

*thecium*, *Trichothecium*, *Dactylaria*, and *Dactylella* might seem to imply.

The non-predacious parasite described in detail by Zopf as *Harposporium anguillulae* Lohde was also often found highly destructive to nemas in many agar cultures. In undisturbed and well developed material four of the crescentic spores were rather regularly seen attached to the tip of the slender cylindrical outgrowth arising from the spherical part sessile on the fertile branch, thus plausibly characterizing the flask-shaped structure as a basidium, and the fungus as a basidiomycete (Fig. 11).

ZOOLOGY.—*A bivulvar specimen of the nematode Mononchus muscorum* (Dujardin) Bastian.<sup>1</sup> GERTRUDE HENDERSON CASSIDY, Hawaiian Sugar Planters' Association. (Communicated by G. STEINER.)

*Mononchus muscorum* (Dujardin) Bastian 1865<sup>2</sup> is a species of wide geographical distribution; in 1930 specimens were found for the first time on the island of Maui, Territory of Hawaii.<sup>3</sup>

During that year considerable numbers of *Mononchus* had been collected from the islands of Oahu, Hawaii, Maui, and Kauai, and specimens of twelve species identified. For the most part observations had been restricted to the lower lying cultivated areas bearing sugar cane and pineapples, but later it was considered advisable to include some of the more remote forest lands and unfrequented mountainous ridges with a view to determining the possible indigenous nematode population of the Hawaiian Islands.

For this reason nemic collections were made at known elevations on the slopes of Haleakala, the highest mountain on the island of Maui. The ascent was made under the direction of the forest ranger and a route selected which is seldom if ever frequented save by an occasional pheasant hunter or by the inspecting forester.

The various collections present a wide range of nematode genera including several species of predacious mononchs,—among them the specimen of *M. muscorum* depicted which was found in loose cindery soil surrounding dandelion roots growing on the east side of the crater at an elevation of 8,000 feet. At this elevation practically all vegetative growth had ceased and only stunted grasses and occasional weeds

<sup>1</sup> Received October 13, 1932.

<sup>2</sup> BASTIAN, H. C. *Monograph on the Anguillulidae*. Trans. Linn. Soc. London. 25: 103. 1865.

<sup>3</sup> CASSIDY, G. *Some Mononchs of Hawaii*. Hawaii. Planters' Rec. 35: 330. 1931.

