STUDIES ON THE SYNNEMATOUS FUNGI IMPERFECTI. I

by

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(with 9 figs.)

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This paper constitutes the first in a series concerning the nomenclature, descriptions, and distribution of genera and species of the Stilbellaceae. Two genera and three species are proposed here as new taxa.

Pseudographiella gen. nov.

Synnemata recta, simplicia, fusca, stipite atque capitulo bene definito; conidiophora (apices liberi hypharum synnematis) divergentia, fertilia ad apicem; conidia fusiforma vel falcata, septata, mucosa, singulariter vel catenulate producta.

Synnemata erect, simple, dark, with well-defined stalk and head; conidiophores (free ends of hyphae of synnema) diverging, fertile at the tip; conidia fusiform to falcate, septate, mucoid, produced singly and in chains.

Pseudographiella variaseptata sp. nov.

Synnemata recta vel curva, usque ad 1.5 mm altitudine, usque ad 35 μ lata sub capitulo, usque ad 60 μ lata ad basim; stipites sursum attenuati, compositi ex hyphis longitudinalibus, aliquantulum paralleles, densis, fuscis, septatis, divergentibus ex stipite ad capitulum; conidiophora fusca, exalbescentia et tandem hyalina ad apices, septata, ramosa, ferentia sporas singulas vel breves catenulas faciliter disiunctas; conidia fusiforma vel aliquando falcata, hyalina, fere 1-septata (aliquando 2—3 septata) guttulata, 11—18 $\times$ 1—2 μ.

Type specimen: On *Geoglossum glabrum*?, Hebden Bridge, Crossland, England, November 1894, G. MASSEE (identified as *Harpographium rhizomorpharum*) (NY).

Synnemata straight or bent, up to 1.5 mm tall, up to 35 μ wide below head, up to 60 μ wide near base; stipes attenuated upward,

composed of longitudinal, more-or-less parallel, closely-compacted, dark, septate hyphae which diverge apically to form the heads; conidiophores dark, becoming paler and finally hyaline near the tips, septate, branched, bearing spores singly or in easily separated short chains; conidia fusiform, occasionally slightly curved to falcate, hyaline, usually 1-septate (sometimes 2—3 septate), guttulate, 11—18 × 1—2 μ.

This fungus was obtained on loan from the New York Botanical Garden where it is now deposited. The packet label indicated that the specimen was identified as *Harpographium rhizomorpharum* MONT. by G. MASSEE. All of the species of the genus *Harpographium* have 1-celled, fusiform to falcate spores which are borne dry (MORRIS, 1962). This fungus does have fusiform and occasionally falcate spores, however, the septate nature of the spores is quite evident. Also, the spores are produced in a mucus. These characters preclude the placing of this fungus in the genus *Harpographium*. Other than spore shape, the fungus bears only a slight resemblance to a *Harpographium*. Except for the shape and septate character

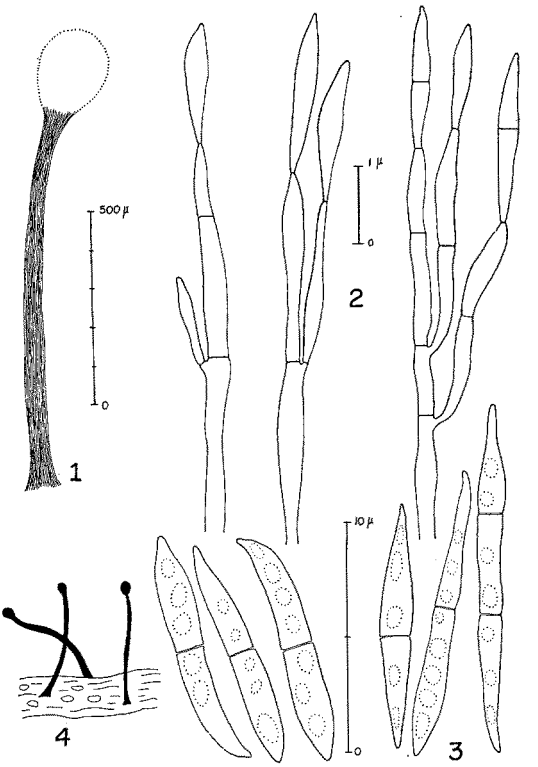

Fig. 1. *Pseudographiella variaseptata*. 1. Synnema; 2. Conidiophores with developing conidia; 3. Mature conidia; 4. Habit.

of the spores, the fungus appears somewhat as a *Graphium*.

Pseudographiella is classified in the group Phragmosporae, section Phaeostilbelleae, Stilbellaceae, Moniliales of the Fungi Imperfecti.

Phragmographium gen. nov.

Synnemata recta, simplicia, fusca, ornata stipite et capitulo; composita ex medio cylindro fertilium hypharum cum cortice sterilium hypharum; conidia multiseptata, fusiformata vel falcata, prolata singillatim et acrogenose ad apices conidiophorum, mucosa.

Synnemata erect, simple, dark, with stipe and head; composed of a central cylinder of fertile hyphae with a cortex of sterile hyphae; conidia multiseptate, fusiform to falcate, mucoid, produced singly and acrogenously at apices of conidiophores.

Phragmographium ulmi sp. nov.

Synnemata fusca vel nigra, usque ad 0.7 mm altitudine, cylindrica vel aliquando radians ad apices, 100—150 μ crassa ad basim, 60—140 μ crassa in medio, usque ad 300 μ crassa ad apicem; interiori regione fertili composita ex hyalinis vel hyphis pallidis, septatis, ramosis; exteriori regione sterili composita ex hyphis fuscis, parallelis, inramosis, septatis; conidia 7—10 septata, hyalina, saepe mediis (5—7) cellulis pallide brunneis attenuatis; fusiformata vel falcata, guttulata, singillatim atque acrogenose producta, mucosa, 55—60 $\times$ 2—3 μ.

