

A New Genus and Species of Gastrotricha from the Atlantic Coast of Florida, U.S.A.¹

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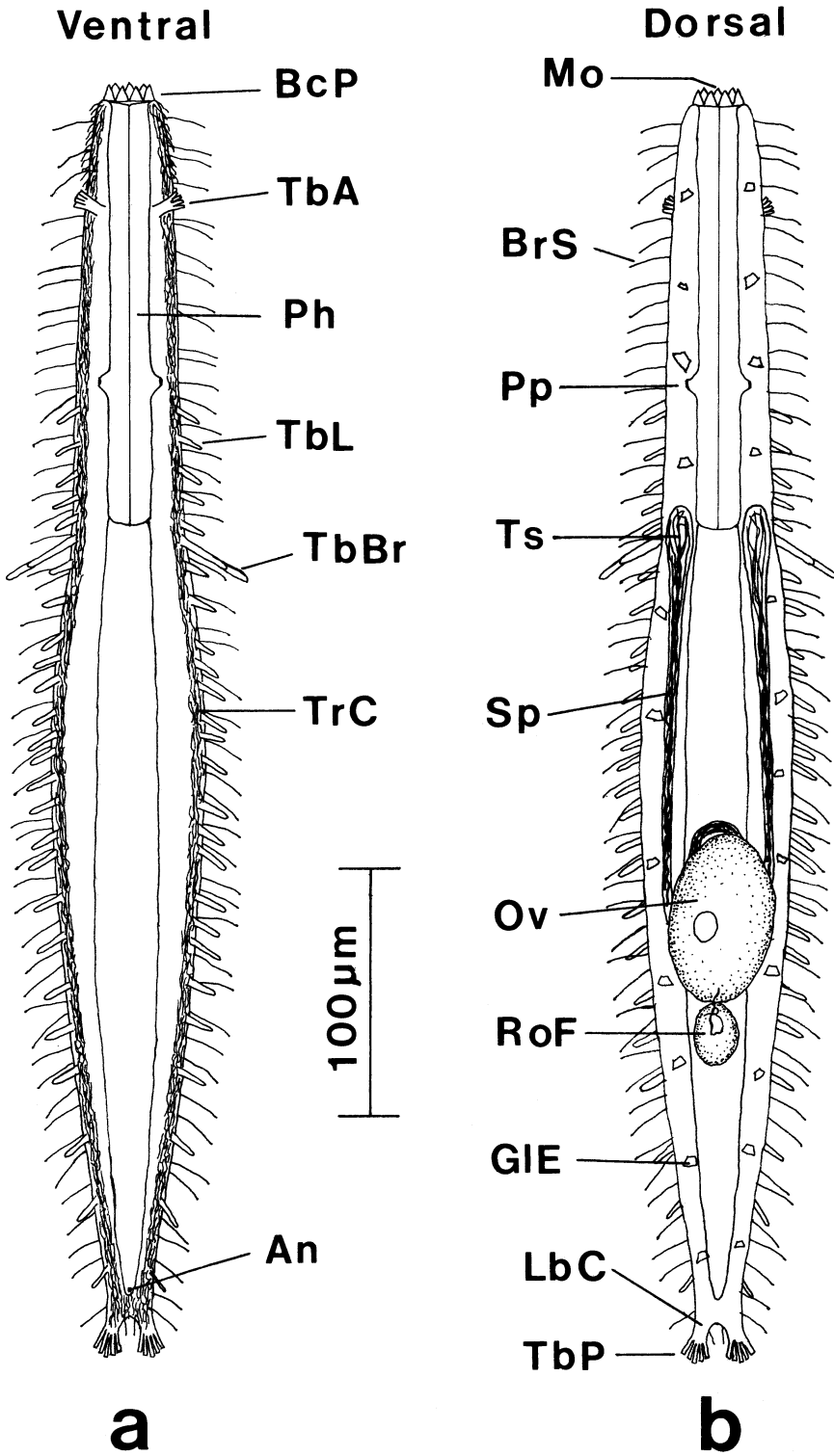
Abstract. A sample of sand from the shallow subtidal waters of St. Augustine Inlet, Florida, U.S.A. yielded a new genus of turbanellid gastrotrich. *Prostobuccantia* is distinguished from its congeners by an anterior projection of the buccal capsule beyond the mouth, by the occurrence of the pharyngeal pores in a submedial position, by paired caudal lobes that bear adhesive tubes only on their posterior borders, and by two unusual adhesive tubes of unequal length that are fused at their bases and occur on either side just posterior to the pharyngeal-intestinal junction. In the adult condition, *P. brocha* is characterized by the serrated border of the forward-projecting buccal capsule, by an inflated trunk, and by few (4-5) adhesive tubes of equal length on each of the anterior and the posterior appendages.

