

A synopsis with keys for the genus *Antennaria* (Asteraceae: Inuleae: Gnaphaliinae) of North America

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Keys to all species of *Antennaria* of North America and Mexico are presented. The number of taxa acknowledged in the current treatment is 46, including 35 species with 17 subspecies circumscribed among some of the more diverse species. The treatment is a highly conservative one, considering the fact that over 350 taxa of *Antennaria* have been described for North America, the majority in the last 100 years. A synopsis enumerates all the recognized taxa and provides their correct name, widely used synonyms, basionym, type locality, key morphological features, and assorted taxonomic notes. The new combinations, *Antennaria friesiana* (Trautv.) Ekman ssp. *neolaskana* (A.E. Pors.) Bayer & Stebbins comb. et stat.nov. and *Antennaria luzuloides* Torr. & A. Gray ssp. *aberrans* (E. Nels.) Bayer & Stebbins comb.nov., are proposed.

Key words: *Antennaria*, Asteraceae, Compositae, Inuleae, taxonomic revision, *Flora of North America*.

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Les auteurs présentent une clé pour toutes les espèces d'*Antennaria* de l'Amérique du nord, incluant le Mexique. Le nombre de taxons reconnus dans la version actuelle est de 46, incluant 35 espèces avec 17 sous-espèces circonscrites parmi certaines des espèces le plus diverses. Le traitement est très conservateur, considérant le fait que plus de 350 taxons d'*Antennaria* ont été décrits pour l'Amérique du Nord, la plupart au cours des 100 dernières années. Une synopsis énumère tous les taxons reconnus, mentionnant leur nom correctement, les synonymes utilisés, le basionyme, le localité du type, les caractéristiques morphologiques critiques et des notes taxonomiques appropriées. Les auteurs proposent deux nouvelles combinaisons soit l'*Antennaria friesiana* (Trautv.) Ekman ssp. *neolaskana* (A.E. Pors.) Bayer & Stebbins comb. et stat.nov. et l'*Antennaria luzuloides* Torr. & A. Gay ssp. *aberrans* (E. Nels.) Bayer & Stebbins comb.nov.

Mots clés : *Antennaria*, Asteraceae, Compositae, Inuleae, révision taxonomique, *Flora of North America*.

[Traduit par la rédaction]

Introduction

At the urging of several colleagues in the systematics community in North America, as well as a few amateur taxonomists, we have constructed a preliminary set of keys for *Antennaria* Gaertner for North America prior to our final treatment for the *Flora of North America* (due for completion in 1998). These keys are urgently needed by several people, as current treatments of the genus for many parts of North America are hopelessly confused, outdated, and (or) poorly written. Since the proof of the utility of a classification is often in the workability of its keys, we hope that early presentation of this classification will give us a chance to identify and resolve any remaining problems with the assistance of fellow taxonomists who will put this classification and keys to the test. We have made detailed studies the systematics of most of the taxa over the past 15 years, but a few problematic taxa, such as the *A. alpina* complex, are still in need of more detailed investigation. Their taxonomy must still be considered provisional at this time.

History of treatments of Antennaria in North America

Antennaria is a genus that is infamous for its taxonomic complexity; however, a worldwide monograph has never been attempted for the genus. Consequently, most North American treatments for the genus are regional ones. An inspection of the Gray Card and Kew Indices reveals that over 350 names

have been proposed for North American *Antennaria*, the majority described by a handful of zealous early twentieth century taxonomists, including E.L. Greene (named 84 taxa), M.L. Fernald (48 taxa), A.E. Porsild (22 taxa), E. Nelson (20 taxa), and P.A. Rydberg (17 taxa). Early floristic treatments for the genus (Rydberg 1922; Fernald 1945, 1950; Malte 1934; Nelson 1901; Porsild 1950, 1965; among others) recognized many minor apomictic variants as distinct taxa. However, the keys of treatments are unworkable because they tend to use qualitative characters that are not well defined or have overlapping features. For example, even with the type specimens in hand, it is nearly impossible to determine specimens of *Antennaria* from Atlantic Canada using Fernald's classification for that region (Fernald 1950). More recent regional floristic treatments, such as Cronquist (1955) and Gleason and Cronquist (1991), recognized more realistic numbers of taxa, and several of these are in line with our current thoughts as to the ultimate number of species that should be recognized for those regions.

The revised classification

The number of taxa recognized in our current treatment is 46, including 35 species and several subspecies within several of those species. This treatment is based on our taxonomic and evolutionary work to date on the genus (Bayer 1984, 1985a, 1985b, 1987a, 1987b, 1988, 1989a, 1989b, 1989c, 1989d, 1989e, 1990a, 1990b, 1990c, 1990d, 1991a; Bayer and Crawford 1986; Bayer et al. 1990, 1991; Bayer and Stebbins

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1981, 1982, 1983, and 1987; Stebbins 1932a, 1932b, 1935, 1936), as well as our extensive field experience with this genus. We have also taken into account the recent work of others (Chmielewski and Chinnappa 1988, 1990; Chmielewski et al. 1990a, 1990b; Urbanska 1983), which is largely in concordance with our own findings. Although the number of recognized species is a conservative one, many of the taxa are still difficult to identify because of tremendous amounts of morphological variability within some of the polyploid species complexes.

Keys to success in identifying *Antennaria*

Several details must be kept in mind when collecting and trying to identify species of *Antennaria*. Unfortunately, one of the most determinative characters relies on a feature that may not be readily identified on herbarium specimens, that being whether the populations are gynodioecious or dioecious. This character is readily determined in the field by simple gender ratios; however, on herbarium specimens, absence of staminate could mean that they were not collected or that they were actually absent from the population. This character comes into use in separating the infraspecific taxa within both *A. monocephala* and *A. friestiana*. If this character cannot be readily determined on herbarium material, i.e., when staminate are absent, then

those specimens are best keyed only to the specific level.

Another feature of importance in the taxonomy of *Antennaria* is the presence or absence of well-developed stolons that root at their tips. Some *Antennaria* (Key II), produce short, stiff, semi-erect stolons that do not root at the tips, and these should not be confused with typical stolons that are more elongate and horizontal, rooting at the tips. The final feature of great taxonomic importance in *Antennaria* is the presence or absence of flags on the upper and middle cauline leaves. These are flat, linear, scarious, appendages of the leaf tips that are similar to the tips of the phyllaries, not to be confused with the ordinary subulate or blunt leaf tips that are essentially green and herbaceous. The following keys will work for all North American *Antennaria*, including Mexico, where *A. marginata* and *A. parvifolia* have southern extensions of their ranges. The keys are mostly artificial, and phylogenetic relationships of taxa should not be inferred from them. Treatments for *Antennaria* from over 50 North American floras were used as a starting point for constructing the keys presented here and thus many taxa are separated using these customary key characters. In many instances these traditionally used key characters did not work satisfactorily and new key characters were devised.

Key to groups of *Antennaria* of North America

1. Flowering stalks mostly monocephalous or occasionally 2–3 headed Key I
1. Flowering stalks almost always pleio- or poly-cephalous and only rarely monocephalous 2
2. Plants essentially nonstoloniferous, not mat forming, with the stolons, if present, erect, usually not rooting at the apex, staminate and pistillate plants essentially the same height at maturity Key II
2. Plants definitely stoloniferous, mat forming, with the stolons usually prostrate, ascending and usually rooting at the apex, pistillate plants usually conspicuously taller than staminate plants or the same height at maturity 3
3. Basal leaves with 3–7 prominent veins Key III
3. Basal leaves with a single prominent vein 4
4. Phyllaries dark in color, the tips brown, olivaceous green, to black, only the inner ones sometimes whitish; plants of arctic or alpine tundra to just below tree line Key IV
4. Phyllaries light in color, the tips light brown, rose, pink, and ivory to pure white; plants of various habitats other than arctic or alpine tundra (except sometimes *A. corymbosa* is alpine) Key V

Key I

Plants with predominantly monocephalous (infrequently bi- or tri-cephalous flowering stalks. Monocephalous individuals do occur rarely in other sexual species of *Antennaria*, such as *A. neglecta* (= *A. neglecta* var. *simplex* Peck), *A. parvifolia*, and other pleiocephalous species. This should be considered when keying monocephalous individuals that may be one of these rare monocephalous forms as prevailing pleiocephalous taxa should be keyed elsewhere.

1. Leaves with 3–7 prominent veins in the basal leaves; plants of the southeastern United States *A. solitaria*
1. Leaves with a single prominent vein in the basal leaves; plants of western North America and the Arctic 2
2. Plants essentially acaulescent, flowering stalks very short, 1–2 cm high, head sessile among the basal leaves *A. rosulata*
2. Plants distinctly caulescent, flowering stalks longer, greater than 2 cm high, heads appearing well above the basal leaves 3
3. Plants suffrutescent, leaves green-glabrous on adaxial surface, emarginate or obtuse at the tips; plants of Josephine and Curry Co. Oregon and Del Norte and Humboldt Co., California *A. suffrutescens*
3. Plants herbaceous, leaves green-glabrous or gray pubescent on adaxial surface, acute to obtuse at the tips; plants from various parts of North America, but not southwestern Oregon and northwestern California 4
4. Leaves green-glabrous or rarely villous-floccose pubescent adaxially, upper and middle cauline leaves tipped with brown scarious appendages (flags); plants of arctic and alpine tundra 5
5. Plants gynodioecious; staminate plants absent from populations *A. monocephala* ssp. *angustata*
5. Plants dioecious; staminate and pistillate plants present in equal frequency in populations *A. monocephala* ssp. *monocephala*

4. Leaves sericeous gray-tomentose adaxially, upper and middle cauline leaves merely acute, not tipped with brown scarios appendages (flags); semidesert plants of sagebrush steppe or cushion plants of limestone talus near tree line 6
6. Plants densely caespitose, not mat forming, nonstoloniferous; semidesert plants *A. dimorpha*
6. Plants mat forming, stoloniferous; semidesert plants or cushion plants of limestone talus 7
7. Leaves spatulate to cuneate; stolons relatively short with leaves along their entire length; gynoeceious subalpine-alpine plants of the Spring Mountains, Clark County, Nevada *A. soliceps*
7. Leaves narrowly linear; stolons relatively long, naked and bearing small tufted plantlets at their tips (flagellate); dioecious semidesert plants of the northwestern United States, not of southern Nevada *A. flagellaris*

Key II

Plants polycephalous and essentially nonstoloniferous, not mat forming (except *A. argentea* to some extent), with the stolons, if present, erect usually not rooting at the apex, staminate and pistillate plants of most dioecious taxa essentially the same height at maturity.

