

A NEW SPECIES AND NEW RECORDS IN THE LICHEN FAMILY PARMELIACEAE (ASCOMYCOTINA) FROM THE PHILIPPINES

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ABSTRACT: *Parmotrema negrosorientalum* from the Philippines is described as new to science. In addition, 13 species of Parmeliaceae are reported for the first time for the Philippines.

KEY WORDS: *Parmotrema negrosorientalum*, *Hypotrachyna*, *Hypogymnia*, *Parmotrema*, *Platismatia*, *Rimelia*

In recent years there has been a significant increase in interest and appreciation of the lichen flora of Philippines, with localised studies of lichen biodiversity (Elix & Bawingan *ined.*), as well as several intensive field investigations by F. Schumm (lichens) & U. Schwarz (bryophytes). We have now undertaken a detailed survey of the recent collections of Parmeliaceae from the Philippine islands of Leyte, Mindanao and Negros culminating in our describing a species new to science and 13 new records for the country. Throughout the present work chemical constituents were identified by thin layer chromatography (Culberson 1972; Culberson & Johnson 1982; Elix & Ernst-Russell 1993), high performance liquid chromatography (Feige *et al.* 1993; Elix *et al.* 1997) and comparison with authentic samples.

***Parmotrema negrosorientalum* Elix & Schumm, sp. nov.**

Fig. 1

Thallus ut in *Parmotrema rampoddense* sed magnus, coriaceus, superfice superiore maculata et sporis majoribus differt.

Type: PHILIPPINES. Negros, Negros Oriental Province: Mt Talinis (Cuernos de Negros), Lunga Nature Trail between Camp Vendiola (9°16'N, 123°11'E) and Lake Nailig (9°15'N, 123°10'E), 1170 m, on bark, *F. Schumm & U. Schwarz*, 10 Aug. 2000; holo: herb. Schumm 7521.

Thallus corticolous, foliose, loosely adnate, coriaceous, to 8–12 cm wide. *Lobes* imbricate, subirregular, 5–12 mm wide; margins crenate or irregularly incised-dentate, ascending or revolute; cilia moderately dense, 0.2–5.0 mm long; lobules rare along the lobe margins. *Upper surface* pale grey to grey-green, flat, \pm maculate, irregularly cracked, \pm with black discoloured patches, isidia absent; soralia linear on small incised marginal laciniae or on ascending lobe margins, sometimes spreading submarginally, with marginally sorediate lobes becoming involute; soredia farinose, becoming blackened, with orange patches on older lobes in the thallus centre. *Medulla* white, becoming orange-red in older lobes particularly adjacent to lower cortex. *Lower surface* black, with a white to pale brown erhizinate marginal zone; rhizines unevenly distributed, simple, slender, to 1 mm long. *Apothecia* rare, submarginal, stipitate to substipitate, 3–10 mm wide; disc perforate or imperforate, becoming undulate distorted; thalline exciple strongly rugose and maculate, becoming sorediate, thalline margin crenate. *Ascospores* ellipsoid, 26–30 \times 10–17 μ m. *Pycnidia* rare, immersed - only immature pycnidia observed.

Chemistry. Cortex K⁺ yellow; medulla K⁻, C⁻, KC⁺ red, P⁻; pigmented medulla K⁺ violet; containing atranorin (minor), chloroatranorin (minor), alectoronic acid (major), α -collatolic acid (major), dehydrocollatolic acid (minor), skyrin (minor).

Parmotrema negrosorientalum closely resembles *P. rampoddense* (Nyl.) Hale, as these two species have similar loosely adnate thalli with prominent cilia, marginal soralia and contain alectoronic acid, α -collatolic acid and skyrin in the medulla. However, *P. negrosorientalum* can clearly be separated by the larger, coriaceous thallus (membranaceous in *P. rampoddense*), the often maculate upper surface (emaculate in *P. rampoddense*), ultimately perforate apothecial discs (imperforate in *P. rampoddense*), and the much larger spores (26–30 \times 10–17 μ m cf. 10–12 \times 6–7 μ m). In overall morphology *P. negrosorientalum* closely resembles *P. lobulascens* (Steiner) Hale, but the latter species lacks the orange-red pigmentation of the lower medulla and soralia. This pigmentation is due to substantial concentrations of the bis-anthraquinone, skyrin. At present, the new species is known from several localities in Negros Oriental Province in the Philippines.

Specimens Examined

PHILIPPINES. Negros, Negros Oriental Province: type locality, *F. Schumm & U. Schwarz*, 10 Aug. 2000 (CANB, herb. Schumm 7463, 7465, 7466); Mt Talinis (Cuernos de Negros), Lunga Nature Trail near Lake Yagumyum,



Figure 1. *Parmotrema negrosorientalum* (isotype in CANB). Scale bar = 5 mm.

