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Austrographa, a new genus in the Roccellaceae with three species from Australia

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Abstract: The genus *Austrographa* is described in the Roccellaceae. Although the new genus shows affinities with both *Chiodecton* and *Enterographa*, it differs from *Chiodecton* by the strongly branched excipulum hyphae, frequently branched paraphysoids and the absence of roccellic acid and byssoid or fibrous structures, and from *Enterographa* by the acicular, thin-walled ascospores, distinctly cylindrical asci and a carbonized hypothecium. *Austrographa kurrinensis*, *A. pseudopallidella* and *A. skyrinica* are described from a single mangrove stand on the east coast of Queensland, Australia.

Introduction

Chiodecton and its allied genera have been monographed by Thor (1990). Since that time three additional species have been described, namely *Chiodecton applanatum* G.Thor (Thor 2007), *C. montanum* G.Thor (Kantvilas & Thor 1993) and *C. papillosum* G.Thor (Henssen & Thor 1998). All known species of *Chiodecton* contain roccellic acid, and most are thinly pruinose or byssoid and possess a fibrous prothallus. *Enterographa* was monographed by Sparrius (2004), and several additional species have been described since then, all having a non-carbonized excipulum or hypothecium, rather thick-walled ascospores and clavate to subcylindrical asci. In this paper, we describe the new genus *Austrographa* that shows clear affinities with *Chiodecton* and *Enterographa*, but has characteristics that differ from both (Table 1). The three new species of *Austrographa* are compared in Table 2.

***Austrographa* Sparrius, Elix & A.W.Archer gen. nov.**

Chiodectonum et *Enterographam* similis est. Thallus non byssoideus, sine acidum roccellinum. Paraphysoides c. 1.0 late, frequentem furcatae. Pseudostromata lirelliformes vel furcatae. Hypothecium atrum, excipulum hyalinum. Ascosporae 45–60 × 2.5–3.0 μm, 3-septatae.

Thallus crustose, corticolous, firmly attached to the substratum, smooth, water-repellent, to 0.5 mm thick, densely filled with fine crystals, with a cortical gel. Prothallus bordering the thallus, thin or indistinct. Photobiont *Trentepohlia*. *Ascomata* rounded to lirellate, usually aggregated in linear or rounded pseudostromata. Excipulum hyaline, composed of richly branched periclinial hyphae, filled with crystals. Thalline margin slightly paler than the thallus. Epithecium orange to straw-coloured, containing crystals or not, K-. Hypothecium carbonized, dark brown, K- or K+ green or violet. Hymenium hyaline, KI+ deep blue. *Paraphysoids* frequently branched and anastomosed, c. 1.0 μm thick, apices c. 1.2 μm thick. *Asci* 8-spored, cylindrical, *Opegrapha*-type (Grube 1998), wall uniformly thickened towards the apex, with a distinct apical dome, 60–90 × 12–17 μm. Apical dome KI+ blue. *Ascospores* acicular, 45–60 × 2.0–3.0 μm, 3-septate, hyaline, curved, thin-walled, perispore not visible. *Conidiomata* not seen.

Chemistry: Thallus K-, C-, P-, UV-. No secondary substances detected by TLC (solvents A, C) or HPLC. One species contains skyrin in the ascomata.

Etymology. The generic epithet *Austrographa* derives from Australia where the genus was found.

Austrographa kurriminensis Sparrius, Elix & A.W.Archer, sp. nov. Figs 1, 4a
Thallus corticolus, sine acidis lichenis, epruinatus. Pseudostromata lirelliformes, non furcatae. Ascospores 45–55 × 2.5–2.8 μm, 3-septatae.

Type: Australia. *Queensland:* Kurrimine Beach, just N of Caravan Park, 17°46'31"S, 146°06'35"E, 1–2 m alt., on *Rhizophora* in mangroves, *J.A. Elix* 38347, 30.vii.2006 (BRI – holotype; L – isotype); *ibid.* *J.A. Elix* 38339, 38340 (CANB, hb Sparrius–paratypes).

Thallus 0.2–0.4 mm thick, cream-coloured. *Ascomata* rounded to ellipsoid, punctate, 0.10–0.25 × 0.15–0.40 mm; disc open above, dark orange-brown, in groups of 5–15 in linear pseudostromata 5–10 mm diam., raised 0.2–0.3 mm above the thallus. Thalline margin 0.2–0.3 mm wide. Epithecium 20–30 μm tall, with crystals 2 μm diam., K–. Hypothecium 50–70 μm tall, K–. Hymenium 100–130 μm tall. *Asci* 70–90 × 12–15 μm. *Ascospores* acicular, 45–55 × 2.5–2.8 μm.

