

***Plagiostromella* v. HÖHN., a forgotten Genus of Ascomycetes**

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Zusammenfassung: Die seit ihrer Beschreibung fast verschollene Ascomycetengattung *Plagiostromella* v. HÖHN. wird anhand ihrer Typusart, *Plagiostromella pleurostoma*, revidiert. Drei neue Arten aus dem Himalaya (*P. indica* auf *Pentapanax*, *P. leptodermidis* auf *Leptodermis* und *P. berberidis* auf *Berberis*) können der Gattung zugeordnet werden. All diese in der Rinde lebender Holzpflanzen parasitierenden Ascomyceten gehören in die Familie der Pleosporaceae der Dothideaales.

Plagiostromella v. HÖHNEL (1917) was described for *Phyllachora*-like ascomycetes having branched paraphysoids which extend into the ostiolar canal and having a periphysate ostiolar canal. The genus was said to differ from the Clypeosphaeriaceae, a family name formerly used for ascomycetes having ascomata covered by epidermal stromatic clypei but otherwise being heterogenous. These differences are e. g. the rather thick covering stromata which penetrate deeper in the host bark and the orientation of the ascomata with their long axis parallel to the surface of the host. v. HÖHNEL (1917) thus proposed the family Plagiostromellaceae to accomodate this genus. Re-examination of the type species, however, shows its close relationship with the Pleosporaceae (v. ARX and MÜLLER 1975).

CLEMENTS and SHEAR (1931) considered *Plagiostromella* to be synonymous with *Aglaospora* de NOT. According to Shoemaker (1975) *Aglaospora*, based on its type species, *A. profusa* (FR. ex FR.) de NOT., is characterized by ascomata and ascospores similar to *Massaria* de NOT. but differing in its peculiar ascus structure, and in the brown pigmentation of the ascospore cell contents but not represented in the spore wall. The type species of *Plagiostromella* is obviously distinct from both *Massaria* and *Aglaospora*. *Plagiostromella* does not seem to have been reported since the original description and apart from CLEMENTS and SHEAR (1931), it has not been included in any of the major taxonomic reviews of the ascomycetes.

It is unfortunate that v. HÖHNEL (1918) later introduced the genus *Plagiostromella* for *Gnomonia*-like ascomycetes (*P. carpinicola* v. HÖHN.; MÜLLER and v. ARX 1962). While there is no doubt as to the legitimacy of the two names, *Plagiostromella* and *Plagiostromella*, the similarity in their spelling can easily create confusion.

We have recently found three collections from the Himalayan district Almora (U. P. India) which represent new species of *Plagiostromella*. According to the protocol of *Plagiostromella*, ascospores should be brown. However, the ascospores of *P. leptodermidis* BOSE et MÜLLER n. sp. are only light yellow in colour. Because morphological features of this species agree well with those of the type species, *P. pleurostoma*, we feel justified in broadening the concept of *Plagiostromella* to include species having lightly coloured ascospores.

Plagiostromella v. HÖHN.

Sitzber. K. K. Akad. Wiss. Wien, math.-naturw. Kl. I. Abt., **126**, 372 (1917).

Type species: *Plagiostromella pleurostoma* v. HÖHN. l. c.

Ascomata single or aggregated in irregular clusters, immersed in the bark of woody plants with main axis parallel with host surface, each with a lateral, recurved ostium; ostioli may be collectively erumpent from clustered ascomata or may be united when the individual ascomata are found as cavities in a common stroma. Asci arranged parallel to host surface, bitunicate, eightspored, embedded in filiform paraphysoids. Ascospores broadly fusoid, phragmosporous, colourless to brown, thin- to thick-walled, smooth or verrucose.

