


## ***Graphis* and *Allographa* (lichenized Ascomycota: *Graphidaceae*) in Sri Lanka, with six new species and a biogeographical comparison investigating a potential signature of the ‘biotic ferry’ species interchange**

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**Abstract:** We provide an updated survey for Sri Lanka of species of *Graphis sensu* Staiger, recently divided into *Graphis* s. str. and *Allographa*, including brief descriptions and a key to all 124 species currently known. Six new species are described: *Allographa bambusicola* Weerakoon, Lücking & Aptroot, a bambusicolous *Allographa* with entire labia, a laterally carbonized excipulum, 80–100 × 15–17 µm large, muriform ascospores and a rather thick, irregularly verrucose lateral thalline margin of the lirellae; *A. weerasooriyana* Weerakoon, Arachchige & Lücking, a corticolous *Allographa* resembling *A. rustica* Kremp. in overall anatomy and chemistry, but with a verrucose thalline margin of the lirellae and labia not distinctly raised above the thalline margin; *Graphis flosculifera* Weerakoon, Lücking & Aptroot, a corticolous *Graphis* resembling *G. insulana* but differing in the unique disposition of the lirellae and the slightly more elongate ascospores; *G. rajapakshana* Weerakoon, Lücking & Aptroot, a corticolous *Graphis* resembling *G. desquamescens*, including in ascospore size, but with lirellae with a distinct lateral thalline margin; *G. rimosothallina* Weerakoon, Lücking & Aptroot, a corticolous *Graphis* with a thick, uneven, rimose thallus and *Fissurina*-like lirellae, a completely carbonized excipulum and transversely 7-septate ascospores, 32–37 × 8–10 µm; and *G. thunsihalayensis* Weerakoon, Arachchige & Lücking, a corticolous *Graphis* resembling *G. subalbostrigata* but with smaller ascospores and lacking white lines between the striae of the labia. We also validate the name *G. verrucoserpens* Lücking. A total of 106 species are reported here for the first time from Sri Lanka. A biogeographical comparison with two other well-sampled countries (Costa Rica and Thailand) revealed a significantly higher similarity in species composition with Costa Rica than between Thailand and Costa Rica, suggesting a potential signature of the ‘biotic ferry’ hypothesis, that is the migration of lineages from Gondwana (partly corresponding to the modern Neotropics) via the north-eastwards drifting Indian subcontinent and subsequent interchange with Laurasia (partly corresponding to the modern eastern Paleotropics). However, the evolutionary timeline of the clades involved does not support this hypothesis and suggests an alternative explanation of geologically more recent mid- to long-distance dispersal.

**Key words:** Central Province, central mountain region, Horton Plains, lichens, Sabaragamuwa hill range, Western Province

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### **Introduction**

Molecular phylogenies have dramatically changed the understanding of generic classification within *Graphidaceae*, the largest family of tropical crustose lichens (Mangold *et al.* 2008; Rivas Plata & Lumbsch 2011; Rivas Plata *et al.* 2012; Lücking *et al.* 2014). Quantitative extrapolations and molecular data for species complexes in tandem with new fieldwork in underexplored areas of the tropics suggest that the family *Graphidaceae* may contain up to 3500 species, that is 1400 undescribed species in

addition to the 2100 currently known (Lücking *et al.* 2014; Joshi *et al.* 2018). The family has already been treated in several studies focusing on material from Sri Lanka, revealing a large number of taxa new to science (Awasthi & Singh 1978; Singh & Awasthi 1979; Hale 1981; Nagarkar & Hale 1989; Breuss & Brunnbauer 1997; Papong *et al.* 2009; Weerakoon *et al.* 2012a, b, 2014, 2015; Rivas Plata *et al.* 2013; Li *et al.* 2016; Jatnika *et al.* 2019).

A recent analysis of new collections from Sri Lanka found *c.* 250 species including *c.* 170 new records and led to the discovery of *c.* 30 new species in *Graphidaceae*. The most speciose group was *Graphis sensu* Staiger (2002) with over 100 taxa, including six new taxa described by Weerakoon *et al.* (2012a, b). *Graphis sensu* Staiger was recently divided into the two genera *Graphis* s. str. and *Allographa* (Kalb *et al.* 2018; Lücking & Kalb 2018). Therefore, in the present paper, in addition to describing six species new to science, we also provide an updated key to all species known from Sri Lanka in the two genera, with the taxa repositioned into *Graphis* s. str. and *Allographa*. As noted by Lücking & Kalb (2018), it is currently not possible to readily separate *Graphis* and *Allographa* at the genus level phenotypically, despite the two genera being very distantly related. The bulk of the species in both genera differ in lirellae morphology (delicate vs. robust), excipulum development (thin vs. massive), hamathecium inspersion when present (type A vs. type B), and the often anastomosing lateral paraphyses in *Allographa*; however, in both genera there are a number of exceptions to these rules, particularly concerning species with black, striate labia. Therefore, keying out the taxa at species level is necessary.

In addition, an attempt is made to place the richness and composition of *Graphis* and *Allographa* in Sri Lanka into context, discussing a possible signature of the 'biotic ferry' species interchange, by a comparison with two other well-sampled countries, namely Costa Rica in the Neotropics and Thailand in the eastern Paleotropics.

## Materials and Methods

Specimens were examined using Olympus SZX7, Leica MS5 and Motic K400 dissecting microscopes and Olympus BX50 with Nomarski, Zeiss Axioscop 2 and Vista-Vision VWR V036 compound microscopes, in part connected to Nikon Coolpix E995, Jenoptic ProgRes C3 and C5 digital microscope cameras. Specimens are deposited at BM and PDA. Anatomical measurements refer to specimens mounted in water; for iodine reactions, we used Fluka 62650 Lugol's solution. We performed thin-layer chromatography (TLC) using solvent C (Orange *et al.* 2010). Named lirellae-types follow Lücking *et al.* (2009) and Kalb *et al.* (2018).

We compared the species inventories of *Graphis* and *Allographa* for four countries, two in the Neotropics (Costa Rica, Mexico) and two in the eastern Paleotropics (Sri Lanka, Thailand). To assess compositional similarity, we computed pairwise Sørensen similarity values between all four countries in PC-Ord 6.0 (McCune & Mefford 2011). To statistically compare species sampling between Sri Lanka and Thailand and its effect on the Sørensen metrics, we performed 50% jackknifing with 1000 repeats in each case, and for each repeat we computed the Sørensen similarity value with the full sample from Costa Rica by multiplying the subsample result by two and randomly correcting by 0, +1 or -1 to avoid exclusively even numbers.

## Results and Discussion

The total number of species of *Allographa* and *Graphis* now recorded for Sri Lanka is 124, thus surpassing the previously reported numbers for Costa Rica (115; Lücking *et al.* 2008), Thailand (115; Kalb *et al.* 2018) and Mexico (71; Wirth & Hale 1963, specimens in US revised by R. Lücking; Bárcenas-Peña *et al.* 2014; Fig. 1). This is remarkable as Sri Lanka covers an area of only 65 000 km<sup>2</sup>, compared to Thailand with 513 000 km<sup>2</sup> (almost eight times the size). On the other hand, the area of Costa Rica (51 000 km<sup>2</sup>) is comparable with that of Sri Lanka and species density is about the same, with between 1.9 (Sri Lanka) and 2.3 (Costa Rica) species per 1000 km<sup>2</sup>, whereas Thailand has 0.22 species per 1000 km<sup>2</sup>. In addition to area, these differences might be explained partly by topography, especially as most species of *Graphis* and *Allographa* favour mid elevations. The effect of area can be roughly balanced by log-transformed area values, since species richness relates logarithmically to area (Lücking *et al.* 2011). Thus, a better estimate is richness

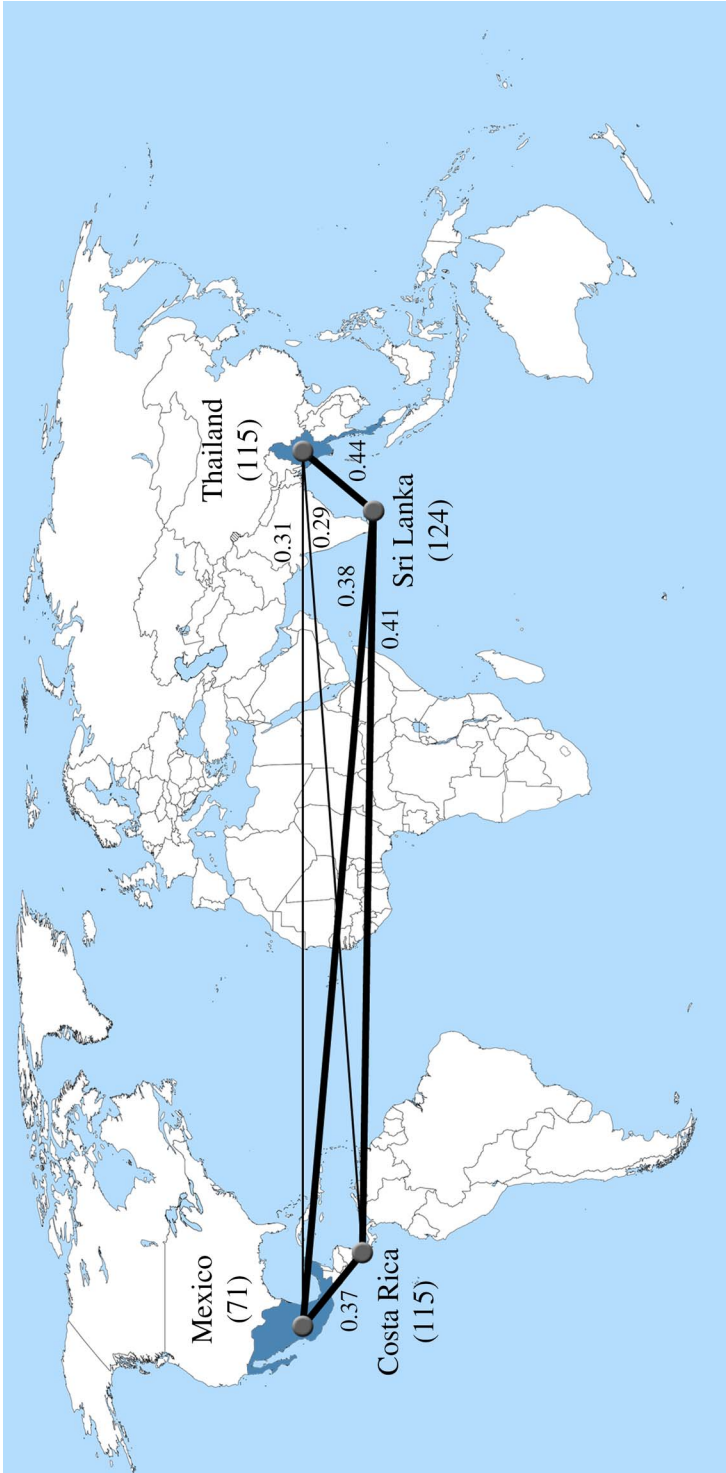


FIG. 1. Comparison of the richness and composition of *Graphis* and *Allographa* species from Sri Lanka with Costa Rica and Mexico in the Neotropics and Thailand in the eastern Palearctic. Numbers in parentheses indicate the total recorded species of *Graphis* for each country. Increased line thickness reflects greater pairwise Sørensen similarity values for the two countries being compared, with the exact values reported next to each line. In colour online.

per  $\log_{\text{area}}$ , which results in 26 for Sri Lanka, 24 for Costa Rica, 20 for Thailand and 11 for Mexico. It can be assumed that Costa Rica and Sri Lanka are comparatively well sampled, whereas sampling effort in Thailand is lower and for Mexico it is still quite low. To obtain similar species per  $\log_{\text{area}}$  scores as Costa Rica and Sri Lanka, the total richness for Thailand would have to amount to 140 species, and for Mexico to 160 species, which implies that currently 80% of the expected species richness in these two genera is known from Thailand, and only little more than 40% from Mexico. The only country with a higher number of reported names in *Graphis* and *Allographa* is Brazil, but no updated inventory is yet available for that country.

A pairwise comparison between species composition of the four countries yielded Sørensen similarity values of 37% between Mexico and Costa Rica (Neotropics) and 44% between Thailand and Sri Lanka (eastern Paleotropics), the difference probably explained by the low sampling effort in Mexico. Cross-comparison between the neotropical and paleotropical countries showed notable differences: between Costa Rica (or Mexico) and Thailand, similarity amounted to 29 and 31%, respectively, whereas between Costa Rica (or Mexico) and Sri Lanka, it ranged between 38% and 41%, *c.* 10% higher in both cases (Fig. 1). Since all four inventories are based on the same modern species concept and are largely assembled by the same group of taxonomists, this difference cannot be considered a bias of taxonomic concept. Furthermore, randomized subsampling of species in Sri Lanka and Thailand demonstrated a highly significant difference in the central tendency of the similarity values of both countries with Costa Rica (Fig. 2; Mann-Whitney U test,  $P = 0.001$ ). The individually observed value for Thailand (0.29) was outside the 99.9% range obtained for Sri Lanka (Fig. 2;  $P = 0.001$ ), whereas the individually observed value for Sri Lanka (0.41) was outside the 99.6% range obtained for Thailand (Fig. 2;  $P = 0.01$ ).

One explanation for the higher similarity of Sri Lanka (as compared to Thailand) with

Costa Rica is that this is a signature of the so-called 'biotic ferry' species interchange. Sri Lanka being compared forms part of the Indian geological block, which until 160 mya was connected to Gondwana. After the break-up of Gondwana this block drifted slowly across the Tethys and eventually collided with the Eurasian Plate around 55 mya, carrying both Gondwana and endemic elements and thus acting as a 'biotic ferry' (McKenna 1973; Ashton & Gunatilleke 1987; Macey *et al.* 2000; Morley 2000; Rust *et al.* 2010). For this hypothesis to hold, species composition in areas of tropical Africa should be similar to those in the Neotropics, which is currently not possible to assess due to the lack of data from tropical Africa. However, a major contradiction to that hypothesis would be the assumed age of the species, at over 100 my. According to various molecular clock studies, the genera *Graphis* and *Allographa* did not diversify until *c.* 30–50 mya, and the age of most species is probably not greater than 5–10 my (Lücking *et al.* 2013; Kraichak *et al.* 2015), meaning that the genera and their species originated long after the Gondwana break-up and even after the collision of the Indian subcontinent with the Eurasian plate. Thus, even if one assumes that taxa currently identified as 'species' in these inventories represent species complexes, the timeline to postulate a Gondwana origin of selected lineages present in both the Neotropics and Sri Lanka would be wrong. A more likely explanation would be geologically recent mid- to long-distance dispersal facilitated by paleoclimatic conditions combined with the relative proximity of India (and Sri Lanka) to the African Paleotropics, as compared to other parts of tropical Asia. This has, for example, been shown for *Melastomataceae*, with evidence of multiple dispersal between Africa, Madagascar and India during the Miocene, 23–5 mya (Renner 2004).

Certainly, to further elucidate this intriguing issue, good sampling across all tropics and a solid phylogeny are needed for these and other lichen genera with similar distribution and richness patterns.

