

## **New or interesting lichen records from Guatemala I**

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PIETER VAN DEN BOOM, JOHN ELIX & HARRIE SIPMAN

## New or interesting lichen records from Guatemala I

### Abstract

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184 lichen taxa are reported from three mountain areas and one coastal locality in Guatemala, 159 of which are considered new records for Guatemala; of these, 52 are new to Central America and 12 new to the Neotropics. Notes on ecology and detailed chemical analyses are given for many taxa.

Key words: Neotropics, lichen diversity, Central America, lichen chemistry, lichen ecology.

### Introduction

Although lichen diversity in the Neotropics is receiving more and more attention, the lichen flora of Guatemala is still very poorly known. To date only two papers on Guatemalan lichens have been published (Barillas & Lücking 1992, Barillas & al. 1993), in which 104 and 45 taxa of foliicolous lichens were treated, respectively. Records for another c.100 lichen taxa from Guatemala have been reported in other recent publications. Those taxa that have not been re-collected in the present work are recorded in the Appendix.

A study visit by the first author and his wife in 2004 was supported by Prof. Roselvira Barillas (Guatemala City), and this provided the opportunity to further the knowledge of Guatemala's lichen flora. The lichen diversity in a wide range of substrata and habitats from sea level to 3150 m was sampled. The location of the main collecting sites is indicated in Fig. 1. Over 900 collections were made and the initial results (dealing mainly with macrolichens) are listed here. Currently 184 lichen species have been identified, of which 12 taxa are new to the Neotropics, 52 new to Central America and 159 new to Guatemala.

### Material and methods

The specimens investigated are deposited in the herbarium of the first author. For details of the collecting localities see the list, below.

Measurements of ascospores and pycnosporos were made in water at  $\times 400$  or  $\times 1000$  magnification. Amyloid reactions were tested using Lugol's iodine solution (K/I). The secondary metabolites present in most foliose and fruticose specimens were analysed by TLC using the methods of Culberson & Ammann (1979), Culberson & Johnson (1982) and/or by HPLC (Feige & al. 2003).



Fig. 1. Indication of the main collecting sites – A-E refer to the following localities: A = 1-9, B = 10, 20, 21, C = 11, D = 12 – 17- E = 18-19, see text.

In the absence of a thorough checklist, species not recorded in the literature mentioned in the introduction above or in the Appendix are considered to be new for Guatemala. To establish whether a record was new for Central America, the catalogue of the lichens of Costa Rica (Umaña Tenorio & al. 2002) was consulted, as well as the catalogue of lichens of El Salvador (Sipman 2001) where 309 species are listed, and publications by Breuss (2000, 2001) for Costa Rica and Nicaragua (Breuss 2002); in this latter paper, 273 lichen species are recorded.

#### Localities investigated

- 1 SSE of Quezaltenango, S of Zunil, Fuentes Georginas, near swimming pool, between small houses, path along rock face, often shaded by fog, 14°45.4'N, 91°28.8'E, 2400 m, 21.7.2004, P. & B. van den Boom.
- 2 WSW of Quezaltenango, San Martin, SE edge of village, along path to Laguna Chicabal, small mixed forest, 14°48.7'N, 91°38.6'E, 2490 m, 22.7.2004, P. & B. van den Boom.
- 3 WSW of Quezaltenango, San Martin, SE of village, along path to Laguna Chicabal, mixed forest on NW slope, scattered outcrops along path and at open places, 14°48.2'N, 91°38.8'E, 2700 m, 22.7.2004, P. & B. van den Boom.
- 4 S of Quezaltenango, S of Llano del Pinal, N slope of volcano Santa Maria, path along small agriculture fields with small forests, shrubs, trees and outcrops, 14°47.1'N, 91°32.9'E, 2500 m, 23.7.2004, P. & B. van den Boom.
- 5 S of Quezaltenango, S of Llano del Pinal, N slope of volcano Santa Maria, path along small agriculture fields with small forests, shrubs, trees and outcrops, 14°46.6'N, 91°33.3'E, 2700 m, 23.7.2004, P. & B. van den Boom.

- 6 NE of Quezaltenango, San Andrés Xecul, centre of village, bank of sand along street, tiles on small houses and tombstones in churchyard, 14°54.3'N, 91°29.2'E, 2500 m, 24.7.2004, *P. & B. van den Boom*.
- 7 NW of Quezaltenango, NNW of San Marcos, along trail from San Sebastian to top of volcano Tajumulco, on ENE slope, below the small village El Rodeo, shrubs, trees and outcrops, 15°03.1'N, 91°50.5'E, 2950 m, 25.7.2004, *P. & B. van den Boom*.
- 8 NW of Quezaltenango, NNW of San Marcos, along trail from San Sebastian to top of volcano Tajumulco, on ENE slope, above the small village El Rodeo, shrubs and outcrops in open field, 15°02.9'N, 91°51.3'E, 3150 m, 25.7.2004, *P. & B. van den Boom*.
- 9 SSE of Quezaltenango, S of Zunil, Fuentes Georginas, near swimming pool, steep trail in tropical rain forest, often shaded by fog, 14°45.2'N, 91°28.6'E, 2400 m, 26.7.2004, *P. & B. van den Boom*.
- 10 Guatemala Ciudad, garden around San Carlos University, scattered mixed trees, 14°37.2'N, 91°33.3'E, 1730 m, 27.7.2004, *P. & B. van den Boom & R. Barillos*.
- 11 NNW of Guatemala Ciudad, Mixco Viejo, scattered mixed trees (mainly *Mimosaceae*) and a few stones among Maya monuments, 14°52.4'N, 90°39.7'E, 870 m, 28.7.2004, *P. & B. van den Boom & R. Barillos*.
- 12 Coban, 2 km SW of the city, Vivero Verapaz, orchid garden, dominated by tree ferns, 15°27.6'N, 90°23.3'E, 1330 m, 30.7.2004, *P. & B. van den Boom*.
- 13 E of Coban, San Pedro Carcha, Balneario Las Islas, hill along and above cascades, *Acer*, *Pinus* and *Quercus* trees and some outcrops, 15°28.0'N, 90°18.5'E, 1320 m, 31.7.2004, *P. & B. van den Boom*.
- 14 Coban, centre of the city, garden of hotel 'La Posada', mixed trees and shrubs, and coffee plantation, 15°28.2'N, 90°22.5'E, 1310 m, 31.7.2004, *P. & B. van den Boom*.
- 15 SSE of Coban, SE of Purulhá, Biotopo Mario Dary Rivera (Biotopo del Quetzal), 'Fern Trail', including the area of the biological station, NE exposed slope with tropical rain forest, 15°13.5'N, 90°13.6'E, 1700 m, 1.8.2004, *P. & B. van den Boom*.
- 16 SSE of Coban, SE of Purulhá, Biotopo Mario Dary Rivera (Biotopo del Quetzal), 'Moss Trail', NE exposed slope with tropical rain forest, 15°13.2'N, 90°13.9'E, 1850 m, 1.8.2004, *P. & B. van den Boom*.
- 17 Coban, NW of city, forest (national park) 'Las Victorias', with many trails and mixed trees and shrubs, 15°28.4'N, 90°22.8'E, 1320 m, 3.8.2004, *P. & B. van den Boom*.
- 18 Monterrico, E of village, nature reserve 'Biotopo Monterrico-Hawaii', coastal mangrove swamps, 13°54.2'N, 90°28.3'E, 1 m, 5.8.2004, *P. & B. van den Boom*.
- 19 Monterrico, at village, near Tortugario Monterrico, little museum in a small park with mixed trees, 13°54.3'N, 90°29'E, 20 m, 5.8.2004, *P. & B. van den Boom*.
- 20 NE of Antigua Guatemala, Florencia park, mature and small, young *Quercus* trees, 14°34.1'N, 90°42.1'E, 1800 m, 6.8.2004, *P. & B. van den Boom & R. Barillas*.
- 21 Guatemala Ciudad, south side, near Tikal Futura Hotel, small garden at restaurant, on young trees, 14°38'N, 91°33'E, 1650 m, 7.8.2004, *P. & B. van den Boom*.

