

**A DACTYLELLA WITH CONIDIA RE-  
SEMBLING THOSE OF DACTY-  
LELLA STENOBROCHA IN  
SIZE AND SHAPE**

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(WITH 1 FIGURE)

Several maize-meal-agar plate cultures, which, after being overgrown with mycelium of *Pythium mamillatum* Meurs, had been further planted with small quantities of leaf mold collected in deciduous woods near Newport News, Virginia, on October 15, 1948, became abundantly infested in about ten days with free-living nematodes as well as with different species of *Amoebae* and testaceous rhizopods. In all the cultures the eelworms then began to suffer losses from the capture and destruction of many individuals by the predacious hyphomycete I described earlier (2: 508-513) as *Dactylella gephyropaga*. After this hyphomycete had extended its mycelium throughout the substratum it continued for weeks to destroy eelworms and to produce conidia on its sparsely scattered conidiophores. Two of the cultures on being examined 35 days after the leaf mold had been added showed, besides, in areas near the deposits of forest detritus some development of erect conidiophores that bore solitary conidia manifestly alien not only to *Dactylella gephyropaga* but also to all congeneric species hitherto made known. During the ensuing weeks the new fungus gradually spread over both of the aging cultures, putting forth additional conidial apparatus rather sparingly though in ample quantity for study.

The colorless procumbent mycelial filaments (FIG. 1, A-D: a) from which the erect conidiophores (FIG. 1, A-D: b) of the new

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fungus arose were of moderate width for members of the predacious series, and like the hyphae of allied forms were divided at moderate intervals by commonplace cross-walls. The conidiophores similarly offered little distinctiveness. As their height did not usually exceed  $400\ \mu$ , they appeared in general a little shorter than the intermixed conidiophores of *Dactylella gephyropaga*. From a comparison of measurements they would seem, perhaps, on the whole, somewhat shorter also than the conidiophores of my *Dactylella stenobrocha* (5) and my *Dactylella heterospora* (3), though the dimensional differences concerned here are not impressive for descriptive purposes. While the conidiophores of the new fungus, as a rule, were simple (FIG. 1, A-C: b) and regularly produced a single conidium (FIG. 1, A, c) at the tip, in occasional instances (FIG. 1, D, b) they gave off a lateral branch (FIG. 1, D, c) from which a second conidium would be abjoined. When eventually a denuded conidiophore fell onto the substratum it would frequently give rise to a secondary conidiophore from one of its living segments. Through repetition of the same developmental sequence conidiophores of the third and fourth orders were brought into being.

The conidia thus formed aloft sparingly were mostly of an elongated ellipsoidal or strobiliform shape, thereby showing rather marked similarity to the conidia of *Dactylella stenobrocha*, which, indeed, they further resembled closely in their main dimensions. With respect to shape and dimensions they bore notable resemblance also to the larger type of conidia produced by *Dactylella heterospora*, though they lacked the abruptly truncate basal profile so characteristic of the latter. They were decisively distinguished, however, from the conidia of both *D. stenobrocha* and *D. heterospora* by more abundant septation, as they contained from 1 to 9 cross-walls. The specimens showing one septum (FIG. 1, E, a, b), two septa (FIG. 1, F, a-f), and three septa (FIG. 1, G, a-h)—the entire range of septation in *D. stenobrocha*—included only about one-seventh of the conidia produced by the new fungus. Conidia with four (FIG. 1, H, a-l), five (FIG. 1, I, a-j), six (FIG. 1, J, a-l), or seven (FIG. 1, K, a-p) cross-walls were present in large numbers, while specimens with eight (FIG. 1, L, a-b), or nine

