

SYSTEMATICS

FAMILY HOLOTHURIIDAE LUDWIG, 1894

Genus *Holothuria* Linnaeus, 1767

Subgenus *Lessonothuria* Deichmann, 1958

*Holothuria (Lessonothuria) cavans*, new species

(Figs. 2-4, Pl. 1A)

**Material examined.** - Holotype (Institut Royal des Sciences Naturelles de Belgique, Brussels: IRSNB, IG 28156/2/7), Kakaban Island (lagoon), East Kalimantan, Indonesia, coll. T. Tomascik, May.1994.

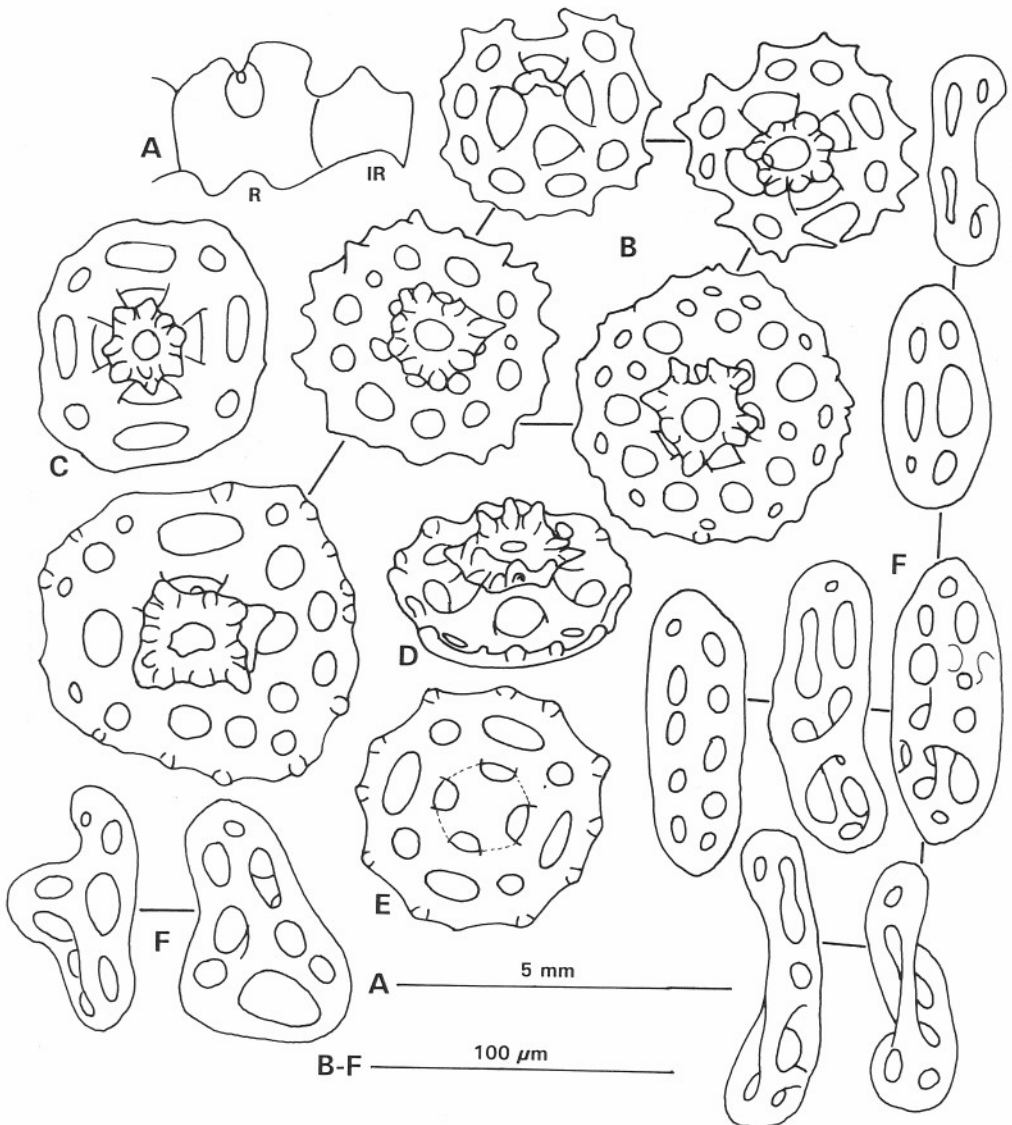


Fig. 2. *Holothuria (Lessonothuria) cavans*, new species. A: calcareous ring (R: radial piece; IR: interradial piece); B-E: tables of body wall; F: buttons of body wall.

Paratypes - five specimens (IRSNB, IG28156/2/1,4,8,9,10), Kakaban Island (lagoon), East Kalimantan, Indonesia, coll. T. Tomascik, May.1994.- two specimens (Museum Zoologicum Bogoriense, Bogor, Indonesia: MZB), Kakaban Island (lagoon), East Kalimantan, Indonesia, coll. T. Tomascik, May.1994.- two specimens (National Museum of Natural History, Washington D.C., USA: NMNH), Kakaban Island (lagoon), East Kalimantan, Indonesia, coll. T. Tomascik, May.1994. Moreover, tens of specimens were observed for the colour and ecological data.

**Diagnosis.** - Medium-size holothurian (39-75mm long); 18 peltate tentacles; darkish-silver-gray with some black brownish spots dorsally and light gray to white ventrally. Ossicles as tables, buttons and rods, tube feet without perforated plates; tables with low spire and without cross-beams; end plate of the tube feet small (125-180  $\mu\text{m}$  in diameter).

**Type locality.** - Kakaban Island, East Kalimantan, Indonesia.

**Description.