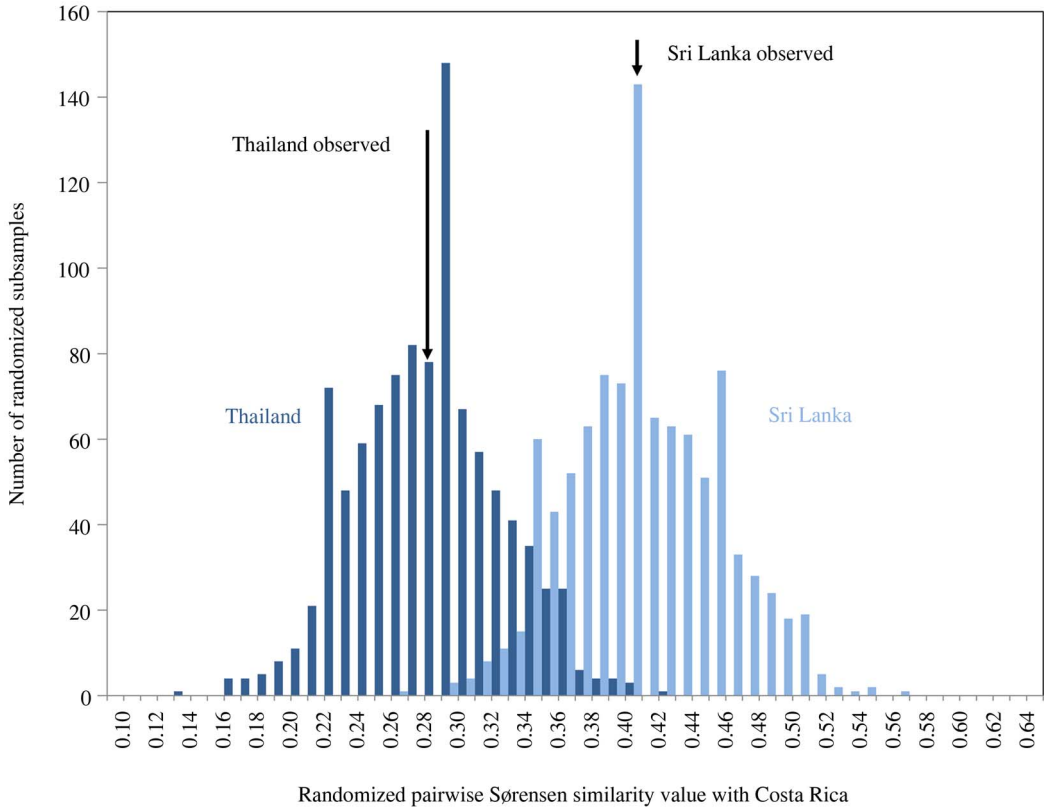


FIG. 2. Random subsampling of the species composition of *Allographa* and *Graphis* in Thailand and Sri Lanka, with 1000 repeats and subsequent comparison of each repeat to a random subsample of Costa Rica. The resulting Sørensen pairwise similarity values with Costa Rica exhibit significant differences between Thailand and Sri Lanka. The observed central tendency values are indicated for each country. In colour online.

**Key to *Allographa* and *Graphis* in Sri Lanka**

**Key to species groups**

- 1 Hamathecium inpersed ..... 2
- Hamathecium not inpersed ..... 4
- 2(1) Ascospores muriform ..... **Group A**
- Ascospores only transversely septate ..... 3
- 3(2) Thallus K- ..... **Group B**
- Thallus K+ yellow > red or K+ red ..... **Group C**
- 4(1) Thallus UV+ yellow (lichexanthone), hamathecium not inpersed ..... **Group D**
- Thallus UV-, hamathecium variable ..... 5
- 5(4) Ascospores muriform (at least terminally) ..... 6
- Ascospores only transversely septate ..... 7

- 6(5) Thallus K+ yellow or yellow > red ..... **Group E**  
 Thallus K- ..... **Group F**
- 7(5) Thallus K+ yellow, in section forming a persistently yellow efflux (stictic acid) ...  
 ..... **Group G**  
 Thallus K+ yellow > red, K+ red or K- ..... 8
- 8(7) Thallus K+ yellow > red or K+ red, in section forming a yellow efflux and subse-  
 quently either conspicuous, red, needle-shaped crystals (norstictic acid) or very  
 small, red crystals (salazinic acid) ..... **Group H**  
 Thallus K- ..... 9
- 9(8) Labia becoming striate ..... **Group I**  
 Labia entire ..... **Group J**

### Group A. *Hamathecium* inspersed, ascospores muriform

- 1 Thallus K- ..... 2  
 Thallus K+ yellow or yellow > red ..... 4
- 2(1) Ascospores 12–17  $\mu\text{m}$  wide; lirellae with apically thick complete thalline cover ...  
 ..... **Allographa elixii**  
 Ascospores 15–35  $\mu\text{m}$  wide; lirellae with apically thin complete thalline cover ... 3
- 3(2) Labia becoming striate ..... **Allographa argentata**  
 Labia entire ..... **Allographa phaeospora**
- 4(1) Thallus K+ yellow (stictic acid); ascospores 50–130  $\times$  15–25  $\mu\text{m}$  .....  
 ..... **Graphis diplocheila**  
 Thallus K+ yellow > red (norstictic acid); ascospores variable ..... 5
- 5(4) Ascospores 8 per ascus, 25–35  $\times$  7–8  $\mu\text{m}$  ..... **Allographa knucklensis**  
 Ascospores 1–2 per ascus, >60  $\mu\text{m}$  long ..... 6
- 6(5) Excipulum completely carbonized ..... 7  
 Excipulum laterally carbonized ..... 8
- 7(6) Ascospores 1 per ascus, 100–145  $\times$  25–40  $\mu\text{m}$ ; lirellae erumpent, elongate and irregu-  
 larly branched (*subserpentina* morph) ..... **Graphis novopalmicola**  
 Ascospores 1–2 per ascus, 60–110  $\times$  16–30  $\mu\text{m}$ ; lirellae prominent, short and  
 unbranched (*dussii* morph) ..... **Allographa leprographa**
- 8(6) Marginal lirellae elongate, dispositioned radially and typically curved, central lirellae  
 short and straight; thalline margin of lirellae thin, labia appearing roughened and  
 not sharply delimited from thalline margin ..... **Graphis flosculifera**  
 Lirellae irregularly arranged, without marked difference between marginal and central  
 lirellae and central lirellae usually longer; thalline margin of lirellae thick, labia  
 largely covered or when visible, rather well delimited from thalline margin ...  
 ..... **Graphis insulana**





**Group D. Hamathecium not inspersed, thallus UV+ yellow (lichexanthone)**

- 1 Ascospores 15–20 × 5–8 μm; excipulum laterally carbonized; thallus K+ yellow > red (norstictic acid in addition to lichexanthone) . . . . . **Graphis stipitata**  
 Ascospores 45–60 × 10–14 μm; excipulum completely carbonized; thallus K– (no other substances) . . . . . **Allographa sauroidea**

**Group E. Hamathecium not inspersed, ascospores muriform, thallus UV–, K+ yellow or yellow > red**

- 1 Thallus K+ yellow, in section forming a persistently yellow efflux (stictic acid) . . 2  
 Thallus K+ yellow > red, in section forming a yellow efflux and subsequently conspicuous, red, needle-shaped crystals (norstictic acid) . . . . . 3
- 2(1) Ascospores 2–4 per ascus, 50–70 × 18–25 μm . . . . . **Graphis japonica**  
 Ascospores 1 per ascus, 70–95 × 20–30 μm . . . . . **Graphis streblocarpa**
- 3(1) Ascospores 8 per ascus, 25–35 × 9–12 μm . . . . . **Graphis renschiana**  
 Ascospores 1 per ascus, >80 μm long . . . . . 4
- 4(3) Lirellae elongate and irregularly branched . . . . . **Graphis subserpentina**  
 Lirellae short and unbranched . . . . . **Graphis hiascens**

**Group F. Hamathecium not inspersed, ascospores muriform, thallus K– and UV–**

- 1 Ascospores up to 70 μm long . . . . . 2  
 Ascospores generally >70 μm long . . . . . 8
- 2(1) Lirellae short and unbranched, sessile and lacking thalline cover (*nuda*-morph) . 3  
 Lirellae at least partly branched, erumpent (to prominent), with lateral to apically thin complete thalline margin . . . . . 4
- 3(2) Ascospores 4–8 per ascus, 35–65 × 10–20 μm . . . . . **Allographa ruiziana**  
 Ascospores 8 per ascus, 25–40 × 10–20 μm . . . . . **Allographa nuda**
- 4(2) Labia becoming striate; excipulum apically carbonized . . . . . 5  
 Labia entire; excipulum laterally or completely carbonized . . . . . 7
- 5(4) Ascospores 1–2 per ascus, >16 μm wide; thalline margin lateral **Graphis diserpens**  
 Ascospores 2–8 per ascus, <16 μm wide; thalline margin variable . . . . . 6
- 6(5) Ascospores 2–6 per ascus; thalline margin complete but apically thin . . . . .  
 . . . . . **Graphis paraserpens**  
 Ascospores 8 per ascus; thalline margin lateral . . . . . **Graphis galactoderma**



- 7(4) Ascospores 20–40 × 10–12 µm; thalline margin complete but apically thin. . . . .  
 . . . . . **Graphis subtecta**  
 Ascospores 50–70 × 15–22 µm; thalline margin lateral . . . . . **Graphis lapidicola**
- 8(1) Ascospores only terminally muriform . . . . . 9  
 Ascospores muriform throughout . . . . . 10
- 9(8) Lirellae with yellow-orange pruina . . . . . **Allographa jayatilakana**  
 Lirellae lacking pigmented pruina . . . . . **Allographa vestitoides**
- 10(8) Excipulum laterally carbonized . . . . . 11  
 Excipulum completely carbonized . . . . . 13
- 11(10) Ascospores 2–4 per ascus; thallus thinly verrucose . . . . **Allographa bambusicola**  
 Ascospores 1 per ascus; thallus not verrucose . . . . . 12
- 12(11) Thalline margin complete . . . . . **Graphis subhiascens**  
 Thalline margin basal . . . . . **Allographa mahaaliyensis**
- 13(10) Labia becoming striate . . . . . 14  
 Labia entire . . . . . 17
- 14(13) Ascospores 2–6 per ascus . . . . . **Allographa acharii**  
 Ascospores 1–2 per ascus . . . . . 15
- 15(14) Ascospores 1–2 per ascus; thalline margin lateral . . . . . **Graphis myrtacea**  
 Ascospores 1 per ascus; thalline margin complete, although apically usually thin 16
- 16(15) Lirellae prominent . . . . . **Allographa macella**  
 Lirellae immersed . . . . . **Allographa consanguinea**
- 17(13) Ascospores 2–4 per ascus; lirellae immersed . . . . . **Graphis dolichographa**  
 Ascospores 1 per ascus; lirellae prominent to sessile . . . . . 18
- 18(17) Thalline margin lateral, conspicuously thickened; lirellae sessile, very short . . . . .  
 . . . . . **Allographa plagiocarpa**  
 Thalline margin complete; lirellae prominent, distinctly elongate . . . . .  
 . . . . . **Allographa illinata**

**Group G. Hamathecium not inspersed, ascospores transversely septate, thallus K+ yellow (stictic acid)**

- 1 Thallus with isidia; lirellae with complete thalline cover . . . . . **Graphis isidiza**  
 Thallus without isidia; lirellae with basal or lateral thalline cover . . . . . 2
- 2(1) Disc exposed, often pruinose . . . . . 3  
 Disc closed . . . . . 4
- 3(2) Ascospores 60–100 × 8–12 µm . . . . . **Graphis longiramea**  
 Ascospores 25–45 × 6–10 µm . . . . . **Graphis sundarbanensis**

- 4(2) Labia white pruinose; lirellae usually radiating ..... **Graphis dendrogramma**  
 Labia not pruinose; lirellae variable ..... 5
- 5(4) Thallus and/or thalline margin verrucose ..... 6  
 Thallus and thalline margin not verrucose ..... 8
- 6(5) Ascospores 35–40 × 7–8 μm ..... **Graphis allugallenensis**  
 Ascospores longer ..... 7
- 7(6) Thalline margin verrucose; ascospores 15–21-septate .....  
 ..... **Allographa weerasooriyana**  
 Thalline margin not verrucose; ascospores 11–17-septate .... **Allographa rustica**
- 8(5) Labia becoming striate ..... 9  
 Labia remaining entire ..... 11
- 9(8) Carbonization lateral; thalline margin basal; *duplicata*-morph .....  
 ..... **Graphis brahmanensis**  
 Carbonization usually only apical; thalline margin lateral or absent; *tenella*- or  
*striatula*-morph ..... 10
- 10(9) Thalline margin absent ..... **Graphis stenotera**  
 Thalline margin lateral ..... **Graphis vittata**
- 11(8) Ascospores usually >40 μm ..... 12  
 Ascospores usually <40 μm ..... 13
- 12(11) Excipulum laterally to completely carbonized; thalline margin lateral, thick .....  
 ..... **Graphis crassilabra**  
 Excipulum only laterally carbonized; thalline margin lateral, thin .....  
 ..... **Graphis leptogramma**
- 13(11) Excipulum completely carbonized; thalline margin lateral, thick .....  
 ..... **Graphis descissa**  
 Excipulum only laterally carbonized; thalline margin lateral, thin .....  
 ..... **Graphis immersella**

**Group H. Hamathecium not inspersed, ascospores transversely septate, thallus K+ yellow > red (norstictic acid) or K+ red (salazinic acid)**

- 1 Thallus K+ yellow then quickly red, in section forming a yellow efflux and rapidly very  
 small, red crystals (salazinic acid) ..... 2  
 Thallus K+ yellow then slowly red, in section forming a yellow efflux and subse-  
 quently conspicuous, red, needle-shaped crystals (norstictic acid) ..... 4
- 2(1) Labia orange; disc exposed, ochraceous ..... **Graphis ferruginea**  
 Labia not pigmented; disc concealed ..... 3
- 3(2) Ascospores 5–7-septate; only salazinic acid present (TLC) ..... **Graphis bakeri**  
 Ascospores 7–9-septate; protocetraric acid also present (TLC) . **Graphis litoralis**

- 4(1) Thalline margin absent; ascospores thickly double-walled . . . . . **Graphis elegans**  
Thalline margin present; ascospores not double-walled . . . . . 5
- 5(4) Disc exposed, white pruinose . . . . . **Graphis pyrrocheiloides**  
Disc concealed . . . . . 6
- 6(5) Labia white pruinose . . . . . 7  
Labia not pruinose . . . . . 8
- 7(6) Excipulum completely carbonized; labia with thin complete thalline margin . . . . .  
. . . . . **Graphis caesiocarpa**  
Excipulum laterally carbonized; labia with lateral thalline margin **Graphis caesiella**
- 8(6) Ascospores 20–30 × 5–8 µm . . . . . **Graphis librata**  
Ascospores >50 µm . . . . . 9
- 9(8) Labia becoming striate, with thin complete thalline margin **Allographa leptospora**  
Labia entire, with lateral thalline margin . . . . . **Allographa marginata**

**Group I. Thallus K– and UV–, hamathecium not inspersed, ascospores transversely septate, labia becoming striate**

- 1 Thalline margin absent to basal . . . . . 2  
Thalline margin complete to lateral . . . . . 15
- 2(1) Thalline margin absent . . . . . 3  
Thalline margin basal . . . . . 9
- 3(2) Ascospores mostly >50 µm long . . . . . 4  
Ascospores never >50 µm long . . . . . 5
- 4(3) Excipulum laterally carbonized . . . . . **Allographa striatula**  
Excipulum apically carbonized . . . . . **Graphis caribica**
- 5(3) Excipulum apically to laterally carbonized . . . . . 6  
Excipulum completely carbonized . . . . . 8
- 6(5) Excipulum laterally carbonized; lirellae erumpent . . . . . **Graphis duplicata**  
Excipulum apically carbonized; lirellae prominent . . . . . 7
- 7(6) Lirellae unbranched; ascospores 5–7-septate . . . . . **Graphis granulocarpa**  
Lirellae branched; ascospores 7–11-septate . . . . . **Graphis tsunodae**
- 8(5) Lirellae erumpent . . . . . **Allographa rimulosa**  
Lirellae prominent . . . . . **Graphis dupaxana**
- 9(2) Ascospores >50 µm long . . . . . 10  
Ascospores never >40 µm long . . . . . 12

