

STUDIES ON THE FAUNA OF CURAÇAO AND OTHER
CARIBBEAN ISLANDS: No. 204

NEW RECORDS OF CIRRIPEDES FROM
TRINIDAD AND TOBAGO

by

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An earlier report (BACON, 1976) described collections of Cirripedes from Trinidad containing 26 species. These included 4 Lepadomorpha, 21 Balanomorpha and 1 Sacculinid from intertidal and shallow water habitats. Eight additional species are reported on here, further notes are given on two of the Cirripedes listed previously and on a recent revision of the Trinidad Chthamalidae by DANDO & SOUTHWARD (1980).

Information on the sister island of Tobago is sparse. BOSCHMA (1931, 1969) recorded *Sacculina bicuspidata* and *Lernaeodiscus crenatus* on crabs and SOUTHWARD (1975) listed only *Lepas anatifera*, *Tetraclita stalactifera*, *Tetraclitella divisa* and one species of *Chthamalus* from intertidal localities. A provisional list of the Cirripedes of Tobago is given here, using these literature sources and unpublished records.

A total of 34 species is now recorded for Trinidad and 12 species for Tobago.

References under species synonymy are reduced, only major papers and monographs, such as that of NEWMAN & ROSS (1976), are listed. Most of the specimens discussed have been deposited at the British Museum (Natural History), London, or at the Institute of Marine Affairs or the University of the West Indies in Trinidad, the registration numbers being stated with the descriptions.

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NEW RECORDS FOR TRINIDAD

Family SCALPELLIDAE Pilsbry

Scalpellum arietinum Pilsbry

Scalpellum arietinum PILSBRY, 1907, p. 26, 43-45, fig. 13a, b; WEISBORD 1977, p. 242-243, pl. 26, fig. 3-5.

Three specimens attached to spines of *Eucidaris tribuloides* trawled by USSS Oregon, May 1976, north of the Grand Boca at 200 m deep. Oregon Locality No. 19838. BM(NH) No. 1980-96-98. Seven specimens trawled in the Grand Boca at 240 m deep, May 1976. Oregon Locality No. 19818. BM(NH) No. 1980-99-105.

The present record extends the southern distribution of *S. arietinum*, given by WEISBORD (1977) as from Florida and the Gulf of Mexico. It also increases the habitat depth for this species.

Scalpellum diceratum Pilsbry

Scalpellum diceratum PILSBRY, 1907, p. 26, 45-46, fig. 14a, b; WEISBORD 1977, p. 244-246, pl. 27, fig. 5, 6.

Single specimen attached to spine of *Eucidaris tribuloides* trawled by USSS Oregon, May 1976, in the Grand Boca at 240 m deep. Oregon Locality No. 19818. BM(NH) No. 1980-95.

WEISBORD (1977) lists the few other localities for *S. diceratum* as North Carolina, Florida, Cuba and Colombia. Its range is extended to the south-east Caribbean region.

Oxynaspis gracilis Totton

Oxynaspis gracilis TOTTON, 1940, p. 472, fig. 8.

Four specimens on *Antipathes gracilis*, 2 specimens on *A. atlantica*, in the Third Boca, probably Chacachacare Bay, 1979, collected by G. Warner.

The specimens were light yellow and translucent, showing less pigmen-

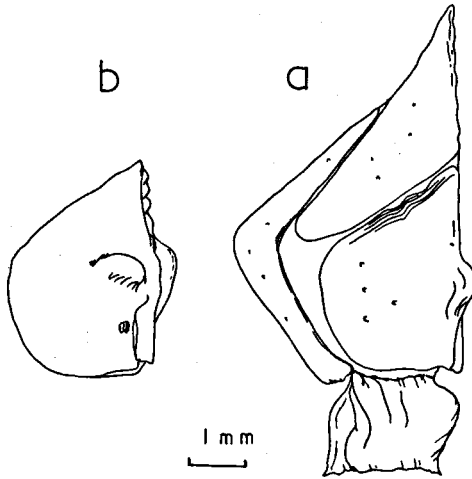


Fig. 44. *Oxynaspis gracilis*. a-external features, b-interior of scutum.

tation than *O. hirtae* (BACON 1976, p.9). The size of the largest individual was as follows – capitulum length 6 mm, capitulum width 3.5 mm, length of peduncle 7 mm. The scutum was smooth externally with very few short spines. The umbo was distinct at about the middle of the occludent margin, the valve showing fine growth lines along the tergal margin but no transverse ribbing (Fig. 44a). Internally the projection of the umbo could be seen, the adductor muscle pit was large and deep and the occludent margin incurved at the base (Fig. 44b). The tergum had the occludent margin about 2/3rd the length of the scutal occludent margin, and was straight and pointed. The basal angle was rounded and more than 40°. The tergum was smooth internally. The carina was angled at 90–100°, the distal limb only slightly longer than the basal. The scutum and tergum did not meet the carina, leaving a large area of membrane between them.

