlets trailing, white tomentose. Petioles terete, continuous but not decurrent with the branchlet, 1–2 mm long. Leaves spreading, opposite or alternate, narrowly to linear-elliptic to obovate, 35–55 × 3–10 mm, glabrous, venation prominently reticulate; apex acute with 3–4 mm long filiform mucro; margins not recurved; base cuneate. Stipules erect, filiform, 6–8 mm long. Inflorescences condensd terminal and axillary racemes, 2–6-flowered; peduncle 2–3 mm long; rachis 1–2 mm long; subtending bracts caducous, scale-like, filiform 4 mm long. Pedicels terete, 2–3 mm long. Calyx campanulate, 7–8 mm long including the c. 1.5-mm receptacle, moderately villous, lobes not or scarcely recurved; upper 2 lobes united higher than the lower 3, rounded, c. 3 mm long; lower 3 lobes triangular, acute, c. 2.5 mm long. Corolla: standard transversely ovate, c. 10 × 12–15 mm including the 5-mm claw, orange-yellow red ring surrounding the yellow centre, apex emarginate, base strongly cordate, not auriculate; wings obovate, 11–12 × 4.5 mm long including the c. 4-mm claws, orange, apex rounded, incurved, overlapping and enclosing the keel, base auriculate on the upper margin only, saccate; keel half
transversely elliptic, margins not incurved, c. 10 × 4 mm including the 4-mm claws, red, apex obtuse, base auriculate, saccate. Style long, incurved, pubescent at very base; ovary shortly stipitate, densely pubescent; ovules 4–8. Pod almost sessile, ovoid, 7–9 × 2.5–4 mm, moderately pubescent. Seed not seen.

Flowering period: June–September. Fruiting period: September–November.

Distribution (Fig. 99): south-western Western Australia. Widespread along the Darling Range escarpment, from Gingin in the north to Capel, near Busselton and King Georges Sound in the south.

Habitat: grows in a variety of habitats, from wet to quite dry, on sandy to loamy soils in woodland or open forest.

Selected specimens (36 examined): WESTERN AUSTRALIA, Darling district: Gingin cemetery, 31°21'S, 115°54'E, A. Kanis 1503, 7.viii.1973 (CANB); 0.5 km S of Yoongarillup Community Hall on Vasse Hwy (c. 12 km SE of Busselton), 33°43'15"S, 115°26'00"E, M.D. Crisp 8943 & W. Keys, 12.x.1996 (CANB, PERTH); Reserve 23172 (C58) along Harvey River, about 8 km E of Yalgorup, 32°52'S, 115°46'E, B.J. Keighery & N. Gibson 120, 2.ix.1993 (CANB, PERTH).

Toxicity: unknown.

Affinity: this species is somewhat similar to G. acutum, which is easily distinguished by the inflorescence, which has flowers that are solitary or in pairs in the axes and the leaves are shorter and relatively broader (12–22 × 4–6 mm). The broader-leaved form of G. linearifolium is similar to G. capitatum, but can be distinguished by the tomentose to villos indumentum and the glabrate leaves that are shorter and relatively broader (12–22 × 4–6 mm). The style of G. capitatum has a sericeous indumentum (or the calyx may tend to be villous), the leaves are more or less persistently sericous beneath and are ovate (rarely obovate).

70. **Gastrolobium alternifolium** G.Chandler & Crisp, sp. nov. Type: Western Australia: Darling District: Brookton Highway, 1.7 km W of Warradale Road, 32°16'02"S, 116°29'15"E, F. Hort 556 & L. Boyle, 22 Aug. 1999 (holo: CANB; iso: PERTH!)

Frutex humilis ad 0.3 m altus floribus fere sessilis geminis vel solitariis in axilbus supernis; a Gastrolobii speciebus ceteris foliis magnis (25–50 × 12–30 mm) ovatis alternis nec oppositis nec verticillatis facie distincta.

A low shrub up to 0.3 m high with paired or solitary flowers almost sessile in the upper branches, which is easily distinguished from most species of *Gastrolobium*, as the large, ovate leaves (25–50 × 12–30 mm) are alternately arranged, not opposite or whorled.

Etymology: this species is named after the unusual leaf arrangement for *Gastrolobium*, being alternate.

Open, many stemmed shrubs, up to 0.3 m high. Branchlets ascending, angular, scruffy with mostly appressed hairs, glabrescent. Petioles terete, continuous and slightly decurrent with the branchlet, 1–2 mm long. Leaves spreading to ascending, alternate, ovate, 25–50 × 12–30 mm, glabrous, upper surface slightly glaucous, lower surface green, venation prominently reticulate, raised; apex rounded, often somewhat emarginate, stiffly mucronate; margins very slightly crenulate and undulate; base cordate, rounded or obtuse. Stipules recurved, triangular, 2–4 mm long, base pubescent. Inflorescences single or paired flowers in upper axils; peduncle nil; rachis nil; subtending bracts caducous, scale-like, trilobed, lobes all about the same length as the tube, 4–5 mm long. Pedicels pubescent, less than 1 mm long. Calyx campanulate, 6–8 mm long including the c. 1-mm receptacle, densely villous, lobes not or scarcely recurved; upper 2 lobes united higher than the lower 3, acute, 3.5–4 mm long; lower 3 lobes triangular, acute, 3.5–4 mm long. Corolla: standard elliptic, c. 11.5–13 × 10 mm including the 4-mm claw, yellow outer, red in the large, mid-part of the lamina, with a tiny, yellow centre, apex emarginate, base cordate; wings broadly obovate, c. 10 × 5 mm including the 3-mm claws, yellow and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on upper margin only, saccate; keel half obliquely very broadly elliptic, margins not incurved, c. 9–11 × 3.5 mm including the 3-mm claws, deep maroon, apex broadly rounded, base auriculate, saccate. Style strongly incurved, lower third pubescent; ovary sessile, densely pubescent; ovules 2 or 3. Pod sessile, ovoid, 6–8 mm long, softly grey pubescent. Seed not seen. (Fig. 20)

Flowering period: July–September. Fruiting period: October and November.

Distribution (Fig. 100): south-western Western Australia. Grows in the Darling escarpment region east of Perth, near York.

Habitat: grows in sandy gravel in Banksia attenuata heath.

Conservation status: CALM: P3. This taxon is rare, but not considered to be at risk, but further survey work is required.

Specimens examined: WESTERN AUSTRALIA, Darling District: 33 km WNW of Beverley, W Talbot Rd, 3 km NW of Gunpin Ridge Rd turnoff, 32°00'00"S, 116°35'00"E, M.D. Crisp 8513 & W. Keys, 27.ix.1993 (CANB, PERTH).

Toxicity: unknown.

Affinity: the large, ovate, alternately arranged leaves easily distinguish this species from its close relatives *G. capitatum* and *G. acutum* which have opposite leaves. Furthermore, *G. capitatum* has narrower leaves (2–10 mm broad) and *G. acutum* has generally smaller leaves (12–22 × 4–6 mm).
71. Gastrolobium linearifolium G.Chandler & Crisp, nom. nov. Callistachys oxylobioides Mein. in Lehm., Pl. Preiss. 1: 27 (1844). Oxylobium reticulatum Mein. in Lehm., Pl. Preiss. 1: 29 (1844), pro parte (only those specimens based on Callistachys oxylobioides Mein.). Type citation: ‘In arenosis sylvae prope deversorium publicum Pineapple (Perth) d. 6. Jun. Herb. Preiss. no. 842. et in calcareis inter frutices densos prope oppidum Freemantle, d. 18. Dec. 1839. No. 841.’ Type specimens: lectotype (here chosen): LD (Preiss 842); isolecito: GOET (2 sheets), MO (left hand specimen); NY (right hand and centre specimens), S (left hand specimen); W (2 sheets)

Notes: a new specific epithet is required because the name Gastrolobium oxylobioides is already occupied (see Gastrolobium oxylobioides).

Etymology: the new specific epithet refers to the linear leaves.

Low, bushy, sometimes almost prostrate shrubs, 0.3–1 m high. Branchlets spreading, angular, densely villous. Petioles terete, continuous and decurrent with the branchlet, 1–2 mm long. Leaves initially opposite and slightly obovate, rapidly becoming ternate in later developmental stages and very narrowly elliptic to essentially linear, 35–70 × 4–8 mm, glabrous, venation prominently reticulate, raised; apex recurved, prominently mucronate; margins becoming conduplicate; base cuneate. Stipules recurved, hyaline, 4–6 mm long. Inflorescences condensed axillary racemes or solitary flowers in the axils; peduncle 0–2 mm long; rachis 0–4 mm long; subtending bracts caducous, scale-like, trifid, the lobes about equal and much shorter than the tube, 2–3 mm long. Pedicels less than 3 mm long. Calyx campanulate, c. 7 mm long including the c. 1-mm receptacle, densely villous, lobes scarcely recurved; upper 2 lobes united slightly higher than the lower 3, acute, c. 5.5 mm long; lower 3 lobes triangular, acuminate, 5 mm long. Corolla: standard transversely ovate, 13–14 × 14–16 mm including the c. 2.5-mm claw, yellow-orange, with a deep maroon reverse side, apex emarginate, base cordate, not auriculate; wings obliquely obovate, c. 9–11 × 3 mm including the 2.5-mm claws, red and yellow, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half broadly to very broadly ovate, 8–10 × 3 mm including the 3.5-mm claws, dark red-brown, apex rounded, base auriculate, saccate. Style long, strongly incurved, base pubescent; ovary shortly stiptate, densely pubescent; ovules 8 or 9. Pod almost sessile, broadly ovoid, 8–10 × 4–5 mm long, silky pubescent. Seed not seen.

Flowering period: August–October. Fruiting period: October and November.

Distribution (Fig. 101): south-western Western Australia. Occurs mainly north of Perth, on the coastal plain and in the Darling escarpment.

Habitat: grows on the near-northern coastal sandplains and in the escarpment on sandy soils, in eucalypt woodland and scrub with a heath understorey.


Toxicity: unknown.

Affinity: this species has previously been confused with Gastrolobium nervosum Mein. [syn. Nemcia reticulata (Meisn.) Domin], but differs in the dense, silky white, erect hairs on new growth and calyces, the ternate, conduplicate (more or less folded lengthwise) linear leaves with a size range of 35–70 × 4–8 mm and the apex recurved and mucronate, rather than bilobed. The broader-leaved form of G. linearifolium is similar to G. capitatum, but the latter has a sericeous indumentum (or the calyx may tend to be villous), the leaves are more or less persistently serious beneath and are ovate to elliptic (rarely obovate), whereas G. linearifolium has a tomentose to villous indumentum and the glabrate leaves are generally obovate.


Typification: a new specific epithet is required because the name Gastrolobium reticulatum is already occupied [see Gastrolobium nervosum], so the next available name, G. nervosum, was chosen.

Small shrubs, 0.3–0.5 m high. Branchlets ascending, angular, moderately tomentose. Petioles terete, continuous and decurrent with the branchlet, 2–5 mm long. Leaves opposite, linear, narrowly spatulate, narrowly obovate to obovate, rarely longitudinally recurved, 25–40 × 20–22 mm, glabrous, venation prominently reticulate; apex bilobed or acute, unarmed or mucronate or rarely pungent-pointed; margins flat, slightly crenulate, or strongly undulate, sometimes incurved; base obtuse. Stipules erect, hyaline, 3–5 mm long. Inflorescences axillary umbels or in pairs in the
axils; peduncle 0–4 mm long; rachis nil; subtending bracts caducous, scale-like, obtiangular, trilobed, lobes much longer than tube, 4–5 mm long. Pedicels terete, up to 2 mm long. Calyx campanulate, 6–7 mm long including the c. 1-mm receptacle, densely tomentose; lobes not recurved; upper 2 lobes united higher than the lower 3, acute, c. 3.5 mm long; lower 3 lobes triangular, acute, c. 3.5 mm long. Corolla: standard transversely ovate, 11–12 × 14–15 mm including the c. 3.5-mm claw, yellow and red, apex emarginate, base truncate to slightly cordate, not auriculate; wings oblong, c. 9–10 × 3 mm including the 3-mm claws, yellow and red, apex rounded, incurred and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half very broadly elliptic, margins not incurved, c. 8–9 × 3 mm including the 3.5-mm claws, maroon, deeper at the apex, apex obtuse to slightly rounded, base auriculate, saccate. Style longer than the ovary, slightly hooked, lower third pubescent; ovary stipitate, densely pubescent; ovules 6–10. Pod stipitate, ovoid, 9–11 × 3–4 mm, moderately pubescent. Seeds ellipsoid, slightly ridged, c. 2.5 mm long, arillate.

Flowering period: August–October. Fruiting period: October and November.

Distribution (Fig. 102): south-western Western Australia. Occurs widely, from Eneabba south to Busselton. Habitat: grows on the coastal limestone plain and coastal sandplains north of Perth in heath and shrubland.

Selected specimens (11 examined): WESTERN AUSTRALIA, Darling district: City Beach, N of Perth, 31°56′E, 115°45′E, J. Pulley 1323, 12.viii.1973 (CANB, L); City Beach, 31°56′S, 115°45′E, R.J. Cranfield 394, 7.ix.1978 (CANB, PERTH); 1 km S of Seabird, 31°16′S, 115°26′E, M.D. Crisp 8526 & W. Keys, 3.x.1993 (CANB, NSW, PERTH, UWA); Whitford's Node's, Coast Rd opp. Whitford's Ave, Wanneroo, 25 km N of Perth, 31°45′S, 115°48′E, G.J. Keighery 7085, 1.viii.1984 (CANB, PERTH).

Toxicity: unknown.

Affinity: Gastrolobium nervosum is similar to G. lineariifolium, which differs in habitat and has erect, villous hairs on new growth and the calyx. Also, G. nervosum always has opposite, obovate, mostly truncate or bilobed leaves, 25–40 × c. 20–25 mm, the margins are often undulate or incurred and are not conduplicate. Gastrolobium nervosum has also been confused with and is vegetatively similar to G. crispatum, which is a tall shrub up to 2 m high, with leaves in whorls of two to five and terminal clusters of up to 10 flowers, which serves to distinguish it quite easily.

Fruites altis, ramuli flavi internodiis longis, folia ternata spatulata marginibus maxime undulatis, bracteae subtendentes 4–5 mm longae integrae et ad apicem recurvae attenuatae, infloroscentia racemus condensatus, calyx villosus pilis argenteis ad basim et aurei-brunneis versus lobiorum apices.

Tall shrubs with long internode distances on the yellow stems, the leaves are ternate, spatulate and have crisped to undulate margins, the subtending bracts are 4–5 mm long, entire and tapering to a recurved apex, the inflorescence is a condensed raceme, the calyx is villous with silver-white hairs at the base and golden brown hairs towards the lobe apices.

Etymology: the specific epithet refers to the crisped leaf margins.

Tall shrubs, up to 2.5 m high. Branchlets ascending, angular, densely sericeous. Petioles terete, continuous and prominently decurrent with the branchlet, c. 5 mm long. Leaves bilobed in early developmental stages, opposite or in whorls of 3–5, spatulate, 20–35 × 15–20 mm, glabrous or with the lower surface slightly hispid, surfaces shining green, purplish in new growth, venation prominently reticulate; apex rounded, slightly recurved, slightly mucronate; margins crisped to undulate, somewhat recurved; base cuneate. Stipules erect, linear-triangular, 6–9 mm long, base pubescent. Infloroscentia condensed terminal racemes, c. 10-flowered; peduncle 15–30 mm long; rachis 3–7 mm long; subtending bracts caducous, scale-like, entire, with a thick base, tapering to a long, recurved apex, 4–5 mm long. Pedicels terete, 2–4 mm long. Calyx campanulate, 5–6 mm long including the c. 0.5-mm receptacle, moderately to densely pubescent, with silky silvery hairs at the base and golden hairs on the lobes, lobes not or scarcely recurved; upper 2 lobes united higher than the lower 3, acute, c. 3 mm long; lower 3 lobes triangular, acute, c. 3 mm long. Corolla: standard transversely ovate, c. 8.5–12 × 8–12 mm including the 4-mm claw, yellow becoming orange basally, apex emarginate, base cordate, not auriculate; wings obovate, c. 8.5–10 × 3 mm including the 3-mm claws, mainly yellow, apex rounded, incurred and overlapping to enclose the keel, base auriculate on the upper margin only, slightly saccate; keel half very broadly elliptic, c. 9–10 × 3 mm including the 3-mm claws, red, apex rounded, base auriculate, saccate. Style long, strongly incurved, base pubescent; ovary very slightly stipitate, densely pubescent; ovules 2. Pod ± sessile, ovoid, 6–7 × 3–3.5 mm, moderately pubescent. Seeds reniform, c. 2.5 mm long, arillate. (Fig. 21)

Flowering period: September and October. Fruiting period: October and November.

Distribution (Fig. 103): south-western Western Australia. Restricted to the Bindoon area, north of Perth.

Habitat: grows in steep gullies in Eucalyptus accedens and Corymbia calophylla woodland with Acacia sp.,

73. Gastrolobium crispatum G.Chandler & Crisp, sp. nov. Type: Western Australia: Darling District: Track to Mount Byroomanning, NE of Bindoon, 31°22′09″S, 116°07′22″E, M. Hislop 1700, 27 Sep. 1999 (holo: PERTH; iso: CANB!). Notes: this species has also been referred to as Nemcia sparsa (Crisp, ined.) in the past.
Xanthorrhoea sp. Hypocalymma angustifolium, Melaleuca uncinata and Hakea undulata.

Conservation status: ROTAP: 2K. CALM: P1. This species is rare and is at some risk, with further survey work urgently required to determine the conservation status.

Specimens examined: WESTERN AUSTRALIA, Darling District: Julimar Farm, Flat Rocks Rd, Bindoon, c. 31°23’S, 116°06’E, S. Patrick 158, 8.x.1988 (CANB, PERTH); Bindoon, c. 29°57’S, 115°12’E, J. Elliot s.n., xi.1987 (CANB, PERTH).

Toxicity: trace levels of fluoroacetate were found in this species (<20 µg g⁻¹; tested by the Chemistry Centre, Department of Mines, Western Australia, 24 Nov. 1988).

Affinity: the extremely undulate or crisped leaf margins of this species make it difficult to confuse with any other species of Gastrolobium.


Diffuse, open, spreading, straggling shrubs up to 1 m high and broad. Branchlets ascending, angular, densely pubescent. Petioles terete, continuous but not decurrent with the branchlet, c. 2 mm long, moderately pubescent. Leaves broadly spreading, ternate, narrow oblong to elliptic, 10–25 × 3–4 mm, glabrous, venation thickly reticulate, lower surface with areoles impressed-punctate; apex obtuse, scarcely recurved; margins entire, not recurved; base tapering into the petiole. Stipules erect, hyaline, prominent, 2–3 mm long. Inflorescences condensed axillary racemes, 2–6-flowered; peduncle 0–2 mm long; rachis 0–1 mm long; subtending bracts caducous, tridif, up to 4 mm long, moderately sericeous. Pedicels terete, c. 0.5 mm long. Calyx campanulate, 4–5 mm long including the c. 0.5-mm receptacle, moderately villous, lobes not recurved; upper 2 lobes united much higher than the lower 3, acute, c. 2 mm long; lower 3 lobes triangular, acute, c. 1.5 mm long. Corolla: standard transversely broadly elliptic, c. 9.5 × 9 mm including the 3.5-mm claw, apricot with red-maroon markings, apex emarginate, base truncate; wings obovate, c. 8 × 3 mm including the 2-mm claws, apricot and maroon, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half broadly ovate, c. 8 × 2.5 mm including the 2-mm claws, maroon, apex ± acute, base auriculate, saccate. Style long, hooked, lower half pubescent; ovary ± sessile, densely pubescent; ovules 2. Pod and seed not seen.

Flowering period: July–August. Fruiting period: unknown.