Key to species

1. Ascomata predominantly single, scattered, with main axis parallel to host surface, ostium lateral, ascospores $22-33 \times 8.5-13 \mu\text{m}$, smooth.
 2. Ascospores two- to four-celled, colourless or slightly yellow, thin-walled (less than $1 \mu\text{m}$ thick), in young stages with an undistinct mucous sheath
 3. *P. leptodermidis*
 4. *P. berberidis*
 - 1*. Ascomata predominantly aggregated or occurring as connected cavities within a common stroma, ostioli collectively erumpent, ascospores mainly four-celled, thick-walled (walls more than $1.5 \mu\text{m}$ thick).
 3. Ascospores verrucose, $37-50 \times 14-17 \mu\text{m}$
 1. *P. pleurostoma*
 2. *P. indica*
 - 3*. Ascospores smooth, $17-22 \times 6.5-9 \mu\text{m}$

1. *Plagiostromella pleurostoma* v. HÖHN. — Fig. 1

Sitzber. K. K. Akad. Wiss. Wien, math.-naturw. Kl., I. Abt., **126**, 372 (1917), (with figure).

Mycelium as black, thick-walled, intercellular hyphae. Ascomata subepidermal-intracortical, forming scattered, raised, black, shining spots, measuring $0.6-1.6 \text{ mm}$ diam., each spot, regular or

irregular in outline, consisting of from 1—6 raised areas corresponding to the number of ascomal locules and a centrally located papilla; ascomata within each aggregate cruciately arranged, flattened parallel to host surface (200—300 μ long and up to 150 μ high); ascomal wall, except basally, 30—40 μ wide, composed of brown, thick-walled cells measuring 4—6 μ in diam; basal wall composed of one to two layers of small, light coloured cells. Papilla arising laterally, from each ascoma, perpendicular to surface of host; when ascomata are clustered, papillae arising from a central position, often united to form a single

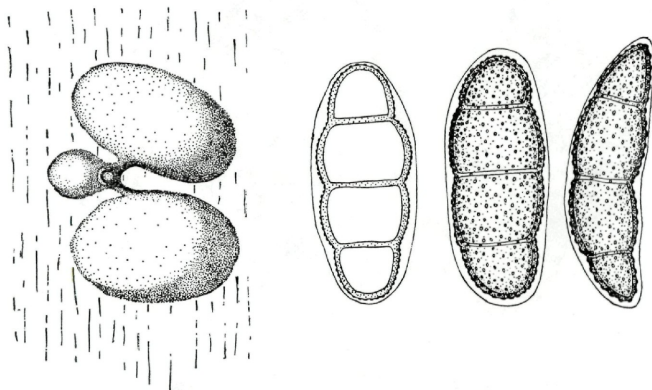


Fig. 1. *Plagiostromella pleurostoma* v. HÖHN. (type): Stroma seen from outside, with two ascomata connected by a common papilla, $\times 50$. — Three ascospores, the first in section, $\times 1000$

opening (fig. 1); each papilla up to 360 μ long and up to 100 μ broad, ostiolar canal periphysate.

Asci bitunicate, 160—200 $\times$ 24—36 μ , elongate-clavate, with a short stipe, 8-spored, arising from the wall opposite the ostiolar opening and arranged parallel to the host surface. Ascospores (fig. 1) 3-septate with 2 slightly larger middle cells and 2 smaller end cells, 37—50 $\times$ 14—17 μ , brown, broadly fusoid, straight or slightly curved, constricted at the septa, thick-walled, verrucose and surrounded by a narrow gelatinous sheath. Paraphysoids numerous, filiform, sometimes branched, becoming slimy in mature ascomata.

Holotype: Japan, in bark of living *Sapindus* sp., 1913 (FH!).

Note: This species is well described and illustrated by v. HÖHNEL (1917, p. 373—375).