1. Dwarf plants of arctic and alpine tundra less than 10 cm high; upper and middle cauline leaves with a flat, linear, scarios, tip (flag), similar to the tips of the phyllaries; plants of arctic North America 2
2. Plants gynoeceious; staminate plants absent from populations; pistillate involucre bracts dark, olive or black, and relatively narrow *A. friesiana* ssp. *friesiana*
2. Plants dioecious; staminate and pistillate plants present in equal frequency in populations; pistillate involucre bracts usually lighter often dark brown or whitish and relatively wide *A. friesiana* ssp. *alaskana*
1. Tall plants of various habitats, but not arctic-alpine tundra, and greater than 10 cm high, or if of arctic-alpine tundra then greater than 10 cm high, or if less than 10 cm then of desert-steppe habitats; upper and middle cauline leaves with or without flags; plants from various other regions of North America, but only *A. pulcherrima* from the Arctic 3
3. Leaves narrowly linear or linear-elliptic, 3 mm or less wide; phyllary tips green or greenish black; plants low, usually less than 10 cm high *A. stenophylla*
3. Leaves lanceolate or spatulate, 3 mm or more wide; phyllary tips whitish, red, pink, brown, or green or greenish black; plants higher, usually greater than 10 cm high 4
4. Involucre scarious throughout and glabrous from the very base to the apex 5
5. Plants with robust rhizomes forming loose mats; pistillate heads 5–7 mm high, pale green to silvery white in color; middle cauline leaves linear-oblong *A. argentea*
5. Plants with a branched caudex or short stout rhizomes not forming loose mats; pistillate heads 3–5 mm high, usually light brown to golden and often red or pink flecked in color; middle cauline leaves linear 6
6. Heads in a corymbose arrangement; leaves mostly 3-nerved; plants of dry sagebrush – ponderosa pine communities *A. luzuloides* ssp. *luzuloides*
6. Heads in racemose-paniculate arrangement; leaves mostly 1-nerved or obscurely veined; plants of moist meadows or along moist drainages in ponderosa pine communities *A. luzuloides* ssp. *aberrans*
4. Involucre scarious only at the tips and hairy from the base midway to the apex 7
7. Plant suffrutescent with many erect woody stems; basal leaves absent; involucre densely pubescent to well above the middle, tips of phyllaries pink to red, infrequently whitish *A. geyeri*
7. Plant herbaceous with erect or suberect stems or rhizomes; basal leaves present; involucre moderately pubescent to below the middle, tips of phyllaries whitish, brown, green, or black, rarely with red or pink flecks 8
8. Veins of basal leaves one or obscure; flags prominent on upper, middle and often the lower cauline leaves; plant less than 2 dm tall; outer bracts fuscous throughout with a large dark spot at the base; plants of alpine slopes *A. lanata*
8. Veins of basal leaves 3 or more and prominent; flags usually present only on upper cauline leaves or absent; plant greater than 2 dm tall; tips of outer bracts brownish or white with a large to very small dark spot at the base; plants mostly subalpine, montane, or subarctic 9
9. Tips of pistillate phyllaries obtuse, white or whitish; dark spot at base of involucre small (<1 mm); plants of dry montane or steppe habitats *A. anaphaloides*
9. Tips of pistillate phyllaries acute, black, brown, or whitish; dark spot at base involucre relatively large (1–3 mm); plants of wet habitats at subalpine elevations or in the subarctic (*A. pulcherrima*) or on limestone substrates near sea level (*A. eucosma*) 10
10. Pistillate corollas 4.5–6.5 mm long; staminate corollas 4–5 mm long; upper cauline leaves usually with a flat, linear, scarios, tip (flag), similar to the tips of the phyllaries; plants of wet habitats in willow thickets at subalpine elevations or in the subarctic in western North America from Colorado to Alaska and east to Ontario and parts of western Quebec *A. pulcherrima*
10. Pistillate corollas 3.0–4.4 mm long; staminate corollas 3–4 mm long; upper cauline leaves usually blunt or with subulate or subulate-aristate tips (only those about the corymb with flags); plants of limestone substrates in willow thickets endemic to western Newfoundland and Anticosti Island *A. eucosma*

Key III

Plants polycephalous and stoloniferous; basal leaves broad with 3–7 prominent veins; pistillate plants conspicuously taller than staminate at maturity. Both sexual and apomictic phases occur in the polyploid, *A. parlinii*.

1. Heads arranged in loose racemes or panicles on long pedicels; basal leaves glabrous on the adaxial surface; upper flowering stem below heads with purple glandular hairs; montane plants of western North America from the Cascade Ranges east to Wyoming, South Dakota, and Alberta *A. racemosa*
1. Heads arranged in tight corymbs on rather short pedicels; basal leaves glabrous or pubescent on the adaxial surface; upper flowering stem below heads with or without purple glandular hairs; plants of deciduous forest margins in the eastern North America from the Atlantic seaboard west to eastern Manitoba, Minnesota, Missouri, and Texas 2
2. Pistillate involucre 5–7 mm high; pistillate corollas 3–4 mm high; staminate corollas 2–3.5 mm high; basal leaves tomentose adaxially and usually long petiolate; young stolons mostly ascending; plants of the Appalachians, Piedmont, and Atlantic seaboard, the driftless area of Wisconsin and Minnesota, and eastern Manitoba *A. plantaginifolia*
2. Pistillate involucre 7–10 mm high; pistillate corollas 4–7 mm high; staminate corollas 3.5–5 mm high; basal leaves tomentose or glabrous adaxially and either short or long petiolate; young stolons mostly decumbent; plants widespread throughout eastern North America from the Atlantic seaboard to the eastern margin of the Great Plains 3
3. Basal leaves glabrous adaxially or nearly so; summit of young flowering stem usually beset with purple glandular hairs ...
..... *A. parlinii* ssp. *parlinii*
3. Basal leaves tomentose adaxially; summit of young flowering stem usually glandless *A. parlinii* ssp. *fallax*

Key IV

Plants polycephalous and stoloniferous; basal leaves with narrow single veins; scarious portions of phyllaries dark in color; pistillate plants conspicuously taller than staminate at maturity. Both sexual and apomictic phases occur in the polyploids *A. media* and *A. aromatica*. The plants are mostly dwarf alpine or arctic plants or cushion plants restricted to limestone talus just below the treeline.

1. Basal leaves cuneate to cuneate spatulate, less than two times longer than wide, densely caespitose and arising from short prostrate stolons; plants endemic to limestone talus from northern Wyoming to Yukon Territory and adjacent Northwest Territories ...
..... 2
2. Stalked glandular hairs present on flowering stalks, bases of phyllaries and leaves; living plants with odor of citronella when crushed; upper cauline leaves blunt or with subulate or subulate-aristate tips (only those about the corymb with flags); basal leaves mostly 6.0 mm or more long; pistillate phyllaries mostly 5.0 mm or more long *A. aromatica*
2. Stalked glandular hairs absent from flowering stalks, bases of phyllaries and leaves; living plants odorless; upper and middle cauline leaves with a flat, linear, scarious, tip (flag), similar to the tips of the phyllaries; basal leaves mostly less than 6.0 mm long; pistillate phyllaries mostly less than 5.0 mm long *A. densifolia*
1. Basal leaves spatulate or oblanceolate, more than two times longer than wide, caespitose with well-developed prostrate stolons; plants of habitats other than limestone talus and from various parts of western North America from Arizona and New Mexico to the circumpolar arctic 3
3. Scarious upper portion of pistillate phyllaries whitish, light brown to umber colored, phyllaries usually blunt; stolons usually erect and often lignescent; plants of upper montane habitats rarely extending above the tree line *A. umbrinella*
3. Scarious upper portion of pistillate phyllaries olivaceous green to black (occasionally white at the very tip), phyllaries usually acute; stolons usually decumbent and herbaceous; plants of arctic, alpine, and rarely subalpine localities 4
4. Pistillate corolla less than or equal to 3.0 mm at maturity; staminate corolla usually less than or equal to 2.75 mm at anthesis; lowermost cauline leaf less than or equal to 11 mm at maturity; glandular hairs often present on basal leaves, cauline leaves, stem and involucre; plants of the Sierra Nevada from the Lake Tahoe region south to the Mt. Whitney area, California and adjacent Nevada *A. pulchella*
4. Pistillate corolla greater than 3.0 mm at maturity; staminate corolla usually greater than 2.75 mm at anthesis; lowermost cauline leaf greater than 11 mm at maturity; glandular hairs present or absent from leaves, stems and involucre; plants widespread in western North America from California, Arizona, and New Mexico north to Yukon, the Northwest Territories and the eastern Arctic 5
5. Purple glandular hairs present and usually abundant on leaves, stems and involucre *A. friesiana* ssp. *neolaskana*
5. Purple glandular hairs absent from leaves, stems and involucre 6
6. Upper and middle cauline leaves with a flat, linear, scarious, tip (flag), similar to the tips of the phyllaries *A. alpina*
6. Upper and middle cauline leaves blunt or with subulate or subulate-aristate tips (only those about the corymb with flags) *A. media*

Key V

Plants polycephalous and stoloniferous; basal leaves narrow with single veins (except 1–3 veins in *A. howellii* ssp. *howellii*); phyllaries light in color; pistillate plants conspicuously taller than staminate at maturity in dioecious taxa. Both sexual and apomictic phases occur in the polyploids, *A. parvifolia* and *A. marginata*, whereas *A. howellii* and *A. rosea* are entirely apomictic.

1. Young and mature basal leaves glabrous adaxially, a white margin of hairs from the abaxial surface often encircling the leaf when viewed from above; phyllary tips white or pink 2

2. Basal leaves 1- to 3-nerved, greater than 9.0 mm wide; phyllaries tips light brown; flags absent from upper cauline leaves *A. howellii* ssp. *howellii* 3
2. Basal leaves 1-nerved, less than 9.0 mm wide; phyllaries tips whitish or pink; flags present or absent on upper cauline leaves 3
3. Flags present on upper cauline leaves, phyllaries tips whitish; plants primarily of boreal regions of eastern and central North America from New England and Atlantic Canada to Alberta *A. howellii* ssp. *canadensis*
3. Flags absent from upper cauline leaves, phyllaries tips whitish or pinkish; plants of the southwestern United States, northern Mexico, and the Aleutian Islands of Alaska 4
4. Upper flowering stem lacking glandular hairs; stolons surface pubescent, but not densely woolly; plants of the Aleutian Islands of Alaska; *A. dioica*
4. Upper flowering stem usually beset with purple glandular hairs; stolon surface densely woolly obscuring the surface of the stolon; plants of northern Mexico, Arizona, New Mexico, southeastern California and southwestern Colorado *A. marginata*
1. Young basal leaves pubescent adaxially, mature basal leaves pubescent or sometimes glabrous with age (in *A. neglecta*); phyllary tips white, ivory, pink, red, light brown, dark brown, dark green or black 5
5. Largest basal leaves greater than 6.0 mm wide and greater than 20 mm long; phyllary tips white, ivory, to light brown never pink, red, dark brown, dark green or black 6
6. Middle and upper cauline leaves blunt or with subulate or subulate-aristate tips (only those about the corymb with flags); young and mature leaves pubescent 7
7. Basal leaves oblanceolate lacking a distinct petiole; stolons mostly 8–12 cm long, with leaves along the stolon smaller than those of the rosette at the end *A. howellii* ssp. *petaloidea*
7. Basal leaves spatulate with a distinct petiole; stolons mostly 5–8 cm long, with leaves along the stolon almost equal in size to those of the rosette at the end *A. howellii* ssp. *neodioica*
6. Middle and upper cauline leaves tipped with flat scarious appendages (flags) similar to the tips of the phyllaries; mature basal leaves glabrous and young leaves pubescent, more or less glabrescent with age *A. neglecta*
5. Largest basal leaves less than 6.0 mm wide and less than 20 mm long, or if greater than 20 mm long then less than 6.5 mm wide, or if greater than 6.5 mm wide then less than 20 mm long; phyllary tips white, ivory, pink, red, light to dark brown, dark green or black 8
8. Scarious upper portion of phyllaries light brown to amber colored (rarely some individuals white or pink flecked); stolons either erect and lignescent or herbaceous and strongly arched 9
9. Stolons usually strongly erect and lignescent; the plants somewhat suffrutescent; plants widespread in the western Cordillera from Wyoming and northwestern California north to British Columbia and Alberta *A. umbrinella*
9. Stolons strongly arcuate (bow-shaped) and herbaceous; the plants never suffrutescent; plants narrowly endemic to small regions of Blaine Co., Idaho, Elko Co., Nevada, and Fremont Co., Wyoming *A. arcuata*
8. Scarious upper portion of phyllaries pink, ivory white to pure white; stolons usually decumbent and herbaceous, the plants strongly humifuse 10
10. Pistillate involucre 8–15 mm high; flowering stems usually 2–8 cm tall *A. parvifolia*
10. Pistillate involucre 4–8 mm high; flowering stems usually 8–35 cm tall (except *A. virginica* sometimes 6–8 cm tall) 11
11. Phyllaries with a chestnut brown spot near the base of the scarious portion; plants glandless throughout; basal leaves oblanceolate; plants of willow thickets and similar moist habitats in subalpine to alpine zones in the Rocky Mountains and central Sierra Nevada of California *A. corymbosa*
11. Scarious portion of phyllaries zoned combinations of white, pink, rose, sanguine, or light brown; upper stem with or without glandular hairs; basal leaves spatulate, cuneate, broadly linear or oblanceolate; plants of various habitats 12
12. Phyllaries pure white to near the base of the scarious portion; plants dioecious, staminate and pistillate plants equally frequent in populations; upper stem with or without glandular hairs 13
13. Upper stem without glandular hairs; basal leaves moderately pubescent, greenish gray in color; plants endemic to open forests on shale barrens in eastern Ohio, western Pennsylvania, Virginia, and West Virginia *A. virginica*
13. Upper stem with glandular hairs; basal leaves densely pubescent, silvery gray in color; plants of floodplains and dry alkaline prairie basins mostly in prairie, steppe, and lower montane zones in western North America, east to Ontario in Canada *A. microphylla*
12. Phyllaries zoned combinations of white, pink, rose, sanguine, or light brown to near the base of the scarious portion (if phyllaries pure white then stem without glands and (or) plants not of the Appalachian region of the eastern United States); plants gynoeceous, staminate plants absent from populations; upper stem without glandular hairs (*A. rosea* complex) 14
14. Longest leaves of flowering rosettes 20.0 mm more in length; phyllaries shades of white, pink, green, or red, but usually not brown *A. rosea* ssp. *rosea*
14. Longest leaves of flowering rosettes less than 20.0 mm in length; phyllaries of various shades of white, pink, green, red, and light brown 15

