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Notes on Some Common Xylariaceous and Diatrypaceous Fungi on Hardwoods in Japan I

By

Yasuhisa ABE[1]

Summary : Six species of xylariaceous and diatrypaceous fungi are described : *Hypoxylon truncatum*, *H. howeianum*, *H. fuscum*, *Rosellinia aquila*, *Graphostroma platystoma*, and *Diatrype stigma*. These fungi are taxonomically and morphologically reviewed including their anamorphs.

Introduction

Xylariaceous and diatrypaceous fungi are commonly found on various kinds of hardwoods and contribute to their decay. They can often occur on bed logs of cultivated mushrooms, especially *Lentinula edodes* (BERK.) PEGLER and prevent growth of mycelia from inoculated mushroom spawn. Thus, prevention of these fungi has become important in mushroom cultivation in Japan. The fungi have been studied by some investigators in Japan (as listed elsewhere in this paper), however, there still seems to be a need to study more about them, especially with regard to taxonomy. This paper is an attempt to review species commonly found on bed logs of mushrooms. In the review, the writer intends to list available Japanese literature on them in both scientific and non-scientific papers not limited in taxonomy.

Materials and methods

Specimens from the following herbaria were examined : U. S. National Fungus Collections, Beltsville (BPI); Royal Botanic Gardens, Kew (K); Forestry and Forest Products Research Institute (TFM); National Science Museum, Tokyo (TNS). Abbreviations of these herbaria are based on HOLMGREN *et al.* (1981).

Cultures of the fungi studied herein were obtained by isolating single ascus using a micromanipulator, except for cultures of two collections, TFM-F-12048 and 12049 (multi-spored). Cultural characteristics of these fungi were observed on potato dextrose agar (PDA) and their anamorphs were studied in these cultures. Anamorphs of *Diatrype stigma* were observed by scanning electron microscopy (SEM). These materials were prepared as follows : sporulating parts of mycelia with agar were cut out in about 3 mm square and fixed in 2.5% gultaraldehyde, rinsed in 0.1 M phosphate buffer, dehydrated in a graded ethanol series, dried at critical point, and gold coated. Observation was made under the SEM, JSM-35 C.

Methods in observation of tissue types of stromata together with morphological terms have been supplied elsewhere (ABE, 1984). Terms used in describing cultural characters are those employed by NOBLES (1948). Names of collectors of specimens are written between the data and the number of specimens in most cases. Y. A. means the specimen was collected by the writer. Sp. p., which appears in the description of species, means the spore bearing

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part of the ascus.

Hypoxylon truncatum (SCHW.: FR.) MILLER, Trans. Br. mycol. Soc. 17. 130. 1932. (Plate 1)

Stromata extremely variable in shape, hemispheric, or pulvinate to effused in irregular outline, or consisting of independent perithecia as in *Rosellinia*, dark brown to black, often black and shining, very carbonaceous; ostioles finely or obtusely papillate, surrounded by disks of 0.2～0.65 mm diam., at first covered with ectostroma which is removed at maturity; conidial layer olive to olive brown, produced on immature stromata in early summer; perithecia globose to oblong, 0.3～1.0 mm diam., monostichous; asci cylindric, sp. p. 60～90×4～6 μm with stipe 10～50 μm long, 75～130 μm in total length, with apical rings stained blue in MELZER's reagent, 8-spored; ascospores diagonally or straight uniseriate, inequilaterally elliptic to fusiform, dark brown, 7～11.5×3.5～5 μm, with hyaline exospores and germ slits; ascospores germinated by removal of exospores, followed by opening germ slits and finally by elongation of germ tubes from both ends; paraphyses filiform, numerous; olive pigment extracted when stroma soaked in 5% KOH.

This species seems to be divided into the following three groups mostly based on stromatal shapes.

1) ***Bovei*-type group**

Perithecial stromata single, scattered on bark as in *Rosellinia*, 0.6～1.4 mm diam. externally in each, or 2～20 perithecial stromata joined together, becoming more effused forms by further joining; stromata below perithecia sparce; ostioles finely papillate, with disks 0.3～0.65 mm diam.; perithecia globose, 0.5～1.0 mm diam.

2) ***Marginatum*-type group**

Stromata hemispheric, 3～15 mm diam. singly, 3～4 cm long and 1 cm high in conjugate forms; stromata below perithecia well-developed, sometimes with faint concentric zonation; perithecia immersed in stromata; ostioles finely papillate or obtusely conical, with disks 0.35～0.65 mm diam., disks sometimes not prominent; perithecia globose to oblong, 0.5～0.65×0.3～0.65 mm.

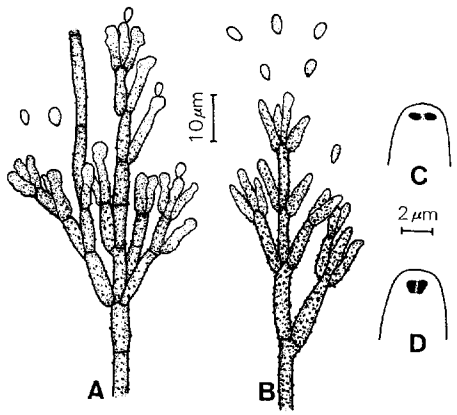

Fig. 1. *Hypoxylon truncatum*. A, B. Conidiophores and conidia. A. TFM-F-12138. B. TFM-F-12532. C, D. Amyloid apical rings of asci. C. *marginatum*-type. D. *bovei*-type and *truncatum*-type. Scales: A, B=10 μm, C, D=2 μm.

3) ***Truncatum*-type group**

Stromata pulvinate or effused in irregular outline, perithecia strongly projected, usually black and shining, each perithecial stroma 0.5～0.95 mm in outer diam.; stromata below perithecia developed; ostioles finely papillate with disks 0.2～0.6 mm diam.; perithecia globose, 0.3～0.7 mm diam.

Cultural characters: Colonies variable under cultural conditions, white to grayish yellow to dull yellow on PDA in most cases, felty, often gray to black crust produced on colonies; growth rapid, 40～80 mm diam. in 7 days at 25°C, optimum growth between 27.5～32.5°C; reverse stained brown to black.

Anamorph: *Nodulisporium* PREUSS. Conidio-

phores hyaline when young, later becoming light brown, often encrusted with granules, usually main axes prominent; conidia sympodially produced, hyaline to amber, 1-celled, smooth, obovoid to oblong, 2.5～5×1.5～3.5 μm.

Specimens examined :

1) *Bovei*-type group

Hypoxylon bovei Speg. var. *microspora* Miller, China, 1923, S. Q. Deng (849) in BPI; *H. bovei* var. *microspora*, China, 18-III-1934, S. C. Teng 1398 (Mo. Bot. G. 73740) in BPI; *H. bovei* var. *microspora*, Philippines, 1920, O. Reinking (9596) in BPI; Mikura-jima Is., Tokyo, 5-X-1979, Doi (TNS-F-198551); Yona, Kunigami-gun, Okinawa Pref., 22-I-1973, Doi (TNS-F-198552); Komi, Iriomote Is., Okinawa Pref., 17-VII-1976, Doi (TNS-F-227260); Mt. Chibusa-yama, Hahajima, Bonin Is., 3-XII-1977, Doi (TNS-F-231528); Mt. Aigo-dake, Yakushima Is., Kagoshima Pref., 17-IX-1977, Doi (TNS-F-231575); Onoaida, Yakushima Is., Kagoshima Pref., 16-IX-1977, Doi (TNS-F-231586); on *Quercus acutissima*, Hourai-cho, Minamishitara, Aichi Pref., 7-I-1977, Sawa (TFM-F-12023); Kiyosumi, Chiba Pref., 5-VII-1978, Y. A., (TFM-F-12050); Miyazaki-city, Miyazaki Pref., 13-X-1978, Y. A. (TFM-F-12069); and specimen with the following numbers from Ibaraki, Chiba, Kanagawa, Shizuoka, Gifu, Miyazaki, Kagoshima and Okinawa Pref., TFM-F-12015; 12017; 12018; 12024; 12026; 12027; 12031; 12055; 12057; 12070; 12204; 12264; 12284; 12285; 12326; 12695; 12800.

2) *Marginatum*-type group

Sphaeria marginata Schw., Car. Sup., M. A. Curtis (129, 240, 376) in K; *Hypoxylon annulatum* Schw., on Oak, H. W. Ravenel's herb., Gainesville, Fla. (42) in K; *H. annulatum*, Esashi, Iwate Pref., 24-X-1910, Kagawa (TNS-F-204758); *H. annulatum*, Okazaki, Aichi Pref., IV-1912, Umemura (TNS-F-204773); *H. annulatum*, Aichi Pref., 5-VII-1913, Matsuzaki (TNS-F-204771); *H. annulatum*, Sakaide, Kagawa Pref., 8-X-1914, Hori (TNS-F-204781); *H. annulatum*, Hita, Oita Pref., 14-XII-1919, Nakayama (TNS-F-204783); on *Quercus serrata*, Naka, Ibaraki Pref., 27-XI-1976, Ishii (TFM-F-12029); Nagasawa, Yokosuka, Kanagawa Pref., XI-1976, Y. A. (TFM-F-12048); and specimens with the following numbers from Fukushima, Ibaraki, Chiba, Tokyo, Kanagawa, Gunma, Shizuoka, Nagano and Kagoshima Pref., TFM-F-12028; 12037; 12044; 12058; 12088; 12148; 12251; 12254; 12302; 12350; 12381; 12489.

3) *Truncatum*-type group

Sphaeria truncata Schw., TYPE. (M. 746, 282) in K; *H. truncatum* (Schw. ex Fr.) Miller, Corral, Chile, XII-1905, R, Thaxter, 6859, ex FH (TNS-F-231116); *H. annulatum*, on *Zelkova serrata*, Aichi Pref., 30-X-1914, Matsuzaki (TNS-F-204772); Monobe, Kami-gun, Kouchi Pref., 11-X-1976, Ougishi (TNS-F-227989); Kiyosumi, Chiba Pref., 22-X-1977, Amano (TNS-F-231392; 231393); Mt. Mikazukiyama, Chichijima, Bonin Is., Tokyo, 6-XII-1977, Doi (TNS-F-231399); Izuhara, Kamiagata, Tsushima Is., Nagasaki Pref., 16-X-1977, Doi (TNS-F-231436); Mt. Chibusa-yama, Hahajima, Bonin Is., Tokyo, 3-XII-1977, Doi (TNS-F-231524); on *Quercus acutissima*, Kitakata, Higashiusuki, Miyazaki Pref., 29-IX-1976, Aoshima & Tsunoda (TFM-F-12005; 12020; 12025; 12030; 12039); on *Q. serrata*, Shintou, Kitagunma, Gunma Pref., 30-XI-1976, Hikimachi (TFM-F-12004); and specimens with the following numbers from Ibaraki, Chiba, Tokyo, Kanagawa, Shizuoka, Aichi, Gifu, Yamaguchi, Miyazaki, Kagoshima and Okinawa Pref., TFM-F-12016; 12019; 12021; 12022; 12032; 12033; 12035; 12036; 12038; 12040～12042; 12056; 12089; 12138; 12210; 12265; 12281; 12502; 12504; 12507; 12525; 12532; 12539; 12574; 12589a; 12806～12808; 12810; 12811.