- 10(9) Ascospores 50–110 × 4–8 μm; excipulum laterally carbonized .....  
 ..... **Allographa polystriata**  
 Ascospores broader, 7–12 μm wide; excipulum apically carbonized ..... 11
- 11(10) Ascospores 60–100 × 10–12 μm ..... **Graphis dotalugalensis**  
 Ascospores 50–80 × 7–10 μm ..... **Graphis thunsinhalayensis**
- 12(9) Excipulum completely carbonized ..... **Graphis slendrae**  
 Excipulum apically to laterally carbonized ..... 13
- 13(12) Lirellae sparsely branched (*tenella*-morph) ..... **Graphis chlorotica**  
 Lirellae irregularly branched (*striatula*-morph) ..... 14
- 14(13) Thallus verrucose ..... **Graphis verrucoserpens**  
 Thallus smooth to uneven ..... **Graphis proserpens**
- 15(1) Thalline margin complete ..... 16  
 Thalline margin lateral ..... 19
- 16(15) Lirellae immersed; thallus rimose, *Fissurina*-like ..... **Graphis rimosothallina**  
 Lirellae erumpent to prominent; thallus smooth to uneven, *Graphis*-like ..... 17
- 17(16) Ascospores <50 μm long; excipulum laterally carbonized .. **Allographa ingarum**  
 Ascospores mostly >50 μm long; excipulum completely carbonized ..... 18
- 18(17) Lirellae prominent; ascospores 70–120 × 12–18 μm ..... **Allographa angustata**  
 Lirellae erumpent; ascospores 50–80 × 8–12 μm ..... **Allographa glauconigra**
- 19(15) Ascospores mostly >40 μm long ..... 20  
 Ascospores <40 μm long ..... 23
- 20(19) Thallus verrucose; lirellae prominent, more or less stellately branched; excipulum  
 completely carbonized ..... **Allographa asterizans**  
 Thallus smooth; lirellae erumpent, irregularly branched; excipulum variable .. 21
- 21(20) Ascospores 80–125 × 8–12 μm; excipulum apically carbonized .....  
 ..... **Graphis subalbostrata**  
 Ascospores <70 μm long ..... 22
- 22(21) Ascospores 50–70 × 10–13 μm; excipulum completely carbonized .....  
 ..... **Allographa longula**  
 Ascospores 30–50 × 7–10 μm; excipulum laterally carbonized **Graphis leptoclada**
- 23(19) Labia white pruinose; excipulum apically carbonized ..... 24  
 Labia not pruinose; excipulum variable ..... 25
- 24(23) Thallus ecorticate ..... **Graphis glaucescens**  
 Thallus corticate ..... **Graphis chloroalba**
- 25(23) Excipulum apically carbonized; ascospores >30 μm ..... **Graphis subtenella**  
 Excipulum laterally or completely carbonized; ascospores <30 μm ..... 26

- 26(25) Excipulum laterally carbonized . . . . . **Graphis tenella**  
 Excipulum completely carbonized . . . . . **Graphis aurita**

**Group J. Thallus K– and UV–, hamathecium not inspersed, ascospores transversely septate, labia entire**

- 1 Ascospores at least partly >45 µm long . . . . . 2  
 Ascospores never >45 µm long . . . . . 11
- 2(1) Ascospores at least partly >80 µm long . . . . . 3  
 Ascospores never >80 µm long . . . . . 5
- 3(2) Excipulum laterally carbonized; thalline margin basal . . . . . **Allographa hossei**  
 Excipulum completely carbonized; thalline margin complete or absent . . . . . 4
- 4(3) Thalline margin absent; lirellae very short and unbranched (*nuda* type) . . . . .  
 . . . . . **Allographa bifera**  
 Thalline margin complete; lirellae elongate and branched (*rhizicola* type) . . . . .  
 . . . . . **Allographa rhizicola**
- 5(2) Labia or disc white pruinose . . . . . 6  
 Labia nor disc pruinose; disc concealed . . . . . 8
- 6(5) Disc open, pruinose . . . . . **Graphis scripta** s. lat.  
 Disc concealed . . . . . 7
- 7(6) Thallus ecorticate; excipulum laterally carbonized . . . . . **Allographa pavoniana**  
 Thallus corticate; excipulum apically carbonized . . . . . **Allographa sayeri**
- 8(5) Thalline margin absent; lirellae very short and unbranched (*nuda* type). . . . .  
 . . . . . **Allographa adpressa**  
 Thalline margin complete to lateral; lirellae elongate and branched . . . . . 9
- 9(8) Thalline margin complete . . . . . **Allographa anguilliradians**  
 Thalline margin lateral . . . . . 10
- 10(9) Excipulum laterally carbonized . . . . . **Allographa elongata**  
 Excipulum completely carbonized . . . . . **Allographa flavens**
- 11(1) Thalline margin absent; lirellae very short and mostly unbranched . . . . . 12  
 Thalline margin present; lirellae branched . . . . . 13
- 12(11) Ascospores 15–25 × 5–8 µm; excipulum laterally carbonized . . . **Allographa nana**  
 Ascospores 25–45 × 7–13 µm; excipulum completely carbonized . . . . .  
 . . . . . **Graphis conferta**
- 13(11) Excipulum apically or laterally carbonized . . . . . 14  
 Excipulum completely carbonized . . . . . 17

- 14(13) Excipulum apically carbonized ..... 15  
 Excipulum laterally carbonized ..... 16
- 15(14) Ascospores 30–40 × 8–10 µm; labia white pruinose ... **Allographa xanthospora**  
 Ascospores 25–35 × 6–8 µm; labia not pruinose ..... **Graphis oligospora**
- 16(14) Thallus partly ecorticate; lirellae partly white pruinose ..... **Graphis furcata**  
 Thallus corticate; lirellae not pruinose ..... **Graphis pinicola**
- 17(13) Thallus ecorticate; lirellae white pruinose ..... **Allographa sitiana**  
 Thallus corticate; lirellae not pruinose ..... 18
- 18(17) Ascospores 20–30 × 5–8 µm ..... 19  
 Ascospores 30–45 × 7–9 µm ..... 20
- 19(18) Thalline margin basal; lirellae usually stellately branched ... **Graphis dracaenae**  
 Thalline margin lateral; lirellae irregularly branched ..... **Graphis immersicans**
- 20(18) Thalline margin complete, apically thin ..... **Graphis negrosina**  
 Thalline margin lateral and thickened ..... **Graphis oxyclada**

### The New Species

#### **Allographa bambusicola Weerakoon, Lüicking & Aptroot sp. nov.**

Mycobank No.: MB 832538

Bambusicolous *Allographa* with entire labia, laterally carbonized excipulum, 80–100 × 15–17 µm large, muriform ascospores and rather thick, irregularly verrucose lateral thalline margin of the lirellae.

Type: Sri Lanka, Central Province, Galhiriya Estate, 5 km NNW of Hunasgiriya, 7°26'N, 80°42'E, 1241 m, high altitude, cardamom plantation, December 1989, *Cloonan* 56 (PDA—holotype).

(Fig. 3A & B)

*Thallus* bambusicolous, up to 5 cm diam., continuous; surface thinly verrucose, creamish to light green-grey; prothallus not observed. Thallus in section 80–120 µm thick, with cortex 10–20 µm thick, photobiont layer 20–30 µm thick, and medulla 50–70 µm thick, containing large clusters of calcium oxalate crystals.

*Lirellae* more or less straight, short, unbranched, prominent, *rhizicola*-type, with a rather thick, protruding, irregularly verrucose lateral thalline margin, 0.5–1.0 mm long, 0.2–0.3 mm wide, 0.25–0.30 mm high; *disc* concealed, labia entire. *Excipulum*

laterally carbonized, 50–70 µm wide; *hypothecium* prosoplectenchymatous, 10–15 µm high, pale olive; *hymenium* 150–180 µm high, colourless, not inspersed; *epithecium* granulose, 5–10 µm high, brownish. *Paraphyses* unbranched; *asci* fusiform, 150–160 × 25–30 µm. *Ascospores* 2–4 per ascus, fusiform to oblong, muriform, 80–100 × 15–17 µm, 5–6 times as long as wide, colourless, I+ amyloid.

*Secondary chemistry.* No substances detected by TLC.

*Etymology.* The name refers to the bambusicolous growth.

*Distribution and habitat.* The new species was collected in montane forest in the central region of Sri Lanka. It is thus far known only from the type locality.

*Discussion.* This species belongs to a group of taxa with entire labia, a laterally carbonized excipulum and large, muriform ascospores. *Allographa atrocetata* (A. W. Archer) Lüicking & Kalb is similar in lirella morphology, except that the thalline margin is smooth, but its ascospores are much larger (100–140 × 30–40 µm). *Graphis xylophaga* (R. C. Harris) Lendemer has erumpent lirellae with a smooth,



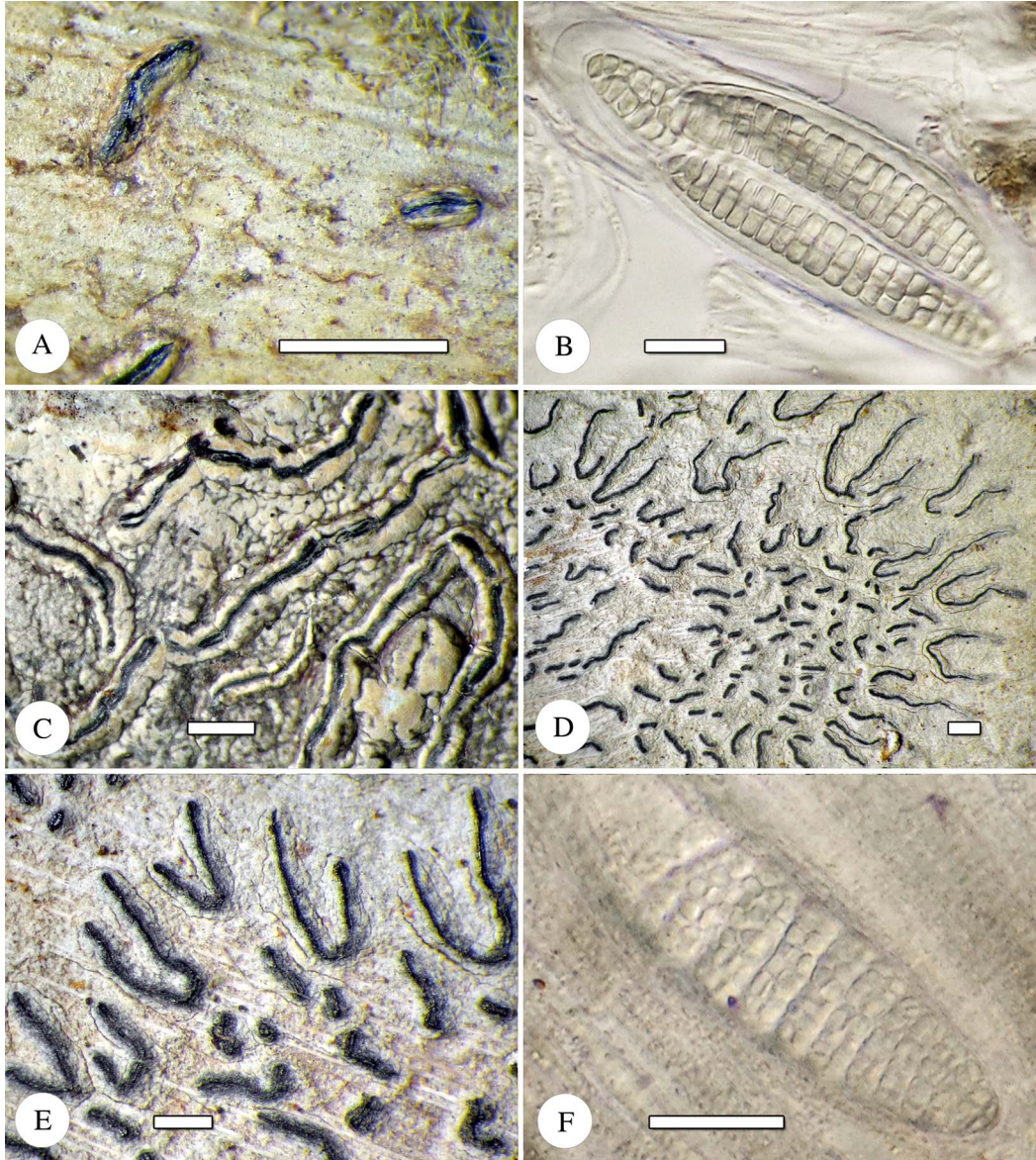


FIG. 3. Habitus and ascospores of *Allographa* and *Graphis* species, all holotypes. A & B, *A. bambusicola*; C, *A. weerasooriyana*; D–F, *G. flosculifera*. Scales: A, C, D & E = 1 mm; B & F = 20  $\mu$ m. In colour online.

lateral thalline margin with apically jet black labia and distinctly broader ascospores (20–30  $\mu$ m), and *G. lapidicola* Fée also differs in the erumpent lirellae, with an apically rather thick, smooth complete margin and relatively broader ascospores (3–4 times as long as wide).

***Allographa weerasooriyana* Weerakoon, Arachchige & Lüicking sp. nov.**

Mycobank No.: MB 832539

Corticolous *Allographa* resembling *A. rustica* Kremp. in overall anatomy and chemistry, but with verrucose thalline margins of the lirellae, and labia not distinctly raised above the thalline margin.

Type: Sri Lanka, Sabaragamuwa hill range, 10 km from Yathiyanthota, Halgolla Tea Estate, 7°02'N, 80°23'E, 1241 m, high altitude, tea estate, July 1988, *Cloonan* 686 (PDA—holotype).

(Fig. 3C)

*Thallus* corticolous, up to 10 cm diam., continuous; surface marmorate and coarsely verrucose, light yellowish grey. Thallus in section 100–150 µm thick, with prosoplectenchymatous cortex 10–15 µm thick, irregular algal layer 30–50 µm thick, intermingled with and partially covered by large clusters of calcium oxalate crystals, and medulla 50–80 µm thick, filled with numerous grey crystals.

*Lirellae* flexuose, irregularly branched, erumpent to prominent, *marginata*-type, with protruding, irregularly verrucose, rather thick lateral thalline margins but with the labia not distinctly raised, 3–10 mm long, 0.4–0.6 mm wide, 0.30–0.35 mm high; *disc* concealed, labia entire. *Excipulum* completely carbonized, 50–120 µm wide; *hypotheicum* prosoplectenchymatous, 20–30 µm high, pale yellowish; *hymenium* 150–170 µm high, colourless, not interspersed; *epitheicum* indistinct. *Paraphyses* unbranched; *asci* fusiform, 120–140 × 20–30 µm. *Ascospores* (mostly young in the type, with few asci with mature ascospores observed) 4–8 per ascus, oblong, 15–21-septate, 70–90 × 10 µm, 7–9 times as long as wide, colourless, I+ amyloid.

*Secondary chemistry.* Stictic acid.

*Etymology.* This new species is named in honour of Aruna Weerasooriya, Professor at PVAMU (Texas A & M University System), a pioneer botanist in Sri Lanka.

*Distribution and habitat.* The new species was collected in a high elevation tea plantation in the Sabaragamuwa mountain range of Sri Lanka, where it is known only from the type locality.

*Discussion.* This species most closely resembles *Allographa rustica* (Kremp.) Lücking & Kalb in overall anatomy and chemistry but differs in the coarsely verrucose to

marmorate thallus and the verrucose thalline margin of the lirellae, as well as the upper part of the labia being level with the thalline margin. *Graphis schroederi* Zahlbr. can be separated by the erumpent lirellae with smooth margins that mostly cover the labia (Lücking *et al.* 2009).

*Additional specimen examined.* **Sri Lanka:** Sabaragamuwa: mountain range, Coolbone Tea Estate, 7°01'N, 80°28'E, 860 m, mid altitude, 1988, *Cloonan* 077 (PDA).

### ***Graphis flosculifera* Weerakoon, Lücking & Aptroot sp. nov.**

Mycobank No.: MB 832540

Corticolous *Graphis* resembling *G. insulana* but differing in the unique disposition of the lirellae and the slightly more elongate ascospores.