An adult specimen of a species of Gastrotricha was found in sand taken from 1 m subtidal depth in St. Augustine Inlet, St. Augustine, Florida, U.S.A. on 16 June 1990. Further examination of nearby intertidal sands taken at the same time and of subtidal sands taken from the same site in September 1990 and February 1991 revealed no further individuals of this species. Although only one specimen was observed, it was a sexually mature adult in excellent condition. All taxonomic characters of crucial importance in differentiating among genera in the family Turbanellidae Remane, 1925 were readily observable. Thus, the specimen represents a new species whose unique set of taxonomic characters warrant the erection of a new genus in the family Turbanellidae.

METHODS

Subtidal samples were taken at a depth of 1 m during low tide by inserting a hand-held piston corer with a diameter of 2.5 cm into the bottom sediment to a depth of approximately 12 cm. The sand in the corer was extruded into a plastic bag which was then sealed. Intertidal samples were taken by digging holes approximately 0.5 m deep at low tide and by scooping sediment from the walls of the hole with a plastic scoop. Sand obtained in this manner was also placed into plastic bags. Upon return to the laboratory, samples were stored at 14°C to extend the life of the organisms. Gastrotrichs were extracted from the sediments by narcotization with isosmotic MgCl₂, and then by subsequent rinsing of the sediments with seawater and decantation into 60-mm plastic Petri dishes. Individual living gastrotrichs were located by examining the supernatant fluid at 50× magnification under a Wild M-8 dissecting microscope

¹ This research was supported in part by Ohio University Research Committee Grant 2335 to W.A.E., and O.U. Research Challenge Grants 88-55, 88-75, and 89-26 and National Science Foundation Grant BSR-9006798 to W.D.H. We thank M. Antonio Todaro and the anonymous reviewers for improving the manuscript.



and were removed by mouth pipette to a glass slide, on which was mounted an 18-mm square coverslip supported by bits of non-toxic modeling clay on its corners.

Further examination, drawing, and video recording were done under Nomarski differential interference contrast optics on a Zeiss Photomicroscope. High-resolution video images were taken with an MTI CCD-72 camera (570-line resolution) with electronic image enhancement circuitry, and stored on a Panasonic AG-1960 Super-VHS video recorder (400-line resolution). Drawings, made concurrently with image recording by means of a drawing tube, were transferred to AutoCAD 386 using a Kurta IS/ONE digitizing pad. The computerized images were modified and detailed within AutoCAD after reviewing the video images on an MTI 104100-01 black-and-white flat-field monitor (1,000-line resolution), from which, in turn, measurements could be made directly with a plastic ruler.

TAXONOMIC ACCOUNT

Order Macrodasyida Rao & Clausen, 1970

Family Turbanellidae Remane, 1925

Prostobuccantia n. gen.

Diagnosis. Turbanellidae, with buccal capsule projecting forward beyond mouth; with pharyngeal pores located in submedial position; with paired caudal lobes that bear adhesive tubes only on their posterior borders; with two adhesive tubes of unequal length that are fused at their bases and occur ventrolaterally on either side just behind pharyngeal-intestinal junction.

Etymology. *prosto* (L), projection; *bucca* (L), buccal capsule; *antia* (L), possession.

Prostobuccantia brocha n. sp.