Erect, leafy shrubs, c. 0.5 m high. Branchlets ascending, ± terete, densely tomentose. Petioles terete, articulate with the branchlet, 1–2 mm long. Leaves patent to retrorse, in whorls of 3, linear, 20–30 × 2–3 mm, upper leaf surface with distinctive horizontally grooved venation, lower surface with only the midrib visible; apex pungent-pointed; margins recurved; base cuneate. Stipules erect, linear-triangular, 8–12 mm longer than tube, the middle lobe shorter usually than outer lobes, up to 5 mm long. Pedicels terete, 1–2 mm long. Calyx campanulate, 5–6 mm long including the c. 1-mm receptacle, moderately pubescent, lobes not recurved; upper 2 lobes united higher than the lower 3, acute, c. 3 mm long; lower 3 lobes triangular, acute, c. 3 mm long. Corolla: standard transversely broadly elliptic, 7–9 × 7–10 mm including the c. 2.5-mm claws, yellow with a red-brown centre, apex emarginate, base cordate, slightly auriculate; wings obovate, c. 7–9 × 2 mm including the 2.5-mm claws, yellow, apex rounded, not incurved, not enclosing the keel, base auriculate on the upper margin only, saccate; keel half broadly to very broadly elliptic, 7–9 × 2.5 mm including the 2.5-mm claws, red-brown, apex rounded, base auriculate, saccate. Style much longer than the ovary, slightly hooked, base pubescent; ovary sessile, densely pubescent; ovules 2. Pod and seed not seen.

Distribution (Fig. 104): south-western Western Australia. Occurs around Lake Grace.

Habitat: grows on undulating dunes on gravelly, sandy soil in mallee and mixed scrub.

Conservation status. ROTAP: 2K. CALM: P2. This species is rare, but does not appear to be at risk.

Specimens examined: known from the type material only.

Toxicity: unknown.

Affinity: with the distinctive punctate pattern on the underside of the leaf, this species is unlikely to be confused with any other. Gastrolobium punctatum has similar leaf patterning, but much smaller leaves (8–12 × 2–3 mm) that are strongly recurved and exstipulate and has single or paired flowers in the axils, rather than condensed racemes. Gastrolobium stipulare also shows some similarity to G. effusum, but has erect, linear leaves (c. 2 mm broad) with craspedodromous venation lacking deeply impressed areoles on the lower surface and the stipules are longer (up to 12 mm long).
Flowering period: September. Fruiting period: unknown.

Distribution (Fig. 105): south-western Western Australia. Known only from a few collections, occurring around the Brookton and Boyagin Rock areas.

Habitat: grows on sandy soils over laterite in heath. Consolation status: IUCN: R. ROTAP: 2RCi. CALM: P4. This species is rare, but does not appear to be at risk.


Toxicity: unknown.

Affinity: the crowded, linear leaves of this species make it unlikely to be confused with any other species of Gastrolobium.

IX. The *G. ilicifolium* group

This group contains species that generally have more than three pungent apices on each leaf, with clustered inflorescences.


Tall, erect shrubs up to 4 m high. Branchlets ascending, angular, moderately villous. *Petioles* terete, continuous and decurrent with the branchlet, 1–2 mm long. Leaves spreading to ascending, ternate, ± spathulate, 18–48 × 15–30 mm, glabrous, venation prominently reticulate; apex truncate, fiercely pungent-pointed; margins lobed, with numerous pungent angles, slightly recurved; base cuneate. *Stipules* erect, hyaline, 7–8 mm long. *Inflorescences* dense, axillary clusters, 2–5-flowered; *peduncle* 2–3 mm long; *rachis* 1–3 mm long; *subtending bracts* somewhat persistent, scale-like, trifid with the central lobe robust and shorter than the 2 outer, more acuminate lobes, c. 5 mm long. *Pedicels* terete, 2–5 mm long. *Calyx* campanulate, 6–7 mm long including the c. 1-mm receptacle, moderately to densely villous, lobes not recurved; upper 2 lobes united higher than the lower 3, c. 3.5 mm long; lower 3 lobes triangular, acute, c. 3 mm long. *Corolla* standard transversely elliptic, c. 9–10 × 9 mm including the 4-mm claw, yellow with some red present towards the centre, apex emarginate, base cordate, not auriculate; wings obovate, c. 9.5 × 3 mm including the 3-mm claws, yellow, apex rounded, not incurved, not enclosing the keel, base auriculate on the upper margin only, saccate; keel half circular, margins not incurved, c. 9 × 3 mm including the 6-mm claws, red, apex rounded, base strongly auriculate, saccate. *Style* long, strongly incurred to hooked, lower third pubescent; *ovary* stipitate, densely pubescent; *ovules* 2. Pod stipitate, broadly ellipsoid, c. 5 × 3 mm long, moderately to densely villous. Seed not seen.

Flowering period: August–October. Fruiting period: unknown.

Distribution (Fig. 106): south-western Western Australia. Occurs from Dinner Hill (which is between Eneabba and Moora) south to Beverley, east of Perth, with an outlier further to the south at Kojonup.

Habitat: grows on sand, sandy loam and lateritic clay in heathland and woodland.

Selected specimens (10 examined): WESTERN AUSTRALIA, Darling District: Kojonup, 33°50′S, 115°38′E, C.F. Bailey & sons, v.1962 (CANB, PERTH); Dinner Hill, 30°41′S, 115°37′E, K. Newby 2959, 26.viii.1969 (PERTH); Marchagee Track, 15–20 km E of Brand Hwy, 30°12′S, 115°38′E, D. Foreman 468, 1.ix.1984 (AD, CANB, MEL, PERTH); Mt Misery, W of Dandaragan, 30°41′S, 115°37′E, E.A. Griffin 5044, 11.ix.1988 (CANB, PERTH); Catchment Rd, Sullivan State Forest, Beverley, 8 km SE of Qualen Rd, 32°08′31″S, 116°38′07″E, F. & J. Hort 631, 6.x.1999 (CANB, PERTH).

Toxicity: unknown.

Affinity: the highly distinctive leaves make it difficult to confuse with any other species of *Gastrolobium*, as they are generally narrowly obovate to spatulate with numerous pungent points.

77. *Gastrolobium rhombifolium* G.Chandler & Crisp, sp. & stat. nov. Type: Western Australia: Darling District: 10 km E (towards York) along Helena Road from West Talbot Road turnoff, 31°57′34″S, 116°37′55″E, M.D. Crisp 8910 & W. Keys, 8 Oct. 1996 (holo: CANB! (CBG 9616013); iso: AD!, K!, MEL!, PERTH!)


Robust shrubs with rhomic to cruciform leaves that are fiercely pungent-pointed, the inflorescences are terminal clusters with a short peduncle and rachis (<5 mm long each) and a bicoloured calyx, with white hairs at the base becoming golden brown on the lobes.

Notes: known previously as *Nemcia triloba* (Meisn.) Crisp, ined., but a new specific name was required as previous homonyms already exist for both *G. trilobum* and *G. dilatatum*.

Fiercely robust shrubs, up to 2 m. Branchlets ascending, angular, rigid, moderately to densely tomentose.
Petioles terete, continuous and decurrent with the branchlet, 1–3 mm long. Leaves ascending, ternate, rhombic or cruciform, 20–49 × 8–25 mm, glabrous, leaf surfaces with thickened venation; apex subacute, recurved, pungent-pointed; margins becoming complicate; base cuneate. Stipules erect, hyaline, 2–3 mm long. Inflorescences terminal clusters, 2–7-flowered; peduncle less than 5 mm long; rachis <5 mm long; subtending bracts caducous, scale-like, either rhombic and sheathing or trilobed, the lobes shorter than the tube, 4–6 mm long. Pedicels terete, 1–2 mm long. Calyx up to 6 mm long, lobes much shorter than the tube, moderately villous, bicoloured with white silky hairs at the base becoming golden brown on the lobes, lobes not or slightly recurved; upper 2 lobes united higher than the lower 3, obtuse, c. 5 mm long; lower 3 lobes triangular, acute, c. 4 mm long. Corolla: standard transversely ovate, 10–11 × 12–13 mm including the 3-mm claw, yellow with a red ring around the white or yellow centre, apex emarginate, base cordate, not auriculate; wings oblong, c. 10 × 3 mm including the 3-mm claw, yellow with red markings, apex rounded, incurved and slightly overlapping to enclose the keel, base auriculate on both margins, saccate; keel half very broadly elliptic, margins not or very slightly incurved, 9–10 × 3.5–5 mm including the 3-mm claws, red, apex narrowly rounded, base auriculate, strongly saccate. Style very long, strongly incurved, lower third pubescent; ovary shortly stipitate, densely pubescent; ovules c. 4. Pod and seed not seen. (Fig. 22)

Flowering period: September. Fruiting period: unknown.

Distribution (Fig. 107): south-western Western Australia. Occurs east and south-east of Perth, on the eastern side of the Darling escarpment, particularly in the Boyagin Nature Reserve and Talbot regions.

Habitat: grows on clay-loam over laterite, in Wandoo and Marri woodland.

Selected specimens (10 examined): WESTERN AUSTRALIA, Darling District: 10 km E (toward York) along Helena Rd from West Talbot Rd turnoff, 31°57′4″S, 116°37′55″E, M.D. Crisp 8912 & W. Keys, 8.x.1996 (AD, CANB, MEL, PERTH); Catchment Rd and Deefor Rd junction, Talbot State Forest, York, 31°59′08″S, 116°35′44″E, F. & J. Hort 632 & 636, 6.x.1999 (CANB, PERTH); 74.6 miles [120 km] from Perth towards New Norcia, along Geraldton Hwy, E.M. Canning s.n., 29.ix.1968 (CANB).

Toxicity: unknown.

Affinity: the uniquely shaped leaves of this species, rhombic and generally fiercely pungent-pointed, make this species difficult to confuse with any other species of Gastrolobium. The only other species with rhombic leaves is G. laytonii, but the leaves are not as robust as G. rhombifolium and the inflorescence consists of long, open racemes (peduncle 3–10 mm long, rachis 25–55 mm long) with 15–30 flowers.


Erect, villous shrubs, up to 1 m high. Branchlets ascending, angular, densely villous. Petioles terete, continuous and decurrent with the branchlet, <1 mm long. Leaves ascending, crowded, mostly ternate, trilobed-spatahulate, 20–30 × 5–15 mm, venation prominently reticulate; apex acute, trilobed, pungent-pointed; margins apically trilobed, with all angles pungent-pointed; base cuneate. Stipules erect, ± broad at base, then hyaline, 4–5 mm long. Inflorescences condensed axillary racemes, 2–5-flowered; peduncle 1–3 mm long; rachis 0–3 mm long; subtending bracts trilobed with lobes similar size to tube, all about equal, c. 2–3 mm long. Pedicels terete, 1–3 mm long. Calyx campanulate, 5–6 mm long including the c. 0.75-mm receptacle, densely villous with golden brown hairs, lobes not recurved; upper 2 lobes united higher than the lower 3, acute, c. 3 mm long; lower 3 lobes triangular, acute, c. 3.5 mm long. Corolla: standard transversely elliptic, 8–10 × 8–10 mm including the 4-mm claw, yellow with a dark red centre, apex emarginate, base cordate, not auriculate; wings obovate, c. 7–8 × 2.5 mm including the 2-mm claws, yellow, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half very broadly elliptic, margins not or very slightly incurved, c. 7–8 × 2.5 mm including the 3-mm claws, red, apex obtuse, base auriculate, saccate. Style very long, strongly incurved to hooked, lower third pubescent; ovary ± sessile, densely pubescent; ovules 2. Pod and seed not seen.

Flowering period: September–October. Fruiting period: unknown.

Distribution (Fig. 108): south-western Western Australia. This species has quite a narrow distribution, occurring around the Dudinin and Kulin areas.

Habitat: grows on undulating dunes over laterite, in open mallee woodland or mixed heath.

Specimens examined: WESTERN AUSTRALIA, Avon District: Dudinin, 32°52′S, 117°54′E, C.A. Gardner s.n., x.1934 (CANB, PERTH); Nature Reserve No. 36598, 26 km SSW of Kulin on Grays Rd no. 19, 32°53′S, 118°05′E, J.M. Brown 129, 8.x.1984 (CANB, PERTH).

Toxicity: unknown.

Affinity: this species is vaguely similar to G. ilicifolium, which differs by having larger leaves (18–45 × 15–30 mm) and more than three pungent points per leaf.
X. The *G. cruciatum* group

These species all lack stipules at the base of the leaf and used to belong to *Nemcia*. Their affinities to other groups are uncertain, as they were not included in the molecular analysis, with future work to determine which other species of *Gastrolobium* that they are most closely related to.

79. *Gastrolobium cruciatum* G.Chandler & Crisp sp. nov.

*Type*: Western Australia: Roe district: 16 km from Newdegate towards Lake King, 33°05′46″S, 119°10′56″E, *M.D. Crisp* 8521 & *W. Keys*, 28 Sep. 1993 (holo: CANB!; iso: GAUBA!, MEL!, NSW!, PERTH!, UWA!, K!)

*G. reticulato* similis sed habitu effuso 20–50 cm alto latoque, foliis minutis (2–8 mm longis) conspicue decussatis, calyce bicolorato flavo ruboque tantum pubescenti pilis albis adpressis, lobis tubo multo brevioribus differt.

Similar to *Gastrolobium reticulatum*, but the plants are spreading shrubs 20–50 cm high and wide with tiny leaves that are conspicuously opposite and decussate, the calyces are bicoloured yellow and red, the lobes are much shorter than the calyx tube and both lobes and tube are only moderately pubescent with appressed white hairs.

*Etymology*: from the Latin crux (genitive crucis) = a cross and refers to the erect leaves which are appressed to the branchlet in a cross-like (decussate) fashion.

Spreading shrubs, 20–50 cm high and wide. *Branchlets* ascending, angular, moderately to densely tomentose. *Petioles* terete, continuous and slightly decurrent with the branchlet, <0.5 mm long. *Leaves* erect and appressed to the branchlet, stem clasping, opposite and decussate, oblong to obovate, 2–8 × 1.5–5 mm, glabrous, venation thickly reticulate; apex rounded, slightly recurved, unarmed; margins incurved; *ovules* 2. *Mature pods* and *seed* not seen. (Fig. 23)

Flowering period: September. Fruiting period: unknown, but probably October.

*Distribution* (Fig. 109): south-western Western Australia. Occurs around the Newdegate and Lake King areas.

*Habitat*: grows on undulating landscapes on sand over laterite, in *Grevillea* and *Allocasuarina* heath.


*Toxicity*: unknown.

*Affinity*: similar to *Gastrolobium reticulatum*, but spreading shrubs 20–50 cm high and wide with exstipulate, tiny leaves that are noticeably arranged opposite and decussate, not whorled. The calyces are bicoloured yellow and red, the lobes much shorter than the calyx tube, both lobes and tube only moderately pubescent (under surface visible) with appressed white hairs.


Narrow, erect *shrubs* up to 1 m high. *Branchlets* ascending, angular, densely villous. *Petioles* terete, continuous and decurrent with the branchlet, <1 mm long. *Leaves* broadly spreading to retrorse, ternate, oblong to ovate, 11–14 × 8 mm, glabrous, venation prominently reticulate; apex with a c. 3-mm-long pungent point; margins becoming plicate; base broadly rounded. *Stipules* absent. *Inflorescences* single or paired flowers in upper axils; *peduncle* nil; *rachis* nil; *subtending bracts* caducous, scale-like, entire, ovate, 1–2 mm long, moderately pubescent. *Pedicels* terete, 1–2 mm long, moderately pubescent. *Calyx* campanulate, 3–4 mm long including the c. 0.5-mm receptacle, moderately pubescent, lobes slightly recurved; upper 2 lobes united slightly higher than the lower 3, obtuse, c. 2 mm long; lower 3 lobes triangular, acute, c. 1.5 mm long. *Corolla*: standard transversely elliptic; 6–8 × 6.5–7 mm including the c. 2.5-mm claw, rich golden yellow with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; *wings* obovate, c. 6–7 × 1.5 mm including the 2-mm claws, yellow with red markings, apex rounded, incurved and just overlapping to enclose the keel, base auriculate on the upper margin only, saccate; *keel* half very broadly elliptic, margins recurved, c. 6–7 × 2 mm including the 2-mm claws, red, apex subacute, base auriculate, saccate. *Style* long, incurved, very base pubescent; *ovary* stipitate, densely pubescent; *ovules* 2. *Mature pods* and *seed* not seen. (Fig. 23)
densely pubescent; ovules 2. Pod enclosed in the calyx, sessile, ovoid, c. 8 × 3 mm, densely pubescent. Seed not seen.

**Flowering period:** August and September. **Fruiting period:** October.

**Distribution** (Fig. 110): south-western Western Australia. Occurs from around Toodyay south to the Dale Forest.

**Habitat:** grows on sandy or loamy soils in open woodland.

**Specimens examined:** WESTERN AUSTRALIA, Darling District: 26 km SE of the Great Northern Hwy along Toodyay Rd. 31°25′S 116°17′E, P.S. Short 2769 et al., 8.x.1986 (CANB, PERTH); 20 km beyond Keenan College toward New Norcia, N. Oliverenshaw 101, 4.x.1975 (CANB); between Toodyay and Bindoon, C.E. & T.D. Woolcock W678, 24.viii.1982 (CANB); Dale Forest Block, 32°06′29″S, 116°17′28″E, F. Hort 170, 3.x.1998 (CANB, PERTH).

**Toxicity:** unknown.

**Affinity:** this species is often confused with Gastrolobium acutum, but the latter species is easily distinguished by the presence of stipules and also has longer, narrower, elliptic leaves (12–22 × 4–6 mm).


Gastrolobium reticulatum (Meisn.) Benth. var. recurvum E.Pritz. in Diels & Pritzel, Bot. Jahrb. Syst. 35: 253 (1904). **Type citation:** ‘Ex interioribus distr. Stirling: Cranbrook (D. 4469), Kalgan super. (D. 4605), usque ad regiones interiores distr. Eyre pr. Gibsons Soak extendit (D. 5420). Fl. m. Sept., Oct.: **Type specimens:** unknown, possibly destroyed when the Berlin herbarium was bombed. Neotype (here chosen): Western Australia: Roe district, 11 km south of Gnowangerup along Gnowangerup–Jerramungup road from Borden turn-off, 34 deg 01 min S, 118 deg 09 min E, J.M. Taylor 1892 and P. Oliverenshaw, 16 Sep. 1983 (CANB); isoneo: AD n.v., MEL!, PERTH!!.

Small, compact shrubs 0.3–1 m high. Branchlets ascending to erect, ± terete, moderately sericeous. Petioles terete, continuous but not decurrent with the branchlet, c. 1 mm long. Leaves whorled, stem clasping, oblong to ovate, 8–12 × 2–3 mm, upper leaf surface rarely seen, lower surface with distinctive thickened raised venation, somewhat punctate; apex slightly recurved; margins incurved; base rounded. Stipules absent. Inflorescences single or paired flowers in the axis; peduncle nil; rachis nil; subtending bracts caducous, scale-like, ± entire to slightly trifid, 2–3 mm long. Pedicels terete, 1–2 mm long. Calyx 4.5–6 mm long including the c. 0.75-mm receptacle, sparsely to moderately pubescent, unicoloured, lobes not to slightly recurved; upper 2 lobes united higher than the lower 3, acute, 2–3 mm long; lower 3 lobes triangular, acute, 2–3 mm long. Corolla: standard transversely elliptic, c. 7.5–9 × 7–9 mm including the 3-mm claw, rich yellow with brown on the reverse, apex emarginate, base ± truncate, auriculate; wings obovate, c. 6–7.5 × 2 mm including the 2–2.5-mm claws, yellow, apex rounded, curvature unknown, base auriculate, slightly saccate; keel half very broadly elliptic, margins incurved, 6–8 × 2–3 mm including the 2.5–3-mm claws, red, apex rounded, base auriculate, saccate. Style long, strongly incurved to hooked, lower half quite pubescent; ovary ± sessile, densely pubescent; ovules 2. Pod half enclosed in the calyx, sessile, globose, 5–6 × 5–6 mm, moderately pubescent. Seeds ellipsoid, 1–2 mm long, bluntly ridged, arillate.

**Flowering period:** September and October. **Fruiting period:** November–January.

**Distribution** (Fig. 111): south-western Western Australia. Occurs in a band from Katanning east to the Lake King-Ravensthorpe area.

**Habitat:** grows on sandy soils in heath and mallee.

**Selected specimens** (10 examined): WESTERN AUSTRALIA, Eyre District: Ravensthorpe area, 25 km from Ravensthorpe along Lake King Rd. 33°12′S 119°55′E, B. Ramsley 479, 10.i.1979 (CANB, PERTH); Roe District: between Newdegate and Lake Grace. 1.6 km from Newdegate (at 248 milepeg), E.M. Canning WA/69, 7370, 7.xi.1968 (CANB); 19 km S of Lake King, 33°14′S, 119°44′E, C.E & D.T. Woolcock W2357, 1.x.1985 (CANB).

