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The species of Hemigrapha (lichenicolous Ascomycetes, Dothideales) on Peltigerales

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The species of *Hemigrapha* (lichenicolous Ascomycetes, Dothideales) growing on Peltigerales are revised. *H. atlantica* sp. nov., on the cyanobacterial morph of *Sticta canariensis* from the Azores and the British Isles, *H. nephromatis* sp. nov., on *Nephroma australe* from Tasmania and New Zealand, and *H. pseudocyphellariae* sp. nov., on *Pseudocyphellaria* from Papua New Guinea are described and compared with the type species, *H. asteriscus*, which grows on species of *Peltigera* in the southern hemisphere and in Europe. *Hemigrapha* is shown to belong to the Microthyriaceae (Dothideales). Pycnothyrial anamorphs, morphologically identical to the thyriothecia, with hyaline, non-septate microconidia and/or macroconidia, and conidiogenous cells arising from the upper conidiomatal wall, are known in *H. asteriscus*, *H. atlantica* and *H. pseudocyphellariae*. A key is given for the species of *Hemigrapha* on Peltigerales.

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Introduction

Hemigrapha, a genus of lichenicolous ascomycetes, has received surprisingly little attention, although the species growing on macrolichens are quite eye-catching, commonly producing abundant black star-shaped ascomata on the upper cortex of the host. Several species seem to be distributed in the Southern Hemisphere, and some are quite common there, although obviously very overlooked.

Hemigrapha was originally described as a section of the genus *Melanographa* by Müller [Argoviensis] (1882) who included here three species with lirelliform, black 'perithecia', without a continuous wall under the hymenium. Later Müller added *Melanographa tenellula*, lichenicolous on *Porina epiphylla* (Fée) Fée, to the section (Müller 1883). Müller (1887) moved the section *Hemigrapha* to the genus *Melaspilea*, and later Keissler (1933) transferred the non-lichenized *Melaspilea* species to *Mycomelaspilea* Reinke.

Santesson (1952) mentioned *H. tenellula*, a combination not validly published in his work. Folan and Mitchell (1970) reported *H. asteriscus* as new to Ireland, a report shown here to refer to *H. atlantica* which is described below. The combination *H. asteriscus* was not validly published in the paper by Folan and Mitchell. Finally, *Hemigrapha* was raised to generic level by Hawksworth (1975), and the combination *H. asteriscus* (Müll. Arg.) D. Hawksw. was made.

Matzer (1996) provided a valuable and detailed description of the genus with an account of the species growing on foliicolous lichens, including the description of two new species. He also validated the combination *H. tenellula* (Müll. Arg.) Matzer.

The taxonomic position of the genus has not been settled. Eriksson & Hawksworth (1991) suggested that

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Fig. 3. World distribution of *Hemigrapha asteriscus*.

m, on *Peltigera* cf. *hymenina*, vii 1990, H. Sipman 30351 (B, with *Corticifraga fuckelii* and *Illosporium carneum*).

Australia: Tasmania: Hobart, Mount Wellington, E slope, 42°55' S, 147°15' E, 600 m, iii 1988, A. & M. Aptroot 22862 p. p. (herb. Aptroot, herb. Diederich); NW Tasmania, Sumac Spur 2, S of Arthur River, 1980, G. Kantvilas 650/80 (BM); Southwest Conservation Area, along Gordon River Rd, close to Little Florentine River, 42°44' S, 146°25' E, c. 440 m, 1990, M. Wedin 3036 (UPS).

New Zealand: North Island: South Auckland: Urewera Nat. Park, Taupeupe saddle, along track from Huiarau Summit, 38°38' S, 177°01' E, c. 920 m, 1992, M. Wedin 3992a (UPS); Gisborne: Urewera Nat. Park, Lake Waikaremoana, along Ruapani Track, 38°44' S, 177°08' E, c. 760 m, 1992, M. Wedin 4093 (UPS; also to be distributed in Santesson Fungi Lichenicoli Exsiccati). South Island: Nelson: Nelson Lakes Nat. Park, 1.5 km SE of St. Arnaud, along St. Arnaud Range Track, 41°48' S, 172°51' E, c. 625 m, 1990, M. Wedin 2628a (UPS); NW of Nelson Forest Park, Mt Arthur, track from Flora Saddle to Mt Arthur Hut, 41°11' S, 172°43' E, 1995, M. Wedin 4974 (UPS); NW of Maruia Springs, E of Springs Junction, along Rough Creek Walk, c. 975 m, 1990, M. Wedin 2746a (UPS); Southland: Longwood State Forest, 19 km NNW Riverton, Purakino River Camp, along Granity Stream, [illegible] S, [illegible] E, c. 150 m, 1990, M. Wedin 2990 (UPS, AK); Westland: Westport, Cape Foulwind, [illegible] S, [illegible] E, 1981, Walker s. n. (BM).