2. *Plagiostromella indica* Bose et MÜLLER nov. spec. — Fig. 2

Ascstromata subepidermalia, maculis dispersis, nigris, prominentes, $1000 \times 250 \mu$ formantibus; ascromata complura, orbiculara, superficie plantae hospitae horizontaliter inserta, $130-330 \times 115-130 \mu$; paries ascromatorum basaliter $20-26 \mu$ crassus, clare brunneus, hyphis elongato-torulosis, $2-4 \mu$ crassis compositus, lateraliter et apicaliter $22-28 \mu$ crassus, cellulis fuscis, isodiametricis, $2-4 \mu$ crassis compositus; ostioli lateraliter inserti, demum verticaliter curvati, saepe confluentes. Asci bitunicati, horizontaliter inserti,

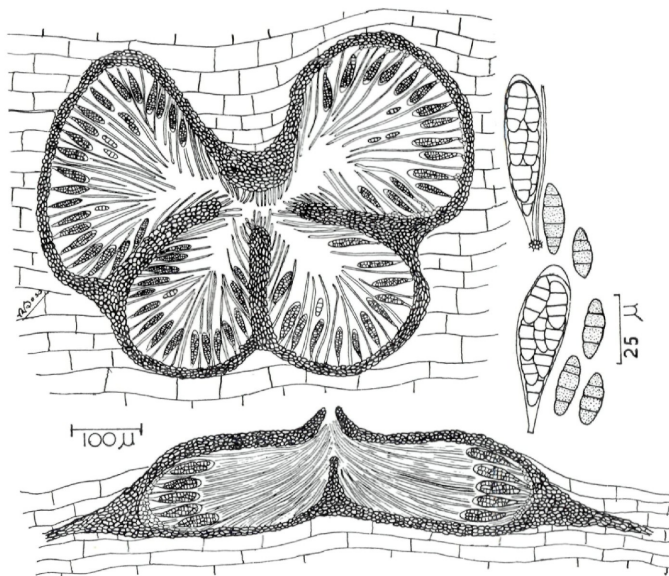


Fig. 2. *Plagiostromella indica* BOSE & MÜLLER (type): Ascstroma, section parallel to host surface, with four cruciately arranged ascromata, and cross-section indicating the common ostiole. — Ascospores

$55-70 \times 11-13(-17) \mu$, cylindraceo-clavati, octospori, paraphysoidibus filiformibus circumdati. Ascosporae $17-22 \times 6,5-9 \mu$, cylindraceo-fusoidae, $3-5$ — transverse-septatae, fuscae, leves. Hab. in cortice *Pentapanicis* parasitici (D. DON.) SEEM. (Araliaceae) viventis; India, Ranikhet (Distr. Almora, U. P.), 2. 11. 1968, leg. S. K. Bose. (Typus, ZT).

Ascstromata subepidermal, forming scattered, raised, black, elliptic spots measuring $1000 \times 250 \mu$ diam.; containing a number of ascromata, which are cruciately arranged, flattened, parallel to the host surface and measure $130-330 \times 115-130 \mu$; ascomal wall,

except basally, 22–28 μm wide, composed of brown, polyhedral cells measuring 2–4 μm in greatest dimension; ascomal wall below 20–26 μm wide, composed of light brown, elongate-torulose hyphae, measuring 2–4 μm wide; cells at exterior of ascomal wall growing into host periderm which is thus incorporated into the wall. Papilla arising laterally from each ascoma, perpendicular to surface of host, when ascomata are clustered, papillae united to form a single opening, papilla up to 60 μm long; ostiolar canal 17–33 μm diam., not distinctly periphysate.

Asci bitunicate, 55–70 $\times$ 11–13 (–17) μm , cylindrical to clavate with a short stipe, up to 4 μm wide, arising from the wall opposite the ostiolar opening and arranged parallel to host surface, eight spored.

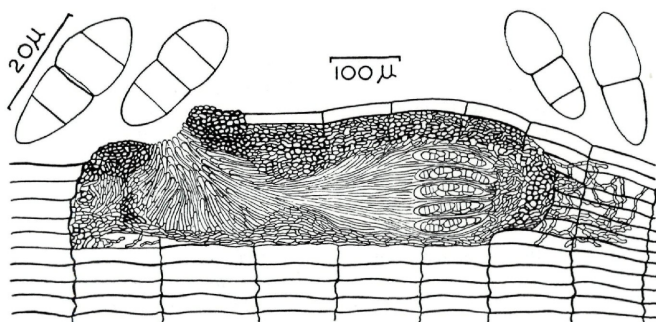


Fig. 3. *Plagiostromella leptodermidis* BOSE & MÜLLER (type): Ascostroma in cross-section. — Ascospores

Ascospores 3–(5) — septate, 17–22 $\times$ 6.5–9 μm , brown, ends rounded or one end subapiculate, with a large vacuole in each cell, constricted at the septa, thickwalled, smooth. Paraphysoids filiform, 1.5 μm wide, hyaline, branching, becoming slimy at maturity.