Cultures examined (cultures were isolated from the following specimens) : TFM-F-12048;

12050; 12055; 12057; 12058; 12069; 12070; 12088; 12089; 12095; 12138; 12204; 12210; 12254; 12264; 12265; 12281; 12284; 12285; 12326; 12350; 12381; 12489; 12502; 12504; 12532; 12571; 12589a; 12695.

Habitat : On various kinds of deciduous wood, especially *Quercus*.

Japanese name : Kurokobu-take (YASUDA).

Japanese literature : HARA (1913b); YASUDA (1915); KITAJIMA (1933); HENMI and AKAI (1945); MATSUO (1960); NISHIKADO and FURUYA (1970); TSUNEDA and ARITA (1984); TSUNEDA (1985).

Notes : Specimens were sorted into these three groups temporarily, as this grouping was not intended to make new infraspecific taxons based on the International Code of Botanical Nomenclature. Treatment of these morphological differences should be produced only after further study. There are still many intermediate types between these groups as noted by MILLER (1961).

MILLER (l. c.) described a small-spored variety of *H. bovei*, i. e. *H. bovei* var. *microsporum* MILLER. According to him, this variety differs from the species in having smaller ascospores of 8～10×3～4 μm, but has large perithecia of 1～1.5 mm wide, 1～2 mm high and large disks 0.7～1 mm diam. as in the species. The writer could not examine the type specimen of the variant, but did examine three authentic specimens in BPI. The sizes of their disks were 0.38～0.63 mm diam., and the outer diameter of perithecial stromata 1～1.4 mm, asci 68～81×4～5 μm with stipe 38～102 μm long, and ascospores 7～10.5×3～5 μm. Their disks were smaller than in the original description. Though these specimens had slightly larger perithecia and ostiolar disks, they could be included in *H. truncatum*. Stromata of *bovei*-type collections were usually covered with a dark brown powdery layer, but under it black shining stromata were present as in *truncatum*-type collections.

ELLIS and EVERHART (1892), SHEAR (1945) and MARTIN (1968b) thought *marginatum*-type and *truncatum*-type to be different species. MILLER (1942) concluded that these variations were environmental forms of the same species. Later he (1961) adopted three forms, i. e. f. *annulata*, f. *marginata* and f. *emarginata* for these variations in the plates of his monograph, though they had not been validated. The writer inoculated a culture of *marginatum*-type collection into sterilized oak logs (ca. 8 cm diam. and 15 cm long logs of *Quercus acutissima*). Stromata formed on the log after one year. Most of them were *marginatum*-type, but a few stromata showed intermediate-type between *marginatum*-type and *truncatum*-type. On the other hand, stromata seemed to become *marginatum*-type form on decorticated wood and *bovei*-type form on small twigs. Stromatal shapes appear to have been influenced both by environmental and hereditary factors. Amyloid ascal rings tended to be thinner in *marginatum*-type than in *bovei*-type and *truncatum*-type groups. They were about 0.5 μm thick in the former and about 1 μm thick in the latter groups in most cases. Tissue types of stromata were the same as in these three groups. There was no distinct difference in their cultural characters and anamorphs. It might be correct to regard these morphological differences as infraspecific characters.

The writer examined a part of the type specimen in K. There were two sizes of perithecia on the piece of wood, 0.75～0.9 mm diam. in large perithecia and about 0.5 mm diam. in small ones. The large perithecia had ascospores 8.5～10.5×3.5～4.5 μm, but ascus was not seen. Their ostiolar disks were 0.3～0.35 mm diam. Smaller ones were immature and ostiolar disks unclear. Stromatal shapes were both effused forms. According to Dr. DOI (Natn. Sci. Mus., Tokyo, pers. comm.), there is another specimen of *Sphaeria truncata* (M. 796) labelled "TYPE"

in K and this specimen also has effused stromata.

HARA (1913 b) first reported this species from Japan, but his specimen has not been found since. Specimens YASUDA (1915) cited are *marginatum*-type.

***Hypoxylon howeianum* PECK,** 24th Rep. N. Y. State Mus. p. 98. 1872. (Plate 2 A～C)

Stromata hemispheric to semiglobose, often slightly constricted at the base, 1～20 mm diam. and 1～10 mm high, with resemblance to *Daldinia* in larger ones, frequently combined with one another, perithecial elevations prominent or not prominent, elevations usually prominent in small stromata less than 5 mm diam., but not prominent in larger ones, brownish orange to reddish brown to dark brown and finally black in surface, corky to woody; endostroma dark brown to black, sometimes with faint concentric zonation; ostioles umbilicate; perithecia monostichous, globose, 0.2～0.35 mm diam., or oblong 0.2～0.35 mm high and 0.1～0.3 mm wide; synnemata pale yellowish brown to brown, produced under the basal part of stromata in early summer; asci cylindric, sp. p. 50～65×4～5 μm with stipe 20～75 μm long, 70～132 μm in total length, with apical rings stained blue in MELZER's reagent, 8-spored; diagonally or straight uniseriate, inequilaterally elliptic to fusiform, brown to dark brown, 6～9×3～4 μm, with exospores and germ slits; germination pattern the same as in *H. truncatum*; paraphyses filiform, numerous; dark reddish orange to reddish brown pigment extracted when stroma soaked in 5% KOH.

Cultural characters : Colonies extremely variable depending on strains, white to pale orange to reddish orange to partially dark green, floccose, partially wooly, plumose, or felty; growth slow to moderate, 12～50 mm diam. in 7 days at 25°C; reverse stained dark brown or dark green.

Anamorph : *Nodulisporium*-type. Conidiophores hyaline when young, later becoming brownish, wart-like secretion attached on old conidiophores, variable in shape, short, simple, or branched with prominent or non-prominent main axes; conidia sympodially produced, hyaline to amber, 1-celled, smooth, obovoid to oblong, 2.5～5×1.5～3 μm.

Specimens examined : *Hypoxylon howeianum* PK., on *Quercus*, 2842, ELL. Fungi of N. J., in K; *H. pulcherrimum* v. HÖHNEL, on *Quercus serrata*, Sendai, Miyagi Pref., 15-X-1922, YASUDA (TNS-F-198509); *H. coccineum* BULL., Kesengun, Iwate Pref., 18-XII-1920, TOBA (TNS-F-204787); *H. coccineum* BULL., Mt. Akagi, Gunma Pref., 18-IX-1915, TSUNODA (TNS-F-204790); Monobe, Kami-gun, Kouchi-Pref, 11-X-1976, OUGISHI (TNS-F-227990); on *Quercus acutissima*, Higashiusuki, Miyazaki Pref., 29-IX-1976, AOSHIMA & TSUNODA (TFM-F-12003; 12793); on *Alnus*, Higashiusuki, Miyazaki Pref., 18-VII-1978, FURUKAWA (TFM-F-12051); Matsuzaki, Izu Pen., Shizuoka Pref., 6-III-1980, Y. A. (TFM-F-12282; 12283); on *Quercus serrata*, Fujimi-mura, Seta-gun, Gunma Pref., 8-XII-1976, HIKIMACHI & KENMOCHI (TFM-F-12008); and specimens with the following numbers from Hokkaido, Ibaraki, Chiba, Gunma, Saitama and

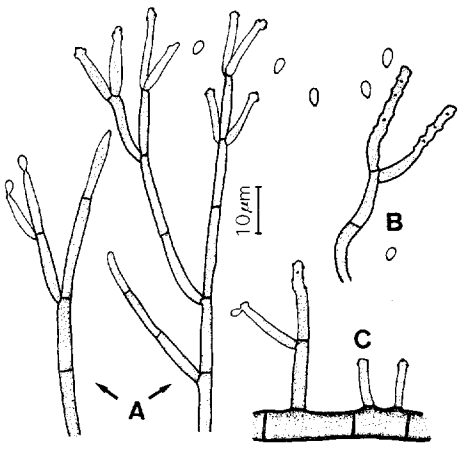

Fig. 2. *Hypoxylon howeianum*. Conidiophores and conidia.
A. TFM-F-12074. B. TFM-F-12080. C. TFM-F-12068.
Scale = 10 μm.

Miyazaki Pref., TFM-F-12002; 12068; 12074; 12080; 12097; 12154; 12395; 12437; 12439; 12592; 12692; 12074; 12725; 12785; 12788; 12790～12792; 12794.

Cultures examined (cultures were isolated from the following specimens) : TFM-F-12051; 12068; 12074; 12080; 12097; 12154; 12395; 12592; 12692.

Habitat : On various kinds of deciduous wood, especially *Quercus*.

Japanese name : Hime-akakobu-take (YASUDA). Based on the specimen TNS-F-198509.

Japanese literature : YASUDA (1923); KATUMOTO (1978).

Notes : This species resembles *H. fragiforme* (PERS. : FR.) KICKX in appearance. *H. fragiforme* has larger asci and ascospores than *H. howeianum*. In collection the writer identified as *H. fragiforme*, sizes of asci are sp. p. 68～85×6.5～8.5 μm with stipe 20～50 μm long, 86～132 μm in total length, and of ascospores 10.5～14×4.5～6.5 μm. But there are some collections on *Fagus*, having intermediate-sized asci and ascospores between *H. fragiforme* and *H. howeianum* (collections : TFM-F-12103; 12602; 12619). The sizes of their asci are sp. p. 53～71×4.5～5.5 μm with stipe 20～45 μm long, 86～100 μm in total length, and of ascospores 8～10×3.5～4.5 μm. MILLER (1961) distinguished both species based on sizes of asci and ascospores. In his description, *H. fragiforme* has asci of 70～85×5～7 μm with stipe 60～70 μm and ascospores of 11～15×5～7 μm, and *H. howeianum* has asci of 50～60×5～6 μm with stipe 40～50 μm and ascospores of 6～9×3～3.5 μm. MARTIN (1969) separated both species also based on ascospore size in his key, as *H. fragiforme* has ascospores of 11.0～13.0×5.0～6.5 μm and *H. howeianum* 7.5～9.5×3.5～5.0 μm, however, in the description he stated that the former ranged from 7.5～15.5×3.5～7.5 μm and the latter 6.0～11.5×3.2～6.5 μm, overlapping in sizes of both species. MILLER (l. c.) also stated *H. fragiforme* usually occurs on *Fagus* and *H. howeianum* on various dicotyledonous trees. In Japan *H. fragiforme* occurs mainly on *Fagus* and *H. howeianum* on various woods especially *Quercus*. The writer has not found *H. fragiforme* on Shii-take bed logs of *Quercus acutissima* and *Q. serrata*. Though host range of both species appears to be differentiated, morphological difference between them is sometimes unclear. GREENHALGH and WHALLEY (1970) stated both species can be readily differentiated on the basis of their stromal pigment content. Shape and color of cultures are very characteristic as mentioned by GREENHALGH and CHESTERS (1968). Conidiophores are often similar to *Geniculosporium* CHESTERS & GREENHALGH.

