

## A new *Thecacineta* species (Ciliophora, Suctorea) on *Desmodora pontica* (Nematoda, Desmodorida) from a seagrass bed in Taiwan

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### Summary

A suctorian ciliate *Thecacineta urceolata* sp. nov. is described from the sediment specimens collected in a seagrass bed at Ludao, Taiwan. The suctorian was found colonizing the body surface of nematode *Desmodora pontica*. The new species differs from relatives, *Thecacineta cothurnioides* and *Thecacineta oregonensis*, in the lorica structure, which characteristic by the urceolate apical part.

**Key words:** ciliate, epibiont, nematode, suctorian, Taiwan, *Thecacineta urceolata*

### Introduction

Suctorian ciliates are discovered as epibionts on diverse benthic invertebrates (Jankowski, 1981; Dovgal, 1996, 2002, 2013; Dovgal et al., 2008). A number of suctorian species have been recorded attaching to the cuticle of various nematodes, in particular those with cuticular ornamentation (Allgen, 1934; Murphy, 1965).

For instance, members of the family Desmodoridae are commonly infested by suctorian epibionts (e.g., Fisher, 2003; Dovgal et al., 2009a; Ingole et al., 2010). To our knowledge, only two cases have been reported on halacarid mites in the Taiwanese waters, i.e., *Praethecacineta halacari* (Schulz) on *Copidognathus* mite and *Thecacineta calix* (Schroder) on *Agauopsis* mite (Dovgal et al., 2009b; Chatterjee et al., 2011).

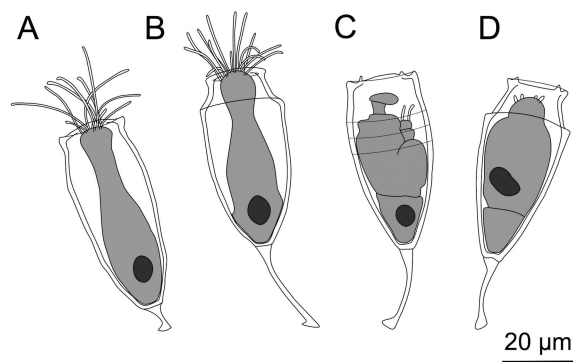
This paper describes a new species of *Thecacineta* Collin, 1909, *Thecacineta urceolata* sp. nov.,

collected on nematodes from a seagrass bed at Ludao, Taiwan.

### Material and methods

Cores of 2 cm diameter collected sediment samples on 17 March 2012 from a seagrass bed of *Thalassia hemprichii* (Ehrenberg) Ascherson at Shihlang (22°39'08"N, 121°28'25"E), Ludao, Taiwan. Salinity was 20 PSU in the water depth of 30 cm during the sampling occurrence at low tide. The sediment has the average median grain size  $537 \pm 51 \mu\text{m}$  with low silt/clay content (<1%). All the meiofauna retained on a 42- $\mu\text{m}$  sieve were fixed, stained with Rose Bengal, and sorted under a stereomicroscope. The details were reported in Liao et al. (2015).

For permanent slide preparation, infested nematodes were transferred into glycerol and mounted. Terminology and systematic position of



**Fig. 1.** *Thecacineteta urceolata* sp. nov. A, B, D – side view; C – budding stage.

suctorian ciliates followed Dovgal (2002, 2013). The measurements of ciliates were conducted using the AxioVision software for processing of digital images. Permanent slides of infested nematodes were deposited in the Biodiversity Research Museum, Academia Sinica, Taipei, Taiwan.

## Results and discussion

SYSTEMATICS (AFTER DOVGAL, 2013):

Class SUCTOREA Claparède et Lachmann, 1859  
 Subclass EXOGENIA Collin, 1912  
 Order VERMIGEMMIDA Jankowski, 1973  
 Family THECACINETIDAE Matthes, 1956  
 Genus *Thecacineteta* Collin, 1909

*Thecacineteta urceolata* Liao et Dovgal, sp. nov.  
 (Figs 1–4).

**Etymology:** The specific name reflects the urn-like shape of the lorica apertural part in *Thecacineteta urceolata*.

**Diagnosis:** Marine loricate suctorian. Cell body attached to the bottom of lorica. The apical part of body narrowed and just protruded from lorica aperture. Up to 15 capitate tentacles placed at apical body surface. Macronucleus spherical or ellipsoid, located at the bottom of body. Contractile vacuole small, single, and near to macronucleus. Lorica smooth or with 1–3 weakly ribbed transversely (Fig. 1, C). The mouth of lorica has characteristically urceolate structure (Figs 3; 4). Lorica aperture ridged. Stalk long and curved, with apical widening (physon). Reproduction by vermigemmic budding with formation of laterally vermiform protomit (Figs 1, C; 4).

