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PROTANKYRA GRAYI NEW SPECIES AND
LABIDOPLAX BUSKII (McINTOSH) FROM OFF
NORTH CAROLINA (HOLOTHUROIDEA; SYNAPTIDAE)

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Since October 1964, the R/V *Eastward* of the Duke University Marine Laboratory has conducted qualitative and quantitative investigations of the continental shelf and slope to the north and south of Cape Hatteras, North Carolina. I have identified the holothurians collected during these surveys and two specimens of synaptid holothurians are described below. One, collected by I. E. Gray, is a new species of the genus *Protankyra*, apparently related to *P. benedeni* (Ludwig) from Brazil. The other, collected by J. Frederick Grassle, is *Labidoplax buskii* (McIntosh), a common Northern European species of a genus hitherto unknown from the Americas. The synaptid holothurian fauna of the Western Atlantic now comprises 14 of the 140 known species.

I am grateful to the staff and students of the Duke University Marine Laboratory for sending me holothurians for study, and to Miss Ailsa M. Clark and Mr. F. W. E. Rowe of the British Museum (Natural History) for making available comparative material of *Labidoplax buskii*. The investigations of R/V *Eastward* are supported by NSF Grant G-17669; those of Dr. I. E. Gray are supported by NSF Grant G-25128.

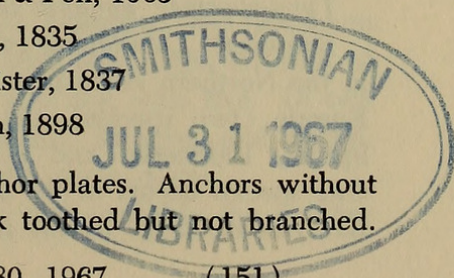
Subclass APODACEA Pawson & Fell, 1965

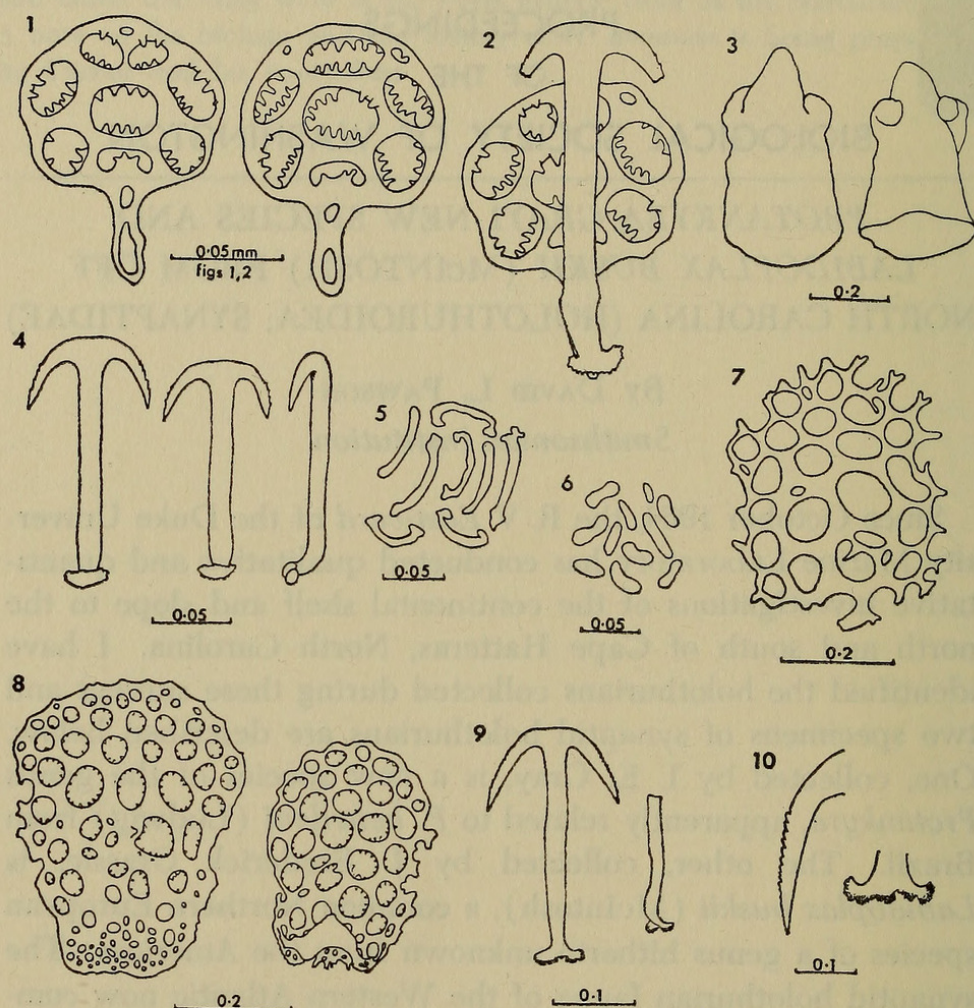
Order APODIDA Brandt, 1835

Family Synaptidae Burmeister, 1837

Labidoplax Oerstergren, 1898

Diagnosis: Deposits are anchors and anchor plates. Anchors without knobbed vertices, arms usually serrate, stock toothed but not branched.





