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A new species, new combination, and new
report in the Australian Graphidaceae

A.W. Archer & J.A. Elix

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**A new species, new combination, and new report
in the Australian Graphidaceae**

Alan W. Archer

National Herbarium of New South Wales
Mrs Macquaries Road, Sydney, N.S.W. 2000, Australia

John A. Elix

Research School of Chemistry, Building 33
Australian National University, Canberra, A.C.T. 0200, Australia

Abstract: *Phaeographis neutriconica* A.W.Archer & Elix is described as new to science, the new combination *Diorygma australasicum* (Elix) Lücking, Elix & A.W.Archer is made for *Leprocaulon australasicum* Elix, and *Acanthothecis abaphoides* (Nyl.) Staiger & Kalb is reported for the first time from Australia.

Australian Graphidaceae have been the subject of a monograph (Archer 2006), supplemented by additional new species and records (Archer 2007; Archer & Elix 2007a, 2007b, 2008a, 2008b), and most recently by a *Flora of Australia* treatment of the family (Archer 2009). A new species, new combination, and new record are documented here. The chemistry of the specimens was studied by thin-layer chromatography (Elix & Ernst-Russell 1993) and high-performance liquid chromatography (Elix *et al.* 2003).

Phaeographis neutriconica A.W.Archer & Elix, sp. nov. Figs 1 & 2
Similis *Phaeographis neutricosa* Redinger sed ascosporis majoribus et muriformibus, et lirellae marginibus thallinis conspicuis.

Type: *Northern Territory*: Litchfield National Park, below Florence Falls, 42 km SW of Batchelor, 13°05'58"S, 130°47'05"E, alt. 75 m, on *Ficus* twigs in monsoon forest with *Syzygium* and *Gordenia*, *J.A. Elix* 39419, 9.viii.2005 (holo: CANB).

Thallus pale olive-green, smooth and glossy, somewhat cracked, lacking soredia and isidia, corticolous. Apothecia lirelliform, sessile, scattered, simple or branched, 1–3 mm long, 0.15–0.30 mm wide, with conspicuous thalline margins. Epithecium black, white-pruinose; proper exciple non-carbonized, inconspicuous; hymenium 80–100 µm tall, not inspersed. Ascospores 8 per ascus, brown, elongate-ellipsoid, muriform, 24–30 µm long, 9–11 µm wide, with 6 transverse and 2 longitudinal locules; terminal locules usually undivided.

Chemistry: neutricone [major].

ADDITIONAL SPECIMENS EXAMINED

Northern Territory: • type locality, on *Ficus* twigs, *J.A. Elix* 39416, 9.viii.2005 (DNA); • on fallen branches, *J.A. Elix* 39443, 9.viii.2005 (CANB).

Phaeographis neutriconica is characterized by the brown, muriform ascospores, the simple to branched lirellae with conspicuous thalline margins, and the presence of neutricone. It is distinguished from the chemically similar *P. neutricosa* Redinger by the larger, muriform ascospores (24–30 × 9–11 µm versus 17–25 × 6–8 µm) and the simple to branched lirellae. In *P. neutricosa* the lirellae branch radially and form substelate clusters. A specimen of *P. neutricosa* (*Elix* 39429) collected at the same locality had brown, 4-locular ascospores (Fig. 3).

Etymology: The epithet *neutriconica* refers to the depsidone neutricone present in this new species.

This new species is known only from the type locality. Associated species include *Buellia rechingeri*, *Chrysothrix xanthina* (Vain.) Kalb, *Coccocarpia palmicola* (Spreng.) Arv.

& D.J.Galloway, *Coenogonium luteum* (Dicks.) Kalb & Lücking, *Cratiria lauricassiae* (Fée) Marbach, *Cryptothecia faveomaculata* Makhija & Patw., *Dirinaria consimilis* (Stirt.) D.D.Awasthi, *D. picta* (Sw.) Schaer. ex Clem., *Fellhanera tropica* Elix, *Letrouitia leptolytoides* S.Kondr. & Elix and *Pertusaria velata* (Turner) Nyl.

Acanthothecis abaphoides (Nyl.) Staiger & Kalb, *Mycotaxon* 73, 93 (1999) Fig. 4
Type: United States of America. *Florida*: Jacksonville, on *Persea*, *Eckfeldt & Calkins* 107; holotype: H-NYL 6862 *n.v.*, *vide* Staiger & Kalb, *loc. cit.*

Thallus off-white to pale grey; surface minutely subtuberculate, corticolous. Apothecia lirelliform, white, scattered, sessile, simple, straight or curved, 1–2 mm long, 0.3–0.5 mm wide, with swollen thalline margins; lips closed. Exciple non-carbonized, indistinct. Hymenium 150–170 µm tall, not inspersed. Ascospores 1–2 per ascus, ellipsoid, long-tapering, hyaline, muriform, the terminal locules becoming somewhat enlarged, 80–105 µm long, 18–22 µm wide, 1–

Chemistry: protocetraric acid [major].