** - Medium-size holothurian, 39-75 mm long and 16-27 mm in diameter when in alcohol. Body more or less cylindrical, narrowing anteriorly; 18 peltate tentacles in one crown. Tube feet few, scattered all over both dorsal and ventral surface; however serial arrangement visible, particularly near the mouth. Tube feet long, conical, without terminal sucker, more abundant on ventral surface than on dorsal surface. Undisturbed individuals are always partially burrowed and are covered by a layer of fine sediment. Colour in life darkish silver-gray with barely visible black-brownish spots dorsally, and light gray to white ventrally (Pl. 1A).

Calcareous ring stout (Fig. 2A); interradial pieces with a median anterior projection; radial pieces with a median anterior notch and much wider than the interradial pieces. One long Polian vesicle (nearly 1/4 of body length); one very short contorted stone canal. No Cuvierian tubules.

Ossicles represented by tables, buttons and rods. Tables and buttons dorsally and ventrally in the body wall. Tables are 80-100  $\mu\text{m}$  in diameter and 25-30  $\mu\text{m}$  in height (Fig. 2B). Disc of the tables with one central hole and 8-11 peripheral holes. The most common tables have eight peripheral holes: four round and four oval (Fig. 2C). In the largest tables a second outer circle of small holes is present (Fig. 2B). Rim of the disc knobbed to spinose and turned up to give a "cup and saucer" aspect to the table in lateral view (Fig. 2D); four (sometimes three or five) very short pillars without cross-beam and ending in a cluster or a crown of spines (Fig. 2B). Some tables have the pillars reduced to a cross partitioning the central hole into three-four holes (Fig. 2E). Buttons are 60-100  $\mu\text{m}$  long with three-five pairs of holes (Fig. 2F), often irregular with bridges and sometimes knobs. In the body wall, the buttons are gathered in heaps which appear as small white spots on the skin. These heaps are distributed all over the body and are very abundant.