**Toxicity:** unknown.

**Affinity:** similar to G. reticulatum, which differs most notably by the lower surface of the leaf being honeycombed with raised reticulation, but not with the thickened reticulation of G. punctatum. Gastrolobium cruciatum differs by having smaller leaves (2–8 × 1.5–5 mm) that are strictly opposite and decussate and the calyx is bicoloured (with yellow and rusty hairs).


Erect shrubs up to 1.2 m high. Branchlets moderately to densely tomentose. Petioles absent. Leaves stem clasping and in whorls of 3, elliptic, less than 10 × 2 mm, upper leaf surface rarely seen, lower surface with prominent, finely reticulate venation, not punctate; apex obtuse; margins slightly incurved; base decurrent with the branchlet. Stipules absent. Inflorescences single or paired flowers in the axis; peduncle nil; rachis nil; subtending bracts caducous, scale-like, trifid, sheathing, apiculate, 1–3 mm long. Pedicels less than 3 mm long. Calyx campanulate, 5–6 mm long including the c. 0.5-mm receptacle, villous, unicoloured, lobes not recurved; upper 2 lobes united higher than the lower 3, acute, 2–2.5 mm long; lower 3 lobes triangular, acute, 1.5–2 mm long. Corolla: standard very broadly ovate,
7–8 × 7–8 mm including the c. 2.5mm claw, orange with a white or pale yellow centre, apex emarginate, base slightly cordate, slightly auriculate; wings obovate, 6–7 × 1.5–2 mm including the 2–2.5-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half very broadly obovate, margins not or slightly incurved, c. 6–7 × 2 mm including the 2.5–3-mm claws, dark red-brown, apex subacute, base auriculate, saccate. Style long, strongly incurved, lower third pubescent; ovary sessile, densely pubescent; ovules 2. Pod half enclosed in the calyx, sessile, 5–6 × 3–4 mm long, moderately pubescent. Seed ellipsoid, 1–2 mm long, arillate.

Flowering period: July–October. Fruiting period: unknown.

Distribution (Fig. 112): south-western Western Australia. Occurs from Dryandra south and east to Kamballup.

Habitat: grows on white sand over laterite in heathland and open forest.

Selected specimens (6 examined): WESTERN AUSTRALIA, Darling District: Dryandra Forest. 32°47'S, 116°58'E, M.G. Corrick 8406, 12.x.1982 (CANB, MEL); 3 miles [5 km] E of Kambalup, corner of Synd Rd, 34°35'S, 118°02'E, T.E.H. Aplin 6027, 25.ix.1974 (CANB, PERTH); c. 20 km WSW of Harrismith, 3 km SSW of Wedin, 33°00'S, 117°41'E, M.D.Crisp 6150 et al. 26.ix.1979 (CANB, NSW, PERTH, US); Highbury, 16 km S of Narrogin, 33°04'S, 117°04'E, C.A. Gardner, viii.1934 (CANB, PERTH).

Toxicity: unknown.

Affinity: differs from the close extipulate relatives, G. cruciatum and G. punctatum, in having leaves that are whorled, not opposite and decussate (see G. cruciatum) and the lower surface of the leaf is honeycombed with raised reticulation that is not thickened as in G. punctatum.

XI. The G. pyramidalae group

These species all have somewhat crenulate leaves, large, orange flowers in terminal and/or axillary clusters and appear somewhat intermediate between the typical, bee-pollinated flowers of most species of Gastrolobium and the red-flowered G. celsianum group.

83. Gastrolobium coriaceum (Sm.) G.Chandler & Crisp, comb. nov. Base name: Chorizema coriaceum Sm., Trans. Linn. Soc. London 9: 254 (1808), as ‘Chorozema’. Podolobium coriaceum (Sm.) DC., Prod. 2: 103 (1825). Callistachys coriacea (Sm.) Kuntze, Revisio Generum Pl. 1: 168 (1891). Oxylobium coriaceum (Sm.) C.A.Gardner, Enum. Pl. Austr. Occid.: 56 (1930). Type citation: ‘Found also by Mr. Menzies at King George’s Sound’. Type specimens: lectotype (here chosen): LINN (King George’s Sound, west coast of New Holland, whence seeds were brought by Mr. J. Richardson. The specimens from which our drawing was made were communicated from Mr. Colvill’s Nursery...’ nom. superfl. & illeg. (Chorizema coriaceum Sm. given as synonym).


Erect shrubs, up to 2 m high. Branchlets ascending, angular, moderately to densely villous. Petioles terete, continuous and decurrent with the branchlet, 6–10 mm long. Leaves spreading to ascending, mainly ternate, ovate, 25–80 × 6–30 mm, venation prominently reticulate, raised; apex bilobed to emarginate, mucronate; margins crenulate, undulate; base rounded to almost truncate. Stipules erect, rigid, lanceolate, 4–5 mm long, base pubescent. Inflorescences condensed, terminal racemes, floral internodes very short (<3 mm long); peduncle angular, up to 40 mm long, densely pubescent; rachis condensed, 0.5–7 mm long; subtending bracts caducous, scale-like, entire, ovate, 3–4 mm long. Pedicels terete, 3–4 mm long, densely pubescent. Calyx campanulate, 7–12 mm long including the c. 1.5-mm receptacle, densely villous, hairs bicoloured, with the basal silky-white hairs becoming golden brown towards the lobes, lobes not recurved; upper 2 lobes united higher than the lower 3, triangular, obtuse, 3–3.5 mm long; lower 3 lobes triangular, acute, 3–3.5 mm long. Corolla: standard very broadly elliptic, 11–12 × 14–16 mm including the 4-mm claw, orange with a red ring surrounding the orange to yellow centre, apex emarginate, base ± truncate; wings obovate, 10.5–11 × 3.5–4 mm including the 2.5–3-mm claws, orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half broadly elliptic, margins not incurved, 10–11 × 4 mm including the 3-mm claws, pink and red, apex rounded, base auriculate, saccate. Style long, incurved, lower quarter pubescent; ovary very shortly stipitate, almost sessile, densely pubescent; ovules 4. Pod very shortly stipitate, ovoid, 5–6(–8) mm long, moderately to densely villous. Seed ellipsoid, 1–2 mm long, arillate.

Flowering period: September and October. Fruiting period: November and December.

Distribution (Fig. 113): south-western Western Australia. Occurs along the south coast, from around Albany in the Mt Manypeaks area east to Fitzgerald River National Park, but
with an outlier recorded from the Whicher Range (C. E. & D.T. Woolcock W2355).

Habitat: grows on sandplains or mountain slopes often over limestone on sand, or occasionally on granite, in shrubland or heathland.


Toxicity: unknown.

Affinity: this species is similar to G. congestum, G. pyramidale and G. crenulatum. Gastrolobium congestum has a longer rachis [5–13–80 mm long] and has a greater number of flowers per inflorescence (30 to more than 50), G. pyramidale has rust-coloured hairs on the stems, underside of the leaves and inflorescence axes (whereas G. coriaceum has white hairs) and G. crenulatum has crenulate leaves and two ovules.


Erect shrubs, up to 1.2 m high. Branchlets ascending, angular, densely tomentose. Petioles terete, continuous and decurrent with the branchlet, c. 3 mm long. Leaves spreading, in whorls of 3 or 4, ± oblong or obovate, 11–35 × 9–20 mm, glabrous to glabrescent, venation prominently reticulate, raised; apex emarginate to bilobed, unarmed; margins crenulate; base truncate. Stipules erect, hyaline, 2–3 mm long. Inflorescences condensed axillary racemes, 3–6-flowered; peduncle 3–8 mm long; rachis to 5 mm long; subtending bracts caducous, scale-like, prominently trifid, 4–6 mm long. Pedicels terete, less than 2 mm long. Calyx campanulate, c. 5 mm long including the c. 1-mm receptacle, densely villous, hairs bicoloured, with silky white hairs at the base becoming golden brown towards the apices of lobes, lobes not recurved; upper 2 lobes united higher than the lower 3, obtuse, 3.5 mm long; lower 3 lobes triangular, acute, 3 mm long. Corolla: standard very broadly elliptic, 7–8 × 9.5 mm including the 2.5-mm claw, rich yellow; apex emarginate, base cordate, not auriculate; wings broadly obovate, 5.5–9 × 3.5–3.5 mm including the 2-mm claws, rich yellow, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half transversely elliptic, 7–8 × 3.5 mm including the 2-mm claws, dark red, apex rounded, base auriculate, saccate. Style long, hooked, lower third pubescent; ovary ± sessile, densely pubescent, ovules 2. Pod half enclosed in the calyx, sessile, ovoid, 5–8 mm long, densely pubescent. Seed not seen.

Flowering period: September–November. Fruiting period: November and December.

Distribution (Fig. 114): south-western Western Australia. Occurs along the south coast and slightly inland, in the Barren and Stirling Ranges.

Habitat: grows on mountain slopes on skeletal sediment in open woodland.

Conservation status: ROTAP: 2KC-. CALM: P2. This species is rare, but does not appear to be at risk.

Selected specimens (11 examined): WESTERN AUSTRALIA, Eyre District: 36.5 km along Stirling Range Drive from Red Gum Pass Rd, 34°22’18”S, 118°04’26”E, G.T. Chandler 490 et al. 17.ii.1998 (CANB); Mt Toolbrunup, west Gorge, 34°23’S, 118°03’E, A. Morrison s.n., 4.x.1902 (CANB, PERTH); Thumb Peak range, A.S. George 71468 (CANB, PERTH); Stirling Range, Mt Hassell carpark, 34°23’S, 118°04’E, M.D. Crisp 8942 & W. Keys, 24.ix.1993 (CANB, GAUBA, PERTH, UWA); 1.65 km NNE of Ellen Peak, near base of steep spur, 34°20’30”S, 118°20’30”E, M.D. Crisp 8947 & W. Keys, 15.x.1996 (CANB); Thumb Peak Range, c. 34°02’S, 119°43’E, A.S. George 71468B, 31.x.1965 (PERTH).

Toxicity: unknown.

Affinity: this species is similar to G. congestum, G. coriaceum and G. pyramidale. Gastrolobium congestum has a longer inflorescence rachis [(5–)13–80 mm long] and has a greater number of flowers per inflorescence (30 to more than 50), G. coriaceum differs by not having crenulate leaves and has a greater number of ovules (5–8 ovules) and G. pyramidale has rust-coloured hairs on the stems, underside of the leaves and inflorescence axes, whereas G. crenulatum has white hairs.


Type citation: ‘...was raised by Messers. Henderson of the Edgewater Road, from seeds forwarded by Mr. Drummond from the Swan River colony.’ Type specimens: Lectotype (here chosen): the plate


Erect shrubs, up to 1.5 m. Branchlets ascending, angular, densely pubescent with rusty brown hairs. Petioles terete, continuous and decurrent with the branchlet, 5–6 mm long. Leaves broadly spreading, opposite or in whorls of 3, stem clasping, oblong to slightly obovate, 25–50 × 12–25 mm, upper surface glabrous, lower surface sparsely to densely tomentose with rust-coloured hairs (particularly when younger), venation prominently reticulate; apex
emarginate, slightly mucronate; margins slightly crenulate; bases rounded or cordate. *Stipules* recurved, hyaline, 9–12 mm long. Inflorescences condensed terminal racemes, 5–12-flowered, densely villous with rust-coloured hairs; *peduncle* 1–15 mm long; *rachis* to 3 mm long; *subtending bracts* caducous or somewhat persistent, scale-like, obtriangular, prominently trilobed, the lobes as long as the base, 5–6 mm long including the c. 3 mm lobes; all villous with golden brown hairs. Calyx 6–9 mm long including the c. 1-mm receptacle, densely pubescent, lobes slightly recurved; upper 2 lobes united very slightly higher than the lower 3, broadly triangular, ± acute, c. 4 mm long; lower 3 lobes triangular, acute, c. 4 mm long. *Pedicels* terete, 2–4 mm long. *Corolla*: standard transversely ovoate, 10–12 × 15 mm including the 4-mm claw, orange and yellow with a darker centre, apex emarginate, base cordate, not auriculate; *wings* obovate, c. 11 × 4.5 mm including the 2-mm claws, orange-yellow, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; *keel* half very broadly elliptic, c. 10 × 4 mm including the 3-mm claws, dark red, apex broadly rounded, base auriculate, strongly saccate. *Style* very long, strongly recurved, lower half pubescent; *ovary* sessile, densely pubescent; *ovules* 2. **Pod and seed** not seen.

**Flowering period:** September and October. **Fruiting period:** November and December.

**Distribution** (Fig. 115): south-western Western Australia. Occurs in the Stirling Range.

**Habitat:** grows on flats, hills or saddles, sometimes in quite craggy places, on skeletal sandy or sandy clay, often stony soils, in tall heath dominated by *Dryandra* and *Allocasuarina*, or in mallee-heath.

**Selected specimens** (13 examined): WESTERN AUSTRALIA, Eyre District: Stirling Range, foothill NW of Barnett Peak, 34°23′S, 117°52′E, M.D. Crisp 8964 & W. Keys, 17.x.1996 (CANB, PERTH); Stirling Range, Mondurup walking track, 100 m from road, 34°24′S, 117°49′E, M.D. Crisp 8501 & W. Keys, 25.ix.1993 (CANB, GAUBA, PERTH); Stirling Range, saddle 3 km ESE of Donelly Peak, 34°21′S, 117°45′E, M.D. Crisp 8475 & W. Keys, 23.ix.1993 (CANB, PERTH); Red Gum Springs, Stirling Range, 34°22′S, 117°47′E, J.W. Wrigley WA/68–4349, 10.x.1968 (CANB).

**Toxicity:** unknown.

**Affinity:** this species is outwardly similar to *G. congestum*, *G. coriaceum* and *G. crenulatum*, but can be easily distinguished by the rust-coloured hairs on the stems, underside of the leaves and inflorescence axes, which are not present on these other species.

XII. The *G. celsianum* group

This group of species has red flowers that are putatively modified for bird-pollination, such as the red coloration and a reduced standard petal.


**Type citation:** ‘...it is abundant on Congineerup, near the east end of the mountain, growing in all sorts of soil, from the base to the summit.’ **Type specimen:** lectotype (here chosen): KW (Drumm. Coll. V. n. 53)

Erect shrubs, 1–2 m high. Branchlets ascending, compressed, ridged, densely tomentose. *Petioles* terete, continuous and decurrent with the branchlet, c. 15 mm long. *Leaves* spreading, opposite, broadly elliptic, 50–65 × 20–40 mm, glabrous, venation prominently reticulate; apex slightly emarginate; margins slightly crenulate and decurrent with the branchlet, c. 15 mm long. *Branchlets* sessile, densely pubescent; *peduncle* 4–6 mm long; *rachis* nil; *subtending bracts* ± persistent, scale-like, trifid, lobes much shorter than tube, 5–6 mm long, densely tomentose, middle lobe shorter than outer lobes. **Flowers:** resupinate; **pedicels** terete, 2–3 mm long, densely pubescent. Calyx c.10 mm long including the c. 1-mm receptacle, densely villous, hairs unicoloured to bicoloured, lobes not or scarcely recurved; upper 2 lobes united much higher than the lower 3, obtuse, c. 5 mm long; lower 3 lobes triangular, acute, 4.5 mm long. *Corolla:* standard broadly elliptic to circular, often somewhat folded up longitudinally, c. 18–20 × 14 mm including the 4-mm claw, red or more rarely orange-yellow, with a small, yellow centre, apex emarginate, base cordate; *wings* elliptic, incurved longitudinally, c. 15–16 × 5 mm including the 4-mm claws, red or more rarely orange-yellow, apex rounded, not incurved, not enclosing the keel, base scarcely or not auriculate, saccate; *keel* half very broadly elliptic to circular, incurved longitudinally, margins slightly incurved, c. 15–16 × 6 mm including the 5-mm claws, red, apex rounded, base auriculate, saccate. **Style** very long, strongly incurved to hooked, lower quarter pubescent; *ovary* ± sessile, densely pubescent; *ovules* 4. **Pod** sessile, ovoid, c. 12 × 4 mm, moderately to densely pubescent. **Seed** not seen.

**Flowering period:** September. **Fruiting period:** November.

**Distribution** (Fig. 116): south-western Western Australia. Occurs along the ridge between Ellen Peak and Bluff Knoll, in the Stirling Range.

**Habitat:** grows on mountain peaks on skeletal sandy soil in scrubby heath and mallee.

**Selected specimens** (10 examined): WESTERN AUSTRALIA, Eyre district: 1.65 km NNE of Ellen Peak, near base of steep spur,
34°20′S, 118°20′03″E, M.D. Crisp 8946 & W. Keys, 15.x.1996 (CANB); Stirling Range, Bluff Knoll walking track, c. 0.7 km above carpark, 34°22′S, 118°15′E, M.D. Crisp 8481 & W. Keys, 24.ix.1993 (CANB, GAUBA, PERTH); Stirling Range, 34°25′S, 117°53′E, A.S. Weston s.n., 2.vi.1978 (CANB, PERTH).

Toxicity: unknown.

Affinity: this species can be distinguished from G. rubrum, G. vestitum and G. luteifolium by the often somewhat resupinate flowers, the silvery haired calyx and very long petioles at the base of the discolorous leaves. Its closest relative is G. mondurup, which differs in having smaller leaves (25–58 × 11–24 mm), the standard petal is not fully reflexed, the inflorescences rarely extend beyond the leaves and are often racemose (rather than consistently umbellate) and the calyx is consistently bicoloured, with white villous hairs towards the base with dense brown golden hairs towards the tips of the lobes.

87. Gastrolobium mondurup G.Chandler & Crisp, sp. nov.  
Type: Western Australia: Eyre district: Stirling Range, Mondurup, summit ridge, 100 m above first saddle, 34°24′S, 117°49′E, 25 Sep. 1993, M.D. Crisp 8495 & W. Keys (holo: CANB; iso: K!, PERTH!)

G. leakeano arte affinis sed foliis paulo minoribus et proportione angustioribus (25–58 × 11–24 mm), vexillio vix expanso cucullato, carina alii longiore (19–24 mm longa) prominenti, inflorescentia folia raro excedenti distinguenda.

Similar to the close relative Gastrolobium leakeanum in having resupinate flowers and a somewhat reduced standard petal, but G. mondurup differs in the smaller leaves (25–58 × 11–24 mm), the standard petal is not fully reflexed, the calyx is consistently bicoloured (white villous towards the base with dense golden brown hairs towards the tips of the lobes) and the inflorescences rarely extend beyond the leaves.

Etymology: named after the peak from which it was first collected, Mondurup Peak, in the Stirling Range.

Erect shrubs, 2–3 m high. Branchlets ascending, prominently angular, densely tomentose. Petioles terete, continuous and decurrent with the branchlet, 6–10 mm long. Leaves spreading, alternate, elliptic to oblong, 25–58 × 11–24 mm, glabrous, venation prominently reticulate; apex emarginate to bilobed, mucronate; margins crenulate; base rounded. Stipules hyaline, 6–10 mm long. Inflorescences axillary racemes or umbels, not exceeding the leaves, 4- or 5-flowered; peduncle angular to compressed, ridged, 5–7 mm long, pubescent; rachis 0–5 mm long; subtending bracts caducous, scale-like, apex trilobed, 4–5 mm long, densely tomentose. Flowers: resupinate; pedicels 5–10 mm long, densely pubescent. Calyx campanulate, 10–12 mm long including the c. 1.5-mm receptacle, densely villous, mostly unicoloured with white villous hairs but often some golden brown hairs appearing towards the tips of the lobes, lobes not recurved; upper 2 lobes united higher than the lower 3, rounded, c. 5 mm long; lower 3 lobes triangular, acute, c. 5 mm long. Corolla: standard very broadly elliptic, 16–18 × 14–15 mm including the 4.5-mm claw, rosy red with a yellow centre, apex emarginate, base cordate; wings elliptic, 20–24 × 4 mm including the 6-mm claws, rosy red, apex rounded, not incurved, not enclosing the keel, base scarcely auriculate on the lower margin only, saccate; keel half ovate, margins incurved, 19–24 × 6–7 mm including the 4–5-mm claws, rosy red, apex obtuse, base auriculate, saccate. Style very long, incurved, lower half pubescent; ovary ± sessile, densely pubescent; ovules 5. Pod and seed not seen. (Fig. 24)

Flowering period: September. Fruiting period: unknown.