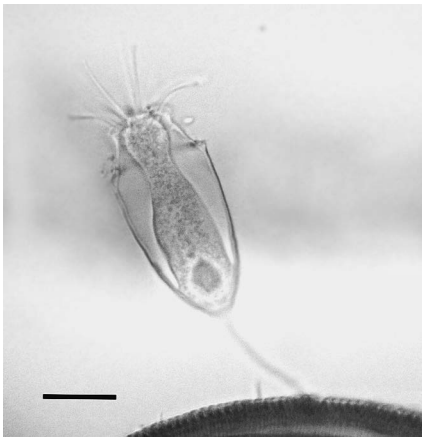


**Fig. 2.** The distribution of *Thecacineteta urceolata* sp. nov. on *Desmodora pontica* from Ludao, Taiwan. Scale bar: 100 µm.

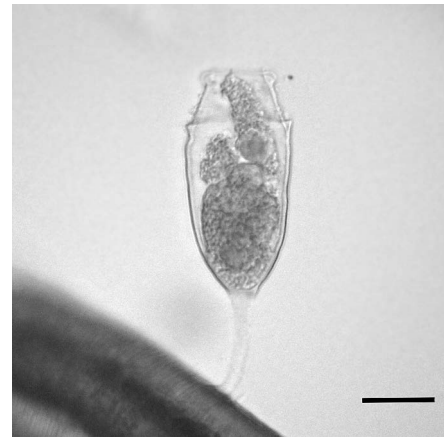
Dimensions (in µm): Lorica length 56–70, lorica width 26–36, width of lorica mouth 10–18, height of lorica neck 10–20, body length 48–66, body width 16–26, width of body neck 6–12, tentacle length 14–24, tentacle thickness 1, macronucleus diameter 6–8, stalk length 8–30, stalk thickness 2.

**Differential diagnosis:** The new suctorian species is probably close related to *Thecacineteta cothurnioides* (Collin, 1909) and *Thecacineteta oregonensis* (Murphy, 1965) where recorded on harpacticoid copepod *Cletodes longicaudatus* (Boeck, 1872) from Banyuls-sur-Mer at Mediterranean coast of France (Collin, 1912) and nematode *Tricoma* sp. from Ratnagiri, west coast of India, Indian Ocean (Dovgal et al., 2009a) and on *Desmodora* sp. from Yaquina Head, Oregon, Pacific west coast of USA (Murphy, 1965), respectively. They are similar in the shape of lorica, tentacle number, and the stalk widening (physon). However, the lorica in *T. cothurnioides* is smooth without folds and *T. oregonensis* has single fine striation apparent midway in lorica, whereas the mouthpart of lorica in *T. urceolata* has shaped like the neck of the jar.

Another morphologically relative species, *Praethecacineteta halacari* (Schulz, 1933) has been reported on a mite (*Copidognathus* sp.) from He-Ping-Dao (Dovgal et al., 2009b). It resembles to *T. urceolata* by the pyriform body. However, the stylotheca of *P. halacari* is smooth and without ribbing. In addition, *P. halacari* was placed into the family Praethecacinetidae Dovgal, 1996, based on the semi-circumvaginate exogemmic budding with formation of laterally positioned ciliate protomit, which differs from the vermigemmic budding of the Thecacinetidae (Dovgal, 1996).



**Fig. 3.** *Thecacineteta urceolata* sp. nov. Scale bar: 20  $\mu$ m.



**Fig. 4.** Budding specimen of *Thecacineteta urceolata* sp. nov. Scale bar: 20  $\mu$ m.

**Type locality:** Shihlang (22°39'08"N, 121°28'25"E), Ludao, Taiwan.

**Type host:** *Desmodora pontica* Filipjev, 1922.

**Type material:** A hapantotype slide (registration number: ASIZ01000008) has been deposited in the Biodiversity Research Museum, Academia Sinica, Taipei, Taiwan. The *Thecacineteta* ciliates (n=26) are still attached to seven specimens of nematodes and mounted in glycerol.

**Host specificity:** *Thecacineteta urceolata* is only observed on the type host, *Desmodora pontica* (previously identified as *Pseudochromadora* in Liao et al., 2015), and absent on the other meiofauna (including harpacticoid copepods, halacarid mites, nematodes, and even the other *Desmodora* species) from the same collection. A total of 1,680 specimens of nematodes belonging to 63 genera were isolated from the meiofaunal samples, and *D. pontica* (87 individuals) accounted for approximately 5.2%. Among these, 31 out of 87 (35.6%) of *D. pontica* were infested with suctorians. Among the infested *D. pontica*, 13 were male and 18 were female. A total of 100 individuals of suctorian ciliates were found on the nematodes, from 1 to 11 individuals for each host individual. If divided the nematode into three equal sections, 26, 39, and 35 ciliates attached to the head, middle, and tail regions, respectively. Thus, *T. urceolata* were not obviously situated close to the cloaca of nematode hosts as the other species (e.g., Fisher, 2003; Ingole et al., 2010). *D. pontica* is characterized by the coarser striated cuticle in the anterior region but finer at the middle and posterior parts (Armenteros et al., 2014). Considering the heavily cuticular ornamentation may provide proper attached points for the ciliates, the head region

possibly has equal benefit with the cloaca of hosts for these ecto-commensals.

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