Etymology. The specific epithet derives from the Latin suffix *-ensis* (place of origin) and the type locality Kurrimine Beach.

Remarks. This species is characterized by the cream-coloured thalli and the rounded to ellipsoid ascomata with dark, orange-brown, punctate open discs grouped in raised, linear pseudostromata. At present this new species is known only from the type locality where it occurs on the bark of *Rhizophora* in a mixed stand of mangroves and strand vegetation. Associated lichen species included *Cratiria lauricassiae* (Fée) Marbach, *Diorygma hieroglyphicum* (Pers.) Staiger & Kalb, *D. rufopruinosum* (A.W.Archer) Kalb, Staiger & Elix, *Dirinaria picta* (Sw.) Schaer. ex Clem., *D. subconfluens* (Fr.) D.D.Awasthi, *Graphis geraensis* Redinger, *G. rimulosa* (Mont.) Trevis., *Haematomma accolens* (Stirt.) Hillmann, *H. stevensiae* R.W.Rogers, *Lecanora tropica* Zahlbr., *Pertusaria velata* (Turner) Nyl., *Pyxine fallax* (Zahlbr.) Kalb and *Sarcographa tricola* (Leight.) Müll. Arg. as well as the two other new species of *Austrographa* described below.

Austrographa pseudopallidella Sparrius, Elix & A.W.Archer, sp. nov. Figs 2, 4b
Thallus corticolus, epruinatus, sine acidis lichenis. Pseudostromata lirelliformes, furcatae. Ascospores 45–60 × 2.0–2.5 μm, 3-septatae.

Type: Australia. *Queensland:* Kurrimine Beach, just N of Caravan Park, 17°46'31"S, 146°06'35"E, 1–2 m alt., on *Rhizophora* in mangroves, *J.A. Elix* 38359, 30.vii.2006 (BRI – holotype).

Thallus 0.2–0.4 mm thick, brownish grey. *Ascomata* richly branched lirellae, 0.5–2.5 × 0.1–0.2 mm; disc dark red-brown, not distinctly grouped. Thalline margin 0.1–0.2 mm wide, level with the thallus. Excipulum 12–15 μm thick, dark brown, ±carbonized. Epithecium orange-brown, 15–20 μm tall, with crystals of 2 μm diam., K+ green. Hypothecium 25–30 μm tall, K+ green. Hymenium c. 150 μm tall. *Paraphysoids* frequently branched and anastomosed, c. 1.0 μm thick, apices c. 1.2 μm thick. *Asci* 60–75 × 12–17 μm. *Ascospores* acicular, 45–60 × 2.0–2.5 μm.

Etymology. The growth form of this species closely resembles that of *Enterographa pallidella* (Nyl.) Redinger, which occurs in the same habitat.

Remarks. This new species differs from *Enterographa pallidella* by the negative C reaction, the dark hypothecium and thin-walled ascospores. In contrast, the thallus of *E. pallidella* reacts C+ red due to the presence of gyrophoric acid, has a colourless hypothecium and smaller, clavate to fusiform, often slightly curved, 6–15-septate ascospores, 22–33 × 2.5–3.5 μm (Sparrius 2004).

Austrographa skyrinica Sparrius, Elix & A.W.Archer, sp. nov. Figs 3, 4 c
Thallus corticolus, sine acidis lichenis, epruinatus. Pseudostromata lirelliformes, furcatae. Hypothecium cum skyrino. Ascospores 45–55 × 2.5–3.0 μm, 3-septatae.

Type: Australia. *Queensland:* Kurrimine Beach, just N of Caravan Park, 17°46'31"S, 146°06'35"E, 1–2 m alt., on dead tree in mangrove and strand vegetation, *J.A. Elix* 38393, 30.vii.2006 (BRI – holotype; L – isotype).

Thallus 0.3–0.5 mm thick. *Ascomata* lirellate and branched, 0.10–0.15 × 0.2–2.0 mm; disc dark brown to black, each branched lirella forming a rounded to ellipsoid pseudostroma 5–10 mm diam., raised 0.2–0.5 mm above the thallus. Thalline margin 0.3–0.4 mm wide. Excipulum 20–25 μm thick, black-brown, carbonized, K+ violet. Epithecium orange to straw-coloured, 10–15 μm tall, without crystals. Hypothecium 50–100 μm tall, extending downwards to the substratum, K+ violet. Hymenium 180–200 μm tall. *Asci* 70–80 × 12–17 μm. *Ascospores* acicular, 45–55 × 2.5–3.0 μm, slightly curved.

