Paraturbanella solitaria, a new psammic species
(Gastrotricha: Macroasyida: Turbanellidae),
from the coast of California

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Abstract.—A new species of marine gastrotrich is described. Adults of Paraturbanella solitaria new species are simultaneous hermaphroditic, ribbon shaped, up to 530 μm long and up to 64 μm wide. The head bears a pair of sensorial piston pits and its anterior-most portion is hexagonally shaped. The adhesive apparatus consists of anterior and posterior adhesive tubules in addition to bilateral “Seitenfüßchen” organs that take origin in the middle of the pharyngeal region. The new species is placed and discussed within the “telostiern” species assemblage. This is the first gastrotrich reported from the coast of California.

Materials and Methods

Sand was collected on 26 November 1994, from Huntington Beach, California (Fig. 1). After digging a 30 cm deep hole at MLLW, 200 cm³ of sediment was removed from the wall and bottom of the hole, placed in a plastic bag and shipped to the laboratory within 72 h. In the laboratory the sediment was kept in a cold-room at 14°C and processed within 3 days. Specimens were extracted by the narcotization-decantation technique using an isosmotic magnesium chloride solution (Plamnkuche & Thiel 1988). Supernatant was poured in 5-cm plastic dishes and gastrotrichs were located under a M 5 Wild dissecting microscope. Twenty-five sexually mature, living, relaxed individuals were transferred by a glass micropipette to slides and observed using either differential interference contrast optics with a Microphot-FXA Nikon microscope or phase contrast with a Wild M 20 microscope. At that time gastrotrichs were photographed and/or recorded on S-VHS video tape. Measurements of all specimens observed were obtained from the microscope using a ocular micrometer, or
most portion of the head hexagonally shaped. Eight to ten anterior and ten posterior adhesive tubes; lateral adhesive tubes absent. Caudal cone 7–9 μm long. Caudal lobe 40 μm long. "Seitenfüßchen" organs at the middle of the pharyngeal region, shorter tubes 13–17 μm, longer 25–28 μm. Large, heavily cuticularized buccal cavity; pharynx up to 150 μm long with pharyngeal pores 14–16 μm from the pharyngeal-intestinal junction.

Description.—Mature specimens attain a total body length of 460–531 μm and a width of 47–64 μm (Fig. 2; Table 1). The body is transparent, dorsoventrally flattened and slightly tapering towards the posterior end where it is 23–33 μm wide. The head is 29–30 μm wide and somewhat hexagonal in shape (Fig. 2A). It bears marginal cilia as well as several sensory bristles 10–14 μm long. The posterior margin of the head is demarcated from the rest of the body by a slight constriction, 25–26 μm wide. Located just posterior to the constriction, on each side, is a sensorial piston pit 3.8 μm in diameter (Fig. 2A, C). No other sensorial organ (i.e., ventral sensorial papillae) is present. The adhesive apparatus consists of anterior and posterior adhesive tubes in addition to bilateral "Seitenfüßchen" adhesive organs. Eight to ten anterior tubes (2–5 μm long) are arranged in two ventral symmetrical, hand-shaped, groups (Fig. 2C). Ten posterior tubes (6–21 μm long) are part of the 39–41 μm long caudal lobes. A caudal cone, 7–9 μm long, occurs between the symmetrical caudal lobes (Fig. 2A, B). The two "Seitenfüßchen" adhesive organs, literally "lateral foot," referred also as "dorn" tube groups by Evans & Hummon (1991), consist each of two tubes of unequal length originating ventrolaterally, about in the middle of the pharyngeal region, and directed backwards; the longer tube is 25–28 μm in length while the shorter one is 13–17 μm (Fig. 2C).