(Figs. 1, 2)

Description. Holotype adult (Fig. 1a, b) *Prostobuccantia*, with triangular, pointed projections of buccal capsule extending forward beyond mouth. Buccal cavity reduced within. Pharyngeal region 180 μm long, with constant width of 45 μm , terminating at U35 (U0, anterior-most tip; U100, posterior-most tip; in the terminology of Schoepfer-Sterrer, 1969). Pharyngeal pores located at U23, about one-third of distance from pharyngeal-intestinal junction to mouth. Trunk widens beginning at pharyngeal-intestinal junction, reaching a maximum width of 68 μm at U54, and then tapering gradually to a minimum width of 18 μm at U96, near base of caudal lobes. Maximum width of trunk not coincident

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FIG. 1. *Prostobuccantia brocha* n. gen., n. sp., ventral (a) and dorsal (b) views. An, anus; BcP, buccal projections; BrS, sensory bristle; GLE, epidermal glands; LbC, caudal lobes; Mo, mouth; Ov, ovum; Ph, pharynx; Pp, pharyngeal pores; RoF, frontal organ with sperm; Sp, sperm in sperm tubes; TbA, anterior adhesive tubes; TbBr, elongated lateral adhesive tubes ("brocha"-tubes); TbL, lateral adhesive tubes; TbP, posterior adhesive tubes; TrC, ciliary tract; Ts, testis.

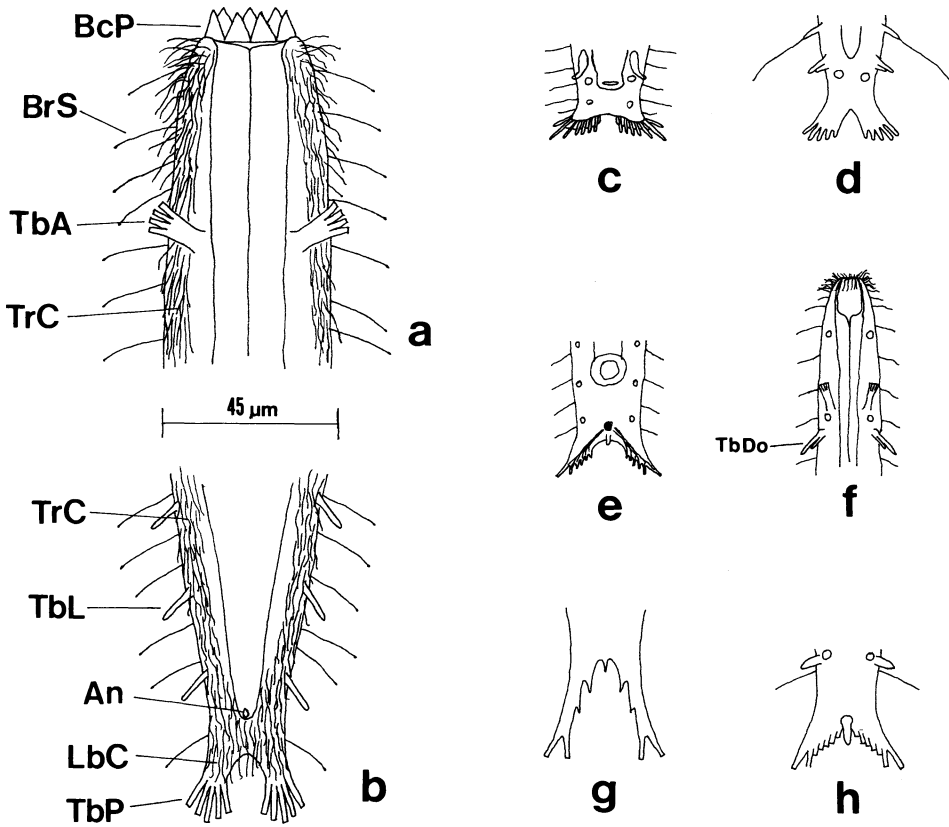


FIG. 2. Anterior (a) and posterior (b) ventral views of *Prostobuccantia brocha* with posterior ventral views of (c) *Desmodasys phocoides*, (d) *Dinodasys mirabilis*, (e) *Paraturbanella dohrni*, (g) *Pseudoturbanella stylifera*, and (h) *Turbanella ambronensis* provided for comparison. Note the paired, elongated tubes in the anterior view of *P. dohrni* (f). Abbreviations as in Fig. 1; TbDo, "dohrni"-tube groups.

with internal structures such as testes or mature ova. Paired caudal lobes elongated, symmetrical about their oblique axes, and rounded at their distal margins (Fig. 2b). Ventral ciliation of two narrow bands running from head to caudal appendages; bands closely follow lateral margins of body and join medially posterior to anus (Figs. 1a; 2a, b). Dorsal ciliary band traversing head, just behind mouth, was not observed.

