

# GREEFFIELLA<sup>1</sup>

(*Trichoderma* Greeff, 1869; not *Trichoderma* Steph. 1835)

CONTRIBUTIONS TO A SCIENCE OF NEMATOLOGY, XII

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In 1869, Greeff described an externally peculiar and very interesting small animal form under the name *Trichoderma*. Though it proves in the end to be internally a typical nema, it is only after many years that the fact becomes fully established. The minute size of the species and the fact that the setose cuticle obscures the internal organs, taken together, have delayed a fuller understanding of the internal anatomy.

Opportunity has occurred to reexamine a species of this genus in a living condition, and the results are presented herewith. They serve to establish the view that the genus comprises typical nemas presenting striking relationships to *Desmoscolex*. Greeff's original discovery is commemorated by renaming the genus Greeffiella. *G. oxycaudata* (Greeff) is retained as the type species.

**Greeffiella**, nom. nov.

*Trichoderma* Greeff, Arch. f. Naturg., Berlin, v. 35, bd. 1, 1869. Not *Trichoderma* Steph., 1835, or Swains., 1839.

**Greeffiella dasyura** n. sp.  $\frac{1.5}{3.4} \frac{10.4}{9.6} \frac{13}{13} \frac{56}{35} \frac{70}{9.8} > 0.31^{100}$  The thin layers of the transparent, colorless, hairy cuticle are traversed by about fifty-six plain transverse annules, easy of resolution, which are not materially altered on the lateral fields. The number of annules corresponds with the number of encircling rows of somatic setae. While there are no wings opposite the lateral fields, wing spaces are faintly indicated by a slight sparseness, or absence, of setae near the lateral lines; this however is a faint feature extending only from the neck to the anus, and is perhaps more pronounced on the female than on the male. The contour of the body is crenate, especially toward the head. There appear to be toward thirty small unequal cephalic setae on the front of the head, disposed, apparently, in two closely approximated circles. These setae average to be about as long as the head is wide and are apparently too numerous and crowded to permit of any exact order; however, about twelve of the anterior ones are spread outward and forward while all the others spread out more or less backward. These somewhat curved, rather slender, tapering acute, somewhat stiff cephalic setae are of the same

<sup>1</sup> This paper was published in the Journal of the Washington Academy of Sciences, vol. 12, no 13, pp. 229-303 (issued July 19, 1922). It is printed with changed pagination but without other material alteration.

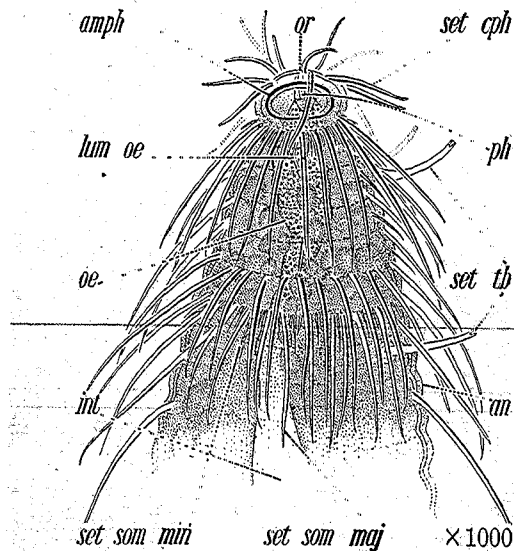


Fig. 1.—Head end of *Greeffiella dasyura*. The setae on several annules immediately behind the head have been omitted so as to show internal details more clearly. *amph*, amphid; *an*, annule; *int*, location of the beginning of the intestine (see also Fig. 2); *lum oe*, lumen of the oesophagus; *oe*, oesophagus; *or*, mouth opening; *ph*, pharynx; *set cph*, cephalic setae,—a number of which are omitted; *set som maj*, one of the larger somatic setae; *set som min*, one of the smaller somatic setae; *set tb*, tubular setae.