### List of records

Numbers in brackets after the name refer to the localities listed above. The subsequent 5-digit number refers to the voucher specimens, which are deposited in the private herbarium of P. van den Boom. The lichen substances reported have been found in all the specimens of the particular species, except where indicated otherwise.

Species marked with an asterisk are new records for Central America, those with two asterisks are new to the Neotropics and those species in bold are new for Guatemala. The criteria for these new records are presented under Material and methods.

*Acanthothecis hololeuroides* (Nyl.) Staiger & Kalb – (13) 33313, on *Pinus*.

\**Agonimia opuntiiella* (Poelt & Buschardt) Vězda – (11) 33167, on *Acacia* trunk, conf. E. Sérusiaux.

- Arthonia cinnabarina* (DC.) Wallr. – (1) 32768, on *Yucca elephantipes*; (2) 32819, on small tree; (17) 33509, on smooth bark of large tree.
- \**Arthonia muscigena* Th. Fr. – (4) 32912, on S exposed boulder.
- Asterothyrium monosporum* Müll. Arg. – (14) 33340, on shrub leaf, det. E. Sérusiaux.
- Auriculora byssomorpha* (Nyl.) Kalb – (15) 33369, on small trunk.
- Bactrospora myriadea* (Fée) Egea & Torrente – (18) 33557, on *Rhizophora mangle*; (19) 33579, on small trunk.
- Baomyces rufus* (Huds.) Rebut. – (5) 32956; (8) 33060, both terricolous on sandy soil.
- Brigantiaea leucoxantha* (Spreng.) R. Sant. & Hafellner – (17) 33511, on smooth bark of large tree. – Recorded by Hafellner (1997).
- \**Bryophagus gloeocapsa* Nitschke ex Arnold – (8) 33056, terricolous on bank of path, on decaying mosses.
- Bunodophoron melanocarpum* (Sw.) Wedin – (15) 33371, on large, mossy trunk.
- Calenia aspidota* (Vain.) Vězda – (12) 33252, on fern leaf, det. E. Sérusiaux.
- Calicium hyperelloides* Nyl. – (13) 33318, on *Pinus* trunk, det. L. Tibell.
- Calopadia puiggarii* (Müll. Arg.) Vězda – (12) 33254, on fern leaf, det. E. Sérusiaux. – Recorded by Barillas & Lücking (1992).
- \**Caloplaca cerina* (Ehrh. ex Hedw.) Th. Fr. – (10) 33140, 33154, on *Tabebuia rosea*.
- \**Candelaria concolor* (Dicks.) Stein – (10) 33157, on *Jacaranda mimositolia*; (11) 33196, on *Acacia*.
- Candelariella rosulans* (Müll. Arg.) Zahlbr. – (6) 33004, on exposed tile; (8) 33068, on horizontal and vertical faces of rock outcrop, det. M. Westberg.
- Candelina mexicana* (de Lesd.) Poelt – (11) 33208, on stones of wall, conf. M. Westberg.
- \**Candelina submexicana* (de Lesd.) Poelt – (11) 33209, on stones of wall, conf. M. Westberg.
- \**Canoparmelia amabilis* Heiman & Elix – (11) 33184, on *Acacia*. – Atranorin (minor), chloroatranorin (minor), stenoporic acid (major), perlatolic acid (minor), glomelliferic acid (minor).
- Canoparmelia carneopruinata* (Zahlbr.) Elix & Hale – (10) 33143, on *Tabebuia rosea*, 33144, on *Fraxinus*; (11) 33169, on *Acacia*; (20) 33629, on mature *Quercus* trunk. – Atranorin (minor), stictic acid (major), constictic acid (minor), cryptostictic acid (minor), menegazziaic acid (minor).
- Canoparmelia texana* (Tuck.) Hale – (11) 33182, on *Acacia*, 33163, on *Enterolobium cyclocarpum*; (20) 33623a, on *Quercus*. – Atranorin (minor), divaricatic acid (major), nordivaricatic acid (minor).
- \**Catillaria nigroclavata* (Nyl.) Schuler – (7) 33032, on *Baccharis vaccinooides*.
- Chrysothrix xanthina* (Vain.) Kalb – (3) 32864, on mature *Alnus arguta* trunk.
- Cladia aggregata* (Sw.) Nyl. – (16) 33441, on mossy trunk. – Barbatic acid (major), 4-*O*-demethylbarbatic acid (trace). – Recorded by Ahti (2000).
- Cladonia ceratophylla* (Sw.) Spreng. – (1) 32798, on vertical outcrop; (9) 33127, on mature trunk; (13) 33278, on *Quercus*, 33291, on tall stump; (15) 33380, on large trunk; (16) 33450, terricolous on vertical bank of path; (17) 33516, on *Pinus*. – Atranorin (minor) in (32798, 33278, 33291, 33380), fumarprotocetraric acid (major) in (32798, 33127, 33278, 33291, 33380), protocetraric acid (trace) in (32798, 33127, 33278, 33291, 33380), confumarprotocetraric acid (trace) in (33380), physodalic acid (trace) in 33278. – Recorded by Ahti (2000).
- Cladonia coccifera* (L.) Willd. – (4) 32922, 32930, on rock outcrops and terricolous. – Usnic acid (major), zeorin (minor); skyrin (minor) in (32922).
- Cladonia corymbites* Nyl. – (1) 32758, on vertical face of rock outcrop; (13) 33303a, on *Pinus*. – Fumarprotocetraric acid (major), protocetraric acid (trace); protolichesterinic acid (minor) in (33303a).
- Cladonia didyma* (Fée) Vain. – (13) 33303, on *Pinus*; (16) 33439, terricolous on shaded bank of path. – Barbatic acid (minor), condidymic acid (minor), didymic acid (major), subdidymic acid (minor), thamnolic acid (minor); isodidymic acid (minor) in (33303), diacetylgraciliformin (trace) in (33303), rhodocladonic acid (trace) in (33303). – Recorded by Ahti (2000).