Chemistry: Traces of skyrin by HPLC.

Etymology. The specific epithet *skyrinica* refers to the presence of skyrin in this species.

Remarks. Skyrin also occurs in *Chiodecton sublaevigatum* Kremp., but is restricted to the thallus in that species (Thor, 1990). *Chiodecton sublaevigatum* is further distinguished by its loosely attached, white-pruinose thallus and distinct prothallus with a whitish inner part and a brown outer part. In contrast, the prothallus of *Austrographa skyrinica* is indistinct, and the epruinose thallus is firmly attached to the substratum. Further, the ascomata are perithecioid and aggregated in distinctly elevated stroma-like structures in *C. sublaevigatum* rather than being lirellate as in *A. skyrinica*.

References

- Grube, M (1998): Classification and phylogeny in the Arthoniales (lichenized Ascomycetes). *Bryologist* **101**, 377–391.
- Henssen, A; Thor, G (1998): Studies in taxonomy and developmental morphology in *Chiodecton*, *Dichosporidium*, *Erythrodictyon* and the new genus *Pulvinodecton* (Arthoniales, lichenized Ascomycetes). *Nordic Journal of Botany* **18**, 95–120.
- Kantvilas, G; Thor, G (1993): The lichen genus *Chiodecton* in Tasmania. *Papers and Proceedings of the Royal Society of Tasmania* **127**, 39–41.
- Sparrius, LB (2004): A monograph of *Enterographa* and *Sclerophyton*. *Bibliotheca Lichenologica* **89**, 1–141.
- Thor, G (1990): The lichen genus *Chiodecton* and five allied genera. *Opera Botanica* **103**, 1–92.
- Thor, G (2007): The genera *Chiodecton*, *Dichosporidium* and *Erythrodictyon* in Peninsular Malaysia. *Bibliotheca Lichenologica* **95**, 543–548.

Table 1. *Austrographa*, *Chiodecton* (Thor 1990) and *Enteroglypha* (Sparrius 2004) compared.

character	<i>Austrographa</i>	<i>Chiodecton</i>	<i>Enteroglypha</i>
prothallus	indistinct or thin and smooth	thin or thick and fibrous	indistinct or thin and smooth
paraphysoid width	c. 1.0 μm	< 1.0 μm	mostly < 1.0 μm
paraphysoid branching	frequent	sparse	frequent
hypotheecium	carbonized	carbonized	hyaline
ascus shape	cylindrical	clavate to subcylindrical	clavate to subcylindrical
perispore	absent	absent	present
ascospore septation	3	3(-7)	(3-15)
excipulum hyphae	periclinally arranged richly branched	anticlinally arranged sparsely branched	periclinally arranged richly branched

Table 2. The three *Austrographa* species compared.

character	<i>A. kurriminensis</i>	<i>A. pseudopallidella</i>	<i>A. skyrinica</i>
secondary metabolites	none	none	skyrin in excipulum
hypotheecium in KOH	negative	green	violet
spore length (μm)	45-55	45-60	45-55
ascomata colour	dark orange-brown dots	pale orange dots	pale orange dots
ascomata aggregation	lines	branched lines	branched lines

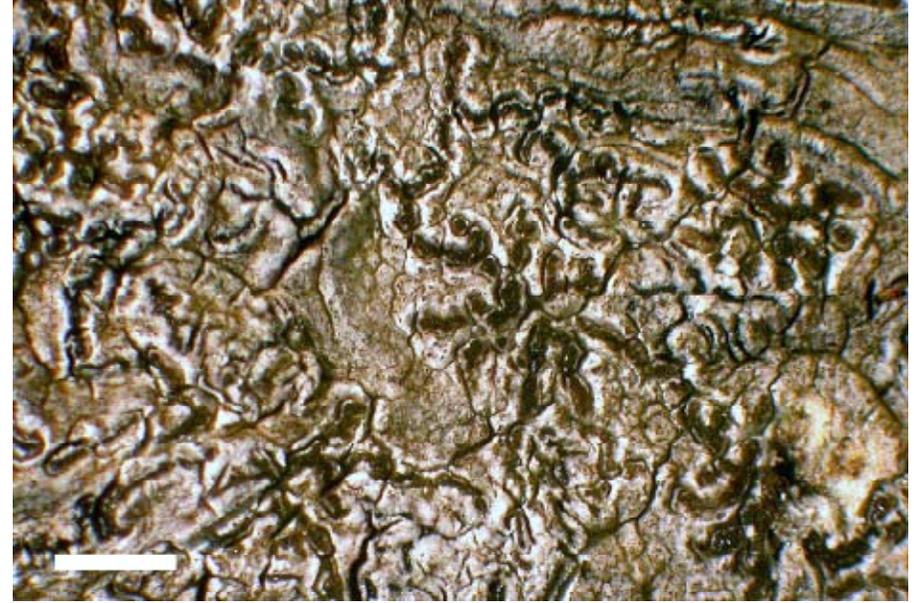


Fig. 2. *Austrographa pseudopallidella* habit (type). Bar = 1 mm.