***Hypoxylon fuscum* PERS. : FR.**, Summa Veg. Scand. p. 384. 1849. (Plate 2 D～G)

Stromata hemispheric, 0.5～3 mm diam., 0.5～2 mm high, or somewhat flattened dome-shaped to pulvinate, 1～8 mm diam., 0.5～2 mm high, or gregarious and effused, dark purple red to dark brown purple to reddish gray and finally black in surface, often undulated with prominent perithecial elevations; endostroma dark brown, corky to woody; ostioles umbilicate; perithecia monostichous, globose, 0.13～0.3 mm diam., or oblong, 0.2～0.44 mm high and 0.13～0.3 mm wide; asci cylindric, sp. p. 70～100×6～9 μm with stipe 10～50 μm long, 80～140 μm in total length; with apical rings stained blue in MELZER's reagent, 8-spored; ascospores diagonally or straight uniseriate, inequilaterally elliptic, brown to dark brown, 11～16(19)×5～6.5(7) μm, with exospores and germ slits; paraphyses filiform, numerous; dark brown or dark violet to black pigment extracted when stroma soaked in 5% KOH.

Cultural characters : Colonies at first downy, white, later becoming floccose to felty, white to grayish brown to brownish gray; growth moderate, 30～50 mm diam. in 7 days at 25°C; reverse stained light brown to brown or reddish brown.

Anamorph : *Nodulisporium*-type. Conidiophores hyaline when young, later becoming amber,

wart-like secretion attached on old conidiophores; conidia sympodially produced, hyaline to amber, 1-celled, smooth, obovoid, 3.5～5.5×1.5～3 μm.

Specimens examined : *Hypoxylon fuscum* Pers. ex Fr., on *Betula*, Wyre Forest, Eng., 20-IX-1921, E. Wakefield, in BPI; *H. fuscum*, on *Betula*, Salem. N. C., 13-X-1921, C. L. Shear, in BPI; *H. fuscum*, on *Betula*, Decature, Ala., 3-III-1926, C. L. Shear, in BPI; *H. fuscum*, on *Betula*, Brockley, Camb., Eng., 2-IX-1930, C. L. Shear, in BPI; *H. fuscum*, on *Betula*, Lowell., Mass., 9-VII-1922, C. L. Shear, in BPI; *H. fuscum*, on dead *Alnus tenuifolia*, Priest River, Idaho, 12-V-1920, J. R. Weir & A. S. Rhoods, ex FH (TNS-F-204813); on *Alnus*, Narusawa, Minamitsuru, Yamanashi Pref., 16-II-1950, Aoshima (TFM-F-1872); Mt. Asakusa-dake, Tadami, Minamiaizu, Fukushima Pref., 23-X-1979, Y. A. (TFM-F-12122); Houkizawa, Ashigarakami-gun, Kanagawa Pref., 1-XII-1979, Y. A. (TFM-F-12197; 12199); Kusatsu, Gunma Pref., 3-IX-1980, Y. A. (TFM-F-12354); Motosu, Nishiyatsushiro, Yamanashi Pref., 24-X-1980, Y. A. (TFM-F-12433); Iwaki, Fukushima Pref., 21-XI-1980, Y. A. (TFM-F-12477); on *Alnus*, Nanasawa, Atsugi, Kanagawa Pref., 16-XI-1976, Ohno (TFM-F-12798); Yamabe, Furano, Hokkaido, 18-IX-1980, Amano (TFM-F-12799); and specimens with the following numbers from Hokkaido, Aomori, Ibaraki, Tokyo, Kanagawa, Shizuoka and Nagano Pref., TFM-F-12646; 12727; TFM-FPH-2209; 2324; 2808; 2810; 3054; 3309.

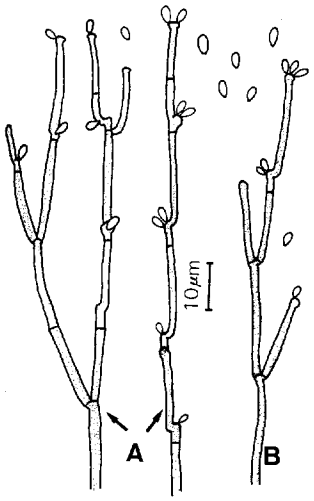

Fig. 3. *Hypoxylon fuscum*.
Conidiophores and conidia.
A. TFM-F-12122.
B. TFM-F-12197.
Scale=10 μm.

Cultures examined (cultures were isolated from the following specimes) : TFM-F-12122; 12197; 12354; 12477.

Habitat : On deciduous wood, especially *Alnus* and *Betula*.

Japanese name : Hannokikobu-take (Katumoto).

Japanese literature : Katumoto (1978).

Notes : This species is commonly found on *Betula* and *Alnus* in north temperate zones. It would seem to be easy to identify this species due to its purple and small hemispheric stromata. However, it becomes confusing in effused forms of the species. The effused form of this species resembles *H. rubiginosum* (Pers : Fr.) Fr. and *H. vogesiacum* Pers. var. *microsporum* Miller. Jong and Rogers (1972) stated that conidial *H. fuscum* might fit more logically in *Virgariella* than in *Nodulisporium*.

Rosellinia aquila **(Fr.) de Not.**, Giorn. Bot. Ital. 1 : 334. 1844. (Plate 2 H～L)

Stromata globose to subglobose, consisting of one perithecium, 0.9～1.5 mm diam., often several stromata joining together, dark brown to black in surface, carbonaceous, with papillate ostioles, surrounded by dark brown mycelial mat; hyphae of mat dark brown, thick-walled, frequently branched, 2.5～7.5 μm wide; perithecia globose to subglobose, 0.65～1.3 mm diam.; asci cylindric, sp. p. 140～225×9～13 μm with stipe 15～50 μm long, with vase-like shaped apical rings stained blue in Melzer's reagent, 8-spored; ascospores diagonally or straight uniseriate, inequilaterally fusiform, dark brown, 20～35×7.5～12 μm, with germ slit and small hyaline appendages at both ends; no pigment extracted when stroma soaked in 5% KOH.

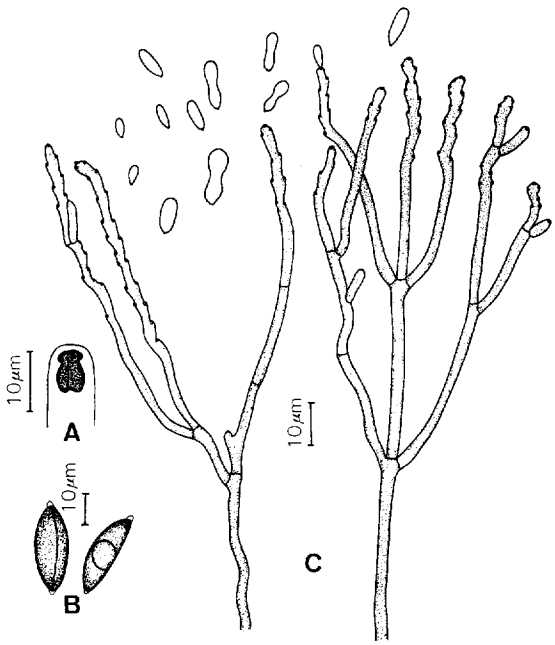

Fig. 4. *Rosellinia aquila*. A. Amyloid apical ring of ascus. B. Ascospores with hyaline appendages. C. Conidiophores and conidia. TFM-F-12362. Scales=10 μm.

Tissue types of stromata : The perithecia-bearing part in a stroma composed of two layers, textura angularis in outer layer, thick-walled t. angularis to strongly thick-walled t. angularis in inner layer; the basal part of a stroma also composed of two layers, thick-walled or strongly thick-walled t. angularis in outer layer, t. intricata in inner layer which is under the perithecium.

Cultural characters : Colonies white to gray to pale yellowish brown, plumose, aerial hyphae sparce on central part and absent on the other part, margin bayed and submerged, later becoming gray and farinaceous because of the production of a mass of conidia; growth moderate, 40～60 mm diam. in 7 days at 25°C; reverse not stained.

Anamorph : *Geniculosporium* Chesters & Greenhalgh. Conidiophores hyaline at first, later becoming amber to brown; conidia sympodially produced, hyaline to amber, 1-celled, smooth, extremely variable in shape and size, obovoid to oblong or guitar-shaped, 6～20×2.5～7.5 μm.

Specimens examined : *Sphaeria aquila* Fr., on *Cornus florida*, No. 4972, Herb. Berkeley, in K; *Rosellinia aquila* (Fr.) de Not., on *Syringa vulgaris*, Oregon, U. S. A., VIII-1978, Sherwood, ex FH (TNS-F-231144); Shima, Agatsuma, Gunma Pref., 4-IX-1980, Y. A. (TFM-F-12362); on *Quercus acutissima*, Kuji, Ibaraki Pref., 18-IX-1976, Ishii (TFM-F-12650); on *Quercus serrata*, Yazu, Tottori Pref., 28-IX-1962, Takida (TFM-F-12651); on *Quercus acutissima*, Shintou, Kitagunma, Gunma Pref., 29-X-1976, Kenmochi (TFM-F-12652); on *Quercus serrata*, Fujimi, Seta, Gunma Pref., 8-XII-1976, Hikimachi (TFM-F-12653); on *Quercus acutissima*, Meguro, Tokyo, 24-XI-1977, Y. A. (TFM-F-12657); on *Quercus serrata*, Machida, Tokyo, 18-X-1976, Shimizu (TFM-F-12658).

Culture was isolated from the specimen TFM-F-12362.

Habitat : On deciduous woods, especially *Quercus*.

Japanese name : Katatsubu-take (newly named). Based on the specimen TFM-F-12651.

Japanese literature : Hara (1913a; 1927; 1936); Kobayashi *et al.* (1939).