- Cladonia mexicana* Vain. – (1) 32752, on vertical face of rock outcrop. – Atranorin (major), fumarprotocetraric acid (major), protocetraric acid (minor). – Recorded by Ahti (2000).
- Cladonia* cf. *polyscypha* Ahti & L. Xavier – (5) 32998, on horizontal trunk of *Yucca elephantipes*. – Fumarprotocetraric acid (major), protocetraric acid (minor).
- Cladonia pyxidata* (L.) Hoffm. s.l. – (13) 33309, on *Pinus*. – Fumarprotocetraric acid (major), protocetraric acid (trace).
- Cladonia subsquamosa* Kremp. – (4) 32911, on S exposed boulder; (12) 33217, on stump. – Fumarprotocetraric acid (major), protocetraric acid (minor). – Recorded by Ahti (2000).
- Coccocarpia filiformis* L. Arvidss. – (17) 33502, on small trunk. – No lichen substances detected by TLC.
- Coccocarpia palmicola* (Spreng.) L. Arvidss. & D. Gallow. – (11) 33166, on *Enterolobium cyclocarpum*; (12) 33233, on *Cola paba*, 33241, 33247, on *Yucca elephantipes*; (13) 33297, on exposed roots of large tree; (17) 33469, on *Pinus*.
- \**Coenogonium pulchrum* (Müll. Arg.) Kalb – (17) 33545, on smooth bark of large tree, det. E. Sérusiaux. (syn. *Dimerella chiodectionoides* Kalb)
- Collema pulcellum* Ach. var. *pulcellum* – (14) 33352, on unidentified shrub, det. M. Schulz.
- \**Cresponea proximata* (Nyl.) Egea & Torrente – (18) 33563, on *Rhizophora mangle*, conf. E. Sérusiaux.
- Cryptothecia rubrocincta* (Ehreb.) Thor – (12) 33214, on tree fern; (13) 33311, on *Pinus*.
- \*\**Dermatocarpon americanum* Vain. – (13) 33295, on horizontal and sloping faces of rock outcrops along stream, det. S. Heidmarsson.
- Dictyonema glabratum* (Spreng.) D. Hawksw. – (1) 32763, on horizontal surface of boulder; (8) 33061, on vertical and sloping soil.
- Dirinaria applanata* (Fée) D. D. Awasthi. – (10) 33152, on *Tecoma stans*; (11) 33192, on *Acacia*; (20) 33638, on *Quercus*. – Atranorin (major), divaricatic acid (major), 3 $\beta$ -acetoxyhopane-1 $\beta$ ,22-diol (minor), unknown triterpenes (minor).
- Dirinaria confluens* (Fr.) D. D. Awasthi – (18) 33570, on white mangrove. – Atranorin (major), divaricatic acid (major), 3 $\beta$ -acetoxyhopane-1 $\beta$ ,22-diol (minor), unknown triterpenes (minor).
- Dirinaria papillulifera* (Nyl.) D. D. Awasthi – (18) 33571, on white mangrove. – Atranorin (major), divaricatic acid (major), 3 $\beta$ -acetoxyhopane-1 $\beta$ ,22-diol (minor), unknown triterpenes (minor).
- Dirinaria picta* (Sw.) Clem. & Shear – (10) 33161, on *Tabebuia rosea*. – Atranorin (major), divaricatic acid (major), 3 $\beta$ -acetoxyhopane-1 $\beta$ ,22-diol (minor), unknown triterpenes (minor).
- \**Endocarpon pusillum* Hedw. – (6) 33002, on loamy soil on road bank.
- \**Erioderma glabrum* P. M. Jørg. – (15) 33378, on small trunk. – 6-*O*-Methylarthothelin (major), vicanicin (minor).
- Erioderma verruculosum* (Vain.) Hue – (15) 33363, on small trunk. – Eriodermin (major).
- Everniastrum sorocheilum* (Vain.) Hale ex Sipman – (7) 33013, 33034, on *Baccharis vaccioides*. – Atranorin (minor), salazinic acid (major), consalazinic acid (minor); protocetraric acid (trace) in (33013), protolichesterinic acid (minor) in (33013).
- Everniastrum vexans* (Zahlbr.) Hale ex Sipman – (1) 32755, on horizontal face of boulder; (16) 33455, on fallen branch. – Atranorin (minor), salazinic acid (major), consalazinic acid (minor), protolichesterinic acid (minor).
- Fellhanera fuscata* (Müll. Arg.) Vězda – (9) 33088, 33133, on shrub leaf, 33087, on fern leaf, conf. E. Sérusiaux.
- Fellhanera subfuscata* Lücking – (9) 33101, on fern leaf.
- Flavoparmelia caperata* (L.) Hale – (3) 32876, on underside of slanting trunk of large tree; (5) 32985, on mature *Alnus arguta*. – Usnic acid (minor), protocetraric acid (major); caperatic acid (minor) in (32985), subvirensic acid (trace) in (32876).
- \**Flavopunctelia borrerioides* Kurok. – (4) 32913, on S exposed vertical face of rock outcrop, moderately shaded. – Usnic acid (minor), lecanoric acid (major), 5-chlorolecanoric acid (trace).