Distribution (Fig. 117): south-western Western Australia. This species is restricted to several peaks in the central Stirling Ranges.

Habitat: grows on mountain peaks on skeletal soils in heath, or dense mallee-heath.

Specimens examined: WESTERN AUSTRALIA, Eyre district: Stirling Range, Mr Magog, S slope (upper), 34°23′50″S, 117°56′38″E, M.D. Crisp 8971 & W. Keys, 18.x.1996 (CANB, PERTH); ibid., M.D. Crisp 8972, 8973 & W. Keys, 18.x.1996 (CANB); Mount Magog, 34°24′00″S, 117°48′00″E, S. Barrett 102, 15.x.1994 (CANB, PERTH); central summit of Barnett Peak, 34°21′05″S, 117°52′48″E, M.D. Crisp 8966 & W. Keys, 17.x.1996 (CANB, MEL, PERTH); Mondurup, summit ridge, 100 m above first saddle, 34°24′S, 117°49′E, M.D. Crisp 8496, 8497 & W. Keys, 25.ix.1993 (CANB, NSW, UWA).

Toxicity: unknown.

Affinity: this species is very similar to G. leakeanum in having somewhat resupinate flowers and a partially reduced standard petal, but G. mondurup differs most notably by the standard petal being longer than the wing and keel petals (in G. mondurup it is the other way around) and also in having larger leaves (50–65 × 20–40 mm), a fully reflexed standard petal (in G. mondurup it is only partially recurved), the inflorescence is consistently umbellate rather than often a raceme (rachis up to 5 mm long) and extends beyond the leaves and the calyx is unicoloured with white, villous hairs, or sometimes bicoloured, with white hairs at the base and rust-coloured hairs towards the apex.


Tall, erect shrubs, 1–1.3 m high. Branchlets ascending, compressed, prominently ridged, glabrous. Petioles terete, tuberculate, continuous and decurrent with the branchlet, 8–10 mm long. Leaves opposite, obovate to elliptic, 30–50 × 20–30 mm, glabrous, venation prominently reticulate; yellow-green; apex truncate, may be emarginate; margins crenulate, undulate; base rounded. Stipules erect, thickly...
lanceolate, plicate, 2–3 mm long. Inflorescences short, axillary umbels, 4–5-flowered; peduncles compressed, with sheathing, basal bracts that are up to 15 mm long, 10–12 mm long; rachis nil; subtending bracts ± caducous, scale-like, bilobed, slightly trifid or ± entire, c. 13 mm long, densely tomentose. Flowers: resupinate; pedicels terete, 2–3 mm long. Calyx slightly ventricose, 13–15 mm long including the 1.5-mm receptacle, bicoloured, with basal white silky hairs becoming golden on the lobes, upper 2 lobes recurved, lower 3 lobes straight; upper 2 lobes united higher than the lower 3, obtuse, c. 5 mm long; lower 3 lobes triangular, rounded, c. 5 mm long. Corolla: standard very broadly elliptic, c. 13–17 × 15 mm including the 6-mm claw, red with yellow guide marks, apex emarginate, base cordate; wings elliptic, incurved longitudinally, c. 17–18 × 5–6 mm including the 6-mm claws, red, apex rounded, incurved and slightly overlapping to ± enclose the keel, base auriculate on both margins, saccate; keel half very broadly elliptic, incurved longitudinally, margins scarcely incurved, c. 18–19.5 × 7 mm including the 6.5-mm claws, red, noticeably longer than standard, apex rounded, base auriculate, strongly saccate. Style very long, incurved, base pubescent; ovary scarcely stipitate, densely pubescent; ovules 6. Pod and seed not seen.

Flowering period: September. Fruiting period: unknown.

Distribution (Fig. 118): south-western Western Australia. Occurs in the Stirling Ranges and is known only from Mt Trio.

Habitat: mountain slopes and the summit area of Mt Trio, on skeletal sandy soils in shrubland.

Conservation status: CALM: P2. This species is rare, but does not appear to be at risk.

Specimens examined: WESTERN AUSTRALIA, Eyre District: Stirling Range, summit of Warrungup Peak (Mt Trio), 34°21′S, 118°03′E, M.D. Crisp 8507 & W. Keys, 25.ix.1993 (CANB, PERTH).

Toxicity: unknown.

Affinity: this species has been reinstated in this treatment and is noticeable for the bicoloured calyces and the keel petals being longer than the standard petal. Gastrolobium luteifolium is very similar to G. vestitum, but the latter differs by the leaf margins being strongly recurved (rather than undulate in G. luteifolium), the leaves are villous on both leaf surfaces and are tardily glabrescent, with the midrib remaining villous (the leaves of G. luteifolium are sericeous, glabrate and the midrib is soon glabrous), the subtending floral bracts are smaller (6–10 mm long) and the flowers are generally smaller (c. 18 mm long).


Erect, arborescent shrubs, 1–3 m high. Branchlets ascending, compressed, angular, ridged, densely villous. Petioles terete, continuous and decurrent with the branchlet, up to 10 mm long. Leaves spreading, opposite, elliptic to ± rhombic, 30–45 × 25–35 mm, upper surface with prominent venation, lower surface moderately to densely villous, especially along the veins; apex truncate to retuse; margins strongly recurved; base rounded. Stipules erect, c. 15 mm long, mostly villous. Inflorescences axillary, 4-flowered; peduncle compressed, ridged, 10–18 mm long; rachis nil; subtending bracts somewhat persistent to caducous, scale-like, semi-globose, shallowly trifid, up to 18 mm long including 8–13-mm midrib decurrent extension, densely tomentose. Flowers: not resupinate, erect; pedicels terete, 4–5 mm long, densely pubescent. Calyx 12–13 mm long including the c. 1.5-mm receptacle, densely pubescent, unicoloured, with either golden brown or white villous hairs only present, or bicoloured, with both golden brown and white hairs present, upper 2 lobes recurved, lower 3 lobes straight; upper 2 lobes united higher than the lower 3, ± obtuse, c. 6 mm long; lower 3 lobes triangular, subacute, c. 5.5 mm long. Corolla: standard transversely elliptic, fleshy, not fully reflexed, giving a hooded appearance, 16–18 × 17–18 mm including the 6.5-mm claw, margins orange, deep red at base with yellow markings, apex emarginate, base cordate, slightly auriculate; wings broadly obovate, 16–17 × 6 mm including the 5.5–6-mm claws, deep red, apex rounded, incurved and touching, ± enclosing the keel, base truncate, not or very scarcely auriculate on the upper margin only, saccate; keel half broadly elliptic, incurved longitudinally, 16–17 × 6 mm including the 6-mm claws, deep red, margins not incurred, apex broadly rounded, base auriculate, saccate. Style very long, strongly recurved, lower-third pubescent; ovary shortly stipitate, densely pubescent; ovules 4 or more. Pod sessile, ovoid, 10–12 × 6–7 mm, moderately to densely villous. Seed not seen.

Flowering period: October. Fruiting period: November.

Distribution (Fig. 119): south-western Western Australia. Occurs in the Stirling Range and is known only from Mt Toolbrunup and the adjacent Mt Hassell.

Habitat: grows on the summit to mid-slopes of Mt Toolbrunup on skeletal soils, in heathland.

Conservation status: ROTAP: 2KC-t. CALM: P2. This species is rare, but does not appear to be at risk.

Specimens examined: WESTERN AUSTRALIA, Eyre District: Stirling Range, Toolbrunup Peak walking track, scree immediately below summit knoll, 34°23′3′′S, 118°03′3′′E, M.D. Crisp 8489 & W. Keys, 24.ix.1993 (CANB, K, PERTH); ibid., M.D. Crisp 8490 & W. Keys, 24.ix.1993 (CANB, GAUBA, PERTH, UWA); Stirling Range NP, walking track from carpark to Toolbrunup Peak, 34°23′S, 118°03′E, J.M. Fox 88/264, 9.x.1988 (CANB, PERTH); Mt Toolbrunup, 34°23′S, 118°03′E, A. Morrison s.n., 4.x.1902 (CANB, PERTH).

Toxicity: unknown.

Affinity: Gastrolobium vestitum is similar to G. leakeanum, G. luteifolium, G. monodurup and G. ribrum,
but *G. vestitum* differs from all of these species in its fleshy petals, the rhombic leaves and recurved leaf margins and is generally more hairy. *Gastrolobium leakeanum* differs by the very long, distinct petioles at the base of the discolorous leaves, the often somewhat resupinate flowers and the silvery-haired calyx. *Gastrolobium lutefolium* differs in the rusty tomentose, sheathing bracts to 15 mm long on the peduncle and having a keel petal longer than the standard petal. *Gastrolobium monondorum* differs by having narrower leaves (11–24 mm broad), smaller peduncles and subtending floral bracts (peduncle up to 7 mm long, bracts 4–5 mm long) and much larger flowers (e.g. keel 19–24 mm long). *Gastrolobium rubrum* differs in the obovate to elliptic leaves, the shorter peduncle and subtending floral bracts (peduncle 7–8 mm long, bracts 3–4 mm long), the ventricose calyx and the larger flowers (e.g. keel 18–24 mm long).


Erect, slender shrubs, up to 1.5 m high. *Branchlets* ascending, angular to compressed, densely tomentose. *Petioles* terete, continuous and decurrent with the branchlet, tuberculate, 6–8 mm long, shortly pubescent. *Leaves* spreading, opposite and ternate, stem claspig, obovate to elliptic, 30–70 × 12–30 mm; leaf surfaces with prominent venation; apex emarginate, slightly mucronate; margins slightly crenulate; base rounded. *Stipules* hyaline, 5–6 mm long. *Inflorescences* condensed, axillary racemes, 3–6-flowered; *peduncle* 6–8 mm long; *rachis* to 1–3 mm long; *subtending bracts* caducous, scale-like, entire, sheathing, 3–4 mm long. *Flowers*: mutant, not resupinate; *pedicels* terete, 2–3 mm long. *Calyx* campanulate, ventricose, 10–12 mm long including the c. 1.5-mm receptacle, tube truncate at the base, densely villous, hairs bicoloured, with white hairs at the base becoming golden brown near the apices on a maroon surface; upper 2 lobes united much higher than the lower 3, obtuse, c. 5.5 mm long; lower 3 lobes triangular, ± acute, c. 5 mm long. *Corolla*: *standard* very broadly elliptic to ± circular, longitudinally folded up so that the face is rarely visible, 18–20 × 14–18 mm including the 6-mm claw, orange and red, base truncate, slightly auriculate; *wings* ovate, 18–20 × 6–7 mm including the 4–5-mm claws, red, apex acute to narrowly rounded, not incurved, not enclosing the keel, base auriculate on the lower margin only, not saccate; *keel* half ovate, margins not incurved, c. 18–22 × 6–7 mm including the 5-mm claws, red, apex subacute to slightly obtuse, base truncate, only very slightly auriculate, saccate. *Style*: very long, slightly incurved, base pubescent; *ovary* very shortly stipitate, densely pubescent; *ovules* 6. Pod wholly enclosed in the calyx, sessile, ovoid, c. 9 × 5 mm, moderately to densely pubescent. *Seed* not seen.

*Flowering period:* September and October. *Fruiting period:* unknown.

*Distribution* (Fig. 120): south-western Western Australia. Widespread in the Stirling Range, at both high and low elevations, but is also known from near Denmark.

*Habitat:* mountain slopes and peaks and valleys on skeletal sandy soils, in heath.

*Selected specimens* (9 examined): WESTERN AUSTRALIA, Eyre District: Stirling Range, Bluff Knoll walking track, c. 600 m from carpark, 34°22′S, 118°15′E, *M.D. Crisp* 8483 & W. Keys, 24.ix.1993 (CANB, GAUBA); Stirling Range, Mondurup, summit ridge, 100 m above 1st saddle, 34°24′S, 117°49′E, *M.D. Crisp* 8498 & W. Keys, 25.ix.1993 (CANB, PERTH); Stirling Range NP: walking track from car park to summit of Toolbrunup Peak, 34°23′S, 118°03′E, J.M. Fox 88/273, 9.x.1988 (CANB, MEL); 21 km along Stirling Range Drive from Red Gum Pass Rd, 34°24′40″S, 117°57′38″E, G.T. Chandler 489 et al. 17.ii.1998 (CANB).

*Toxicity:* unknown.

*Affinity:* fairly easily distinguished from its close relatives *G. leakeanum*, *G. lutefolium*, *G. monondorum* and *G. vestitum* by the large nodding, not resupinate red flowers, with the reduced standard not opening and the ventricose calyx with very white hairs at the base becoming golden brown at the apices.


Ascending to erect shrubs, up to 3 m high. *Branchlets* ascending, slightly angular, glabrescent. *Petioles* terete, continuous but not decurrent with the branchlet, 1–3 mm long. *Leaves* broadly spreading, mostly alternate, more rarely with some opposite, narrowly ovate to almost elliptic, becoming oblong, 14–60 × 4–20 mm, glabrescent, venation prominently reticulate; apex rounded to acute, mucronate, occasionally emarginate; margins crenulate, undulate or not, slightly recurved; base rounded or obtuse.

*Flowering period:* September and October. *Fruiting period:* unknown.

*Distribution* (Fig. 120): south-western Western Australia. Widespread in the Stirling Range, at both high and low elevations, but is also known from near Denmark.

*Habitat:* mountain slopes and peaks and valleys on skeletal sandy soils, in heath.

*Selected specimens* (9 examined): WESTERN AUSTRALIA, Eyre District: Stirling Range, Bluff Knoll walking track, c. 600 m from carpark, 34°22′S, 118°15′E, *M.D. Crisp* 8483 & W. Keys, 24.ix.1993 (CANB, GAUBA); Stirling Range, Mondurup, summit ridge, 100 m above 1st saddle, 34°24′S, 117°49′E, *M.D. Crisp* 8498 & W. Keys, 25.ix.1993 (CANB, PERTH); Stirling Range NP: walking track from car park to summit of Toolbrunup Peak, 34°23′S, 118°03′E, J.M. Fox 88/273, 9.x.1988 (CANB, MEL); 21 km along Stirling Range Drive from Red Gum Pass Rd, 34°24′40″S, 117°57′38″E, G.T. Chandler 489 et al. 17.ii.1998 (CANB).
Stipules recurved, filiform, 2–3 mm long. Inflorescences reduced axillary racemes maturing 1- or 2-flowered, rarely more, with an aborting, terminal bud; peduncle spreading to recurved, wiry, 5–20 mm long; rachis 0–3 mm long; subtending bracts caducous, scale-like or resembling a reduced leaf, sometimes cupped around calyx: if scale-like: tridif, c. 1 mm long. Flowers: pendulous; pedicels terete, 0–1.5 mm long. Calyx inflated in the lower half, somewhat constricted in the middle, truncated at base, 6–8 mm long including the 1–2 mm receptacle, densely sericeous, lobes not recurved; united slightly higher and slightly broader than the lower 3, ovate, obtuse, 3–4 mm long; lower 3 lobes triangular to ovate, middle lobe the longest, acute, 3–4 mm long. Corolla: standard strongly reflexed, broadest across the auricles, c. 13 × 5 mm including the 5-mm claws, purple-black, occasionally paler, tapering to a narrowly emarginate apex, lamina bent forwards with incurved margins, base auriculate; wings narrowly oblong, c. 13 × 3.5 mm including the 3-mm claws, purple-black, occasionally paler, apex broadly rounded, not incurved, not enclosing the keel, base auriculate, not saccate; keel half ovate, margins not incurved, c. 14 × 6 mm including the 3-mm claws, purple-black, occasionally paler, apex broadly rounded, base auriculate, saccate. Style long, incurved, base pubescent; ovary slightly stipitate, with a disc at the base, densely pubescent; ovules c. 17. Pod partly enclosed in the calyx, obliquely obloid, 9–13 × 4–5 mm, moderately villous. Seed not seen.

Flowering period: September–December. Fruiting period: December.

Distribution (Fig. 121): south-western Western Australia. Occurs from Kojonup and Frankland, in the Darling escarpment south of Perth, west to the Blackwood River.

Habitat: grows on the margins of freshwater swamps and streams, where it forms thickets.

Selected specimens (8 examined): WESTERN AUSTRALIA, Darling District: 20 km E of Tonebridge towards Frankland; Kulanilup Nature Reserve, 34°13′05″S, 116°54′00″E, M.D. Crisp 8473 & W. Keys, 23.ix.1993 (CANB, K, PERTH); 15 km along Northern Rd from turnoff at Perup Rd at 40 km E of Manjimup, 34°12′S, 116°35′E, M.D. Crisp 8470 & W. Keys, 23.ix.1993 (CANB, GAUBA, PERTH, UWA); Manjimup, 34°14′S, 116°08′E, R.D. Royce 2732, 28.ix.1948 (B, CANB, PERTH).

Toxicity: unknown.

Affinity: the deep purple, almost black flowers of G. melanopetalum immediately distinguish it from all other species of Gastrolobium, except for G. subcordatum, which has deep burgundy-coloured flowers. However, G. subcordatum has strictly opposite, cordate, broadly ovate or suborbicular leaves, the inflorescence has several flowers (2–6) that are not pendulous and a standard petal with a truncate apex.

92. Gastrolobium sericeum (Sm.) G.Chamberl & Crisp, comb.nov. Base name: Chorizema sericeum Sm., Trans. Linn. Soc. London 9: 253 (1808), ‘Chorozema’. Brachysema sericeum (Smith) Domi, Vestník královské České Společnosti Nauk, Trida Matematicko-Physiodevecké 1921–2, 2: 25 (1923b). Type citation: ’Gathered at King George’s Sound by Mr. Menzies.’ Type specimens: holo: King George’s Sound, west coast of New Holland, lat. 35, Menzies, 1803 (LINN); iso: BM

Brachysema undulatum Ker Gawler, Bot. Reg. 8: t. 642 (1822). Type citation: ‘Lately raised by Messrs. Colvill, of the Chelsea Nursery, from seed said to have been collected in the recently explored interior of New South Wales.’ Type specimens: unknown; holo: the plate.

Prostrate or weakly ascending shrubs, up to 1 m high, often straggling up through other shrubs. Branchlets ascending, ± terete, glabrescent. Petioles terete, continuous but not decurrent with the branchlet, 1–3 mm long. Leaves ascending, alternate, elliptic to orbicular, occasionally ovate or obovate, 6–50 × 6–30 mm, brittle, glabrescent, venation prominently reticulate; apex rounded to acute, sometimes emarginate, mucronate; margins crenulate, undulate, recurved; base rounded or broadly obtuse. Stipules recurved, filiform, 2–3 mm long. Inflorescences reduced axillary racemes, 1- or 2-flowered (rarely more), with an aborted, terminal bud, densely sericeous; peduncle 5–18 mm long; rachis c. 1–3 mm long; subtending bracts caducous, scale-like or resembling a reduced leaf, sometimes cupping the base of the calyx; if scale-like: tridif, c. 1 mm long. Flowers: pendulous; pedicels terete, 0–1.5 mm long. Calyx inflated in the lower half, slightly constricted in the middle, base truncated, 6–10 mm long including the 1.5-mm receptacle, densely sericeous, lobes not recurved; upper 2 lobes broader and united scarcely higher than the lower 3, obtuse, c. 2.5–4.5 mm long; lower 3 lobes ovate, acute, middle lobe the longest, 2.5–4.5 mm long. Corolla: standard ± ovate, strongly reflexed, lamina bent forwards, margins incurved, c. 15 × 5 mm including the 5-mm claw, pale yellow-green, occasionally infused with pink, drying red-brown, apex peaked, acute, base slightly cordate, auriculate; wings narrowly oblong, c. 16 × 3.5 mm including the 3-mm claws, pale yellow-green, occasionally infused with pink, apex rounded, not incurved, not enclosing the keel, sitting above the keel, base auriculate on the upper margin only, slightly saccate; keel half obliquely ovate, margins slightly incurved, c. 17 × 6 mm including the 3-mm claws, pale yellow-green, occasionally infused with pink, apex rounded, base auriculate, saccate. Style very long, slightly incurved, base pubescent; ovary subsessile, with a disc present at the base, densely pubescent; ovules 12–14. Pod half enclosed in the calyx, slightly stipitate, obliquely oblong, 9–11 × 4–5 mm, sparsely villous. Seed not seen.

