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BOTANY.—*Morphological features of some more fungi that capture and kill nematodes.*[1] CHARLES DRECHSLER, Bureau of Plant Industry.

Four additional fungi found capturing and killing nematodes such as *Diploscapter coronatus* Cobb, *Cephalobus persignis* de Man and va-

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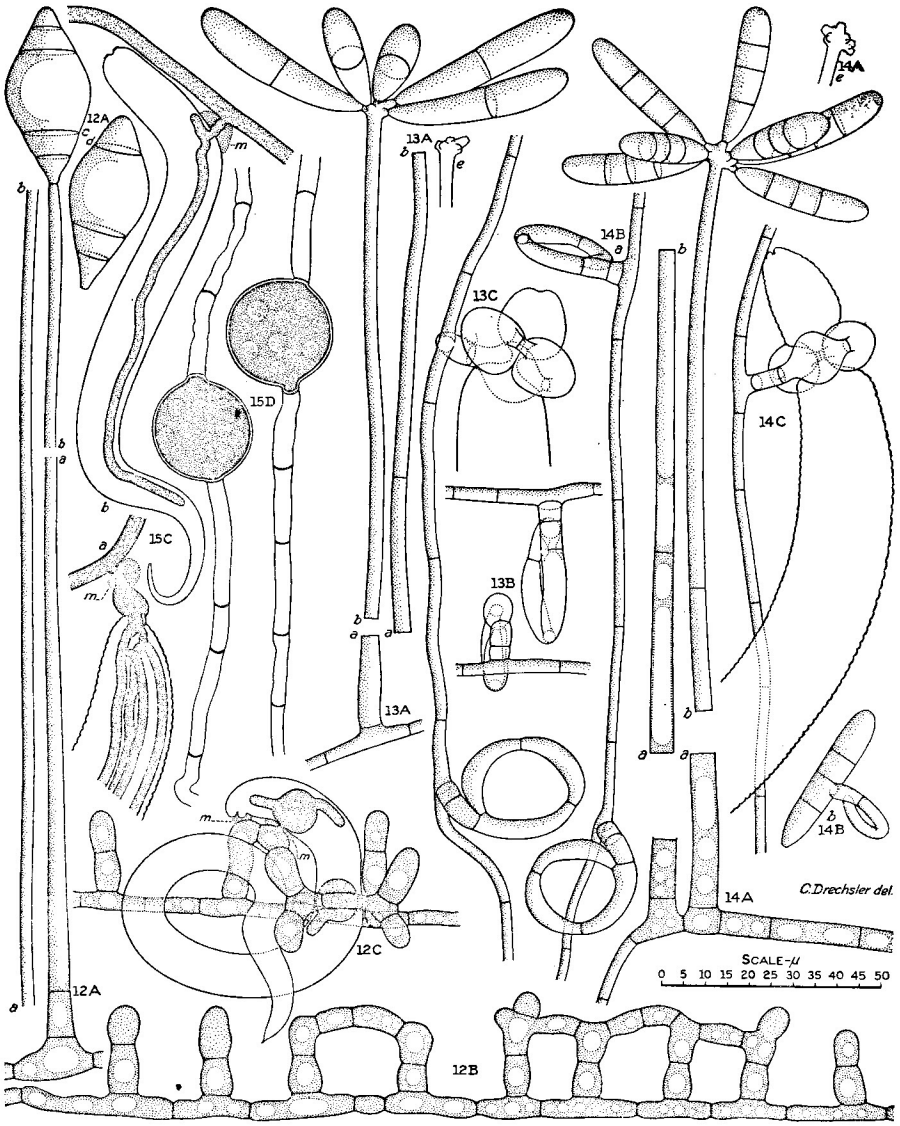
rious forms referable to the genera *Rhabditis*, *Diplogaster* and *Bunonema*, show different degrees of morphological similarity to certain of the nema-capturing fungi noted in an earlier summary.[2] Of these four, one (Fig. 12, A) greatly resembles the fungus therein shown in Fig. 7, similarly bearing terminally mostly solitary broad fusoid spores, which are however less regularly 4-septate (Fig. 12, A, *c*), as 3-septate spores (Fig. 12, A, *d*), not greatly unlike those typical of the fungus shown in Fig. 5, often occur abundantly. The somewhat undecided condition with respect to septation is associated with the production on the surface of the substratum of apparatus of capture combining both adhesive knob-cells and hyphal loops, each of which are found unmixed in the two forms previously figured. In the form under consideration the two types of organs are less distinctly characterized, the adhesive knob-cell and its stalk being here of approximately equal diameter and together constituting a stubby two-celled process. Often such processes are produced in some number at short rather regular intervals on the same hypha, and at right angles to it, with the result that when neighboring processes become joined apically by bridging connections, hyphal loops approximately rectangular in shape result (Fig. 12, B). Further adhesive processes and closed loops may later be produced repeatedly from the anastomosing elements to yield an extensive intricate system. Killing of the animals results from the intrusion of one or more bulbous hyphal outgrowths following narrow penetration of the integument (Fig. 12, C).