15. Involucre less than 6.5 mm in length; corolla 3.5 mm or less in length; pappus usually 5.0 mm or less in length; cauline leaves tapering to a slender, subulate tip; phyllaries usually various shades of brown... *A. rosea* ssp. *confinis*
15. Involucre 6.5 mm or greater in length; corolla greater than 3.5 mm in length; pappus usually greater than 5.0 mm long; cauline leaves sometimes tipped with a flat, lanceolate scarious appendage; phyllaries of various colors... 16
16. Flowering stalks greater than 17 cm high; lowermost cauline leaves usually greater than 19 mm long; heads usually 6–12 in number... *A. rosea* ssp. *arida*
16. Flowering stalks less than 17 cm high; lowermost cauline leaves usually 19 mm or less in length; heads usually 3–5 in number... *A. rosea* ssp. *pulvinata*

Enumeration of taxa

The following section gives the correct name, all widely used synonyms (i.e., names appearing in North American floras), the type locality, key morphological features, and taxonomic notes for each of the taxa. Over 50 North American floras were used to compile a list of commonly used synonyms. If the correct name is not the basionym, then the basionym is also provided. An alphabetized list of synonyms (Appendix) allows for the easy determination of taxonomic affinities of these names.

Antennaria Gaertn., De Fruct. Sem. Pl. 2: 410. 1791

TYPE SPECIES: *A. dioica* (L.) Gaertn.

Perennials, caespitose or stoloniferous, or the stems solitary; plants dioecious or gynoeious. Stems 1–50 cm. Leaves basal and cauline, the basal 1- to 7-nerved, alternate, simple, entire, often ± tomentose. Inflorescence: heads discoid or disciform, solitary or in cymes, panicle-like or raceme-like clusters; phyllaries many, overlapping in several series, papery or membranous, those of staminate heads relatively broad and conspicuous, those of pistillate heads narrower, more acute, less conspicuous; receptacle naked. Staminate flowers 2–6 mm; corollas narrowly funnel-shaped or tubular, white, yellow, or red; ovary much reduced, pappus bristles in most species enlarged at tip. Pistillate flowers 2–10 mm; corollas narrowly tubular, minutely lobed, white, yellow, or red. Fruit elliptic to ovoid, 0.5 to 3.5 mm long; pappus bristles numerous, soft and slender, weakly barbed. (Latin: antenna, from the shape of the staminate pappus bristles of most species.)

1. *A. alpina* (L.) Gaertn., De Fruct. Sem. Pl. 2: 410. 1791

BASIONYM: *Gnaphalium alpinum* L. Sp. Pl. 850. 1753

= *A. arenicola* Malte, *A. atriceps* Fern., *A. bayardi* Fern., *A. brunnescens* Fern., *A. cana* (Fern. and Wieg.) Fern., *A. canescens* (Lge.) Malte, *A. canescens* (Lge.) Malte var. *pseudoporsildii* Böcher, *A. columnaris* Fern., *A. compacta* Malte, *A. confusa* Fern., *A. crymophila* A. E. Pors., *A. foggii* Fern., *A. glabrata* (J. Vahl) E.L. Greene, *A. intermedia* (Rosenv.) A.E. Pors., *A. labradorica* Nutt., *A. longii* Fern., *A. pallida* E. Nels., *A. pedunculata* A.E. Pors., *A. porsildii* Ekman, *A. sornborgeri* Fern., *A. stolonifera* A.E. Pors., *A. subcanescens* Ostenfeld ex Malte, *A. ungavensis* (Fern.) Malte, *A. vexillifera* Fern., *A. wiegandii* Fern.

TYPE LOCALITY: Lapland (deposited in herbarium of the Linnaean Society).

This circumpolar species complex is one of the most morphologically variable of all the agamic complexes in the genus. Some taxonomists have argued that true *A. alpina* does not occur in North America, based on the fact that none of the North American material exactly matches the type of *A. alpina*, which is from Lapland (Malte 1934; Porsild 1965). If one uses a strict typological species concept then this is true, but we recognize that this species complex is composed of innumerable

apomictic clones and are circumscribing a broad species concept for *A. alpina*. The list of synonyms presented above is still somewhat incomplete and a revision of this complex is forthcoming. It is likely that infraspecific categories will be recognized to describe major subspecific groups in *A. alpina*, similar to what was done for the other large polyploid complexes such as *A. howellii* and *A. rosea*. The species in North America is gynoeious and is characterized by its dark green to black phyllaries and conspicuous flags on the upper cauline leaves. The basal leaves vary from glabrous, as in the type material, to pubescent.

2. *A. anaphaloides* Rydb., Mem. N.Y. Bot. Gard. 1: 409. 1900

= *A. pulcherrima* ssp. *anaphaloides* (Rydb.) Wm. Weber

TYPE LOCALITY: Spanish Basin, Montana, U.S.A.

The species is native to the northern Rocky Mountains and is characterized by whitish phyllaries with a small black spot at their base. There appears to be some morphological overlap between this species and *A. pulcherrima*. However, the two taxa do occur in different habitats: *A. anaphaloides* occurs in dry meadows and aspen forest openings, while *A. pulcherrima* is found in moist willow thickets along streams (Urbanska 1983). Future research on this taxon may indicate that it is best to follow Weber's (1987) concept of the taxon and reduce it to an infraspecific taxon under *A. pulcherrima*.

3. *A. arcuata* Cronq., Leaf. West. Bot. 6:41. 1950

TYPE LOCALITY: Carey, Blaine Co., Idaho, U.S.A.

This is one of the rarest species of *Antennaria*, known from three widely disjunct areas in Idaho, Nevada, and Wyoming (Bayer 1992). It occurs in moist alkaline basins in sagebrush steppe and is characterized by its long arching stolons and white woolly indumentum (Bayer 1992). No one has ever questioned the distinctness of this species and it is not easily confused with any other species of *Antennaria*.

4. *A. argentea* Benth., Plantae Hartweg. 319. 1849

= *A. luzuloides* var. *argentea* (Benth.) A. Gray

TYPE LOCALITY: In montibus Sacramento, California, U.S.A.

This species is closely related to *A. luzuloides* and *A. microcephala*, but is readily distinguished by its robustly stoloniferous habit and its silvery white phyllaries. It occurs in openings in dry coniferous forests from Oregon and western Nevada to northern California (Bayer and Stebbins 1987).

5. *A. aromatica* Evert, Madrono, 31: 109–112. 1984

TYPE LOCALITY: Beartooth Plateau, Carbon Co., Montana, U.S.A.

This recently discovered species is narrowly endemic to sub-alpine limestone talus in northwest Wyoming, western Montana, and southern Alberta (Bayer 1989c, 1991b). It is characterized by its distinct glandulosity, cuneate leaves, and odor of citronella in crushed leaves of living material. *Antennaria aromatica* is most closely related to *A. densifolia* of the Northwest territories and Yukon (Bayer 1989c). Some collections of pistillate plants

from Colorado and other areas of the Rockies superficially resemble and undoubtedly have *A. aromatica* in their parentage. However, they are nonglandular and odorless. They are closer to the type of *A. pulvinata*, which is recognized under the circumscription of *A. rosea*, as *A. rosea* ssp. *pulvinata* (Bayer 1989c).

6. *A. corymbosa* E. Nels., Bot. Gaz. 27: 212. 1899
= *A. acuta* Rydb., *A. dioica* (L.) Gaertn. var. *corymbosa* (E. Nels.) Jeps., *A. hygrophila* E.L. Greene, *A. nardina* E.L. Greene

TYPE LOCALITY: Battle Lake, Sierra Madre Range, Wyoming, U.S.A.

Antennaria corymbosa is found in moist willow thickets at subalpine to alpine elevations in the northern Rockies and Sierra Nevada (Bayer and Stebbins 1987; Bayer et al. 1991). It is characterized by its long linear-oblongeolate basal leaves and white-tipped phyllaries with a distinct black spot near the base of the scarious portion. This taxon is not easily confused with any other species of the genus. A black-phyllaried form, referable to the name *A. acuta* Rydb., occurs sporadically throughout the range of the species (Bayer 1988).

7. *A. densifolia* A.E. Pors., Bull. Natl. Mus. Can. No. 101. 1945

= *A. ellyae* A.E. Pors.

TYPE LOCALITY: District of MacKenzie, Northwest Territories, Canada.

Like *A. aromatica*, this narrow endemic is found on limestone talus below the tree line. It differs from *A. aromatica* in being nonglandular and other characters of the key. It is found in the MacKenzie, Richardson, and Ogilvie Mountains of the District of MacKenzie and Yukon Territory (Bayer 1989c). One disjunct population of *A. densifolia* was recently found in Granite Co., Montana. A detailed taxonomic treatment of *A. aromatica* and *A. densifolia* with complete distribution maps is found in Bayer (1989c).

8. *A. dimorpha* (Nutt.) Torr. & A. Gray, Flora N. Am. 2: 431. 1843

BASIONYM: *Gnaphalium dimorphum* Nutt., Trans. Am. Philos. Soc. II, 7: 405. 1841

= *A. dimorpha* (Nutt.) Torr. & A. Gray var. *macrocephala* Eaton, *A. dimorpha* (Nutt.) Torr. & A. Gray var. *integra* Henderson, *A. dimorpha* (Nutt.) Torr. & A. Gray var. *nuttallii* Eaton, *A. latisquama* Piper, *A. macrocephala* (Eaton) Rydb.

TYPE LOCALITY: On the Black Hills of the Platte, U.S.A.

This species is widely distributed in western North America from Alberta and British Columbia to near the Mexican border. It is perhaps the most xerophytic of all the *Antennaria* species, occurring on sagebrush steppe, blooms in the early spring of the year, and is most closely related to *A. flagellaris* and *A. stenophylla* (Bayer 1990a). *Antennaria dimorpha* is characterized by its narrowly oblanceolate leaves and relatively large solitary heads.

9. *A. dioica* (L.) Gaertn., De Fruct. Sem. Pl. 2: 410. 1791

BASIONYM: *Gnaphalium dioicum* L. Sp. Pl. 850. 1753

= *A. hyperborea* D. Don, *A. insularis* E.L. Greene

TYPE LOCALITY: Habitat in Europae apricis aridis.

Antennaria dioica is widely distributed across Eurasia from the British Isles to Japan and its range extends east into North America only in the Aleutian Islands. It is characterized by

glabrous adaxial leaf surfaces and pink or white bracts. The circumscription of *A. dioica* in North America has long been a topic of debate, as *A. marginata* (syn. *A. dioica* var. *marginata* (Greene) Jeps.) of the southwestern states bears a remarkable similarity to *A. dioica*. The two species differ by the characters of the key, as well as being strongly allopatric, and it seems best to recognize the two as distinct species.