Type: Sri Lanka, Western Province, Gampaha, 2 km from Divulapitya, 7°30'N, 80°62'E, 130 m, low altitude, coconut plantation, September 1988, on bark of *Cocos nucifera*, *Cloonan* 988 (PDA—holotype).

(Fig. 3D–F)

*Thallus* corticolous, up to 8 cm diam., pruinose, white to ash grey; *prothallus* not observed. Thallus in section 80–100 µm thick, lacking a cortex and entirely formed by an irregular photobiont layer intermingled with large clusters of calcium oxalate crystals.

*Lirellae* flexuose, unbranched to very sparsely branched, in the central portion of the thallus very short and irregularly arranged, in the periphery much longer and distinctly radiating, erumpent, *subserpentina*-type, with lateral thalline margins, 1–5 mm long, 0.3–0.4 mm wide, 0.20–0.25 mm high; *disc* concealed, labia entire, appearing roughened and not sharply delimited from the rather thin thalline margin. *Excipulum* laterally carbonized, 50–80 µm wide; *hypotheicum* prosoplectenchymatous, 10–15 µm high, pale olive; *hymenium* 100–120 µm high, colourless, interspersed (type A *sensu* Lücking *et al.* 2009); *epitheicum* indistinct, olive brown. *Paraphyses* unbranched; *asci* clavate, 80–100 × 20–25 µm. *Ascospores* 1 per ascus, muriform, 80–100 × 20–25 µm, 3.5–4.5 times as long as wide, colourless, I+ amyloid.



*Secondary chemistry.* Norstictic acid.

*Etymology.* The name refers to the flower-like arrangement of the lirellae.

*Distribution and habitat.* The new species was collected in a low elevation coconut plantation in the Western Province of Sri Lanka. It grew on almost every coconut tree in the area of the type locality.

*Discussion.* This new species is close to *Graphis insulana* (Müll. Arg.) Lücking and differs mainly in the unique disposition of the lirellae; in *G. insulana*, the lirellae are typically irregularly arranged and of similar length throughout, as in most species of the genus. Considering the ontogeny of the lirellae, one would usually expect those in the thallus centre to be larger or longer, as they are older, but in *G. flosculifera* the opposite is the case. In addition, in *G. insulana* the thalline margins of the lirellae are rather thick and the black labia, when visible, are rather sharply delimited from the latter. There are also slight differences in ascospore shape with those in *G. insulana* typically 3.0–3.5 times as long as wide (Lücking et al. 2009). In addition, *G. insulana* has a thicker thallus and thalline margin of the lirellae, with the black labia rather sharply delimited although mostly covered by the thallus. In *G. flosculifera* the thallus and thalline margins of the lirellae are thin and the labia appear dark grey and roughened, and not sharply delimited from the thalline margin.

**Graphis rajapakshana Weerakoon, Lücking & Aptroot sp. nov.**

MycoBank No.: MB 832541

Corticolous *Graphis* resembling *G. desquamescens*, including in ascospore size, but having lirellae with a distinct lateral thalline margin.

Type: Sri Lanka, central mountain region, 20 km from Nuwaraeliya, Pattipola, 6°50'N, 80°50'E, 1850 m, high altitude, Pattipola Tea Plantation, September 1988, *Cloonan* 195 (PDA—holotype).

(Fig. 4A & B)

*Thallus* corticolous, up to 5 cm diam., continuous; surface smooth to uneven, pale white

to green-white; *prothallus* not observed. Thallus in section 100–150 µm thick, with prosoplectenchymatous upper cortex, 10–15 µm thick, irregular algal layer 30–60 µm thick, intermingled with and partially covered by large clusters of calcium oxalate crystals; medulla 50–80 µm thick, encrusted with large clusters of calcium oxalate crystals following the outlines of the dead periderm cells of the bark, and also filled with small, grey crystals.

*Lirellae* flexuose, sparsely branched, erumpent, *lineola*-type, with a lateral thalline margin, 1–3 mm long, 0.20–0.25 mm wide, 0.15–0.20 mm high; *disc* concealed, labia entire. *Excipulum* completely carbonized, 30–50 µm wide; *hypotheorium* prosoplectenchymatous, 10–15 µm high, pale yellowish; *hymenium* 100–120 µm high, colourless, densely interspersed (type A *sensu* Lücking et al. 2009); *epithecium* granulose, 5–10 µm high, olive brown. *Paraphyses* unbranched; *asci* fusiform, 100–110 × 20 µm. *Ascospores* 8 per ascus, oblong and tapering, 11–13-septate, 35–50 × 7–8 µm, 5–6 times as long as wide, colourless, I+ amyloid.

*Secondary chemistry.* Norstictic acid.

*Etymology.* This new species is named in honour of Dr Ranil Rajapaksha, senior lecturer at the University of Peradeniya, a pioneer pteridologist in Sri Lanka.

*Distribution and habitat.* The new species was collected in a high elevation tea plantation in the central mountain range of Sri Lanka.

*Discussion.* This new species belongs to a small group centred around *Graphis desquamescens* (Fée) Zahlbr., with entire labia, a completely carbonized excipulum, an interspersed hymenium, transversely septate ascospores and containing norstictic acid. Among these, *Graphis centrifuga* Räsänen corresponds in the lateral thalline margin but has very long, radiately branched lirellae and very small ascospores (15–25 µm long). *Graphis cervinonigra* Zahlbr. and *G. gonimica* Zahlbr., also have a lateral thalline margin and small ascospores (20–30 µm long) and, at first, the

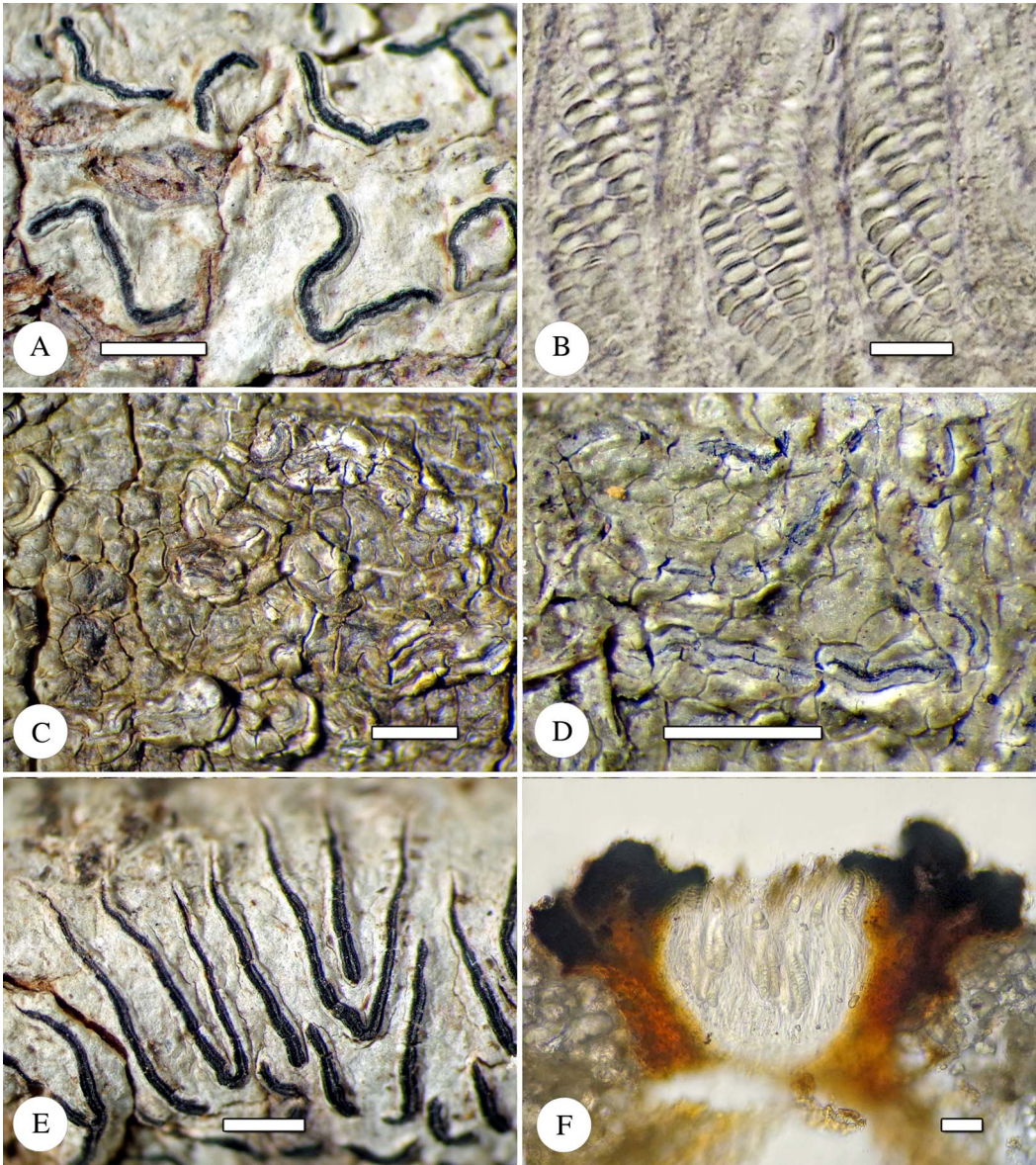


FIG. 4. Habitus, ascospores and lirella anatomy of *Graphis* species, all holotypes. A & B, *G. rajapakshana*; C & D, *G. rimosothallina*; E & F, *G. thunsinhalayensis*. Scales: A, C, D & E = 1 mm; B & F = 20  $\mu$ m. In colour online.

lirellae are stellately branched. *Graphis desquamescens* (Fée) Zahlbr. agrees with the new species in ascospore size but its lirellae lack a thalline margin. *Graphis mikuraensis* Y. Ohmura & M. Nakan. (syn.: *G. srilankensis* Weerakoon *et al.*; see below) also belongs to this group but differs from the new species

in the prominent lirellae and larger ascospores (50–70  $\mu$ m long).

*Additional material examined.* **Sri Lanka:** Sabaragamuwa: mountain range, Coolbone Tea Estate, 7°01'N, 80°28'E, 860 m, mid elevation, July 1988, *unknown collector* 630. **Central Province:** Mahagasthota upper division, 6°56'N, 80°47'E, 1760 m, high elevation, February



1989, *unknown collector* 198; Nawaganala Tea Estate, 7°19'N, 80°51'E, 1180 m, high elevation, December 1989, *Cloonan* 228 (all PDA).

**Graphis rimosothallina Weerakoon, Lücking & Aptroot sp. nov.**

MycoBank No.: MB 832542

Corticolous *Graphis* with a thick, uneven, rimose thallus and *Fissurina*-like lirellae, a completely carbonized excipulum and transversely 7-septate ascospores of 32–37 × 8–10 µm.

Type: Sri Lanka, Horton Plains, 8 March 2015, *Weerakoon* NE224 (PDA—holotype; isotype: BM).

(Fig. 4C & D)

*Thallus* corticolous, up to 10 cm diam., continuous; surface uneven and rimose (deeply broken in parts), pale greenish; *prothallus* not observed. Thallus in section 0.5–1.0 mm thick, with prosoplectenchymatous upper cortex, 20–35 µm thick, irregular algal layer 50–100 µm thick, intermingled with, and partially covered by, large clusters of calcium oxalate crystals, and medulla 0.5–1.0 mm thick, encrusted with large clusters of calcium oxalate crystals.

*Lirellae* flexuose, often curved, sparsely branched, immersed, with a complete thalline margin, most similar to the *consanguinea*-type but superficially resembling a *Fissurina*, 1.0–3.5 mm long, 0.35–0.50 mm wide; *disc* concealed, labia striate, covered by a thin thalline margin or thick pruina. *Excipulum* completely carbonized, 50–100 µm wide; *hypotheceum* not observed; *hymenium* 150–500 µm high, colourless, not interspersed; *epitheceum* granulose, 5–10 µm high, olive brown. *Paraphyses* unbranched; *asci* fusiform, 100–180 × 20 µm. *Ascospores* 8 per ascus, fusiform, 7-septate, 32–37 × 8–10 µm, 3.5–4.0 times as long as wide, colourless, I+ amyloid.

*Secondary chemistry.* No substances detected by TLC.

*Etymology.* The name refers to the deeply fissured thallus.

*Distribution and habitat.* The new species was collected in the southern mountain range of Sri Lanka.

*Discussion.* *Graphis rimosothallina* has striate labia, a completely carbonized excipulum, a clear hymenium and transversely septate ascospores, and thus keys out in group 17 in the world key by Lücking *et al.* (2009). In that group, it differs from other species with small ascospores and lacking secondary compounds by its rather unique morphology, strongly resembling a species of *Fissurina*. All the other species in that group have a *Graphis*-like thallus and at best a lateral thalline margin, with the striate labia clearly exposed. *Graphis rimosothallina* is distinguished from species of *Fissurina* by the strongly carbonized excipulum and the multi-septate, amyloid ascospores.

**Graphis thunsinhalayensis Weerakoon, Arachchige & Lücking sp. nov.**

MycoBank No.: MB 832543

Corticolous *Graphis* resembling *G. subalbostriata* but with smaller ascospores and lacking white lines between the striae of the labia.

Type: Sri Lanka, central mountain region, 20 km from Nuwaraeliya, Pattipola, 6°50'N, 80°50'E, 1760 m, high altitude, Mahagasthota Tea Estate, upper division, September 1988, *Cloonan* 72 (PDA—holotype).

(Fig. 4E & F)

*Thallus* corticolous, up to 5 cm diam., continuous; surface smooth to uneven, white to light yellowish grey; *prothallus* not observed. Thallus in section 100–120 µm thick, with loose upper cortex, 5–10 µm thick, irregular algal layer 30–50 µm thick, intermingled with and partially covered by large clusters of calcium oxalate crystals, and medulla 40–60 µm thick.

*Lirellae* flexuose, irregular to radiately branched, erumpent, with a thin, lateral thalline margin, *tenella*- to *dichotoma*-type, especially when young, older lirellae with a basal thalline margin, 1–10 mm long, 0.2–0.3 mm wide, 0.15–0.25 mm high; *disc* concealed, labia finely striate. *Excipulum* crenulate, apically carbonized, 25–50 µm wide; *hypotheceum* prosoplectenchymatous, 10–15 µm high, hyaline to pale yellowish; *hymenium* 100–120 µm high, colourless, not interspersed; *epitheceum* granulose, 5–10 µm high, olive brown. *Paraphyses* unbranched; *asci* fusiform, 100–110 × 20–25 µm. *Ascospores* 8 per ascus, oblong,

13–17-septate, 50–80 × 7–10 µm, 7–8 times as long as wide, colourless, I+ amyloid.

*Secondary chemistry.* No substances detected by TLC.

*Etymology.* The name refers to Thun Sinhalaya, which was the last kingdom in the Kandy area and lost its autonomy in 1817 (Pieris 1945).

*Distribution and habitat.* The new species was collected in a high elevation tea plantation in the central mountain range of Sri Lanka.

*Discussion.* *Graphis thunsinhalayensis* is part of a small group with apically carbonized, striate labia and medium-sized to large ascospores, lacking inspersion and secondary substances. The neotropical *Graphis subalbostriata* Vain. ex Lücking has larger ascospores and distinct white lines between the striae, and *G. olivacea* Redinger, also with larger ascospores, has lirellae with an apically thin, complete thalline margin. *Graphis supertecta* Müll. Arg. corresponds in ascospore size but differs in the immersed lirellae with pruinose labia. *Graphis caribica* Lücking differs in the greenish thallus and the prominent lirellae lacking or with a basal thalline margin only.