flattish hemispheroidal head, set off by a narrow, deep and distinct constriction. The lips are amalgamated and fixed. Nothing is known concerning the labial papillae. The pharynx is exceedingly minute and easily overlooked, but is, in fact, a minute, simple, obscure, straight, regular, tubular, closed, unarmed region about one-sixth as wide as the head and twice as long as wide; these measurements include its enclosing pharyngeal tissue. Under ordinary circumstances there is to be seen here only a closed lumen. Passing backward from the pharynx, the oesophagus for a distance two and one-half times as great as the width of the head, is cylindroid; however, it widens slightly, so that it becomes as wide as the head, or one-half as wide as the corresponding portion of the neck, that is to say that portion of the neck marked by the fifth circlet of cervical setae. At this point there is a rather faint diminution of the oesophagus, which continues thence a little narrower, afterward widening out, and then soon coming to contain granules like those found in the cells of the intestine. This latter appears to begin about opposite the tenth row of setae. There are two narrow ducts, one emptying into the posterior part of

character as the great bulk of the somatic setae. Among the somatic setae however are a few relatively large, hollow, open bristles of another character, resembling the locomotor bristles found on *Draconema*, *Desmoscolex*, etc. For instance, on the third and eighth annule of the female, and on the second and seventh annule of the male, that is to say in the rows of setae on these annules, there occur subdorsal (on the second and third annules) and dorsally submedian (on the seventh and eighth annules) pairs of spreading tubular open-mouthed setae, or bristles, a little longer than the regular somatic setae. These special setae have extra large bases and are probably connected with glands. The rows of ordinary cervical setae have a fringe of shorter setae in their midst. As before remarked, the somatic setae are in fifty-six or fifty-seven transverse rows,—excluding those on the head, but counting the finely pilose region in front of the spinneret as two annules. See Fig. 3. Passing backward, the setae grow steadily longer from the head to the tail; the posterior ones are about one and one-half times as long as the spinneret, while the anterior ones are somewhat shorter than the spinneret. Back as far as the beginning of the intestine, the rows of setae present minute toothed fringes, accentuating the annules. The conoid neck ends in a rounded, somewhat

each amphid; these ducts can be followed backward to near the pigmented bodies soon to be mentioned, and possibly may be connected with them. The external expressions of the amphids, each of which is symmetrical to two lines, are of unequal diameter, without central markings, and are located toward the front of the head; they are about as wide as the corresponding portion of the head, each being about twice as wide as long. The two greenish pigmented bodies mentioned above (*org?*, Fig. 2), are olive green in color and present a nucleus in the midst of a colorless spherical cell (?) as wide as one of the cuticular annules in the immediate vicinity. These bodies are naturally rather difficult to observe on account of the hairy nature of the cuticle through which they are viewed; they are located well outside the intestine, one on each side of the body, somewhat behind the base of the neck.

The broad cardiac constriction lies opposite the eighth to tenth rows of setae, and is about as wide as the distance between these rows. The thick-walled intestine presents a faint lumen and is composed of cells of such a size that about twelve occur in each cross section. In the male, at least, the intestine gradually becomes one-half as wide as the body. There is no pre-rectum. From the minute anus, whose anterior lip is somewhat elevated, the inconspicuous rectum extends inward at right angles to the ventral surface half way across the body; the intestine itself extends past the anus. No anal muscles are to be seen. There are two kinds of colorless granules of variable size to be seen in the cells of the intestine; the largest of these have a diameter equal to the distance between the rows of somatic setae; the finest of the granules are exceedingly fine. The granules are not so arranged as to give rise to a tessellated effect. The more or less convex-conoid tail tapers from in front of the anus to the tubular spinneret, which comprises two-sevenths of the whole tail. This tubular spinneret is about as wide as one of the spicules of the male; it is a simple truncate affair which tapers but very little. A marked peculiarity of the posterior extremity of the nema is the existence of numerous minute setae; for a distance equal to the length of the spinneret the setae on the portion of the tail immediately in front of the spinneret are very much reduced and more numerous. The spherical caudal glands are located behind the anus in the anterior fourth of the tail and empty through separate ducts; each is about one-fifth as wide as the corresponding portion of the tail, or as wide as one of the somatic annules opposite. Only two nuclei were seen in

