

## NEW RECORD OF A SEA CUCUMBER, *HOLOTHURIA (STAUROPORA) FUSCOCINEREA* JAEGER, 1833 (HOLOTHUROIDEA: ASPIDOCHIROTIDA: HOLOTHURIIDAE) IN SINGAPORE

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### INTRODUCTION

There are about 1,400 known species of holothuroids globally (Pawson, 2007), but the dearth in information on sea cucumbers still warrants more study. The sea cucumbers in Singapore are insufficiently documented despite some attempts at compiling data on them or identifying the fauna (e.g. Lane & Vandenspiegel, 2003; Teo & Ng, 2009). This paper represents the first published record of *Holothuria (Stauropora) fuscocinerea* Jaeger, 1833, formerly documented as the “pink spotted sea cucumber” (Tan, 2009).

### MATERIALS AND METHODS

The specimen was collected on 10 Oct.2009 at about 2100 hours beneath a granite rock which is part of the seawall adjacent to Tanah Merah Ferry Terminal (1°18'44"N 103°59'37"E). It was fixed in 10% formaldehyde for two weeks before preservation in 75% ethanol. The specimen was subsequently deposited in the Zoological Reference Collection (ZRC), Raffles Museum of Biodiversity Research, National University of Singapore (ZRC: ECH 0094).

Parts of the tegument, papillae and podia were cut and placed in glass vials containing 2 ml of sodium hypochlorite (NaOCl). These were left to stand for 30 minutes until the tissues dissolved. The ossicles, which remained as white sediment at the base of the vials, were then examined under a compound microscope for species identification. The holothurian was identified as *Holothuria (Stauropora) fuscocinerea* Jaeger, 1833.

Comparison of the specimen was made with photographs taken from previous sightings. The earliest sighting of the species as well as the localities where it was found was also obtained to provide a historical record of this animal in Singapore.

### DESCRIPTION AND DISCUSSION

**Specimen details.** – At rest, the specimen is elongated (390 mm long and 63 mm at the widest point) and generally cylindrical in shape. The dorsal surface (Fig. 1a) is brown with six dark brown bands while the ventral side (Fig. 1b) is white. Black spots (approximately 2–4 mm) are scattered irregularly over the soft tegument. The mouth is situated ventrally and bordered by 20 off-white peltate tentacles, each measuring 6–8 mm long (Fig. 1c). The anus is encircled by a distinct dark brown colouration (Fig. 1d).

The entire dorsal tegument is covered with retractable papillae that are brown from the base and gradually fade off towards the tip (Fig. 1e). Each brown-ringed papilla protrudes from a wart-like extension of the tegument. The mouth and anus are also lined by a collar of papillae. Pedicels (similarly coloured as the papillae) are apparent on the ventral surface (Fig. 1f). Both the papillae and pedicels are irregularly arranged on the tegument.

**Ossicle examination.** – The ossicles in the tegument, papillae and pedicels differ in form. In the tegument, buttons and rods are present. The buttons are small, smooth and poorly developed (Fig. 2a) while the rods are either perforated at the ends (Fig. 2b) or simple and curved (Fig. 2c). Similar structures are present in the papillae, but with larger and more developed buttons (Fig. 2d). Some of these buttons are marked by the presence of a central longitudinal ridge. There are also few short tables. The spire of each table lacks a crown and consists of four short pillars supported by a single cross beam (Fig. 2e). Large plates which are highly perforated are present in the pedicels (Fig. 2f), together with rods and buttons that bear similar forms as with those in the papillae.

