

Additions to the lichen flora of Fiji and Vanuatu based on Graphidaceae in the F.R.M. Wilson collection at the National Herbarium of New South Wales

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Abstract

Alan W. Archer (Royal Botanic Gardens, Mrs. Macquaries Road, Sydney, NSW 2000, Australia) 2004. Additions to the lichen flora of Fiji and Vanuatu based on Graphidaceae in the F.R.M. Wilson collection at the National Herbarium of New South Wales. *Telopea* 10(4): 771–776. Six species in the family Graphidaceae are added to records of the lichen flora of Fiji, and 12 species in the same family are added to records of the lichen flora of Vanuatu. A key to identification is provided. All the specimens are from the Wilson lichen collection at NSW.

Introduction

The recent *Catalogue of the Lichens of the Smaller Pacific Islands* (Elix & McCarthy 1998) lists one taxon in the family Graphidaceae from Vanuatu, viz: *Graphis assimilis* f. *ochracea* Räs., and three species in the family from Fiji, viz: *Graphina insulana* Müll. Arg., [= *G. subserpentina* (Nyl.) Müll. Arg.], *Graphis fagorum* (A. Massal.) Kremp. and *Phaeographina heterocarpoides* (Nyl.) Zahlbr.

The Reverend Francis R.M. Wilson collected lichens in Fiji and Vanuatu in 1892, and again in 1895 in Vanuatu when he visited his son-in-law T.W. Leggatt (Ralston 2001). The Wilson collection also includes specimens sent to him in Australia by Leggatt from Mallecola [Malekula], Vanuatu. A recent examination of this collection, housed at NSW, has found it to include six species in the family Graphidaceae previously unreported from Fiji, and 12 species previously unreported from Vanuatu. The species are here listed and briefly described.

Key to the Wilson Graphidaceae from Fiji and Vanuatu

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|---|--|---------------------------------|
| 1 | Ascospores hyaline | 6 |
| | Ascospores pale brown or brown | 2 |
| 2 | Ascospores muriform, 45–110 µm long | Phaeographina quassicola |
| | Ascospores with linear, lenticular locules | 3 |
| 3 | Ascospores 4-locular, 16–20 µm long, lichen compounds absent | Phaeographis tremulans |
| | Ascospores 5–9-locular, 16–37 µm long | 4 |
| 4 | Lirellae immersed in conspicuous stroma, ascospores 16–20 µm long, norstictic acid present | Sarcographa intricans |
| | Lirellae not immersed in stroma | 5 |
| 5 | Stictic acid present | Phaeographis dendroides |
| | Lichen compounds absent | Phaeographis exaltata |

- 6 Ascospores with linear, lenticular locules, exciple carbonised or not 12
 Ascospores muriform, exciple uncarbonised 7
- 7 Ascospores < 20 µm long, lirellae closed 8
 Ascospores > 20 µm long, lirellae open or closed 9
- 8 Lirellae conspicuous, ascospores 11–16 µm long; salazinic acid present
 **Graphina colliculosa**
 Lirellae inconspicuous, ascospores 9–16 µm long, norstictic acid present
 **Graphina dimorphodes**
- 9 Ascospores < 70µm long, lirellae closed, stictic acid present 10
 Ascospores > 70 µm long, lirellae open, stictic or norstictic acid present 11
- 10 Lirellae inconspicuous, immersed, exciple red-brown, ascospores 28–35 µm long
 **Graphina abdita**
 Lirellae conspicuous, sessile, exciple lacking, ascospores 22–30 µm long
 **Graphina austenensis**
- 11 Hymenium Iodine + blue, ascospores 70–105 µm long, norstictic acid present
 **Graphina mendax**
 Hymenium Iodine -ve, ascospores 80–145 µm long, stictic acid present
 **Graphina pallido-ochracea**
- 12 Lirellae immersed in conspicuous stroma; ascospores 32–55 µm long **Glyphis cicatricosa**
 Lirellae sessile or immersed in thallus, not immersed in stroma 13
- 13 Ascospores 62–80 µm long, 13–16-locular, lichen compounds absent **Graphis longula**
 Ascospores ≤ 40 µm long, norstictic acid present 14
- 14 Lirellae immersed, ascospores 24–26 µm long, 6–8-locular **Graphis schiffneri**
 Lirellae sessile, ascospores 28–40 µm long, 8–11-locular **Graphis apertella**

The family Graphidaceae from Fiji and Vanuatu

Glyphis cicatricosa Ach., *Syn. Meth. Lich.*: 107 (1814)

Lirellae crowded, open, immersed in conspicuous stromata; ascospores hyaline, 32–55 µm long, 8–12 µm wide, 8–12-locular; chemistry: no lichen compounds found. A detailed description is given by Archer (2004).