- Flavopunctelia flaventior* (Stirt.) Hale – (3) 32852, on fence post (*Sambucus* wood); (4) 32933, shaded sloping outcrop; (7) 33030, on *Baccharis vaccinoides*. – Usnic acid (minor), lecanoric acid (major), 5-chlorolecanoric acid (trace).
- Glyphis cicatricosa* Ach. – (17) 33535, on *Casuarina equisetifolia*; (20) 33599, on *Quercus*.
- Graphis anguilliformis* Taylor – (13) 33299, on *Pinus*.
- Gyalectidium denticulatum* Lücking – (14) 33334, on shrub leaf, det. E. Sérusiaux.
- Gyalectidium imperfectum* Vězda – (14) 33354, on *Coffea arabica* leaf, det. E. Sérusiaux.
- Gyalideopsis vainioi* Kalb & Vězda – (13) 33298, on *Pinus* trunk, conf. E. Sérusiaux.
- \**Halecania viridescens* Coppins & P. James – (5) 32968, on solitary *Sambucus* shrub; (7) 33653, on *Baccharis vaccinoides*.
- Hemithecium chrysenferon* (Mont.) Trevis. – (17) 33514, on smooth bark of large tree.
- Heterodermia albicans* (Pers.) Swinscow & Krog – (11) 33188, on *Acacia*; (20) 33612, 33623, on *Quercus*. – Atranorin (major), salazinic acid (major), zeorin (minor/major); consalazinic acid (minor) in (33188, 33612), chloroatranorin (trace) in (33188, 33612), 16 $\beta$ -acetoxyhopane-6 $\alpha$ ,22-diol (minor) in (33188, 33612), hypoconstictic acid (minor) in (33188), 3-*O*-methylconsalazinic acid (minor) in (33188), norhypoconstictic acid (trace) in (33188), norstictic (trace) in (33188).
- Heterodermia circinalis* (Zahlbr.) W. A. Weber – (8) 33058, on vertical soil of bank. – Atranorin (major), zeorin (major).
- Heterodermia comosa* (Eschw.) Follmann & Redón – (11) 33193, on *Acacia* branch; (14) 33343, on branch of small citrus tree. – Atranorin (major), zeorin (major/minor), 16 $\beta$ -acetoxyhopane-6 $\alpha$ ,22-diol (minor/major); 6 $\alpha$ -acetoxyhopane-16 $\beta$ ,22-diol (trace) in (33343), leucotylin (trace) in (33343). – Reported by Kurokawa (1962).
- Heterodermia diademata* (Taylor) D. D. Awasthi – (1) 32773, on *Yucca elephantipes*; (20) 33649, on *Quercus*. – Atranorin (major) in (32773), zeorin (major) in (32773), leucotylin (minor) in (32773).
- Heterodermia galactophylla* (Tuck.) Trevis. – (17) 33499, on small trunk, 33508, on smooth bark of large tree. – Atranorin (major) in (33499), zeorin (minor) in (33499).
- Heterodermia granulifera* (Ach.) W. Culb. – (20) 33630, on *Quercus*. – Atranorin (minor), chloroatranorin (trace), salazinic acid (major), hypoconstictic acid (minor), consalazinic acid (minor), 3-*O*-methylconsalazinic acid (minor), norhypoconstictic acid (trace), norstictic acid (trace), 16 $\beta$ -acetoxyhopane-6 $\alpha$ ,22-diol (minor), zeorin (minor).
- Heterodermia isidiophora* (Vain.) D. D. Awasthi – (1) 32764, on boulder, 32774, on *Yucca elephantipes*, 32777, on *Brugmansia* sp.; (17) 33539, on trunk of big tree. – Atranorin (major), zeorin (major); 16 $\beta$ -acetoxyhopane-6 $\alpha$ ,22-diol (minor) in (33539).
- \**Heterodermia japonica* (M. Satô) Swinscow & Krog – (1) 32772, on *Yucca elephantipes*; (3) 32860, on slanting trunk; (5) 32972, on solitary *Sambucus* shrub; (17) 33465, 33485, on large trunk. – Atranorin (major), leucotylin (minor), 16 $\beta$ -acetoxyhopane-6 $\alpha$ ,22-diol (minor), zeorin (major); leucotylin (minor) in (32772, 32860), norstictic acid (minor) in (33465, 33485); unknown triterpene Rfc 30 (minor) in (32972).
- Heterodermia leucomelos* (L.) Poelt – (13) 33269, on *Acer*; (15) 33375, on small trunk. – Atranorin (major), zeorin (major). – Reported by Kurokawa (1962).
- Heterodermia leucomelos* subsp. *boryi* (Fée) Swinscow & Krog – (1) 32767, on horizontal and vertical face of wall. – Atranorin (major), 6 $\alpha$ -acetoxyhopane-16 $\beta$ ,22-diol (minor), zeorin (major).
- Heterodermia magellanica* (Zahlbr.) Swinscow & Krog – (3) 32872, 32893, on *Alnus arguta*; (5) 32967, on *Sambucus*; (20) 33603, 33617, on mature *Quercus* trunk. – Atranorin (major), zeorin (major); 20 $\alpha$ -acetoxyhopane-6 $\alpha$ ,22-diol (minor) in (33603, 33617), 6 $\alpha$ -acetoxyhopane-16 $\beta$ ,22-diol (minor) in (33603, 33617), leucotylin (minor) in (32872, 32872), unknown triterpene Rfc 30 (minor) in (32872).
- Heterodermia podocarpa* (Bél.) Awas. – (15) 33403, on stone of pathway. – Atranorin (major), norstictic acid (minor), 16 $\beta$ -acetoxyhopane-6 $\alpha$ ,22-diol (minor), zeorin (major).