Chromosome number: 2n = 16 (Sands 1975).

Flowering period: September–December. Fruiting period: December.
**Distribution** (Fig. 122): south-western Western Australia. Occurs from east of Denmark, to Cranbrook, on the western edge of the Stirling Range.

**Habitat**: grows on the banks of water courses and at swamp margins on clay or sandy soils in open shrubland.

**Selected specimens** (10 examined): WESTERN AUSTRALIA, Darling District: 9 km N of Albany, 1 km along road to Two People Bay, 34°56′S, 117°54′E, M.D. Crisp 6095 et al. 24.ix.1979 (AD, CANB, PERTH); Cranbrook turnoff, Albany Hwy, 34°17′S, 117°30′E, M.D. Crisp 8474 & W. Keys, 23.ix.1993 (CANB, GAUBA, PERTH, UWA); Porongurup Range, W slopes of Nancy’s Peak, 34°41′S, 117°52′E, P.G. Wilson 4234, 29.ix.1966 (CANB, PERTH).

**Toxicity**: unknown.

**Affinity**: *Gastrolobium sericeum* is a very variable species, but is quite distinctive, characterised by the slender, few-flowered inflorescence, pendulous turgid flowers with yellow-green petals. The prostrate forms of *G. sericeum* may be confused with *G. minus*, which is easily distinguished by possessing a standard petal with recurved margins, an inflorescence rachis much shorter [1–3(–5) mm long] and not recurved and the hairs on the pod sericeous, not villous.


Prostrate, trailing *shrubs*, 0.2 m high. *Branchlets* spreading, terete, densely sericeous. *Petioles* terete, continuous but not decurrent with the branchlet, 2–8 mm long. *Leaves* ± erect, alternate, ovate, elliptic or orbicular, 10–75 × 10–40 mm, upper surface glabrous, lower surface densely sericeous, venation reticulate; apex obtuse to rounded, often emarginate, mucronate; margins undulate; base rounded, usually slightly cordate. *Stipules* erect, setaceous, ± angular, concave on lower surface, slightly denticulate, 2–7 mm long. *Inflorescences* very condensed axillary racemes, 1 or 2 per axil, usually 1-flowered, often with an aborted bud above the flower; *peduncle* with c. 2 barren basal bracts, 1–3(–5) mm long; *rachis* ± nil; *subtending bracts* caducous, scale-like, cupulate, strongly trifid, c. 3 mm long. *Flowers*: upright; *pedicels* terete, 2–4 mm long. *Calyx* campanulate, ventricose, 8–10 mm long including the 1.5–2.5 mm receptacle, densely sericeous, lobes not recurved; upper 2 lobes united scarcely higher than the lower 3, ovate, 3.5–4.5 mm long; lower 3 lobes ovate, acute, middle lobe longer than the rest, 3.5–5 mm long. *Corolla*: standard strongly reflexed, oblong, deeply concave, constricted above the broad, rounded auricles, c. 16 × 5.5 mm including the 5-mm claw, red and yellow, or rarely almost white, apex truncate, ± emarginate, becoming obtuse as upper corners recurve with age, base slightly cordate, strongly auriculate; *wings* narrowly oblong, margins incurved, c. 17 × 2.5 mm including the 6-mm claws, red, apex rounded, not incurved, not enclosing the keel, base slightly auriculate, saccate; *keel* half elliptic, c. 17 × 5 mm including the 6-mm claws, red, apex obtuse, sometimes apiculate, base auriculate, saccate. *Style* long, slightly incurved, base pubescent; *ovary* scarcely stipitate, with a disc at the base, densely pubescent; *ovules* 12 or 13. *Pod* partly enclosed in the calyx, ± sessile, obliquely oblong, 9–13 × 5–8 mm, sparsely sericeous. *Seed* not seen.

**Flowering period**: July–October, rarely in summer. **Fruiting period**: September–October.

**Distribution** (Fig. 123): south-western Western Australia. Occurs in the Mount Barker and Cranbrook area, with an outlier near Middle Mount Barren in Fitzgerald River National Park.

**Habitat**: grows on sandy loam and gravelly clay soils in *Eucalyptus marginata* open forest.

**Selected specimens** (8 examined): WESTERN AUSTRALIA, Darling District: midway between Denmark and Mt Barker, 34°45′S, 117°30′E, C.E. Woolcock s.n. & D.T. Woolcock, 6.ix.1982 (CANB); Mt Barker, town limits, on road to Porongurups, 34°37′8″S, 117°40′24″E, M.D. Crisp 8922 & W. Keys, 10.x.1996 (CANB); 8 miles [13 km] from Cranbrook towards Mt Barker on Albany Hwy, 34°25′S, 117°34′E, J.W. Wrigley WA/68-4429, 11.x.1966 (CANB); 45 km from Denmark towards Mt Barker, 34°39′S, 117°36′E, J.W. Wrigley WA/68-4558, 13.x.1968 (CANB).

**Toxicity**: unknown.

**Affinity**: *Gastrolobium minus* is vegetatively similar to *G. latifolium*, but the latter species has terete, filiform stipules, larger flowers (e.g. calyx 10–12 mm long, keel c. 43 mm long), the calyx lobes do not overlap as far (c. 0.3 mm zone of overlap, compared with a 0.8–1 mm zone of overlap in *G. minus*) and a villous (not sericeous) pod. *Gastrolobium modestum* also bears some resemblance to *G. minus*, but has stoloniferous shoots, which usually bear the inflorescences, larger flowers (e.g. calyx 8–12 mm long, keel c. 19 mm long) and creamy pink petals.


Prostrate to clumped *shrubs*, up to 0.5 m high and 1–3 m broad. *Branchlets* prostrate or ascending, with the prostrate branchlets stoloniferous, often rooting at the nodes, terete, moderately sericeous. *Petioles* terete, continuous but not decurrent with the branchlet, 2–6 mm long. *Leaves* ± erect, alternate, elliptic, ovate or orbicular, 15–70 × 8–45 mm, upper surface glabrescent, lower surface sericeous, venation reticulate; apex obtuse to rounded, occasionally emarginate, mucronate; margins undulate, not recurved; base rounded to cuneate. *Stipules* erect, setaceous, ± angular, concave on
lower face, slightly denticulate, 2–6 mm long. **Inflorescences** dimorphic: those on leafy aerial stems consist of 1 or 2 very condensed racemes per axil, usually 1-flowered, with an aborting bud above the flower, **rachis** 1–3 mm long; those on stolons similar but aggregated into loose panicles by suppression of leaves, up to 30 cm long, with only the flowers emerging from the litter, unit racemes 1–2-flowered, **rachis** up to 25 mm long; **subtending bracts** caducous, scale-like, cupulate, strongly tridif. 1.5–1.5 mm long. **Pedicels** terete, 4–12 mm long. **Calyx** campanulate, ventricose, 8–12 mm long including the 2–3-mm receptacle, densely sericeous, lobes not recurved; lobes subequal, upper 2 not united prominently higher than the lower 3, ovate, apiculate, 4–6 mm long, the lower-most lobe being slightly longer and narrower than the others. **Corolla**: cream to pale green, infused with pale pink; **standard** strongly reflexed, truncate, recurved to curled with age, constricted above the broad, rounded auricles, c. 16 × 5.5 mm including the 6-mm claw, apex emarginate, base truncate, strongly auriculate; **wings** narrowly obovate, sigmoid with incurved margins, c. 19 × 3 mm including the 5-mm claws, apex rounded, not incurved, not enclosing the keel, base auriculate on the upper margin only, slightly saccate; **keel** half broadly elliptic, c. 19 × 5 mm including the 6-mm claws, apex apiculate, base auriculate, saccate. **Style** long, slightly incurved, base pubescent; **ovary** scarcely stipitate, with a disc at the base, densely pubescent; **ovules** c. 13. **Pod** enclosed in the calyx, ± sessile, obliquely obloid, turgid, c. 8 × 4 mm, sparsely villous. Seed not seen.

**Flowering period**: September–October. **Fruiting period**: unknown.

**Distribution** (Fig. 124): south-western Western Australia. Occurs near Busselton, south of Perth, on the edge of the Whicher Range.

**Habitat**: grows on the edges of an ironstone flat on shallow rock-loam or grey sand, in an ecotone between a seasonal swamp–heath dominated by *Dasyypogon* and *Xanthorrhoea* and open forest dominated by jarrah (*Eucalyptus marginata*) and marri (*E. calophylla*)

**Conservation status**: IUCN: V. **ROTAP**: 2V. **CALM**: R. This species is very rare and considered to be vulnerable and measures need to be taken to ensure its survival.

**Specimens examined**: due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA, Darling District: SSW of Busselton, near Vasse River, M.D. Crisp 8465 & W. Keys, 22.ix.1993 (CANB, GAUBA, K, MEL, PERTH, UWA); base of Whicher Range, B.J. Keighery 734 & N. Gibson, 9.xi.1992 (CANB, PERTH); ibid., B.J. Keighery 683 & N. Gibson, 15.x.1992 (CANB, PERTH).

**Toxicity**: unknown.

**Affinity**: this species is distinguished by its inflorescence-bearing stolons, 0.5 m or longer, which makes it difficult to confuse with any species of *Gastrolobium* except for *G. minus*, which has a similar general aspect and shares with *G. modestum* the unique character of recurved margins at the apex of the standard. However, *G. minus* differs in the inflorescence-bearing stems that, while prostrate, are leafy and never stoloniferous, the inflorescences are never paniculate, the flowers are smaller (e.g. keel c. 17 mm long) and the petals are typically red with yellow markings on the standard.


*Capulanthus bracteolus* (F.Muell.) Hutch., *The Genera of Flowering Plants*, 341 (1964). **Base name**: *Brachysema bracteolatum* F.Muell. **Notes**: nom. nud. & inval.—no reference is made to the original place of publication of the base name.

Prostrate or straggling **shrubs**, up to 1 m high. **Branchlets** spreading, angular, moderately sericeous to glabrescent. **Petioles** terete, continuous and sometimes slightly decurrent with the branchlet, 2–5 mm long. **Leaves** ascending, alternate, linear-elliptic, becoming broader and obovate towards the base of the branchlet, 30–125 × 2–22 mm, glabrescent, venation reticulate; apex acute or obtuse, rarely truncate and emarginate, mucronate; margins recurved; base tapering into the petiole. **Stipules** ± caducous, recurved, subulate, 3–6 mm long. **Inflorescences** reduced axillary racemes, 1-flowered, 1–3 per axil; **peduncle** recurved, wiry, continuing as a sterile tip 1–2 mm beyond the insertion of the flower, 8–20 mm long; **rachis** 1–2 mm long; **subtending bracts** persistent, enlarged and cupped around the base of the calyx, with two round lobes, the midrib continued as a 1 mm mucro between the lobes, 5–7 mm long, glabrescent. **Flowers**: pendulous, sessile; **pedicels** nil. **Calyx** campanulate, scarcely ventricose, 13–18 mm long including the 3–4-mm receptacle, densely sericeous, lobes not recurved; upper 2 lobes united higher than the lower 3, oblong, 6–9 mm long; lower 3 lobes ovate, subacute, 6–9 mm long. **Corolla**: orange-red, red-brown or deep red, with purple markings, or yellow-green; **standard** ± ovate, with two broad round auricles abruptly constricted above into a short, narrow, hooded lamina and constricted below into a long claw, 15–20 × 9–10 mm including the c. 10-mm claw, apex truncate, ± emarginate, base obtuse, auriculate; **wings** narrowly oblong, c. 25 × 3 mm including the 10-mm claws, apex truncate, base auriculate on the upper margin only, saccate; **keel** half ovate to oblong, margins slightly incurved, c. 25 × 5 mm including the 8-mm claws, apex obtuse, base auriculate, saccate. **Style** long, slightly incurved, base pubescent; **ovary** subsessile, with a disc at the base, densely pubescent; **ovules** 6–8. **Pod** fully enclosed in the calyx, ellipsoid, c. 15 × 8 mm, densely pubescent. **Seed** ovoid, c. 3.5 mm long, arillate.
Chromosome number. 2n = 16 (Sands 1975).

Flowering period: July–November. Fruiting period: October–November.

Distribution (Fig. 125): south-western Western Australia. Occurs along the south coast from Bremer Bay to Mt Manypeaks, near Albany and north to the Stirling Range.

Habitat: grows on broad dunes or occasionally in moist sites, on sand or clay, in mallee and heathland.

Selected specimens (21 examined): WESTERN AUSTRALIA, Eyre District: gully between Mondurup and Baby Barnett Hill, 3.6 km along Stirling Drive from Red Gum Pass, 34°24′S, 117°49′E, M.D. Crisp 8503 & W. Keys, 25.ix.1993 (CANB, GAUBA, NSW, PERTH, UWA); 4 km E of Kalgan River, 34°53′S, 118°02′E, R.D. Royce 4270, 30.vii.1953 (CANB, PERTH); 1.9 km along Swamp Rd towards Fitzgerald River NP, from Bremer Bay Rd, 34°23′12″S, 119°17′18″E, G.T. Chandler 426 et al. 15.i.1998 (CANB); 2 mls [3 km] S of Chester Pass, Stirling Range, 34°25′S, 118°06′E, M.E. Phillips s.n., 10.x.1962 (CANB).

Toxicity: unknown.

Affinity: Gastrolobium bracteolosum is easily distinguished from all other species of the genus Gastrolobium by its combination of narrow leaves, enlarged, 2-lobed bracts cupped around the calyx, a long claw on the standard and an elongated aril on the seed.


Bushy, erect or spreading shrubs, up to 1.5 m high. Branchlets ascending, slightly angular, densely sericeous. Petioles terete, continuous but not decurrent with the branchlet, 1–3 mm long. Leaves spreading, decussate, broadly to very broadly ovate or suborbicular, 6–45 × 7–35 mm, upper surface glabrous, lower surface densely sericeous, venation prominently reticulate; apex obtuse, rounded or slightly emarginate, mucronate; margins crenulate, strongly undulate; base slightly cordate. Stipules erect to recurred, setaceous, up to 5 mm long. Inflorescences terminal racemes on short shoots or axillary, 2–4(–6)-flowered, rarely once-branched, densely sericeous; peduncle occasionally with a pair of barren basal bracts, 0–4 mm long; racis 2–8 mm long; subtending bracts caducous, leaf-like or scale-like; if scale-like: trifid, c. 2 mm long. Flowers: not resupinate; pedicels terete, 1–2 mm long. Calyx campanulate, ventricose, 6–8 mm long including the c. 1-mm receptacle, densely sericeous, lobes not recurved; upper 2 lobes united scarcely higher than the lower 3, obtuse, c. 2.5–3.5 mm long; lower 3 lobes triangular, acute to acuminate, 3–4 mm long. Corolla: standard ± oblong, strongly reflexed, strongly concave, constricted around the large basal auricles, c. 10 × 5 mm including the 4-mm claw, burgundy, apex emarginate, base truncate, strongly auriculate, causing the base to flare; wings narrowly obovate, slightly recurved longitudinally, c. 14 × 3 mm including the 4–5-mm claws, burgundy, apex obtuse, not incurred, not enclosing keel, base auriculate on the upper margin only, saccate; keel half obliquely elliptic, margins not incurved, c. 12.5 × 3 mm including the 4-mm claws, burgundy, apex rounded, base auriculate, slightly saccate. Style long, incurved, lower third pubescent; ovary subseisile, with a disc present at the base, densely pubescent; ovules 2–6. Pod ± enclosed in the calyx, ± sessile, obliquely ovoid, 8–9 × 4.5–6 mm, sparsely pubescent. Seed reniform, c. 3 mm long, arillate.

Flowering period: September–October. Fruiting period: October and November.

Distribution (Fig. 126): south-western Western Australia. This species occurs in the Porongurup Range and may extend into the Stirling Range.

Habitat: grows in granite declivities on sandy soils, in open shrubland and the margins of Eucalyptus diversicolor forest.

Conservation status: IUCN: R. ROTAP: 2RC-. This species is rare, but does not appear to be in any immediate danger.

Selected specimens (6 examined): WESTERN AUSTRALIA, Eyre District: Porongurup Range, Devils Slide, base of granite dome, 34°41′S, 117°52′E, M.D. Crisp 6097 et al., 24.ix.1979 (AD, CANB, NSW, PERTH); Porongurup Range, track to Hayward Peak, c. 1 km from Tree in the Rock, 34°41′S, 117°52′E, M.D. Crisp 8511 & W. Keys, 26.ix.1993 (CANB, GAUBA, PERTH, UWA); Porongurup Range, W slopes of Nancy’s Peak, P.G. Wilson 4254, 29.ix.1966 (CANB, PERTH).

Toxicity: unknown.

Affinity: this species is somewhat similar to G. melanolapatulum in its floral morphology and dark petals, but differs by always having mostly alternate leaves, the leaf base is never consistently cordate and the lower leaf surface is glabrescent.


Monograph of Gastrolobium

Brachysea lanceolatum Meisn. [var.] gamma planifolium Meisn. in Lehm., Pl. Preiss. 1: 25 (1844), 'planifolia'. Type citation: 'In glareosis sylvae 15 mill. a Kojonup (Goderich) m. Febr. 1841. Herb. Preiss. no. 815.' Type specimens: lecto: NY; isolecto: LD.


Prostrate, scrambling or bushy ascending shrubs, up to 1.2 m high. Branchlets spreading to ascending, terete, densely sericeous. Petiolar terete, continuous but not decurrent with the branchlet, 2–5 mm long. Leaves broadly spreading, decussate or some alternate, ovate, narrowly ovate or rarely sublinear, 15–100 × 4–55 mm, upper surface glabrous, lower surface densely sericeous, venation reticulate; apex acute, acuminate or rarely rounded, mucronate, unicinate or rarely cirrhous; margins ± undulate, crenulate, not recurved; base rounded. Stipules erect to recurved, setaceous, 3–5 mm long.

Inflorescences axillary racemes, 2–6-flowered; peduncle 1–3 mm long; rachis 0–10 mm long; subtending bracts caducous, leaf-like or scale-like and trifid, 3–4 mm long. Flowers: resupinate; pedicels terete, 2–3 mm long. Calyx campanulate, scarcely ventricose, 12–16 mm long including the 3–4-mm receptacle, densely sericeous, lobes not recurved; upper 2 lobes united higher than the lower 3, obtuse, 5–7 mm long; lower 3 lobes triangular, middle lobe narrower than the other two, 5–7 mm long. Corolla: standard subreflexed, narrowly ovate to oblong, concave, c. 15 × 4 mm including the 5-mm claw, red with a yellow centre, apex subacute; wings obliquely narrowly obovate, c. 17 × 4–5 mm including the 2-mm claws, red, apex subacute, base auriculate on both margins, saccate; keel halfelliptic, margins not recurved, c. 30 × 7 mm including the 9-mm claws, red, apex acute, base auriculate, saccate. Style long, slightly incurved, base pubescent; ovary stipitate, with a disc at the base, densely pubescent; ovules 14–18. Pod ± enclosed in the calyx, ellipsoid, 10–15 × 3–5 mm, densely pubescent. Seed reniform, c. 2.5 mm long, arillate.

Chromosome number: 2n = 16 (Sands 1975).

Flowering period: August–November, more rarely in July. Fruiting period: October and November.

Distribution (Fig. 127): south-western Western Australia. Occurs from Wagin south to Bremer Bay, with outliers occurring on the Moore River, near Busselton and near Ravensthorpe.

Habitat: grows along watercourses on sandy, gravelly soils, but also extends to flats or moist depressions in mallee and woodland.


Toxicity: unknown.

Affinity: Gastrolobium celsiun is easily identifiable by its distinctive floral morphology, particularly the wing petals being about half the length of the keel and scarcely emergent from the calyx, making it difficult to confuse with any other species of Gastrolobium. The long, curving keel is the most conspicuous feature of the flower.

98. Gastrolobium formosum (Kippist ex Lindl.) G.Chandler & Crisp, comb. nov. Base name: Jansonia formosa Kippist ex Lindley, Gard. Chron. 7: 307 (1847). Type citation: ‘...from the south-west coast of New Holland...specimens...in museums of Mr. Heward and Dr. Leman.’ Type specimens: Drumm. 100: G. Notes: Kippist read a paper describing Jansonia to a meeting of the Linnean Society of London on 4 May 1847, but the full text was not published until 1851, in the Transactions of the Linnean Society. Meanwhile, versions of the paper appeared in a succession of periodical articles (Hervey 1847; Kippist 1847; Lindley 1847; Kippist 1848), among which Lindley’s appears to have effected valid publication of the name Jansonia formosa.