9°15'N, 123°11'E, 1360 m, on bark, F. Schumm & U. Schwarz, 11 Aug. 2000 (CANB, herb. Schumm 7571).

New Records of Parmeliaceae for the Philippines

Hypotrachyna corneola Kurok. & Moon, *Bull. Bot. Gard. Toyama* 5: 41 (2000)

Previously this species was only known from Papua New Guinea (Kurokawa & Moon 2000).

Specimen Examined

PHILIPPINES. Mindanao, Bukidnon Province: Intavas, west of Malabalay at foot of Mt Kitanglad, 8°12'N, 124°57'E, 1270 m, on bark, F. Schumm & U. Schwarz, 18 Aug. 1999 (herb. Schumm 6237). Cotabato Province: Mt Apo,

Marbel River Campsite, 7°00'N, 125°15'E, 1490 m, on bark, *F. Schumm & U. Schwartz*, 9 Aug. 1999 (herb. Schumm 8031).

Hypotrachyna imbricatula (Zahlbr.) Hale, *Smithsonian Contr. Bot.* 25: 41 (1975)

A widely distributed subtropical-tropical species also known from the Americas, Southeast Asia, Australia, Papua New Guinea and Hawaii (Elix 1994a; Hale 1975).

Specimen Examined

PHILIPPINES. Mindanao, Bukidnon Province: Intavas, west of Malabalay at foot of Mt Kitanglad, 8°12'N, 124°57'E, 1270 m, on bark, *F. Schumm & U. Schwartz*, 18 Aug. 1999 (CANB, herb. Schumm 6246).

Hypotrachyna physcioides (Nyl.) Hale, *Smithsonian Contr. Bot.* 25: 54 (1975)

A common species in tropical America, India, Thailand, Malaysia and Papua New Guinea (Hale 1975; Kurokawa 1979; Pooprang *et al.* 1999).

Specimens Examined

PHILIPPINES. Mindanao, Bukidnon Province: west of Malabalay, intermediate camp site, Mt Kitanglad, 8°10'N, 124°56'E, 1870-2800 m, on bark in tropical montane rainforest, *F. Schumm & U. Schwartz*, 19 Aug. 1999 (herb. Schumm 6297). Cotabato Province: summit of Mt Apo, 6°59'N, 125°16'E, 2900 m, on rocks, *O. L. Bernabe*, 12 Aug. 1999 (CANB, herb. Schumm 6194, 6202); between Lake Venado and summit of Mt Apo, 6°59'-7°00'N, 125°16'-125°20'E, 2200-2800 m, on bark in tropical montane rainforest, *F. Schumm & U. Schwartz*, 11 Aug. 1999 (herb. Schumm 6151, 6181).

Hypotrachyna reducens (Nyl.) Hale, *Smithsonian Contr. Bot.* 25: 60 (1975)

A temperate and tropical species also known from Australia, Malaysia (Sabah), New Guinea, Central and South America (Elix 1994a; Hale 1975; Kurokawa 1979).

Specimen Examined

PHILIPPINES. Mindanao, Bukidnon Province: west of Malabalay, intermediate camp site, Mt Kitanglad, 8°10'N, 124°56'E, 1870-2800 m, on bark in tropical montane rainforest, *F. Schumm & U. Schwartz*, 19 Aug. 1999 (CANB, herb. Schumm 6273).

Hypogymnia zeylanica (R. Sant.) Awasthi & Singh

This species was previously known only from Sri Lanka, India (Awasthi & Singh 1971) and Papua New Guinea (Elix & Jenkins 1989).

Specimen Examined

PHILIPPINES. Cotabato Province: Mt Apo, swamp region on west bank of Lake Venado, 7°00'N, 125°16'E, 2210 m, on bark in open montane area, U. Schwartz, 20 Mar. 1999 (B, herb. Schumm 5479).

Parmotrema cooperi (J. Steiner & Zahlbr.) Sérus., *Bryologist* 87: 4 (1984)

This species was previously known from Africa, Madagascar, Asia, India (Hale 1965; Krog & Swinscow 1981) and Australia (Elix 1994b).

Specimen Examined

PHILIPPINES. Cotabato Province: near Ilomavis, on the road past Kidapawan, 7°02'N, 125°11'E, 730 m, on Cocos palm, F. Schumm & U. Schwartz, 7 Aug. 1999 (CANB, herb. Schumm 5885).

Parmotrema dilatatum (Vain.) Hale, *Phytologia* 28: 335 (1974)

This species is widespread in Africa, India, Australia, New Zealand, Papua New Guinea and South America (Elix 1994b; Hale 1965; Krog & Swinscow 1981; Louwhoff & Elix 2000).