Distribution: a widely distributed tropical to temperate species from Brazil, Uruguay, Mexico, the United States (Florida), Japan, the Philippines, Singapore, Indonesia, New Caledonia, Fiji, Vanuatu, New Zealand, Australia (Queensland, northern New South Wales) and Norfolk Island.

Specimens examined: Vanuatu: *F. Wilson s.n.*, 1895 (NSW L4984 p.p.); *F. Wilson s.n.* (NSW L5051 p.p.).

Graphina abdita A.W. Archer, A.W. Archer, *Mycotaxon* 77: 160 (2001)

Lirellae inconspicuous, fissurine, immersed, scattered; exciple pale reddish-brown; ascospores hyaline, muriform, 28–35 µm long, 8–10 µm; chemistry: stictic acid. A detailed description and illustration are given by Archer (loc. cit.).

Distribution: Fiji, the Solomon Islands and Australia (Queensland).

Specimen examined: Fiji: *s. loc.*, *F. Wilson s.n.* (NSW 426676).

Graphina austenensis A.W. Archer, *Mycotaxon* 83: 361 (2002)

Lirellae conspicuous, white pruinose, sessile; carbonised exciple absent; ascospores hyaline, muriform, 22–30 µm long, 11–14 µm wide; chemistry: stictic acid. A detailed description is given by Archer (loc. cit.).

Distribution: Fiji, Indonesia and the Solomon Islands. It has not been found in Australia.

Specimen examined: Fiji, *s. loc.*, *Leucographina suvana*, *nom. nud.*, in sched., F.R.M. Wilson *s.n.*, (NSW 426694).

Graphina colliculosa (Mont.) Hale, *Smithsonian Contr. Bot.* 40: 34 (1978)

= *Sclerophyton colliculosum* Mont., *Ann. Sci. Nat., Bot. sér.* 3, 16: 61 (1851)

Lirellae numerous, conspicuous, proper exciple uncarbonised; ascospores hyaline, muriform, 11–16 µm long, 5–7 µm wide, 4 × 1–2-locular; chemistry: salazinic acid. A detailed description and illustration are given by Wirth and Hale (loc. cit. 1978).

Distribution: pantropical and is reported from India, the Philippines, Indonesia, Tahiti, Fiji, Papua New Guinea, Hong Kong and Vanuatu. It has not been found in Australia.

Specimen examined: Vanuatu: Malo Island, F. Wilson *s.n.*, 1895 (NSW L4983).

Graphina dimorphodes (Nyl.) Zahlbr., *Cat. Lich. Univ.* 2: 404 (1923)

= *Graphis dimorphodes* Nyl. in Leighton, W.A., *Trans. Linn. Soc. London* 27: 176 (1869)

Lirellae inconspicuous, proper exciple uncarbonised; ascospores hyaline, muriform, 9–16 µm long, 5–8 µm wide, 4–5 × 1–3-locular; chemistry: norstictic acid. Small muriform ascospores and the presence of norstictic acid. A detailed description and illustration are given by Nakanishi et al. (2001).

Distribution: Sri Lanka, India, Thailand, the Solomon Islands and Vanuatu. It has not been found in Australia.

Specimen examined: Vanuatu: F. Wilson *s.n.*, 1895 (NSW 43851 p.p.)

Graphina mendax (Nyl.) Müll. Arg., *Rev. Mycol.* 10: 177 (1888)

= *Graphis mendax* Nyl., *Ann. Sci. Nat. Bot., sér.* 4, 11: 244 (1859)

Lirellae inconspicuous, open; epithecium white pruinose; ascospores hyaline, muriform, 70–105 µm long, 20–35 µm wide; chemistry: norstictic acid. A detailed description with synonyms is given elsewhere by Archer (2001a).

Distribution: Fiji, Vanuatu, the Philippines, India, Tahiti, Thailand, Indonesia, New Caledonia, Vanuatu and in Australia (Northern Territory and Queensland).

Specimens examined: Fiji: *s. loc.*, F. Wilson *s.n.*, (NSW 499956); Vanuatu: F. Wilson *s.n.*, 1895 (NSW L4981).