- Heterodermia squamulosa* (Degel.) W. Culb. – (1) 32813, on *Cupressus lusitanica*; (3) 32879, 32891, on trunk. – Atranorin (major), leucotylin (minor), 16 $\beta$ -acetoxypentane-6 $\alpha$ ,22-diol (minor), zeorin (major).
- Hyperphyscia adglutinata* (Flörke) H. Mayrhofer & Poelt – (10) 33145, on *Fraxinus* – (19) 33575, on trunk. – No lichen substances detected by TLC.
- \**Hyperphyscia pandani* (H. Magn.) Moberg – (10) 33155, on *Albizia carbonaria*; (11) 33187, on *Acacia*. – Skyrin.
- \**Hypotrachyna aspera* C. H. Ribeiro & M. P. Marcelli – (12) 33225, on *Cola paba*; (13) 33302, on *Pinus*. – Atranorin (minor), chloroatranorin (minor), colensoic acid (major), hydroxycolensoic acid (major); norcolensoic acid (minor) in (33302).
- \**Hypotrachyna breviphiza* (Kurok.) Hale – (7) 33028, on *Baccharis vaccinoidea*. – Atranorin (minor), norstictic acid (trace), salazinic acid (major), consalazinic acid (minor), protocetraric acid (trace).
- Hypotrachyna imbricatula* (Zahlbr.) Hale – (13) 33301, on *Pinus*. – Atranorin (minor), chloroatranorin (trace), barbatric acid (major), 4-*O*-demethylbarbatric acid (minor), obtusatic acid (minor), norobtusatic acid (minor). – Recorded by Hale (1975).
- \**Hypotrachyna revoluta* (Flörke) Hale – (7) 33024, 33029, on *Baccharis vaccinoidea*. – Atranorin (minor), gyrophoric acid (major), 5-*O*-methylhiassic acid (minor), 4,5-di-*O*-methylhiassic acid (minor); chloroatranorin (minor) in (33024), hiassic acid (minor) in (33024), lecanoric acid (minor) in (33024).
- Hypotrachyna rockii* (Zahlbr.) Hale – (3) 32840, 32880, on *Alnus arguta*, 32848, on smooth bark of trunk. – Atranorin (minor), evernic acid (major), lecanoric acid (minor).
- \*\**Hypotrachyna showmanii* Hale – (7) 33033, on *Baccharis vaccinoidea*. – Atranorin (minor), chloroatranorin (minor), gyrophoric acid (major), 3-methoxy-2,4-di-*O*-methylgyrophoric (minor), 5-*O*-methylhiassic acid (minor), lecanoric acid (minor), umbilicic acid (minor), 3-methoxyumbilicic acid (minor).
- Hypotrachyna sinuosa* (Smith) Hale – (8) 33038, on *Baccharis vaccinoidea*. – Usnic acid (minor), salazinic acid (major), consalazinic acid (minor), norstictic acid (trace).
- Jamesiella perlucida* (Vězda & Hafellner) Lücking & al. – (20) 33625, on young *Quercus* trunk, conf. E. Sérusiaux.
- \*\**Japewiella tavaresiana* (H. Magn.) Printzen – (3) 32839, on *Alnus arguta*, 32844, on smooth trunk; (5) 32988, on *Alnus arguta*; (7) 33026, on *Baccharis vaccinoidea*. – The apothecia vary from 0.3-0.85 mm in diam.; no granules were detected in thallus or excipulum, comparable with specimens from Portugal (herb. Boom), to which this material fits very well.
- \**Lecania turicensis* (Hepp) Müll. Arg. – (6) 33006, on horizontal face of tombstone.
- \**Lepraria incana* (L.) Ach. – (1) 32079, on vertical face of rock outcrops. – Divaricatic acid (major), stenosporic acid (minor), oxostenosporic acid (minor), nordivaricatic acid (trace).
- \**Lepraria lobificans* Nyl. – (3) 32855, on *Sambucus*, 32878, on underside of slanting, large trunk. – Atranorin (major), zeorin (major), stictic acid (major), constictic acid (minor), cryptostictic acid (trace), norstictic acid (trace), peristictic acid (trace).
- \**Lepraria nivalis* J. R. Laundon – (1) 32810, on *Cupressus lusitanica*. – Protocetraric acid (major).
- \**Lepraria umbricola* Tønsberg – (16) 33419, on large trunk. – Thamnic acid (major), decarboxyathamnic acid (trace).
- \**Lepraria vouauxii* (Hue) R. C. Harris – (4) 32924, on vertical face of rock outcrop. – Pannaric acid 6-methyl ester (major), 4-oxypannaric acid 6-methyl ester (minor), 4-oxypannaric acid 2-methyl ester (minor).
- Leprocaulon arbuscula* (Nyl.) Nyl. – (15) 33407, on trunk of very large tree; (16) 33420, on very large trunk. – Fumarprotocetraric acid (major), protocetraric acid (minor), succinprotocetraric acid (major), confumarprotocetraric acid (minor), grayanic acid (major), vioxanthin (minor) [only 33407 studied by TLC].
- Leptogium* cf. *austroamericanum* (Malme) C. W. Dodge – (20) 33598, on mature *Quercus* tree.
- Leptogium azureum* (Ach.) Mont. – (1) 32795, on vertical face of rock outcrops; (3) 32895, on *Alnus*; (12) 33230, on *Cola paba*; (17) 33494, on small trunk.



- Leptogium cochleatum* (Dickson) P. M. Jørg. & P. James – (1) 32782, on *Cupressus lusitanica*; (15) 33376, on small trunk; (20) 33607, on mature *Quercus* trunk.
- Leptogium cyanescens* (Rabenh.) Körb. – (1) 33651, on *Cupressus lusitanica*.
- Leptogium marginellum* (Sw.) S. F. Gray – (11) 33199, on *Acacia* trunk.
- \**Leptogium milligranum* Sierk – (14) 33350, on shrub.
- Leptogium phyllocarpum* var. *phyllocarpum* (Pers.) Mont. – (11) 33644, on *Acacia*, (14) 33347, on shrub.
- Lobaria* cf. *patinifera* (Tayl.) Müll. Arg. – (12) 33216, on *Mespilus*. – No lichen substances detected by TLC.
- \**Lobaria tenuis* Vain. – (9) 33116, on small trunk. – Atranorin (minor), gyrophoric acid (major), lecanoric acid (minor), pseudocyphellarin A (minor), 4-*O*-methylgyrophoric acid (major), methyl hiascate (major), unknown (minor).
- Lopezaria versicolor* (Fée) Kalb & Hafellner – (1) 32791, on *Cupressus lusitanica*, 32769, on *Yucca elephantipes*; (3) 32909, on trunk; (9) 33125, on bark of small tree; (12) 33226, on *Cola paba*; (15) 33393, on trunk. – Recorded by Sipman (1983).
- Megalospora tuberculosa* (Fée) Sipman – (15) 33364, on smooth bark of large tree; (17) 33458, on smooth bark of large tree.
- \**Micarea peliocarpa* (Anzi) Coppins & R. Sant. – (16) 33440, on small trunk.
- Myriotrema punctum* (Ach.) Hale – (19) 33583, on trunk.
- Normandina pulchella* (Borrer) Nyl. – (7) 33015, on *Alnus arguta*; (14) 33345, on small trunk.
- Ocellularia perforata* (Leight.) Müll. Arg. – (15) 33414, on young trunk.
- \*\**Opegrapha herbarum* Mont. – (1) 32775, on *Brugmansia*, det. D. Ertz.
- \*\**Opegrapha ochrocheila* Nyl. – (17) 33474, on smooth bark of large tree, det. D. Ertz.
- Oropogon loxensis* (Fée) Th. Fr. – (8) 33055, on W facing soil of bank along path. – Atranorin (major), protocetraric acid (major), salazinic acid (minor), unknown barbatolic acid derivate (major).
- \**Pannaria malmei* C. W. Dodge – (20) 33596, on mature *Quercus*. – No lichen substances detected by TLC.
- Parmeliella miradorensis* Vain. – (9) 33106, on small trunk. – Atranorin (major-contaminant?).
- Parmeliella pannosa* (Sw.) Müll. Arg. var. *pannosa* – (13) 33279, on *Quercus*; (15) 33370, on wood of fence post. – Ursolic acid (major) in (33370).
- \**Parmelinopsis afrorevoluta* (Krog & Swinscow) Elix & Hale – (1) 32766, on boulder. – Atranorin (minor), gyrophoric acid (major), 5-*O*-methylhiascic acid (minor).
- Parmelinopsis horrescens* (Taylor) Elix & Hale – (1) 32762, on boulder; (3) 32882, on a trunk; (13) 33310b, on *Pinus*; (17) 33520, on *Pinus*. – Atranorin (minor), chloroatranorin (minor), gyrophoric acid (major), 3-methoxy-2.4-di-*O*-methylgyrophoric acid (major), 2.4-di-*O*-methylgyrophoric acid (major), lecanoric acid (trace), 4.5-di-*O*-methylhiascic acid (minor), umbilicic acid (minor).
- Parmelinopsis minarum* (Vain.) Elix & Hale – (3) 32850, 32877, on trunk; (13) 33305, on *Pinus*; (17) 33503, on large tree. – Atranorin (minor), gyrophoric acid (major), 5-*O*-methylhiascic acid (minor); 4.5-di-*O*-methylhiascic acid (trace) in (32877).
- Parmotrema austrosinense* (Zahlbr.) Hale – (10) 33141, on *Tabebuia rosea*. – Atranorin (minor), lecanoric acid (major).
- Parmotrema chiapense* (Hale) Hale – (20) 33602, on *Quercus* trunk. – Atranorin (minor), chloroatranorin (minor), alectoronic acid (major), dehydroalectoronic acid (minor),  $\beta$ -alectoronic acid (trace).
- Parmotrema hababianum* (Gyeln.) Hale – (11) 33194, on *Acacia*. – Atranorin (minor), chloroatranorin (minor), loxodin (minor), norlobaridone (major). – Recorded by Hale (1965).
- Parmotrema mesotropum* (Müll. Arg.) Hale – (11) 33186, on *Acacia*. – Atranorin (minor), chloroatranorin (minor), dehydroconstipatic acid (major), protodehydroconstipatic acid (minor), constipatic acid (minor). – Recorded by Hale (1965).