Notes : Tissue types of stromata of this species were rather different from those observed by Dargan and Thind (1979) under a light microscope. They stated the tissues of entostroma as t. angularis to t. subangularis at the base. Conidia in culture were extremely variable in shape and size. Greenhalgh and Chesters (1968) described conidia as ovoid elliptical to cylindrical and their sizes are 3.5～11.5×1.5～4.5 μm. Martin (1968a) described conidia as oval to botuliform with truncate or narrow or convex bases and sizes are 2.5～3.1×3.7～6.8 μm, 3.0×

5.0 μm in average.

Graphostroma platystoma (SCHW.) PIROZYNSKI, Can. J. Bot. 52 : 2131. 1974. (Plate 3)

Stromata at first formed within the periderm, then appeared outside by rupturing the outer periderm, applanate and indefinitely effused, from 5×5 mm to more than 20×20 cm, 0.3 ~1.5 mm thick; ectostroma smooth, grayish brown to dark brown in surface, initially covered with a yellowish white to pale yellow conidial layer, usually with short and simple, occasionally long and branched conidiophores; ectostroma peeled off at maturity revealing endostroma; endostroma dark gray to dark brown to black in surface, appearing smooth in small ostioles, and rough in large ostioles, often with cracks, inside black, carbonaceous; ostioles projecting, varying in shape and size, hemispheric or disk-shaped with central part depressed; perithecia monostichous, oblong or rarely globose, 0.13~0.9 mm high, 0.06~0.25 mm wide; asci cylindric, sp. p. 15~35×3~6 μm with stipe 5~15 μm long, 25~40 (44) μm in total length, with apical rings stained blue in MELZER's reagent, 8-spored; ascospores biseriately arranged, fusiform to allantoid, somewhat tapering at ends, hyaline, 1-celled, 4~9×1~1.5 μm; paraphyses 50~130 μm long, 4~7 μm wide at the base, tapering toward the apex, usually 2~7 septate, numerous.

Tissue types of stromata : In longitudinal section, ectostroma textura angularis or thick-walled t. angularis; surface layer of endostroma t. angularis; perithecia-bearing part in endostroma t. angularis or t. prismatica, or partially strongly thick-walled t. angularis; tissues of ostiole thick-walled t. angularis. Surface of ostiole consisting of pores. Perithecia were directly formed on host tissues.

Cultural characters : Colonies at first white and velvety, then mycerial strands radially produced, finally becoming light brown or partially white to yellowish gray or brown, downy

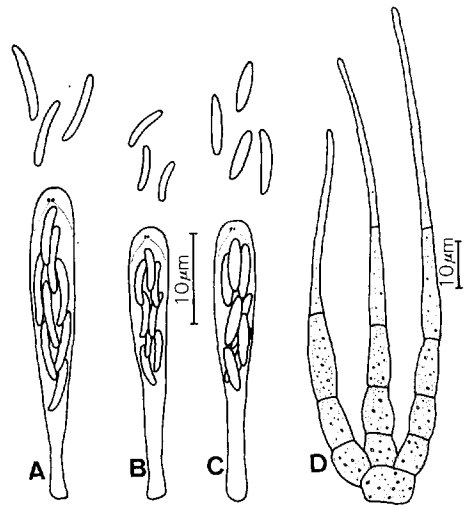

Fig. 5. *Graphostroma platystoma.*
A, B, C. Asci and ascospores.
D. Paraphyses.
A. TFM-F-12142. B. TFM-F-12469. C, D. TFM-F-12290.
Scales=10 μm.

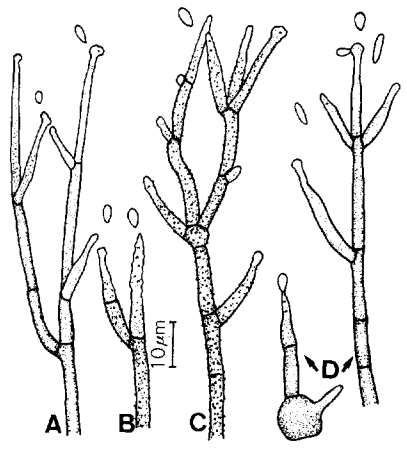

Fig. 6. *Graphostroma platystoma.*
Conidiophores and conidia.
A. TFM-F-12142. B. TFM-F-12469. C. TFM-F-12320.
D. TFM-F-12343.
Scale=10 μm.

to wooly, sometimes small light brown or dark gray mycerial projections formed on colonies; growth moderate to rapid, 30～80 mm diam. in 7 days at 25°C; reverse stained brown to black.

Anamorph : *Nodulisporium*-type. Conidiophores hyaline when young, later becoming brown, vary in shape depending on strains, main axes prominent and frequently branched, or stalks short and sparingly branched; conidia sympodially produced, hyaline to amber, 1-celled, smooth, subglobose to obovoid or oblong to fusiform, 2.5～10×1.5～3 μm.

Specimens examined : *Sphaeria platystoma* Schw., Fr. II. 351, 62 TYPE, in K; *Diatrype platystoma* Schw., on *Acer rubrum*, No. 6347, Pa., Michener, Herb. Berk. 1879, in K; *Sphaeria stigma* Hoffm., No. 342, Car. Sup., Herb. Berk. 1879, in K; Mt. Tsukuba, Ibaraki Pref., 9-VIII-1978, Y. A. (TFM-F-12010); Miyazaki, Miyazaki Pref., 13-X-1978, Y. A. (TFM-F-12075); Higashiusuki, Miyazaki Pref., 11-X-1978, Y. A. (TFM-F-12078); Nagasawa, Yokosuka, Kanagawa Pref., 3-XI-1979, Y. A. (TFM-F-12142); Higashiusuki, Miyazaki Pref., 24-X-1979, Tsunoda (TFM-F-12190); Houkizawa, Ashigarakami-gun, Kanagawa Pref., 1-XII-1979, Y. A. (TFM-F-12193); Matsuzaki, Izu Pen., Shizuoka Pref., 6-III-1980, Y. A. (TFM-F-12290); Mera, Izu Pen., Shizuoka Pref., 7-III-1980, Y. A. (TFM-F-12300); Amagi, Izu Pen., Shizuoka Pref., 8-III-1980, Y. A. (TFM-F-12320); Shima, Agatsuma, Gunma Pref., 28-VI-1980, Y. A. (TFM-F-12343); Kusatsu, Gunma Pref., 3-IX-1980, Y. A. (TFM-F-12351; 12352); Shima, Agatsuma, Gunma Pref., 4-IX-1980, Y. A. (TFM-F-12370); Mt. Fuji, Narusawa, Yamanashi Pref., 24-X-1980, Y. A. (TFM-F-12430; 12435); Mt. Komagatake, Minamiuonuma, Niigata Pref., 5-XI-1980, Y. A. (TFM-F-12453); Shiobara, Tochigi Pref., 18-XI-1980, Y. A. (TFM-F-12469); Iwaki, Fukushima Pref., 21-XI-1980, Y. A. (TFM-F-12487); Iriomote Is., Okinawa Pref., 22-XII-1980, Y. A. (TFM-F-12506); on *Quercus acutissima*, Oita, 1976, Matsuo (TFM-F-12649; 12757; 12759～12764); on *Quercus acutissima*, Higashiusuki, Miyazaki Pref., 29-IX-1976, Aoshima & Tsunoda (TFM-F-12747; 12750～12754; 12758; 12778; 12803); Kiyosumi, Chiba Pref., 22-II-1984, Y. A. (TFM-F-12702); Yamabe, Furano, Hokkaido, 1-X-1984, Y. A. (TFM-F-12720); Saba, Yamaguchi Pref., 26-III-1974, Furukawa (TFM-F-12755); Shizuoka Pref., 1976, Mutou (TFM-F-12756).

Cultures examined (cultures were isolated from the following specimens) : TFM-F-12075; 12078; 12142; 12190; 12193; 12290; 12320; 12343; 12351; 12370; 12469; 12487.

Habitat : On various kinds of deciduous wood, especially *Quercus*.

Japanese name : Nimaigawa-kin (Ohira, Nagasawa and Arita).

Japanese literature : Ohira (1974a); Ohira, Yamamoto and Kinugawa (1975); Ohira, Nagasawa and Arita (1979); Tsunoda and Ando (1981).

Notes : This species was first reported by Ohira *et al.* (1979) from Japan. Surface of endostroma varies because of ostiolar shape. When ostioles are small (less than 0.07 mm diam.), hemispheric and not strongly projected, the surface looks smooth, and it looks rough when ostioles are large (more than 0.1 mm diam.), disk-shaped and/or strongly projected. Collections of smooth surface had generally smaller ascospores of less than 6 μm long (TFM-F-12193; 12351; 12430; 12469; 12506; 12649; 12702; 12758) and collections of rough surface had generally larger ascospores of more than 6 μm long (TFM-F-12010; 12078; 12190; 12290; 12300; 12320; 12370; 12755). However, variations of ascospore sizes were continuous suggesting difficulty in separation. Tissues of ostioles were just the same as in these two types under SEM. Central part of ostiole opens widely in maturity and appears disk-shaped.

Ascospores of Japanese specimens are a little smaller than those described by Pirozynski (1974), as 6.2～6.6×0.6～0.8 μm to 8～10×1.5～1.9 μm. The type specimen of *Sphaeria platystoma* (with no datum) in K had ascospores of 5.5～7.5×1.2～1.4 μm and specimen of No. 6347 again

in K had ascospores of 6.5～7.5×1～1.2 μm.

Pirozynski (l. c.) presumed germ slits were present in ascospores in this species. The writer observed germination of ascospores. On PDA, at first ascospores swell two to three times in size, then germ tubes grow usually from both ends. Germ slits and rigid colored cell walls in ascospores were not observed, though they are essential factors in members of the Xylariaceae. Germination pattern was just the same as in *Diatrype stigma*. Septate paraphyses were also present in immature perithecia of *D. stigma*. Pirozynski placed the genus *Graphostroma* in the Xylariaceae because it has *Nodulisporium*-type anamorph. In this study, the writer observed stromata of this species were made only from fungal elements, though stromata of *D. stigma* consisted of both fungal and host tissues. However, it lacked other characters of the Xylariaceae, e. g. the shape of ascospores and paraphyses. *Graphostroma platystoma* appears to have intermediate characters between the Xylariaceae and the Diatrypaceae. The development of ascocarps should be studied in this species.

Shape of conidiophores in cultures were variable depending on strains, sometimes approaching *Ramichloridium* Stahel apud de Hoog or *Rhinocladiella* Nannf. Jensen (1985) studied the morphology of the peridia of this species and *Rosellinia aquila*.