*Additional material examined.* **Sri Lanka:** central mountain region, Galhiriya Tea Estate, 7°26'N, 80°42'E, 1241 m, high elevation, December 1989, *unknown collector* 055; Cottaganga Ella, 7°22'N, 80°48'E, 1471 m, high elevation, December 1989, *unknown collector* 008; Galhiriya Tea Estate, upper division, 7°25'N, 80°42'E, 1260 m, high elevation, December 1989, *unknown collector* 291; road to Horton Plains, 6°50'N, 80°48'E, 1869 m, high elevation, February 1989, *unknown collector* 602; Pedro Tea Estate, 7°00'N, 80°44'E, 1920 m, high elevation, February 1989, *unknown collector* 074 & 087 & Cloonan 962 (all PDA).

### Name Validation

#### *Graphis verrucoserpens* Lücking ex Lücking sp. nov.

Mycobank No.: MB 832544

*Graphis verrucoserpens* Lücking in Lücking *et al.*, *Lichenologist* 41: 421 (2009) [nom. inval.].

Corticolous *Graphis* resembling *G. proserpens* but with a distinctly and rather coarsely verrucose thallus surface.

Type: Jamaica, parish of St. Thomas, Monkey Hill to south slope of Mossmans Peak, Blue Mts., 1494 m, 19 February 1953, *Imshaug* 14579 (MSC-0029035!—holotype; NYBG!—isotype).

(Fig. 5)

*Thallus* corticolous, up to 5 cm diam., continuous; surface rather coarsely verrucose, greenish grey; *prothallus* not observed. Thallus in section 50–150 µm thick, with dense upper cortex, 5–10 µm thick, irregular algal layer 20–50 µm thick, intermingled with and partially covered by large clusters of calcium oxalate crystals (particularly in the verrucae), and medulla 20–60 µm thick.

*Lirellae* flexuose, irregularly branched, erumpent, with a basal thalline margin, *striatula*-type, 1–5 mm long, 0.1–0.2 mm wide, 0.10–0.15 mm high; *disc* concealed, labia finely striate. *Excipulum* crenulate, apically (to laterally) carbonized, 20–30 µm wide; *hypothecium* prosoplectenchymatous, 10–15 µm high, hyaline to pale yellowish; *hymenium* 80–100 µm high, colourless, not inspersioned; *epithecium* granulose, 5–10 µm high, olive brown. *Paraphyses* unbranched; *asci* fusiform, 80–90 × 15–20 µm. *Ascospores* 8 per ascus, oblong, 7–11-septate, 25–35 × 5–7 µm, 4.5–5.5 times as long as wide, colourless, I+ amyloid.

*Secondary chemistry.* No substances detected by TLC.

*Discussion.* This taxon had already been keyed out in Lücking *et al.* (2009) but has not yet been validly described, an oversight corrected here. It is in most aspects identical to *Graphis proserpens* but differs clearly in the rather coarsely verrucose thallus.

*Additional specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 964 (BM).

### Other Species

#### *Allographa acharii* (Fée) Lücking & Kalb

In Kalb *et al.*, *Phytotaxa* 377: 15 (2018).—*Graphis acharii* Fée, *Essai Crypt. Écorc.*: 39 (1824).—*Graphina acharii* (Fée) Müll. Arg., *Mém. Soc. Phys. Genève* 29(8): 38 (1887); type: South America, unknown locality, s. dat., s. col. (G, not seen).



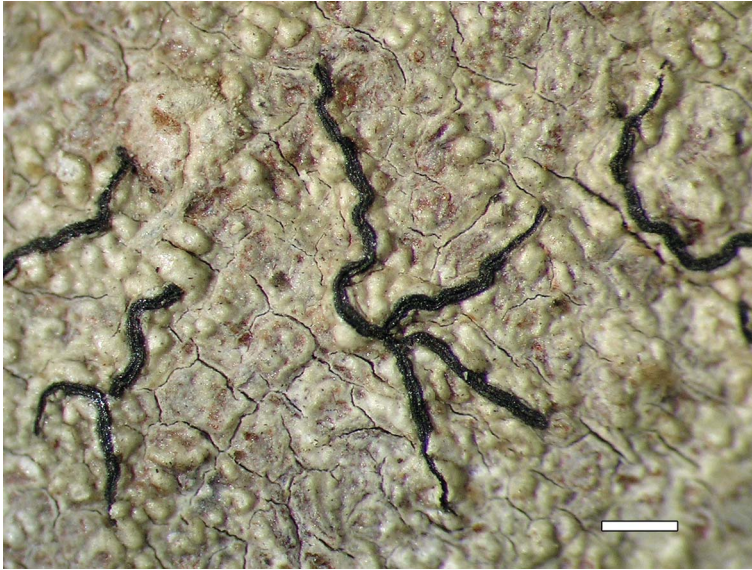


FIG. 5. Habitus of *Graphis verrucoserpens*, holotype. Scale = 1 mm. In colour online.

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, elongate-irregularly branched, with a complete (thin) thalline margin, *acharii*-type, 1–10 × 0.5–1 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 2–6 per ascus, muriform, 80–170 × 15–30 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 944 (BM).

### ***Allographa adpressa* (Vain.) Lücking & Kalb**

*Herzogia* 31: 546 (2018).—*Graphis adpressa* Vain., *Acta Soc. Fauna Fl. Fenn.* 7: 119 (1890); type: Brazil, Vainio s. n. (TUR-Vainio 27851! Vainio, *Lich. Bras. Exs.* 1289—lectotype, Wirth & Hale 1978).

*Thallus* corticate, smooth, white-grey. *Lirellae* sessile, very short-unbranched, without a clear thalline margin, *nuda*-type, 0.5–1.5 × 0.25–0.35 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8

per ascus, transversely 9–17-septate, 50–70 × 13–15 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Nawalapitiya, 2015, *Weerakoon* 10020 (BM).

### ***Allographa anguilliradians* Lücking ex Lücking**

In Lücking & Kalb, *Herzogia* 31: 544 (2018).—*Graphis anguilliradians* Lücking, in Lücking et al., *Lichenologist* 41: 408 (2009) [nom. inval.]; type: Trinidad, *Imshaug & Imshaug* 31858 (MSC-0024122!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, very long-radiately branched, with a complete (thin) thalline margin, *anguilliradians*-type, 3–10 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 6–8 per ascus, transversely 9–13-septate, 50–70 × 8–11 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 319 (BM).

***Allographa angustata* (Eschw.) Lücking & Kalb**

*Herzogia* 31: 547 (2018).—*Graphis angustata* Eschw., in Martius, *Fl. Bras.* 1(1): 73 (1833); type: Brazil, *Martius* s. n. (M, not seen).

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, elongate-irregularly branched, with a complete (thin) thalline margin, *acharii*-type, 1–7 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 11–15-septate, 50–100 × 12–18 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Nawalapitiya, 2015, *Weerakoon* 10019 (BM).

***Allographa argentata* (Lücking & Umaña) Lücking & Kalb**

*Herzogia* 31: 547 (2018).—*Graphis argentata* Lücking & Umaña, in Lücking *et al.*, *Fieldiana* 46: 59 (2008); type: Costa Rica, Puntarenas, La Amistad International Park, Altamira Station (La Amistad Pacifico Conservation Area), Talamanca Ridge, *Lücking* 15269d (INB!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, elongate-irregularly branched, with a complete (thin) thalline margin, *acharii*-type, 1–6 × 0.3–0.5 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* interspersed. *Ascospores* 4–6 per ascus, muriform, 90–120 × 15–25 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 518C (BM).

***Allographa asterizans* (Nyl.) Lücking & Kalb**

*Herzogia* 31: 547 (2018).—*Graphis asterizans* Nyl., *Acta Soc. Sci. Fem.* 7(2): 467 (1863); type: China, Hong Kong, s. col. (H-Nyl 7781!—holotype).

*Thallus* corticate, verrucose, greenish grey. *Lirellae* prominent, stellately branched, with a lateral (thick) thalline margin, *asterizans*-type, 1–5 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 15–23-septate, 40–70 × 7–10 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Imbulpitiya, 2015, *Weerakoon* Im72 (BM).

***Allographa bifera* (Zahlbr.) Lücking & Kalb**

*Herzogia* 31: 547 (2018).—*Graphis bifera* Zahlbr., in Handel-Mazzetti, *Symbol. Sinic.* 3: 47 (1930); type: China, Yunnan, *Handel-Mazzetti* 12262 (W!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* sessile, very short-unbranched, without a clear thalline margin, *nuda*-type, c. 3 × 0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 15–21-septate, 80–100 × 8–15 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 619 (BM).

***Allographa consanguinea* (Müll. Arg.) Lücking & Kalb**

*Herzogia* 31: 549 (2018).—*Graphina consanguinea* Müll. Arg., *Nuov. Giorn. Bot. Ital.* 21: 362 (1889).—*Graphis consanguinea* (Müll. Arg.) Lücking, in Lücking *et al.*, *Fieldiana* 46: 6 (2008); type: Brazil, *Glaziou* s. n. (G!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* immersed, elongate-irregularly branched, with complete (thick) thalline margin, *consanguinea*-type, 1–7 × 0.4–0.5 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 1 per

ascus, muriform, 110–125 × 30–35 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 558 (BM).

### **Allographa elixii (A. W. Archer) Lüicking & Kalb**

*Herzogia* 31: 550 (2018).—*Phaeographina elixii* A. W. Archer, *Biblioth. Lichenol.* 78: 14 (2001).—*Graphis elixiana* A. W. Archer, *Telopea* 11: 73 (2005); type: Australia, Queensland, *Elix* 16321 (CANB—holotype, photograph seen).

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, short-sparsely branched, with a complete (thick) thalline margin, *illinata*-type, 1–3 × 0.4–0.6 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* interspersed. *Ascospores* 1 per ascus, muriform, 15–21 × 1–3-septate, 90–130 × 12–17 µm, hyaline.

*Secondary chemistry.* Hirtifructic acid.

*Selected specimen examined. Sri Lanka:* Horton Plains National Park, 2015, *Weerakoon* 76A (BM).

### **Allographa elongata (Zenker) Lüicking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 18 (2018).—*Graphis elongata* Zenker, in Goebel & Kunze, *Pharmaceutische Waarenkunde (Eisenach)* 1: 165, tab. XXII, fig. 1 (1827); type: not seen.

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, 1–5 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 13–17-septate, 70–80 × 11–15 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 982 (BM).

### **Allographa flavens (Müll. Arg.) Lüicking & Kalb**

*Herzogia* 31: 550 (2018).—*Graphis flavens* Müll. Arg., *Flora* 65: 334 (1882); type: Indonesia, Java, *Funghuhn* 446 (L—holotype; G—isotype!).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, with a lateral (thick) thalline margin, *marginata*-type, 1–5 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 11–15-septate, 50–70 × 9–11 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 224 (BM).

### **Allographa glauconigra (Vain.) Lüicking & Kalb**

*Herzogia* 31: 550 (2018).—*Graphis glauconigra* Vain., *Ann. Acad. Sci. Fenn., Ser. A* 15(no. 6): 242 (1921); type: Philippines, *Merrill* 6791 (TUR-Vainio 27884!—lectotype, Lüicking *et al.* 2009).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, short-sparsely branched, with a complete (thin) thalline margin, *acharii*-type, 1–3 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 4 per ascus, transversely 9–13-septate, 40–80 × 8–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 300 (BM).

### **Allographa hossei (Vain.) Lüicking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 18 (2018).—*Graphis hossei* Vain., *Ann. Bot. Soc. Zool.-Bot. Fenn. Vanamo* 1(no. 3): 53 (1921); type: Thailand [Siam], *Hosseus* s. n. (TUR-Vainio 27806!—lectotype, Lüicking *et al.* 2009).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, with a basal thalline margin, *hossei*-type, 1–5 × 0.3–0.4 mm; *disc* closed, labia smooth,

not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 2–8 per ascus, transversely 11–17-septate,  $50\text{--}110 \times 8\text{--}14 \mu\text{m}$ , hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 674 (BM).

### ***Allographa illinata* (Eschw.) Lücking & Kalb**

*Herzogia* 31: 551 (2018).—*Graphis illinata* Eschw., in Martius, *Fl. Bras.* 1: 82 (1833).—*Graphina illinata* (Eschw.) M. Wirth & Hale, *Smiths. Contr. Bot.* 40: 37 (1978); type: Brazil, Martius s. n. (M—lectotype, Wirth & Hale (1978), not seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, with a complete thalline margin, *illinata*-type,  $1\text{--}7 \times 0.4\text{--}0.6 \text{ mm}$ ; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 1 per ascus, muriform,  $100\text{--}150 \times 18\text{--}30 \mu\text{m}$ , hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Nuwaraeliya, 2015, *Weerakoon* Ne476 (BM).

### ***Allographa ingarum* (Vain.) Lücking & Kalb**

*Herzogia* 31: 551 (2018).—*Graphis ingarum* (Vain.) Lücking, in Lücking *et al.*, *Lichenologist* 41: 436 (2009).—*Graphis angustata* var. *ingarum* Vain., *Ann. Acad. Sci. Fenn., Ser. A* 6(no. 7): 158 (1915); type: Guedeloupe, *Duss* 1190 (TUR-Vainio 27848!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, elongate-irregularly branched, with a complete (thin) thalline margin, *acharii*-type,  $1.5\text{--}7.0 \times 0.2\text{--}0.3 \text{ mm}$ ; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–13-septate,  $38\text{--}48 \times 7\text{--}10 \mu\text{m}$ , hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Adam's Peak, 2015, *Weerakoon* 352 (BM).

### ***Allographa jayatilakana* Weerakoon, Arachchige & Lücking**

In Jatnika *et al.*, *Lichenologist* 51: 230 (2019); type: Sri Lanka, Western Province, Colombo City, Hokandara, *G. Weerakoon* GW 100 (PDA!—holotype; B!, BM!—isotypes).

*Thallus* corticate, uneven, white-grey. *Lirellae* prominent, unbranched to sparsely branched, pigmented, *chrysocharpa*-type,  $1\text{--}5 \times 0.3\text{--}0.4 \text{ mm}$ ; *disc* closed, labia mostly entire but becoming striate in older lirellae, apically exposed, black, laterally covered by a yellow to yellow-orange pruina. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, terminally muriform, with 15–19 transverse septa and usually one or two of the (sub)terminal cells on each side with a longitudinal septum,  $80\text{--}120 \times 9\text{--}12 \mu\text{m}$ , hyaline.

*Secondary chemistry.* Lirellae covered with yellow anthraquinone, K+ yellow slowly turning violet, in microscopic section with vanishing K+ yellow efflux and pigment granules, then turning purple-violet.

*Selected specimen examined. Sri Lanka:* type.

### ***Allographa knucklensis* (Weerakoon, Wijey. & Wolseley) Lücking & Kalb**

*Herzogia* 31: 552 (2018).—*Graphis knucklensis* Weerakoon *et al.*, in Weerakoon *et al.*, *Bryologist* 115: 79 (2012); type: Sri Lanka, Knuckles conservation area, *Weerakoon & Wijeyaratne* 971 (PD!—holotype).

*Thallus* ecorticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *albotecta*-type,  $1\text{--}3 \times 0.2\text{--}0.3 \text{ mm}$ ; *disc* partly exposed, white, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* interspersed. *Ascospores* 8 per ascus, muriform  $7\text{--}9 \times 0\text{--}2$ -septate,  $25\text{--}35 \times 7\text{--}8 \mu\text{m}$ , hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined. Sri Lanka:* type.



### **Allographa leprographa (Nyl.) Lücking & Kalb**

*Herzogia* 31: 552 (2018).—*Graphis leprographa* Nyl., *Acta Soc. Sci. Fenn.* 26(no. 10): 21 (1900); type: Sri Lanka [Ceylon], 1879, *Almqvist* (H-Nyl 7398!)—lectotype, *Staiger* 2002).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* prominent, short-sparsely branched, with a lateral (thick) thalline margin, *marginata*-type, 1–3 × 0.25–0.35 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* inspersion. *Ascospores* 1–2 per ascus, muriform, 60–110 × 16–30 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* Sri Lanka: type.