Argentina: Rio Negro: Lago Nahuel Huapi, in valley leading from Puerto Blest to Lago Frias, xii 1957, Kalela [illegible] (UPS); Reserva Nacional Nahuel Huapi, c. 30 km SW of Bariloche, 3 km SE Villa Mascardi, along Arroyo Negro, 41°27' S, 71°28' W, c. 1000 m, 1989, M. Wedin 1867 & Messuti (UPS). Tierra del Fuego: Ushuaia, on *P. 'chilensis'*, v 1896, Dusén 254b (UPS); N of Harberton, Mozen, on *P. 'rufescens'*, 1902, Skottsberg (UPS).

Brazil: São Paulo: Serra da Mantiqueira, Campos do Jordão, Parque Estadual de Campos do Jordão, 22°40' S, 45°30' W, c. 1500 m, ix 1997, A. Aptroot 41749 (herb. Aptroot, herb. Diederich).

Chile: Cautin: Conguillo Nat. Park, at NE base of Volcan Llaima, E shore of Laguna Conguillo, along the track up to Sierra Nevada, S-exposed slope, 38°38' S, 71°37' W, c. 1080 m, iii 1989, M. Wedin 1747 (UPS). Tierra del Fuego: Isla Grande, Rio Caleta, xii 1986, S. Stenroos 2116 (UPS); Canal Whiteside, Puerto Yartou, 1941, R. Santesson S 317, S 319 (UPS). Valdivia: Rio San Pedro, Malihue, ix 1940, R. Santesson S 398 (UPS); Lago Riñihue, Riñihue, Cerro Tralcan, ix 1940, R. Santesson S 347 (UPS).

Hemigrapha atlantica Diederich & Wedin sp. nov.

A *Hemigrapha asterisco* ascosporis majoribus 13-15 × 4.5-6 µm differt.

Typus: Great Britain, Scotland, VC 97, Westerness, Morvern, Killundine, NW of Beinn Dubh, costal woodland below cliff, grid 17/59.47, 6 ii 1992, B. Coppins & A. O'Darc 14857 (E: holotypus). Isotypes are planned to be distributed in Santesson Fungi Lichenicoli Exsiccati.