Sensory bristles 15–20 μm long with one row on each side inserted dorsolaterally and a second row inserted ventrolaterally. Bristles terminate in broadened, spear-like tips (Fig. 2a, b).

Adhesive tubes contain two canals, each with separate opening at tip and are postulated to be of the duo-gland type (Tyler & Rieger, 1980). Anterior adhesive tubes borne on ventrally attached fleshy projections or "hands" (10 μm long, inserted at U10), with four equal-length (6 μm) tubes attached ter-

minally on each hand (Fig. 2a). Lateral adhesive tubes 10–12 μm long with rounded tips and inserted ventrolaterally (Fig. 1a). Total of 23 lateral adhesive tubes occurs on either side from U25 to U93, with four positioned anterior to, and a fifth at, pharyngeal-intestinal junction; tubes more or less evenly spaced, but spacing interval increases toward rear. Dorsal adhesive tubes of lateral series not observed. Five posterior duo-gland adhesive tubes 9–11 μm in length borne terminally on each of two caudal lobes (Fig. 2b). One pair of elongate tubes of unequal length (20 and 30 μm), fused at their bases, inserted ventrolaterally on either side of body at U36, just posterior to pharyngeal-intestinal junction (this group of tubes henceforth will be termed “brocha”-tubes). These tubes may be either adhesive or sensory in function.

Reproductive structures seen include paired testes (from U32 to ca. U40), tapering posteriorly into sperm-containing vasa deferentia that continue posteriorly (to U68) before looping back anteriorly, where they join ventrally along midline (at U58). Frontal organ, *sensu* Ruppert & Shaw, 1977 (U72-U76), containing sperm just behind mature ovum (U58-U72), 72 \times 42 μm (germinal vesicle 10 μm diameter).

Epidermal glands 5–10 μm , occurring in two lateral columns of about 10 glands each; consist of numerous compact rod-shaped subunits, narrower at one end than the other, laying more or less parallel to one another.

Holotype. The adult specimen, 550 μm in length, which is illustrated and represented on Super-VHS format videotape [ICZN, 1985: Art. 72(c)(v)], but which is no longer extant. St. Augustine Inlet, St. Augustine, Florida, U.S.A. (29°53'N, 81°17'W); 1 m water depth in sandy sediments; June 1990. Copies of this high resolution (400-line) Super-VHS video recording and a lower resolution VHS (240-line) version have been deposited at the United States National Museum, Washington, D. C. (USNM 235527).

Etymology. *brocha* (L), projecting teeth.

DISCUSSION

Five genera have been recognized thus far in the family Turbanellidae: *Desmodasys* Clausen, 1965, *Dinodasys* Remane, 1927, *Paraturbanella* Remane, 1927, *Pseudoturbanella* d'Hondt, 1968, and *Turbanella* Schulze, 1853. *Prostobuccantia* clearly belongs in this family (*sensu* Hummon, 1974; Remane, 1925), owing to the possession of anterior adhesive tubes borne on ventral hand-like appendages, a bilobed posterior end that bears adhesive tubes, paired testes, two rows of ventral cilia, and the absence of cuticular armature.

Prostobuccantia is distinguished from other genera in the Turbanellidae in its possession of the following characters: (1) projection of the buccal capsule beyond the mouth; (2) pharyngeal pores located submedially, about one-third of the distance from the pharyngeal-intestinal junction to the mouth (Fig. 1b); (3) elongated caudal lobes that are symmetrical about their oblique axes, form an elliptical border medially, and bear adhesive tubes only on the posterior border; and (4) two elongated lateral adhesive tubes of unequal length on either side that are fused at their bases and insert ventrolaterally just posterior to the pharyngeal-intestinal junction.