Small, trailing shrubs, up to less than 1 m high. Branchlets ascending, angular, glabrous to sparsely pubescent. Petioles terete, up to 5 mm long. Leaves opposite, lanceolate, 40–55 × 10–18 mm, softly pubescent, venation prominently reticulate; apex rounded, softly mucronate; margins almost flat, crenulate or undulate; base rounded to slightly cordate. Stipules recurved to slightly coiled, hyaline, up to c. 5 mm long. Inflorescences terminal capitula, usually on a short, axillary shoot, 4-flowered, enclosed in sheathing globose decurrent bracts; peduncle up to 5 mm long; rachis nil; subtending bracts persistent, scale-like, globose, trifid, sheathing the base of the inflorescence, 10–12 mm long, densely golden pubescent. Pedicels nil. Calyx 15–17 mm long including the c. 2-mm receptacle, densely pubescent, bicoloured, with hairs towards the base silvery and hairs in the upper half golden-brown, lobes not recurved; upper 2 lobes united lower than the lower 3 and much reduced, acute, c. 3 mm long; lower 3 lobes enlarged, with the middle lobe longer and broader than the other two, ovate to triangular, subacute, middle lobe c. 10 mm long, other two lobes 8 mm long. Corolla: standard considerably reduced to less than a third the length of wings, strongly reflexed, ovate, c. 6.5 × 3 mm including the 3-mm claw, red, apex triangular,
acute, entire, base cuneate, not auriculate; wings elliptic, c. 14 × 5 mm including the 5-mm claws, red, apex rounded, not incurved, not enclosing the keel, base auriculate on the upper margin only, saccate; keel half elliptic, margins not incurved, c. 16 × 4 mm including the 4-mm claws, red, apex ± obtuse, base auriculate, saccate. Style very long, hooked, lower third pubescent; ovary slightly stipitate, densely pubescent; ovules 2–5. Pod and seed not seen. (Fig. 25)

Flowering period: November. Fruiting period: unknown.

Distribution (Fig. 128): south-western Western Australia. Occurs in the wetter, far SW corner of this region, around Margaret River and Augusta.

Habitat: grows along river banks or in swamps on clay loam soils, in marri forest or swamp vegetation.

Conservation status: ROTAP: R. CALM: R. This species is rare, but it may be due to the difficulty in locating this plant even when in flower, as the bright red flowers are enclosed in a brown calyx.


Toxicity: unknown.

Affinity: the unique inflorescence of *G. formosum*, a 4-flowered capitulum enclosed in sheathing bracts with the large calyx lobes obscuring the corolla, makes it very difficult to confuse with any other species of *Gastrolobium*.


Tangled, clumped shrubs, up to 1.5 m high, often climbing through other shrubs. Branchlets ascending, wiry, terete, densely pubescent. Petioles terete, continuous but not decurrent with the branchlet, 1–3 mm long. Leaves spreading to ascending, opposite (seedling leaves with some subalternate), mostly obrescentic, tending to transversely narrowly rhombic or obtriangular, 5–18 × 10–28 mm, glabrescent, venation reticulate; apex stiply mucronate, almost pungent-pointed, often with a small triangular lobe; margins undulate, crenulate, recurved; base rounded or cordate. Stipules recurved to curled up, setaceous, 3–5 mm long. Inflorescences racemes, axillary or terminal on short, axillary shoots, 2(–4)-flowered; peduncle 15–25 mm long; rachis 0–15 mm long; subtending bracts leaf-like or reduced to trilobed scales c. 3 mm long. Flowers: pendulous, not resupinate; pedicels wiry, 6–10 mm long. Calyx campanulate, 12–13 mm long including the 2–3-mm receptacle, densely villous, lobes not recurved; upper 2 lobes united higher than the lower 3, acute, 7–9 mm long; lower 3 lobes triangular, acute, incurved, 8–10 mm long. Corolla: cream to red, darkening with age; standard reflexed, narrowly oblong, constricted above the auricles, c. 15 × 6 mm including the 6-mm claw, apex emarginate, base strongly auriculate; wings narrowly elliptic, c. 18 × 4 mm including the 5-mm claws, apex rounded-obtuse, not incurved, not enclosing the keel, base auriculate on the upper margin only, slightly saccate; keel half elliptic, c. 20 × 6 mm including the 5-mm claws, apex rounded, base auriculate, saccate. Style long, slightly incurved, base pubescent; ovary stipitate, with a disc present at the base, densely pubescent; ovules c. 12. Pod ± enclosed by the calyx, slightly stipitate, obliquely narrowly ellipsoid, 13–15 × c. 5 mm, moderately villous. Seed not seen.

Flowering period: from October. Fruiting period: unknown.

Distribution (Fig. 129): south-western Western Australia. Occurs near Busselton, south of Perth, on the edge of the Whicher Range.

Habitat: grows on flat plains on sandy clay over ironstone, in low, open, mixed heath.

Conservation status: IUCN: E. ROTAP: 2V. This species is quite rare and is thought to be endangered.

Specimens examined: due to the conservation status of this species, precise localities are not given. WESTERN AUSTRALIA, Darling District: M.D. Crisp 8461 (CANB, GAUBA, PERTH); ibid., M.D. Crisp 8462 (CANB, PERTH); ibid., M.D. Crisp 8463 (CANB, PERTH); base of Whicher Range, near Williamson Rd in State Forest, B.J. Keighery 1058, 16.x.1992 (CANB, PERTH).

Toxicity: unknown.

Affinity: this species is very difficult to confuse with any other species of *Gastrolobium*, due to the leaf shape and texture and the nodding, paired flowers. The only exception would be *G. praemorsum*, which has similar leaves, but which differs by having softer, herbaceous leaves that are not pungent, the leaf shape is obovate to obtriangular, rather than crescentic, there is a paler marginal band on the leaf that contrasts with the darker leaf tissue which is absent in *G. papilio* and the flowers are erect, resupinate and larger (e.g. keel c. 30 mm long).


Tangled, ± prostrate shrubs, up to 0.6 m high. Branchlets tangled, spreading, terete, moderately pubescent. Petioles terete, continuous but not decurrent with the branchlet,
1–6 mm long. Leaves spreading, opposite, broadly to transversely broadly obcordate to obovate, 9–55 × 7–52 mm, glabrescent, venation prominently reticulate, often with a paler marginal band 1–2 mm broad on both faces; apex rounded to ± truncate, occasionally emarginate, often with a small triangular lobe at the apex, mucronate; margins undulate, crenulate, recurved; base rounded to cuneate. Stipules recurved, setaceous, 3–5 mm long. Inflorescences racemes, axillary or terminal on short shoots, 2–4-flowered, rarely once-branched; peduncle 3–15 mm long; rachis 4–25 mm long; subtending bracts leaf-like and indistinguishable from the leaves, or progressively reduced to 3 mm long and scale-like with 3 subulate lobes. Flowers: resupinate; pedicels terete, 4–10 mm long. Calyx campanulate, 13–16 mm long including the 2–3-mm receptacle, moderately to densely pubescent, lobes not recurved; upper 2 lobes united slightly higher than the lower 3, triangular, acuminate, 8–10 mm long; lower 3 lobes triangular, acuminate, middle lobe the longest, c. 13 mm long. Corolla initially dull red to greenish, becoming a darker and purer red with age: standard subreflexed, narrowly oblong, concave, constricted near the middle of the lamina, c. 18 × 6 mm including the 5-mm claw that has a broader, rounded base, apex emarginate, base truncate, prominently auriculate; wings narrowly elliptic, c. 22 × 5 mm including the 5-mm claws, apex rounded-obtuse, not incurved, not enclosing the keel, base auriculate on the upper margin only, slightly saccate; keel half elliptic, c. 30 × 8 mm including the 5-mm claws, apex acute, base auriculate, saccate. Style long, slightly incurved, base pubescent; ovary stipitate, with a disc present at the base, densely pubescent; ovules c. 19. Pod partly enclosed in the calyx, slightly stipitate, ellipsoid, c. 15 × 6 mm, moderately villous. Seed reniform, c. 3 mm long, arilate.

Chromosome number: 2n = 16 (Sands 1975).

Flowering period: August–December. Fruiting period: unknown.

Distribution (Fig. 130): south-western Western Australia. Occurs from Geographe Bay east to Albany, with outliers as far north as Bullbrook, just north of Perth.

Habitat: grows very well in disturbed areas and occurs in a wide variety of habitats, from wet, boggy areas to laterite. Habitat: grows well in disturbed areas and occurs in a wide variety of habitats, from wet, boggy areas to laterite.


Toxicity: unknown.

Affinity: the unusual shape of the leaves of this species makes it difficult to confuse with any other species of Gastrolobium, except for G. papillo, which shares similarly shaped leaves, but differs in having consistently crescentic leaves with a pungent-point and no paler marginal band and the flowers are pendulous and shorter (e.g. keel 20 mm long).

XIII. Unplaced species

These species were not included in any phylogenetic analysis of Gastrolobium and their morphology alone is not sufficient to place them into any particular group without further evidence.

101. Gastrolobium ferrugineum G.Chandler, Crisp & R.J.Bayer, sp.nov. Type: Western Australia: Eyre District: Ca 20 km SW of Narrikup, L.R. Anderson SPN 1027, 11 Aug. 1992 (holo: PERTH; iso: PERTH!)

G. reflexo et G. spectabile vegetative similis sed stipulis nullis, inflorescencia condensata saepe axillari et pedunculo rhachideque angulato distinguenda.

Vegetatively similar to G. reflexum and G. spectabile, but G. ferrugineum has no stipules, the inflorescence is condensed, often axillary, the inflorescence axes are generally covered in short, rust-coloured hairs and the peduncle and rachis are angular.

Etymology: from the Latin ferrugineus = rust-coloured and refers to the short, generally rust-coloured hairs on the inflorescence axes.

Erect shrubs, 2.5–3 m high. Branchlets spreading to ascending, angular, glabrous to sparsely pubescent. Petioles sometimes absent; when present: angular, continuous and decurrent with the branchlet, 0–0.5 mm long. Leaves spreading, opposite, very broadly triangular, 20–30 × 23–39 mm, glabrous, venation prominently reticulate, intramarginal vein prominent; apex obtuse to barely acute, mucronate or shortly pungent-pointed; margins minutely crenulate, not recurved; base cordate. Stipules usually absent; when present erect, very small, c. 0.25 mm long. Inflorescences terminal or axillary racemes or rarely umbels, 1–4 per terminus or axil, 3–10-flowered; peduncle angular, 10–27 mm long; rachis angular, 0–10 mm long; subtending bracts ± persistent, scale-like, entire, elliptic, 6–8 mm long. Pedicels terete, c. 2 mm long, Calyx campanulate, 5.5–7 mm long, bicoloured, with densely villous white hairs at the base and rust-coloured hairs on the apex of the non-recurred lobes; upper 2 lobes united into an almost truncate lip, rounded, c. 3 mm long; lower 3 lobes triangular, subacute, c. 2.5 mm long. Corolla: standard transversely ovate, c. 13 × 12 mm including the 5.5-mm claw, yellow to yellow-orange with a maroon ring surrounding the yellow centre, apex emarginate, base truncate, slightly auriculate; wings obovate, c. 11 × 3 mm including the 4-mm claws, yellow and maroon,
apex rounded, base auriculate on the upper margin only, not saccate; keel half broadly elliptic, margins not incurved, c. 11 × 3 mm including the 4-mm claws, maroon and pink, apex rounded, base auriculate, saccate. Style long, incurved to hooked, very broadly flattened, slightly pubescent at the very base only; ovary stipitate, densely pubescent; ovules 4. Pod and seed not seen. (Fig. 26)

Flowering period: May–September. Fruiting period: unknown.

Distribution (Fig. 131): south-western Western Australia. Known only from a few collections south of Perth in the Narrikup and Mount Barker regions.

Habitat: grows on sandy gravelly soil in Eucalyptus marginata forest.

Conservation status: CALM: P2. This species is poorly known and apparently rare and further survey work is required to fully determine its conservation status.


Toxicity: unknown.

Affinity: vegetatively similar in appearance to G. reflexum and G. spectabile. Gastrolobium reflexum has prominent, reflexed stipules, a more open, terminal raceme and the peduncle and rachis are terete, whereas the stipules are absent in G. ferrugineum, the inflorescence is condensed and often axillary and the peduncle and rachis are angular. Gastrolobium spectabile differs by its prominent recurved to reflexed stipules, long terminal racemes (peduncle 10–20 mm long and rachis 40–60 mm long) and has a terete inflorescence axis.

102. Gastrolobium humile G.Chandler & Crisp, sp. nov.

Type: South Stirlings, F.L. Counsel s.n., Nov. 1967 (holo: CANB; iso: PERTH!)

Hac species G. stowardii arte similans sed stipulis longis (4–8 mm longis) partim connatis triangularibusque, racemibus longioribus (pedunculis 4–10 mm longus, rachis 20–45 mm longa) floribus plus (a 15 ad plus quam 30) distincta.

The long stipules (4–8 mm long) which are partly fused and triangular and the relatively long, many-flowered racemes (15- to more than 30-flowered, peduncle 4–10 mm long, rachis 20–45 mm long) distinguish this species from G. stowardii, which it most closely resembles.

Etymology: the specific epithet refers to the low-growing habit of this species.

Low shrubs. Branchlets ascending, slightly angular to terete, densely pubescent. Petioles terete, continuous but not decurrent with the branchlet, 1–1.5 mm long. Leaves spreading to ascending, opposite, cuneiform, 8–11 × 4–6 mm, upper surface glabrous, lower surface moderately to densely villous, venation reticulate; petiole truncate to bilobed, weakly mucronate, recurved; margins irregularly recurved; base rounded. Stipules erect, partly fused behind the axillary bud, triangular with a long, acuminete apex, 4–8 mm long, moderately pubescent. Inflorescences terminal racemes, 15- to more than 30-flowered, densely pubescent; peduncle 4–10 mm long; rachis 20–45 mm long; subtending bracts not seen. Pedicels terete, 2–3 mm long, densely pubescent. Calyx campanulate, c. 4 mm long including the c. 0.5-mm receptacle, moderately to densely pubescent, lobe recurvature unknown; upper 2 lobes united higher than the lower 3, obtuse, c. 2.5 mm long; lower 3 lobes triangular, acuminate, c. 2.5 mm long. Corolla not seen. Style long, incurved, pubescent in the lower third; ovary shortly stipitate, densely pubescent; ovules 2. Pod shortly stipitate, ovoid, c. 4 × 3.5 mm, densely pubescent. Seed ellipsoid, c. 2.5 mm long, arillate. (Fig. 27)

Notes: very little is known about this species. Despite separate searches by G. T. Chandler and M. D. Crisp, this species has not been relocated and only one collection is known. It is probable that it is very localised in the vicinity of South Stirling, where there is a large nature reserve and is difficult to locate.

Flowering period: unknown. Fruiting period: beginning in November.

Distribution (Fig. 132): south-western Western Australia. Known from only the one, vague locality at or near South Stirling, which is on the plain c. 30 km south of the Stirling Range.

Habitat: unknown.

Conservation status: no official conservation status has been given to this new species, but after a number of searches throughout this study, this species has not been found. It is quite possible that its habitat was cleared for farmland and that this species is extinct. Following the IUCN guidelines, it is recommended that this species be coded Ex/E (possibly extinct in the wild), pending further searches in the future.

Specimens examined: known only from the type collection.

Toxicity: unknown.

Affinity: the leaf shape is similar to that of G. stowardii, but the large stipules and long, racemose inflorescence distinguish G. humile from this species.

103. Gastrolobium venulosum G.Chandler & Crisp, sp. nov.

Type: Western Australia: Eyre District: 14 km SW of Fitzgerald River Bridge, Ravensthorpe–Jerramungup road, 33°53'S, 119°07'E, M.D. Crisp 6070, J. Taylor & R. Jackson, 22 Sep. 1979 (holo: CBG!; iso: NSW!, PERTH!)
G. crassifolium similis sed foliis proportione latioirbus (20–27 × 4–7 mm), venatione aperte reticulata et carinæ apice orem hydriae simulanti sed vix acuto et margine infero integro differt.

Gastrolobium crassifolium is similar but has relatively narrower leaves (20–27 × 4–7 mm) and openly reticulate leaf venation, which is obscured by glaucousness of the upper leaf surface. Also, G. crassifolium has a distinctive keel, which has a prominently spout-like apex and a hole in the base of the lower margin near the claws, through which the stamens are exposed. Gastrolobium venulosum also has a spout-like apex, but it is not as acute as in G. crassifolium and the lower margin is entire.

Etymology: from the Latin venulosus = veined and refers to the prominently open reticulate venation on the leaves.

Erect, bushy shrubs, c. 0.5 m high. Branchlets ascending, angular, glabrous. Petioles terete, continuous and somewhat decurrent with the branchlet, 1–1.5 mm long. Leaves ascending, in whorls of 3, elliptic, 20–27 × 4–7 mm, glabrous, lower surface sometimes glaucous, glabrous, with hairs along the midrib, or densely sericeous; apex rounded, occasionally slightly emarginate, slightly mucronate; margins slightly recurved, occasionally slightly con-duplicate; base rounded. Stipules erect, hyaline, c. 2 mm long. Inflorescences terminal racemes, 18–30-flowered, internodes between flowers quite short (<5 mm long); peduncle with a sheath of barren bracts at the base, 3–6 mm long, densely pubescent; rachis 20–30 mm long, densely pubescent; subtending bracts caducous, scale-like, entire or slightly trifid, ovate, c. 2 mm long. Pedicels terete, 1–2 mm long. Calyx campanulate, 5–6 mm long including the c. 0.75-mm receptacle, sparsely pubescent; upper 2 lobes not recurved, united into an almost truncate lip, obtuse, c. 2 mm long; lower 3 lobes recurved, triangular, acute, c. 1.5 mm long. Corolla: standard transversely elliptic, c. 6 × 6.5 mm including the 2-mm claw, orange, sometimes with a reddish tinge, with a red ring surrounding the yellow centre, apex emarginate, base cordate; wings obovate, c. 7 × 2.5 mm including the 2.5-mm claws, orange and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half transversely elliptic, c. 5 × 3 mm including the 1.5-mm claws, maroon, apex acute, spout-like, base auriculate, saccate. Style long, hooked, lower third pubescent; ovary stipitate, densely pubescent; ovules 2. Pod stipitate, broadly ellipsoid to globose, 4–5 × 4–4.5 mm, moderately pubescent. Seed not seen. (Fig. 28)

Flowering period: August and September. Fruiting period: October.

Distribution (Fig. 133): south-western Western Australia. Occurs along the inland part of the south coast, from west of Jerramungup to Ravensthorpe and as far north as near Lake King.

Habitat: grows on undulating landscapes on sand, in mallee heath.

Specimens examined: WESTERN AUSTRALIA, Eyre District: Dunn Rock Nature Reserve, 30 km SW of Lake King, 33°20’S, 119°30’E, D.J. Backshall 202, 15.iv.1984 (PERTH); West River (via Ravensthorpe), 33°40’S, 119°40’E, S. Kiuper 194, 15.viii.1964 (PERTH); Ravensthorpe Range, G. Grewar s.n., x.1959 (PERTH); Jerramungup, 33°56’S, 118°55’E, E. Lindgren s.n., 29.viii.1957 (PERTH); 20 km N of Ravensthorpe, 33°25’S, 120°01’E, C.E. Woolcock W 265 & D.T. Woolcock, 1.viii.1981 (CANB); W of Jerramungup, C.E. Woolcock s.n. & D.T. Woolcock, 14.viii.1982 (CANB); north slopes of Mt Short, 5.5 km E on Mt Short Rd, c. 20 km N of Ravensthorpe, 32°27’32’S, 120°00’04’E, G.T. Chandler 920 et al., 18.ix.1999 (CANB, MEL, PERTH); ibid., G.T. Chandler 708 & S. Donaldson, 28.x.1998 (BRI, CANB); ibid., G.T. Chandler 709 & S. Donaldson, 28.x.1998, seedlings (CANB, PERTH); 511 km S of Perth on Lake King–Ravensthorpe road, E to Mount Short (c. 30 km NW of Ravensthorpe), 33°23’S, 119°49’E, R.A. Saffrey 373, 8.viii.1968 (CANB, PERTH).