Ventral tube feet and dorsal papillae with tables, buttons and rods. Tables (60-120  $\mu\text{m}$  in diameter) are similar to those of the body wall (Fig. 3A). Buttons 80-140 $\mu\text{m}$  long, as irregular as in the body wall (Fig. 3B). Rods 180-400  $\mu\text{m}$  long, curved, very often with enlarged perforated extremities and sometimes with a central perforated process (Fig. 3C) or a spine. Tube feet with a terminal plate 125-180  $\mu\text{m}$  in diameter. In the dorsal papillae, rods with a central spine are rare; some rods have bifurcated extremities (Fig. 4A).

In the tentacles, there are few ossicles. At the base of the shaft, some tables and rods similar to those of the tube feet; in the shaft, no ossicles; at the apex, only a few rods (70-140  $\mu\text{m}$  long) which are arched and thorny (Fig. 4B).

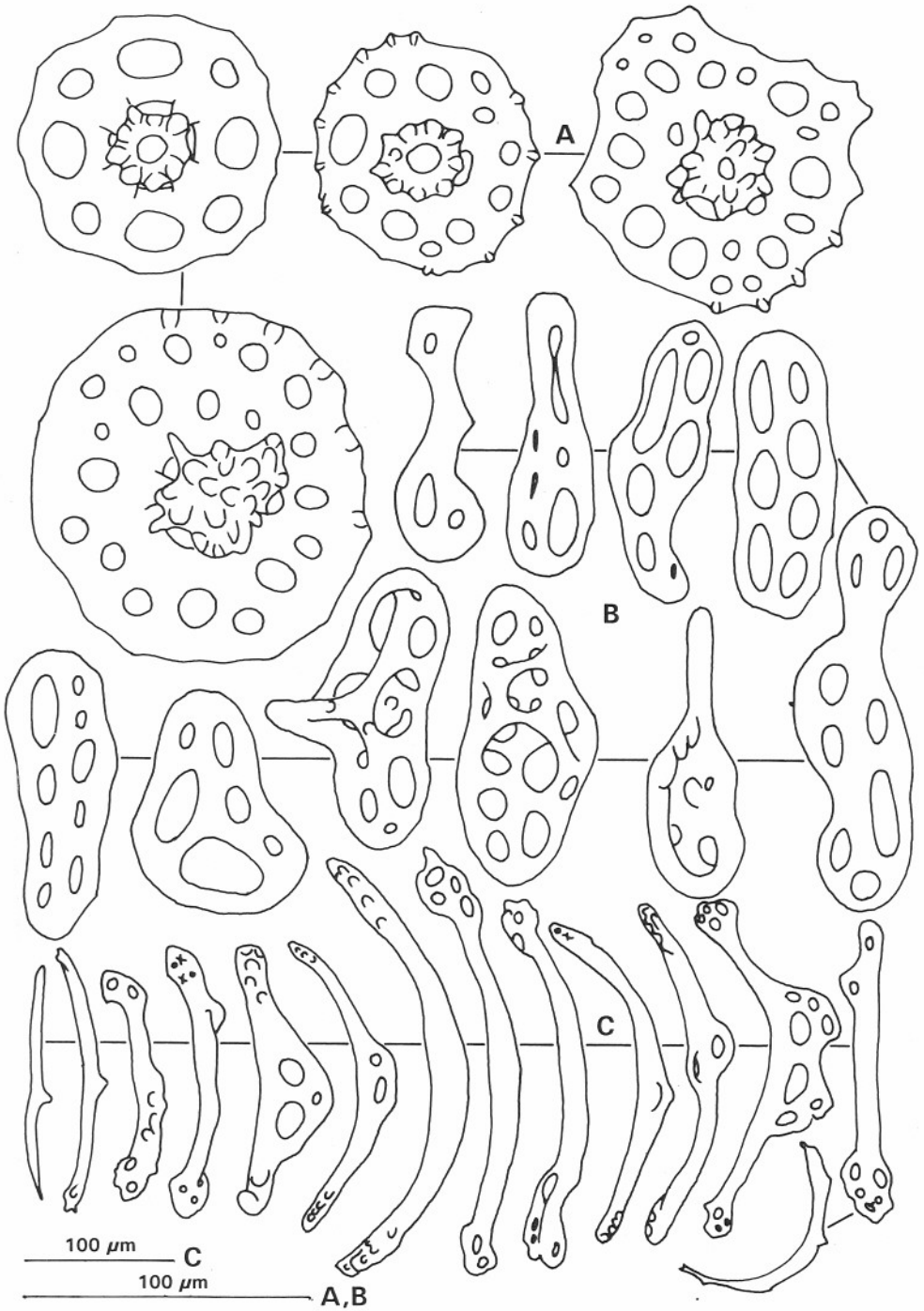


Fig. 3. *Holothuria (Lessonothuria) cavans*, new species. A: tables of tube feet; B: buttons of tube feet; C: rods of tube feet.

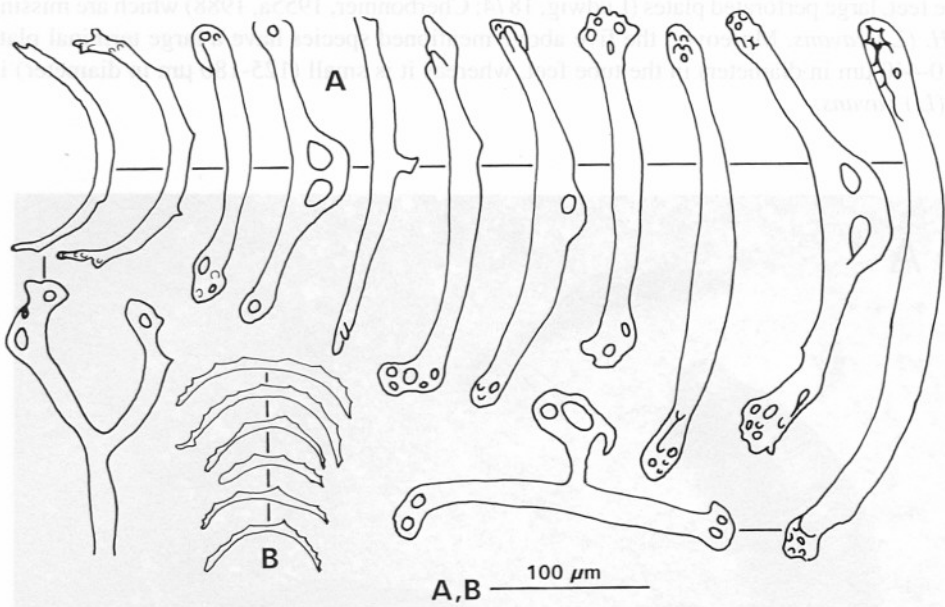


Fig. 4. *Holothuria (Lessonothuria) cavans*, new species. A: rods of dorsal papillae; B: rods of tentacles.

**Etymology.** - The name “*cavans*” is derived from the Latin verb “*cavare*” which means “to dig”. It refers to the burrowing habit of the species.