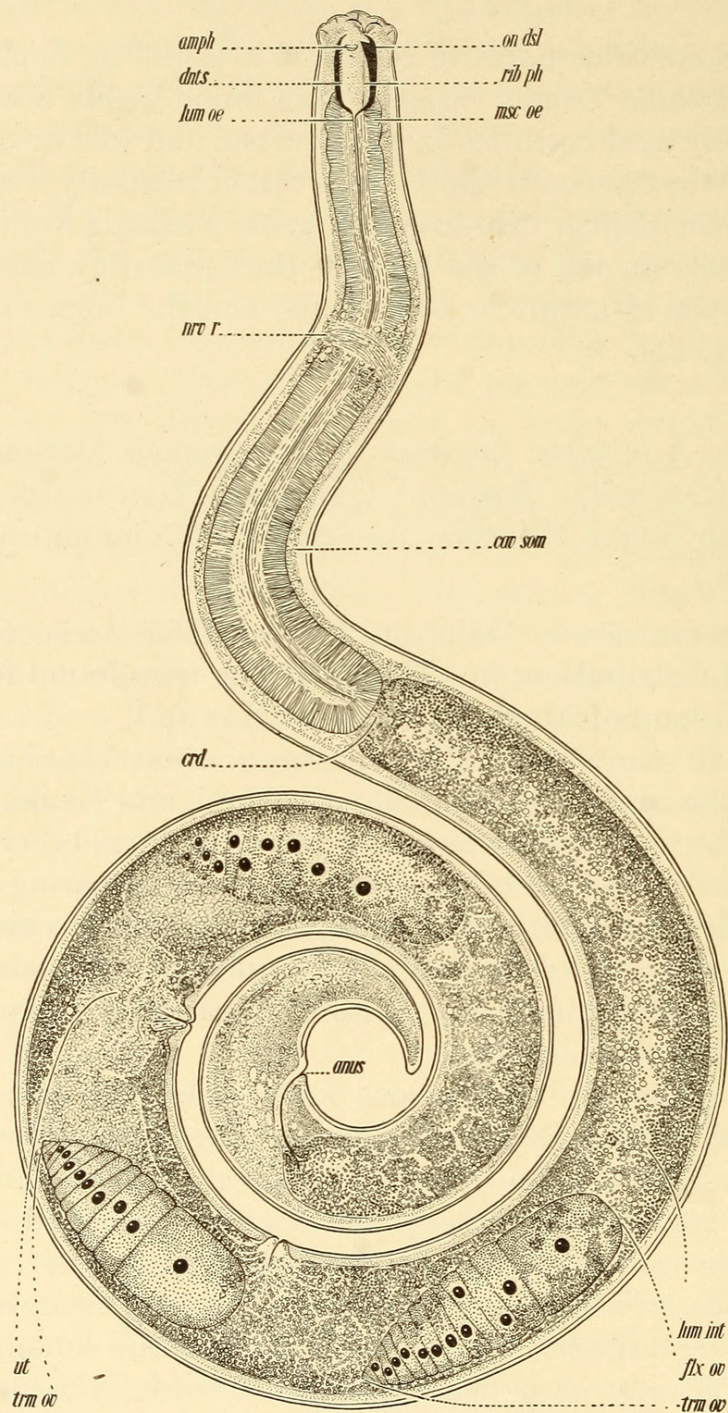


Fig. 1. Bivulvar *Mononchus muscorum*: *amph*, amphid; *anus*, anus; *cav som*, somatic cavity; *crd*, cardia; *dnts*, pharyngeal teeth; *flx ov*, flexure of ovary; *lum int*, lumen of intestine; *lum oe*, lumen of oesophagus; *msc oe*, musculature of oesophagus; *nrv r*, nerve ring; *on dsl*, dorsal onchium; *rib ph*, pharyngeal rib; *trm ov*, terminus of ovary; *ut*, uterus.  $\times$  about 200.

were to be found in the coarse cindery deposit of the upper volcanic ridges.

This specimen of *M. muscorum* immediately attracted attention by reason of the abnormality of the reproductive organs. Two well developed vulvar openings are clearly defined: one situated at 55 per cent of the total body length, and the other at 66 per cent. (See Fig. 1.) Three reflexed ovarian tubes are present: one, on the left side, lying anterior to the proximal vulva; the other two situated anterior (left side) and posterior (right side) to the distal vulva. The distal vulva is regarded as more nearly approaching the normal by reason of the slightly better development of the supporting muscles, by its position (normal specimens commonly show the vulvar aperture at about 64 per cent) and because of the paired ovarian tubes and uteri connected with it.

The percentage measurements of this specimen are as follows:

|     |     |      |                     |                                     |      |         |
|-----|-----|------|---------------------|-------------------------------------|------|---------|
| 2.7 | 9.0 | 23.5 | <sup>15</sup> .55.0 | <sup>15</sup> .66.0 <sup>16</sup> . | 91.0 | 1.7 mm. |
| 3.0 | —   | 4.0  | 5.0                 | 5.0                                 | 3.0  |         |

The percentage measurements of a normal specimen obtained from the same collection are as follows:

|     |     |      |                                     |      |         |
|-----|-----|------|-------------------------------------|------|---------|
| 2.7 | 9.0 | 23.5 | <sup>16</sup> .64.0 <sup>16</sup> . | 91.0 | 2.0 mm. |
| 3.0 | —   | 4.0  | 5.0                                 | 3.0  |         |

This is the fourth case of bivulvarity yet recorded from free-living nemas. The first was mentioned by Bütschli<sup>4</sup> for a marine nematode *Linhomoeus mirabilis* Bütschli; the second by Paramonov<sup>5</sup> for the freshwater species *Trilobus gracilis* Bastian, and the third by the present writer<sup>6</sup> for a *Dorylaimus* species. Undoubtedly all these cases must be considered abnormal or even pathological. The one here described is the most pronounced because it concerns not only a duplication of vulva and vagina, as in the instances mentioned by Bütschli, Paramonov, and Cassidy, but the duplication includes also uterus and ovary.