The specimens were all taken from dried Antipatharian material and the internal parts were decayed. However, it was possible to distinguish this species from the *O. hirtae* described previously from Trinidad on the more elongated body form, presence of the scutal umbo, straight occlu-

dent margin and lack of recurvature in the tergum, and the shorter distal arm of the carina.

TOTTON's (1940) material came from the "West Indies" on "*Antipathella gracilis*". This more detailed locality record confirms the presence of this species in the Caribbean region and gives a second host.

WARNER (1981) comments that these stalked barnacles collected from *A. atlantica* "were always oriented so that the cirri, when extended, formed a dish-shaped net facing to windward- tiny dishes within the main dish of the Antipatharian colony. In all barnacles that were examined closely it was observed that antipatharian tissue had grown over the stalk or valves". Further, in personal communication May 1982, WARNER noted that stalked barnacles occurred all over the Antipatharian fans but were commoner towards the centre.

Family HETERALEPADIDAE Nilsson-Cantell

***Paralepas minuta* (Philippi)**

Alepas minuta PHILIPPI, 1836, tab. xii, fig. 23; DARWIN 1851, p. 160-163.

Paralepas minuta, PILSBRY 1907, p. 100; STUBBINGS 1965, p. 881-884, fig. 1,2.

Ten specimens attached to spines of *Eucidaris tribuloides*, trawled by USSS Oregon, May 1976, in the Grand Boca at 240 m deep, Oregon Locality No. 19818. BM(NH) No. 1980-106-115.

Living animals had the capitulum up to 2 mm long, coloured orange with tessellated off-white patches, becoming yellow-brown after soaking in spirit; peduncle up to 1.5 mm long. The mouthparts and appendages of the Trinidad material differed only slightly from the description of *P. minuta* given by STUBBINGS (1965) from West African specimens. The mandible had short, stout spines on the 2nd and 3rd teeth, with a fringe of slender spines below the lower point; the first maxilla had unequal spines on the distinctly stepped front edge and the penis was indistinctly annulated and without backwardly directed setae. In these characters it resembled *P. minuta* var *americana* Pilsbry (1953) from deep water off Florida. The Trinidad material could be separated from var *americana*, however, by the longer caudal appendages, which had from 7-15 segments, whereas PILSBRY's sub species had only 3 segments. Furthermore,

the possession of short spines on the mandible and of projections on the front edge of the maxilla are characters listed by DARWIN (1851) in an earlier description of *P. minuta*. DARWIN (1851) included the West Indies and Atlantic in the range of this species. It is of interest that it is reported here on the same cidarid host species as some of STUBBINGS (1965) specimens from West Africa, giving further evidence of similarities in the deep water Cirripede fauna of the eastern and western Atlantic.

Family ARCHAEOBALANIDAE Newman & Ross

Memranobalanus declivus (Darwin)

Balanus declivus DARWIN, 1854, p. 275.

Memranobalanus declivus, PILSBRY 1916, p. 230; BARNES & KLEPAL 1971, p. 86.

Six specimens in the sponge, *Terpios zeteki*, north side of Nelson Island, Nov. 1979, at 3 m deep, collected by R. Hubbard. IMA No. 79.

BARNES & KLEPAL (1971) gave the distribution of *M. declivus* as Florida, Bermuda, Jamaica and the West Indies. As PILSBRY (1916) suggests, this species appears to be confined to the Antillean faunal province.

Acasta cyathus Darwin

Acasta cyathus DARWIN, 1854, p. 312, pl. 9, figs. 3a-c; PILSBRY 1916, p. 244, pl. 57, figs. 1-3, 79-80.

Single specimen in the sponge, *Dercitopsis* sp., Huevos Island, Feb. 1982, in 24 m deep. IMA No. 84. Collected R. Hubbard.

