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A new species of *Hydroides* (Polychaeta: Serpulidae) from western Mexico

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A new species of *Hydroides* (Polychaeta: Serpulidae), is described. Thirty specimens of *Hydroides tenhovei* sp. nov. were found on a flat PVC structure on soft-bottoms near Punta San Juanico and five additional specimens from Cabo San Lázaro, Baja California Sur, Mexico. The new species is characterized by the presence of a verticil with three large dorsal hammer-shaped spines, partially fused; basal internal spinules are absent in these spines; other spines curve outwards, with sharp tips and a basal internal spinule.

INTRODUCTION

The genus *Hydroides* Gunnerus, 1768, with more than 80 recognized species, is the most diverse genus in the family Serpulidae. Incomplete descriptions and confused identifications have caused taxonomic problems in *Hydroides* (ten Hove & Jansen-Jacobs, 1984). No new species have been described in the last ten years but the curve of described species is still far from being asymptotic.

The Eastern Pacific is a region poor in *Hydroides* species. Only 11 species have been described or recorded from this region, as opposed to the 41 species from the Indo-Pacific. This might be due to the little attention that has been given in the Eastern Pacific region to the taxonomy of serpulids in general and to the genus *Hydroides* in particular. The *Hydroides* species described from the Eastern Pacific are the following nine species: from western Mexico, *H. brachyacanthus* Rioja, *H. glandifer* Rioja, *H. humilis* (Bush), *H. ochoterenai* Rioja, *H. recurvispina* Rioja and *H. similis* (Treadwell); from California, *H. gracilis* (Bush); from Chile, *H. cruciger* Mörch; and from Galapagos, *H. inermis* Monro. Also recorded were two widespread species: *H. elegans* Haswell and *H. diramphus* Mörch.

In this paper, a new species of *Hydroides* is described from western Mexico, as the tenth species from Eastern Pacific. The specimens were found in Punta San Juanico and additional specimens from Cabo San Lázaro, both sites located on the western coast of Baja California Sur, Mexico (Figure 1). From the same sites the second author recorded three species of Serpulidae (de León-González, 1990).

MATERIALS AND METHODS

The material was obtained from trawling during April 1988 on soft-bottoms up to a depth of 30 m (Punta San Juanico) and again in May 1988 on soft-bottoms in 27 m (Cabo San Lázaro). The trawling was carried out by a shrimp-trawl on board the ship 'Marsep XVI'. Among the material there was a flat PVC structure in which several serpulid tubes were found. The tubes were rasped and immediately fixed in 10% formaldehyde and later preserved in 70% isopropyl alcohol.

The specimens were studied following the methods and terminology by ten Hove & Jansen-Jacobs (1984) and ten Hove (1990). Measurements on each specimen were taken with a millimetre rule in different sections. Characters of the operculum have been observed in lateral and apical views; radii and spines have been counted, recording the internal spinules. In order to study chaetae and uncini the fourth thoracic chaetiger and two abdominal parapodia, from the anterior and posterior regions were extracted; chaetae and uncini were mounted in semi-permanent preparations for further observations. The notation in the description follows the proposals by ten Hove & Jansen-Jacobs (1984); each number before any notation between parentheses refers to the holotype; r refers to data range, μ to mean and $\pm$ to standard deviation. Only the number of radii, spines and the opercular peduncle position are recorded in all specimens. The drawings of the specimens were made with a camera lucida. All scales in millimetres.

The material was deposited in the following institutions: El Colegio de la Frontera Sur, Unidad Chetumal (ECOSUR), Los Angeles County Museum of Natural History-Allan Hancock Foundation (LACMNH-AHF), Universidad Autónoma de Nuevo León (UANL), United States National Museum, Washington (USNM), and Zoölogisch Museum, Amsterdam (ZMA).

SYSTEMATICS

Hydroides Gunnerus, 1768
Hydroides tenhovei sp. nov.
(Figures 2A–M & 3A–H)

Material studied

Holotype ZMA V.Pol. 4994 and four paratypes: ZMA V.Pol. 4994, Cabo San Lázaro (24°50′N 112°15′W).

Additional material: 30 specimens from Punta San Juanico (26°13′N, 112°13′W): ECOSUR SERP-34 (9), LACMNH-AHF (4), UANL 5029 (10), USNM (4), and ZMA V.Pol. 5031 (3).

