

**A FIRST REPORT OF SYMBIOTIC POLYCHAETE SCALE WORM *GASTROLEPIDIA CLAVIGERA* SCHMARD, 1861 (PHYLLODOCIDA: POLYNOIDAE) FROM LAKSHADWEEP ARCHIPELAGO, INDIA**

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The fact that symbiotic polychaete species are assigned to have commensal association with other marine invertebrates is a common phenomenon. The effects of a symbiont on their hosts determine the type of their interactions and many of these associations are poorly understood since their study requires much time and effort (Britaev & Lyskin 2002). Martin & Britaev (1998) describe 375 species of symbiotic polychaetes

with 294 considered as commensal and 81 said to be parasitic. More than 50 species of symbiotic polychaetes belong to the family Polynoidae, which are commonly occurring medium-sized scale worms (Fauchald 1977).

In the present study a survey for commensal scale worms was confined to the intertidal area (eastern side) of Agatti Island, Lakshadweep during the months of September and October 2011. In total, 52 belt transects (50x10 m) were positioned between high and mid tidal regions with a distance of 100m among each of the transects. The individuals of symbiotic polychaete *Gastrolepidia clavigera* Schmarda (Image 1a,b) were counted by observing from the body surface of the hosts dorsally, central and near the oral cavity. The holothurian host was less abundant in the low tidal region due to rocky areas and hence, the survey was restricted to the middle and southeastern side of the Agatti Island where sandy substrates were more common. Underwater documentations were done by an Olympus camera (μTough series) over the depth ranges from 0–1.5 m. Worms were often found in pairs and associated with a variety of holothurians belonging to the families Holothuridae and Stichopodidae. The worms were clinging to the anterior or posterior end of the host body, but when disturbed they tended



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DATA DEFICIENT	LEAST CONCERN	NEAR THREATENED	VULNERABLE	ENDANGERED	CRITICALLY ENDANGERED	EXTINCT IN THE WILD	EXTINCT
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*Gastrolepidia clavigera*  
Scale Worm



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Image 1. Symbiotic polychaete *Gastrolepidia clavigera* Schmarda, 1861 (TL 21mm) (10°50'39.80"N & 72°11'16.85"E) (MBRC/ZSI M<sub>1</sub>-64), 22.x.2011, intertidal, Agatti, Lakshadweep, India.

A - same-dorsal view; B - same-ventral view.

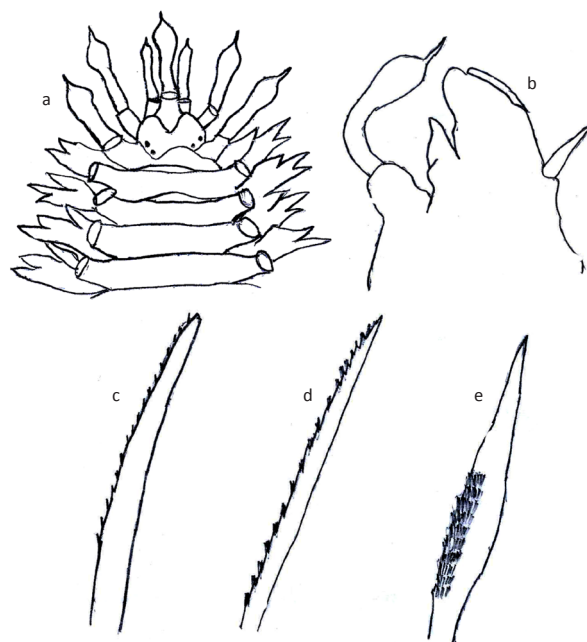


Figure 1. Symbiotic polychaete *G. clavigera* Schmarda, 1861  
A - anterior end (dorsal view); B - cirrigenous parapodium (posterior view);  
C - notosetae; D - neurosetae (upper); E - same (middle).  
Scale: A = 1mm; B = 0.5mm; C-E = 0.1mm.

to hide inside the oral cavity of the host. The size of worms was measured in millimeters (total length in mm) and the host was measured in centimeter (total length in cm). Host holothurians were identified using field guides (Allen & Steene 2000) and worm specimens were identified using Hanley (1989), Britayev et al. (1999) and Barnich et al. (2004). Description and coloration of the symbiotic worm *G. clavigera* was based on the recently collected specimens and further used for taxonomic identifications. The samples were preserved in 5–10 % sea water formalin and deposited in the Marine Biological Regional Centre (MBRC), Zoological Survey of India (ZSI), Chennai, Tamil Nadu.

Order Phyllodocida Dales, 1962

Suborder Aphroditiformia Levinsen, 1883

Family Polynoidae Malmgren, 1867

Genus *Gastrolepidia* Schmarda, 1861

*Gastrolepidia clavigera* Schmarda, 1861 (Image 1 A,B; Fig.1 A–E)

**Material examined:** MBRC/ZSI M<sub>1</sub>-64, 11 individuals, 22.x.2011, TL 11–24 mm, intertidal area (eastern side), Agatti Island, Lakshadweep (10°50'39.80"N & 72°11'16.85"E), coll. T. Marudhupandi & S. Prakash.

**Diagnostic characters:** Body flattened, tapering anteriorly and posteriorly up to 36 segments, scute-like processes at the base of each parapodium. Elytra large, smooth and soft without papillae, overlapping medially and posteriorly (Fig. 1A). Elytron with pouch on anterior margin. Prostomium bilobed and wider, without

cephalic peaks, palps short and tapering gradually to a filiform tip. Ceratophores of median antenna large and truncated in anterior notch, style smooth, basally cylindrical and expanding to large bulbous subterminal inflation and lateral antenna distinct, shorter and smaller, terminoventrally on distal ends of prostomium.