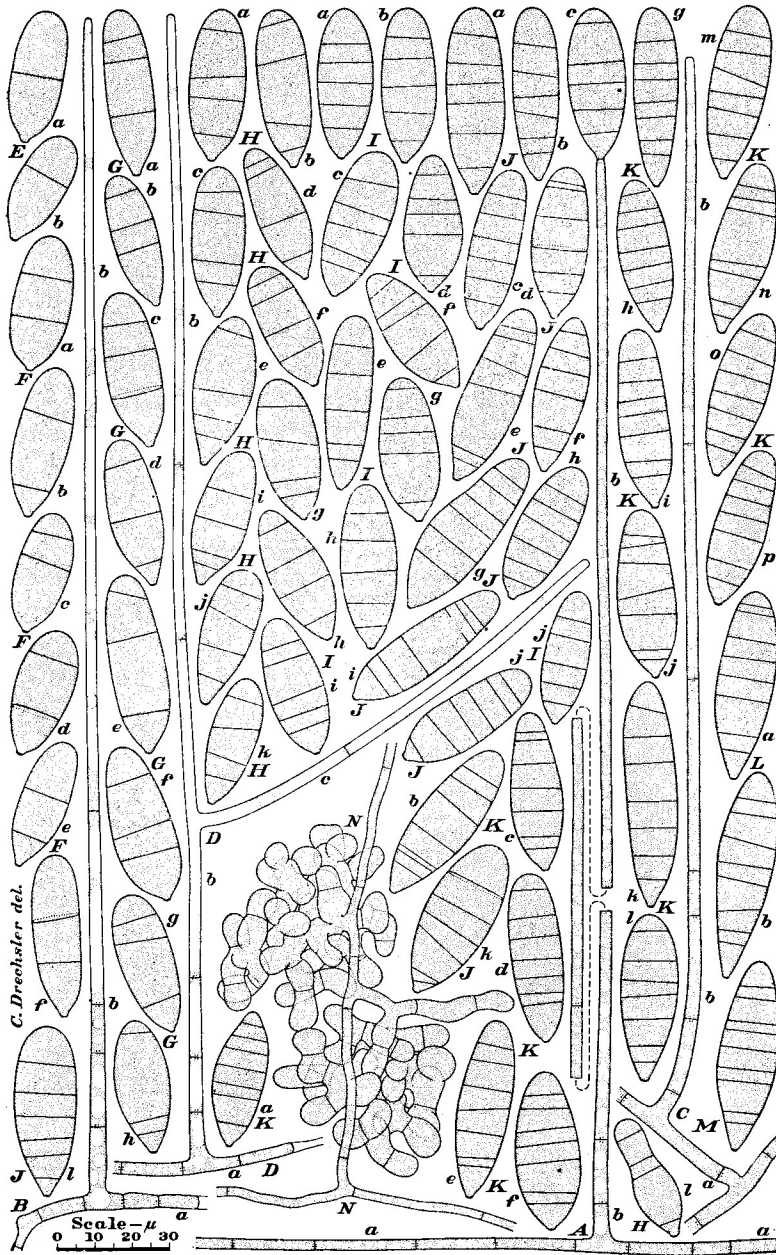


FIG. 1. *Dactylella strobilodes*.

(FIG. 1, *M*) partitions were few. Of 125 conidia taken more or less at random a frequency distribution was noted as follows: 1 septum, 2; 2 septa, 7; 3 septa, 9; 4 septa, 28; 5 septa, 29; 6 septa, 30; 7 septa, 17; 8 septa, 2; 9 septa, 1. The same assortment of conidia gave measurements for length, expressed in the nearest integral number of microns, distributed as follows: 31  $\mu$ , 1; 32  $\mu$ , 1; 34  $\mu$ , 2; 35  $\mu$ , 5; 36  $\mu$ , 6; 37  $\mu$ , 7; 38  $\mu$ , 14; 39  $\mu$ , 6; 40  $\mu$ , 17; 41  $\mu$ , 5; 42  $\mu$ , 14; 43  $\mu$ , 4; 44  $\mu$ , 13; 45  $\mu$ , 5; 46  $\mu$ , 8; 47  $\mu$ , 3; 48  $\mu$ , 5; 49  $\mu$ , 2; 50  $\mu$ , 4; 52  $\mu$ , 1; 55  $\mu$ , 1; 60  $\mu$ , 1; and measurements for greatest width, expressed in the nearest integral number of microns, with the following distribution: 11  $\mu$ , 1; 12  $\mu$ , 6; 13  $\mu$ , 15; 14  $\mu$ , 34; 15  $\mu$ , 33; 16  $\mu$ , 27; 17  $\mu$ , 7; 18  $\mu$ , 2.

