

## Taxonomical Notes on Japanese Graphidaceae (Ascomycotina), Including Some New Combinations

Minoru Nakanishi<sup>1</sup>, Hiroyuki Kashiwadani<sup>2</sup> and Kwang Hee Moon<sup>3</sup>

<sup>1</sup> Faculty of Science, Okayama University of Science,  
1–1–1 Ridai-cho, Okayama city, 700–0005 Japan  
E-mail: nakanisi@das.ous.ac.jp

<sup>2</sup> Department of Botany, National Science Museum,  
Amakubo 4–1–1, Tsukuba, 305–0005 Japan  
E-mail: hkashiwa@kahaku.go.jp

<sup>3</sup> Natural Science Institute, Sookmyung Women's University,  
Seoul, 140–742 Korea  
E-mail: moonroh@hotmail.com

**Abstract** The following twenty new combinations are proposed for Japanese taxa of the Graphidaceae: *Carbacanthographis iriomotensis* (M.Nakan.) M.Nakan. & Kashiw. *Diorygma soozana* (Zahlbr.) M.Nakan. & Kashiw., *Fissurina flavicans* (Kashiw.) M.Nakan. & Kashiw., *Fissurina fujisanensis* (Kashiw. & M.Nakan.) M.Nakan. & Kashiw., *Fissurina inabensis* (Vain.) M.Nakan. & Kashiw., *F. subtropica* (M.Nakan.) M.Nakan. & Kashiw., *F. undulata* (Müll.Arg.) M.Nakan. & Kashiw., *Graphis hunanensis* (Zahlbr.) M.Nakan. & Kashiw., *Hemithecium aphanes* (Mont.) M.Nakan. & Kashiw., *H. endofuscum* (M.Nakan.) M.Nakan. & Kashiw., *H. oshioi* (M.Nakan.) M.Nakan. & Kashiw., *H. polymorphum* (M.Nakan.) M.Nakan. & Kashiw., *Leiorreuma vicarians* (Vain.) M.Nakan. & Kashiw., *L. yakushimensis* (M.Nakan.) M.Nakan. & Kashiw., *Phaeographis laevigata* (M.Nakan.) M.Nakan. & Kashiw., *P. pseudomontagnei* (M.Nakan.) M.Nakan. & Kashiw., *Platygramme platyloma* (Müll.Arg.) M.Nakan. & Kashiw., *P. pudica* (Mont. & Bosch) M.Nakan. & Kashiw., *Platythecium hypoleptum* (Nyl.) M.Nakan. & Kashiw., and *P. intortulum* (Stirt.) M.Nakan. & Kashiw. *Charbacanthographis amicta* (Nyl.) Staiger & Kalb is reduced to a synonym of *C. marcescens* (Fée) Straiger and a key to all taxa is provided.

**Key words:** Graphidaceae, new combination, Japan.

Genera belonging to the Graphidaceae were recently well defined by Staiger (2002) who stressed the value of ascocarps and their accessory organs rather than spore morphology (*e.g.* Nakanishi, 1966; Wirth & Hale, 1978) for generic delimitation. Unfortunately, however, almost all taxa reported from Japan and adjacent areas, such as Korea and Taiwan, were not mentioned in the report. In the present paper, all taxa known from Japan and the adjacent areas previously classified under *Graphina* and *Phaeographina* are enumerated, proposing new combinations when necessary, and the following key for the Japanese taxa is provided:

### Key to the species of Graphidaceae in Japan (excluding *Sarcographa* and *Glyphis*)

1. Exciples carbonized or reddish-brown . . . . 2
1. Exciples totally not carbonized . . . . . 43
2. Labia completely covered with thalline margin . . . . . 3
2. Labia surrounded with thalline margin . . . . 9
3. Disc closed; labia convergent, covered with gray-white pruina at the apices of exciples . . . . . 4
3. Disc open; labia divergent, lateral exciples well developed. . . . . 5
4. Ascospores muriform; salazinic acid present . . . . . *Carbacanthographis marcescens*
4. Ascospores with transverse septa only; stic-