SPECIMENS EXAMINED

Northern Territory: • Litchfield National Park, below Florence Falls, 42 km SW of Batchelor, 13°05'58"S, 130°47'05"E, alt. 75 m, on fallen branches in monsoon forest with *Syzygium* and *Gordenia*, *J.A. Elix* 39435, 39452, 39458, 9.viii.2005 (CANB).

Acanthothecis abaphoides is characterized by the non-amyloid, muriform ascospores, the non-carbonized exciple, and the presence of protocetraric acid. The ascospores have somewhat enlarged terminal locules, which distinguishes this species from the similar *A. hololeucooides* (Nyl.) Staiger & Kalb (Staiger & Kalb 1999). The chemically identical and morphologically similar *A. borealis* A.W.Archer & Elix (Archer & Elix 2007b) has smaller (40–56 µm long), 16–18-locular ascospores. *Acanthothecis abaphoides* is also known from Brazil and Paraguay. The genus *Acanthothecis* now contains 21 species (Lücking & Rivas Plata 2008), seven of which occur in Australia.

Diorygma australasicum (Elix) Lücking, Elix & A.W.Archer, comb. nov. Figs 5 & 6
Basionym: *Leprocaulon australasicum* Elix, *Mycotaxon* 94, 221 (2005)

Type: *Norfolk Island*: • Norfolk Island National Park, West Palm Glen Track, 29°01'06"S, 167°56'33"E, alt. 140 m, on base of *Cyathea* in subtropical forest, *J.A. Elix* 29042, 16.vi.1992 (holo: CANB).

When this species was first described (Elix 2005), only ecorticate, isidiate specimens were available. More recently, a partially pseudocorticate specimen with immature lirellae (Fig. 5) was discovered, and although the lirellae contained no mature asci, their morphology (exciple non-carbonized, hymenium not inspersed) as well as that of the ecorticate isidia (Fig. 6) and the chemistry were entirely consistent with the genus *Diorygma* Eschw. (Kalb *et al.* 2004). This species contains protocetraric acid [major], salazinic acid [minor], norstictic acid [minor] and atranorin [minor]. It is distinguished from the chemically identical *D. rufopruinosum* (A.W.Archer) Kalb, Staiger & Elix by the presence of ecorticate isidia. The isidia are initially globose, but they become elongate-cylindrical, delicate, fragile, simple or coralloid-branched and entangled, erect or ±decumbent, 0.1–1.0 mm high, 0.10–0.15 mm thick, bearing small, leprose-arachnoid granules, 20–70 µm wide, often with dense, projecting hyphae up to 20 µm long.

ADDITIONAL SPECIMENS EXAMINED

Queensland: • Paluma Rainforest Walk, Paluma, 19°00'27"S, 146°12'24"E, alt. 830 m, on tree trunk at margins of rainforest, *J.A. Elix* 37587, 24.vii.2006 (CANB); • Broadwater

State Forest Park, 45 km NW of Ingham, 18°25'01"S, 145°56'38"E, alt. 50 m, on base of *Eucalyptus* at margins of rainforest along the Herbert River, J.A. Elix 38604, 26.vii.2006 (CANB); • Tully River State Forest Park, 45 km NW of Tully, 17°46'24"S, 145°39'00"E, alt. 80 m, on *Eucalyptus* trunk in storm-damaged rainforest, J.A. Elix 39057, 28.vii.2006 (CANB).

Norfolk Island: • Track between Mt Pitt and Mt Bates, Mount Pitt National Park, 29°00'50"S, 167°56'05"E, alt. 270 m, on dead *Cyathea* in disturbed subtropical forest, J.A. Elix 27357, 27367, 15.vi.1992 (CANB).

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Fig. 1. *Phaeographis neutriconica*, holotype (CANB). Fig. 2. *Phaeographis neutriconica*, ascospores.



Fig. 3. *Phaeographis neotricosa* Redinger, Elix 39429 (CANB). Fig. 4. *Acanthothecis abaphoides*, Elix 39435 (CANB).



Fig. 5. *Diorygma australasicum*, isidia, Elix 27367 (CANB). Fig. 6. *Diorygma australasicum*, lirellae, Elix 27357 (CANB).