PILSBRY (1916) gives the western Atlantic distribution of *A. cyathus* as the West Indies, west coast of Florida and Colon, and in addition WELTNER (1917) gives La Guayra and Caracas. The last locality may be an error as Caracas is not a marine site. The Trinidad material confirms the presence of this species in the southeastern Caribbean.

Family BALANIDAE Leach

Megabalanus stultus (Darwin)

Balanus stultus DARWIN, 1854, p. 216.

Balanus (Megabalanus) stultus, ROSS 1968, p. 14.

Megabalanus stultus, NEWMAN & ROSS 1976, p. 42.

Four specimens in *Millepora complanata*, Salybia Reef, Toco, March 1979, at 3 m deep. Collected P. Bacon.

Previous records, summarized by ROSS (1968) and SOUTHWARD (1975), give the distribution of *M. stultus* as Curaçao, Klein Bonaire, south Florida, Cuba, Anguilla, St. Eustatius and Dominica. The range is extended to the south-eastern Caribbean.

Family PYRGOMATIDAE Gray

Boscia madreporarum (Bosc)

Balanus madreporarum BOSCH, 1812, p. 66.

Boscia madreporarum, ROSS & NEWMAN 1973, p. 163–166, fig. 21–23.

Boscia madreporarum, NEWMAN & ROSS 1976, p. 59. (The spelling of the specific name appears to be an error).

Four specimens in *Madracis decactis*, Huevos Island, March 1981, at 24 m deep. 10 specimens, in *M. decactis*, Feb. 1982, in 20 m deep, Huevos Island. Collected R. Hubbard.

SOUTHWARD (1975) recorded this species from Klein Bonaire and its range is here extended to the south-eastern Caribbean. It was not found in reefs on the north coast of Trinidad and BACON (1976) suggested that salinity was too low there. Its occurrence in the Boca near Huevos supports this view as salinity and current movements produce true marine conditions in these deep waters.

BOSC (1812) originally reported this species in *Madrepora (Agaricia) agaricites* and *Pavonia cristata*, while ROSS & NEWMAN (1973) and SOUTHWARD (1975) also reported it in *Agaricia*. Its occurrence in the further host, *Madracis decactis*, is of interest.

NOTES ON PREVIOUSLY RECORDED TRINIDAD SPECIES

Oxynaspis hirtae Totton

This species was reported attached to an Antipatharian in Chacachacare Bay (BACON 1976, p. 9). The Antipatharian was identified subsequently by D. M. OPRESKO as *Antipathes pennacea* Pallas, a species reported from Panamá, Honduras, México and Curaçao. Further specimens have been collected on another Antipatharian host.

Three specimens of *O. hirtae* on *Antipathes thamea* Warner, Gulf of Paria, 1979, collected by G. Warner.

Balanus venustus venustus Darwin

BACON (1976, p. 20) reported this species attached to scallop shells in a dredge sample taken between Trinidad and Guyana, the exact locality unknown. Further collecting confirms the presence of *B. v. venustus* in Trinidad waters.

Six specimens attached to *Megabalanus antillensis* attached to a fragment of indeterminate gorgonian, trawled in the Gulf of Paria, May 1979, collected by the Fisheries Division. BM(NH) No. 1980-90-94.

Revision of some Trinidad *Chthamalus* records*Chthamalus proteus* Dando & Southward

This is the dominant species of *Chthamalus* in Trinidad. It is most abundant in the Gulf of Paria north to Scotland Bay, but becomes more sporadic along the north and north east coasts. When common it can form a zone about 3 dm wide.

For synonymy and past history (as *C. fragilis* and *C. bisinuatus*) see DANDO & SOUTHWARD (1980).

Type locality: Port of Spain.

Chthamalus angustitergum (Pilsbry)

Less common than *C. proteus*. Present in small numbers on north and north east coasts, with a maximum population at Maracas Bay jetty of 30% of the *Chthamalus* population.

For synonymy and description see DANDO & SOUTHWARD (1980).