Description

Tube: white, internal diameter 1.8 mm (N=6; r, 1.6–1.9; μ=1.7 ±0.1), external diameter 2.5 mm (N=6; r, 2.2–2.7;

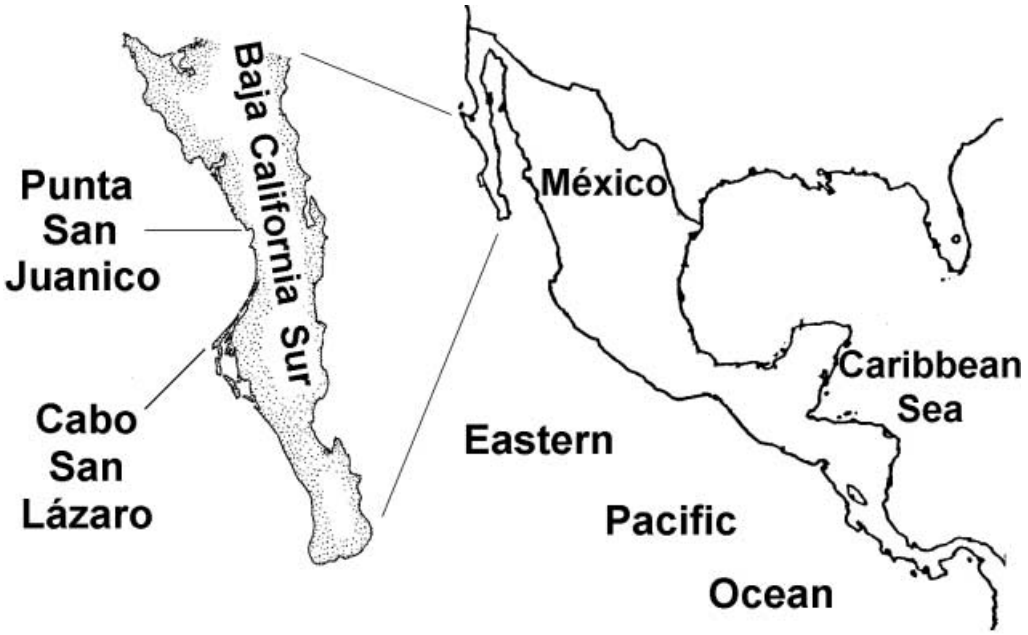

Figure 1. Type locality, Cabo San Lázaro, and additional sampling locality, Punta San Juanico, of *Hydroides tenhovei* sp. nov. in western Mexico.

μ=2.4 ±0.2); attached to the substrate throughout their length. Most tubes fragmentary and/or covered by epibionts, but in six anterior ends no peristomes were found; two specimens have transversal ridges, not observed in the rest of the tubes; no longitudinal ridges were found.

Body colour and size: body yellow to brownish. Total length 40.0 mm (N=9; r, (15.0)15.0–40.0; μ=26.3 ±9.6).

Radiole: crown with 17 radioles (N=14; r, (13–20)13–19; μ=16.7 ±1.7) in the left lobe, and 17 radioles (N=13; r, (11)14–20, μ=16.6 ±1.5) in the right lobe. Radiolar length 3.5 mm (N=14; r, (2.2)2.2–5.1; μ=3.1 ±0.8). Terminal filament is longer than the pinnules.

Peduncle: total length of peduncle and operculum 5.5 mm (N=14; r, (3.2)4.0–6.5, μ=5.0 ±0.6). Insertion left (N=19; 54%) or right (N=16; 46%); opercula at both sides, damaged or in regeneration have not been observed. Pseudoperculum always present, elongated (Figure 3A).

Operculum: funnel and verticil yellowish in colour. Total length of operculum 2.2 mm (N=14; r, (1.1)1.5–2.2; μ=1.9 ±0.2), diameter of funnel 1.2 mm (N=14; r, (0.6)0.7–1.2; μ=0.9 ±0.1). Funnel with 33 radii (N=35; r, 20–42; μ=31.6 ±4.3) with a sharp tip (Figures 2A,B & 3B). Interradial grooves mostly 2/5 of funnel length (N=14). Verticil with 14 spines (N=35; r, 9–14; μ=11.9 ±1.2), to directed outwards (Figures 2A,B & 3B,C). Obvious constriction between funnel and peduncle. Three large dorsal spines, hammer-shaped, partially fused (Figure 2B); each one with globularly expanded tip (Figure 2C); basal internal spinules are absent in these spines but a flat plate joins the distal and basal internal sections of the spine (Figure 2D) or the distal internal section of the spine with the central disc (Figure 3B). Other spines similar in form and size, with sharp tip and one basal internal spinule (Figures 2C & 3B,C); without external and lateral spinules; without lateral wings. Verticil without central tooth.