Several attempts were made to isolate the fungus by removing its conidia from the erect conidiophores to newly poured plates of maize meal agar—the removal being accomplished, with suitable precautions against contamination, by means of small slabs of sterile agar medium held on a flamed platinum spatula. The conidia in all instances failed to germinate on the sterile agar, though the same materials and procedures have been employed successfully in isolating nearly all of the clampless nematode-capturing hyphomycetes encountered under similar conditions.

As the general habit and morphology of its conidial apparatus left little room for doubt that the fungus was intimately related to the nematode-capturing hyphomycetes, its mycelium both on and under the surface of the agar was examined for some sort of biological relationship. However, I was unable to discover the fungus in any parasitic or predacious relationship either to eelworms or to any other of the several types of minute animals infesting the cultures. Nor could I find it parasitizing *Pythium mamillatum*, or *Dactylella gephyropaga*, or any other fungus that had grown out from the superadded leaf mold into the transparent agar. In a few places submerged filaments were found bearing a somewhat elaborate system of distended, colorless, septate, closely ramified hyphal elements, filled with protoplasm of nearly homogeneous consistency (FIG. 1, *N*). These ramifying systems had much resemblance to the dichotomously branched assimilative apparatus produced by *Dactylella tylophaga* Drechs. (1) in captured speci-

mens of *Amoeba verrucosa* Ehrenb., but were never found loosely enveloped by any recognizable membrane. Hence there seems little likelihood that the fungus could have subsisted on a pelliculate rhizopod, though the possibility remains that it might have subsisted on a rhizopod devoid of a persistent pellicle. A destructive biological relationship involving a protozoan without any durable membrane—a relationship comparable to that of my *Acaulopage crobrylospora* (4) to *Leptomyxa* sp.—might well be difficult of detection.

In respect to its uncertain biological character, the fungus invites comparison with the two allied species I referred earlier to *Dactylella rhombospora* Grove (2: 539–540) and *Dactylaria pulchra* Linder (3: 349–352), as also with the three species I have described under the binomials *Dactylella heptameres* (3: 352–354), *Dactylella rhopalota* (3: 354–357), and *Dactylella atractoides* (3: 357–360). Among the several species that have been described under *Dactylella* in the literature but have so far not developed in my agar cultures, it seems most to resemble *Dactylella minuta* Grove (6). Identity with *D. minuta* seems unlikely, however, as that species has considerably shorter (120 to 150  $\mu$ ) conidiophores together with generally longer (60 to 70  $\mu$ ) conidia; these conidia, moreover, to judge from Grove's figures, being of clavate rather than elongated ellipsoidal shape. The fungus from Newport News apparently has no close morphological similarity to any of the forms described in *Monacrosporium*, a genus presumably identical with *Dactylella*. Its description as a new species may advantageously forestall confusion with *Dactylella stenobrocha* and *Dactylella heterospora*. The specific epithet applied to it is intended to be conveniently suggestive in signaling the resemblance in shape of its conidia to pine cones.