### **Allographa leptospora (Vain.) Lücking & Kalb**

In Kalb et al., *Phytotaxa* 377: 19 (2018).—*Graphis leptospora* Vain., *Ann. Bot. Soc. Zool.-Bot. Fenn. Vanamo* 1(no. 3): 53 (1921); type: Thailand [Siam], *Hosseus* s. n. (TUR-Vainio 27807!)—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, short-sparsely branched, with a complete (thin) thalline margin, *acharii*-type; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–23-septate, 80–120 × 6–10 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* Sri Lanka: Nawalapitiya, 2015, *Weerakoon* 10023 (BM).

### **Allographa leucaenae (Aptroot) Lücking & Kalb**

*Herzogia* 31: 552 (2018).—*Graphis leucaenae* Aptroot, in Lücking et al., *Lichenologist* 41: 437 (2009); type: Indonesia, Java, *Groenhart* 5190 (L!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, short-sparsely branched, with a complete (thin) thalline margin, *acharii*-type, 1–5 × 0.7–1.2 mm; *disc* closed, labia smooth, not pruinose, becoming striate.

*Excipulum* completely carbonized. *Hymenium* inspersion. *Ascospores* 8 per ascus, transversely 13–19-septate, 75–100 × 15–22 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* Sri Lanka: Knuckles Mountain Range, 2015, *Weerakoon* 817 (BM).

### **Allographa longula (Kremp.) Lücking & Kalb**

*Herzogia* 31: 552 (2018).—*Graphis longula* Kremp., *Flora* 59: 380 (1876); type: Brazil, *Glaziou* 5497 (G!—lectotype, *Wirth & Hale* 1978).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *tenella*-type, 1–10 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely to laterally carbonized. *Hymenium* clear. *Ascospores* 6–8 per ascus, transversely 11–17-septate, 50–70 × 10–13 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* Sri Lanka: Knuckles mountain range, 2015, *Weerakoon* 243 (BM).

### **Allographa macella (Kremp.) Lücking & Kalb**

In Kalb et al., *Phytotaxa* 377: 20 (2018).—*Graphis macella* Kremp., *Flora* 59: 380 (1876).—*Graphina macella* (Kremp.) Müll. Arg., *Flora* 63: 39 (1880); type: Brazil, *Glaziou* 6289b (M!—lectotype, *Wirth & Hale* 1978).

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, short-sparsely branched, with a complete (thin) thalline margin, *acharii*-type, 1–3 × 0.5–0.7 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely to laterally carbonized. *Hymenium* clear. *Ascospores* 1 per ascus, muriform, 70–170 × 20–40 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* Sri Lanka: Knuckles Mountain Range, 2015, *Weerakoon* 900 (BM).

**Allographa mahaelyensis (Weerakoon, Jayalal & Lücking) Lücking & Kalb**

*Herzogia* 31: 553 (2018).—*Graphis mahaelyensis* Weerakoon *et al.*, in Weerakoon *et al.*, *Nova Hedwigia* 101: 82 (2015); type: Sri Lanka, Central Province, Horton Plains, *Jayalal* B.6.3.2.5 (PD!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a basal thalline margin, *striatula*-type, 1–3 × 0.4–0.6 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 1 per ascus, muriform, 90–100 × 20–25 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** type.

**Allographa marginata (Raddi) Lücking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 20 (2018).—*Graphis marginata* Raddi, *Memor. Soc. Ital. Sc.* 18: 344 (1820); type: Brazil, *s. col.* (not seen).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* prominent, elongate-irregularly branched, with a lateral (thick) thalline margin, *marginata*-type, 1–8 × 0.3–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 11–25-septate, 50–120 × 9–18 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 841 (BM).

**Allographa nana (Fée) Lücking & Kalb**

*Herzogia* 31: 553 (2018).—*Graphis nana* (Fée) Spreng., *Syst. Veget.* 4(1): 249 (1827).—*Opegrapha nana* Fée, *Essai Cryptog. Écorc. Offic.* 1: 26 (1824); type: South America, *s. col.* (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* sessile, very short-unbranched, without a clear thalline margin, *nuda*-type; *disc* closed, labia smooth, not pruinose, entire. *Excipulum*

laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–9-septate, 15–25 × 5–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Nawalapitiya, 2015, Weerakoon 10013 (BM).

**Allographa nuda (H. Magn.) Lücking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 75 (2018).—*Graphis nuda* (H. Magn.) Staiger & Lücking, in Lücking *et al.*, *Fieldiana* 46: 93 (2008).—*Graphina nuda* H. Magn., *Ark. Bot.* 3 (10): 266 (1955) [non *Graphis nuda* Staiger, *Biblioth. Lichenol.* 85: 245 (2002), nom. inval., ICBN, Art. 32, 35–37]; type: Hawaii, *Faurie* 1025b (UPS!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* sessile, very short-unbranched, without a clear thalline margin, *nuda*-type; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, muriform, 25–40 × 10–20 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Horton Plains, 2015, Weerakoon 19215 (BM).

**Allographa pavoniana (Fée) Lücking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 21 (2018).—*Graphis pavoniana* Fée, *Essai Crypt. Écorc. Offic.* 1: 40 (1824); type: unknown locality, *s. dat.*, *s. col.* (G!—lectotype, Staiger 2002).

*Thallus* partly ecorticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *caesiella*-type, 1–5 × 0.1–0.2 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 7–17-septate, 30–60 × 7–11 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 600 (BM).



### **Allographa phaeospora (Vain.) Lücking & Kalb**

In Kalb et al., *Phytotaxa* 377: 21 (2018).—*Graphis phaeospora* Vain., *Acta Soc. Fauna Fl. Fenn.* 7: 97 (1890); type: Brazil, *Vainio* s. n. (TUR-Vainio 27166!)—holotype; *Vainio*, *Lich. Bras. Exs.* 682).

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, elongate-irregularly branched, with a complete (thin) thalline margin, *negrosina*-type, 1–7 × 0.4–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* inspersioned. *Ascospores* 1–4 per ascus, muriform, 110–130 × 25–35 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 119 (BM).

### **Allographa plagiocarpa (Fée) Lücking & Kalb**

*Herzogia* 31: 554 (2018).—*Graphis plagiocarpa* Fée, *Essai Crypt. Écorc. Offic.* 1: 38 (1824); type: unknown locality, *s. col.* (G!—isotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* sessile, very short-unbranched, with a lateral (thick) thalline margin, *dussii*-type, 0.5–1.5 × 0.3–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 1 per ascus, muriform, 80–120 × 10–18 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Sinharaja, 2015, *Weerakoon* MO72 (BM).

### **Allographa polystriata (Makhija, A. Dube, Adaw. & Chitale) Lücking & Kalb**

*Herzogia* 31: 555 (2018).—*Graphis polystriata* Makhija et al., *Geophytology* 36: 65 (2006); type: India, Maharashtra, *Makhija & Mantri* 00.278 (AMH—holotype, not seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched,

with a basal thalline margin, *striatula*-type, 1–7 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally to completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 11–23-septate, 50–110 × 4–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 1006 (BM).

### **Allographa rhizicola (Fée) Lücking & Kalb**

In Kalb et al., *Phytotaxa* 377: 22 (2018).—*Opegrapha rhizicola* Fée, *Essai Crypt. Écorc. Offic.* 1: 33 (1824).—*Graphis rhizicola* (Fée) Lücking & Chaves, in Lücking et al., *Fieldiana* 46: 102 (2008); type: South America, unknown locality (G—holotype, not seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, with a complete thalline margin, *illinata*-type, 2–10 × 0.4–0.6 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 19–25-septate, 70–130 × 11–20 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 303 (BM).

### **Allographa rimulosa (Mont.) Lücking & Kalb**

In Kalb et al., *Phytotaxa* 377: 22 (2018).—*Opegrapha rimulosa* Mont., *Ann. Sci. Nat. Bot., Ser. 2* 18: 271 (1842).—*Graphis rimulosa* (Mont.) Trevis., *Spighe et Paglie*: 11 (1853).—*Graphis rimulosa* (Mont.) Müll. Arg., *Bull. Soc. Roy. Bot. Belg.* 30: 79 (1891) [nom. illeg., ICBN Art. 52.1]; type: Guyana, *Leprieur* 200 (PC—lectotype, Wirth & Hale (1978), not seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, short-sparsely branched, without a clear thalline margin, *striatula*-type, 1–3 × 0.2–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear.

*Ascospores* 4–8 per ascus, transversely 7–11-septate, 30–50 × 7–13 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 583 (BM).

### ***Allographa ruiziana* (Fée) Lüicking & Kalb**

*Herzogia* 31: 555 (2018).—*Opegrapha ruiziana* Fée, *Essai Crypt. Écorc. Offic.* 1: 27 (1824).—*Graphis ruiziana* (Fée) A. Massal., *Mem. Lichenogr.*: 111 (1853).—*Graphina ruiziana* (Fée) Müll. Arg., *Mém. Soc. Phys. Genève* 29 (8): 38 (1887); type: South America, unknown locality, *Humboldt & Bonpland* s. n. (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* sessile, very short-unbranched, without a clear thalline margin, *nuda*-type, 0.5–1.5 × 0.2–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, muriform, 35–65 × 10–20 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 352 (BM).

### ***Allographa rustica* (Kremp.) Lüicking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 23 (2018).—*Graphis rustica* Kremp., *Nuovo Giorn. Bot. Ital.* 7: 61 (1875); type: Singapore, *Beccari* 258 (M—lectotype, Archer (2006), not seen).

*Thallus* corticate, bumpy, greenish grey. *Lirellae* prominent, elongate-irregularly branched, with a lateral (thick) thalline margin, *marginata*-type, 1–7 × 0.4–0.6 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 11–17-septate, 65–85 × 8–11 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 812 (BM).

### ***Allographa sauroidea* (Leight.) Lüicking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 23 (2018).—*Graphis sauroidea* Leight., *Trans. Linn. Soc. London* 25: 452 (1866); type: Brazil, *Spruce* 331 (BM—holotype, not seen).

*Thallus* corticate, smooth, pale greenish grey. *Lirellae* prominent, elongate-irregularly branched, without a clear thalline margin, *hossei*-type, 1–5 × 0.3–0.4 mm; *disc* exposed, dark, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–15-septate, 45–60 × 10–14 µm, hyaline.

*Secondary chemistry.* Lichexanthone.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 013 (BM).

### ***Allographa sayeri* (Müll. Arg.) Lüicking & Kalb**

*Herzogia* 31: 555 (2018).—*Graphis sayeri* Müll. Arg., *Flora* 70: 401 (1887); type: Australia, *Sayers* s. n. (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* immersed, elongate-irregularly branched, with a lateral (thick) thalline margin, *caesiella*-type, 1–5 × 0.2–0.3 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 9–11-septate, 30–55 × 6–10 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 179 (BM).

### ***Allographa sitiana* (Vain.) Lüicking & Kalb**

*Herzogia* 31: 555 (2018).—*Graphis sitiana* Vain., *Acta Soc. Fauna Fl. Fenn.* 7(2): 120 (1890); type: Brazil, *Vainio* 533 (TUR-Vainio 27854!—holotype).

*Thallus* ecorticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, with a lateral (thick) thalline margin, *farinulenta*-type, 1–5 × 0.15–0.25 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* completely carbonized.

*Hymenium* clear. *Ascospores* 8 per ascus, transversely 3–5-septate, 20–30 × 7–9 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Jaffna, 2015, Weerakoon JF27 (BM).

### **Allographa striatula (Ach.) Lücking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 26 (2018).—*Graphis striatula* (Ach.) Spreng., *Syst. Veg.*, Ed. 16 4(1): 250 (1827).—*Opegrapha striatula* Ach., *Syn. Meth. Lich.*: 74 (1814); type: Guinea, *s. col.* (H-Acharius 629!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, short-sparsely branched, without a clear thalline margin, *striatula*-type, 1–3 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally to completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 9–15-septate, 40–60 × 8–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 626 (BM).

### **Allographa vestitoides (Fink) Lücking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 27 (2018).—*Graphis vestitoides* (Fink) Staiger, *Biblioth. Lichenol.* 85: 263 (2002).—*Graphina vestitoides* Fink, *Mycologia* 19: 218 (1927); type: Puerto Rico, Fink 1986 (MICH—lecto-type, Wirth & Hale (1978), not seen).

*Thallus* corticate, smooth, greenish grey. *Lirellae* prominent, elongate-irregularly branched, with a complete (thin) thalline margin, *acharii*-type, 1–8 × 0.5–0.8 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 2–6 per ascus, terminally muriform, 19–23 × 0–2-septate, 80–140 × 12–16 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 636 (BM).

### **Allographa xanthospora (Müll. Arg.) Lücking & Kalb**

In Kalb *et al.*, *Phytotaxa* 377: 29 (2018).—*Graphis xanthospora* Müll. Arg., *Bull. Herb. Boissier* 3: 320 (1895); type: Australia, Sayer s. n. (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* immersed, elongate-irregularly branched, with a lateral (thick) thalline margin, *caesiella*-type, 1–5 × 0.2–0.3 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–9-septate, 30–40 × 8–10 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 095 (BM).

### **Graphis allugallenensis Weerakoon, Wijey. & Rivas Plata**

In Weerakoon *et al.*, *Bryologist* 115: 77 (2012); type: Sri Lanka, Central Province, Allugallena nature trail, Weerakoon & Wijeyaratne 255A (PD!—holotype).

*Thallus* corticate, verrucose, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *tenella*-type, 1–5 × 0.2–0.3 mm; *disc* closed, labia verrucose, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 9–11-septate, 35–40 × 7–8 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** type.

### **Graphis anfractuosa (Eschw.) Eschw.**

In Martius, *Fl. Bras.* 1(1): 86 (1833).—*Scaphis anfractuosa* Eschw., *Syst. Lich.*: 25 (1824); type: Brazil, Martius s. n. (M—lectotype, Wirth & Hale (1978), not seen; G!—isolectotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, short-sparsely branched, without a clear thalline margin, *hossei*-type, 1–3 × 0.1–0.2 mm; *disc* closed, labia smooth, not

pruinose, entire. *Excipulum* completely carbonized. *Hymenium* interspersed. *Ascospores* 8 per ascus, transversely 7–11-septate, 25–45 × 6–9 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Hakgala, 2015, *Weerakoon* Hg51 (BM).

### **Graphis arbusculiformis (Vain.) Lücking**

In Lücking *et al.*, *Lichenologist* **44**: 391 (2012).—*Graphis subdispersens* f. *arbusculiformis* Vain., *Bot. Tidsskr.* **29**: 132 (1909); type: Thailand, *Schmidt* s. n. (TUR-Vainio 27563!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, very long-radiately branched, with a lateral thalline margin, *centrifuga*-type, 1–10 × 0.20–0.25 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely to laterally carbonized. *Hymenium* interspersed. *Ascospores* 8 per ascus, transversely 7–9-septate, 25–35 × 6–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Hakgala, 2015, *Weerakoon* 299 (BM).

### **Graphis aurita Eschw.**

In Martius, *Fl. Bras.* **1**: 90 (1833); type: Brazil, *s. col.* (M—holotype, not seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, short-sparsely branched, with a lateral thalline margin, *tenella*-type, 1–3 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–13-septate, 17–25 × 6–8 µm, hyaline.

*Secondary chemistry*

No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 238 (BM).

### **Graphis bakeri Vain.**

*Ann. Acad. Sci. Fenn., Ser. A* **15**(no. 6): 253 (1921); type: Philippines, *Baker* 547 (TUR-Vainio 27874!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *caesiella*-type, 1–5 × 0.20–0.25 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–7-septate, 20–40 × 6–9 µm, hyaline.

*Secondary chemistry.* Salazinic acid.

*Selected specimen examined.* **Sri Lanka:** Jaffna, 2015, *Weerakoon* JF26 (BM).

### **Graphis brahmanensis Aptroot**

In Lücking *et al.*, *Lichenologist* **41**: 434 (2009); type: Papua New Guinea, Madang, Ramu Valley, Brahman, along road to Bundi, *Aptroot* 31685 (B!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a basal thalline margin, *striatula*-type, 1–5 × 0.1–0.2 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 9–11-septate, 20–30 × 4–6 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Monaragala, 2015, *Weerakoon* Mn16 (BM).