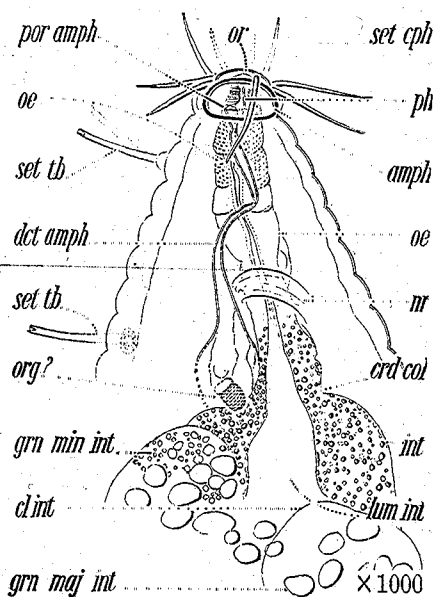


Fig. 2.—Internal anatomy of the head end of *Greeffella dasyura*. Lettering as in Fig. 1. *cl int*, one of the cells of the intestine; *crd col*, cardiac collum; *dct amph*, duct connecting with the amphidial pore; *grn maj int*, one of the larger intestinal granules; *grn min int*, smaller intestinal granules; *int*, intestine; *lum int*, lumen of the intestine; *nr*, nerve ring; *org?*, organ of doubtful significance; *set tb*, tubular seta.

connection with these glands, and these were located in the vicinity of the anus, their number indicating that the number of caudal glands may be less than the usual three. The excretory pore lies near the nerve-ring opposite the sixth annule in the male and opposite the seventh in the female; its spherical ampulla is one-fourth as wide as the corresponding portion of the neck. The nervering surrounds the oesophagus somewhat obliquely where it first diminishes in diameter somewhat behind the middle. In the dorsal side of the neck, opposite the 9-14 rows of setae there are some relatively large organs,—probably two or more finely granular cells. From the somewhat inconspicuous, small, elevated vulva, which is surrounded by minute setae, the small, weak, non-cutinized, tubular vagina leads inward at right angles to the ventral surface about one-third the distance across the body. Little is known concerning the double symmetrically reflexed female sexual organs.

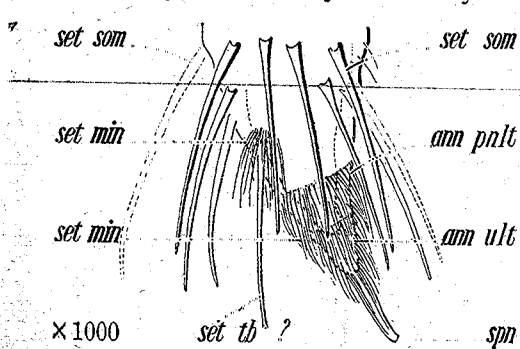


Fig. 3.—Tail end of *Greeffiella dasyura*. Lettering as in Figs. 1 and 2. *ann pntlt*, penultimate annule; *ann ult*, ultimate annule; *spn*, spinneret.

winged. No gubernaculum has been seen. On the fifth and eleventh annules in front of the anus occur ventrally submedian papilla-like organs, indicated by the presence of minute setae arranged in a cluster about a nerve ending (?),—about ten setae on the fifth annule and a much smaller number on the eleventh. There are also similar ventrally sublateral bunches of setae on the annules preceding the large (duplex?) conical one bearing the spinneret. On the lateral field near the middle of the male, a bunch of minute setae was observed like those on the fifth annule in front of the anus. The nature of these special organs, for such they must be, remains in doubt. It seems quite possible that some of them are male supplementary organs. The wide cylindrical testis is one-half as wide as the body and is reflexed to near the proximal ends of the spicula.

*Habitat:* Found in sponges, Biscayne Bay, Florida, U. S. A., March, 1916. Male examined and measured in a living condition; female fixed in Flemming's solution and soon after examined and measured in water. The form of the pharynx and oesophagus; the presence of special tubular setae; the structure of the spinneret, and the relatively small number of annules, seem to indicate a closer relationship of *Greeffiella* with *Desmoscolex* than has been hitherto imagined. Perhaps *Greeffiella* should be placed in the same family with *Desmoscolex*, *Tricoma*, etc.

1.5	6.6	10.6	4 <sup>m</sup>	76.	> 0.34--
3.2	7.7	11.	18.	11.	

The slightly arcuate, irregularly conoid, faintly sigmoid tail of the male, on the whole, rather resembles that of his mate. The two equal, straight, very slender, uniform, acute, colorless spicula, which are slightly cephalated by expansion, are about one and one-fourth times as long as the anal body diameter. If swung around behind the anus, they would just about reach to the base of the spinneret; they are about twice as wide as the bases of the somatic setae, are a little larger distally than elsewhere, and are perhaps