From the description and figure given by Bütschli, it is assumed that only the anlage of vulva and vagina was doubled and this at a rather late stage of development, judging from the close position of the duplicates.

<sup>4</sup> BÜTSCHLI, O. *Zur Kenntniss der freilebenden Nematoden, insbesondere der des Kieler Hafens.* Abhandl. d. Senckenb. naturf. Gesell. Frankfurt a.M. 9: 33. 1874.

<sup>5</sup> PARAMONOV, A. *Über einen Fall von "Bivulvarität" bei einem freilebenden Nematoden.* Russ. Hydrobiol. Ztschr. 5: 218-222. 1926.

<sup>6</sup> CASSIDY, G. *A meristic variation in a female nematode.* Nature 121: 476-477. 1928.

The same was apparently true for *Trilobus gracilis* described by Paramonov, but here the duplicates are more distant, suggesting a somewhat earlier separation.

In the bivulvar *Dorylaimus* previously recorded by the present writer there were two vulvae 0.062 mm. apart, each with a vagina, a uterus, and an ovary. This suggests that a separation of the paired anlage of the anterior and the posterior branch of the female apparatus took place, since normally these dorylaims are amphidelphic.

In the *Mononchus* here described the duplication involves the whole anterior branch of the normal female apparatus suggesting a separation of its anlage at a very early date of its development, but still at a time when the anlage for the normal female apparatus would have already divided into its anterior and posterior branch.

The causes for these duplications are unknown. It is remarkable that they all concern female specimens and that up to the present no such duplications have been observed in male nematodes.

ZOOLOGY.—*Two new species of Isopod Crustaceans from California.*<sup>1</sup>

J. O. MALONEY, U. S. National Museum. (Communicated by WALDO L. SCHMITT.)

In the course of his studies on littoral ecology at Monterey Bay, California Coast, Dr. G. E. MacGinitie of the Hopkins Marine Station obtained, among other crustaceans, two species of isopods of the family Idotheidae which seem never to have been described, *Synidotea macginitiei* and *Pentidotea montereyensis*. The description of each is based on a male holotype preserved in alcohol.

A specimen from San Francisco Bay, however, has been taken as the type of *S. macginitiei*, as Dr. MacGinitie's specimens were small and with adult characters not fully developed. The specimens from San Francisco Bay were identified by earlier workers as *Synidotea laticauda*,<sup>2</sup> though they are more closely related to *Synidotea bicuspidata* (Owen).<sup>3</sup>

*Synidotea macginitiei*, new species

*Description.*—Body ovate, length 15 mm., width 7.25 mm. (third and fourth thoracic segments widest). Head 2.5 mm. long, 3.25 mm. wide, with

<sup>1</sup> Published by permission of the Secretary of the Smithsonian Institution. Received November 30, 1932.

<sup>2</sup> BENEDICT, JAMES E. *A revision of the genus Synidotea*. Proc. Acad. Nat. Sci. Philadelphia, 1897. 389-404. figs. 1-13.

<sup>3</sup> RICHARDSON, H. *Monograph on the Isopods of North America*. U.S.N.M. Bull. 54: pp. i-lviii, 1-727. figs. 1-740. 1905.



Cassidy, Gertrude Henderson. 1933. "A bivulvar specimen of the nematode *Mononchus muscorum* (Dujardin) Bastian." *Journal of the Washington Academy of Sciences* 23, 141–144.

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