10. *A. eucosma* Fern. & Wieg., Rhodora, 13: 23. 1911

? = *A. carpatica* (Wahl.) Bl. & Fingerh. var. *humilis* Hook.

TYPE LOCALITY: Table Mountain, Port au Port Bay, western Newfoundland, Canada.

This species is endemic to western Newfoundland and Anticosti Island. Its morphological similarity to *A. pulcherrima* is obvious, and the two are separated only by the presence of prominent flags in *A. pulcherrima* and absence in *A. eucosma*. A.E. Porsild, who had a very narrow species concept in *Antennaria*, included it as a synonym of *A. pulcherrima* (Porsild 1965). It may be best to recognize *A. eucosma* as a infraspecific taxon under *A. pulcherrima* (see discussion under *A. anaphaloides*).

11. *A. flagellaris* (A. Gray) A. Gray, Proc. Am. Acad. Arts Sci. 17: 212. 1882

BASIONYM: *A. dimorpha* var. *flagellaris* A. Gray, Bot. Wilkes Exped. Phanol. 17: 366. 1874

TYPE LOCALITY: Between Spipen River and the north fork of the Columbia, Washington, U.S.A.

Antennaria flagellaris is among the most distinctive species of *Antennaria*, with its long, flagellate (whiplike with leaves only at the very end) stolons, and solitary heads. Related to *A. dimorpha* and *A. stenophylla*, it inhabits seasonally dry basins from Washington to California east to Wyoming and Idaho (Bayer and Stebbins 1987; Bayer 1990a).

- 12a. *A. friesiana* (Trautv.) Ekman ssp. *alaskana* (Malte) Hult., Ark. Bot. 7: 134. 1967

BASIONYM: *A. alaskana* Malte, Rhodora, 36: 107. 1934

TYPE LOCALITY: Near Port Clarence, Alaska, U.S.A.

The *A. friesiana* complex consists of *A. friesiana* ssp. *alaskana*, *A. friesiana* ssp. *nealaskana*, and *A. friesiana* ssp. *friesiana*, the former two being the dioecious (sexual) phases of the later gynoeious (asexual) form. The sexual populations are restricted to Alaska and cordilleran areas of northern Yukon and adjacent Northwest Territories (Bayer 1991a). The apomictic phase (ssp. *friesiana*) is almost circumpolar, occurring from the central and eastern Siberian plateau eastward across the North American Arctic to Greenland (Bayer 1991a). Hultén (1968) circumscribed a fourth subspecies within *A. friesiana* s.l., *A. friesiana* ssp. *compacta* (Malte) Hultén. After studying its morphology, both in the field and in the herbarium, it is apparent that Hultén's taxon contains at least three incongruous entities. These are probably not at all related to the other two subspecies of *A. friesiana*. Hultén's (1968) circumscription of *A. friesiana* ssp. *compacta* included *A. densifolia*, which we recognize as a distinct species, and *A. crymophila* Porsild and *A. nealaskana* Porsild as taxonomic synonyms. *Antennaria compacta* Malte s.str. and *A. crymophila* are perhaps hybrid apomicts and are included as synonyms under *A. alpina* (see Bayer 1991a for details). *Antennaria nealaskana* is treated as a subspecies of *A. friesiana* (see below).

- 12b. *A. friesiana* (Trautv.) Ekman ssp. *friesiana*, Ark. Bot. 7: 134. 1967

BASIONYM: *A. alpina* (L.) Gaertn. var. *friesiana* Trautv.,

- Tr. Imp. S. Peterb. Bot. Sada, 6: 24. 1878
 = *A. angustifolia* Ekman, *A. ekmaniana* A.E. Pors., *A. friesiana* (Trautv.) Ekman
 TYPE LOCALITY: Siberia, Russia.
 See above discussion under *A. friesiana* ssp. *alaskana*.
- 12c. *A. friesiana* (Trautv.) Ekman ssp. *neolaskana* (A.E. Pors.) Bayer and Stebbins comb. et stat. nov.
 BASIONYM: *A. neolaskana* A.E. Pors., *Sargentia*, 4: 71. 1943
 TYPE LOCALITY: Canada, Northwest Territories, HOLOTYPE: CAN!
 Subspecies *neolaskana* occurs from the eastern Brooks Range, Alaska, to the Richardson Mountains and into the central MacKenzie Mountains, on the Yukon – Northwest Territories boundary (Bayer 1991a). Its habitat is arctic fell fields or gravelly frost boils (Bayer 1991a). As was mentioned above, Hultén (1968) included this species in synonymy under *A. friesiana* ssp. *compacta*, but we believe it is best included as a separate subspecies of *A. friesiana*. It intergrades somewhat with the other two subspecies of *A. friesiana*. The taxon can be separated from other arctic members *Antennaria* because it is dioecious, pleiocephalous, and has well-developed elongate stolons.
13. *A. geyeri* A. Gray, Mem. Am. Acad. II, 4: 107. 1849
 TYPE LOCALITY: Arid sandy woods near Tshimakaine, Spokane[e], Country, Washington, U.S.A.
 This species is very distinctive because it has woody upright branches and is nonstoloniferous. It lacks basal leaves and has heads that are often described as sub-dioecious (central flowers are often hermaphroditic). The species is not closely related to any other species of *Antennaria* and in fact bears strong similarities to some species of *Anaphalis* (Bayer 1990a). *Antennaria geyeri* occurs in dry pine forests from Washington and California and northwestern Nevada (Bayer and Stebbins 1987).
- 14a. *A. howellii* E.L. Greene ssp. *canadensis* (E.L. Greene) Bayer, Brittonia, 41: 397. 1989e
 BASIONYM: *A. canadensis* E.L. Greene, Pittonia, 3: 275. 1898
 = *A. canadensis* E.L. Greene var. *randii* Fern., *A. canadensis* E.L. Greene var. *spatulata* Fern., *A. neglecta* E.L. Greene var. *randii* (Fern.) Cronq., *A. neodioica* E.L. Greene ssp. *canadensis* (E.L. Greene) Bayer & Stebbins, *A. neodioica* E.L. Greene var. *randii* (Fern.) Boivin, *A. spatulata* (Fern.) Fern.
 TYPE LOCALITY: Rocky places, Campbellton, New Brunswick, Canada.
 The *A. howellii* species complex is highly variable morphologically and four more or less distinct subspecies can be recognized within it. The species is entirely gynodioecious and its range extends from the Appalachians and Atlantic seaboard across boreal Canada to the Pacific coast. Subspecies *canadensis* is almost exclusively restricted to the eastern half of North America. Cronquist (1945) and Gleason and Cronquist (1991) included members of this complex as synonyms of *A. neglecta*, but we maintain that since these apomicts are of hybrid polyploid origin from among many sexual progenitors, they best not be included under the circumscription of any one sexual progenitor, i.e., *A. neglecta* (for detailed discussion of this debate see Bayer 1989e, page 397). This subspecies is probably most closely related to *A. racemosa* and *A. neglecta*. (See Bayer 1985a for a complete discussion of the origins of the complex.)
- 14b. *A. howellii* E.L. Greene ssp. *howellii*, Brittonia, 41: 396. 1989d
 BASIONYM: *A. howellii* E.L. Greene, Pittonia, 3: 174. 1897 (27 May)
 = *A. callilepis* E.L. Greene, *A. exima* E.L. Greene, *A. neglecta* E.L. Greene var. *howellii* (E.L. Greene) Cronq., *A. neglecta* E.L. Greene ssp. *howellii* (E.L. Greene) Hult., *A. neodioica* E.L. Greene ssp. *howellii* (E.L. Greene) Bayer
 TYPE LOCALITY: St. Helens, Oregon, U.S.A.
 Subspecies *howellii* is most common in the western half of the range of *A. howellii*. Based on morphology, it is obvious that the group of apomicts is closely related to *A. racemosa* (Bayer 1985a).
- 14c. *A. howellii* E.L. Greene ssp. *neodioica* (E.L. Greene) Bayer, Brittonia, 41: 397. 1989e
 BASIONYM: *A. neodioica* E.L. Greene, Pittonia, 3: 184. 1897 (20 July). Note: As pointed out earlier (Bayer 1989e), the transfer of *A. neodioica* ssp. *neodioica* to *A. howellii* as a subspecies was necessary because of the nomenclatural priority of *A. howellii* over *A. neodioica* by 2 months.
 = *A. grandis* (Fern.) House, *A. neglecta* E.L. Greene var. *attenuata* (Fern.) Cronq., *A. neglecta* E.L. Greene var. *neodioica* (E.L. Greene) Cronq., *A. neodioica* E.L. Greene ssp. *neodioica*, *A. neodioica* E.L. Greene var. *attenuata* Fern., *A. neodioica* E.L. Greene var. *chlorophylla* Fern., *A. neodioica* E.L. Greene var. *grandis* Fern., *A. neodioica* E.L. Greene var. *interjecta* Fern., *A. neodioica* E.L. Greene var. *rupicola* (Fern.) Fern., *A. neodioica* E.L. Greene var. *typica* Fern., *A. obovata* E. Nels., *A. rupicola* Fern.
 TYPE LOCALITY: Bushkill, Pennsylvania, U.S.A.
 It is likely that *A. virginica* is the primary sexual progenitor of apomicts circumscribed under subspecies *neodioica* (Bayer 1985a). This subspecies is most common in the eastern half of the range of *A. howellii*, although it is also found sporadically in the west-central portion of the range as far west as Montana and Alberta.
- 14d. *A. howellii* E.L. Greene ssp. *petaloidea* (Fern.) Bayer, Brittonia, 41: 397. 1989e
 BASIONYM: *A. neodioica* E.L. Greene var. *petaloidea* Fern., Proc. Boston Soc. Nat. Hist. 28: 245. 1898
 = *A. appendiculata* Fern., *A. concolor* Piper, *A. neglecta* E.L. Greene var. *petaloidea* (Fern.) Cronq., *A. neodioica* E.L. Greene ssp. *petaloidea* (Fern.) Bayer & Stebbins, *A. pedicellata* E.L. Greene, *A. petaloidea* (Fern.) Fern., *A. petaloidea* (Fern.) Fern. var. *novaboracensis* Fern., *A. petaloidea* (Fern.) Fern. var. *scariosa* Fern., *A. petaloidea* (Fern.) Fern. var. *subcorymbosa* (Fern.) Fern., *A. stenolepis* E.L. Greene
 TYPE LOCALITY: Near the Town Hall, Jaffrey, New Hampshire, U.S.A.
 This subspecies is most common in the eastern half of the range of *A. howellii* but is also frequent as far west as British Columbia and Washington. Its sexual progenitors include *A. plantaginifolia* and *A. neglecta* (Bayer 1985a).
15. *A. lanata* (Hook.) E.L. Greene, Pittonia, 3: 288. 1898
 BASIONYM: *A. carpatica* (Wahl.) Bl. & Fingerh. *β lanata* Hook., Flora Bor. Am. 1: 329. 1834
 TYPE LOCALITY: Summits of the most elevated among the Rocky Mountains, lat. 52°, Canada.
Antennaria lanata occurs in alpine habitats in the northern Rocky Mountains and Cascade Mountains of British Columbia (Bayer and Stebbins 1987). It is closely related to the other members of this "pulcherrima" group (Carpaticae of some authors), *A. pulcherrima*, *A. eucosma*, and *A. anaphaloides*

(Bayer 1990a). This taxon is perhaps the most distinct species of the pulcherrima group in North America.

16a. *A. luzuloides* Torr. & A. Gray ssp. *luzuloides*
A. luzuloides Torr. & A. Gray, Flora N. Am. 2: 430. 1843
 = *A. luzuloides* var. *oblanceolata* (Rydb.) Peck, *A. oblanceolata* Rydb.

TYPE LOCALITY: Oregon or Rocky Mountains, U.S.A.