In a fungus bearing terminally in rather open capitate arrangement 1-septate elongated, straight or slightly curved conidia tapering markedly toward the base (Fig. 13, A), the capture of a nema in an individual 3-celled intramatrical hyphal loop attached to the parent filament by a short 2-celled branch (Fig. 13, B), and its being killed by extreme constriction effected through pronounced swelling of the loop-cells especially toward the center of the loop (Fig. 13, C), ensues as in the fungus shown earlier in Fig. 10. Entirely similar organs of capture (Fig. 14, B) and a similar mode of killing (Fig. 14, C) are found in a vigorously predacious fungus bearing terminally in loose capitate arrangement elongated conidia with three septa so placed that the two middle cells, approximately equal to one another, are

[2] This JOURNAL **23**: 138–141. 1933. As the present summary constitutes an addition to the earlier one, the numbering of the figures is made continuous through the two, so that all citations of figures given herein and bearing numerals less than 12, refer to illustrations in the earlier paper. Occasion may be taken here also to emend the opening sentence in the earlier paper by supplying the words "by various fungi,"—these to be interpolated between the words "destroyed" and "often" in the third line of the text.



Figs. 12–15.—Various nema-capturing fungi, each numeral denoting a separate species, and all species drawn with the aid of the camera lucida at the same magnification; ×580. A, Conidiophore with conidia of approximately average size, shape and condition with respect to septation; the conidiophore, because of its length being shown in several parts, *a* and *b* indicating corresponding points on these parts; *c* and *d*, spores of alternative septation; *e*, denuded tip of conidiophore. B, Organs of capture, consisting either of adhesive processes and loops (in Fig. 12), or (in Figs. 13 and 14) of constricting loops, the latter arising from vegetative hyphae (in Figs. 13, B and 14, B, *a*) or from a spore (in Fig. 14, B, *b*). C, Relation of captured animal to fungus, *a* and *b* in Fig. 15, representing separate examples, differing in place of attachment and in respect to presence of external hyphal distension; *m*, adhesive mucous substance. D, Intercalary conidia borne on creeping hyphae that have become septate on being evacuated.

noticeably inferior in length to the two end cells (Fig. 14, A). The parallelism in predacious habit of these two fungi with the fungus shown in Fig. 10, is somewhat at variance with expectations suggested by similarities in the shape of the conidium, through which articulation with the species illustrated earlier in Figs. 3 and 4 would seem indicated.

In rather moist agar plates a fungus having originally non-septate mycelium which subsequently on progressive evacuation of contents becomes often rather abundantly septate, captures nemas in large numbers, the animal being held fast on the creeping hypha by means of adhesive material appearing as a thickish sigillate yellowish pad at the place of contact (Fig. 15, C). A hyphal distension is sometimes formed outside the animal previous to perforation of the integument (Fig. 15, C, *a*), though such modification, when present, rarely approaches in size the external swelling characteristic of the fungus earlier shown in Fig. 8. Internally the mycelium shows no marked differentiation. Of reproductive bodies the fungus has so far produced only globose conidia mostly intercalary in the creeping hyphae (Fig. 15, D), the entire appearance being that of a species of Pythium.