Toxicity: unknown.

Affinity: this species resembles G. crassifolium, but can be distinguished by the relatively narrower leaves of G. crassifolium (12–25 × 4–14 mm) and by the leaf venation pattern, which is more obscured on G. crassifolium because of the upper leaf surface being glaucous. Also, G. crassifolium has a distinctive keel, which it shares with the rest of the G. floribundum group, which has a prominently spout-like apex and a hole in the base of the lower margin near the claws, exposing the stamens, whereas G. venulosum has a spout-like apex, but is not as acute as in G. crassifolium and the lower margin is entire.


Type specimens: holotype (here chosen): NY; iso: BM, K, P

Spreading shrubs up to 1.2 m high, 0.5 m wide. Branchlets ascending, angular, moderately to densely tomentose. Petioles terete, continuous but not decurrent with the branchlet, 3–4 mm long. Leaves spreading, opposite, elliptic to almost orbicular in earlier developmental stages, 20–40 × 7–22 mm, upper surface glabrous, lower surface softly pubescent, venation prominently reticulate, raised; apex obtuse, pungent-pointed; margins slightly undulate; base cuneate. Stipules erect, subulate, 3–4 mm long. Inflorescences condensed terminal or axillary racemes, 4–8-flowered, densely pubescent; peduncle 2–4 mm long; rachis 1–3 mm long; subtending bracts caducous, scale-like, entire, c. 4 mm long including 1-mm-long micro. Pedicels terete, 1–2 mm long. Calyx campanulate, ventricose, c. 9 mm long including the 1.5-mm receptacle, moderately to densely villous, lobes not or scarcely recurved; upper 2 lobes united higher than the lower 3, ovate, acute, c. 3 mm long; lower 3
lobes triangular, acuminated, c. 2.5 mm long. **Corolla**: standard very broadly elliptic, 9–10 × 9–10 mm including the c. 4-mm claw, orange-yellow with a red ring surrounding the white centre apex emarginate, base obtuse, slightly auriculate; wings obovate, c. 8.5–9 × 3 mm including the 2-mm claws, orange-yellow, red at base, apex rounded, not or scarcely incurved, may slightly overlap to partially enclose the keel, base auriculate on the upper margin only, slightly saccate; keel half very broadly elliptic, margins not incurved, c. 8.5–9 × 3 mm including the 3-mm claws, maroon, apex ± acute, base auriculate, saccate. **Style** long, hooked, lower third pubescent; ovary sessile, densely pubescent; ovules 4. **Pod** sessile, ovoid, 6–7 mm long, moderately pubescent. **Seed** not seen.

**Flowering period**: September. **Fruiting period**: October. **Distribution**: (Fig. 134): south-western Western Australia. Occurs north of Perth, from around Eneabba south to Dandaragan.

**Habitat**: grows on rolling hills to steep hillsides on sand over laterite, in heath and woodland. **Conservation status**: ROTAP: 3KC-. CALM: P3. This taxon is fairly rare and poorly known and further survey work is required.


**Toxicity**: unknown.

**Affinity**: the juvenile foliage of *G. axillare* somewhat resembles that of *G. nudum*, but the latter always has orbicular leaves when mature which are concolorous and softly pubescent on the lower surface.

105. **Gastrolobium nudum** G.Chandler & Crisp, sp. nov. **Type**: Western Australia: c. 900 m from Governors Drive, northern side of south break, near old track, Avon Valley National Park, 31°34′S, 116°15′E, 28 February 1990, B. Evans 181 (holo: PERTH 01878751!). **Note**: this species has also been known as *Nemcia congesta* Crisp ined., but the the name *Gastrolobium congestum* is pre-empted elsewhere in this monograph

Frutex humilis, folia opposita maximum partem versus ramulorum apices, floribus sessilibus congestis in axillis supernis. *G. axillare* similis sed calycis lobus tubum circa aequantibus et folis concoloribus glabrescentibus distinguenda.

A low shrub with leaves opposite, mostly in the upper branches and with sessile, congested clusters of flowers also in the upper axils. Similar in appearance to *Gastrolobium axillare*, but differing in the calyx lobes being about the same length as the tube and concolorous, glabrescent leaves.

**Etymology**: from the Latin *nudus* = naked and refers to the fact that there are few leaves on the lower portions of the branchlets.

Spreading, twiggy *shrub* up to 0.8 m high, new stems angular ridged, silky white pubescent, glabrescent. *Pezioles* terete, continuous and decurrent with the branchlet, 1–2 mm long, pubescent. **Leaves** mostly in upper branches, opposite, broadly ovate to orbicular, 15–34 × 15–34 mm, glabrous, somewhat glaucous, venation reticulate, main veins prominently yellow; apex rounded to emarginate, semi-pungent; margins minutely crenulate, not recurved; base rounded to slightly cordate. **Stipules** erect, hyaline, up to 4 mm long. **Inflorescences** sessile clusters in upper axils; peduncle nil; rachis nil; subtending bracts caducous trifid to trilobed to 4 mm long. **Pedicels** 2–3 mm long, densely pubescent. **Calyx** campanulate, 4–5 mm long including the c. 1-mm receptacle, densely pubescent, lobes not recurved; upper 2 lobes united higher than the lower 3, obtuse, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2 mm long. **Corolla**: standard very broadly elliptic, 8–10 × c. 7 mm including the c. 2.5-mm claw, orange with a red ring surrounding the yellow centre, apex emarginate, base cordate, not auriculate; wings obovate, 6.5–8 × c. 1.5 mm including the c. 2.5-mm claws, orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half transversely elliptic, margins not incurved, 6.5–8 × c. 2.5 mm including the 3-mm claws, red, apex rounded, base auriculate, saccate. **Style** long, incurved, lower third pubescent; ovary shortly stipitate, densely pubescent; ovules 2. **Pod** and seed not seen.

**Flowering period**: February. **Fruiting period**: unknown. **Distribution**: (Fig. 135): south-western Western Australia. This species is known only from the Avon Valley National Park and the Chittering area.

**Habitat**: found in low heath on laterite with *Eucalyptus accedens*, *E. calophylla*, *Hakea lissocarpa* and *Xanthorrhoea preissii*.

**Specimens examined**: WESTERN AUSTRALIA, Darling District: S Break, Avon Valley NP, c. 31°37′S, 116°12′E, B. Evans s.n., 26.xi.1989 (PERTH); ibid., B. Evans s.n., 29.x.1990 (CANB, PERTH); Yandan Nature Reserve gazetted Reserve No. 3971, N side along breakaway for 50 m S from firebreak on top and c. 20 m below breakaway, 30°46′S, 115°36′E, S.J. Patrick 654a, 31.vi.1991 (PERTH, CANB); Chittering, 31°28′S, 116°26′E, H.E. Braine s.n., 25.ix.1956 (PERTH).

**Toxicity**: unknown.

**Affinity**: this species is morphologically similar to *Gastrolobium axillare* but the latter species has calyx lobes much longer than the tube and discolorous green leaves with the abaxial surface softly pubescent.
106. Gastrolobium cyanophyllum G.Chandler & Crisp, sp. nov. Type: Western Australia: Darling district: West Talbot Road, 7.8 km W of Helena Road and 3.4 km W of Luelfs Road (Gunapin Ridge Road), 32°00′09″S, 116°35′34″E, M.D. Crisp 8517 & W. Keys, 27 Sep. 1993 (holo: CANB!; iso: GAUBA!, PERTH!, UW A!, K!)

G. dilatato similis sed foliis cyaneis glaucis (in supericiebus ambabus) et apicibus recurvis ferociter pungentibus conspicue differs.

Very similar to Gastrolobium dilatatum but differing conspicuously in the blue-glaucous leaves (both surfaces) with fiercely pungent, recurved apices.

Etymology: from the Greek cyaneus = blue and phyllon = leaf and refers to the blue-green leaves.

Spreading shrub 0.8 × 1.2 m. Branchlets ascending, angular, densely tomentose. Petioles terete, continuous and decurrent with the branchlet, c. 1 mm long. Leaves patent or retrorse, opposite, oblong, 15–30 × 15–20 mm, glabrous, glaucous-blue, venation reticulate; apex acute, recurved, densely tomentose; margins flat to plicate; base cuneate. Stipules erect, hyaline, 6–7 mm long, red. Inflorescences condensed racemes in upper axils; peduncle 0–2 mm long; racis 1–13 mm long, subtending bracts caducous, scale-like, trifid to trilobed, c. 4 mm long, outer surface densely pubescent. Pedicels terete, 1–3 mm long. Calyx campanulate, 5–6 mm long including the c. 0.5-mm receptacle, densely pubescent, lobes strongly recurved to reflexed; upper 2 lobes united higher than the lower 3, acute, c. 2.5 mm long; lower 3 lobes triangular, acute, c. 2 mm long. Corolla: standard transversely elliptic, c. 8–11 × 8–10 mm including the 2.5-mm claw, orange with a red ring surrounding the white apex, apex emarginate, base cordate, not auriculate; wings ovate, c. 7–9 × 2 mm including the 2-mm claws, orange, apex rounded, slightly incurved, not enclosing the keel, base auriculate on upper margin only, saccate; keel half elliptic, margins incurved, c. 7.5–9 × 2 mm including the 2.5-mm claws, red, apex rounded, base auriculate, saccate. Style long, incurved to hooked, base pubescent; ovary stipitate, densely pubescent; ovules 2. Mature pods and seed not seen. (Fig. 29)

Flowering period: September–November. Fruiting period: unknown.

Distribution (Fig. 136): south-western Western Australia. Occurs around the York region, NE of Perth, in the Gunapin State Forest and on Cut Hill.

Habitat: grows on undulating landscapes on yellow-brown sand over laterite, in open eucalypt woodland and Banksia scrub.

Specimens examined: WESTERN AUSTRALIA, Darling District: W. Tuckey property, Mawson, c. 32°00′05″S, 117°10′05″E, C. Brown s.n., 16.1.1988 (CANB, PERTH); Qualen Rd, Gunapin State Forest, York: take Qualen Rd E of Catchment Rd for 12.5 km then track W for c. 800 m to top of the breakaway, 32°05′15″S, 116°39′41″E, F. Hort, J. Hort & M. Hislop 788, 20.xi.1999 (CANB, PERTH), Cut Hill, 31°54′S, 116°43′E, O.H. Sargent 693, 8 Oct 1908 (CANB, NSW).

Toxicity: unknown.

Affinity: similar to G. dilatatum, but differing in the non-glaucous leaves that are less-fiercely pungent-pointed and not recurved.


Oxylobium cuneatum Benth. var. cuneifolium Benth., Fl. Austral. 2: 24 (1864). Nemcia cuneata (Benth.) Domin var. cuneifolia (Benth.) Domin, Preslia 2: 30 (1923). Type citation: ‘Swan River, Drummond, 1st Coll., also n. 71 and 207 (partly).’ Type specimens: lectotype (here chosen): K (Drummond 1st Coll.).


 Erect shrubs, up to 2 m high. Branchlets ascending, angular, densely tomentose. Petioles terete, continuous and decurrent with the branchlet, sheathing the stem, <0.5 mm long. Leaves patent, in whorls of 3 or 4, mostly conuplicate, ± obovate, 20–40 × 8–20 mm, glabrous, venation prominently reticulate, raised; apex semi-pungent; margins becoming plicate; base cuneate. Stipules erect, hyaline, 6–7 mm long. Inflorescences solitary or paired flowers in upper axes; peduncle nil; racis nil; subtending bracts caducous, scale-like, trilobed with a robust middle lobe and hyaline outer lobes, c. 4 mm long. Pedicels terete, 1–2 mm long. Calyx campanulate, 6–7 mm long including the c. 0.75-mm receptacle, base densely pubescent, becoming less dense towards the apex, hairs basically bicoloured, with the lower hairs silvery and the upper hairs golden brown, occasionally all hairs golden brown, lobes recurved; upper lobes united into an emarginate, truncate lip or united higher than the lower 3 and ± triangular, c. 4 mm long; lower lobes triangular, acute c. 3 mm long. Corolla:
standard very broadly elliptic, c. 11–12 × 9 mm including the 3.5-mm claw, orange with a dark red centre, with a tiny, dirty-yellow centre, apex emarginate, base slightly cordate; wings obovate, c. 10 × 3 mm including the 3-mm claws, orange, apex rounded, incurved and overlapping to enclose the keel, base auriculate on both margins, saccate; keel half very broadly elliptic, c. 9–10 × 3 mm including the 3-mm claws, red, apex subacute, base auriculate, saccate. Style very long, strongly incurved, base pubescent; ovary shortly stipitate, densely pubescent; ovules 2. Pod ± sessile, broadly ovoid, c. 8 × 4–5 mm long, densely villous. Seed not seen.

Flowering period: August and September. Fruiting period: October and November.

Distribution (Fig. 137): south-western Western Australia. Occurs in the Darling escarpment east and south of Perth.

Habitat: grows throughout the Darling escarpment on sandy soils in heath and woodland.

Selected specimens (19 examined): WESTERN AUSTRALIA, Darling District: Darlington, Darling Range, 31°55′S, 116°04′E, A. Morrison s.n., 6.xi.1990 (CANB, PERTH); West Talbot Rd, 8 km E of Helena Rd and 3.2 km W of Luelfs Rd (=Gunapin Ridge Rd), Hwy, 32°22′S, 117°42′E, (CANB, GAUBA, PERTH); Kingsbury Drive 2 km from Southwestern Hwy, 32°22′S, 116°02′E, M.G. Corrick 9418, 2.xi.1984 (CANB, HO, MEL).

Toxicity: unknown.

Affinity: this species is very similar to G. cyanophyllum, which differs in having glaucous leaves that are fiercely pungent-pointed and longitudinally recurved. Also, the upper two calyx lobes are not united into an emarginate, truncate lip and the subtending bracts are trilobed and not hyaline.

108. Gastrolobium elegans G.Chandler & Crisp, sp. nov.

Type: Western Australia: Eyre District: Stirling Range, unnamed hill in SW corner of park, 34°23′11″S, 117°42′19″E, M.D. Crisp 8595 & W. Keys, 16 Oct. 1996 (holo: CANB!; iso: CANB!, MEL!, PERTH!)

Frutex erectus gracilis 2–3 m altus, folia opposita anguste elliptica vel oblonga undulata discoloria, pagina inferna sericea, inflorescentia fasciculata axillaris stricta pedunculata, floras minus quam 15 mm longa, petala vitellina maculis rubris, calyx sericeus bicolor pilis albis in tubo et pilis aurei-brunneis in lobis.

An erect, slender shrub 2–3 m high, with opposite, narrowly elliptic or oblong, undulate, discolorous leaves, the undersurface silky pubescent; flowers in pedunculate, erect, axillary clusters, less than 15 mm long, mainly orange and yellow with red markings; calyces silky pubescent and bicoloured, with white hairs on the tube and golden brown hairs on the lobes.

Etyymology: the specific epithet refers to the elegant appearance of this shrub.

Erect, slender shrubs, 2–3 m high. Branchlets ascending, angular, densely tomentose. Petioles terete, continuous and decurrent with the branchlet, c. 6 mm long. Leaves broadly spreading, opposite, narrowly elliptic or oblong, 25–40 × 5–7 mm, upper surface glabrous, lower surface densely sericeous, venation prominently reticulate; apex rounded, semi-pungent-pointed; margins recurved, prominently undulate; base rounded to almost truncate. Stipules erect, hyaline, 4–5 mm long. Inflorescences axillary clusters, 4–6-flowered; peduncle angular, up to 10 mm long, pubescent rachis angular, up to 5 mm long; subtending bracts caducous, scale-like, trilobed, the middle lobe longest, 5–6 mm long, densely pubescent on outer surface. Pedicels terete, 4–5 mm long. Calyx campanulate, 8–9 mm long including the c. 1-mm receptacle, densely villous, bicoloured with silvery white hairs on tube, golden brown hairs on lobes, lobes strongly recurved; upper 2 lobes united higher than the lower 3, ± acute, c. 4 mm long; lower 3 lobes triangular, c. 4 mm long. Corolla: standard transversely elliptic, 14–15 × 17–18 mm including the 3-mm claw, yellow-orange with a red centre, apex emarginate, base cordate, not auriculate; wings obovate, c. 11–12 × 6 mm including the 1.5-mm claws, yellow and red, apex rounded, incurved and overlapping to enclose the keel, base auriculate on the upper margin only, saccate; keel half very broadly obovate, strongly incurved longitudinally, margins not incurved, c. 10–11 × 4 mm including the 2.5-mm claws, dark pink, apex obtuse, base auriculate, saccate. Style very long, strongly incurved, very base slightly pubescent; ovary ± sessile, densely pubescent; ovules 4. Pod and seed not seen. (Fig. 30)

Flowering period: September and October. Fruiting period: unknown.

Distribution (Fig. 138): south-western Western Australia. This species is endemic to the western end of the Stirling Range, on a low ridge.

Habitat: grows on hillsides on skeletal stony quartzite in heath with Lambertia ericifolia, Xanthorrhoea sp., Hakea acucluata, Eucalyptus pachycoma and E. preissiana.

Specimens seen: WESTERN AUSTRALIA, Eyre district: Hill, 3 km SE of Peak Donnelly; Stirling Range, 43°21′S, 117°41′E, G.J. Keighery s.n., 15.xii.1986 (PERTH); Stirling Range, saddle between hills 4 km SW of Donnelly Peak, 34°21′S, 117°32′E, 350 m alt., 25.xi.1993, M.D. Crisp 8504 & W. Keys, 25.xi.1993 (CANB, GAUBA, K, PERTH).

Toxicity: unknown.

Affinity: this species can be distinguished from G. leakeanum, G. mondarup, G. lucifolium and G. rubrum by the erect (i.e. not resupinate) yellow-orange flowers with red markings that are less than 15 mm long and the paired leaves which are narrowly oblong with very undulate margins and the silky pubescent indumentum on the lower surface makes the leaves conspicuously discolorous.

Erect domed shrubs up to 1.5 m high. Branchlets ascending, either terete or slightly angular, densely whitish to greyish tomentose. *Petioles* adaxially shallowly channelled, continuous and decurrent with the branchlet, 1.5–3 mm long, tomentose. *Leaves* ascending at c. 45°, opposite, oblong to elliptic (rarely obovate), usually narrow, 25–50 × 12–22 mm; upper surface glabrescent, obscurely reticulate; lower surface densely tomentose, reticulate; apex more or less rounded, often marginate, slightly mucronate; margins recurved, minutely crenulate; base cuneate to rounded. *Siphyles* erect, subulate, c. 3 mm long, red, sericeous. *Inflorescences* condensed axillary racemes, 6–10-flowered, sericeous; *peduncle* 0–2 mm long; *rachis* 1–3 mm long; *bracts* caducous, not seen. *Calyx* campanulate, c. 4.5 mm long, densely sericeous, lobes not recurved, triangular, c. 3 mm long, acute; upper 2 lobes united c. 1.5 mm higher than the lower 3. *Flowers* yellow and purple; *pedicels* terete, 2–3 mm long, densely sericeous. *Corolla* orange to orange-yellow and red: *standard* transversely to very broadly elliptic, c. 11–15 × 10 mm including the 4.5-mm claw, apex emarginate, base truncate; *wings* obovate, c. 8–10 × 2.5 mm including the 2-mm claws, apex rounded, base auriculate; *keel* half very broadly elliptic, 8–10 × 3 mm including the 3-mm claws, apex subacute, base auriculate. *Style* incurved to slightly hooked, c. 5 mm long, lower third sparsely sericeous; *ovary* ± sessile, densely sericeous; *ovules* 2. *Pod* sessile, ovoid, slightly compressed, c. 7 × 3.5 mm, densely sericeous to villous. *Seed* not seen.


*Distribution* (Fig. 139): south-western Western Australia. Near Cranbrook, at the western end of the Stirling Ranges.

*Habitat*: the single known population occurs on a lateritic breakaway, in red clay, under low woodland of *Eucalyptus marginata* Donn ex Sm. and *E. falcata* Turcz., with *Hakea lissocarpa* R.Br., *Austrostipa* and *Austrodanthonia*.

*Conservation status*: this taxon was presumed extinct (IUCN: Ex. ROTAP: 2X. CALM: X); however, late in 2000 a population of about 90 plants was rediscovered.