The typical subspecies occurs in dry sagebrush-ponderosa pine communities from British Columbia and Alberta south to California and Wyoming (Bayer and Stebbins 1987). It is characterized by its nonstoloniferous habit and relatively small heads in corymbose capitulescences that are often broader than tall.

16b. *A. luzuloides* Torr. & A. Gray ssp. *aberrans* (E. Nels.)
 Bayer and Stebbins comb.nov.

BASEONYM: *A. argentea* ssp. *aberrans* E. Nels., Bot. Gaz. 34: 124. 1902. TYPE in US.

= *A. microcephala* A. Gray, *A. pyramidata* Greene.

TYPE LOCALITY: Mt. Shasta, California, U.S.A.

Although some authors recognized *A. microcephala* as a distinct species, enough intergradation exists between *A. luzuloides* s.str. and *A. microcephala* s.str. that a circumscription as one species with two fairly distinct subspecies seems more justified. This makes it necessary to resurrect E. Nelson's rather inappropriate epithet "aberrans," as he had erroneously thought of this taxon as an aberrant form of *A. argentea*. Like the typical subspecies, it is characterized by its nonstoloniferous habit and relatively small heads; but the heads in subspecies *aberrans* are in racemose-paniculate capitulescences that are usually taller than broad. Perhaps the largest difference between the subspecies is not morphological but in habit preference. Subspecies *aberrans* occurs in moist meadows and drainages in the ponderosa pine zone from Oregon and California to northwestern Nevada, while subspecies *luzuloides* occurs in much drier habitats (R.J. Bayer and G.L. Stebbins, personal observation) and has a much broader range (see above).

17. *A. marginata* E.L. Greene, Pittonia, 3: 290. 1898
 = *A. dioica* (L.) Gaertn. var. *marginata* (E.L. Greene) Jeps.,
A. fendleri E.L. Greene, *A. marginata* E.L. Greene var.
glandulifera A. Nels., *A. permoena* E.L. Greene

TYPE LOCALITY: New Mexico, U.S.A.

Antennaria marginata is so named because of the rim of white hairs that projects around the periphery of the adaxially glabrous leaves from the pubescent undersurface. The species has both dioecious and gynoeious populations and a wide range of cytotypes ranging from diploid to decaploid (Bayer and Stebbins 1987). Since the species is likely one of the sexual progenitors of the *A. parvifolia* polyploid complex, some morphological overlap occasionally occurs between the two taxa. Identification problems can usually be easily resolved based on the state of the pubescence of the basal leaves. The species is endemic to New Mexico, Arizona, Chihuahua, Coahuila, and adjacent portions of southeastern California, and extreme southwestern Colorado.

18. *A. media* E.L. Greene, Pittonia, 3: 286. 1898
 = *A. alpina* (L.) Gaertn. var. *media* (E.L. Greene) Jeps.,
A. austromontana E. Nels., *A. candida* E.L. Greene,
A. densa E.L. Greene, *A. modesta* E.L. Greene, *A. mucronata* E. Nels.

TYPE LOCALITY: Mts. above Coldstream, Placer Co., California, U.S.A.

Antennaria media is common throughout western North

America from Arizona and New Mexico to Alaska and both dioecious and gynoeious populations are encountered (Bayer and Stebbins 1987). The dioecious (sexual) populations are restricted primarily to California and Oregon (Bayer et al. 1990). The main distinction between *A. media* and *A. alpina* is the presence of flat, scarious, tips (flags), at the ends of the upper cauline leaves in *A. alpina*, which are mostly absent in *A. media* (Bayer 1989d, 1990d). Additionally, the phyllaries of the pistillate plants in *A. alpina* tend to be quite acute, whereas they are blunter in *A. media*. Considerable overlap seems to exist between the two taxa and it may be more reasonable to follow the lead of Jepson (1925) and some later authors and recognize *A. media* as a subspecific variant of *A. alpina*. Further investigation on this problem is needed before a final decision is made (see additional comments under *A. alpina*).

19. *A. microphylla* Rydb., Bull. Torrey Bot. Club, 24: 303. 1897
 = *A. bracteosa* Rydb., *A. microphylla* Rydb. var. *solstitialis*
 Lunell, *A. nitida* E.L. Greene, *A. solstitialis* Lunell

TYPE LOCALITY: Manhattan, Montana, U.S.A.

The range of *A. microphylla* extends from New Mexico to Yukon Territory in the Rockies and east to Minnesota and Northern Ontario (Bayer and Stebbins 1987; Bayer et al. 1991). Cronquist (1955) preferred to include *A. rosea* within his circumscription of *A. microphylla*, but the two are really quite distinct. *Antennaria microphylla* is always dioecious, whereas *A. rosea* is always gynoeious. Additionally, *A. microphylla* always has white phyllaries, whereas *A. rosea* only occasionally has white phyllaries. Weber's (1987) keen observation that *A. microphylla* has glandular hairs on the upper stem whereas *A. rosea* does not is also a convenient key character difference. Several authors (Porsild 1950; Moss 1959; Porsild and Cody (1980) recognized *A. nitida* as a distinct species of *Antennaria*, but comparisons of the types of the two species shows that they are identical; therefore the older name, *A. microphylla*, is the correct one. After a reevaluation of the type of *A. bracteosa* Rydb., it is now included in synonymy under *A. microphylla*, whereas previously it was treated under the circumscription of *A. rosea* ssp. *rosea* (Bayer 1989d). It represents a very robust specimen of *A. microphylla*.

20a. *A. monocephala* DC. ssp. *angustifolia* (E.L. Greene) Hult.,
 Ark. Bot. 7: 135. 1967

BASEONYM: *A. angustata* E.L. Greene, Pittonia, 3: 284. 1898
 = *A. burwellensis* Malte, *A. congesta* Malte, *A. fernaldiana*
 Polunin, *A. hudsonica* Malte, *A. megacephala* Fern.,
A. pygmaea Fern., *A. tansleyi* Polunin, *A. tweedsmuirii*
 Polunin

TYPE LOCALITY: Coast of Hudson's Strait, Northwest Territories, Canada.

It seems reasonable to partly follow Hultén's (1968) broad concept of *A. monocephala* (Bayer 1991a). Hultén (1968) circumscribed *A. monocephala* as containing three subspecies. The sexual phase of *A. monocephala* (i.e., ssp. *monocephala* and ssp. *philonipha*) is confined to southern Alaska, south of the Brooks Range and to Yukon Territory and areas of the Northwest Territories immediately adjacent to it (Hultén 1968; R.J. Bayer, personal observation). Within his concept of *A. monocephala* s.l., Hultén (1968) also circumscribed the apomictic form of the species as *A. monocephala* ssp. *angustata*, extending the range of the species across the Canadian Arctic into Greenland and down the western Cordillera into Montana and Wyoming. *Antennaria monocephala* s.l. is most often found on the disturbed margins of solifluction lobes or on

unstable, moist, gravelly sloping tundra (Bayer 1991a).

20b. *A. monocephala* DC. ssp. *monocephala*, Ark. Bot. 7: 135. 1967

BASIONYM: *A. monocephala* DC, Prodr. 6: 269. 1837
 = *A. exilis* E.L. Greene, *A. monocephala* DC. ssp. *monocephala* var. *exilis* (E.L. Greene) Hult., *A. monocephala* DC. ssp. *philonipha* (A.E. Pors.) Hult., *A. nitens* E.L. Greene, *A. philonipha* A.E. Pors.

TYPE LOCALITY: Port Clarence, Alaska, U.S.A.

Hultén's (1968) key distinctions between *A. monocephala* ssp. *monocephala* and *A. monocephala* ssp. *philonipha* are obscure and seemingly arbitrary; therefore ssp. *philonipha* has been subsumed into ssp. *monocephala* (Bayer 1991a). *Antennaria exilis* is a pubescent form of *A. monocephala*, but there is intergradation between this form and the typical glabrous form. Therefore, it does not seem warranted to give taxonomic recognition to the two forms. See additional notes above under ssp. *angustata*.

21. *A. neglecta* E.L. Greene, Pittonia, 3: 173. 1897

= *A. athabascensis* E.L. Greene, *A. campestris* Rydb., *A. chelonica* Lunell, *A. erosa* E.L. Greene, *A. longifolia* E.L. Greene, *A. lunellii* E.L. Greene, *A. nebrascensis* E.L. Greene, *A. neglecta* E.L. Greene var. *neglecta*, *A. neglecta* E.L. Greene var. *simplex* Peck, *A. parvula* E.L. Greene, *A. wilsonii* E.L. Greene.

TYPE LOCALITY: Catholic University grounds, District of Columbia, U.S.A.

This sexual species is one of the sexual progenitors of the *A. howellii* polyploid complex (see additional notes under *A. howellii*). The species is widespread, occurring in grasslands and pastures from the Atlantic seaboard to the west-central Great Plains from Colorado to Alberta (Bayer and Stebbins 1982). The most characteristic features of this species are its long lashlike stolons that bear reduced leaves except at their ends, flags on the upper cauline leaves, and basal leaves that are glabrous or glabrescent with age (Bayer and Stebbins 1982).

22a. *A. parlinii* Fern. ssp. *fallax* (E.L. Greene) Bayer and Stebbins, Syst. Bot. 7: 310. 1982

BASIONYM: *A. fallax* E.L. Greene, Pittonia, 3: 321. 1898
 = *A. ampla* Bush, *A. arkansana* E.L. Greene, *A. arnoglossa* E.L. Greene var. *ambigens* E.L. Greene, *A. bifrons* E.L. Greene, *A. brainerdii* Fern., *A. calophylla* E.L. Greene, *A. farwellii* E.L. Greene, *A. greenii* Bush, *A. mesochora* E.L. Greene, *A. munda* Fern., *A. occidentalis* E.L. Greene, *A. plantaginifolia* (L.) Richards. var. *ambigens* (E.L. Greene) Cronq., *A. umbellata* E.L. Greene

TYPE LOCALITY: Terra Cotta, District of Columbia, U.S.A.

The *A. parlinii* complex consists of two fairly distinct subspecies that are differentiable by indumentum characters of the basal leaves, pubescent in ssp. *fallax* and glabrous in ssp. *parlinii*, as well as other characters of the key (Bayer and Stebbins 1982). *Antennaria parlinii* is distributed in forest opening throughout the deciduous forest of eastern North America from Georgia and Texas to Ontario, Maine, and Atlantic Canada (Bayer and Stebbins 1982, 1983). The complex is composed of polyploid sexual and apomictic populations and is the result of multiple hybridization from among several sexual diploid species including *A. plantaginifolia*, *A. racemosa*, and *A. solitaria* (Bayer 1985b, Bayer and Crawford 1986). Cronquist (1945) and Gleason and Cronquist (1991) included *A. parlinii* within their circumscription of the diploid *A. plantaginifolia*. By not including the hybrid polyploid within the circumscription of a

single one of its sexual progenitors, we present a classification that better portrays the evolutionary relationships between *A. parlinii* and its sexual progenitors. We have applied a similar taxonomic philosophy in the *A. howellii* and *A. rosea* complexes.

22b. *A. parlinii* Fern. ssp. *parlinii*, Syst. Bot. 7: 311. 1982

BASIONYM: *A. parlinii* Fern., Gard. For. 10: 284. 1897
 = *A. arnoglossa* E.L. Greene, *A. parlinii* Fern. var. *arnoglossa* (E.L. Greene) Fern., (*A. plantaginifolia* (L.) Richards. var. *arnoglossa* (E.L. Greene) Cronq., *A. plantaginifolia* (L.) Richards. var. *parlinii* (Fern.) Cronq., *A. propinqua* E.L. Greene

TYPE LOCALITY: North Berwick, Maine, U.S.A.

Subspecies *parlinii* is the glabrous form of *A. parlinii*. This key trait is undoubtedly inherited from one of its sexual progenitors, *A. racemosa* (Bayer 1985b; Bayer and Crawford 1986). See notes under *A. parlinii* ssp. *fallax* for additional information on this species complex.