Collar chaetae: bayonet chaetae with two large teeth in the base and distal blade smooth (Figure 2F) or with fine serrations in the middle (Figure 3D); and 'capillary' chaetae (Figure 2E).

Thorax: total length 5.5 mm (N=14; r, (2.6)2.6–6.0; μ=4.0 ±0.9), width 1.5 mm (N=14; r, (0.5)0.8–1.5; μ=1.0 ±0.3). Thoracic membranes reach to the seventh chaetiger; short apron. Six uncinigerous segments with limbate chaetae (Figure 2I) and saw-shaped uncini with seven denticles (Figure 2J). Each chaetal fascicle arrangement in two rows forming a 'V'.

Abdomen: with 165 abdominal chaetigers (N=9; r, (89)89–183; μ=134.2 ±32.9). Anterior, middle and posterior abdominal chaetigers with flat trumpet-shaped chaetae, with asymmetrical tips (Figure 2K). Posterior abdominal chaetigers without capillary chaetae. Anterior uncinus saw-shaped with four denticles (Figure 2L,M), posterior uncini saw-shaped with six denticles (Figure 3E,F).

Remarks

Opercular funnel sometimes (N=3) with four larger spines. Most specimens have between 11 and 13 spines (Figure 3G), although two specimens have nine spines and two 14. The number of spines is very stable in character, increasing only slightly with increasing thoracic width, while the number of radii is a character less stable in (Figure 3H). The bayonet chaetae sometimes have eroded teeth and blade (Figure 2G,H).

Habitat

Sub-littoral. On an ecological island: a flat and hard PVC structure surrounded by soft-bottom. Other serpulids on the same substrate are *Sclerostyla ctenactis* (Mörch), *Crucigera websteri* Benedict and *H. cruciger* Mörch (de León-González, 1990).