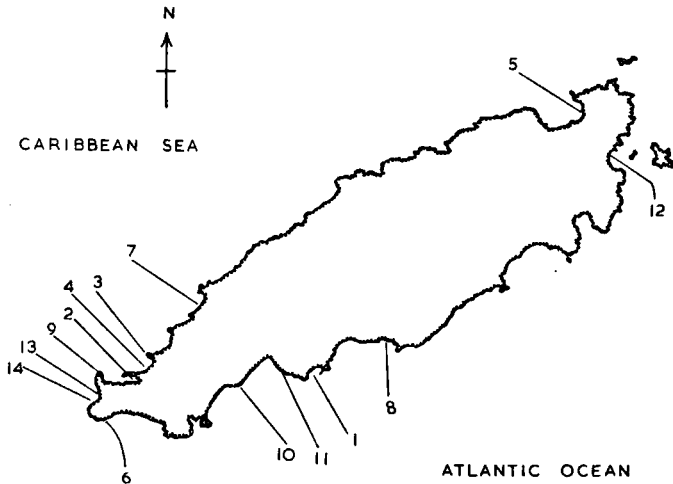


Fig. 45. Map of Tobago showing collection localities. 1-Bacolet Beach, 2-Bon Accord Lagoon, 3-Booby Point, 4-Buccoo Bay, 5-Charlotteville, 6-Crown Point, 7-Mt. Irvine, 8-Mt. St. George, 9-Pigeon Point, 10-Red Point, 11-Scarborough, 12-Speyside, 13-Store Bay, 14-Studley Park. – The island is situated between 60°30'W and 60°51'W and just South of 11°21'N,

CIRRIPEDIA OF TOBAGO

No comprehensive survey has been carried out on the Cirripede fauna of Tobago. The early records of BOSCHMA (1931, 1969) and SOUTHWARD (1975) are summarised below, and followed by data from field notes made by one of us (AJS) during a brief visit in 1976. Recent collection data is given finally, and all collection localities are shown in Figure 45.

Family SACCULINIDAE Lilljeborg

Sacculina bicuspidata Boschma

Sacculina bicuspidata BOSCHMA, 1931, p. 312, 342-344, fig. 71, 31-32; WEISBORD 1975, p. 185-186, pl. 21, fig. 2-3.

Type specimen attached to *Microphrys bicornutus*, Tobago.

Family LERNAEODISCIDAE Boschma

Lernaeodiscus crenatus Boschma

Lernaeodiscus crenatus BOSCHMA, 1969, p. 417-419; WEISBORD 1975, p. 203-204, pl. 25, fig. 5-6.

Type specimens attached to *Petrolisthes marginatus*, Tobago, from a coral reef, 1916.

Family LEPADIDAE Darwin

Lepas anatifera Linnaeus

Lepas anatifera, DARWIN 1854, p. 73; pl. 1, fig. 1; PILSBRY 1907, p. 79; 1927, p. 37; SOUTHWARD 1975, p. 3.

Twenty specimens on beach drift, Cromston Bay, Aug. 1976, collected by C. Forester, UWI No. 1007.

SOUTHWARD (1975) recorded this species at Scarborough, Jan. 1955.

Family TETRACLITIDAE Gruvel

Tetraclita stalactifera (Lamarck)

Tetraclita squamosa stalactifera, PILSBRY 1916, p. 254, pl. 59, fig. 1a, 1b.

Tetraclita stalactifera, PILSBRY 1927, p. 38; ROSS 1968, p. 8; SOUTHWARD 1975, p. 16; BACON 1976, p. 27-28.

Twenty-four specimens on rock, Mount St. George, Bacolet Bay, Store Bay, Studley Park, collected M. Arnold, Sept. 1976. Six specimens on rock, Mount Irvine, collected M. Arnold, Sept. 1976. UWI No. 1008-1012. Reported from Bacolet Beach, Mt. St. George, Crown Point, Buccoo Point, July 1976 (AJS).

SOUTHWARD (1975) recorded *T. stalactifera* from Red Point, Scarborough, on volcanic rock, Jan. 1955.

This species is the most abundant Cirripede on rocky substrata, inter-tidally and sub-tidally, in Tobago.

Tetraclitella divisa (Nilsson-Cantell)

Tetraclitella divisa, ROSS 1968, p. 13; SOUTHWARD 1975, p. 18; BACON 1976, p. 28.

Very common at Bacolet Beach under stones and boulders, July 1976 (AJS).

SOUTHWARD (1975) recorded this species at Red Point, Scarborough, Jan. 1955.

Newmanella radiata (Bruguière)

Newmanella radiata, ROSS 1969, p. 242, fig. 3-4; SOUTHWARD 1975, p. 17.

Few found at Bacolet Beach, July 1976 (AJS).

Family ARCHAEOBALANIDAE Newman & Ross

Acasta cyathus Darwin

Synonymy see above.