23. *A. parvifolia* Nutt., Trans. Am. Philos. Soc. II, 7: 406. 1841

= *A. aprica* E.L. Greene, *A. aureola* Lunell, *A. dioica* (L.) Gaertn. var. *parvifolia* (Nutt.) Torr. & A. Gray, *A. holmii* E.L. Greene, *A. latisquamea* E.L. Greene, *A. minuscula* Boivin, *A. recurva* E.L. Greene, *A. rhodantha* Suksd.

TYPE LOCALITY: On the Black Hills and plains of the upper part of the Platte, U.S.A.

This polyploid species complex contains both sexual (dioecious) and asexual (gynocious) populations (Stebbins 1932b; Bayer and Stebbins 1987). It is quite variable morphologically, but no infraspecific subdivisions seem warranted at this time. The complex ranges from Alberta, Manitoba, and western Ontario south through the Rocky Mountains and western Great Plains to Oklahoma, New Mexico, Arizona, Chihuahua, and Nuevo Leon (Bayer and Stebbins 1987; G. Nesom, personal communication). *Antennaria parvifolia* is characterized by its short stature and relatively small number of large flowering heads. A common misspelling of the species epithet that often appears in floras is "parviflora" (see the key in *Great Plains Flora* (McGregor et al. 1986), *Flora of Alberta* (Moss 1959), *Flora of Canada* (Scoggan 1978), and others). In some floras, the species is confused with *A. microphylla*, but these are two very different species that are probably not closely related.

24. *A. plantaginifolia* (L.) Richards. in Hook., Flora Bor. Am. 1: 330. 1834

BASIONYM: *Gnaphalium plantaginifolium* L., Sp. Pl. 850. 1753

= *A. decipiens* E.L. Greene, *A. denikeana* Boivin, *A. nemoralis* E.L. Greene, *A. pinetorum* E.L. Greene, *A. plantaginifolia* (L.) Richards. var. *plantaginifolia*

TYPE LOCALITY: Eastern North America, U.S.A.

This species is one of the diploid progenitors of the *A. parlinii* complex and is similar to that species except that the heads are much smaller and the basal leaves are always gray pubescent on the adaxial surface (Bayer and Stebbins 1982; Bayer 1985b; Bayer and Crawford 1986). *Antennaria plantaginifolia* is found on dry ridgetops and slopes in forest openings throughout the Appalachian region from New England to Georgia and Arkansas (Bayer and Stebbins 1982). Disjunct populations also occur in the driftless area of Wisconsin and Minnesota (Bayer and Stebbins 1982).

25. *A. pulchella* E.L. Greene, Leaf. Bot. Observ. Crit. 2: 149. 1911

=*A. alpina* (L.) Gaertn. var. *scabra* (E.L. Greene) Jeps.,
A. media E.L. Greene ssp. *ciliata* E. Nels., *A. scabra*
E.L. Greene

TYPE LOCALITY: Mt. Goddard, alt. 11 000, California, U.S.A.

Antennaria pulchella is one of the diploid progenitors of *A. media* and consequently the *A. alpina* complex (Bayer 1990d). *Antennaria scabra* is a glandular form of *A. pulchella* and is considered to be part of the variation within that taxon (Bayer 1990d). The sexually reproducing diploid, *A. pulchella*, has a very restricted range in the subalpine-alpine zones of the southern Sierra Nevada from the area around Lake Tahoe to the Mt. Whitney region (Bayer 1990d). *Antennaria pulchella* is easily differentiated from *A. media* by its shorter pistillate or staminate corolla lengths and shorter cauline leaves (Bayer 1990d).

26. *A. pulcherrima* (Hook.) E.L. Greene, Pittonia, 3: 176. 1897

BASIONYM: *A. carpatica* (Wahl.) Bl. & Fingerh. var. *pulcherrima* Hook., Flora Bor. Am. 1: 329. 1834

=*A. pulcherrima* (Hook.) E.L. Greene var. *angustisquama* A.E. Pors., *A. pulcherrima* (Hook.) E.L. Greene var. *sordida* Boivin

TYPE LOCALITY: Rocky Mountains.

The species is indigenous to the northern Rocky Mountains but is also widespread across boreal and subarctic North America from Quebec to Alaska. It is characterized by whitish phyllaries with a large black spot at their base (Bayer and Stebbins 1987). There appears to be some morphological overlap between this species and *A. anaphaloides*, and future research may indicate that it is best include *A. anaphaloides* under the circumscription of *A. pulcherrima*, following Weber's (1987) concept of the taxon. See additional notes under *A. pulcherrima* and *A. eucosma*.

27. *A. racemosa* Hook., Flora Bor. Am. 1: 330. 1834

=*A. petasites* E.L. Greene, *A. piperi* Rydb.

TYPE LOCALITY: Alpine woods of the Rocky Mountains.

This is one of the most distinct and easily recognizable species of *Antennaria*, characterized by adaxially glabrous basal leaves and an open racemose to panicle arrangement of heads (Bayer 1985b). It is frequent in the Rockies from Wyoming to Alberta and British Columbia but is also found infrequently in the Cascades of Washington, Oregon and northernmost California (Bayer and Stebbins 1987). *Antennaria racemosa* is one of the sexual progenitors of the *A. parlinii* agamic complex (Bayer 1985b; Bayer and Crawford 1986).

28a. *A. rosea* E.L. Greene ssp. *arida* (E. Nels.) Bayer, Brittonia, 41: 57. 1989d

BASIONYM: *A. arida* E. Nels., Bot. Gaz. 27: 210. 1899

=*A. arida* ssp. *viscidula* E. Nels., *A. scariosa* E. Nels.

TYPE LOCALITY: Tipton, SW Wyoming, U.S.A.

The *A. rosea* polyploid agamic complex is one of the most morphologically diverse and widespread complexes of North American *Antennaria*. It occurs from the western cordillera of North America from southern California, Arizona, and New Mexico north to subarctic Alaska and east to Greenland. Additionally, *A. rosea* occurs disjunctly in the Canadian Maritime Provinces, eastern Quebec, and immediately north of and adjacent to Lake Superior (Bayer and Stebbins 1987; Bayer et al. 1991). The group is taxonomically confusing because of numerous agamosperous microspecies having been recognized as distinct species. Morphometric and isozyme analyses demonstrated that the primary source of morphological variability in

the complex derives from six sexually reproducing progenitors, *A. aromatica*, *A. corymbosa*, *A. pulchella*, *A. microphylla*, *A. racemosa*, and *A. umbrinella* (Bayer 1989b, 1990b). Additionally, two other sexually reproducing species, *A. marginata* and *A. rosulata*, may have contributed to the genetic complexity of the *A. rosea* complex (Bayer 1990b). Four reasonably distinct subspecies can be recognized within the complex, all differing from each other by the characters of the key. Subspecies *arida* is most closely related to *A. microphylla* (Bayer 1989d), as shown by their similar morphology.

28b. *A. rosea* E.L. Greene ssp. *confinis* (E.L. Greene) Bayer, Brittonia, 41: 57. 1989d

BASIONYM: *A. confinis* E.L. Greene, Pittonia, 4: 40. 1899

=*A. albicans* Fern., *A. arida* E. Nels. *humilis* (Rydb.) E. Nels., *A. angustifolia* Rydb., *A. breitungii* A.E. Pors., ?*A. brevistyla* Fern., *A. concinna* E. Nels., *A. dioica* (L.) Gaertn. var. *kernensis* Jeps., *A. elegans* A.E. Pors., *A. foliacea* E.L. Greene var. *humilis* Rydb., *A. incarnata* A.E. Pors., *A. laingii* A.E. Pors., *A. leontopodioides* Cody, *A. leuchippi* M.T. Pors., *A. polyphylla* E.L. Greene (nomen nudum), *A. rosea* E.L. Greene var. *angustifolia* (Rydb.) E. Nels., *A. sedoides* E.L. Greene, *A. sordida* E.L. Greene, *A. subviscosa* Fern., *A. tomentella* E. Nels.

TYPE LOCALITY: Santa Catalina Mountains, Arizona, U.S.A.

Subspecies *confinis* is most closely related to *A. pulchella* and *A. umbrinella* (Bayer 1989d), as shown by its relatively small basal leaves and smallish heads that usually have dark phyllaries. For additional comments on the *A. rosea* complex see above under *A. rosea* ssp. *arida*.

28c. *A. rosea* E.L. Greene ssp. *pulvinata* (E.L. Greene) Bayer, Brittonia, 41: 59. 1989d

BASIONYM: *A. pulvinata* E.L. Greene, Pittonia 3: 287. 1898

=*A. affinis* Fern., *A. albescens* (E. Nels.) Rydb., *A. fusca* E. Nels., *A. gaspensis* (Fern.) Fern., *A. isolepis* E.L. Greene, *A. maculata* E.L. Greene, *A. manicouagana* Landry, *A. neglecta* E.L. Greene var. *gaspensis* (Fern.) Cronq., *A. neodioica* E.L. Greene var. *gaspensis* Fern., *A. peasei* Fern., *A. pulvinata* E.L. Greene ssp. *albescens* E. Nels., *A. sansonii* E.L. Greene, *A. straminea* Fern.

TYPE LOCALITY: Moose Mt., Elbow River, Alta., Mountain slope, alt. 6200–7000', Alberta, Canada.

Antennaria aromatica is undoubtedly one of the sexual progenitors of *A. rosea* ssp. *pulvinata* (Bayer 1989c, 1989d), as evidenced by its comparatively short stature and relatively low number of large heads. For additional comments on the *A. rosea* complex see above under *A. rosea* ssp. *arida*.

28d. *A. rosea* E.L. Greene ssp. *rosea*

BASIONYM: *A. rosea* E.L. Greene, Pittonia, 3: 281. 1898

=*A. acuminata* E.L. Greene, *A. alborosea* A.E. Pors. in M.P. Pors., *A. chlorantha* E.L. Greene, *A. formosa* E.L. Greene, *A. hendersoni* Piper, *A. imbricata* E. Nels., *A. lanulosa* E.L. Greene, *A. oxyphylla* E.L. Greene, *A. rosea* E.L. Greene subsp. *divaricata* E. Nels., *A. speciosa* E. Nels.

TYPE LOCALITY: Mountain Meadows, Kootenai Co., Idaho, U.S.A.

The typical subspecies is most closely related to *A. corymbosa* and *A. racemosa* (Bayer 1989d), as shown by its long basal leaves that range from pubescent to glabrous. For additional comments on the *A. rosea* complex see above under *A. rosea* ssp. *arida*.

29. *A. rosulata* Rydb., Bull. Torrey Bot. Club, 24: 300. 1897 = *A. bakeri* Greene (nomen nudum), *A. serrae-blancae* Rydb.

TYPE LOCALITY: Allen's Park, Mogollon Mts., Arizona, U.S.A.

Antennaria rosulata is one of the most easily recognizable species of the genus, with its silvery gray leaves, dense humifuse growth form, and mostly monocephalous acaulescent flower stalks (Bayer 1987b). Its distribution is centered on the four corners area, the species being widespread in Arizona, New Mexico, southern Colorado, and southern Utah (Bayer and Stebbins 1987; Bayer et al. 1991).

30. *A. soliceps* Blake, Proc. Biol. Soc. Wash. 51: 7-8. 1938

TYPE LOCALITY: Charleston Mtns., Nevada, U.S.A.

Antennaria soliceps is a narrowly endemic apomict, known only from a small area of the Spring Mountains (Charleston Mountains) Clark county, southern Nevada (Bayer and Minish 1993). Its 6-km range is restricted to the talus areas of a ridge, composed of limestone at the tree line between Griffith Peak and Charleston Peak (3050 to 3400 m asl) (Bayer and Minish 1993). It is probably most closely related to *A. aromatica*, an amphimictic species occurring in the northern Rockies, and is characterized by a monocephalous flowering stalk and a cushion plant growth form (Bayer and Minish 1993).