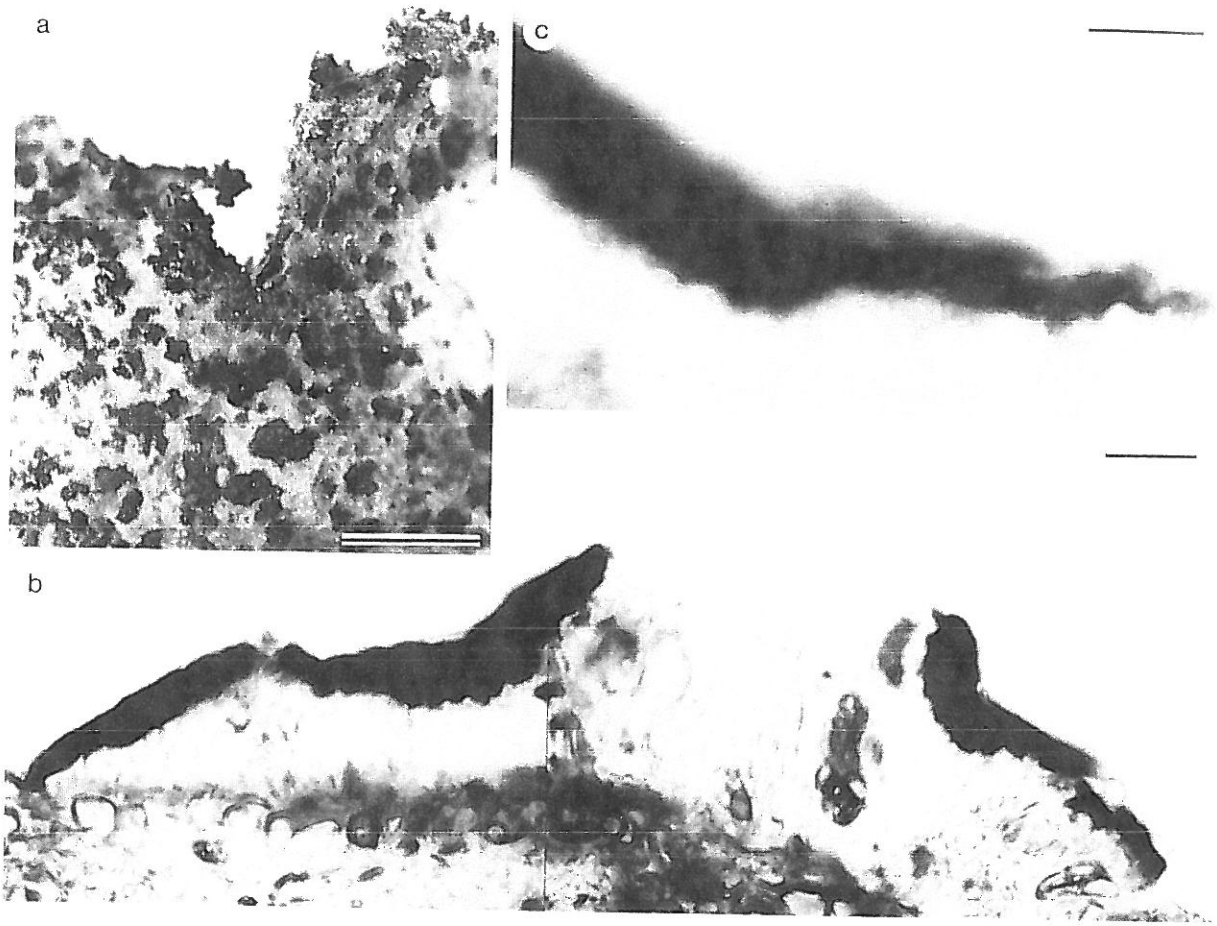

Fig. 5. *Hemigrapha atlantica* (Diederich 8024). a, ascomata on the thallus of *Sticta canariensis* (cyanobacterial morph); b, section through an ascoma (in water; note one ascus with mature, brown ascospores, and one with immature, hyaline ascospores); c, conidiogenous cells arising from the ascomatal wall. – Scale bars 1 mm (a), 20 µm (b), 10 µm (c).

conidia rod-shaped to slightly bent, basally somewhat truncate, 5-7 × 2 µm. – Figs 1b, 5, 8.

Host. Commensalistic on the thallus of the cyanobacterial morph of *Sticta canariensis* (Bory) Delise (= *S. dufourii* Delise).

Distribution. This species is known from the Azores and the British Isles (Ireland and Scotland) (Fig. 8).

Observations. The first specimen of this species was collected in Ireland in 1965 by Folan. As the ascomata in that material didn't contain any ascospores, it was provisionally determined as *H. asteriscus*, and published by Folan & Mitchell (1970) under that name. Santesson, however, regarded this determination as doubtful (Cannon et al. 1985), and our discovery of fertile material has confirmed this opinion.

The new species, *H. atlantica* differs from *H. asteriscus* by the larger ascospores.

Additional specimens examined. Azores: Fayal: Calderira Grande, v 1937, H. Persson (UPS). Sao Miguel: Lagoa do Congro, iv 1937, H. Persson (UPS). Tercerira: SW of Agualva, iv 1937, H. Persson (UPS).

Great Britain: V. C. 104, North Ebudes: Isle of Skye, Tokavaig wood (coord. NG 61 12), v 1987, P. Diederich 8024 (herb. Diederich, E, LG, UPS). - Ireland: V. C. H 16, West Galway: Co. Galway, Derryclare Wood, alt. c. 50', i 1965, A. C. M. Folan s. n. (UPS).

Hemigrapha nephromatis Wedin & Diederich sp. nov.

A *Hemigrapha asterisco* et *H. atlantica* ascosporis