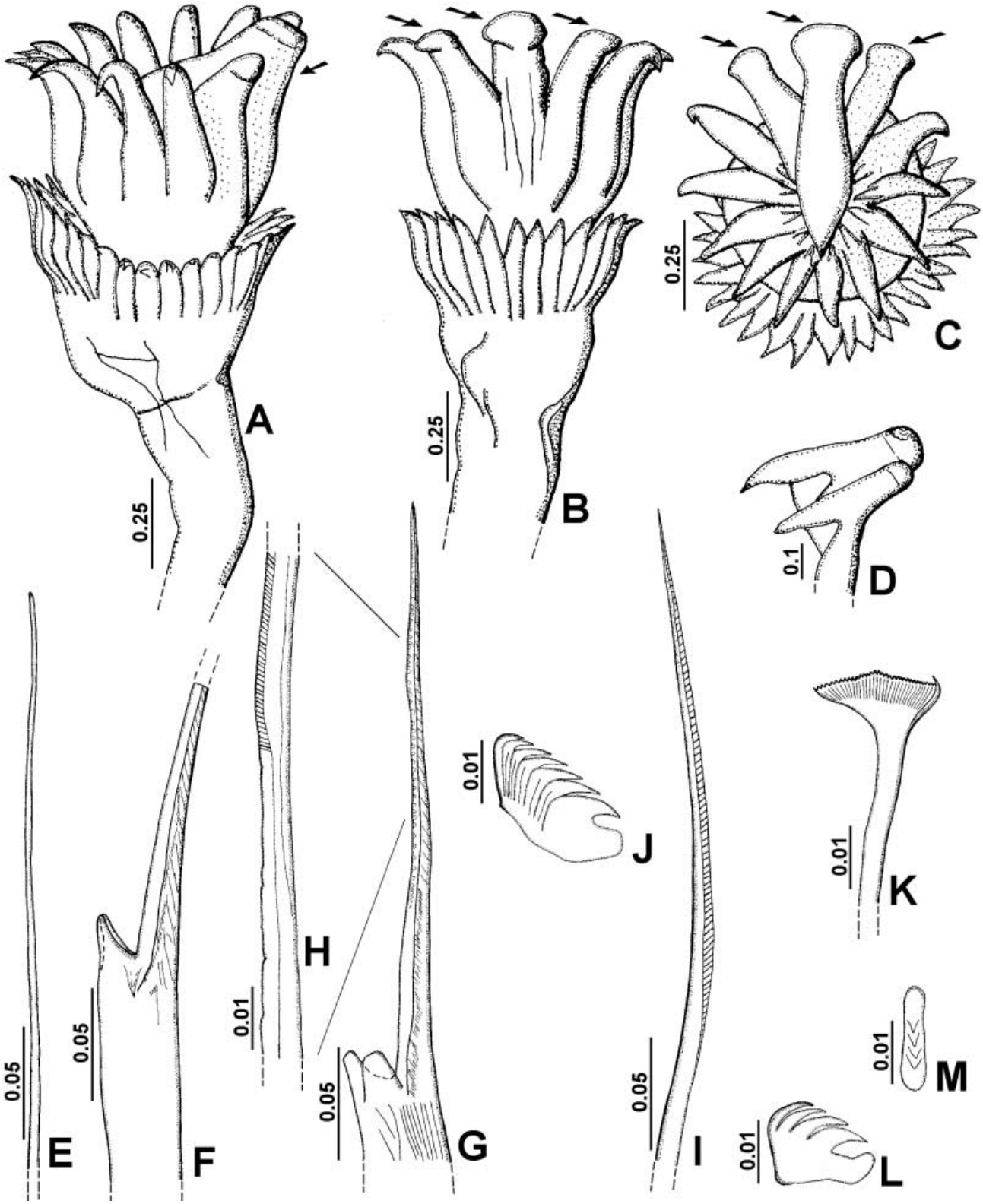

Figure 2. *Hydroides tenhovei* sp. nov. (A) Operculum, lateral view; (B) operculum, dorsal view, (C) operculum, apical view; (D) detail of larger spines, lateral view; (E) 'capillary' collar chaeta; (F) bayonet collar chaeta; (G) bayonet collar chaeta; (H) bayonet collar chaeta, detail; (I) thoracic limbate chaeta; (J) thoracic uncinus, lateral view; (K) anterior abdominal flat trumpet-shaped chaeta; (L) anterior abdominal uncinus, lateral view; (M) anterior abdominal uncinus, apical view. Opercular larger spines are indicated with arrows.