Diatrype stigma **(Hoffm. : Fr.) Fr.,** Summa Veg. Scand. 2. p. 385. 1849. (Plate 4, 5)

Stromata at first form in bark, becoming superficial by peeling off the outer bark; spore horns (cirri) orange, flowed out through cracks of bark preceding the formation of stromata, conidia produced from undulate acervuli in the bark; stromata applanate, plaster-like, indefinitely effused, from a few mm diam. to more than 10×20 cm, often girdling small branches, dark orange to yellowish brown and finally black in surface, even or undulate depending on the shape of bark, 0.2～0.7 mm thick; endostroma white to yellowish white, woody; ostioles

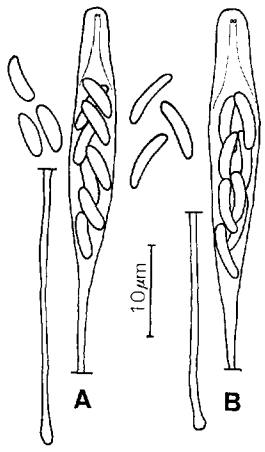

Fig. 7. *Diatrype stigma*.
Asci and ascospores.
A. TFM-F-12765 a.
B. TFM-F-12132.
Scale=10 μm.

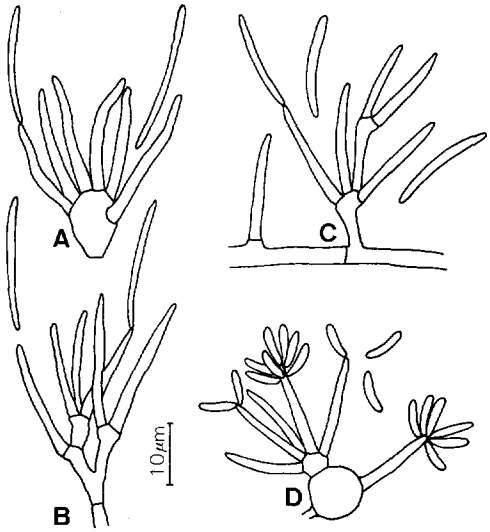

Fig. 8. *Diatrype stigma*.
Conidiophores and conidia.
A, B. TFM-F-12745. C. TFM-F-12713. D. TFM-F-12079.
Scale=10 μm.

black, slightly projecting from the surface, with apices 3 to 4 sulcate; perithecia monostichous, globose to ovoid, 0.2～0.55 mm diam., asci clavate, with apical rings faintly stained in MELZER's reagent, sp. p. 20～40×3.5～6 μm with stipe 10～60 μm long, 8-spored; ascospores biseriately arranged, allantoid, pale yellow, brownish yellow in mass, 5～9.5×1～2 μm; paraphyses present only in immature perithecia, 100～200 μm long, 5～10 μm wide at the base, tapering toward the apex, usually 4～5 septate; ascospores germinated by swelling about three times in size, followed by elongation of germ tubes from one end or both.

Tissue types of stromata : Stromata composed of both fungal elements and host tissues. Tissue type of stromata textura intricata composed of hyphae, 1～4 μm diam.; tissue type of ostioles t. angularis in longitudinal section.

Cultural characters : Colonies white or pale yellow, plumose or felty, later many small mycerial aggregations formed from which orange spore masses produced, sometimes with black sporulating portions; growth rapid, 70～80 mm diam. in 7 days at 25°C; reverse not stained, or partially stained brown to black especially under the part conidia produced, or entirely stained brown to black in some strains; the ability of conidial production diminishes during the storage of cultures.

Anamorph : Anamorph of this species could not be assigned to any form genera now. Conidiophores hyaline, branched, perpendicularly arranged in palisade layers; conidiogenous cells slender, tapering toward the apex, 7～22 μm long, 1～1.5 μm wide at the base; condia produced in percurrent proliferations (annellidic) or in sympodial proliferations, hyaline, 1-celled, smooth, extremely variable in shape, allantoid to filiform, slightly curved in most cases, from 5～8×1～1.4 μm to 18～26×0.6～1.5 μm.

Specimens examined : *Sphaeria stigma* HOFFM., No. 3580, Fla., Pa., MICHENER, Herb. BERK., in K; on *Quercus acutissima*, Higashiusuki, Miyazaki Pref., 29-IX-1976, AOSHIMA & TSUNODA (TFM-F-12049; 12773); Higashiusuki, Miyazaki Pref., 11-X-1978, Y. A. (TFM-F-12077; 12079); Mt. Tsukuba, Ibaraki Pref., 5-X-1979, Y. A. (TFM-F-12099); on *Fagus crenata*, Mt. Asakusa-dake, Tadami, Minamiaizu, Fukushima Pref., 23-X-1979, Y. A. (TFM-F-12128; 12130; 12131; 12132; 12133); Amagi, Izu Pen., Shizuoka Pref., 8-III-1980, Y. A. (TFM-F-12324); Mt. Hijiri, Shizuoka Pref., 24-IX-1980, Y. A. (TFM-F-12401; 12403); on *Fagus crenata*, Mt. Fuji, Yamanashi Pref., 23-X-1980, Y. A. (TFM-F-12414; 12427; 12429); on *Fagus crenata*, Mt. Komagatake, Niigata Pref., 5-XI-1980, Y. A. (TFM-F-12458; 12805); on *Fagus crenata*, Shiobara, Tochigi Pref., 18-XI-1980, Y. A. (TFM-F-12463); Iwaki, Fukushima Pref., 21-XI-1980, Y. A. (TFM-F-12479); on *Fagus crenata*, Mt. Kurikoma, Miyagi Pref., 30-IX-1982, Y. A. (TFM-F-12617); on *Fagus crenata*, Mt. Asakusa-dake, Tadami, Minamiaizu, Fukushima Pref., 7-X-1982, Y. A. (TFM-F-12630; 12632); on *Quercus acutissima*, Tano, Miyazaki Pref., 6-X-1976, FURUKAWA (TFM-F-12648; 12765 a; 12767 a); on *Quercus acutissima*, Oguni, Kumamoto Pref., XII-1973, FURUKAWA (TFM-F-12654); Kiyosumi, Chiba Pref., 22-II-1984, Y. A. (TFM-F-12699); on *Betula*, Yamabe, Furano, Hokkaido, 1-X-1984, Y. A. (TFM-F-12713); Yamabe, Furano, Hokkaido, 30-IX-1984, Y. A. (TFM-F-12729); on *Quercus*, Kukizaki, Inashiki, Ibaraki Pref., 30-X-1984, Y. A. (TFM-F-12745; 12746); on *Quercus crispula*, Hakone, Kanagawa Pref., 21-V-1949, TERAMOTO (TFM-F-12766); on *Quercus serrata*, Shizuoka Pref., 1976, MUTOU (TFM-F-12768; 12770); on *Quercus acutissima*, Takahagi, Ibaraki Pref., 11-VII-1975, FURUKAWA (TFM-F-12769; 12775); on *Quercus acutissima*, Iwate Pref., VII-1971, NONOICHI (TFM-F-12774); Tano, Miyazaki Pref., 6-X-1976, FURUKAWA (TFM-F-12776); Miyazaki, Miyazaki Pref., 13-X-1978, Y. A. (TFM-F-12777); on *Quercus acutissima*, Kukizaki, Inashiki, Ibaraki Pref., VI-1980, Y. A. (TFM-F-12804); Miyake-jima Is., Tokyo, 22-VIII-1982,

Table 1. Comparison of characteristics in teleomorphs and anamorphs of 15 collections of *Diatrype stigma*.

No. of specimen TFM-F-	Thickness of stroma (mm)	Diameter of perithecia (mm)	Size of asci sp. p. (μm)	Size of ascospores (μm)	Host	Size of conidia in culture (μm)	Conidial ontogeny
12713	0.5～0.65	0.25～0.4	30～35 × 4	5～7 × 1.2～1.5	B	18～23 × 0.8～1.5	A
12132	0.25～0.45	0.13～0.2	25 × 4～5	6～7 × 1～1.5	F	8～17 × 1	—
12133	0.3～0.4	0.2～0.3	30～40 × 5	6～7.5 × 1～1.5	F	13～20 × 0.6	—
12458	0.25～0.4	0.15～0.2	30～38 × 4～5	5～7.5 × 1～1.5	F	12～20 × 0.6～1.5	A, S
12617	0.25～0.4	0.13～0.2	25～30 × 4～5	5～7 × 1.2～1.5	F	12～23 × 1～1.2	A
12630	0.3	0.15～0.25	30～35 × 5～6	6.5～8.5 × 1～1.5	F	15～20 × 0.8～1.2	A
12049	0.55	0.25～0.3	28～38 × 4	6～7.5 × 1～1.5	Q	9～23 × 0.8～1.2	A
12745	0.3～0.5	0.2～0.35	30～40 × 4～5	5.5～9 × 1.5～1.8	Q	14～26 × 0.6～1	A
12746	0.35～0.5	0.2～0.3	30～40 × 4～5	5～7.5 × 1.2～1.5	Q	15～25 × 0.6～1.2	A
12077	0.5～0.65	0.2～0.4	30～35 × 4～5	6～8.5 × 1.5～2	U	9～13 × 0.6～1.5	A, S
12079	0.3～0.45	0.2～0.3	30～38 × 5～6	6～8.5 × 1.5～2	U	5～8 × 1～1.4	S
12099	0.35～0.5	0.13～0.2	28～38 × 4～4.5	5～8.5 × 1.2～1.8	U	15～20 × 0.6	—
12479	0.2～0.3	0.13～0.2	28～38 × 4～5	5.5～7.5 × 1.5～1.8	U	12～14 × 1	S
12699	0.25～0.3	0.13～0.2	23～28 × 4～5	5～7 × 1.2～1.5	U	18～26 × 0.6～1.2	A
12729	0.45～0.55	0.25～0.3	33～40 × 4～5.5	7～9.5 × 1.6～1.8	U	10～26 × 0.6～1.4	A, S

* B=*Betula*, F=*Fagus*, Q=*Quercus*, U=Undetermined wood, A=Annellidic, S=Sympodial, —=Not observed. Sp. p.=the spore bearing part of the ascus.

Doi (TNS-F-198508).

Cultures examined (cultures were isolated from the following specimens) : TFM-F-12049; 12077; 12079; 12099; 12132; 12133; 12458; 12479; 12617; 12630; 12699; 12713; 12729; 12745; 12746.

Habitat : On various kinds of deciduous woods, especially *Fagus* and *Quercus*.

Japanese name : Shitone-take (Yasuda).

Japanese literature : Yasuda (1919); Kobayashi *et al.* (1939); Ohira (1974a; 1974b); Ohira, Yamamoto and Kinugawa (1975); Tsunoda and Ando (1981).