Holotype: India, Ranikhet (Distr. Almora, U. P.) on *Pentapanax parasiticum* (D. DON.) SEEM. (Araliaceae), S. K. BOSE, 2 Nov. 1968 (ZT).

Note: In water, the ascal wall often elongates within the ascoma and disintegrates in the middle region.

3. *Plagiostromella leptodermidis* BOSE et MÜLLER nov. spec. — Fig. 3

Ascostromata subepidermalia, maculis dispersis, nigris, ellipticis, prominentes, 250–1000 μ diam. formantia, ascomata solitaria vel nonnullis instructa. Ascomata horizontaliter inserta, 550–950 $\times$ 160–200 μ ; paries ascumatorum basaliter 4–12 μ crassus, stratis pluribus hyphis flavo-fuscis, 2 μ

rassis compositus, lateraliter et apicaliter 30–50 μ crassus, cellulis leviter fuscis, elongatis vel isodiametricis, crasse tunicatis (4 μ diam.) compositus; ostioli lateraliter inserti, demum verticaliter curvati et erumpentes. Asci bitunicati, 70–110 $\times$ 18–25 μ , cylindrici, apicaliter rotundati et crasse tunicati, basaliter truncati, octospori, paraphysibus filiformibus circumdati. Ascosporae 23–33 $\times$ 8.5–13 μ , 3(–4) – constricto-septatae, leviter flavae, rectae vel subcurvatae, tenuiter tunicatae, leves. Hab. in cortice *Leptodermidis lanceolatae* Wall. (Rubiaceae) viventis; Ranikhet, Jhula Dewi, Chaubattia (Distr. Almora, U. P.), S. K. BOSE, 8. 4. 1965 (Typus, ZT).

Mycelium as intracellular, light brown hyphae measuring ca. 2 μ diam. Ascomata subepidermal-intracortical, forming scattered, slightly raised, black. circular spots measuring 0.25–1 mm in diam., solitary or two or three aggregated, flattened, parallel to host surface, pear-shaped with narrow elongated end at ostiolar opening, 550–950 $\times$ 160–200 μ ; ascomal wall, except basal region, 30–50 μ wide, composed of dark brown, elongated or polyhedral, thick-walled cells up to 4 μ in greatest dimension, basal region of ascomal wall 4–12 μ wide, composed of several layers of yellowish-brown, intertwined hyphae measuring 2 μ in diam. Papilla arising laterally from each ascoma, perpendicular to host surface, up to 60 μ long and 40–65 μ wide, ostiolar opening periphysate; aggregated ascomata often opening through a single papilla, densely lined with periphyses, periphyses ca. 2 μ diam., slightly swollen apically.

Asci bitunicate, 70–110 $\times$ 18–25 μ , cylindrical, apically rounded and thickwalled, basally truncate, 8-spored; arising from a position opposite the ostiolar opening; produced from a subhymenial layer 15–25 μ wide, composed of hyaline, septate, intertwined hyphae, 2–4 μ diam. Ascosporae 23–33 $\times$ 8.5–13 μ 3(–4) – septate with the upper cell slightly larger, ends rounded, straight or slightly curved, distinctly constricted at the median septum, light yellow, smooth, biseriate. Paraphyses filiform ca. 1.5 μ wide, hyaline, branching, in mature ascomata becoming slimy.

Holotype: India, Ranikhet, Jhula Dewi, Chaubattia Garden Bridie Path, on living branches of *Leptodermis lanceolata* WALL., S. K. BOSE, 8. April 1965 (ZT).