- tic acid present . . . . .  
 . . . . . *Carbacanthographis iriomotensis*
5. Disc with orange-red pruina . . . . .  
 . . . . . *Thecaria montagnei*
5. Disc with gray-white pruina (if present) or  
 without pruina . . . . . 6
6. Ascospores muriform, more than 100  $\mu\text{m}$   
 long . . . . . *Thecaria quassicola*
6. Ascospores transverse septa only, less than  
 50  $\mu\text{m}$  long . . . . . 7
7. Ascospores up to 30  $\mu\text{m}$  long . . . . . 8
7. Ascospores more than 30  $\mu\text{m}$  long . . . . .  
 . . . . . *Leiorreuma yakushimensis*
8. Disc convex, densely covered with gray-  
 white pruina . . . . . *Leiorreuma vicarians*
8. Disc plane to concave, thinly covered with  
 gray-white pruina . . . . . *Leiorreuma exaltatum*
9. Thallus saxicolous . . . . . 10
9. Thallus corticolous . . . . . 11
10. Thallus yellowish, thick; norstictic acid pre-  
 sent . . . . . *Graphis cervina*
10. Thallus gray-white, rather thin; stictic acid  
 present . . . . . *Graphis hunanensis*
11. Labia striate to crenulated . . . . . 12
11. Labia entire . . . . . 13
12. Exciples apically carbonized . . . . .  
 . . . . . *Graphis proserpens*
12. Exciples completely carbonized . . . . .  
 . . . . . *Graphis dupaxana*
13. Ascospores more than 70  $\mu\text{m}$  long . . . . . 14
13. Ascospores less than 60  $\mu\text{m}$  long . . . . . 19
14. Ascospores brownish to dark brown . . . . . 15
14. Ascospores hyaline . . . . . 18
15. Disc closed, not visible when viewed from  
 above . . . . . 16
15. Disc open, obvious . . . . . 17
16. Labia convergent, exciple apically car-  
 bonized, wedge-shaped . . . . .  
 . . . . . *Platygramme platyloma*
16. Labia convergent, exciple laterally car-  
 bonized . . . . . *Platygramme pudica*
17. Labia developed, exciples laterally car-  
 bonized . . . . . *Phaeographis pseudomontagnei*
17. Labia poorly developed, exciples pale brown  
 . . . . . *Phaeographis laevigata*
18. Ascocarps short, simple, straight; norstictic  
 acid present . . . . . *Graphis cleistoblephara*
18. Ascocarps flexuous, branched; chemical sub-  
 stances absent . . . . . *Graphis bifera* var. *cinerea*
19. Ascocarps covered with a thick thalline mar-  
 gin nearly to the top of labia . . . . . 20
19. Ascocarps covered with a thalline margin  
 only near the base . . . . . 21
20. Ascospores muriform . . . . .  
 . . . . . *Graphis fisso-furcata*
20. Ascospores with transverse septa only . . . . .  
 . . . . . *Graphis awaensis*
21. Exciples carbonized laterally, basally uncar-  
 bonized . . . . . 22
21. Exciples laterally and basally carbonized  
 . . . . . 34
22. Labia carbonized only near the apices . . . . .  
 . . . . . *Graphis rikuzensis*
22. Labia carbonized, exciples more or less  
 dimidiate . . . . . 23
23. Ascospores muriform . . . . . 24
23. Ascospores with transverse septa only . . . . . 25
24. Ascospores 25–35  $\mu\text{m}$  long; stictic acid pre-  
 sent . . . . . *Graphis deserpens*
24. Ascospores 50–60  $\mu\text{m}$  long; chemical sub-  
 stances absent . . . . . *Graphis alpestris*
25. Ascospores hyaline . . . . . 26
25. Ascospores brownish . . . . . 40
26. Ascocarps sessile, prominent . . . . .  
 . . . . . *Graphis prunicola*
26. Ascocarps emergent to subsessile . . . . . 27
27. Ascocarps slender, flexuous, branched . . . . . 28
27. Ascocarps short, not branched . . . . . 33
28. Ascocarps covered with gray-white pruina;  
 stictic acid present . . . . . 29
28. Ascocarps not covered with gray-white pru-  
 ina; stictic acid absent . . . . . 30
29. Disc more or less furrow, ascospores up to  
 20  $\mu\text{m}$  long . . . . . *Graphis batanensis*
29. Disc open concave, ascospores 22.5–30.0  $\mu\text{m}$   
 long . . . . .  
 . . . . . *Graphis subvirginica* var. *rhizophorearum*
30. Disc closed, not visible when viewed from  
 above . . . . . 31
30. Disc slightly open, visible from above; fur-  
 row between exciple and thallus . . . . . 32
31. Thallus gray-white; norstictic acid present