FIGS. 1-4. *Labidoplax buskii* (McIntosh). 1, anchor plates, showing typical *Labidoplax* form; 2, anchor plate with anchor *in situ*; 3, tentacle, outer (left) and inner (right) aspects, showing two short and one long digits; 4, anchors, profile view showing curve near stock.

FIGS. 5-10. *Protankyra grayi* new species. 5, curved rods from anterior body wall; 6, miliary granules; 7, developing anchor plate; 8, anchor plates, internal (left) and external (right) view; 9, anchors: profile view shows curve near stock; 10, details of anchor arm and stock.

Anchor plates abruptly narrowed posteriorly forming handle; bridge rudimentary or absent. Tentacles digitate, 11 or 12, with 3-5 digits.

Type-species: *Synapta buskii* McIntosh.

Remarks: *Labidoplax* comprises seven species with wide distribution in the Northern Hemisphere. Representatives are known from northern Europe (two species), the Mediterranean and Adriatic seas, the Philippines, Indonesia, and North Carolina, U.S.A. (one species each). One species occurs in the Southern Hemisphere, in the Gulf of Guinea. Bathymetric range of the genus is 0-450 m.

Labidoplax buskii (McIntosh)

Labidoplax buskii: Clark, 1908, p. 94, pl. 5 Fig. 23 (synonymy to 1905); Becher, 1912, p. 290, Figs. 1-5, pl. 19; Clark, 1924, p. 492, pl. 4, Fig. 10, pl. 8, Figs. 8-10; Heding, 1931, p. 669.

Material examined: Cruise E-14-65, 13 March 1965, 34°17.5'N, 75°49'W, 445 m, VanVeen Grab, foraminiferan sand, annual average bottom temperature 7.0°C, collected by F. Grassle, 1 specimen (U.S.N.M. catalogue no. E10715).

Description: Total length of specimen 8.5 mm. Body cylindrical; body wall semitransparent with numerous calcareous deposits. Color in alcohol, white. Tentacles 11, expanded, each with three digits, of which central digit is largest (Fig. 3). Smaller lateral digits arising in distal one-third of tentacle. Tentacles transparent, lacking calcareous deposits.

Deposits are anchors and anchor plates, which vary little in size between anterior and posterior ends of body. Stock unbranched, but with numerous fine serrations. Each arm with 2-4 distal serrations. Shaft of anchor curved near stock (Figs. 2, 4). Anchor length 0.12-0.16 mm, average 0.14 mm; breadth 0.07-0.09 mm, average 0.08. Anchor plates (Figs. 1, 2) each with seven or eight large oval to elongate perforations with strong marginal teeth. Often one or more smaller perforations around margin of plate. Handle with two perforations. Length of plate 0.10-0.14 mm, average 0.11 mm; breadth 0.09-0.11 mm, average 0.10 mm. Numerous anchors and plates scattered in body wall.

Remarks: The specimen is obviously a member of the genus *Labidoplax* because of the nature of its anchor plates. The shape of the plates indicates that the specimen represents one of two species, *L. buskii* or *L. media* Oerstergren. Clark (1908) noted that *L. media* differs from *L. buskii* in having 12 tentacles with four digits while *L. buskii* has 11 tentacles with three digits.

For comparative purposes I borrowed two specimens of *L. buskii* from the British Museum (Natural History). These were collected from Harris Sound in the Outer Hebrides, near the type-locality of the species. One is a complete specimen 21 mm in total length. It has 12 tentacles, ten with four digits, one with three and one with five. The other specimen is a fragment 10 mm in total length with 11 tentacles, nine with four digits and two with three each. Mr. F. W. E. Rowe of the British Museum noted (personal communication) that two other specimens from the same locality each have 12 tentacles, one specimen with four digits on each tentacle, the other with four digits on each of ten tentacles, one tentacle with three digits and one with five. In two other lots of smaller specimens, from Bohuslan, Sweden, and Clyde, Scotland, each specimen had 11 tentacles with three digits.

It is evident from the foregoing discussion that probably the number

of digits on each tentacle of *L. buskii* is a variable character, the number of digits per tentacle increasing with growth of the animal. If this is true, then the validity of *L. media* is doubtful. The North Carolina specimen is here referred to *L. buskii*, which is the older name. Re-examination of comprehensive collections of European material of both of these species is required before the problem of tentacle digit numbers can be resolved.

Distribution: *L. buskii* is known from the coasts of Northern Europe, where it occurs at the Outer Hebrides, British Isles, west coast of Sweden and coast of Scandinavia from Kattegat to Porsanger Fiord, at depths of 18–405 m (Clark, 1908). The present new record increases the bathymetric range to 18–445 m.

Protankyra Oerstergren, 1898

Diagnosis: Deposits are anchors and anchor plates. Anchors with stock more or less branched or finely toothed; arms serrate, vertex without knobs. Anchor plates with numerous perforations; plates not abruptly narrowed posteriorly. Tentacles 10–12, digitate, with two digits on each side of distal extremity.

Type-species: *Synapta abyssicola* (Theel) (= *Synapta brychia* Verrill).