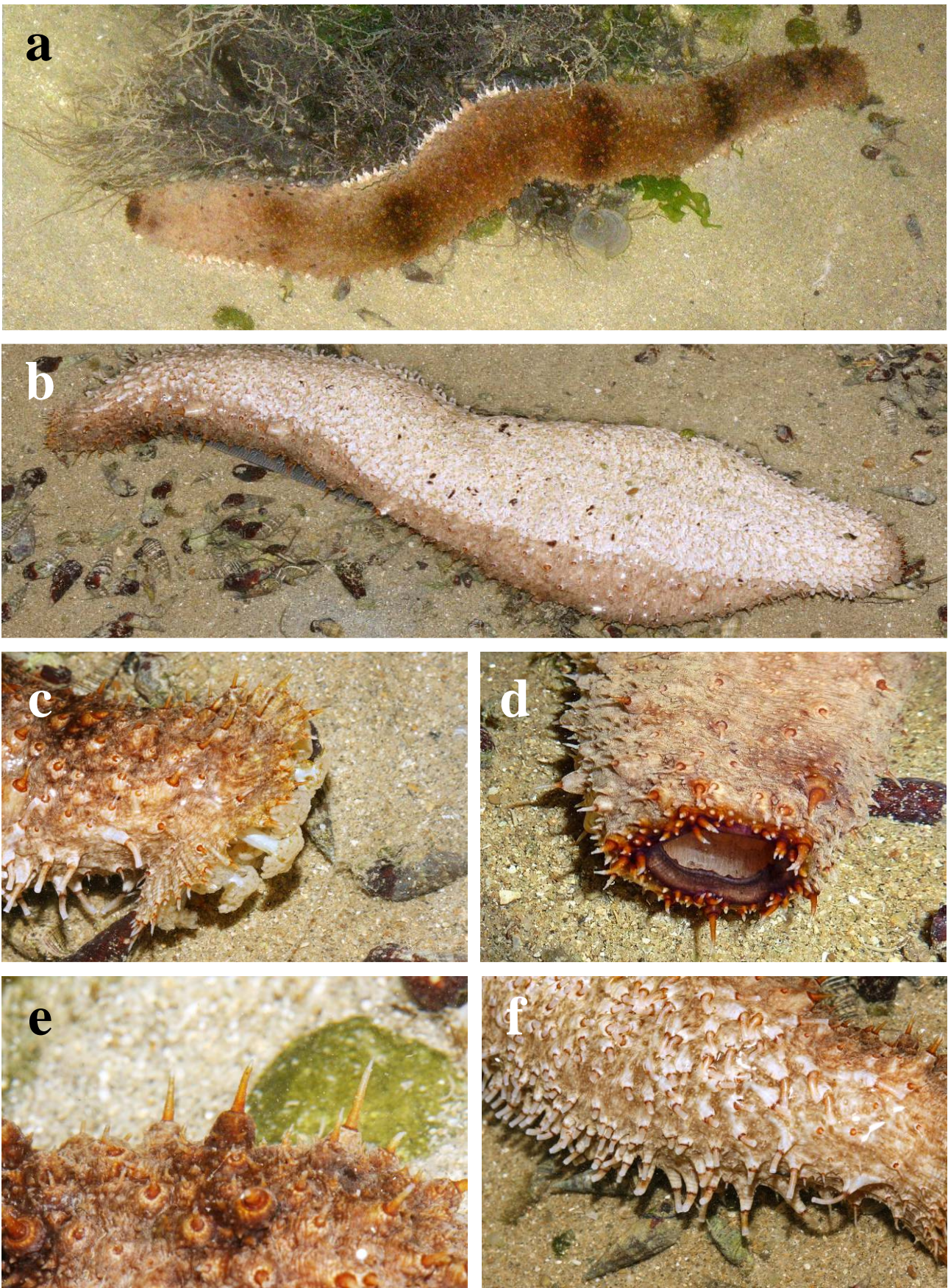


Fig. 1. Various morphological features of *Holothuria fuscocinerea* taken *in-situ*, showing the (a) dorsal side (b) and ventral side, (c) the mouth and feeding tentacles, (d) anus, (e) the papillae and (f) pedicels. Specimen length at rest = 390 mm. {Photographs 1[a] by: Teo Siyang; 1[b, c, e, f] by: James Koh; 1[d] by: Loh Kok Sheng}