No other genus in the family has a projecting mouth tube, though they have been observed in the family Neodasyidae (see Remane, 1927, 1961) and more recently in the family Lepidodasyidae (Hummon et al., in manuscript). The position of the pharyngeal pores of other turbanellids is universally near the base of the pharynx; only in the family Macrodasyidae (see Hummon, 1982) and a single alleged occurrence in the family Lepidodasyidae (See Schmidt, 1974) are they described as being midway along the length of the pharynx. The caudal appendages of the other five turbanellid genera are asymmetrical about their oblique axes (a line drawn from the body midline to the tip of each appendage), are usually tapered from medial to lateral, and bear adhesive tubes on their posterior margins (Fig. 2c-e, g, h). *Dinodasys*, as figured by Remane (1927), appears to be most similar to *Prostobuccantia* in regard to the shape of the caudal lobes, but Hummon (unpublished observation) maintains that these lobes are more typical of those of the family than previously thought. Groups of extraordinary adhesive tubes (those tubes other than the usual anterior, posterior, lateral, and dorsal series) are found in several genera of Gastrotricha. Paired "dohrni"-tube groups, similar in composition to the "brocha"-tubes described here, are found in the genus *Paraturbanella*, where they occur in the middle pharyngeal region (Fig. 2f; see also Remane, 1927). Solitary "cirrata"-tubes that insert ventrally on either side of the body near the pharyngeal-intestinal junction are often found in the genus *Turbanella* (see Hummon, 1974; Papi, 1957). Outside of the family Turbanellidae, extraordinary tube groups are found in the genus *Pleurodasys* (see Hummon, 1982) and *Xenodasys* Swedmark, 1967.

KEY TO GENERA OF THE FAMILY TURBANELLIDAE

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|--|---------------------------------------|
| 1a. Head with elongate, laterally projecting tentacles | 2 |
| 1b. Head, at most, bearing cones or short peg-like projections | 3 |
| 2a. Lateral adhesive tubes abundant | <i>Dinodasys</i> Remane, 1927 |
| 2b. Lateral adhesive tubes lacking | <i>Pseudoturbanella</i> d'Hondt, 1968 |
| 3a. Anterior adhesive tubes borne on ventral fleshy projections (hands) | 4 |
| 3b. Anterior adhesive tubes arranged in tufts, hands absent | <i>Desmodasys</i> Clausen, 1965 |
| 4a. Groups of two extraordinary adhesive tubes, fused at their bases, occur on either side of the body in the anterior half | 5 |
| 4b. Extraordinary tubes, if they occur, are solitary | <i>Turbanella</i> Schulze, 1853 |
| 5a. Buccal capsule does not extend beyond the mouth; extraordinary tube groups located in the mid-pharyngeal region | <i>Paraturbanella</i> Remane, 1927 |
| 5b. Buccal capsule protrudes forward beyond the mouth; extraordinary tube groups located near the pharyngeal-intestinal junction | <i>Prostobuccantia</i> n. gen. |

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Flatworm Symposium

The American Microscopical Society (AMS) will sponsor a symposium entitled "The Biology of Flatworms," scheduled to be held Sunday, 29 December 1991. Organized by John E. Ubelaker and David Bruce Conn, this AMS-sponsored program will complement the American Society of Zoologists (ASZ)-sponsored symposium "Libbie Henrietta Hyman—Life and Contributions" scheduled for the afternoon of Friday, 27 December.

The AMS program will involve examination of a systems approach to studies of the organization of flatworms. Topics and participants are: Integumentary Systems (John Oaks); Digestive Systems (Burton Bogitsh); Excretory/Osmoregulatory Systems (Lynn Hertel); Parenchyma and Extracellular Matrices (David Bruce Conn); Neuromuscular Systems (Harold Koopowitz); Sensory Systems (Seth Tyler); Asexual Reproduction and its Regulation (Robert M. Mead); Sexual Reproductive Systems (George L. Shinn); Embryonic and Postembryonic Development (Julian P. S. Smith III).

The Friends of the Flatworms will host a social honoring symposium speakers 5-6 p.m., 29 December in the AMS suite.