- Parmotrema mellissii* (Dodge) Hale – (16) 33438, on fallen branch; (17) 33517, on *Pinus*. – Atranorin (minor), alectoronic acid (major),  $\alpha$ -collatolic acid (major), dehydrocollatolic acid (minor) in (33438). – Recorded by Hale (1965).
- \*\**Parmotrema pseudocrinitum* (Des Abbayes) Hale – (11) 33202, on *Acacia*. – Atranorin (minor), chloroatranorin (minor), gyrophoric acid (major), lecanoric acid (minor).
- Parmotrema rampoddense* (Nyl.) Hale – (7) 33023, on *Baccharis vaccinoïdes*. – Atranorin (minor), alectoronic acid (major),  $\alpha$ -collatolic acid (major), anhydrofusarubin lactol (minor).
- Parmotrema reticulatum* (Taylor) M. Choisy – (4) 32936, terricolous along a steep rock-face; (7) 33019, on *Alnus arguta*; (15) 33362, on small trunk; (17) 33484, on smooth bark of large tree. – Atranorin (minor), salazinic acid (major), consalazinic acid (minor); protocetraric acid (trace) in (32936).
- \**Parmotrema soređiferum* Hale – (3) 32874, on *Alnus arguta*. – Atranorin (minor), alectoronic acid (major),  $\alpha$ -collatolic acid (major).
- \**Parmotrema subsidiosum* (Müll. Arg.) Hale – (12) 33222, on *Cola paba*; (15) 33377, on small trunk. – Atranorin (minor), salazinic acid (major), consalazinic acid (minor).
- Parmotrema tinctorum* (Nyl.) Hale – (11) 33198, on *Acacia*; (17) 33467, 33504, 33486, on *Pinus* and on smooth bark of large tree. – Atranorin (minor), lecanoric acid (major). – Recorded by Hale (1965).
- Parmotrema xanthinum* (Müll. Arg.) Hale – (17) 33471, on *Pinus*. – Atranorin (minor), gyrophoric acid (minor), 2-methylene-3*R*-carboxy-18*R*-hydroxynonadecanoic acid (major), fatty acid Rfc 40 (minor).
- \*\**Paulia rhizophora* Henssen – (11) 33204, 33205; on mortar and stones of wall, det. M. Schulz.
- Paulia wrightii* (Tuck.) Tretiach & Henssen – (13) 33293, on outcrops, shaded and sheltered under a tree, det. M. Schulz.
- Peltigera didactyla* (With.) J. R. Laundon – (5) 32957, on vertical soil bank. – No lichen substances detected by TLC, conf. O. Vitikainen.
- Peltigera dolichorhiza* (Nyl.) Nyl. agg. – (16) 33430, on soil of shaded vertical bank of path, det. O. Vitikainen. – Tenuiorin (major), methyl gyrophorate (minor), unknown terpene (minor).
- Peltigera neopolydactyla* (Gyeln.) Gyeln. agg. – (1) 32748; (4) 32915, 32929; (5) 32960, 32999, on vertical soil bank. – Tenuiorin (major), methyl gyrophorate (minor), 15 $\alpha$ -acetoxyhopane-22-ol (major), zeorin (minor), det. O. Vitikainen.
- Phaeographis dendritica* (Ach.) Müll. Arg. – (20) 33604, on mature *Quercus* trunk.
- Phaeophyscia hispidula* (Ach.) Moberg – (17) 33512, on smooth bark of large tree.
- Phyllobaëis erythrella* (Mont.) Kalb – (5) 32958; (8) 33053, 33072; (15) 333797, terricolous on vertical face of loamy soil.
- Phyllopsora* aff. *cuyabensis* (Malme) Zahlbr. – (17) 33541, on smooth bark of large tree. – Pannarin (major). – Recorded by Brako (1991).
- Physcia alba* (Fée) Müll. Arg. – (3) 32873, on *Alnus arguta*; (12) 33232, on *Cola paba*. – Atranorin (major), zeorin (major). – Recorded by Moberg (1990).
- Physcia atrostriata* Moberg – (17) 33465a, 33477, 33544, on smooth bark of large tree. – Atranorin (major), zeorin (major), 6 $\alpha$ -acetoxyhopane-16 $\beta$ ,22-diol (minor) in (33544, 33465a); 6 $\alpha$ ,16 $\beta$ -acetoxyhopane-22-ol (major) in (33447). – Recorded by Moberg (1990).
- Physcia crispa* Nyl. – (11) 33172, on *Acacia*. – Atranorin (major). – Recorded by Moberg (1990).
- \*\**Physcia dubia* (Hoffm.) Lettau – (8) 33044, on vertical E exposed face of rock outcrop. – Atranorin (major).
- Physcia integrata* Nyl. – (15) 33397, on fallen tree trunk; (17) 33542, on smooth bark of large tree; (20) 33624, on *Quercus*. – Atranorin (major), zeorin (major), 16 $\beta$ -acetoxyhopane-6 $\alpha$ ,22-diol (major), 6 $\alpha$ -acetoxyhopane-16 $\beta$ ,22-diol (minor); leucotylin (minor) in (33542).
- Physcia pachyphylla* Müll. Arg. – (10) 33153, on *Tecoma stans*; (11) 33180, on *Acacia*. – Atranorin (major), zeorin (major), 6- $\alpha$ -acetoxyhopane-16 $\beta$ ,22-diol (minor), leucotylin (minor) in (33153). – Recorded by Moberg (1990).