Notes : There seems to be difference of opinions in the taxonomy of *Diatrype stigma*. Nitschke (1867), Ellis and Everhart (1892), and Glawe and Rogers (1984) stated the difference in ascospore sizes. Various conidial sizes were reported by Tulasne and Tulasne (1863), Füisting (1867), and Nitschke (1867) under natural conditions and by Wehmeyer (1926a), Prášil *et al.* (1973), and Glawe and Rogers (1982) in cultural studies. Glawe and Rogers (1982; 1984) suggest the name of *D. stigma* has been applied to more than one taxon, and they (1984) tentatively divide *D. stigma* into five groups of collections based on sizes of ascospores and conidia, and stromatal features. Collections studied herein seem to fit to their collection group 4 and 5.

Septate paraphyses were observed in immature perithecia (e. g. TFM-F-12713; 12767a). These paraphyses closely resemble those of *Graphostroma platystoma*. Wehmeyer (1926b) stated that paraphyses are formed, but gelatinize by the time perithecium is mature in Diatrypaceae (Allantosphaeriaceae).

Conidia obtained in pure cultures were extremely variable in size depending on strains and even within one culture. They were filiform in most cases, but allantoid in cultures of TFM-F-12077 and 12079. Conidial ontogeny was studied under a differntial interference microscope (DIF) and under SEM. Sizes of conidia and their conidiogenesis are shown in Table 1. Glawe and Rogers (1982) observed only percurrent proliferation in a culture of *D. stigma* under DIF, but they presumed this species has also sympodial proliferation as did other species of *Diatrype* and *Diatrypella* they studied. Cultures of 12 strains were observed in this study. Among them, 6 strains had only percurrent proliferation, 2 strains only sympodial proliferation, and 3 strains both modes of proliferation. There seemed to be tendency that allantoid conidia were sympodially proliferated and filiform ones percurrently proliferated. Annellations have been more frequently and clearly observed in recently isolated cultures (e. g. TFM-F-12745; 12746) than those stored for several years (e. g. 12049). There was no distinct morphological difference in teleomorphs of these collections, though their anamorphs were extremely variable. *D. stigma* apparently has two modes of conidiogenesis. The writer observed that one material, which seemed to be an anamorph of *D. stigma* under natural condition, also had annellations on conidiogenous cells. Annellations were observed not only under DIF but also under SEM, though Glawe and Rogers (1982) stated they had been observed only under DIF in *D. stigma*.

Anamorphs of *D. stigma* have been usually assigned to *Libertella* Desm. and *Naemospora* Pers. : Fr. (von Arx, 1970; 1981; Kendrick and DiCosmo, 1979). Species have been assigned to *Naemospora* in cases where conidia are allantoid or rod-shaped, and have been assigned to *Libertella* in cases where conidia are filiform or acicular (e. g. Von Arx, l. c.). Croxall (1950) studied anamorphs of *Diatrypella* species and stated that spores of these species are meristem phialospores. He also said that separation of *Naemospora* and *Libertella* seems to be unjustifiable. Barron (1968) interpreted *Libertella* as phialidic. Sutton (1973; 1980) says *Libertella* is holoblastic and sympodial. He (1977) concludes *Naemaspora* Pers. : Fr. is nomina nuda and

recommends use of *Roscoepoundia* O. Kz.* However, conidial ontogeny has not yet been studied in either *Naemospora* or *Roscoepoundia*. As Glawe and Rogers says (1982; 1984), anamorphs of *D. stigma* should not be assigned to these form genera until taxonomic limits of these form genera are determined.

Yasuda (1919) first reported *D. stigma* from Japan and gave it a Japanese name. However, specimens he cited have not been found so far. He stated that ascospores were hyaline and ostioles were papillate, while surface of stroma appeared to be covered with minute warts. His description suggests he mixed up *D. stigma* and *Graphostroma platystoma*. Hara (1919) also reported on *D. stigma*, but it is apparent from his description and illustration that he misidentified another *Diatrype* species as *D. stigma*.

Acknowledgements

I am extremely grateful to the curators of the Royal Botanic Gardens, Kew and U. S. National Fungus Collections, to Dr. Yoshimichi Doi, National Science Museum, Tokyo, for loans of specimens. I should like to thank many individuals for collecting specimens. I owe my sincere thanks to Dr. Shunichi Yokota, Director, Forest Protection Division, Dr. Haruyoshi Saho, Chief, Forest Pathology Section, Dr. Tsuneo Watanabe, Chief, Forest Mycology Laboratory of the Forestry and Forest Products Research Institute, for criticism of the manuscript.

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* The genus *Naemospora* has some taxonomic problems. It was created by Persoon (1796) as *Naemaspora*, later Saccardo (1884) corrected it as *Naemospora* probably from the Latin compound. Sutton (1977) says lectotype species of *Naemaspora* should be *N. crosea* Pers. : Fr. Because this species is also the type species of *Myxosporium*, and is based on a mixture of different fungi, he concludes both genera should be regarded as nomina nuda. Von Arx (1981) chose *Naemospora microspora* Desm. as a lectotype species of *Naemospora* Pers. : Fr. This species was not described by Persoon, but was later described by Desmazières, and sanctioned by Fries (1832), then this species is included in original species. Von Arx's choice is allowed under the new Sydney Code of International Botanical Nomenclature as explained by Korf (1982) and the genus *Naemospora* Pers. : Fr. is validated.

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* In Japanese

** In Japanese with English summary

Explanation of plates

Plate 1. *Hypoxylon truncatum.*

A. Stromata of *bovei*-type collection (TFM-F-12695).
B. Stromata of *marginatum*-type collection (TFM-F-12489).
C, D. Stromata of *trunctum*-type collections (C=TFM-F-12813; D=TFM-F-12210).
E. Longitudinal section of basal part of a stroma in *bovei*-type collection (TFM-F-12326). By SEM.
F. Longitudinal secton of basal part of a stroma in *marginatum*-type collection (TFM-F-12350). By SEM.
G. Ascus (TFM-F-12489).
H. Germination of ascospores. By SEM.
I. Culture on PDA (TFM-F-12502).
(Scales : A～D=1 mm; E, F=100 μm; H=10 μm).

Plate 2. A～C. *Hypoxylon howeianum.* D～G. *H. fuscum.* H～L. *Rosellinia aquila.*

A. Stromata (TFM-F-12080).
B. Ascus (TFM-F-12074).
C. Culture on PDA (TFM-F-12692).
D. Stromata (TFM-F-12646).
E. Effused stromata (TFM-F-12197).
F. Ascus (TFM-F-12646).
G. Culture on PDA (TFM-F-12122).
H. Stromata (TFM-F-12651).
I. Ascus (TFM-F-12362).
J. Culture on PDA (TFM-F-12362).
K. Longitudinal section of perithecia-bearing part in a stroma (TFM-F-12650). By SEM.
L. Longitudinal section of basal part of a stroma (TFM-F-12650). By SEM. P=Perithecium. (Scales : A, D, E, H=1 mm; K=10 μm; L=100 μm).

Plate 3. *Graphostroma platystoma.*

A, B. Stromata (A, TFM-F-12757; B, TFM-F-12290).
C. Longitudinal section of ectostroma (arrow) and endostroma (TFM-F-12469). By SEM.
D. Longitudinal section of endostroma (TFM-F-12764). By SEM.
E. Surface of ostiole (TFM-F-12290). By SEM.
F. Germination of ascospores (TFM-F-12720).
G. Conidiophores and conidia on ectostroma (TFM-F-12763). By SEM.
H, I. Cultures on PDA (H, TFM-F-12320; I, TFM-F-12351).
O=Ostiolum. P=Perithecium. (Scales : A, B=1 mm; C=100 μm; D, E, F=10 μm; G=1 μm).

Plate 4. *Diatrype stigma.*

A. Stroma on *Quercus acutissima* (TFM-F-12648).
B. Stroma on *Fagus crenata* (TFM-F-12132).
C. Longitudinal section of a stroma (TFM-F-12414). By SEM.
D. Spore horns on bark (TFM-F-12804).
E, F. Conidiophores and conidia produced in bark under natural condition. Arrow in-

dicates annellated region. By SEM.

G. Septate paraphyses and immature asci (TFM-F-12713). By phase contrast microscopy.

H. Germination of ascospores (TFM-F-12746).

O=Ostiolum. P=Perithecium. (Scales : A, B=1 mm; C, E, H=10 μm; F=1 μm).

Plate 5. *Diatrype stigma* in culture.

A. Culture on PDA (TFM-F-12746).

B. Conidiophores bearing conidia (TFM-F-12077). Arrow indicates sympodial proliferation. By SEM.

C. Conidiophore bearing conidia (TFM-F-12079).

D. Conidiophore bearing conidia (TFM-F-12458). Arrow indicates sympodial proliferation. By DIF.

E. Conidiophore bearing conidium (TFM-F-12458). Arrow indicates annellations (TFM-F-12458). By DIF.

F. Conidiogenous cells with annellations (TFM-F-12617). Arrows indicate annellations. By DIF.

G. Conidiophores bearing conidia (TFM-F-12630). Arrow indicates annellations. By SEM.

H. Conidiophores bearing conidia (TFM-F-12729). Arrow indicates annellations. By SEM.

(Scales : B, G, H=10 μm).

わが国の広葉樹材上に見出されるクロサイワイタケ科およびシトネタケ科菌類について　第1報

阿　部　恭　久(1)

摘　　要

クロサイワイタケ科およびシトネタケ科菌類の多くの種は広葉樹枯幹・枯枝上にしばしば発生し，材質腐朽を引き起す。これらの菌類の一部の種は栽培きのこのほだ木上に発生し，特にシイタケ栽培においては植菌された種菌の菌糸の蔓延をさまたげることで問題となっている。わが国ではこれらの菌類に関していくつかの報告が出されているが，形態的な変異が大きい種が多いこともあり，未だ充分な分類学的・形態学的検討はなされていない。本報告では6種について不完全時代を含めて分類学的・形態学的検討を加えた。

（1）　*Hypoxylon truncatum* (Schw. : Fr.) Miller (和名：クロコブタケ)

黒色で極めて堅い子座を有し，子のう殻孔口の周囲に小さな円盤状組織があることが特徴である。ほだ木上に最も多く見出される種であるが子座の形態は極めて変化に富む。今回仮に *bovei*-type (子のう殻数個からなる子座が分散して形成されるもの)，*marginatum*-type (子座が半球形のもの)，*truncatum*-type (子座が不定形に平らに広がるもの) の3グループに類別した。種々の広葉樹枯幹・枯枝上，特にコナラ属枯幹・枯枝上。

（2）　*H. howeianum* Peck (和名：ヒメアカコブタケ)

暗褐色の半球形の子座を有することが特徴である。アカコブタケと外見上区別がつかないが子のう胞子はより小形である。しかし両者の中間形も存在する。アカコブタケは主にブナ上に発生し，クヌギ・コナラ上には現在のところヒメアカコブタケだけが見出されている。主としてコナラ属枯幹・枯枝上。