*Specimens examined*: WESTERN AUSTRALIA, Darling district: NW of Cranbrook, c. 34°10′S, c. 117°20′E, S. Barrett 904 & W. Bradshaw, 30.xi.2000 (CANB); prope Cranbrook, Stirling Range, E. Pellow s.n., x.1918 (PERTH); Cranbrook, Mr Johnson s.n., ix.1916 (PERTH); Cranbrook, F. Stoward s.n., 23.ix.1917 (PERTH); Blackwood R., Miss Hester s.n. (PERTH); sine loc., J. Drummond 239 (PERTH 01101749; ‘matches Drummond, Swan River 95’, sine loc. (PERTH 01101765).

Toxicity: unknown.

*Affinity*: the leaves of this species are somewhat similar to those of *G. crenulatum*, but the latter differs in having leaves in whorls of three or four, glabrous or glabrescent and with conspicuously crenulate margin.

*Nomina incertae sedis*


*Names previously in use*

*Brachysema bracteolosum* (F.Muell.) = *Gastrolobium bracteolosum* (F.Muell.) G.Chandler & Crisp

*Brachysema celsianum* Lemaire = *Gastrolobium celsianum* (Lemaire) G.Chandler & Crisp

*Brachysema latifolium* R.Br. = *Gastrolobium latifolium* (R.Br.) G.Chandler & Crisp

*Brachysema melanopetalum* F.Muell. = *Gastrolobium melanopetalum* (F.Muell.) G.Chandler & Crisp

*Brachysema minor* Crisp = *Gastrolobium minus* (Crisp) G.Chandler & Crisp

G.Chandler & Crisp

*Brachysema modestum* Crisp = *Gastrolobium modestum* (Crisp) G.Chandler & Crisp

*Brachysema papilio* Crisp = *Gastrolobium papilio* (Crisp) G.Chandler & Crisp

G.Chandler & Crisp

*Brachysema praemorsum* Meisn. = *Gastrolobium praemorsum* (Meisn.) G.Chandler & Crisp

*Brachysema sericeum* (Sm.) Domin = *Gastrolobium sericeum* (Sm.) G.Chandler & Crisp

*Brachysema subcordatum* Benth. = *Gastrolobium subcordatum* (Benth.) G.Chandler & Crisp

*Gastrolobium forrestii* Ewart = *Gastrolobium cuneatum* Henfr

*Gastrolobium spinosum* Benth. var. *trigulare* Benth. = *Gastrolobium trigulare* (Benth.) Domin

*Gastrolobium spinosum* Benth. var. *trilobum* S.Moore = *Gastrolobium trilobum* Benth.


*Jansonia formosum* Kippist = *Gastrolobium formosum* (Kippist) G.Chandler & Crisp

*Nemcia acuta* (Benth.) Domin = *Gastrolobium acutum* Benth.

*Nemcia axillaris* (Meisn.) Crisp = *Gastrolobium axillare* Meisn.

*Nemcia capitata* (Benth.) Domin = *Gastrolobium capitatum* (Benth.) G.Chandler & Crisp
Nemcia carinata Crisp = Gastrolobium reticulatum (Meisn.) Bentham.
Nemcia coriacea (Sm.) Domin = Gastrolobium coriaceum (Sm.) G. Chandler & Crisp
Nemcia crenulata (Turcz.) Crisp = Gastrolobium crenulatum Turcz.
Nemcia dilatata (Benth.) Crisp = Gastrolobium dilatatum (Bentham.) G. Chandler & Crisp
Nemcia effusa Crisp & Mollemans = Gastrolobium effusum (Crisp & Mollemans) G. Chandler & Crisp
Nemcia emarginata (S. Moore) Crisp = Gastrolobium dorrieni (Domin) G. Chandler & Crisp
Nemcia epacridoides (Meisn.) Crisp = Gastrolobium epacridoides Meisn.
Nemcia hookeri (Meisn.) Crisp = Gastrolobium hookeri Meisn.
Nemcia ilicifolia (Meisn.) Crisp = Gastrolobium ilicifolium Meisn.
Nemcia leakeana (Drumm.) Crisp = Gastrolobium leakeanum Drumm.
Nemcia lehmannii (Meisn.) Crisp = Gastrolobium lehmannii Meisn.
Nemcia luteofolia Domin = Gastrolobium luteofolium (Domin) G. Chandler & Crisp
Nemcia obovata (Benth.) Crisp = Gastrolobium obovatum Bentham.
Nemcia pauciflora (C. A. Gardner) Crisp = Gastrolobium plicatum Turcz.
Nemcia plicata (Turcz.) Crisp = Gastrolobium plicatum Turcz.
Nemcia pulchella (Turcz.) Crisp = Gastrolobium pulchellum Turcz.
Nemcia punctata (Turcz.) Crisp = Gastrolobium punctatum (Turcz.) G. Chandler & Crisp
Nemcia pyramidalis (T. Moore) Crisp = Gastrolobium pyramidale T. Moore
Nemcia reticulata (Meisn.) Domin = Gastrolobium nervosum (Meisn.) G. Chandler & Crisp
Nemcia retusa (Lindl.) Domin = Gastrolobium retusum Lindl.
Nemcia rubra Crisp = Gastrolobium rubrum (Crisp) G. Chandler & Crisp
Nemcia spathulata (Benth.) Crisp = Gastrolobium spathulatum Bentham.
Nemcia stipulare (Meisn.) Crisp = Gastrolobium stipulare Meisn.
Nemcia tricuspidata (Meisn.) Crisp = Gastrolobium tricuspidatum Meisn.
Nemcia vestita Domin = Gastrolobium vestitum (Domin) G. Chandler & Crisp
Oxylobium lineare Meisn. = Gastrolobium ebracteolosum G. Chandler & Crisp
Oxylobium dilatatum Bentham. var. trilobum Meisn. = Gastrolobium rhombifolium G. Chandler & Crisp

Acknowledgments

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http://www.publish.csiro.au/journals/asb
Fig. 1. Distribution of *Gastrolobium sens. lat.*
Fig. 2. Classification tree of Gastrolobium (showing the strict consensus tree) based on two molecular analyses (after Chandler 2001; Chandler, et al. 2001). Outgroups have been condensed to a single node. Informal Gastrolobium groups are shown on the right-hand side, with the numbers in parentheses corresponding to the number of the group presented in the taxonomy section.
Fig. 3. Photograph of the type specimen of *Gastrolobium euryphyllum*. Fig. 4. Photograph of the type specimen of *Gastrolobium wonganensis* (note: there is an additional isotype at PERTH, which was erroneously left of the herbarium label). Fig. 5. Photograph of the type specimen of *Gastrolobium aculeatum*. Fig. 6. Photograph of the type specimen of *Gastrolobium semiteres*. 
Fig. 7. Photograph of the type specimen of *Gastrolobium acrocaroli*. Fig. 8. Photograph of the type specimen of *Gastrolobium involutum*. Fig. 9. Photograph of the type specimen of *Gastrolobium tergiversum*. Fig. 10. Photograph of the type specimen of *Gastrolobium congestum*. 
Fig. 11. Photograph of the type specimen of *Gastrolobium musaceum*. Fig. 12. Photograph of the type specimen of *Gastrolobium discolor*. Fig. 13. Photograph of the type specimen of *Gastrolobium melanocarpum*. Fig. 14. Photograph of the type specimen of *Gastrolobium glabratum*. 
Fig. 15. Photograph of the type specimen of *Gastrolobium diabolophyllum*. Fig. 16. Photograph of the type specimen of *Gastrolobium hians*. Fig. 17. Photograph of the type specimen of *Gastrolobium nutans*. Fig. 18. Photograph of the type specimen of *Gastrolobium reflexum*. 
Fig. 19. Photograph of the type specimen of Gastrolobium tenue. Fig. 20. Photograph of the type specimen of Gastrolobium alterniflorum. Fig. 21. Photograph of the type specimen of Gastrolobium crispatum. Fig. 22. Photograph of the type specimen of Gastrolobium rhombifolium.
Fig. 23. Photograph of the type specimen of *Gastrolobium cruciatum*. Fig. 24. Photograph of the type specimen of *Gastrolobium mondurup*. 
Fig. 25. Line drawing of *Gastrolobium formosum*. (a) Mature branchlet, showing leaves and inflorescences; (b) standard petal, showing top and side views; (c) mature capitulum; (d) flower bud mostly enclosed in the subtending bracts; (e) single flower; (f) seed, showing top and side views; (g) dissected calyx, with the two shortest lobes the upper lobes, which are enclosed in the capitulum; (h) wing petal; (i) keel petal; (j) legume; (k) a pair of larger than usual stipules that sometimes happen to the leaves just below the inflorescences; (l) leaf base and stipule detail. Drawing by A. Prowse.
Fig. 26. Photograph of a representative specimen of *Gastrolobium ferrugineum*. Fig. 27. Photograph of the type specimen of *Gastrolobium humile*. Fig. 28. Photograph of the type specimen of *Gastrolobium venulosum*. Fig. 29. Photograph of the type specimen of *Gastrolobium cyanophyllum*. 
Fig. 30. Photograph of the type specimen of *Gastrolobium elegans*. 
Figs 31–36. Distributions. Fig. 31. *Gastrolobium spinosum*. Fig. 32. *G. euryphyllum*. Fig. 33. *G. wonganensis*. Fig. 34. *G. triangulare*. Fig. 35. *G. trilobum*. Fig. 36. *G. aculeatum*. 
Figs 37–42. Distributions. Fig. 37. Gastrolobium semiteres. Fig. 38. G. stenophyllum. Fig. 39. G. cuneatum. Fig. 40. G. callistachys. Fig. 41. G. acroacrol. Fig. 42. G. involutum.
Monograph of *Gastrolobium*

Figs 43–48. Distributions.  
Fig. 43. *Gastrolobium graniticum*.  
Fig. 44. *G. bilobum*.  
Fig. 45. *G. tergiversum*.  
Fig. 46. *G. grandiflorum*.  
Fig. 47. *G. brevipes*.  
Fig. 48. *G. congestum*.
Figs 49–54. Distributions. Fig. 49. *Gastrolobium parviflorum*. Fig. 50. *G. musaceum*. Fig. 51. *G. discolor*. Fig. 52. *G. melanocarpum*. Fig. 53. *G. tetragonophyllum*. Fig. 54. *G. villosum*. 
Fig. 55. *Gastrolobium densifolium*. Fig. 56. *G. tomentosum*. Fig. 57. *G. glabratum*. Fig. 58. *G. ovalifolium*. Fig. 59. *G. rotundifolium*. Fig. 60. *G. polystachyum*. 

Figs 55–60. Distributions.
Figs 61–66. Distributions. Fig. 61. Gastrolobium propinquum. Fig. 62. G. diabololophyllum. Fig. 63. G. floribundum. Fig. 64. G. glaucum. Fig. 65. G. laytonii. Fig. 66. G. microcarpum.
Figs 67–72. Distributions. Fig. 67. Gastrolobium crassifolium. Fig. 68. G. hians. Fig. 69. G. pycnostachyum. Fig. 70. G. parvifolium. Fig. 71. G. velutinum. Fig. 72. G. heterophyllum.
Figs 73–78. Distributions. Fig. 73. *Gastrolobium nutans*. Fig. 74. *G. pusillum*. Fig. 75. *G. brownii*. Fig. 76. *G. hookeri*. Fig. 77. *G. obovatum*. Fig. 78. *G. plicatum*.
Monograph of *Gastrolobium*

Figs 79–84. Distributions. Fig. 79. *Gastrolobium spathulatum*. Fig. 80. *G. stowardii*. Fig. 81. *G. bennettsianum*. Fig. 82. *G. pulchellum*. Fig. 83. *G. truncatum*. Fig. 84. *G. latifolium*. 
Fig. 85. Gastrolobium appressum. Fig. 86. G. calycinum. Fig. 87. G. hamulosum. Fig. 88. G. oxyloboides. Fig. 89. G. racemosum. Fig. 90. G. reflexum.
Figs 91–96. Distributions. Fig. 91. Gastrolobium rigidum. Fig. 92. G. spectabile. Fig. 93. G. tenue. Fig. 94. G. dorrienii. Fig. 95. G. retusum. Fig. 96. G. whicherensis.
Figs 97–102. Distributions. Fig. 97. Gastrolobium ebracteolosum. Fig. 98. G. acutum. Fig. 99. G. capitatum. Fig. 100. G. alternifolium. Fig. 101. G. linearifolium. Fig. 102. G. nervosum.
Figs 103–108. Distributions. Fig. 103. *Gastrolobium crispatum*. Fig. 104. *G. effusum*. Fig. 105. *G. stipulare*. Fig. 106. *G. ilicifolium*. Fig. 107. *G. rhombifolium*. Fig. 108. *G. tricuspidatum*. 
Figs 109–114. Distributions. Fig. 109. Gastrolobium cruciatum. Fig. 110. G. epacridoides. Fig. 111. G. punctatum. Fig. 112. G. reticulatum. Fig. 113. G. coriaceum. Fig. 114. G. crenulatum.
Figs 115–120. Distributions. Fig. 115. *Gastrolobium pyramidale*. Fig. 116. *G. leakeanum*. Fig. 117. *G. mondurup*. Fig. 118. *G. latefolium*. Fig. 119. *G. vestitum*. Fig. 120. *G. rubrum*. 
Figs 121–126. Distributions. Fig. 121. *Gastrolobium melanopetalum*. Fig. 122. *G. sericeum*. Fig. 123. *G. minus*. Fig. 124. *G. modestum*. Fig. 125. *G. bracteolosum*. Fig. 126. *G. subcordatum*. 
Figs 127-132. Distributions. Fig. 127. Gastrolobium celsianum. Fig. 128. G. formosum. Fig. 129. G. papilio. Fig. 130. G. praemorsum. Fig. 131. G. ferrugineum. Fig. 132. G. humile.
Figs 133–138. Distributions. Fig. 133. *Gastrolobium venulosum*. Fig. 134. *G. axillare*. Fig. 135. *G. nudum*. Fig. 136. *G. cyanophyllum*. Fig. 137. *G. dilatatum*. Fig. 138. *G. elegans*. 
Monograph of Gastrolobium

Taxonomic index

Names in bold type are currently accepted

<table>
<thead>
<tr>
<th>Species</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brachysema acuminatum</td>
<td>696</td>
</tr>
<tr>
<td>Brachysema bracteolosum</td>
<td>695</td>
</tr>
<tr>
<td>Brachysema celsianum</td>
<td>696</td>
</tr>
<tr>
<td>Brachysema lanceolatum</td>
<td>695, 696</td>
</tr>
<tr>
<td>{var.} alpha hypargyreum</td>
<td>696</td>
</tr>
<tr>
<td>{var.} beta glabrescens</td>
<td>695</td>
</tr>
<tr>
<td>{var.} gamma planifolium</td>
<td>696</td>
</tr>
<tr>
<td>Brachysema latifolium</td>
<td>668</td>
</tr>
<tr>
<td>Brachysema melanopetalum</td>
<td>692</td>
</tr>
<tr>
<td>Brachysema melananthum</td>
<td>692</td>
</tr>
<tr>
<td>Brachysema minor</td>
<td>693</td>
</tr>
<tr>
<td>Brachysema modestum</td>
<td>694</td>
</tr>
<tr>
<td>Brachysema papilio</td>
<td>698</td>
</tr>
<tr>
<td>Brachysema platypterus</td>
<td>696</td>
</tr>
<tr>
<td>Brachysema praemorsum</td>
<td>698</td>
</tr>
<tr>
<td>Brachysema sericeum</td>
<td>693</td>
</tr>
<tr>
<td>var. angustifolium</td>
<td>692</td>
</tr>
<tr>
<td>Brachysema speciosum</td>
<td>696</td>
</tr>
<tr>
<td>Brachysema subcordatum</td>
<td>695</td>
</tr>
<tr>
<td>Brachysema undulatum</td>
<td>693</td>
</tr>
<tr>
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<td>692</td>
</tr>
<tr>
<td>Callistachys acuta</td>
<td>678</td>
</tr>
<tr>
<td>Callistachys atropurpurea</td>
<td>689</td>
</tr>
<tr>
<td>Callistachys capitata</td>
<td>678</td>
</tr>
<tr>
<td>Callistachys coriacea</td>
<td>687</td>
</tr>
<tr>
<td>Callistachys cuneata</td>
<td>703</td>
</tr>
<tr>
<td>Callistachys heterophylla</td>
<td>660</td>
</tr>
<tr>
<td>Callistachys linearis</td>
<td>677</td>
</tr>
<tr>
<td>Callistachys ovalifolia</td>
<td>687</td>
</tr>
<tr>
<td>Callistachys oxylobiodae</td>
<td>679</td>
</tr>
<tr>
<td>Callistachys parviflora</td>
<td>643</td>
</tr>
<tr>
<td>Callistachys retusa</td>
<td>676</td>
</tr>
<tr>
<td>Gastrolobium acrocaroli</td>
<td>637</td>
</tr>
<tr>
<td>Gastrolobium aculeatum</td>
<td>633</td>
</tr>
<tr>
<td>Gastrolobium acutum</td>
<td>678</td>
</tr>
<tr>
<td>Gastrolobium alternifolium</td>
<td>679</td>
</tr>
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<td>Gastrolobium appressum</td>
<td>669</td>
</tr>
<tr>
<td>Gastrolobium axillare</td>
<td>699</td>
</tr>
<tr>
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<td>666</td>
</tr>
<tr>
<td>Gastrolobium bidens</td>
<td>652</td>
</tr>
<tr>
<td>Gastrolobium bilobum</td>
<td>639</td>
</tr>
<tr>
<td>var. angustifolium</td>
<td>639</td>
</tr>
<tr>
<td>Gastrolobium bracteolosum</td>
<td>695</td>
</tr>
<tr>
<td>Gastrolobium brevipes</td>
<td>642</td>
</tr>
<tr>
<td>Gastrolobium brownii</td>
<td>662</td>
</tr>
<tr>
<td>Gastrolobium callistachys</td>
<td>636</td>
</tr>
<tr>
<td>Gastrolobium calycinum</td>
<td>669</td>
</tr>
<tr>
<td>Gastrolobium capitatum</td>
<td>678</td>
</tr>
<tr>
<td>Gastrolobium celsianum</td>
<td>696</td>
</tr>
<tr>
<td>Gastrolobium congestum</td>
<td>642</td>
</tr>
<tr>
<td>Gastrolobium cordatum</td>
<td>673</td>
</tr>
<tr>
<td>Gastrolobium coriaceum</td>
<td>687</td>
</tr>
<tr>
<td>Gastrolobium corymbosum</td>
<td>639</td>
</tr>
<tr>
<td>Gastrolobium crassifolium</td>
<td>657</td>
</tr>
<tr>
<td>Gastrolobium crenulatum</td>
<td>688</td>
</tr>
</tbody>
</table>

Fig. 139. Distribution of Gastrolobium lehmannii.
<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Additional Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastrolobium crispatum</td>
<td>681</td>
<td></td>
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<tr>
<td>Gastrolobium crispifolium</td>
<td>667</td>
<td>Gastrolobium ovalifolium Henfrey</td>
</tr>
<tr>
<td>Gastrolobium cruciatum</td>
<td>684</td>
<td>Gastrolobium ovalifolium (Meisn.) Lemaire</td>
</tr>
<tr>
<td>Gastrolobium cuneatum</td>
<td>636</td>
<td></td>
</tr>
<tr>
<td>Gastrolobium cyanophyllum</td>
<td>702</td>
<td>Gastrolobium oxylobioides var. microcarpum</td>
</tr>
<tr>
<td>Gastrolobium densifolium</td>
<td>648</td>
<td>Gastrolobium papilio</td>
</tr>
<tr>
<td>Gastrolobium diabolophyllum</td>
<td>653</td>
<td>Gastrolobium parviflorum</td>
</tr>
<tr>
<td>Gastrolobium dilatatum</td>
<td>703</td>
<td>Gastrolobium parviflorium</td>
</tr>
<tr>
<td>Gastrolobium discolor</td>
<td>645</td>
<td>Gastrolobium pauciflorum</td>
</tr>
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<td>Gastrolobium dorrienii</td>
<td>675</td>
<td>Gastrolobium plicatum</td>
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<tr>
<td>Gastrolobium drummondii</td>
<td>670</td>
<td>Gastrolobium polycephalum</td>
</tr>
<tr>
<td>Gastrolobium ebracteolatum</td>
<td>677</td>
<td>Gastrolobium polystachyrum</td>
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