Graphina pallido-ochracea (Kremp.) Zahlbr., *Cat. Lich. Univ.* 2: 417 (1924)

= *Graphis pallido-ochracea* Kremp., *Nuovo. Giorn. Bot. Ital.* 7: 32 (1975)

Lirellae conspicuous, open, discs pruinose; carbonised proper exciple absent; large ascospores muriform, hyaline, 80–145 µm long, 20–45 µm wide; chemistry: stictic acid. A detailed description, with synonyms, is given by Archer (2001a).

Distribution: Sarawak, the Philippines, the Solomon Islands, Vanuatu, and in Australia (Queensland, New South Wales).

Specimens examined: Vanuatu, Malokola [Malekula], *F. Leggatt s.n.*, Mar. 1890 (NSW 438458 p.p.); *s. loc.*, *F. Wilson s.n.*, 1895 (NSW).

Graphis apertella A.W. Archer, *Aust. Syst. Bot.* 14: 258 (2001)

Lirellae, conspicuous, open, disc slightly pruinose; proper exciple laterally carbonised; ascospores 28–40 µm long, 6–9 µm wide, 8–11-locular; chemistry: norstictic acid. A detailed description and illustration are given by Archer (2001e).

Distribution: occurs in Australia (Queensland, New South Wales, Lord Howe Island) and on Norfolk Island and Vanuatu.

Specimen examined: Vanuatu: Mallecola [Malekula], *F. Leggatt s.n.*, Mar. 1890 (NSW 438458 p.p.); *s. loc.*, *F. Wilson s.n.*, 1895 (NSW 4985 p.p.).

Graphis longula Krempf., *Flora* 59: 414 (1876)

Lirellae, numerous, thin, sub-immersed; proper exciple weakly striate, completely carbonised; ascospores hyaline, 62–80 µm long, 8–11 µm wide, 13–16-locular; chemistry: no lichen compounds found. A detailed description is given by Archer (2001d).

Distribution: occurs in Brazil, Mexico, Costa Rica, Dominica, Vanuatu, and in Australia (Queensland, northern New South Wales).

Specimen examined: Vanuatu: *F. Wilson s.n.*, 1895 (NSW)

Graphis schiffneri Zahlbr., *Ann. Cryptog. Exot.* 1: 127 (1828)

Lirellae, thin, black, immersed; proper exciple completely carbonised; ascospores hyaline, 24–26 µm long, 7–9 µm wide, 6–8-locular; chemistry: norstictic acid. A detailed description is given by Redinger (1936).

Distribution: occurs in Indonesia and Vanuatu.

Specimen examined: Vanuatu: *F. Wilson s.n.* (NSW L 4986 p.p.).

Phaeographina quassiicola (Fée) Müll. Arg., *Mém. Soc. Phys. Genève* 29: 47 (1887)

= *Thecaria quassiicola* Fée, *Essai Crypt.*: 97 (1824)

Lirellae conspicuous, pale grey, raised, open (cup-like); proper exciple completely carbonised; ascospores muriform, pale brown, 45–110 µm long, 15–25 µm wide; chemistry: no lichen compounds found. A detailed description and illustration are given by Archer (2001b).

Distribution: occurs in Madagascar, India, Sri Lanka, Thailand, the Philippines, Japan, Indonesia, the Solomon Islands, New Caledonia, Fiji, Australia (Queensland) and on Norfolk Island.

Specimens examined: Fiji: Suva, *F. Wilson s.n.*, Aug. 1892 (NSW 438692); *s. loc.*, *F. Wilson* (NSW L5032; 499951).

Phaeographis dendroides (Leight.) Müll. Arg., *Flora* 65: 208 (1882)

= *Platygrapha dendroides* Leight., *Trans. Linn. Soc. London* 27: 179 (1869)

Lirellae conspicuous, black, open, with a thalline margin; ascospores pale brown, 25–37 µm long, 6–10 µm wide, 5–9-locular; chemistry: stictic acid. A detailed description and illustration are given by Archer (2001c).

Distribution: occurs in Sri Lanka, Thailand, Indonesia, the Philippines, Hawaii, Tahiti, New Caledonia, the Solomon Islands, Fiji, Vanuatu and Australia (Queensland, New South Wales).

Specimens examined: Fiji, *s. loc.*, *F. Wilson, s.n.* (NSW 438744); *ibid.*, *F. Wilson, s.n.* (NSW L 4997 p.p.); *ibid.*, *F. Wilson, s.n.* (NSW L 5002; 499959); Vanuatu: *F. Wilson s.n.*, 1895 (NSW 438451 p.p.).