Synnemata dark brown to black, up to 0.7 mm high, cylindrical or sometimes flaring-out at apices, 100—150 μ wide at base, 60—140 μ wide near center, up to 300 μ wide at apex; inner fertile region composed of hyaline or pale, septate, branched hyphae, outer sterile region composed of dark brown, parallel, unbranched, septate hyphae; conidia 7—10 septate, hyaline, often with central (5—7) cells becoming pale brown, fusiform to falcate, guttulate, produced singly and acrogenously, adhering in mucoid mass, 55—60 $\times$ 2—3 μ.

Specimens examined: On bark of fallen elm branch, developed in moist chamber, Iowa City, Iowa, 31 Dec. 1961, collected by G.W. MARTIN, No. 6462 (TYPE)(IA); On bark of living elm, developed in moist chamber, Macomb, Ill., 22 Feb. 1962, collected by D. E. FINLEY, EFM 252; On bark of living elm, developed in moist chamber, Macomb, Ill., 15 Sept. 1962, collected by D. E. FINLEY, EFM 270.

This unique fungus has been found only on the bark of the American elm, *Ulmus americana* L. In each instance it appeared on bark which had been placed in moist chamber. All attempts to obtain the fungus in culture have failed. The possession of phragmospores which are produced in mucus and the thick stipes which are surrounded by a layer of sterile hyphae serve to distinguish the fungus from other known synnematous genera.

Phragmographium is classified in the group Phragmosporae, section Phaeostilbelleae, Stilbellaceae, Moniliales of the Fungi Imperfecti.

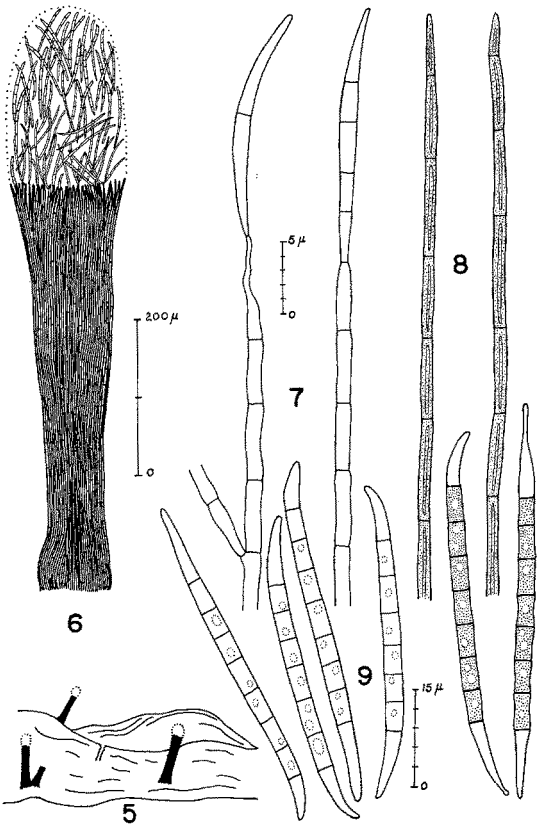

Fig. 2. *Phragmographium ulmi*. 5. Habit; 6. Synnema; 7. Conidiophores with developing conidia; 8. Sterile hyphae; 9. Mature conidia.

Dendrostilbella bonari sp. nov.

Synnemata capitata, solitaria vel aggregata, primo rubro-flavus, deinde pallidioria attenuata, 1—2.5 mm altitudine attingentia, 170—400 μ crassa ad basim; stipites sursum attenuati, superficiebus opertis hyphis prominentibus, fere 10 μ longis; capitula globosa, 0.3—0.6 mm crassa, mucosa; conidiophoris bifurcatis vel verticillatis, 35—50 μ longis, 2—3 μ diametra, hyalina; conidia producta singillatim et acrogenose ex apicibus ramulorum terminalium conidiophororum, continua, hyalina, ellipsoidis vel tenuiter obovoidis, 6—7.5$\times$2.3 μ.

Type specimen: On dead branches of pecan (*Carya illinoensis*

(WANG.) K. KOCH), Durham, North Carolina, 8 July 1963, collected by LEE BONAR (UC).

Synnemata capitate, single or clustered, at first reddish-orange becoming lighter in age, 1—2.5 mm high, 170—400 μ wide at bases; stipes attenuated upward, surfaces covered with hyphal projections averaging 10 μ in length; heads globose, 0.3—0.6 mm wide, mucoid; conidiophores bifurcate to verticillate, 35—50 μ long, 2—3 μ in diameter, hyaline; conidia borne singly and acrogenously, continuous, hyaline, ellipsoidal to slightly obovoid, 6—7.5 $\times$ 2.3 μ.

The possession of short hyphal projections along the surfaces of the synnematal stalks serve to separate the fungus from other species of *Dendrostilbella*. Also, the spore size differs greatly from that of other known species (SACCARDO, 1906 & 1931). The genus *Dendrostilbella* is closely related to the genus *Stilbella*. Except for the dendroid-venticillate branching of the conidiophores, they appear to be congeneric.

Summary

Pseudographiella with the type species, *P. variaseptata*, and *Phragmographium* with the type species, *P. ulmi*, are described as new synnematous taxa. Both of these new species produce phragmospores. In addition, a new species of *Dendrostilbella*, *D. bonari*, is described as new.

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