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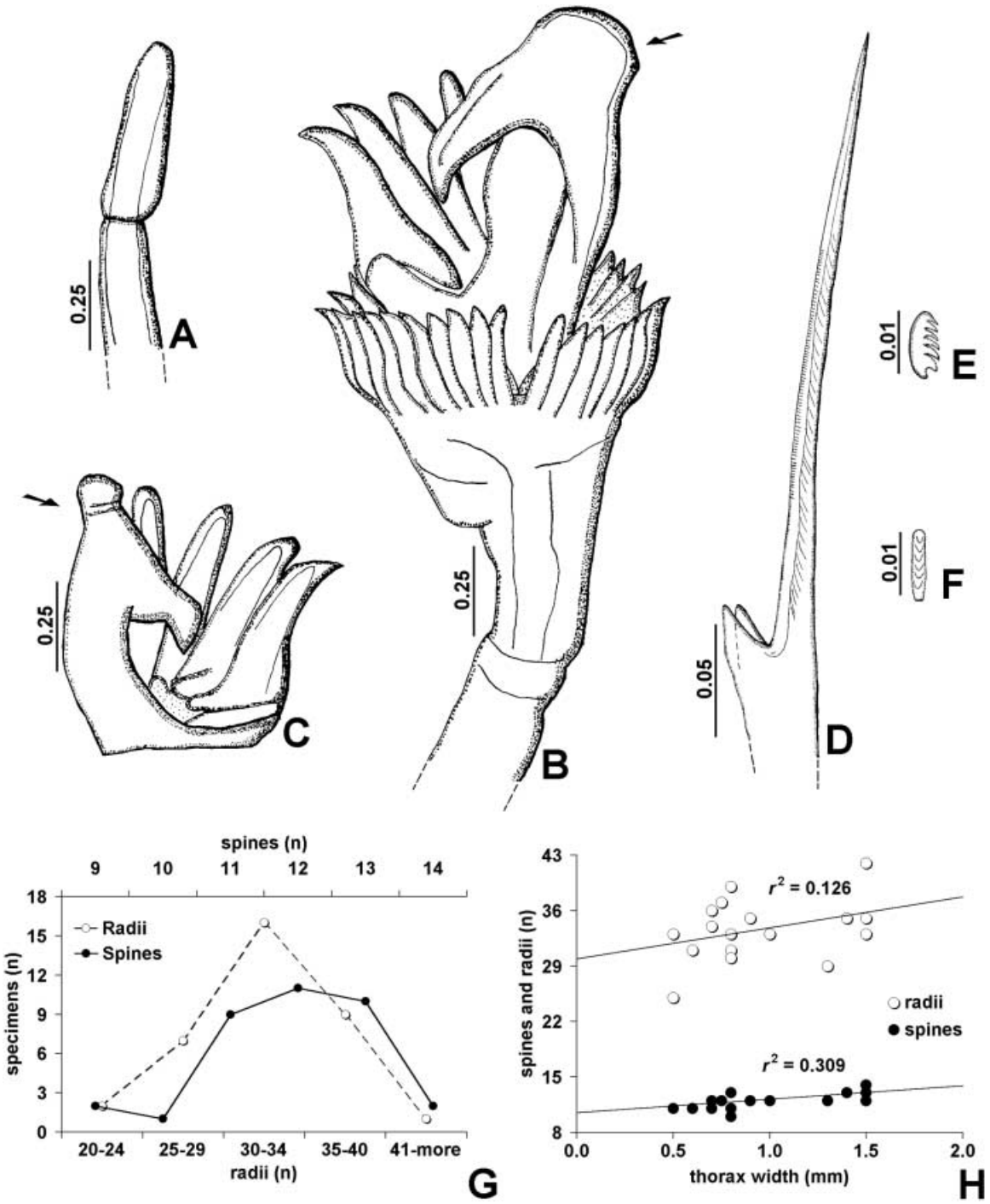

Figure 3. *Hydroides tenhovei* sp. nov. (A) Pseudoperculum, lateral view; (B) operculum with verticil longitudinally sectioned, right side; (C) operculum with verticil longitudinally sectioned, left side; (D) bayonet collar chaeta; (E) posterior abdominal uncinus, lateral view; (F) posterior abdominal uncinus, apical view; (G) frequency of radii and spines including all specimens (N=35); (H) relation of thorax width with number of radii and spines including only the specimens revised, adults and juveniles (N=19). Opercular larger spines are indicated with arrows.

Type locality

Cabo San Lázaro, Baja California Sur, Mexico.

Etymology

Species is named in honour of Harry A. ten Hove, distinguished serpulid specialist, who first recognized the specimens from Cabo San Lázaro to be a new species.

DISCUSSION

Hydroides tenhovei sp. nov. shows a superficial resemblance with *H. brachyacanthus* Rioja, *H. glandifer* Rioja, *H. malleolaspina* Straughan and *H. similis* Treadwell. *Hydroides brachyacanthus* was described from western Mexico (Rioja, 1941), has a large dorsal spine; all spines are directed

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inward and have a basal internal spinule. On the contrary, *H. tenhovei* sp. nov. has three or four large spines without basal internal spinules; all remaining spines are directed outward.

Hydroides glandifer was described from Acapulco (Rioja, 1941) and later found in Cabo Pulmo reef, Baja California Sur (Bastida-Zavala, 1995). This species shares the feature of fused dorsal spines, one of the five forming a protuberance with its distal tip sharply curving inward. However, *H. tenhovei* sp. nov. has only three spines fused and a larger number of radii (20–42 vs 12–18 in *H. glandifer*).

Hydroides malleolaspina was described from Australia (Straughan, 1967), has one large hammer-shaped spine, and all remaining spines and all radii have T-shaped tips. On the contrary, all spines of *H. tenhovei* sp. nov., except the three or four larger spines, have sharp tips and a basal spinule, and the radii have sharp tips.

Hydroides similis was described from Baja California (Treadwell, 1929), has 3–4 larger dorsal spines; all spines are free (not fused), directed inward and with a basal internal spinule. However, the three or four larger spines of *H. tenhovei* sp. nov. are partially fused and lack basal internal spinule; the remaining spines are directed outwards.

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