Tentacular segments not visible, tentaculophores lateral to prostomium with two pairs of dorsal and ventral tentacular cirri, smooth and similar to median antenna. Parapodia subbiramous (Fig. 1B). Notopodium small and flattened with acicular lobe. Neuropodium deeply cut dorsally and ventrally forming a long and thin presetal lobe and short and blunt postsetal lobe. Dorsal cirri without elytra expanding into large subterminal inflation and form filiform tip. Ventral cirri shorter and gradually form filiform tip. Ventral lamellae large and conspicuous at the bases of parapodia.

Notosetae (Fig. 1C) long and slightly curved with serrations on the outer margin with notched tips. Neurosetae (Fig. 1D) long and straight with rows of serrations at the outer edges with notched tips; middle (Fig. 1E) and lower neurosetae short and stout, slightly curved with a few rows of serrations and unindentate tips.

**Distribution:** *Gastrolepidia clavigera* has a circumtropical distribution throughout the Indo-Pacific

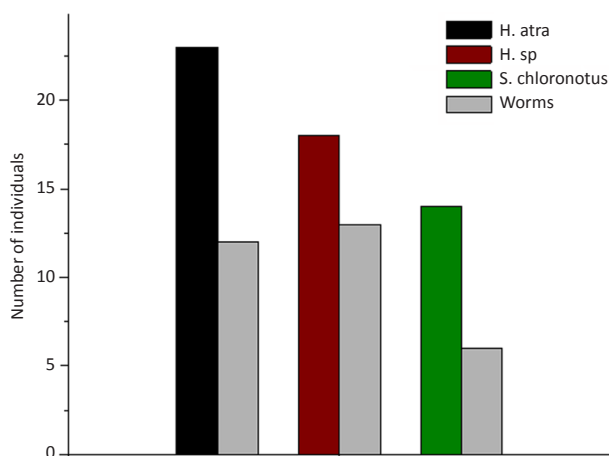


Figure 2. Number of holothurians containing *G. clavigera* as commensal. *Holothuria atra* (12 out of 23), *Holothuria. sp* (13 out of 18) and *Stichopus chloronotus* (6 out of 14)

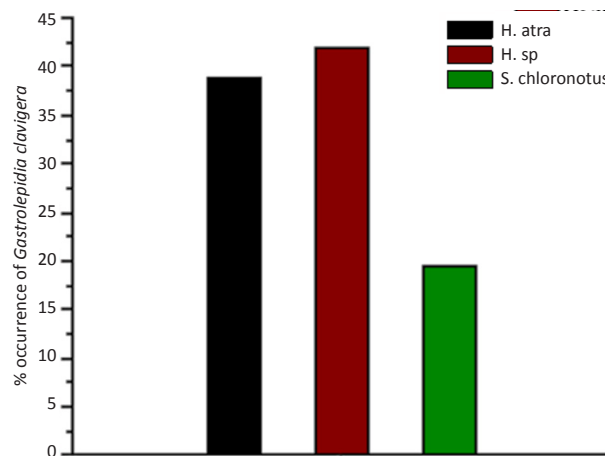


Figure 3. Percentage (%) occurrence of *G. clavigera* associated with three species of holothurians

(Hanley 1993; Martin & Britayev 1998), the South China Sea, Xinsha Islands (Wu et al. 1975), southern Vietnam (Britayev & Zamishlyak 1996) and Hainan Island (Meng et al. 1993; Barnich et al. 2004). In Indian waters it has been recorded from Rameswaram (Fauvel 1941) and Andaman and Nicobar Islands (Tampi & Rangarajan 1964; Tikader et al. 1986). This species has been reported for the first time from Agatti Island, Lakshadweep.

**Remarks:** Potts (1910) was the first to recognize the association between *G. clavigera* and the holothurians. Gibbs (1969, 1972) provided a list of holothurian hosts and suggested that the ventral lamellae might be an adaptation to life on a holothurian, allowing the worms to cling by suction to their hosts.

Nearly 26 species of holothurians have hitherto been recorded from Lakshadweep waters (James 1989) of which 11 species were recorded during the present survey. The *G. clavigera* was mainly found in abundance when associated with three species of holothurians: *Holothuria atra*, *Holothuria sp.* (Holothuridae) and *Stichopus chloronotus* (Stichopodidae). The maximum length of the host was measured as 42.2, 27.8 and 22.5 cm respectively. The remaining host species (*Bohadschia argus*, *Actinopyga mauritiana* and *Holothuria nobilis*) were rarely seen during the survey with worm as a commensal. One further holothurian species in this region is *Synaptus sp.* (Synaptidae), which does not host any symbiotic worm on its body surface (personal observation by TM, SP and MG during the survey).

In total, 55 host individuals were observed for the presence of symbiotic worm and 31 individuals were holding *G. clavigera* in a commensal relationship. *Holothuria atra* (12 of 23), *Holothuria sp.* (13 of 18) and

*Stichopus chloronotus* (6 of 14) (Fig. 2), respectively. Percentage (%) occurrence of symbiotic worm *G. clavigera* on these three host species were calculated. The maximum occurrence was on *Holothuria sp.* (41.9%) followed by *H. atra* (38.7%), suggesting that the surface area of the host may play a vital role in the distribution of these symbiotic worms on the body surface. Whereas a low % occurrence on *S. chloronotus* (19.3%) is due to the lesser body surface of the host species (Fig. 3), in rare occasions, more than two worms were noticed in *Holothuria sp.* including juveniles of 8mm and 11mm in total length.

Both parasitic feeding on the host's tissues and predatory behavior are characteristic of *G. clavigera*, which makes up a complex system of interactions between the polychaete and their host holothurians (Britayev & Lyskin 2002). Both field and experimental studies are required to study the interactions between these symbionts and their hosts.

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