- ..... *Graphis guimarana*
31. Thallus yellowish; chemical substances absent ..... *Graphis subdisserpens*
32. Ascospores more or less slender, usually more than 3  $\mu\text{m}$  long, labia often cracked in aged ascocarps ..... *Graphis tenella*
32. Ascospores thick, up to 2  $\mu\text{m}$  long, labia not cracked ..... *Graphis complex*
33. Ascocarps immersed, narrow, up to 0.1 mm wide, labia sulcate; norstictic acid present ..... *Graphis schiffnei*
33. Ascocarps emergent, up to 0.25 mm wide; labia not sulcate; norstictic acid present ..... *Graphis handelii*
34. Labia more or less divergent; norstictic acid present ..... *Graphis aperiens*
34. Labia convergent; norstictic acid absent ..... 35
35. Ascocarps covered with thalline margin nearly to the top ..... *Graphis assimilis*
35. Ascocarps prominent, without a thalline margin ..... 36
36. Ascocarps slender, often branched ..... 37
36. Ascocarps short, simple, not branched ... 38
37. Norstictic acid present ..... *Graphis desquamescens*
37. Chemical substances absent ..... *Graphis anfractuosa*
38. Ascospores less than 65  $\mu\text{m}$  long ..... 39
38. Ascospores more than 65  $\mu\text{m}$  long ..... *Graphis subdura*
39. Norstictic acid present ..... *Graphis meridionalis*
39. Chemical substances not present ..... *Graphis cognata*
40. Disc closed, ascocarps slender, exciple laterally carbonized, stictic acid present ..... *Phaeographis circumscripta*
40. Disc obviously open, exciple brown at the base, laterally uncarbonized ..... 41
41. Disc plane to concave, reddish-brown pruina present ..... *Phaeographis fuscodisca*
41. Disc plane to convex, gray-white pruina present ..... 42
42. Ascospores 15–20  $\mu\text{m}$  long; norstictic acid present ..... *Phaeographis pruinosa*
42. Ascospores 24–42  $\mu\text{m}$  long; chemical substances absent ... *Phaeographis asteriformis*
43. Ascocarps striate ..... 44
43. Ascocarps entire ..... 48
44. Ascospores hyaline ..... 47
44. Ascospores brownish to dark brown .... 45
45. Exciples thick at the base dark, dark brown; ascospores not muriform ..... 46
45. Exciples thin at the base, colorless to pale brown ..... *Hemithecium chlorocarpoides*
46. Ascospores muriform, 35–60 $\times$ 10–11  $\mu\text{m}$  ..... *Hemithecium endofuscum*
46. Ascospores submuriform, 25–30 $\times$ 7–9  $\mu\text{m}$  ..... *Hemithecium polymorphum*
47. Ascospores submuriform, 12–20 $\times$ 7–9  $\mu\text{m}$ ; salazinic acid present ..... *Platythecium intortulum*
47. Ascospores with transverse septa, 20–28 $\times$ 7  $\mu\text{m}$ ; norstictic acid present ..... *Hemithecium oshioi*
48. Disc more or less open, ascospores muriform, 60–100  $\mu\text{m}$  long; norstictic acid present ..... *Diorygma soozana*
48. Disc fissured, ascospores hyaline, with transverse septa ..... 49
49. Ascospores 16–20 loc., 50  $\mu\text{m}$  long; norstictic, stictic and constictic acids present ..... *Hemithecium aphanes*
49. Ascospores short, up to 40  $\mu\text{m}$  long ..... 50
50. Ascospores muriform ..... 51
50. Ascospores 4 loc., only transversely septate ..... 52
51. Ascospores 21–30  $\mu\text{m}$  long ..... *Fissurina fujisanensis*
51. Ascospores 30–40  $\mu\text{m}$  long ..... *Fissurina undulata*
52. Ascospores hyaline ..... 53
52. Ascospores brownish color ..... 55
53. Exciples rudimentary, undeveloped ..... *Graphis subdisserpens*
53. Exciples more or less developed ..... 54
54. Exciples laterally thickened, base open ..... *Fissurina rufla*
54. Exciples entire, base closed ..... *Fissurina subtropica*
55. Exciple yellowish colored and echinocarpic

- acid present, ascospores smaller 5–7×11–14  $\mu\text{m}$ . . . . . *Fissurina flavicans*  
 55. Exciples hyaline and absence of chemical substances, ascospores 7–10×17–20  $\mu\text{m}$  . . . . . *Fissurina fujisanensis*

### Species

**Carbacanthographis iriomotensis** (M.Nakan.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis iriomotensis* M.Nakan., Hikobia, Suppl., 1: 213 (1981). Type collection: Japan, Pref. Okinawa, Taketomi-cho, Isl. Iriomote, Ohara, Mt. Goza-dake, 30 m., December 25, 1979, M.Nakanishi 20738—holotype in HIRO!, isotype in TNS.