Fig. 1. *Austrographa kurriminensis* habit (type). The blackened ascomata are infected with *cf. Intralichen christiansenii*. Bar = 1 mm.

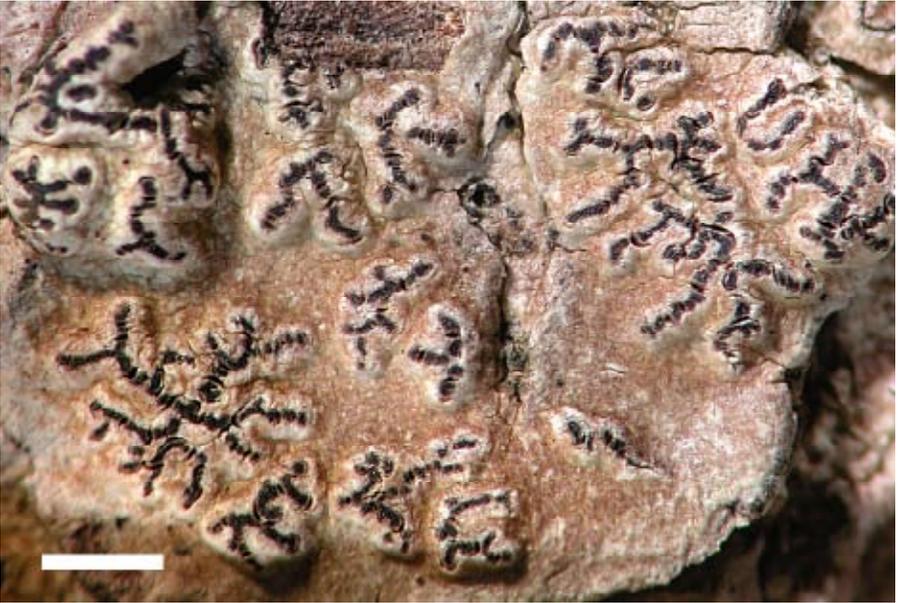


Fig. 3. *Austrographa skyrinica* habit (type). Bar = 1 mm.

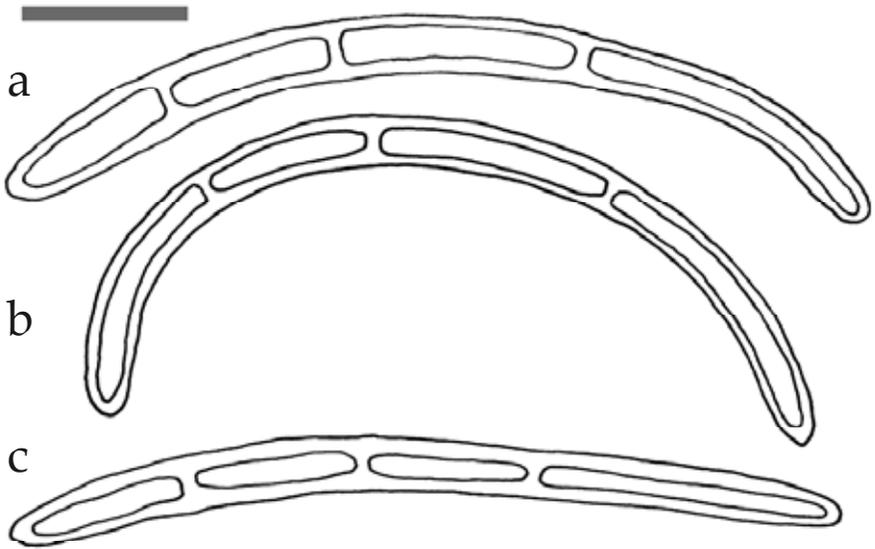


Fig. 4. Ascospores **a.** *A. kurriminensis*, **b.** *A. pseudopallidella*, **c.** *A. skyrinica*. Bar = 10 μ m.