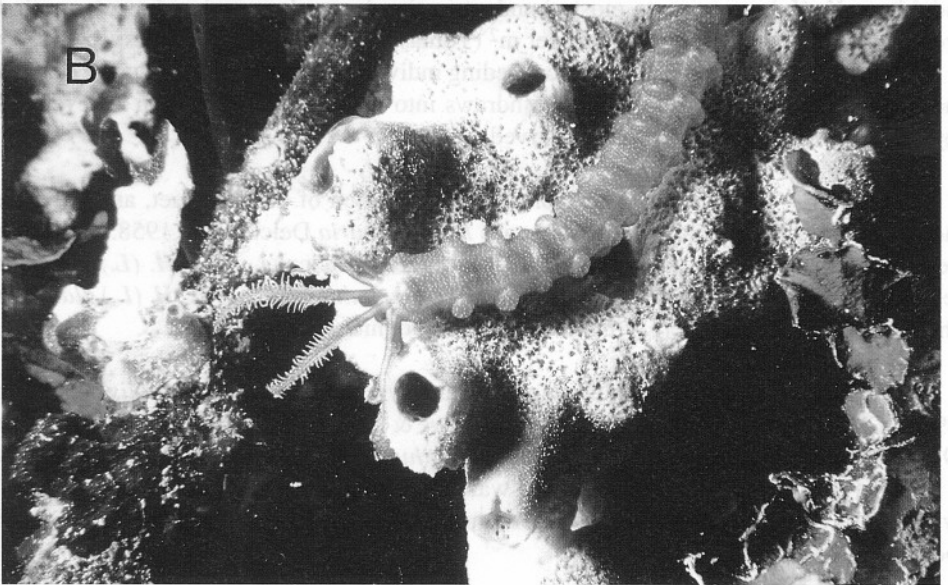
**Biology.** - *Holothuria (Lessonothuria) cavans*, new species, is a burrowing, deposit-feeding holothurian found throughout the lagoonal sediments. The specimens were collected from a depth of five m. However, the species has an observed depth range between 0.25 m and 11 m. *H. (L.) cavans* was most abundant in the deeper lagoonal sediments, with an average abundance of 0.8 individuals per m<sup>2</sup> (Tomascik & Mah, 1994). This species seems to feed continuously day and night, since feeding individuals were observed during both day and night. When disturbed it quickly withdraws into its burrow from which it never fully departs. No visible predators were observed.

**Discussion.** - The number of tentacles, the distribution of the tube feet, and the tables and buttons are characteristic of the subgenus *Lessonothuria* Deichmann, 1958. Six species are actually known in the subgenus viz: *H. (L.) pardalis* Selenka, 1867, *H. (L.) verrucosa* Selenka, 1867, *H. (L.) lineata* Ludwig, 1874, *H. (L.) cumulus* Clark, 1921, *H. (L.) glandifera* Cherbonnier, 1955, and *H. (L.) duoturricula* Cherbonnier, 1988.

*H. (L.) insignis* Ludwig, 1874, is considered as a synonym of *H. (L.) pardalis* by Panning (1935), Clark (1938), Cherbonnier (1951) and Rowe & Gates (1995). *H. (L.) isuga* Mitsukuri, 1912 is considered as a synonym of *H. (Mertensiothuria) fuscobrunnea* Théel, 1886, by Rowe & Gates (1995) and *H. (L.) lineata*, which was considered as a synonym of *H. (L.) pardalis* by Panning (1935), Clark (1938) and Cherbonnier (1951), has been reestablished as a valid species by Rowe & Gates (1995).

*H. (L.) cavans* is readily distinguished from *H. (L.) pardalis*, *H. (L.) verrucosa*, *H. (L.) lineata*, *H. (L.) glandifera* and *H. (L.) duoturricula* because all these species have, in the

tube feet, large perforated plates (Ludwig, 1874; Cherbonnier, 1955a, 1988) which are missing in *H. (L.) cavans*. Moreover, the five above mentioned species have a large terminal plate (230-440  $\mu\text{m}$  in diameter) in the tube feet, whereas it is small (125-180  $\mu\text{m}$  in diameter) in *H. (L.) cavans*.



Pl. 1. A: *Holothuria (Lessonothuria) cavans*, new species; specimens cleaned from its sand layer (photo T. Tomascik); B: *Synaptula spinifera*, new species; specimen creeping on a sponge (photo T. Tomascik).

According to the description given by Clark (1921) and the examination of the holotype, *H. (L.) cumulus* is very close to *H. (L.) cavans*, but differs in having 20 tentacles (18 for *H. (L.) cavans*), in having few heaps of buttons (very numerous for *H. (L.) cavans*), by a low number of tables (very abundant for *H. (L.) cavans*), by table spire with two-three cross-beams (no cross-beam for *H. (L.) cavans*) and by the table disc being round and smooth (table disc quadrangular and spiny for *H. (L.) cavans*).