Chemical substance: stictic acid.

**Carbacanthographis marcescens** (Fée) Staiger & Kalb, in Bibl. Lichen., 85: 109 (2002).

= *Graphis macrescens* Fée, Essai Crypt. Ecorc. Exotiqu. Officin. 38, tab. 15, fig. 2 (1825).

Chemical substance: salazinic acid.

*Graphis amicta* Nyl., Ann. Sci. Nat., Bot. ser. 4, 19: 370 (1863). Type collection: Japan, Bonin Islands, E. J. Gr. 4 (holotype in H-NYL 7525!) = *Carbacanthographis amicta* (Nyl.) Staiger & Kalb, Bibl. Lichen., 85: 103 (2002), syn. nov., *tlc*: salazinic acid

*Carbacanthographis marcescens* is characterized by the prominent ascocarps totally covered by white pruina, the convergent labia, the disc concealed in the thalline margin, the convergent exciples lightly carbonized at both sides, the warty periphysoids at the apices of exciples, the ascus with 8 spores (with 4–5/2 locules) and by the presence of salazinic acid as a major chemical substance.

*Graphis amicta* described by Nylander (1863), with the characteristic features described above, is now reduced to a synonym of *Carbacanthographis marcescens*.

Although widely distributed in tropical areas (Staiger, 2002), in Japan it has only been collected from the Bonin Islands.

**Diorygma soozana** (Zahlbr.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphina soozana* Zahlbr., Fedde Repert., 31: 215 (1933). Type collection: Formosa, Soozan prope Taihoku, Y. Asahina 343 (isotype in TNS!).

Chemical substance: norstictic acid.

*Diorygma soozana* is unique in having prominent ascocarps with non-carbonized labia thickly covered with paraphysoid hyphae which produce a whitish powdery mass along closed discs. It is easily distinguished from *Diorygma hieroglyphica* (Pers.) Staiger & Kalb by the protuberant ascocarps, and by the presence of only norstictic acid

**Fissurina flavicans** (Kashiw.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Phaeographis flavicans* Kashiw., Mem. Natn. Mus., (14): 52 (1981). Type collection: Japan, Honshu, Prov. Kai (Pref. Yamagata): Shoji-guchi 3-gome, Mt. Fuji. On bark of *Abies veitchii*; elevation about 1700 m, H. Kashiwadani 15798 (holotype in TNS)

Chemical substance: echinocarpic acid as a major chemical substance.

This species is characterized by the fissurine apothecia, the exciples without carbonization, the presence of periphysoids, the 3-transversely septate ascospores which are pale brown when mature and the presence of echinocarpic acid.

**Fissurina fujisanensis** (Kashiw. & M.Nakan.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Phaeographis fujisanensis* Kashiw. & M.Nakan., Mem. Natn. Mus. (14): 54 (1981). Type collection: Japan, Honshu, Prov. Kai (Pref. Yamagata): En route from Lake Shoji to Shoji-guchi 1-gome, Mt. Fuji. On bark of *Carpinus cordata*; elevation about 1000 m, H. Kashiwadani 15866 (holotype in TNS)

Chemical substance: nil.

*Fissurina fujisanensis* very much resembles *F. flavicans*, from which it can be distinguished by the labia with dark brown pigments around the top and by the absence of echinocarpic acid.

**Fissurina fujisanensis** (Vain.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis inabensis* Vain., Bot. Mag. Tokyo, 32: 161. (1918) = *Graphina inabensis*

(Vain.) Zahlbr., Cat. Lich. Univ., **2**: 409 (1923). Type collection: Japan, Honshu, Prov. Inaba: Iwai. Ad corticem arborum, 4 August 1914, Y. Ikoma (herb. A. Yasuda 47—isotype in TNS!).

Chemical substance: stictic acid.