- Physcia poncinsii* Hue – (3) 32898, on *Alnus arguta*, (10) 33142, on *Albizzia carbonaria*, (11) 33168, on *Acacia*. – Atranorin (major); zeorin (major) in (32898, 33168), 6 $\alpha$ ,16 $\beta$ -acetoxyhopane-22-ol (major) in (32898).
- Physcia sorediosa* (Vain.) Lyngé – (1) 32780, on *Cupressus lusitanica*; (3) 32892, on horizontally growing trunk; (3) 32905, on tree; (7) 33020, on *Alnus arguta*; (12) 33235, on large trunk. – Atranorin (major), zeorin (major); 6 $\alpha$ -acetoxyhopane-16 $\beta$ ,22-diol (minor) in (32780, 33235); 6 $\alpha$ ,16 $\beta$ -acetoxyhopane-22-ol (major) in (32892, 32905, 33020); leucotylin (minor) in (32780).
- \**Physcia tribacia* (Ach.) Nyl. – (4) 32910, on vertical S exposed face of rock outcrop, moderately shaded. – Atranorin (major).
- Platygramme caesiopruinosa* (Fée) Fée – (17) 33515, on smooth bark of large tree.
- \**Porina leptalea* (Durieu & Mont.) A. L. Sm. – (9) 33135, on exposed roots of large tree; (14) 33329, on *Geonoma seleri*.
- Porina nitidula* Müll. Arg. – (12) 33244, palm and fern leaves; (14) 33326, on shrub leaves, conf. E. Sérusiaux. – Recorded by Barillas & Lücking (1992).
- \**Protoblastenia rupestris* (Scop.) J. Steiner – (1) 32754, on horizontal face of old wall.
- Pseudocyphellaria aurata* (Ach.) Vain. – (14) 33344, on shrub branches.
- Punctelia borreri* (Sm.) Krog – (8) 33047, on horizontal face of rock outcrops. – Atranorin (minor), chloroatranorin (trace), gyrophoric acid (major), orcynyl lecanorate (minor), lecanoric acid (minor).
- \**Punctelia columbiana* Sérus. – (14) 33351, on shrub. – Atranorin (minor), chloroatranorin (trace), gyrophoric acid (major), lecanoric acid (minor), butlerin D (minor), butlerin A/B (minor), butlerin F (trace).
- \**Punctelia perreticulata* (Räsänen) G. Wilh. & Ladd – (3) 32871, on *Alnus arguta*. – Atranorin (major), lecanoric acid (major).
- Punctelia subrudecta* (Nyl.) Krog – (3) 328575, 32888, 32986, on *Alnus arguta*; (7) 33021, on *Baccharis vaccinoides*; (17) 33466, on *Pinus* trunk. – Atranorin (minor), lecanoric acid (major), chloroatranorin (minor) in 33021.
- Pyxine berteriana* (Fée) Imshaug – (18) 33559, on *Rhizophora mangle*. – Eumitrin F (minor), lichexanthone (major), unknown triterpene Rfc 45 (major). – Recorded by Kalb (1987).
- Pyxine cocoes* (Sw.) Nyl. – (18) 33561, on *Rhizophora mangle*. – Lichexanthone (major). – Recorded by Kalb (1987).
- Pyxine eschweileri* (Tuck.) Vain. – (11) 33171, 33191, on *Acacia*. – Atranorin (major), chloroatranorin (minor), eumitrin F (minor), unknown triterpene Rfc 45 (major).
- \**Pyxine meissnerina* Nyl. – (10) 33160, 33160a, on *Albizzia carbonaria*. – Atranorin (major), unknown triterpene Rfc 48, 52, 55, 66, (major/minor).
- Pyxine petricola* Nyl. – (10) 33148, on *Fraxinus*; (11) 33165, on *Enterolobium cyclocarpum*, 33190 on *Acacia*. – Lichexanthone (major), unknown (minor) in (33190). – Recorded by Kalb (1987).
- \**Ramalina aspera* Räsänen – (7) 33014, on *Alnus arguta*. – Cryptochlorophaeic acid (major), usnic acid (minor).
- Ramalina celastri* (Spreng.) Krog & Swinscow – (7) 33017, on *Alnus arguta*; (20) 33608, on *Quercus*. – No lichen substances detected by TLC.
- Relicina abstrusa* (Vain.) Hale – (12) 33228, on *Cola paba*; (13) 33310, on *Pinus*. – Usnic acid (minor), norstictic acid (major), connorstictic acid (trace), hyposalazinic acid (trace).
- \**Schismatomma rediunta* (Hasse) Tehler – (13) 33285, on mature *Quercus*, on bark on trunk base.
- \**Scoliciosporum gallurae* Vězda & Poelt – (8) 33040, on *Baccharis vaccinoides*.
- \**Scoliciosporum umbrinum* (Ach.) Arnold – (3) 32870, on *Alnus arguta* branches.
- Stereocaulon microcarpum* Müll. Arg. – (1) 32757, on horizontal face of wall. – Anziaic acid (minor), atranorin (minor), glomelliferic acid (minor), perlatolic acid (major), stenosporic acid (minor).