31. *A. solitaria* Rydb., Bull. Torrey Bot. Club, 24: 304. 1897 = *A. monocephala* (Torr. & A. Gray) E.L. Greene not *A. monocephala* DC., *A. plantaginifolia* (L.) Richards. "B"

monocephala Torr. & A. Gray
TYPE LOCALITY: Louisiana, U.S.A.

With its large, many-veined, basal leaves and large-headed monocephalous flowering stalks, *A. solitaria* is another easily recognized species of *Antennaria* (Bayer and Stebbins 1982). It grows in moist deciduous forest slopes of the Appalachians and Piedmont from southern Pennsylvania, Ohio, and Indiana south to Louisiana and Georgia (Bayer and Stebbins 1982).

32. *A. stenophylla* (A. Gray) A. Gray, Proc. Am. Acad. 17: 213. 1882

BASIONYM: *A. alpina* (L.) Gaertn. var. *stenophylla* A. Gray, Bot. Wilkes Exp. 17: 366. 1874

= *A. leucophaea* Piper

TYPE LOCALITY: Spipen River, Washington, U.S.A.

Antennaria stenophylla is a xerophytic species that is related to *A. dimorpha* and *A. flagellaris* (Bayer 1990a). It occurs on dry sagebrush covered hillsides and dry margins around moist depressions in sagebrush steppe from central Washington to Idaho, south to northern Nevada (Bayer and Stebbins 1987). The species is easily distinguished by its narrow leaves and pleiocephalous flowering stems with dark brown or black phyllaried heads.

33. *A. suffrutescens* E.L. Greene, Pittonia, 3: 277. 1898

TYPE LOCALITY: Near Waldo, Josephine Co., Oregon, U.S.A.

This is one of the more distinctive species of *Antennaria*, characterized by suffrutescens growth form, small, emarginate, adaxially glabrous, coriaceous leaves, and large-headed monocephalous flower stalks. The species is endemic to serpentine soils in open montane pine forests in Curry and Josephine Co., Oregon, and neighboring Del Norte and Humboldt Co., California (Bayer and Stebbins 1987).

34. *A. umbrinella* Rydb., Bull. Torrey Bot. Club, 24: 302. 1897 = *A. aizoides* E.L. Greene, *A. flavescens* Rydb., *A. reflexa* E. Nels.

TYPE LOCALITY: Long Baldy, Little Belt Mts., Montana, U.S.A.

Antennaria umbrinella is one of the primary sexual progenitors of the *A. rosea* complex (Bayer 1990b). It is characterized by somewhat erect, somewhat woody stolons and phyllaries that are usually various shades of brown but can sometimes be white or streaked with pink (Bayer 1987b). The habitat of *A. umbrinella* is somewhat variable (Bayer et al. 1991), ranging from sagebrush steppe to dry coniferous forests to subalpine meadows. The species occurs from northern Colorado and northwestern California north to interior British Columbia and western Alberta (Bayer and Stebbins 1987; Bayer et al. 1991).

35. *A. virginica* Stebbins, Rhodora, 37: 230. 1935

= *A. neglecta* E.L. Greene var. *argillicola* (Stebbins) Cronq.,

A. neodioica E.L. Greene var. *argillicola* (Stebbins) Fern.,

A. virginica Stebbins var. *argillicola* Stebbins

TYPE LOCALITY: Open woods and roadsides, in shaly soil, Hanging Rock, Hampshire Co., West Virginia, U.S.A.

This species is endemic to Devonian age shale barrens from western Pennsylvania, western Virginia, West Virginia, to eastern Ohio (Stebbins 1935; Bayer and Stebbins 1982). We have always maintained that *A. virginica* is a distinct species (Stebbins 1936; Bayer and Stebbins 1982). In light of new evidence (Bayer and Stebbins 1982; Bayer 1985a; Bayer and Crawford 1986), Cronquist (Gleason and Cronquist 1991) agreed, when previously he had recognized it as a variety of *A. neglecta* (Cronquist 1945). It is one of the sexual progenitors of the *A. howellii* complex and is most closely related to *A. howellii* ssp. *neodioica* (Bayer 1985a). *Antennaria virginica* is dioecious and is characterized by its relatively small, spatulate, basal leaves and subulate-tipped cauline leaves, which serve to separate it from *A. neglecta* and the gynoecious *A. howellii* complex (Stebbins 1935; Bayer and Stebbins 1982).

Hybrid taxa

A few names represent hybrid or intermediate taxa. These include the following:

A. erigeroides E.L. Greene = *A. corymbosa* × *A. racemosa*

A. foliacea E.L. Greene = *A. microphylla* × *A. racemosa*

A. macounii E.L. Greene = *A. media* × *A. umbrinella*

A. oblancifolia E. Nels. = *A. racemosa* × *A. umbrinella*

A. rousseaui A.E. Pors. = ? *A. alpina* × *A. rosea*

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Appendix

Below is an alphabetized index of more than 200 names that are considered as synonyms of the recognized taxa. These are those names that have commonly appeared in twentieth century North American floras.

- A. acuminata* E.L. Greene = *A. rosea* ssp. *rosea*
A. acuta Rydb. = *A. corymbosa*
A. affinis Fern. = *A. rosea* ssp. *pulvinata*
A. aizoides E.L. Greene = *A. umbrinella*
A. alaskana Malte = *A. friesiana* ssp. *alaskana*
A. albescens (E. Nels.) Rydb. = *A. rosea* ssp. *pulvinata*
A. albicans Fern. = *A. rosea* ssp. *confinis*
A. alborosea A.E. Pors. in M.P. Pors. = *A. rosea* ssp. *rosea*
A. alpina (L.) Gaertn. var. *friesiana* Trautv. = *A. friesiana* ssp. *friesiana*
A. alpina (L.) Gaertn. var. *media* (E.L. Greene) Jeps. = *A. media*
A. alpina (L.) Gaertn. var. *scabra* (E.L. Greene) Jeps. = *A. pulchella*
A. alpina (L.) Gaertn. var. *stenophylla* A. Gray = *A. stenophylla*
A. ampla Bush = *A. parlinii* ssp. *fallax*
A. angustata E.L. Greene = *A. monocephala* DC. ssp. *angustata*
A. angustifolia Rydb. = *A. rosea* ssp. *confinis*
A. angustifolia Ekman = *A. friesiana* ssp. *friesiana*
A. appendiculata Fern. = *A. howellii* ssp. *petaloidea*
A. aprica E.L. Greene = *A. parvifolia*
A. arenicola Malte = *A. alpina*
A. argentea ssp. *aberrans* E. Nels. = *A. luzuloides* ssp. *aberrans*
A. arida E. Nels. = *A. rosea* ssp. *arida*
A. arida E. Nels. *humilis* (Rydb.) E. Nels. = *A. rosea* ssp. *confinis*
A. arida E. Nels. ssp. *viscidula* E. Nels. = *A. rosea* ssp. *arida*
A. arkansana E.L. Greene = *A. parlinii* ssp. *fallax*
A. arnoglossa E.L. Greene = *A. parlinii* ssp. *parlinii*
A. arnoglossa E.L. Greene var. *ambigens* E.L. Greene = *A. parlinii* ssp. *fallax*
A. athabascensis E.L. Greene = *A. neglecta*
A. atriceps Fern. = *A. alpina*
A. aureola Lunell = *A. parvifolia*
A. austromontana E. Nels. = *A. media*
A. bakeri E.L. Greene (nomen nudum) = *A. rosulata*
A. bayardi Fern. = *A. alpina*
A. bifrons E.L. Greene = *A. parlinii* ssp. *fallax*
A. bracteosa Rydb. = *A. microphylla*
A. brainerdii Fern. = *A. parlinii* ssp. *fallax*
A. breitungii A.E. Pors. = *A. rosea* ssp. *confinis*
A. brevistyla Fern. = ? *A. rosea* ssp. *confinis*
A. brunnescens Fern. = *A. alpina*
A. burwellensis Malte = *A. monocephala* ssp. *angustata*
A. callilepis E.L. Greene = *A. howellii* ssp. *howellii*
A. calophylla E.L. Greene = *A. parlinii* ssp. *fallax*
A. campestris Rydb. = *A. neglecta*
A. cana (Fern. and Wieg.) Fern. = *A. alpina*
A. canadensis E.L. Greene = *A. howellii* ssp. *canadensis*
A. canadensis E.L. Greene var. *randii* Fern. = *A. howellii* ssp. *canadensis*
A. canadensis E.L. Greene var. *spathulata* Fern. = *A. howellii* ssp. *canadensis*
A. candida E.L. Greene = *A. media*
A. canescens (Lge.) Malte = *A. alpina*
A. canescens (Lge.) Malte var. *pseudoporsildii* Böcher = *A. alpina*
A. carpatica (Wahl.) Bl. & Fingerh. var. *humilis* Hook. = *A. eucosma*
A. carpatica (Wahl.) Bl. & Fingerh. β *lanata* Hook. = *A. lanata*
A. carpatica (Wahl.) Bl. & Fingerh. var. *pulcherrima* Hook. = *A. pulcherrima*
A. chelonica Lunell = *A. neglecta*
A. chlorantha E.L. Greene = *A. rosea* ssp. *rosea*
A. columnaris Fern. = *A. alpina*
A. compacta Malte = *A. alpina*
A. concinna E. Nels. = *A. rosea* ssp. *confinis*
A. concolor Piper = *A. howellii* ssp. *petaloidea*
A. confinis E.L. Greene = *A. rosea* ssp. *confinis*
A. confusa Fern. = *A. alpina*
A. congesta Malte = *A. monocephala* ssp. *angustata*
A. crymophila A.E. Pors. = *A. alpina*
A. decipiens E.L. Greene = *A. plantaginifolia*
A. denikeana Boivin = *A. plantaginifolia*
A. densa E.L. Greene = *A. media*
A. dimorpha (Nutt.) Torr. & A. Gray var. *flagellaris* A. Gray = *A. flagellaris*
A. dimorpha (Nutt.) Torr. & A. Gray var. *integra* Henderson = *A. dimorpha*
A. dimorpha (Nutt.) Torr. & A. Gray var. *macrocephala* Eaton = *A. dimorpha*
A. dimorpha (Nutt.) Torr. & A. Gray var. *nuttallii* Eaton = *A. dimorpha*
A. dioica (L.) Gaertn. var. *corymbosa* (E. Nels.) Jeps. = *A. corymbosa*
A. dioica (L.) Gaertn. var. *kernensis* Jeps. = *A. rosea* ssp. *confinis*
A. dioica (L.) Gaertn. var. *marginata* (E.L. Greene) Jeps. = *A. marginata*
A. dioica (L.) Gaertn. var. *parvifolia* (Nutt.) Torr. & A. Gray = *A. parvifolia*
A. elegans A.E. Pors. = *A. rosea* ssp. *confinis*
A. ellyae A.E. Pors. = *A. densifolia*
A. ekmaniana A.E. Pors. = *A. friesiana* ssp. *friesiana*
A. erigeroides E.L. Greene = *A. corymbosa* \times *A. racemosa*
A. erosa E.L. Greene = *A. neglecta*
A. exilis E.L. Greene = *A. monocephala* ssp. *monocephala*
A. exima E.L. Greene = *A. howellii* ssp. *howellii*
A. fallax E.L. Greene = *A. parlinii* ssp. *fallax*
A. farwellii E.L. Greene = *A. parlinii* ssp. *fallax*
A. fendleri E.L. Greene = *A. marginata*
A. fernaldiana Polunin = *A. monocephala* ssp. *angustata*
A. flavescens Rydb. = *A. umbrinella*
A. foggii Fern. = *A. alpina*
A. foliacea E.L. Greene = *A. microphylla* \times *A. racemosa*
A. foliacea E.L. Greene var. *humilis* Rydb. = *A. rosea* ssp. *confinis*
A. formosa E.L. Greene = *A. rosea* ssp. *rosea*
A. friesiana (Trautv.) Ekman = *A. friesiana* ssp. *friesiana*
A. fusca E. Nels. = *A. rosea* ssp. *pulvinata*
A. gaspensis (Fern.) Fern. = *A. rosea* ssp. *pulvinata*