This species is characterized by fissurine ascocarps up to 3 mm long, convergent exciples without carbonization, a well developed thalloid margin which completely covers disc, presence of periphysoids, submuriform ascospores, 4–5/1–3 locules, 21–30×10–14  $\mu\text{m}$  and contains stictic acid.

**Fissurina rufula** (Mont.) Steiger, in Bibl. Lichen., **85**: 283 (2002).

= *Graphis rufla* Mont., Ann. Sci. Nat., Bot. Ser. 3, **16**: 57 (1851).

Chemical substance: nil.

**Fissurina subtropica** (M.Nakan.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis subtropica* M.Nakan. Hikobia, Suppl. 1: 217 (1981). Type collection: Japan, Pref. Okinawa, Isl. Iriomote, Mt. Gozadake, elevation 100 m, M.Nakanishi 20744—holotype in HIRO!

Chemical substance: stictic acid.

**Fissurina undulata** (Müll.Arg.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphina undulata* Müll.Arg., Nuov. Giron. Bot. Ital., **24**: 201 (1892). Type collection: Japan, Honshu, Prov. Kohzuke: Nikko, R. Yatabe 262—holotype in G!

Chemical substance: stictic acid.

This species is unique in having prominent ascocarps, well-developed straw-colored exciples covered with thalloid margins, periphysoids, 1-spored asci, muriform ascospores and in producing stictic acid. These characters show that this species should be treated under *Fissurina*.

*F. undulata* is clearly distinguished from *F. inabensis* by the well developed and prominent ascocarps with thick labia and by the larger muriform ascospores, 30–38×15–18  $\mu\text{m}$  in size.

**Graphis alpestris** (Zahlbr.) Staiger, in Bibl. Lichen., **85**: 205 (2002).

= *Graphina alpestris* Zahlbr., in Handel-Mazzetti, Symb. Sinic. 56 (1930).

**Graphis cleistobrephara** Nyl., in Ann. Sci. Nat. Bot. ser. 4, **20**: 265 (1863).

= *Graphina cleistobrephara* (Nyl.) Zahlbr., Cat. Lich. Univ., **2**: 401 (1923).

Chemical substance: norstictic acid and stictic acid.

This species is easily distinguished from other species of *Graphis* by its simple ellipsoidal ascocarps, carbonized exciples constricted at the base, convergent labia covered with thalloid margin nearly to the top, submuriform ascospores (20–25/1–3 locules, 70–120×12–20  $\mu\text{m}$ ) and by the presence of norstictic acid.

**Graphis deserpens** Vain., Ann. Acad. Sci. Fenn., ser. A, **15**: 202 (1921).

= *Graphina deserpens* (Vain.) Zahlbr., Cat. Lich. Univ., **2**: 403 (1923).

Chemical substance: stictic acid.

**Graphis fisso-furcata** Leight., Transact. Linn. Soc. London, **27**: 117 (1869).

Chemical substance: stictic acid and constictic acid.

This species is characterized by carbonized exciples on both sides, divergent labia covered with thalline margin nearly to the top, submuriform colorless spores, 8–10/1–3 locules and 56–65×20–25  $\mu\text{m}$  in size.

*Graphis fisso-furcata* shows considerable variation in exciple carbonization: in some specimens (H. Kashiwadani 14639, TNS), exciples are only carbonized in the upper half, but in other specimens they are totally carbonized from top to bottom (S. Kurokawa 1295, TNS). These variations are observed even in a single specimen.

*G. fisso-furcata*, *G. deserpens* and *G. alpestris* might be confused since they all possess submuriform ascospores. However, *G. fisso-furcata* can be distinguished from the latter two by the prominent ascocarps, which are thickly covered with thalloid exciples. In addition, *G. fissofurcata* and *G. deserpens* have closed discs, whereas *G. alpestris* has an open disc with gray-white pruina.

**Graphis hunanensis** (Zahlbr.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphina hunanensis* Zahlbr., in

Handel-Mazzetti, *Symb. Sinic.*, **3**: 54 (1930).  
Type collection: China, Prov. Hunan, Handel-Mazzetti, 11507—holotype in W!

Chemical substance: nil.

*G. humanensis* might be confused with *G. deserpens*, from which it can be distinguished by the saxicolous habit and by the smaller ascospores (1–2/5–6 locules and 16–25×7–10  $\mu\text{m}$ ); *G. deserpens* is corticolous and has larger ascospores (1–2/8–10 locules and 25–35×10–14  $\mu\text{m}$ ).