Five specimens in the sponge, *Aplysina cauliformis*, Booby Island, Charlotteville, April 1981, R. Hubbard. IMA No. 122.

Family **BALANIDAE** Leach**Megabalanus stultus** (Darwin)

Synonymy see above.

Twenty-five specimens in *Millepora complanata*, Buccoo Reef, Aug. 1965; collected by J. S. Kenny. BM(NH) No. 1980-80-89. Single specimen in *M. complanata* attached to *Pseudoplexaura porosa*, Speyside, at 20 m deep, July 1976; collected by D. Ramsaroop. UWI No. 1005.

Balanus eburneus Gould

Balanus eburneus, DARWIN 1854, p. 248, pl. 5, fig. 4a-d; PILSBRY 1916, p. 80; SOUTHWARD 1975, p. 5; BACON 1976, p. 13-14.

Ten specimens attached to *Rhizophora mangle*, Bon Accord Lagoon, Sept. 1978; collected P. Bacon. UWI No. 1014.

Balanus pallidus Darwin

Balanus pallidus DARWIN, 1854, p. 240; STUBBINGS 1967, p. 277; BACON 1976, p. 18.

Purple form of *B. pallidus* common on washed up tree trunks, Bacolet Beach, July 1976 (AJS).

As with the Trinidad records for this species (BACON 1976), it is found most commonly on driftwood. It will be of interest to see if it eventually establishes and spreads in Tobago as it appears to be doing in Trinidad.

Family **CHTHAMALIDAE** Darwin**Chthamalus proteus** Dando & Southward

Synonymy and description, see above.

Locally abundant Bacolet Beach, less common Mt. St. George, Crown Point and Buccoo Bay, July 1976 (AJS). Six specimens attached to *Tetraclita stalactifera*, Mount Irvine, Sept. 1976, collected M. Arnold. UWI No. 1013.

This is the commonest *Chthamalus* on the east coast of Tobago, but not on the outer rocks where *T. stalactifera* dominates. Much less frequent in the blue-water area of south west Tobago, and then only in extreme shelter.

***Chthamalus angustitergum* (Pilsbry)**

Synonymy and description, see above.

Present, but not common, Bacolet Beach (6% of *Chthamalus*), Mt. St. George (8%), Crown Point (1 seen), Booby Point (57%), July 1976 (AJS).

Not as common in the Buccoo Reef as expected from other Caribbean localities. *C. angustitergum* and *T. stalactifera* can survive in reefs in Barbados and Antigua (DANDO & SOUTHWARD 1980).

DISCUSSION

As with the previous records for Trinidad, the species now reported on are all found in other parts of the Caribbean. BACON (1976) suggested that affinities between the Cirripede fauna of both sides of the Panama Isthmus might be strengthened by further collections from deep water, but this appears not to be the case. *Oxynaspis gracilis*, *Scalpellum arietinum*, *S. diceratum*, *Boscia madreporarum*, *Megabalanus stultus* and *Membranobalanus declivus* are known only from the Western Atlantic. *Paralepas minuta* occurs on both sides of the Atlantic and *Acasta cyathus* appears to be pan-tropical (PILSBRY 1916, NEWMAN & ROSS 1976). The distributions of Antipatharian, coral and echinoid hosts may be a controlling factor in the Cirripede distributions.

Insufficient material is available to allow detail comment on the Cirripede fauna of Tobago, although the east coast of Tobago may be compared with Trinidad. However, except for *Balanus eburneus* in Bon Accord Lagoon and *B. pallidus* on driftwood, estuarine species are much less common than in Trinidad. This is to be expected as the shores of Tobago are dominated by rock and coral reefs and far less habitat diversity exists.

That so few species have been found in Tobago supports the suggestion (SOUTHWARD & NEWMAN, 1977) that the unfavourable character of the reef biotype restricts the diversity and abundance of Cirripedes in the Caribbean sea. Blue-water reefs occur largely on the west coast of Tobago where all barnacles are scarcer. A number of commensal Cirripedes are present on corals, gorgonians and Antipatharia in Trinidad and it would be of interest to compare their populations with those of Tobago where these Coelenterate hosts are more abundant (KENNY 1976). SOUTHWARD & NEWMAN (1977) thought that grazing by echinoids and fishes might hinder the development of barnacle populations in reef environments, and opportunity exists to examine this hypothesis in adjacent, but contrasting, environments in Trinidad and in Tobago.

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