### **Graphis caesiella Vain.**

*Acta Soc. Fauna Fl. Fenn.* **7**: 122 (1890); type: Brazil, *Vainio* s. n. (TUR-Vainio 27730!—holotype; *Vainio, Lich. Brasil Exs.* 45).

*Thallus* corticate, smooth, white-grey. *Lirellae* immersed, elongate-irregularly branched, with a lateral (thick) thalline margin, *caesiella*-type, 1–5 × 0.1–0.2 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–9-septate, 20–40 × 6–8 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 553 (BM).

### Graphis caesiocarpa Redinger

*Ark. Bot.* 27A(3): 23 (1935); type: Brazil, Malme 3602 (S 6507!—lectotype, Lücking et al. 2008).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a complete (thin) thalline margin, *caesiella*-type, 1–7 × 0.15–0.25 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 30–40 × 7–9 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon Kn27 (BM).

### Graphis caribica Lücking

In Lumbsch et al., *Phytotaxa* 18: 59 (2011); type: Dominica, Imshaug & Imshaug 32777-A2 (MSC-0006670!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, without a clear thalline margin, *striatula*-type, 1–5 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 9–15-septate, 50–65 × 9–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 820 (BM).

### Graphis chloroalba Makhija & Adaw.

*Mycotaxon* 91: 373 (2005); type: India, Andaman Islands, Nagarkar & Patwardhan 86.529 (AMH—holotype, not seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* immersed, elongate-irregularly branched, with a lateral thalline margin, *chloroalba*-type;

*disc* closed, labia smooth, white pruinose, becoming striate. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–9-septate, 20–25 × 5–7 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Imbulpitiya, 2015, Weerakoon Im70 (BM).

### Graphis chlorotica A. Massal.

In Kremp., *Verh. K. K. Zool.-Bot. Gesellsch. Wien* 21: 865 (1871); type: Indonesia, Java, s. col. (W—holotype, not seen).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, short-sparsely branched, with a basal thalline margin, *tenella*-type, 1–3 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–13-septate, 30–40 × 5–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Wilpattu National Park, 2015, Weerakoon WL17 (BM).

### Graphis cincta (Pers.) Aptroot

In Archer, *Fl. Australia* 57: 651 (2009); type: Dominican Republic, s. col. (L!—holotype).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *lineola*-type, 1–3 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 8 per ascus, transversely 7–9-septate, 25–35 × 6–8 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 030 (BM).



**Graphis conferta** Zenker

*Pharmaceutische Waarenkunde (Eisenach)* 1(3): 166 (1829); type: not seen.

*Thallus* corticate, smooth, white-grey. *Lirellae* sessile, short-sparsely branched, without a clear thalline margin, *hossei*-type; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 25–45 × 7–13 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Nuwaraeliya, 2015, *Weerakoon* Ne126 (BM).

**Graphis crassilabra** Müll. Arg.

*Flora* 65: 502 (1882); type: Australia, *Hartmann* 78 (G!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally to completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 9–15-septate, 45–65 × 7–12 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 217 (BM).

**Graphis cupei** Vain. ex Lücking

In Lücking *et al.*, *Lichenologist* 41: 436 (2009); type: Cuba, *Ekman* 19 (TUR-Vainio 27371!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, with a basal thalline margin, *hossei*-type, 1–5 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* interspersed. *Ascospores* 4–8 per ascus, transversely 13–17-septate, 60–70 × 7–9 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Imbulpitiya, 2015, *Weerakoon* 70A (BM).

**Graphis dendrogramma** Nyl.

In Crombie, *J. Linn. Soc. London, Bot.* 16: 226 (1877); type: Malaysia, Admiralty Islands, 1875, *Moseley* (H-Nyl 7165!—holotype).

*Graphis irradians* Nyl., *Acta Soc. Sci. Fem.* 26(10): 21 (1900) [nom. illeg., ICBN Art. 53.1, non *Graphis irradians* Fée]—*Graphis ceylandica* Zahlbr., *Cat. Lich. Univ.* 2: 297 (1923); type: Sri Lanka [Ceylon], *Almqvist* s. n. (H-Nyl 7900!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* immersed, very long-radiately branched, with a lateral (thick) thalline margin, *dendrogramma*-type, 1–7 × 0.15–0.25 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* laterally to completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–9-septate, 20–30 × 6–8 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimens examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* Kn66 (BM); type of *Graphis irradians* Nyl.

**Graphis descissa** Müll. Arg.

*Bull. Herb. Boissier* 3: 318 (1895); type: Australia, *Knight* 339 (G!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–5 × 0.15–0.30 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 25–40 × 6–8 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Sinharaja World Heritage Site, 2015, *Weerakoon* Si05 (BM).

**Graphis desquamescens** Fée

*Bull. Soc. Bot. Fr.* 21: 24 (1874); type: Brazil, *Glaziou* 5082 (M!—lectotype, Wirth & Hale 1978).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, elongate-irregularly branched, without a clear thalline margin, *hossei*-type, 1–5 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* inspersed. *Ascospores* 8 per ascus, transversely 5–9-septate, 25–50 × 5–9 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined. Sri Lanka:* Ambewella, 2015, *Weerakoon* Ne102 (BM).

### Graphis diplocheila Vain.

*Ann. Acad. Sci. Fenn., Ser. A 15*(no. 6): 204 (1921); type: Philippines, *McGregor* 8605 (TUR-Vainio 27239!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a complete (thick) thalline margin, *subserpentina*-type, 1–5 × 0.4–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 1–2 per ascus, muriform, 50–130 × 15–25 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 1027 (BM).

### Graphis disserpens Nyl.

*Bull. Soc. Linn. Normandie, Sér. 2 7*: 175 (1874) [non *Graphis disserpens* Vain., nom. illeg.]—*Graphina disserpens* (Nyl.) Müll. Arg., *Flora* 63: 23 (1880); type: Colombia [Nova Granata], *Lindig* 93 (H-Nyl 7415!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, very long-radiately branched, with a lateral thalline margin, *dichotoma*-type, 5–20 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 1–2 per ascus, muriform, 35–45 × 17–24 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 63A (BM).

### Graphis dolichographa Nyl.

*Acta Soc. Sci. Fenn.* 7(2): 465 (1863); type: Colombia [Nova Granata], *Lindig* 866 (H-Nyl 6052!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* immersed, elongate-irregularly branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–10 × 0.4–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 2–4 per ascus, muriform, 40–90 × 16–28 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 668A (BM).

### Graphis dotalugalensis Weerakoon, Wijey. & Rivas Plata

In *Weerakoon et al., Bryologist* 115: 77 (2012); type: Sri Lanka, Central Province, Knuckles conservation area, Dotalugala Mountain peak, *Weerakoon & Wijeyaratne* 214A (PD!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a basal thalline margin, *striatula*-type, 1–6 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 11–15-septate, 60–100 × 10–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* type.

### Graphis dracaenae Vain.

*Cat. Welwitsch Afr. Pl.* 2: 439 (1901); type: Africa, *Welwitsch* 397 (TUR-Vainio 27561!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, stellately branched, with a basal thalline margin, *geraensis*-type, 1–3 × 0.15–0.25 mm; *disc* closed, labia smooth, not



pruinose, entire. *Excipulum* completely to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–7-septate, 20–30 × 5–7 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 326 (BM).

### **Graphis dupaxana Vain.**

*Ann. Acad. Sci. Fenn., Ser. A* 15(6): 241 (1921); type: Philippines, *McGregor* 14313 (TUR-Vainio 27869!—lectotype, *Lücking et al.* 2009).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, short-sparsely branched, without a clear thalline margin, *striatula*-type, 1–3 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–9-septate, 25–40 × 7–9 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 822 (BM).

### **Graphis duplicata Ach.**

*Syn. Meth. Lich.*: 81 (1814); type: South America, unknown locality, *s. col.* (H-Ach 586!—lectotype, *Staiger* 2002).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, without a clear thalline margin, *striatula*-type, 1–5 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 25–45 × 6–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Adam's Peak, 2015, *Weerakoon* AD11 (BM).

### **Graphis elegans (Sm.) Ach.**

*Syn. Meth. Lich.*: 85 (1814).—*Opegrapha elegans* Sm., in Sowerby & Smith, *Engl. Bot.*: 26 (1808).—*Aulacographa elegans* (Sm.) Leight., *Ann. Mag. Nat. Hist., Ser. 2* 13: 389 (1854); type: Great Britain, England, *Borrer* s. n. (BM!—holotype).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, short-sparsely branched, without a clear thalline margin, *striatula*-type, 1–3 × 0.5–0.7 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 9–13-septate, 35–60 × 9–13 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 122 (BM).

### **Graphis ferruginea Vain.**

*Ann. Acad. Sci. Fenn., Ser. A* 15(no. 6): 257 (1921); type: Philippines, *Host* 15028 (TUR-Vainio 27880!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *scripta*-type, 1–5 × 0.15–0.25 mm; *disc* partly exposed, ochraceous, labia orange pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 4-septate, 20–25 × 5–7 µm, hyaline.

*Secondary chemistry.* Salazinic acid and anthraquinone.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 351 (BM).

### **Graphis furcata Fée**

*Essai Crypt. Écorc. Offic.* 1: 40 (1824); type: South America, unknown locality, *Humboldt & Bonpland* s. n. (G!—holotype).

*Thallus* partly ecorticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *caesiella*-type, 1–5 × 0.1–0.2 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear.

*Ascospores* 6–8 per ascus, transversely 5–9-septate, 25–35 × 7–10 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 554 (BM).

### **Graphis galactoderma (Zahlbr.) Lücking**

In Lücking et al., *Lichenologist* **41**: 436 (2009).—*Graphina galactoderma* Zahlbr., in Handel-Mazzetti, *Symbol. Sinic.* **3**: 57 (1930); type: China, Yunnan, Handel-Mazzetti 5912 (W—holotype, not seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *lineola*-type, 1–2 × c. 0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, muriform, 20–45 × 9–16 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Rilhena, 2015, *Weerakoon* Ri52 (BM).

### **Graphis glaucescens Fée**

*Essai Crypt. Écorc. Offic.* **1**: 36 (1824); type: South America, *Humboldt & Bonpland* s. n. (G—lectotype, Wirth & Hale (1978), not seen; S 2184—isolectotype!).

*Thallus* ecorticate, smooth, bluish grey. *Lirellae* immersed, elongate-irregularly branched, with a lateral thalline margin, *glaucescens*-type, 1–5 × 0.15–0.25 mm; *disc* closed, labia smooth, white pruinose, becoming striate. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–9-septate, 25–35 × 5–7 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 106 (BM).

### **Graphis gonimica Zahlbr.**

*Annls Mycol.* **30**: 431 (1932); type: China, Yunnan, *Chung* 591a (W!—lectotype, Lücking et al. 2009).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–3 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* inspersed. *Ascospores* 8 per ascus, transversely 5–7-septate, 20–35 × 5–9 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 530 (BM).

### **Graphis granulocarpa Redinger**

*Ark. Bot.* **27A**(3): 7, 34, tab. II, fig. 23 (1935); type: Brazil, *Malme* 3680 (S-6502—lectotype, Lücking et al. 2009).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, very short-unbranched, without a clear thalline margin, *granulocarpa*-type, 0.5–1.0 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–7-septate, 30–40 × 9–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Illukkubura, 2015, *Weerakoon* 10145 (BM).

### **Graphis handelii Zahlbr.**

In Handel-Mazzetti, *Symbol. Sinic.* **3**: 44 (1930); type: China (Yunnan), Handel-Mazzetti 11403, 12788 (W!—syntypes).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *scripta*-type, 0.7–3.0 × 0.10–0.25 mm; *disc* exposed, white, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 8

per ascus, transversely 5–11-septate, 20–45 × 5–9 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 852 (BM).

### **Graphis hiascens (Fée) Nyl.**

*Ann. Sci. Nat. Bot., Sér. 4* **11**: 226 (1859).—*Opegrapha hiascens* Fée, *Suppl. Essai Crypt. Écorc.*: 25 (1837).—*Graphina hiascens* (Fée) Müll. Arg., *Mém. Soc. Phys. Nat. Hist. Genève* **29**: 42 (1887); type: South America, unknown locality, *s. col.* (G—holotype, not seen).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–3 × 0.3–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 1 per ascus, muriform, 80–120 × 15–32 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 992 (BM).

### **Graphis immersella Müll. Arg.**

*Bull. Herb. Boissier* **3**: 319 (1895); type: Australia, *Shirley* 1793 (G!—lectotype, *Archer* 1999).

*Thallus* corticate, smooth, greenish grey. *Lirellae* immersed, short-sparsely branched, with a lateral thalline margin, *lineola*-type, 1–3 × 0.10–0.15 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 25–40 × 6–8 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Kalupahana, 2015, *Weerakoon* 014 (BM).

### **Graphis immersicans A. W. Archer**

*Aust. Syst. Bot.* **14**: 262 (2001); type: Australia, Queensland, *Streimann* 31317 (CANB—holotype, photograph seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *lineola*-type; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–7-septate, 20–30 × 5–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Jaffna, 2015, *Weerakoon* JF176 (BM).

### **Graphis insulana (Müll. Arg.) Lücking & Sipman**

In Lücking *et al.*, *Fieldiana* **46**: 84 (2008).—*Graphina insulana* Müll. Arg., *Bot. Jahrb.* **4**: 56 (1883); type: Fiji, *s. col.* (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–5 × 0.3–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 1–2 per ascus, muriform, 60–90 × 20–30 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Rilhena, 2015, *Weerakoon* Ri89 (BM).

### **Graphis intermedians Vain.**

*Ann. Bot. Soc. Zool.-Bot. Fenn. Vanamo* **1**(no. 3): 50 (1921); type: Thailand [Siam], *Hosseus* *s. n.* (TUR-Vainio 27214!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–5 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 8 per ascus, transversely 13–15-septate, 40–55 × 9–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 538 (BM).

**Graphis isidiza Adaw. & Makhija**

*Lichenologist* **36**: 361 (2004); type: India, Tamil Nadu, Makhija 01.106 (AMH—holotype, not seen).

*Thallus* corticate, with isidia, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a complete thalline margin, *consanguinea*-type, 2–8 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–9-septate, 20–35 × 4–8 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 07 (BM).

**Graphis japonica (Müll. Arg.)**

**A. W. Archer & Lücking**

In Lücking et al., *Lichenologist* **41**: 437 (2009).—*Graphina japonica* Müll. Arg., *Flora* **74**: 113 (1891); type: Japan, Miyoshi 23 (G!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, short-sparsely branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–3 × 0.4–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 2–4 per ascus, muriform, 50–70 × 18–25 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 214 (BM).

**Graphis kelungana Zahlbr.**

*Feddes Repert.* **31**: 208 (1933); type: Taiwan [Formosa], Faurie 30 (W!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *subserpentina*-type, 1–5 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 8 per ascus, transversely 11–13-septate, 40–60 × 10–14 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Adam's Peak, 2015, Weerakoon AD74 (BM).

**Graphis lapidicola Fée**

*Bull. Soc. Bot. Fr.* **21**: 28 (1874); type: Brazil, Glaziou 3303 (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–5 × 0.4–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally to completely carbonized. *Hymenium* clear. *Ascospores* 2–4 per ascus, muriform, 50–70 × 15–22 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 226 (BM).

**Graphis leptocarpa Fée**

*Essai Crypt. Écorc. Offic.* **1**: 36 (1824); type: South America, unknown locality, Humboldt & Bonpland s. n. (G!—lectotype, Wirth & Hale 1978).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *lineola*-type, 1–5 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 8 per ascus, transversely 7–11-septate, 20–40 × 6–8 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Nuwaraeliya, 2015, Weerakoon 763 (BM).