（3）　*H. fuscum* Pers. : Fr. (和名：ハンノキコブタケ)

暗赤紫色の小さな半球形の子座を有することが特徴であるが，まれに子座はやや平たく広がる。シラカンバ属・ハンノキ属の枯幹・枯枝上。

（4）　*Rosellinia aquila* (Fr.) de Not. (和名：カタツブタケ，新称)

一見クロコブタケに似るが子のう殻孔口の周囲には特別な組織はない。子のう殻1個からなる黒褐色の小さな球形の子座が分散して形成されるのが特徴である。多くの場合子座の周囲に暗褐色の菌糸のマットが存在する。子のう胞子は大型。分生胞子の形・大きさは変化に富む。広葉樹，主にコナラ属枯幹・枯枝上。

（5）　*Graphostroma platystoma* (Schw.) Pirozynski (和名：ニマイガワキン)

黒色の堅いコウヤク状の子座を形成する。子座は上下2層からなり，成熟すると薄い上層部は剝離する。現れた下層部の子座の表面は子のう殻孔口の大きさによって滑らかに，あるいはざらついて見えるが

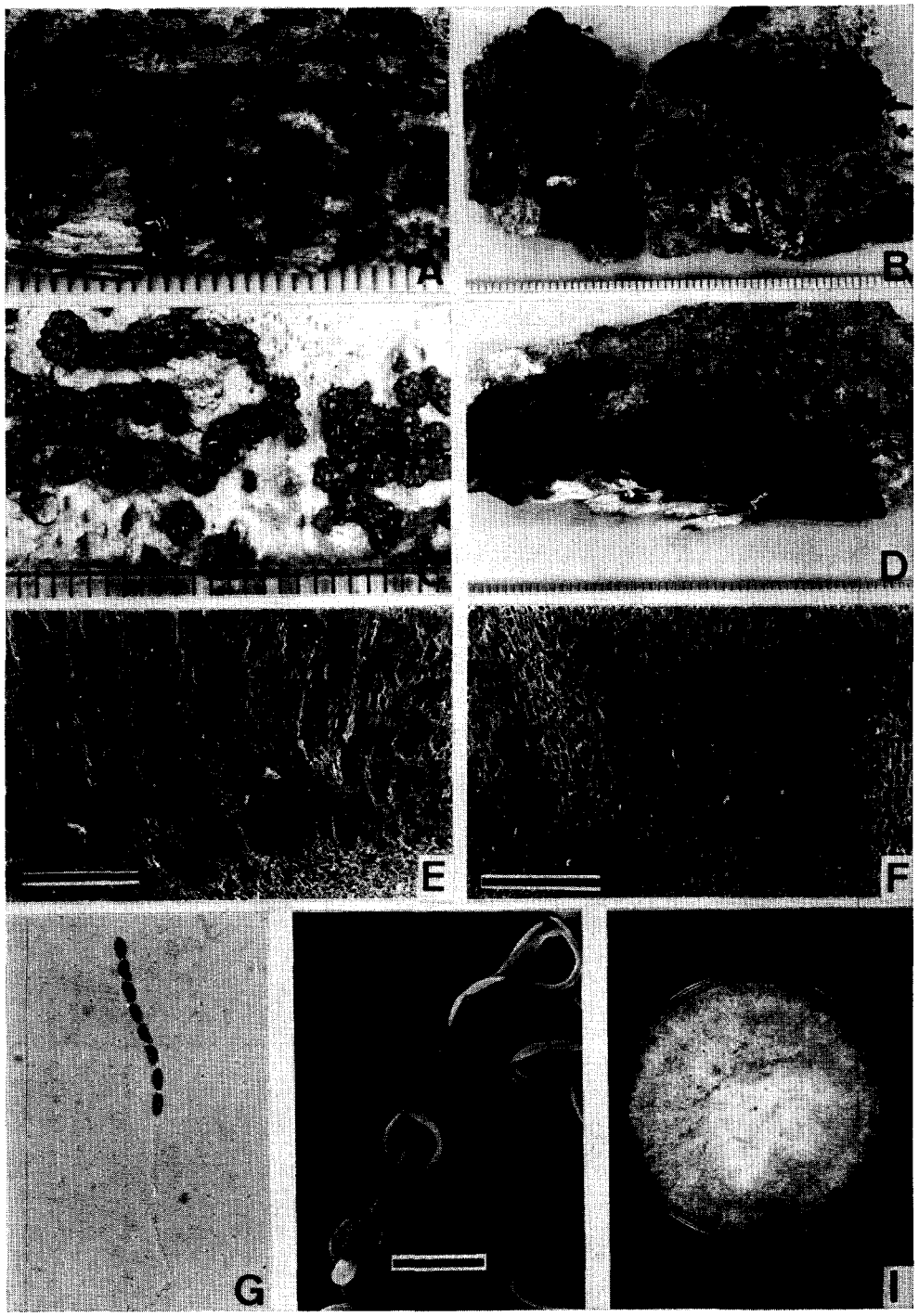
1985年9月17日受理

(1) 保　護　部

組織的には違いはない。本邦産の標本の中には外国産の標本に較べやや子のう胞子の小さいものが存在するが，胞子の大きさの変異は連続的である。子のう胞子は無色。Pirozynski は本種をクロサイワイタケ科に位置づけたが，形態的に検討するとクロサイワイタケ科とシトネタケ科の中間的性質を有するように思われた。種々の広葉樹枯幹・枯枝上。