Specimen Examined

PHILIPPINES. Mindanao, Bukidnon Province: west of Malabalay, intermediate camp site, Mt Kitanglad, 8°10'N, 124°56'E, 1870-2800 m, on bark in tropical montane rainforest, F. Schumm & U. Schwartz, 19 Aug. 1999 (CANB, herb. Schumm 6303).

Parmotrema lobulascens (Steiner) Hale, *Phytologia* 28: 337 (1974)

Previously this species was known from Africa (Krog & Swinscow 1981) and Asia (Hale 1965).

Specimens Examined

PHILIPPINES. Mindanao, Bukidnon Province: west of Malabalay, intermediate camp site, Mt Kitanglad, 8°10'N, 124°56'E, 1870-2800 m, on bark in tropical montane rainforest, F. Schumm & U. Schwartz, 19 Aug. 1999 (herb. Schumm 6272). Cotabato Province: Mt Apo, near Lake Venado, 7°00'N, 125°16'E, 2200 m, on bark in tropical montane rainforest, F. Schumm & U. Schwartz, 10 Aug. 1999 (CANB, herb. Schumm 6071, 6084).

Parmotrema permutatum (Stirt.) Hale, *Phytologia* 28: 338 (1974)

This species is known from Africa, India, Indonesia, Papua New Guinea, Australia, Central and South America (Elix 1994b; Hale 1965; Krog & Swinscow 1981; Louwhoff & Elix 2000).

Specimen Examined

PHILIPPINES. Mindanao, Cotabato Province: near the Lake Agko campsite at foot of Mt Apo, 7°01'N, 125°13'E, 1240 m, on bark, *F. Schumm & U. Schwartz*, 7 Aug. 1999 (herb. Schumm 5941).

Parmotrema rampoddense (Nyl.) Hale, *Phytologia* 28: 338 (1974)

A widespread species known from West Africa, North, Central and South America, Sri Lanka and India (Hale 1965), Australia (Elix 1994b) and Papua New Guinea (Louwhoff & Elix 2000).

Specimens Examined

PHILIPPINES. Leyte, Leyte Province: Lake Kasudsuran near Barangay Liberty (Ormoc City), 11°02'N, 124°45'E, 740 m, on bark, *F. Schumm & U. Schwartz*, 23 Aug. 2000 (herb. Schumm 7943, 7948). Mindanao, Cotabato Province: near the Lake Agko campsite at foot of Mt Apo, 7°01'N, 125°13'E, 1240 m, on bark, *F. Schumm & U. Schwartz*, 7 Aug. 1999 (herb. Schumm 5916, 5978); Mt Apo, near Lake Venado, 7°00'N, 125°16'E, 2200 m, on bark in tropical montane rainforest, *F. Schumm & U. Schwartz*, 10 Aug. 1999 (herb. Schumm 6115). Negros, Negros Oriental Province: Mt Talinis (Cuernos de Negros), Lunga Nature Trail between Barangay Lunga (9°17'N, 123°14'E) and Camp Vendiola (9°16'N, 123°11'E), 1030 m, on bark, *F. Schumm & U. Schwarz*, 10 Aug. 2000 (herb. Schumm 7443); Mt Talinis (Cuernos de Negros), Lunga Nature Trail between Camp Vendiola (9°16'N, 123°11'E) and Lake Nailig (9°15'N, 123°10'E), 1180 m, on bark, *F. Schumm & U. Schwarz*, 10 Aug. 2000 (herb. Schumm 7467, 7533); Mt Talinis (Cuernos de Negros), Lunga Nature Trail, between Lake Yagumyum and Bediao-Dauin, 9°15'N, 123°11'E, 1240 m, on bark, *F. Schumm & U. Schwarz*, 12 Aug. 2000 (herb. Schumm 7613).

Parmotrema sancti-angelii (Lyngé) Hale, *Phytologia* 28: 339 (1974)

This pantropical species has been reported previously from Central and South America, eastern and southern Africa, Papua New Guinea and Australia (Elix 1994b; Hale 1965; Krog & Swinscow 1981; Louwhoff & Elix 2000).

Specimens Examined

PHILIPPINES. Cotabato Province: near Ilomavis, on the road past Kidapawan, 7°02'N, 125°11'E, 730 m, on bark, *F. Schumm & U. Schwartz*, 7 Aug. 1999 (CANB, herb. Schumm 5869, 5874, 5903, 5908).

Platismatia regenerans W. Culb. & C. Culb., *Contr. U.S. Natl Herb.* 34: 547.(1968)

This species has been reported previously from the high mountains of Sabah, Malaysia (Culberson & Culberson 1968).

Specimen Examined

PHILIPPINES. Cotabato Province: Mt Apo, swamp region on west bank of Lake Venado, 7°00'N, 125°16'E, 2210 m, on bark in open montane area, U. Schwartz, 20 Mar. 1999 (herb. Schumm 5485).