Remarks: Madsen (1953) regards *P. abyssicola* (Theel) as a junior subjective synonym of *P. brychia* (Verrill). *Protankyra* embraces about 35 nominal species, of which 22 occur in the Japan-New Zealand arc of the Indo-Pacific region. Only five species, *P. brychia*, *P. benedeni* (Ludwig), *P. ramiurna* Heding, *P. panningi* Heding and *P. grayi* new species are known to occur in the Western Atlantic. These species may be distinguished by means of the following key.

KEY TO THE WESTERN ATLANTIC SPECIES OF *Protankyra*

1. (8) Perforations of anchor plates with marginal teeth.
2. (3) Anchors 0.35–0.40 mm long, plates 0.27–0.30 mm long *P. ramiurna* Heding
3. (2) Anchors exceed 0.6 mm in length; plates exceed 0.40 mm in length.
4. (5) Stock of anchor branched. Anchor plates generally longer than 0.70 mm *P. brychia* (Verrill)
5. (4) Stock of anchor not branched. Anchor plates less than 0.60 mm long.
6. (7) Anchor arms with 5–6 serrations. Perforations in plates with few teeth *P. benedeni* (Ludwig)
7. (6) Anchor arms with up to 12 or more serrations. Perforations in plates with several teeth *P. grayi* new species
8. (1) Perforations of anchor plates without teeth. Anchors 0.30–0.40 mm long *P. panningi* Heding

Protankyra grayi new species

Material examined: Cruise E-28-65, 22 May 1965, 35°18.5'N, 74°58'W, 325 meters, Cape Town (Zoutendyk) Dredge, collected by I. E. Gray, 1 specimen.

Description: Specimen a fragment; extreme anterior end absent. Body contracted, contorted, total length 43 mm. Body wall prickly, due to presence of numerous large projecting anchors. Color in alcohol uniform dark brown.

Anchors and anchor plates occur throughout body wall, those from posterior end only slightly smaller than others. Anchors and plates essentially of one type; possibly two distinct sizes occur.

Anchors (Figs. 9, 10) symmetrical, arms narrow, each with approximately 12 serrations; some have fewer serrations; few have none. Stock with numerous small unbranched spines, but with tendency toward branching. Shaft of anchor curved near stock. Length 0.68–0.81 mm, average 0.73 mm; breadth across arms 0.35–0.57 mm, average 0.44 mm. Two considerably smaller anchors found, one 0.25 mm long and 0.11 mm wide in anterior part of body, the other 0.33 mm long and 0.18 mm wide in posterior.

Anchor plates (Figs. 7, 8) oval to rectangular, with well-defined bridge for anchor support. Plates generally broadest near end opposite bridge. Margin of plate smooth or with few small projecting spines. Fully developed plate with numerous (usually more than 50) perforations, most having marginal teeth. Perforations increase in size toward center of plate. Simple small perforations with no marginal teeth occur under bridge. Developing plates lack both indentations and bridge; these acquired late in development. Length 0.34–0.52 mm, average 0.43 mm. Width 0.21–0.38 mm, average 0.32 mm. Plates usually less than 0.40 mm long and 0.30 mm wide in posterior of body, thus smaller than plates from elsewhere. Developmental stages of plates common posteriorly. One small plate 0.38 mm long and 0.29 mm wide found in anterior end.

Small curved rods (Fig. 5) scattered in body wall at anterior end only. Rods with enlarged ends tending to bifurcate; some rods C-shaped. Ends of rods eroded, therefore impossible to tell whether or not they carried minute spines. Length 0.05–0.08 mm, average 0.06 mm. Radial muscles with numerous miliary granules (Fig. 6) of varying shape, most being oval to elongate.

Holotype: The holotype (catalogue no. E10716) is in the collections of the Museum of Natural History, Smithsonian Institution.

Etymology: It is a pleasure to name this species for Dr. I. E. Gray, Department of Zoology, Duke University.

Remarks: It was at first thought that this specimen represented *P. brychia* (Verrill), which has been collected from off Cape Hatteras at 1,688 m, and elsewhere in the Atlantic, but examination of type ma-

terial of that species and of descriptions by Clark (1908, 1924), Deichmann (1940) and Madsen (1953) convinced me that the present species bears no close relationship to *P. brychia*. The most consistent differences exist in the anchors and anchor plates. In *P. brychia* the plates are larger (generally exceeding 0.7 mm in length) than those in *P. grayi* (averaging 0.43 mm in length), and have more numerous small spines scattered about the plate surface. Perforations in the plates of *P. grayi* are, on the whole, less numerous than those in *P. brychia*. The anchor stock is conspicuously branched in *P. brychia*, but not in *P. grayi*, and the former species has 5-6 spines on the flukes while the latter has up to 12 or more. Furthermore, *P. brychia* does not possess curved rods in the anterior body wall.

P. grayi shares some features with *P. benedeni* (Ludwig) from Brazil, but differs in having generally larger anchors, smaller plates, more numerous teeth on the perforations of the plates and more numerous serrations on the anchor flukes. *P. grayi* does not appear to be closely related to any other species in the genus.

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