**Hemithecium aphanes** (Mont.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis aphanes* Mont. & Bosch, in Junghuhn, *Plant. Junghuhn.*, **4**: 474 (1855).  
Type collection: Java, Teysman s.n.—holotype in L!

Chemical substance: norstictic acid, stictic acid and constictic acid.

**Hemithecium chlorocarpoides** (Nyl.) Staiger, in *Bibl. Lichen.*, **85**: 283 (2002).

= *Graphis chlorocarpoides* Nyl., *Flora*, **49**: 133 (1866) = *Phaeographina chlorocarpoides* (Nyl.) Zahlbr., *Cat. Lich. Univ.*, **2**: 321 (1924).

Chemical substance: nil.

**Hemithecium endofusca** (M.Nakan.) M.Nakan. & Kashiw., comb. nov.

= *Phaeographina endofusca* M.Nakan., *Hikobia*, **8**: 92 (1977). Type collection: Japan, Honshu, Pref. Mie, Kuki, Owase, I. Yoshimura 12657—holotype in HIRO!

Chemical substance: stictic acid.

**Hemithecium oshioi** (M.Nakan.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis oshioi* M.Nakan., *J. Sci. Hiroshima Univ.*, Ser. B, Div. 2, **11**: 60 (1966).  
Type collection; Kyushu, Pref. Kagoshima, Isl. Yakushima, M. Oshio 9446—holotype in HIRO!

Chemical substance: norstictic acid.

**Hemithecium polymorphum** (M.Nakan.) M.Nakan. & Kashiw., comb. nov.

Basionym; *Phaeographis polymorpha* M.Nakan., *J. Sci. Hiroshima Univ.*, ser. B, Div. 2, **11**: 79 (1966). Type collection; Pref. Kagoshima, Mt. Kunimi, M.Nakanishi 4873—holotype in HIRO!

Chemical substance: nil.

**Leiorreuma exultatum** (Mont. & v.d. Bosch) Staiger in *Bibl. Lichen.*, **85**: 298 (2002).

= *Lecanactis exaltata* Mont & v.d. Bosch, in Junghuhn, *F. Plantae Junghuhn.*, **4**: 475. (1855) = *Phaeographis exaltata* (Mont. & v.d. Bosch) Müll.Arg., *Flora*, **65**: 336 (1882).

**Leiorreuma vicarians** (Vain.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis vicarians* Vain., *Bot. Mag. Tokyo*, **35**: 73 (1921). Type collection: Honshu, Sendai, A. Yasuda 253 (hb Vainio 27489—holotype in TUR!).

Chemical substance: nil.

**Leiorreuma yakushimensis** (M.Nakan.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Phaeographis yakushimensis* M.Nakan. *J. Sci. Hiroshima Univ.*, ser. B, Div. 2., **11**: 88 (1966). Type collection; Pref. Kagoshima, Mt. Nagata M. Oshio 9319—holotype in HIRO!

Chemical substance: nil.

**Phaeographis laevigata** (M.Nakan.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Phaeographina laevigata* M.Nakan., *Hikobia*, **8**: 94 (1977). Type collection: Japan, Shikoku, Pref. Kochi: Nakatsugawa, Hata-gun, on bark of *Chamaecyparis obtuse*, M. Oshio 7602—holotype in HIRO!

Chemical substance: echinocarpic acid (major), conechinocarpic acid (minor), subechinocarpic acid (minor), cryptoechinocarpic acid (trace) (determined by J. Elix, pers. comm.).

When the present species was described by Nakanishi (1977), it was known only from the type locality. Three specimens cited below can be identified with this species and the distribution range includes central Honshu, Shikoku and southern Kyushu.

Specimens examined. Japan. Honshu. Prov. Tohtomi: Mt. Akiha, Haruno-cho, Shuchi-gun, around summit area, on bark of *Cryptomeria japonica*; elevation about 700 m. January 24, 1995, H. Kashiwadani 38038 & 38058 (TNS).  
Kyushu. Prov. Ohsumi: Hanano-ego, Yakushima Island, elevation about 1500 m, November 9, 1962, M. Togashi s. n. (TNS).

**Platygramme pseudomontagnei** (M.Nakan.)  
M.Nakan. & Kashiw., comb. nov.

Basionym: *Phaeographina pseudomontagnei*  
M.Nakan., Hikobia, **8**: 97 (1977). Type collection: Japan, Honshu, Pref. Wakayama: Mt. Nachi, Katsuura, on bark of *Cryptomeria japonica*, M.Nakanishi 5324—holotype in HIRO!