The body, dorsally and laterally, bears 18–20 pairs of sensory bristles (9–12 μm long); ventrally it bears the locomotory cli-
Fig. 2. *Paraturbellina solitaria* new species. A. Habitus; B. Caudal lobes, ventral; C. Anterior end, ventral; D. Mid intestine, ventral. An, anus; At, anterior adhesive tubules; Bc, buccal cavity; Ce, caudal cone; Et, Seitenfüllchen organs; Pp, pharyngeal pores; Sp, Sensorial piston pits. Scale bars represent 50 μm.
ia. The latter are arranged in two bands that run parallel to each other from the head to the base of the caudal lobes.

The buccal cavity is spacious with a thick cuticular wall and measures 19–21 μm in length by 10.7–12 μm in width. The pharynx is 125–150 μm long and 15–16 μm wide; the pharyngeal pores open about 14–16 μm from the pharyngeal-intestinal junction (Fig. 2A). The intestine is straight and morphologically recognizable in two parts. The anterior part is wider and has a thinner wall compared to the posterior part. The anus opens ventrally at 24–30 μm from indentation between the caudal lobes. The reproductive system is made up of paired bilateral testes and probably bilateral ovaries. Testes originate 32–38 μm posterior to the pharyngeal-intestinal junction, thence tapering in sperm ducts (vasa deferentia) that run backward laterally to the intestine until the mid-trunk, where apparently they turn anteriorly to join at the midline, ventrally to the intestine, 65–70 μm posterior to the pharyngeal-intestinal junction (Fig. 2D). A single mature ovocyte, 55–70 μm in length, was visible dorsal to the mid-intestine in most of the specimens studied. Neither additional accessory reproductive organs or genital orifices have been observed.

Habitat.—A large population of individuals representative of all age classes inhabits the fine, silicious, clean sand of the intertidal zone of Huntington Beach shore. There, sand granules are of low sphericity, sub-angular and moderately well sorted (Fig. 3). At the time of the collection, water temperature and salinity were 19°C and 35 ppt respectively. Major associated taxa were nematodes and turbellarians.

Remarks.—In these specimens the head lacks laterally projecting tentacles, the buccal capsule does not extend beyond the mouth, the anterior tubes are borne on fleshy projections (hands), and the “Seitenflüchtern” organs are located in the mid-pharyngeal region. These characteristics, according to Evans & Hummon (1991), affiliate them with the genus Paraturbanella.

Among the thirteen species so far ascribed to this genus, because of the morphology of the cephalic region, the absence of lateral adhesive tubes and the morphology of the intestine, the present specimens resemble more closely to species that fall within the “telissiert” group, namely: P. mesoptera
Rao, 1970, *P. microptera* Wilke, 1954, and *P. teissieri* Swedmark, 1954. The specimens from California differ from the ones described from India as *P. mesoptera*, in that they are of a larger size, 460–531 μm vs. 360–380 μm, and in that they bear fewer adhesive tubules in both the anterior groups, 4–5 vs. 9, and in the caudal lobes, 5 vs. 9. The present specimens differ from those affiliated with the European *P. teissieri* in that they lack the ventral sensorial papillae and also because they bear a smaller number of anterior as well as posterior adhesive tubules, 8–10 vs. 12 and 10 vs. 12–20 respectively. Recently Kisielewski (1987), discussed synonymizing *P. microptera* (originally found near Naples, Italy) with *P. teissieri* noticing that the two taxa were described almost simultaneously and that both species were considered by their authors as the second within the genus, and consequently only differences from *P. dor-
Hummon, M. A. Todaro & P. Tongiorgi, unpubl. data). Among the morphological traits shared between the Italian and the north European specimens, were also sensorial pison pits and sensorial papilae. Since neither one of these organs were reported in the original description of P. microptera it was assumed by Todaro et al. (1993), that they were both overlooked by Wilke. On this ground, therefore, I think it is appropriate to affiliate the Californian specimens with a new taxon, proposing the name Paraturbanella solitaria new species for it.

Acknowledgments

I am indebted to Neil Scott, surfer and friend, for providing me with the sand from Huntington Beach. I am grateful to Dr. John W. Fleeger for his encouragement and support. The paper benefitted from the comments of Maria Balsamo, Wayne Evans, William Hummon and Paolo Tongiorgi.

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