Rimelia austrocetrata (Elix & J. Johnst.) Hale & A. Fletcher, *Bryologist* 93: 26 (1990)

This Australasian species is known from Australia, New Zealand, Papua New Guinea, Norfolk and Lord Howe Islands (Elix 1994c; Hale & Fletcher 1990; Louwhoff & Elix 1999, 2000).

Specimens Examined

PHILIPPINES. Cotabato Province: between Lake Venado and summit of Mt Apo, 6°59'-7°00'N, 125°16'-125°20'E, 2200-2800 m, on bark in tropical montane rainforest, F. Schumm & U. Schwartz, 11 Aug. 1999 (CANB, herb. Schumm 6126); Mt Apo, swamp region on east bank of Lake Venado, 7°00'N, 125°16'E, 2210 m, on mossy rocks, U. Schwartz, 20 Mar. 1999 (B, herb. Schumm 5441).

ACKNOWLEDGEMENTS

We thank Stuart Hay and Neal McCracken of the Photographic Unit, ANU, for preparing the photograph.

LITERATURE CITED

- Awasthi, D. D. & Singh, K. P. (1971). Additions to the lichen flora of India. *Geophytology* 1: 97-1021.
- Culberson, C. F. (1972). Improved conditions and new data for the identification of lichen products by a standardized thin-layer chromatographic method. *Journal of Chromatography* 72: 113-125.
- Culberson, C. F. & Johnson, A. (1982). Substitution of methyl *tert*-butyl ether for diethyl ether in the standardized thin-layer chromatographic method for lichen products. *Journal of Chromatography* 238: 483-487.
- Culberson, W. L., Culberson, C. F. (1968). The lichen genera *Cetraria* and *Platismatia* (Parmeliaceae). *Contributions from the United States National Herbarium* 34: 447-558.
- Elix, J. A. (1994a). *Hypotrachyna*. *Flora of Australia* 55: 49-59.
- Elix, J. A. (1994b). *Parmotrema*. *Flora of Australia* 55: 140-162.
- Elix, J. A. (1994c). *Rimelia*. *Flora of Australia* 55: 186-188.
- Elix, J. A., & Ernst-Russell, K. D. (1993). *A Catalogue of Standardized Thin Layer Chromatographic Data and Biosynthetic Relationships for Lichen Substances*, 2nd Edn. (Australian National University, Canberra).

- Elix, J. A. & Jenkins, G. A. (1989). New species and new records of *Hypogymnia*. *Mycotaxon* 35: 469-476.
- Elix, J. A., Wardlaw, J. H., Archer, A. W., Lumbsch, H. T., and Plümper, M. (1997). Four new depsidones from *Pertusaria* and *Lecanora* lichens. *Australasian Lichenology* 41: 22-27.
- Feige, G. B., Lumbsch, H. T., Huneck, S. & Elix, J. A. (1993). The identification of lichen substances by a standardized high-performance liquid chromatographic method. *Journal of Chromatography* 646: 417-427.
- Hale, M. E. (1965). A monograph of *Parmelia* subgenus *Amphigymnia*. *Contributions from the United States National Herbarium* 36: 193-358.
- Hale, M. E. (1975). A revision of the lichen genus *Hypotrachyna* (Parmeliaceae). *Smithsonian Contributions to Botany* 32: 1-29.
- Hale, M. E. & Fletcher, A. (1990). *Rimelia* Hale & Fletcher, a new lichen genus (Ascomycotina: Parmeliaceae). *Bryologist* 93: 23-29.
- Krog, H. & Swinscow, T. D. V. (1981). *Parmelia* subgenus *Amphigymnia* (lichens) in East Africa. *Bulletin of the British Museum (Natural History), Botany Series* 9: 143-231.
- Kurokawa, S. (1979). *Enumeration of species of Parmelia in Papua New Guinea*. (Academia Scientific Book Inc.: Tokyo).
- Kurokawa, S. & Moon (2000). New species and new records in *Hypotrachyna* (Parmeliaceae). *Bulletin of the Botanical Gardens of Toyama* 5: 9-24.
- Louwhoff, S. H. J. J. & Elix, J. A. (1999). The lichen family Parmeliaceae (Ascomycotina) on Lord Howe Island, Australia. *Mycotaxon* 68: 429-463.
- Louwhoff, S. H. J. J. & Elix, J. A. (2000). *Parmotrema* and allied lichen genera in Papua New Guinea. *Bibliotheca Lichenologica* 73: 1-152.
- Pooprang T., Boonpragob, K. & Elix, J. A. (1999). New species and new records in the Parmeliaceae (Ascomycotina) from Thailand. *Mycotaxon* 71: 111-127.