Phaeographis exaltata (Mont. & Bosch) Müll. Arg., *Flora* 65: 336 (1882)

= *Lcanactis exaltata* Mont. & Bosch, in Junghuhn, F., *Plant. Junghuhnianae* 4: 475 (1855)

Lirellae conspicuous, black, open with thalline margins; ascospores pale brown, 21–33 µm long, 7–11 µm wide, 6-locular; chemistry: no lichen compounds. A detailed description and illustration are given by Archer (2001c).

Distribution: a widely distributed species found in Mexico, Dominica, Brazil, Guadalupe, Thailand, Japan, Hawaii, Western Samoa, Sabah, India, the Philippines, Indonesia, Papua New Guinea, the Solomon Islands, New Caledonia, Fiji, Vanuatu, New Zealand and in Australia (Queensland, New South Wales, Victoria, Tasmania).

Specimens examined: Fiji: *s. loc.*, *F. Wilson s.n.*, (NSW 4997 p.p.); Vanuatu: *F. Wilson s.n.*, 1895 (NSW 438451 p.p.).

Phaeographis tremulans Müll. Arg., *J. Linn. Bot. Soc.* 30: 460 (1895)

Lirellae much branched, open; proper exciple completely carbonised with a thick base; ascospores pale brown, 16–20 µm long, 6–8 µm wide, 4-locular; chemistry: no lichen compounds found. A detailed description is given by Müller (1895).

Distribution: occurs in Indonesia, Fiji and Vanuatu. It has not been found in Australia.

Specimen examined: Vanuatu: *F. Wilson s.n.*, 1895 (NSW L5051 p.p.); Fiji: *s. loc.*, *F. Wilson s.n.*, 1892 (NSW L4998; 499953).

Sarcographa intricans (Nyl.) Müll. Arg., *Flora* 70: 77(1887)

= *Graphis intricans* Nyl., *Acta. Soc. Sci. Fenn.* 7: 473 (1863)

Lirellae branched, immersed in conspicuous stromata; carbonised proper exciple absent; ascospores pale brown, 16–20 µm long, 5–7 µm wide, 6-locular; chemistry: norstictic acid. A detailed description and illustration are given by Archer (2004).

Distribution: occurs in Brazil, Colombia, Sri Lanka, Borneo, Vanuatu, New Zealand and Australia (Northern Territory, Queensland).

Specimen examined: Vanuatu: *F. Wilson s.n.*, 1895 (NSW L5051 p.p.).

References

- Archer, A.W. (2001a) The lichen genus *Graphina* (Graphidaceae) in Australia: new reports and new species. *Mycotaxon* 77: 153–180.
- Archer, A.W. (2001b) The lichen genera *Phaeographis* and *Phaeographina* (Graphidaceae) in Australia 2: *Phaeographina* — new reports and new species. *Telopea* 9: 329–344.
- Archer, A.W. (2001c) The lichen genera *Phaeographis* and *Phaeographina* (Graphidaceae) in Australia 3: *Phaeographis* — new reports and new species. *Telopea* 9: 663–677.
- Archer, A.W. (2001d) New taxa and new reports in the lichen family Graphidaceae (Ascomycotina) from Australia. *Mycotaxon* 80: 367–374.
- Archer, A.W. (2001e) The lichen genus *Graphis* (Graphidaceae) in Australia. *Australian Systematic Botany* 14: 245–271.

- Archer, A.W. (2004) The lichen genera *Cyclographina*, *Diplogramma*, *Glyphis*, *Gymnographa*, *Medusulina*, *Sarcographa* and *Sarcographina* (Graphidaceae) in Australia. *Telopea* 10(2): 589–605.
- Elix, J.A. & McCarthy, P. (1998) Catalogue of the Lichens of the Smaller Pacific Islands. *Bibliotheca Lichenologica* 70: 5–361.
- Müller, (1895) Thelotremaceae et Graphideae novae. *J. Linn. Soc. Bot.* 30: 451–463.
- Nakanishi, M., Kashiwadani, H. & Moon, H.K. (2001) Notes on the genera *Graphina* and *Graphis* (Graphidaceae) in Thailand. *Bull. Natl. Sci. Mus., Tokyo*, Ser. B, 27: 47–55.
- Ralston, K. (2001) Francis Robert Muter Wilson: Pioneer Australian Lichenologist. *Bibliotheca Lichenologica* 78: 369–388.
- Redinger, K.M. (1936) Die Graphideen der Sunda-Inseln. *Rev. Bryol. Lichénol.* 9: 31–122.
- Zahlbruckner, A. (1928) Neue und ungenügend beschriebene javanische Flechten. *Ann. Cryptog. Exot.* 1: 109–212.

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