- Stereocaulon myriocarpum* Fr. – (8) 33045, 33062, on soil along steep rock face. – Atranorin (major), cryptostictic acid (trace), menegazziaic acid (minor), peristictic acid (trace), stictic acid (major).
- \**Stereocaulon pachycephalum* Vain. – (8) 33046, on vertical face of rock outcrop. – Atranorin (major), fumarprotocetraric acid (minor), gyrophoric acid (minor).
- Stereocaulon obesum* Th. Fr. – (4) 32925, on low rock outcrop; (5) 32973, on vertical face of rock outcrop. – Atranorin (major), lobaric acid (major). – Recorded by Lamb (1977).
- Sticta weigelii* Isert – (1) 32797, on vertical rock face; (12) 33210, on tree fern; (13) 33294, on liana on large tree; (15) 33365, 33404, on small trunk.
- Syncesia psaroleuca* (Nyl.) Tehler – (2) 32817, on *Alnus arguta*.
- Teloschistes flavicans* (Sw.) Norman – (13) 33271, “terricolous”, fallen from an *Acer* tree.
- Thallocoma hypoleptum* (Nyl.) Staiger – (15) 33410, on young trunk.
- \**Thelenella modesta* (Nyl.) Nyl. – (3) 32851, on trunk.
- Thelotrema lepadinum* (Ach.) Ach. – (1) 32805, on fern tree; (9) 33083, on branch of small tree.
- Thelotrema spondaicum* Nyl. – (13) 33317, on *Pinus*; (20) 33626, on *Quercus*.
- Thelotrema stylotheceum* Vain. – (1) 32747, on *Ficus*; (15) 33394, on trunk.
- Trapelia coarctata* (Sm. & Sow.) M. Choisy – (8) 33066, on vertical face of rock outcrop.
- Umbilicaria leprosa* (Zahlbr.) Frey – (8) 33041, 33077, on sloping face of rock outcrop. – Gyrophoric acid (major), lecanoric acid (minor).
- Usnea rubicunda* Stirton – (11) 33183, on *Acacia* branches. – Constictic acid (minor), cryptostictic acid (minor), menegazziaic acid (minor), peristictic acid (minor), stictic acid (major), usnic acid (major).
- Xanthoparmelia conspersa* (Ach.) Hale – (4) 32927, on top of sloping rock outcrop; (6) 33005, on sloping tile. – Constictic acid (minor), cryptostictic acid (minor), norstictic acid (minor), stictic acid (major), usnic acid (major/minor); atranorin (minor) in (32927), lobaric acid (minor) in (32927).
- \**Xanthoparmelia cumberlandia* (Gyeln.) Hale – (4) 32950, on outcrop; (7) 33027, on horizontal surface of outcrops; (8) 33051, on top of boulder. – Constictic acid (minor), cryptostictic acid (trace), norstictic acid (minor), stictic acid (major), usnic acid (minor).

#### Appendix: Lichen taxa recently recorded from Guatemala and not re-collected

- Ahti 2000: *Cladina arbuscula* subsp. *boliviana* (Ahti) Ahti, *C. confusa* (R. Sant.) Follmann & Ahti, *Cladina subtenuis* (Abbayes) Hale & W. Culb., *Cladonia aleuropoda* Vain., *C. caribaea* S. Stenroos, *C. chlorophaea* (Flörke ex Sommerf.) Spreng., *C. dactylota* Tuck., *C. furcata* (Huds.) Schrad., *C. grayi* G. Merrill ex Sandst., *C. macilenta* Hoffm., *C. nana* Vain., *C. ochrochlora* Flörke, *C. peziziformis* (With.) J. R. Laundon, *C. pocillum* (Ach.) Grognot, *C. ramulosa* (With.) J. R. Laundon, *C. scabriuscula* (Delise) Nyl., *C. squamosa* Hoffm., *C. strepsilis* (Ach.) Grognot, *C. subradiata* (Vain.) Sandst.
- Brako 1991: *Phyllopsora canoumbrina* (Vain.) Brako, *P. corallina* var. *ochroxantha* (Nyl.) Brako, *P. corallina* var. *rappiana* Brako
- Elix & Nash 1997: *Pseudoparmelia cubensis* (Nyl.) Elix & Nash
- Ferraro & al. 2001: *Gyalectidium caucasicum* (Elenk. & Woron.) Vězda
- Frisch & al. 2006: *Chapsa kalbii* A. Frisch; *Ocellularia auberianoides* (Nyl.) Müll. Arg., *Stegobolus schizostomus* (Tuck.) A. Frisch & Kalb
- Guderley 1999: *Lecanora argentata* (Ach.) Degel., *L. chlaronella* Nyl., *L. flavidomarginata* de Lesd., *L. guatemalensis* Guderley, *L. helva* Stizenb., *L. leprosa* Fée, *L. neonashii* Lumbsch, *L. praeferenda* (Nyl.) Nyl., *L. subalbellina* Vain., and *L. tropica* Zahlbr.
- Hale 1965: *Parmotrema aberrans* (Vain.) Abbayes, *P. arnoldii* (Du Rietz) Hale, *P. crinitum* (Ach.) M. Choisy, *P. leucosemtheta* (Hue) Hale, *P. rubifaciens* (Hale) Hale, *P. sancti-angelii* (Lyngé) Hale, *P. stuppeum* (Tayl.) Hale, *P. subrugata* (Kremplh.) Hale, *P. subsumptum* (Nyl.) Hale, *P. subtinctorum* (Zahlbr.) Hale, *P. zollingeri* (Hepp) Hale

- Kalb 2001: *Phaeographis lobata* (Eschw.) Müll. Arg.  
 Kalb & Vězda 1988: *Actinoplaca strigulacea* Müll. Arg., *Gyalideopsis monospora* Kalb & Vězda, *Tricharia carnea* (Müll. Arg.) R. Sant., *T. longispora* Kalb & Vězda  
 Marbach 2000: *Amandinea diorista* (Nyl.) Marbach, *A. insperata* (Nyl.) H. Mayrhofer & Ropin, *A. submontana* Marbach, *A. xylographella* (Nyl.) Marbach, *Baculifera entochlora* (J. Steiner) Marbach, *B. longispora* Marbach, *B. micromera* (Vain.) Marbach, *B. orosa* Marbach & Kalb, *Cratiria obscurior* (Stirton) Marbach, *C. rutilans* Marbach & Kalb, *Gassicurtia cata-sema* (Tuck.) Marbach, *G. coccinea* Fée, *Hafelia pruinosa* Marbach & Kalb, *Sculptolumina serotina* (Malme) Marbach  
 Moberg 1990: *P. erumpens* Moberg, *P. lacinulata* Müll. Arg., *P. tenuis* Moberg  
 Sérusiaux & al. 2007: *Porina heterospora* (Fink) R. C. Harris, *P. africana* Müll. Arg.  
 Sparrius 2004: *Enterographa anguinella* (Nyl.) Redinger  
 Staiger 2002: *Acanthothecis subclavulifera* Staiger & Kalb, *Graphis pavoniana* Fée, *Phaeographis lecanographa* (Nyl.) Staiger, *P. vestigioides* ad int., *Platygramme caesiopruinosa* (Fée) Fée

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