Chemical substance: echinocarpic acid (major), conechinocarpic acid (minor), subechinocarpic acid (minor), cryptoechinocarpic acid (trace) (determined by J. Elix, pers. comm.).

This species is unique in having the prominent ascocarps with open discs, the wedge-shaped carbonized exciple, the open disc, 1-spored asci, muriform and brown ascospores, 25–42 × 125–160 μm and in producing echinocarpic acid as a main chemical substance. These characters show that this species should be treated under *Platygramme*. *P. pseudomontagnei* always found on bark of *Cryptomeria japonica*.

**Platygramme platyloma** (Müll.Arg.) M.Nakan. & Kashiw. comb. nov.

Basionym: *Phaeographina platyloma*  
Müll.Arg., Flora, **65**: 398 (1882). Type collection: Java 119a—lectotype in L!

Chemical substance: nil.

This unique species has been known only from two localities, Java and Kyushu, Japan (Nakanishi, 1977). It is easily distinguished from other Japanese species of *Platygramme* by the closed discs and by the absence of chemical substance.

Specimen examined. Japan. Kyushu. Prov. Satsuma (Pref. Kagoshima) Mt. Inao, Tashirocho, Kimotsuki-gun, on bark, April 18, 1960, M.Nakanishi 4574 (TNS).

**Platygramme pudica** (Mont. & v.d. Bosch)  
M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis pudica* Mont. & v.d. Bosch, in Junghun, Plant. Junghuhn, **4**: 474 (1855). Type collection: Java, Teysman—holotype in L!

Chemical substance: echinocarpic acid (major), conechinocarpic acid (minor), subechinocarpic acid (minor), cryptoechinocarpic acid (trace) (determined by J. Elix, pers. comm.).

*Platygramme pudica* resembles *P. pseudomon-*

*tagnei* in having similar ascocarps and producing echinocarpic acid. However, exciples of *P. pudica* are carbonized laterally and with uniform thickness instead of wedge-shaped ones of the latter species.

Specimen examined. Japan. Kyushu. Prov. Satsuma (Pref. Kagoshima): Mt. Kunimi, Uchinoura-cho, Kimotsuki-gun. On bark of *Tilia japonica*; elevation about 450 m, April 21, 1960, M.Nakanishi 4808 (TNS).

**Platythecium hypoleptum** (Nyl.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis hypolepta* Nyl., Acta. Soc. Sci. Fenn., **7**: 472 (1863). Type collection Nova Granata, 2400 m. Lindig 715—holotype in H!

Chemical substance: nil.

**Platythecium intortula** (Stirt.) M.Nakan. & Kashiw., comb. nov.

Basionym: *Graphis intortula* Stirt. Proc. Phil. Soc. Glasgow, **13**: 186 (1881) = *Graphina intortula* (Stirton) Zahlbr., Cat. Lich. Univ., **2**: 411 (1923).

The occurrence of this species was first made by Nakanishi (1966) under the name *Graphina intortula*. It is characterized by prominent ascocarps with a narrowly open disc with dark olive color, striate thalline margin, non-carbonized exciple at sides and base, colorless submuriform ascospores, 4/1–2 locules and 12–20 × 7–9 μm, and presence of salazinic acid.

*Platythecium intortula* might be confused with *Hemithecium chlorocarpoides* since they both have striate ascocarps with colorless exciples. However, it can be readily distinguished from the latter by its colorless submuriform ascospores; *H. chlorocarpoides* has muriform, brown spores, and contains stictic and constictic acids.

**Thecaria montagnei** (v.d. Bosch) Staiger, Bibl. Lichen., **85**: 446 (2002).

= *Graphis montagnei* v.d. Bosch, Plantgae Junghuhn., **4**: 472 (1885). Type collection: Java, Junghuhn 112—syntype in L! = *Phaeographina montagnei* (v.d. Bosch) Müll.Arg., Flora, **65**: 399 (1882).

Chemical substance: isohypocrellin (red pigments, Staiger, 2002).

**Thecaria quassiiicola** Fée

= *Phaeographina quassiaecola* (Fée)  
Müll.Arg., Mem. Soc. Phys. Hist. Nat. Geneve,  
**29**: 47 (1887).

Chemical substance: nil (Archer, 2001;  
Staiger, 2002).

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