4. *Plagiostromella berberidis* BOSE et MÜLLER nov. spec. — Fig. 4

Ascomata subepidermalia, solitaria, maculis dispersis, prominentibus innata, horizontaliter inserta, hemisphaerica, basaliter plana, 400–600 $\times$ 130–240 μ . Parietis ascomatorum basaliter usque ad 10 μ crassus, stratis paucis instructus, hyphis 3 μ crassis compositus, lateraliter et apicaliter 40–60 μ crassus, cellulis isodiametricis, brunneis, 2–6 μ diam. compositus et cellulis plantae hospitalae inclusus. Ostioli lateraliter inserti, demum verticaliter curvati, poro periphysato perforati. Asci bitunicati, 70–90 $\times$ 18–20 μ , cylindracei vel indistincte clavati, octospori, paraphysoidibus filiformibus circumdati. Ascosporae 22–32 $\times$ 8.5–12 μ , ellipsoideae vel este fusoidae, 3–5 – constricto-septatae, claro-brunneae, crasse tunicatae. Hab. in cortice *Berberidis aristatae*

DC. (Berberidaceae) vivensis; Ranikhet, Chaubattia, (Distr. Almora, U. P., India), S. K. BOSE, 28. 3. 1966. (Typus, ZT).

Mycelium as intracellular, light brown hyphae measuring ca. $2\ \mu$ diam. Ascomata subepidermal-intracortical, forming scattered, raised spots on the epidermis, solitary, hemisphaerical, base flattened, parallel to host surface, $400-600\ \mu$ in length, $130-240\ \mu$ in high, ostiolar opening lateral. Ascomal wall, except basal region $40-60\ \mu$ wide, thickest around the periphery and above the transitional region between the body of the ascoma and the papilla, composed of brown, polyhedral, thick-walled cells measuring $2-6\ \mu$ in greatest dimension; host cells incorporated into ascomal wall; basal region of ascomal wall less than $10\ \mu$ wide, composed of a few layers of intertwined, ca. $3\ \mu$ diam. hyphae. Papilla arising laterally from each ascoma, perpendi-

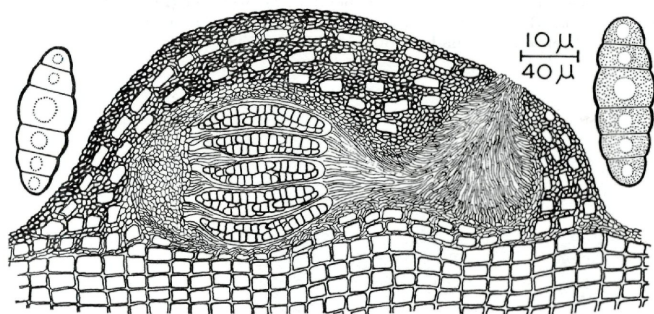


Fig. 4. *Plagiostromella berberidis* BOSE & MÜLLER (type): Ascstroma in cross-section. — Ascospores

cular to host surface, ca. $50\ \mu$ in length and in diam., connected to the ascomal locule by a narrow channel, periphysate; periphyses filiform, septate, hyaline, $2\ \mu$ diam.

Asci bitunicate, $70-90 \times 18-20\ \mu$, cylindrical to narrowly clavate, apically rounded and thick-walled, basally truncate, 8-spored. Ascospores fusiform-elliptic with ends rounded or subapiculate, $22-32 \times 8.5-12\ \mu$, 3-5-septate, straight, constricted at the septa, light brown, thick-walled, smooth, biseriate. Paraphyses filiform, ca. $3\ \mu$ diam., septate.

Holotype: India, Ranikhet, Chaubattia (Distr. Almora, U. P.) on living branches of *Berberis aristata* DC., leg. S. K. BOSE, 23. March 1966. (ZT).

Note: *Plagiostromella berberidis* differs from *P. leptodermidis* by the ascospores. They are thick-walled (in *P. leptodermidis* thin-walled) and they tend to form more septa.

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