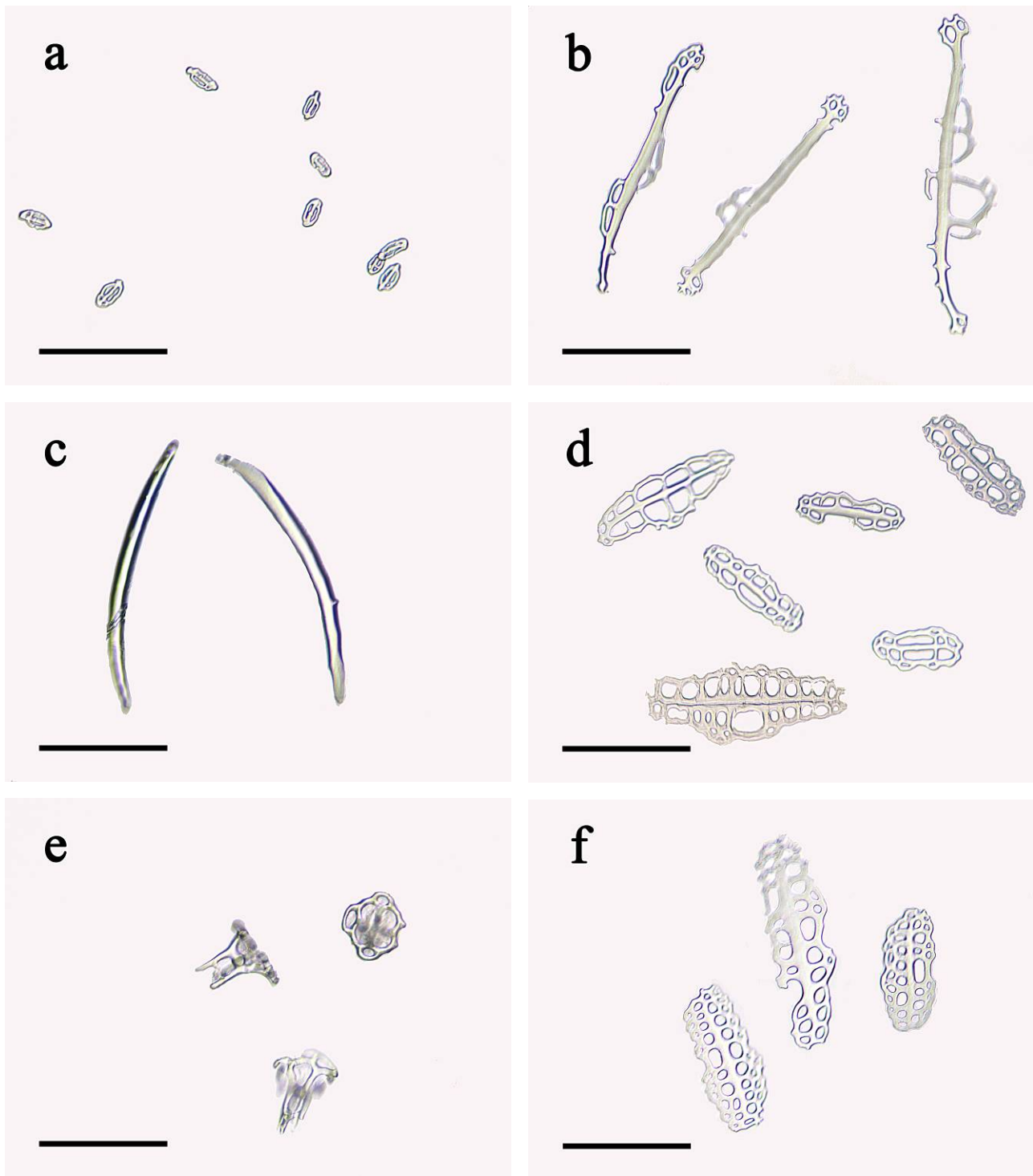


Fig. 2. Ossicle forms in the specimen. (a) Small poorly developed buttons. (b) Perforated rods. (c) Simple, curved rods. (d) Large, fenestrated buttons. (e) Lateral and ventral views of tables. (f) Perforated plates in the pedicels. Scale bars = 0.1 mm. (Photographs by: Teo Siyang)

**Distribution.** – *Holothuria fuscocinerea* is widespread in the tropics. It has been documented from the west of Columbia, the Red Sea, East Africa, Madagascar, India, parts of Southeast Asia, Australia, southern China, Taiwan and Japan. (DMNC, 2009; Liao, 1997, 1998; Samyn & Massin, 2000; Marsh & Morrison, 2004; Kerr et al., 2006; Ameziane, 2007; Cohen-Rengifo et al., 2009). Massin (1999) provided a detailed description of the specific localities as well as a global distribution map for this species. This species is mainly confined to the shallows from the intertidal region to 3 m in depth (DMNC, 2009).

In Singapore, it has been reported in the intertidal zone of Beting Bemban Besar, Pulau Jong, Pulau Semakau, Pulau Subar Laut (J. Koh & R. Tan, pers. comm.) and the coast of Tanah Merah. The earliest record with photographic evidence was on 9 Mar.2005 at Pulau Semakau (R. Tan, pers. comm.).

**Observations.** – *Holothuria fuscocinerea* was reported to promptly eject thick white cuvierian tubules when handled (R. Tan & K. H. R. Yeo, pers. comm.; Fig. 3). This behaviour was, however, not observed with our specimen, which instead only contracted when agitated (Fig. 4). The tegument of the specimen was covered with a film of mucus, which might have aided in camouflage, as seen from the adhesion of a layer of sediment on the body (pers. obs.). It has typically been found beneath live coral, coral rubble (R. Tan & K. H. R. Yeo, pers. comm.), and for our specimen, under boulders.



Fig. 3. *Holothuria fuscocinerea* at Beting Bemban Besar. This animal ejected cuvierian tubules after being handled. (Photograph by: Ria Tan)



Fig. 4. The specimen at Tanah Merah contracted immediately after slight agitation. (Photograph by: Loh Kok Sheng)

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