#### ***Dactylella strobilodes* sp. nov.**

Mycelium sparsum; hyphis sterilibus incoloratis, mediocriter septatis, plerumque 2–4.5  $\mu$  crassis, ex maxima parte parce ramosis, sed cristas crebre ramosas in ramulis brevibus 4–8.5  $\mu$  latis consistentes rarissime ferentibus; hyphis fertilibus incoloratis, erectis, plerumque 3–8 septatis, 250–400  $\mu$  altis, basi 4–7.5  $\mu$  crassis, sursum leniter attenuatis, apice 2–3  $\mu$  crassis, vulgo simplicibus sed quandoque ramo praeditis, in quoque apice conidium gignentibus; conidiis incoloratis, elongato-ellipsoideis vel strobiliformibus, apice late rotun-

dati, basi saepe pediculo obtuso praeditis, 1-9 septatis plerumque 3-7 septatis, 30-60  $\mu$  (saepius circa 41.5  $\mu$ ) longis, 11-18  $\mu$  (saepius circa 14.6  $\mu$ ) crassis.  
Habitat in humo silvestri prope Newport News, Virginia.

Mycelium sparse; vegetative hyphae colorless, septate at moderate intervals, mostly 2 to 4.5  $\mu$  wide, in general rather sparingly branched but in widely spaced positions bearing closely ramified systems composed of branches often 4 to 8.5  $\mu$  in diameter. Conidiophores colorless, erect, often containing 3 to 8 cross-walls, commonly 250 to 400  $\mu$  high, 4 to 7.5  $\mu$  wide at the base, narrowing gradually upward, mostly 2 to 3  $\mu$  wide at the tip, usually simple but occasionally with a lateral branch, at each tip bearing a single conidium. Conidia colorless, elongated ellipsoidal or strobiliform, broadly rounded at the tip, at the base often furnished with a blunt hilar protrusion, divided by 1 to 9 (usually by 3 to 7) cross-walls, measuring mostly 30 to 60  $\mu$  (average 41.5  $\mu$ ) in length and 11 to 18  $\mu$  (average 14.6  $\mu$ ) in width.

Occurring in leaf mold in deciduous woods near Newport News, Virginia.

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#### LITERATURE CITED

1. Drechsler, C. A new mucedinaceous fungus capturing and consuming *Amoeba verrucosa*. *Mycologia* 27: 216-223. 1935.
2. ——. Some hyphomycetes that prey on free-living terricolous nematodes. *Mycologia* 29: 447-552. 1937.
3. ——. A new nematode-capturing *Dactylella* and several related hyphomycetes. *Mycologia* 35: 339-362. 1943.
4. ——. Three zoöpagaceous fungi that capture and consume soil-inhabiting rhizopods. *Mycologia* 39: 253-281. 1947.
5. ——. Several species of *Dactylella* and *Dactylaria* that capture free-living nematodes. *Mycologia* 42: 1-79. 1950.
6. Grove, W. B. New or noteworthy fungi. *Jour. Bot.* 22: 129-136, 195-201; pl. 245, 246. 1884.

#### EXPLANATION OF FIGURE

FIG. 1. *Dactylella strobilodes*, drawn to a uniform magnification with the aid of a camera lucida;  $\times 500$  throughout. A, Prostrate hypha, a, from which has been sent up an unbranched erect conidiophore, b, that bears terminally a quinqueseptate conidium, c; owing to lack of space the conidiophore b is shown in three parts whose proper connection is indicated by broken lines. B, C, Portions of prostrate hyphae, a, from each of which

arises an unbranched erect conidiophore, *b*, shown denuded of the single conidium that had been borne on its tip. *D*, Portion of prostrate hypha, *a*, from which has been sent up a conidiophore, *b*, that bears a lateral branch, *c*; the tip of the main hypha, as also that of the branch, is shown denuded of the single conidium that had been borne on it. *E*, Uniseptate conidia, *a* and *b*. *F*, Biseptate conidia, *a-f*. *G*, Triseptate conidia, *a-h*. *H*, Quadri-septate conidia, *a-l*. *I*, Quinqueseptate conidia, *a-j*. *J*, Six-septate conidia, *a-l*. *K*, Seven-septate conidia, *a-p*. *L*, Eight-septate conidia, *a* and *b*. *M*, Nine-septate conidium. *N*, Densely ramifying system of thick lobulate branches found produced on a submerged mycelial hypha.