（6） *Diatrype stigma* (Hoffm. : Fr.) Fr.（和名：シトネタケ）

褐色，木質のコウヤク状の子座を形成するが古くなると表面は黒色となる。子のう胞子は薄黄色で，多数集合すると薄黄茶色に見える。本菌は安田により我が国からはじめて報告されたが，それらの標本は現在のところ紛失している。安田の記載には本種の形状と一致しない点があることから，安田は本種とニマイガワキンを混同していたのではないかと思われる。そこで今回改めて林業試験場菌類標本 TFM-F-12648 を本種の和名の基礎標本として再指定することを提案する。培養には二つの分生胞子形成様式が存在することが確認された。種々の広葉樹樹皮上，特にコナラ属・ブナ属上。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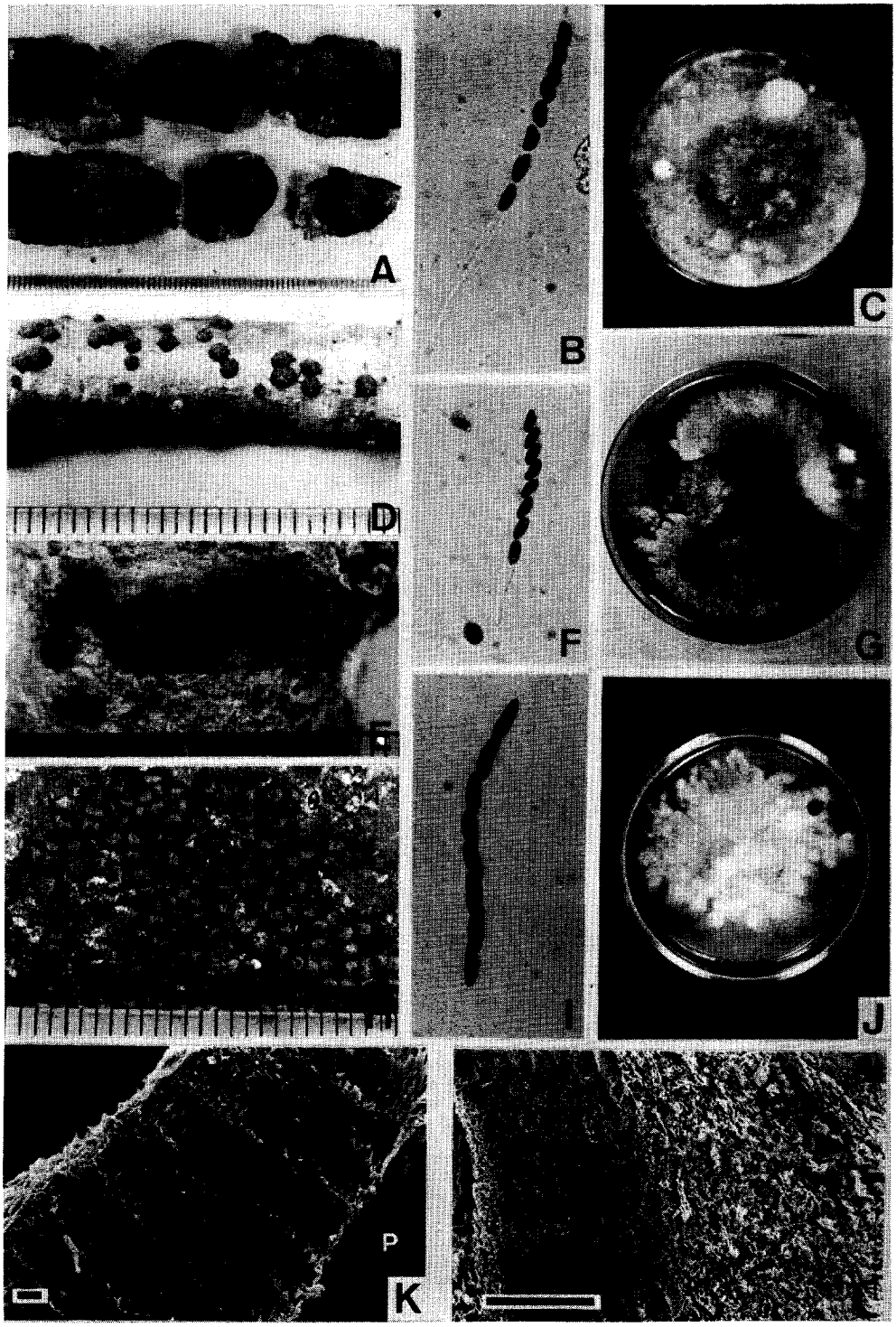
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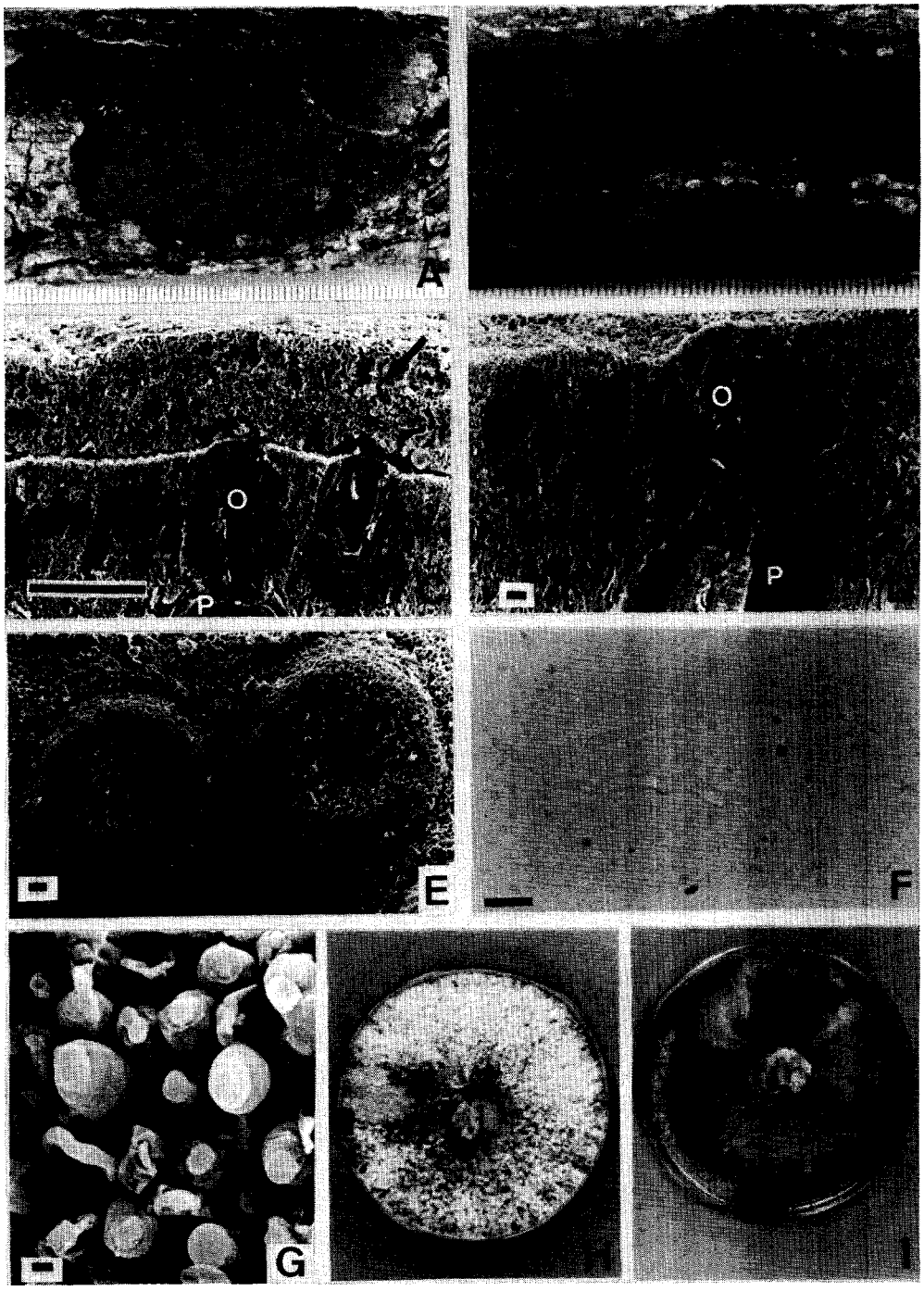
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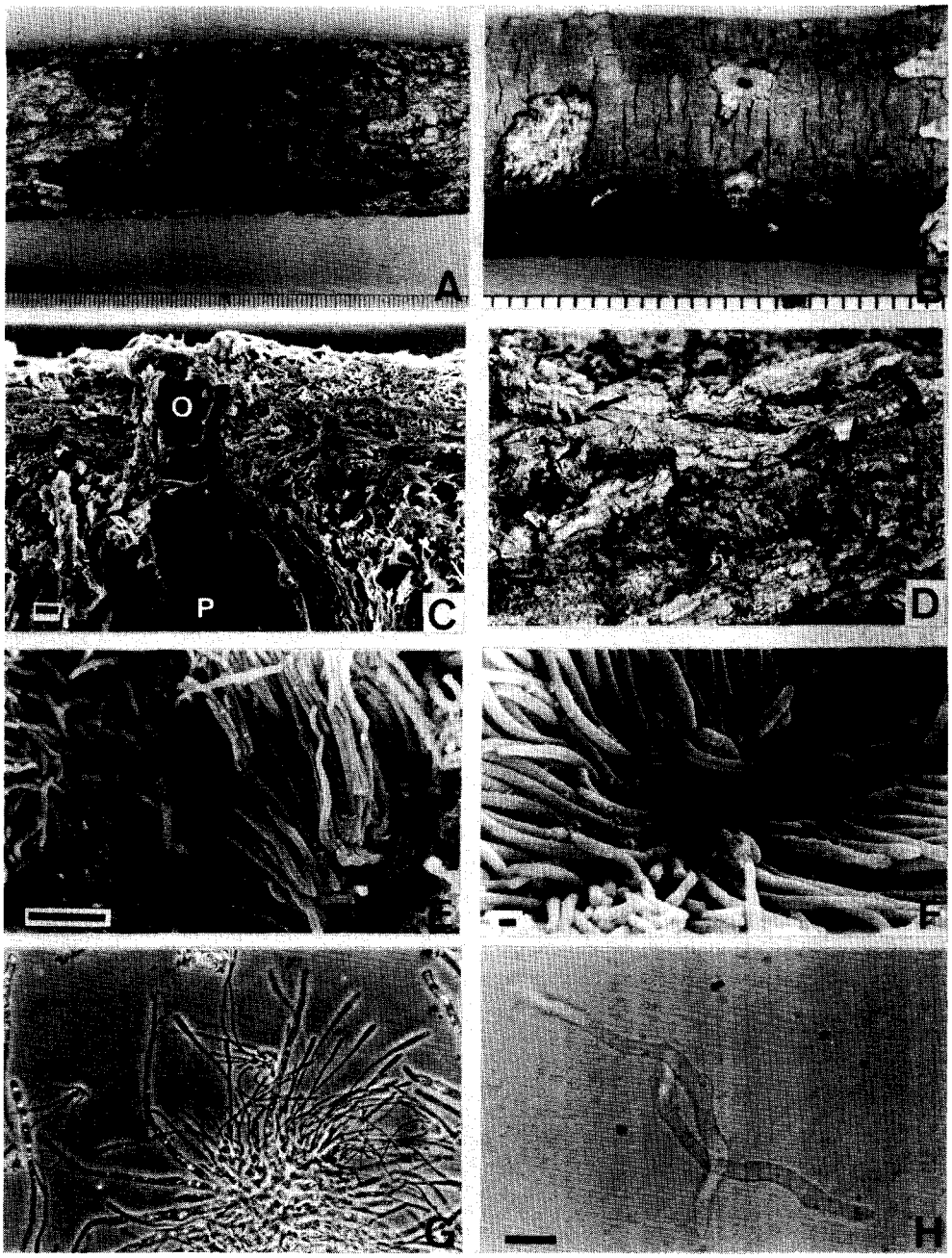
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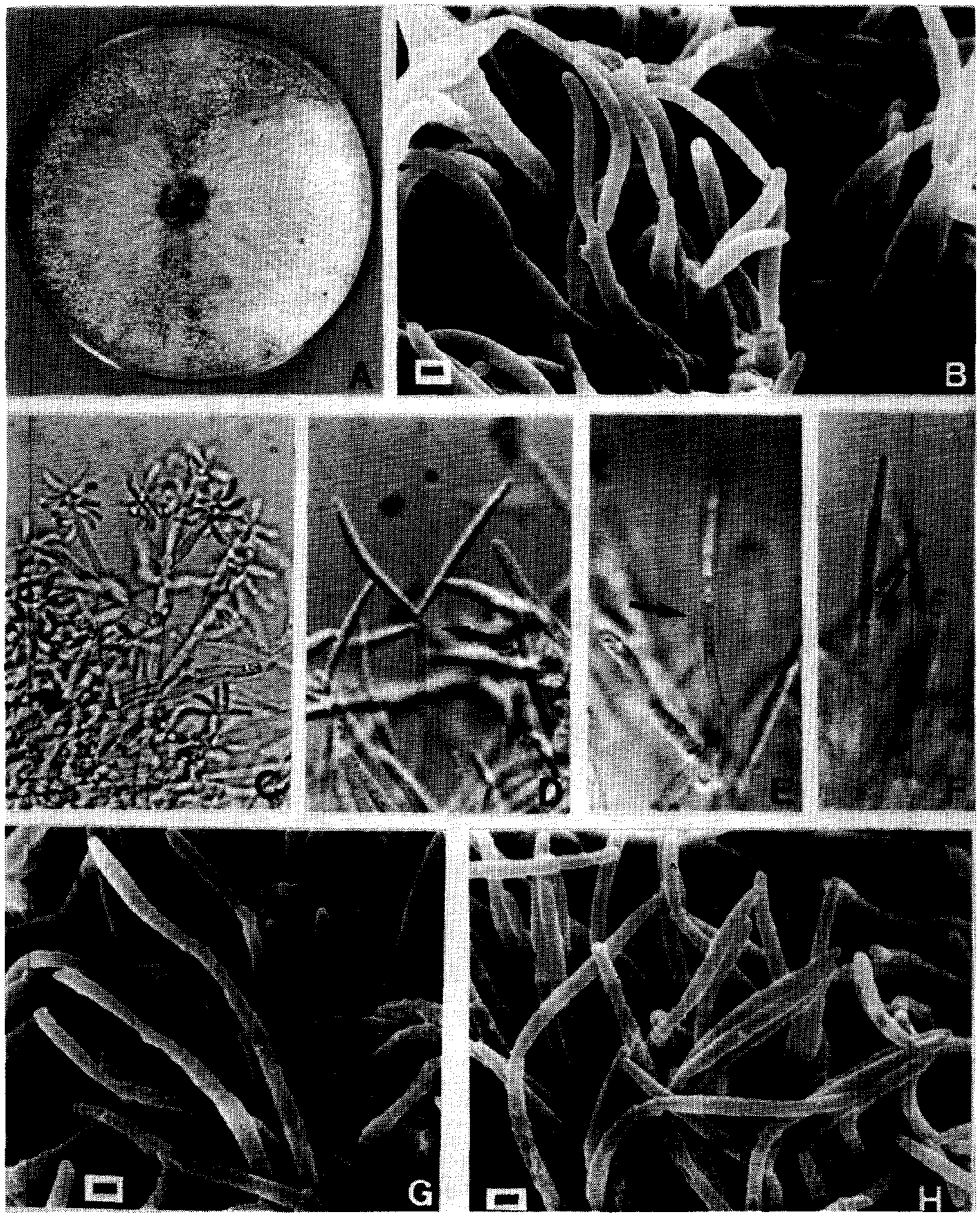
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