- A. glabrata* (J. Vahl) E.L. Greene = *A. alpina*
A. grandis (Fern.) House = *A. howellii* ssp. *neodioica*
A. greenei Bush = *A. parlinii* ssp. *fallax*
A. hendersoni Piper = *A. rosea* ssp. *rosea*
A. holmii E.L. Greene = *A. parvifolia*
A. howellii E.L. Greene = *A. howellii* ssp. *howellii*
A. hudsonica Malte = *A. monocephala* ssp. *angustata*
A. hygrophila E.L. Greene = *A. corymbosa*
A. hyperborea D. Don = *A. dioica*
A. imbricata E. Nels. = *A. rosea* ssp. *rosea*
A. incarnata A.E. Pors. = *A. rosea* ssp. *confinis*
A. insularis E.L. Greene = *A. dioica*
A. intermedia (Rosenv.) A.E. Pors. = *A. alpina*
A. isolepis E.L. Greene = *A. rosea* ssp. *pulvinata*
A. labradorica Nutt. = *A. alpina*
A. laingii A.E. Pors. = *A. rosea* ssp. *confinis*
A. lanulosa E.L. Greene = *A. rosea* ssp. *rosea*
A. laisquama Piper = *A. dimorpha*
A. laisquamea E.L. Greene = *A. parvifolia*
A. leontopodioides Cody = *A. rosea* ssp. *confinis*
A. leuchippi M.T. Pors. = *A. rosea* ssp. *confinis*
A. leucophaea Piper = *A. stenophylla*
A. longifolia E.L. Greene = *A. neglecta*
A. longii Fern. = *A. alpina*
A. lunellii E.L. Greene = *A. neglecta*
A. luzuloides Torr. & A. Gray var. *argentea* (Benth.) A. Gray = *A. argentea*
A. luzuloides Torr. & A. Gray var. *oblanceolata* (Rydb.) Peck = *A. luzuloides* ssp. *luzuloides*
A. macounii E.L. Greene = *A. media* × *A. umbrinella*
A. macrocephala (Eaton) Rydb. = *A. dimorpha*
A. maculata E.L. Greene = *A. rosea* ssp. *pulvinata*
A. manicouagana Landry = *A. rosea* ssp. *pulvinata*
A. marginata E.L. Greene var. *glandulifera* A. Nels. = *A. marginata*
A. media E.L. Greene ssp. *ciliata* E. Nels. = *A. pulchella*
A. megacephala Fern. = *A. monocephala* ssp. *angustata*
A. mesochora E.L. Greene = *A. parlinii* ssp. *fallax*
A. microcephala A. Gray = *A. luzuloides* ssp. *aberrans*
A. microphylla Rydb. var. *solstitialis* Lunell = *A. microphylla*
A. minuscula Boivin = *A. parvifolia*
A. modesta E.L. Greene = *A. media*
A. monocephala DC. = *A. monocephala* ssp. *monocephala*
A. monocephala (Torr. & A. Gray) E.L. Greene = *A. solitaria*
A. monocephala DC. ssp. *monocephala* var. *exilis* (E.L. Greene) Hult. = *A. monocephala* ssp. *monocephala*
A. monocephala DC. ssp. *philonipha* (A.E. Pors.) Hult. = *A. monocephala* ssp. *monocephala*
A. mucronata E. Nels. = *A. media*
A. munda Fern. = *A. parlinii* ssp. *fallax*
A. nardina E.L. Greene = *A. corymbosa*
A. nebrascensis E.L. Greene = *A. neglecta*
A. neglecta E.L. Greene ssp. *howellii* (E.L. Greene) Hult. = *A. howellii* ssp. *howellii*
A. neglecta E.L. Greene var. *attenuata* (Fern.) Cronq. = *A. howellii* ssp. *neodioica*
A. neglecta E.L. Greene var. *canadensis* (E.L. Greene) Cronq. = *A. howellii* ssp. *canadensis*
A. neglecta E.L. Greene var. *gaspensis* (Fern.) Cronq. = *A. rosea* ssp. *pulvinata*
A. neglecta E.L. Greene var. *howellii* (E.L. Greene) Cronq. = *A. howellii* ssp. *howellii*
A. neglecta E.L. Greene var. *neglecta* = *A. neglecta*
A. neglecta E.L. Greene var. *neodioica* (E.L. Greene) Cronq. = *A. howellii* ssp. *neodioica*
A. neglecta E.L. Greene var. *petaloidea* (Fern.) Cronq. = *A. howellii* ssp. *petaloidea*
A. neglecta E.L. Greene var. *randii* (Fern.) Cronq. = *A. howellii* ssp. *canadensis*
A. neglecta E.L. Greene var. *simplex* Peck = *A. neglecta*
A. nemoralis E.L. Greene = *A. plantaginifolia*
A. neolaskana A.E. Pors. = *A. friesiana* ssp. *neolaskana*
A. neodioica E.L. Greene = *A. howellii* ssp. *neodioica*
A. neodioica E.L. Greene ssp. *canadensis* (Greene) Bayer & Stebbins = *A. howellii* ssp. *canadensis*
A. neodioica E.L. Greene ssp. *howellii* (E.L. Greene) Bayer = *A. howellii* ssp. *howellii*
A. neodioica E.L. Greene ssp. *neodioica* = *A. howellii* ssp. *neodioica*
A. neodioica E.L. Greene ssp. *petaloidea* (Fern.) Bayer & Stebbins = *A. howellii* ssp. *petaloidea*
A. neodioica E.L. Greene var. *attenuata* Fern. = *A. howellii* ssp. *neodioica*
A. neodioica E.L. Greene var. *chlorophylla* Fern. = *A. howellii* ssp. *neodioica*
A. neodioica E.L. Greene var. *gaspensis* Fern. = *A. rosea* ssp. *pulvinata*
A. neodioica E.L. Greene var. *grandis* Fern. = *A. howellii* ssp. *neodioica*
A. neodioica E.L. Greene var. *interjecta* Fern. = *A. howellii* ssp. *neodioica*
A. neodioica E.L. Greene var. *petaloidea* Fern. = *A. howellii* ssp. *petaloidea*
A. neodioica E.L. Greene var. *randii* (Fern.) Boivin = *A. howellii* ssp. *canadensis*
A. neodioica E.L. Greene var. *rupicola* (Fern.) Fern. = *A. howellii* ssp. *neodioica*
A. neodioica E.L. Greene var. *typica* Fern. = *A. howellii* ssp. *neodioica*
A. nitens E.L. Greene = *A. monocephala* ssp. *monocephala*
A. nitida E.L. Greene = *A. microphylla*
A. oblanceolata Rydb. = *A. luzuloides* ssp. *luzuloides*
A. oblancifolia E. Nels. = *A. racemosa* × *A. umbrinella*
A. obovata E. Nels. = *A. howellii* ssp. *neodioica*
A. occidentalis E.L. Greene = *A. parlinii* ssp. *fallax*
A. oxyphylla E.L. Greene = *A. rosea* ssp. *rosea*
A. pallida E. Nels. = *A. alpina*
A. parlinii Fern. = *A. parlinii* ssp. *parlinii*
A. parlinii Fern. var. *arnoglossa* (E.L. Greene) Fern. = *A. parlinii* ssp. *parlinii*
A. parvula E.L. Greene = *A. neglecta*
A. peasei Fern. = *A. rosea* ssp. *pulvinata*
A. pedicellata E.L. Greene = *A. howellii* ssp. *petaloidea*
A. pedunculata A.E. Pors. = *A. alpina*
A. peramoena E.L. Greene = *A. marginata*
A. petaloidea (Fern.) Fern. = *A. howellii* ssp. *petaloidea*
A. petaloidea (Fern.) Fern. var. *novaboracensis* Fern. = *A. howellii* ssp. *petaloidea*
A. petaloidea (Fern.) Fern. var. *scariosa* Fern. = *A. howellii* ssp. *petaloidea*
A. petaloidea (Fern.) Fern. var. *subcorymbosa* (Fern.) Fern. = *A. howellii* ssp. *petaloidea*
A. petasites E.L. Greene = *A. racemosa*
A. philonipha A.E. Pors. = *A. monocephala* ssp. *monocephala*
A. pinetorum E.L. Greene = *A. plantaginifolia*
A. piperi Rydb. = *A. racemosa*
A. plantaginifolia (L.) Richards. "B" *monocephala* Torr. & A. Gray = *A. solitaria*
A. plantaginifolia (L.) Richards. var. *ambigens* (Greene) Cronq. = *A. parlinii* ssp. *fallax*
A. plantaginifolia (L.) Richards. var. *arnoglossa* (Greene) Cronq. = *A. parlinii* ssp. *parlinii*
A. plantaginifolia (L.) Richards. var. *parlinii* (Fern.) Cronq. = *A. parlinii* ssp. *parlinii*
A. plantaginifolia (L.) Richards. var. *plantaginifolia* = *A. plantaginifolia*
A. polyphylla E.L. Greene (nomen nudum) = *A. rosea* ssp. *confinis*
A. porsildii Ekman = *A. alpina*
A. pulcherrima (Hook.) E.L. Greene ssp. *anaphaloides* (Rydb.)

- Weber = *A. anaphaloides*
A. pulcherrima (Hook.) E.L. Greene var. *angustisquama* A.E. Pors. =
A. pulcherrima
A. pulcherrima (Hook.) E.L. Greene var. *sordida* Boivin = *A. pulcherrima*
A. pulvinata E.L. Greene = *A. rosea* ssp. *pulvinata*
A. pulvinata E.L. Greene ssp. *albescens* E. Nels. = *A. rosea* ssp. *pulvinata*
A. pygmaea Fern. = *A. monocephala* ssp. *angustata*
A. pyramidata Greene = *A. luzuloides* ssp. *aberrans*
A. recurva E.L. Greene = *A. parvifolia*
A. reflexa E. Nels. = *A. umbrinella*
A. rhodantha Suksd. = *A. parvifolia*
A. rosea E.L. Greene = *A. rosea* ssp. *rosea*
A. rosea E.L. Greene ssp. *divaricata* E. Nels. = *A. rosea* ssp. *rosea*
A. rosea E.L. Greene var. *angustifolia* (Rydb.) E. Nels. = *A. rosea* ssp. *confinis*
A. rousseaui A.E. Pors. = ? *A. alpina* × *A. rosea*
A. rupicola Fern. = *A. howellii* ssp. *neodioica*
A. sansonii E.L. Greene = *A. rosea* ssp. *pulvinata*
A. scabra E.L. Greene = *A. pulchella*
A. scariosa E. Nels. = *A. rosea* ssp. *arida*
A. sedoides E.L. Greene = *A. rosea* ssp. *confinis*
A. sierrae-blancae Rydb. = *A. rosulata*
A. solstitialis Lunell = *A. microphylla*
A. sordida E.L. Greene = *A. rosea* ssp. *confinis*
A. sornborgeri Fern = *A. alpina*
A. spatulata (Fern.) Fern. = *A. howellii* ssp. *canadensis*
A. speciosa E. Nels. = *A. rosea* ssp. *rosea*
A. stenolepis E.L. Greene = *A. howellii* ssp. *petaloidea*
A. stolonifera A.E. Pors. = *A. alpina*
A. straminea Fern. = *A. rosea* ssp. *pulvinata*
A. subcanescens Ostenfeld ex Malte = *A. alpina*
A. subviscosa Fern. = *A. rosea* ssp. *confinis*
A. tansleyi Polunin = *A. monocephala* ssp. *angustata*
A. tomentella E. Nels. = *A. rosea* ssp. *confinis*
A. tweedsmuirii Polunin = *A. monocephala* ssp. *angustata*
A. umbellata E.L. Greene = *A. parlinii* ssp. *fallax*
A. ungavensis (Fern.) Malte = *A. alpina*
A. vexillifera Fern. = *A. alpina*
A. wiegandii Fern. = *A. alpina*
A. wilsonii E.L. Greene = *A. neglecta*