**Graphis leptoclada Müll. Arg.**

*Flora* **65**: 335 (1882).—*Opegrapha rimulosa* Mont. & Bosch, *Lich. Java*: 4 (1857) [nom. illeg., ICBN Art. 53.1; non *Opegrapha rimulosa* Mont.]; type: Indonesia, Java, Junghuhn s. n. (G!—lectotype, Archer 2001).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched,

with a lateral thalline margin, *tenella*-type, 1–5 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 9–13-septate, 30–50 × 7–10 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 268 (BM).

### **Graphis leptogramma Nyl.**

*Bull. Soc. Linn. Normandie, Sér. 2* 2: 111 (1868); type: New Caledonia, *Deplanche* s. n. (H-Nyl 7751!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, 1–5 × 0.1–0.2 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 11–15-septate, 40–60 × 7–9 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 659 (BM).

### **Graphis librata C. Knight**

*Trans. Proc. New Zeal. Inst.* 16: 404 (1884); type: New Zealand, *Knight* 67:23 (WELT—lectotype, Hayward (1977), not seen).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *lineola*-type, 1–3 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally to completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–9-septate, 20–30 × 5–8 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 795 (BM).

### **Graphis lineola Ach.**

*Lichenogr. Univ.*: 264 (1810); type: West Indies, unknown locality, *Swartz* s. n. (H-Ach 584!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *lineola*-type, 1–3 × 0.1–0.2 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 8 per ascus, transversely 7–9-septate, 20–40 × 6–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 788 (BM).

### **Graphis litoralis Lücking, Sipman & Chaves**

In Lücking *et al.*, *Fieldiana* 46: 88 (2008); type: Costa Rica, Limón, Gandoca-Manzanillo Wildlife Refuge, Manzanillo Section (La Amistad Caribe Conservation Area), Manzanillo, *Lücking* 17098b (CR!—holotype).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *caesiella*-type, 1–5 × 0.1–0.2 mm; *disc* closed, labia smooth, white pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–9-septate, 30–35 × 6–8 µm, hyaline.

*Secondary chemistry.* Salazinic acid.

*Selected specimen examined.* **Sri Lanka:** Nuwaraeliya, 2015, *Weerakoon* 795 (BM).

### **Graphis longiramea Müll. Arg.**

*J. Linn. Soc. London, Bot.* 29: 225 (1892); type: India, *Wat* 78 (G!—paratype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, very long-radiately branched, with a lateral thalline margin, *longiramea*-type, 5–15 × 0.4–0.5 mm; *disc* partly exposed, dark, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized.



*Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 7–23-septate, 60–100 × 8–12 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Namunukula, 2015, *Weerakoon* 162 (BM).

### **Graphis luluensis A. W. Archer**

*Mycotaxon* **89**: 326 (2004); type: Solomon Islands, *Hill* 8667 (BM!—holotype).

*Thallus* corticate, verrucose, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a complete (thin) thalline margin, *negrosina*-type; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* interspersed. *Ascospores* 8 per ascus, transversely 5–7-septate, 25–35 × 6–8 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 026 (BM).

### **Graphis mikuraensis Y. Ohmura & M. Nakan.**

In Ohmura et al., *Bull. Natl. Mus. Nat. Sci., Taiwan* **42**: 5 (2016); type: Japan, Izu Islands (Tokyo Metropolis), along the route between Sato and Ieno-sawa, Mikurajima Island, on tree branch, elevation 500 m, 15 July 1981, *Higuchi* 10474 (TNS—holotype, not seen).

*Graphis srilankensis* Weerakoon et al., in Weerakoon et al., *Bryologist* **115**: 79 (2012); holotype: Sri Lanka, Central Province, Manigala Mountain, *Weerakoon & Wijeyaratne* 812 (PD!).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* prominent, elongate-irregularly branched, with a lateral (thick) thalline margin, *marginata*-type, 1–5 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* interspersed. *Ascospores* 8 per ascus, transversely 9–13-septate, 50–70 × 8–10 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** type of *G. srilankensis*.

### **Graphis myrtacea (Müll. Arg.) Lücking**

In Lücking et al., *Fieldiana* **46**: 93 (2008).—*Graphina myrtacea* Müll. Arg., *Hedwigia* **34**: 33 (1895); type: Brazil, *Ule* 127 (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral (thick) thalline margin, *tenella*-type, 1–7 × 0.4–0.5 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 1–2 per ascus, muriform, 75–150 × 25–45 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 248 (BM).

### **Graphis negrosina (Vain.) Lücking**

In Lücking et al., *Lichenologist* **41**: 438 (2009).—*Opegrapha negrosina* Vain., *Ann. Acad. Sci. Fenn., Ser. A* **15** (no. 6): 271 (1921); type: Philippines, *Merrill* 6790 (TUR-Vainio 27630!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a complete (thin) thalline margin, *negrosina*-type, 1–5 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 9–11-septate, 35–45 × 7–9 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Nawalapitiya, 2015, *Weerakoon* 10014 (BM).

### **Graphis novopalnicola A. W. Archer & Lücking**

In Lücking et al., *Lichenologist* **41**: 439 (2009).—*Graphina palnicola* Müll. Arg., *Flora* **70**: 402 (1887); type: Australia, Queensland, *Sayer* s. n. (G!—holotype).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–5 × 0.5–0.6 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely to



laterally carbonized. *Hymenium* inspersed. *Ascospores* 1 per ascus, muriform, 100–145 × 25–40 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 682 (BM).

### **Graphis oligospora Zahlbr.**

In Handel-Mazzetti, *Symbol. Sinic.* 3: 45 (1930); type: China, Yunnan, *Handel-Mazzetti* 2451 (W!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *lineola*-type, 1–3 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–9-septate, 25–35 × 6–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 545A (BM).

### **Graphis oxyclada Müll. Arg.**

*Flora* 68: 512 (1885); type: Kenya, *Hildebrandt* 2540 (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, with a lateral thalline margin, *marginata*-type, 1–5 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 30–45 × 7–9 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 331 (BM).

### **Graphis paraserpens Lizano & Lücking**

In Lücking *et al.*, *Fieldiana* 46: 96 (2008); type: Costa Rica, San José, Leonel Oviedo Ecological Reserve

(Cordillera Volcánica Central Conservation Area), *Lücking* 15667 (USJ!—holotype; F!—isotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a complete (thin) thalline margin, *symplecta*-type, 2–5 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 2–6 per ascus, muriform, 30–40 × 9–11 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Namunukula, 2015, *Weerakoon* 639 (BM).

### **Graphis pinicola Zahlbr.**

In Handel-Mazzetti, *Symbol. Sinic.* 3: 43 (1930); type: China, Yunnan, *Handel-Mazzetti* 2829 (W!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *lineola*-type, 1–3 × 0.1–0.2 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–11-septate, 25–35 × 10–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Sinharaja World Heritage Site, 2015, *Weerakoon* MO16 (BM).

### **Graphis proserpens Vain.**

*Bot. Tidsskr.* 29: 132 (1909).—*Graphis disserpens* Vain., *Acta Soc. Fauna Fl. Fenn.* 7: 123 (1890) [nom. illeg., ICBN Art. 53.1; non *Graphis disserpens* Nyl.]; type: Brazil, *Vainio* s. n. (TUR-Vainio 27577A!—holotype; *Vainio*, *Lich. Bras. Exs.* 1091).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a basal thalline margin, *striatula*-type, 1–5 × 0.2–0.4 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 20–40 × 6–9 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 217 (BM).

### **Graphis pyrrocheiloides** Zahlbr.

*Cat. Lich. Univers.* 2: 321 (1924).—*Graphis pyrrocheila* Vain., *Hedwigia* 46: 179 (1907) [non Mont. & Bosch 1855]; type: Indonesia, Malacca, *Schmidt* 9 (TUR-Vainio 27556!—holotype).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *scripta*-type, 1–5 × 0.2–0.3 mm; *disc* exposed, white, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 5–13-septate, 30–45 × 6–10 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Horton Plains National Park, 2015, *Weerakoon* HO02 (BM).

### **Graphis renschiana** (Müll. Arg.) Stizenb.

*Ber. Tät. St Gall. Naturw. Ges.* 1891: 184 (1891).—*Graphina renschiana* Müll. Arg., *Flora* 68: 512 (1885); type: Madagascar, *Rensch* 969 (G!—holotype).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *lineola*-type, 1–3 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, muriform, 25–35 × 9–12 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 363 (BM).

### **Graphis scripta** (L.) Ach.

*Kgl. Vetensk.-Akad. Nya Handl.* 1809: 145 (1809).—*Lichen scriptus* L., *Spec. Plant.* 2: 1140 (1753); type: tab. XVIII and fig. 1 in Dillenius, *Hist. Musc.*—lectotype,

*Jørgensen et al.* (1994); Sweden, *Malme* s. n. (UPS!—epitype; *Malme, Lich. Suec. Exs.* 47).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *scripta*-type, 1–7 × 0.2–0.4 mm; *disc* partly exposed, white, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–15-septate, 25–70 × 6–10 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 684 (BM).

### **Graphis slendrae** Hale ex Lücking

In Lücking *et al.*, *Lichenologist* 41: 440 (2009); type: Sabah, *Hale* 28009 (US!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* sessile, very long-radiately branched, with a basal thalline margin, *slendrae*-type, 1–10 × 0.1–0.2 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–7-septate, 25–35 × 5–7 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 732 (BM).

### **Graphis stenotera** Vain.

*Ann. Acad. Sci. Fenn., Ser. A* 15(no. 6): 243 (1921); type: Philippines, *Fénix* 12786 (TUR-Vainio 27887!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, short-sparsely branched, without a clear thalline margin, *striatula*-type, 1–3 × 0.15–0.30 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–15-septate, 20–40 × 6–9 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 906 (BM).

### **Graphis stiptata A. W. Archer**

*Mycotaxon* 80: 368 (2001); type: Australia, Queensland, *Streimann* 16826 (CANB—holotype, photograph seen).

*Thallus* corticate, smooth, pale greenish grey. *Lirellae* erumpent, short-sparsely branched, with a basal thalline margin, *hossei*-type, 1–3 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–9-septate, 15–20 × 5–8 µm, hyaline.

*Secondary chemistry.* Lichexanthone.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 549A (BM).

### **Graphis streblocarpa (Bél.) Müll. Arg.**

*Flora* 65: 502 (1882).—*Opegrapha streblocarpa* Bél., *Voy. Indes Or., Bot.* 2(*Cryptog.*): 134 (1846); type: not seen.

*Graphis fissofurcata* Leight., *Trans. Linn. Soc. London* 27: 177 (1869); type: Sri Lanka, *Thwaites* CL75 (BM!—lectotype, Archer 2006).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral (thick) thalline margin, *subserpentina*-type, 1–6 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores* 1 per ascus, muriform, 70–95 × 20–30 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined. Sri Lanka:* type of *Graphis fissofurcata*.

### **Graphis subalbostriata Lücking**

In Lücking *et al.*, *Lichenologist* 41: 440 (2009).—*Graphis angustata* var. *albostriata* Vain., *Ann. Acad. Sci. Fenn., Ser. A* 6(no. 7): 158 (1915); type: Guadeloupe, *Duss* 517 (TUR-Vainio 27847!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *tenella*-type, 1–

5 × 0.25–0.35 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, transversely 9–10-septate, 80–125 × 8–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Kalupahana, 2015, *Weerakoon* 105A (BM).

### **Graphis subhiascens (Müll. Arg.) Lücking**

In Lücking *et al.*, *Fieldiana* 46: 111 (2008).—*Graphina subhiascens* Müll. Arg., *Bot. Jahrb.* 20: 2811 (1894); type: Tanzania, *Holst* 696 (G!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a complete (thick) thalline margin, *subserpentina*-type, 1–5 × 0.3–0.5 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 1 per ascus, muriform, 80–100 × 20–30 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined. Sri Lanka:* Knuckles Mountain Range, 2015, *Weerakoon* 625A (BM).

### **Graphis submarginata Lücking**

In Lücking *et al.*, *Fieldiana* 46: 112 (2008).—*Graphis marginata* G. Mey. & Flot., *Lich. Nova Acta Acad. Leopold.-Carol.* 19(Suppl.): 229 (1843) [nom. illeg., ICBN Art. 53.1; non *G. marginata* Raddi].—*Graphis lineola* var. *marginata* (G. Mey. & Flot.) Zahlbr., *Cat. Lich. Univ.* 2: 317 (1924); type: Indonesia, Java, *s. col.* (not seen).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *scripta*-type, 1–3 × 0.1–0.2 mm; *disc* exposed, white, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* inspersed. *Ascospores* 8 per ascus, transversely 5–9-septate, 25–35 × 6–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Jaffna, 2015, Weerakoon JF19 (BM).

### Graphis subserpentina Nyl.

*Acta Soc. Sci. Fenn.* 7(2): 465 (1863); type: Sri Lanka [Ceylon], Hooker 8012 (G!—holotype).

*Thallus* corticate, smooth, creamish to white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral (thick) thalline margin, *subserpentina*-type, 4–8 × 0.3–0.4 mm; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 1 per ascus, muriform, 80–130 × 20–35 µm, hyaline.

*Secondary chemistry.* Norstictic acid.

*Selected specimen examined.* **Sri Lanka:** type.

### Graphis subsecta (Nyl.) Lücking

In Lücking *et al.*, *Lichenologist* 41: 441 (2009).—*Graphis analoga* var. *subsecta* Nyl., *Acta Soc. Sci. Fenn.* 7(2): 465 (1863); type: Colombia [Nova Granata], Lindig 2725 (H-Nyl 7408b!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a complete (thin) thalline margin, *negrosina*-type; *disc* closed, labia smooth, not pruinose, entire. *Excipulum* completely carbonized. *Hymenium* clear. *Ascospores* 4–8 per ascus, muriform, 20–40 × 10–12 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 556 (BM).

### Graphis subtenella Müll. Arg.

*Flora* 70: 400 (1887); type: Australia, Sayer s. n. (G!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, short-sparsely branched, with a lateral thalline margin, *tenella*-type, 1–3 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores*

8 per ascus, transversely 7–13-septate, 30–40 × 5–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 595 (BM).

### Graphis sundarbanensis Jagadeesh & G. P. Sinha

In Jagadeesh Ram *et al.*, *Lichenologist* 39: 231 (2007); type: India, West Bengal, Jagadeesh Ram 828 (CAL—holotype, not seen).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *scripta*-type; *disc* exposed, white, labia smooth, not pruinose, entire. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–11-septate, 25–45 × 6–10 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 546 (BM).

### Graphis tenella Ach.

*Syn. Meth. Lich.*: 81 (1814); type: Guinea, s. col. (H-Acharius 585!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *tenella*-type, 1–5 × 0.15–0.25 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 5–9-septate, 20–30 × 6–8 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, Weerakoon 876 (BM).

### Graphis tsunodae Zahlbr.

*Annls Mycol.* 14: 47 (1916); type: Japan, Tsunoda 182 (W!—holotype).

*Thallus* corticate, smooth, white-grey. *Lirellae* prominent, elongate-irregularly branched, without a clear thalline margin, *striatula*-type, 1–5 × 0.25–0.35 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 20–40 × 6–9 µm, hyaline.

*Secondary chemistry.* No substances detected by TLC.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 653 (BM).

### **Graphis vittata Müll. Arg.**

*Flora* 65: 335 (1882); type: Indonesia, Java, *Junghuhn* 111 (G!—holotype).

*Thallus* corticate, smooth, greenish grey. *Lirellae* erumpent, elongate-irregularly branched, with a lateral thalline margin, *tenella*-type, 1–5 × 0.2–0.3 mm; *disc* closed, labia smooth, not pruinose, becoming striate. *Excipulum* apically to laterally carbonized. *Hymenium* clear. *Ascospores* 8 per ascus, transversely 7–11-septate, 30–50 × 7–8 µm, hyaline.

*Secondary chemistry.* Stictic acid.

*Selected specimen examined.* **Sri Lanka:** Knuckles Mountain Range, 2015, *Weerakoon* 907 (BM).

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