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The Echinoid Genus *Caenopedina* in New Zealand

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Abstract

A new species of the genus *Caenopedina* is described from a specimen collected in the Bay of Plenty, New Zealand, at a depth of 324–426 metres.

INTRODUCTION

THE genus *Caenopedina* is the sole extant member of the family Pedinidae (Subcl. Euechinoidea, Order Echinothurioida), whose fossil representatives were wide, ranging from Jurassic to Miocene in the Northern Hemisphere. In the Southern Hemisphere, two fossil species are known, one from Madagascar (Upper Jurassic) and one from Patagonia (Miocene). *Caenopedina* is not a large genus, containing ten species, of which eight are known from the Indo-Pacific, one from the Atlantic Ocean, and one from the Gulf of Panama (Mortensen, 1940). These species are all deep sea forms, and some have a wide geographic range. In spite of this mode of life, no representatives of the genus are known from near Australia, and none have hitherto been recorded from New Zealand.

A small collection of echinoderms was recently obtained in the Bay of Plenty, New Zealand, by a commercial fishing vessel. Through the courtesy of Mr J. Costello, of the Union Fish and Ice Co., Tauranga, a member of the Marine Department Fisheries Laboratory, Mr D. Arthur, was on board the vessel, and he collected and preserved the echinoderms and kindly forwarded them to this laboratory for identification. The collection contained a handsome regular echinoid, which upon closer examination proves to be a new species of the genus *Caenopedina*.

I am grateful to the Marine Department for allowing me to examine this specimen, to Professor H. B. Fell, of this Department, for his advice, and to Mr M. D. King for his care in photographing the specimen.

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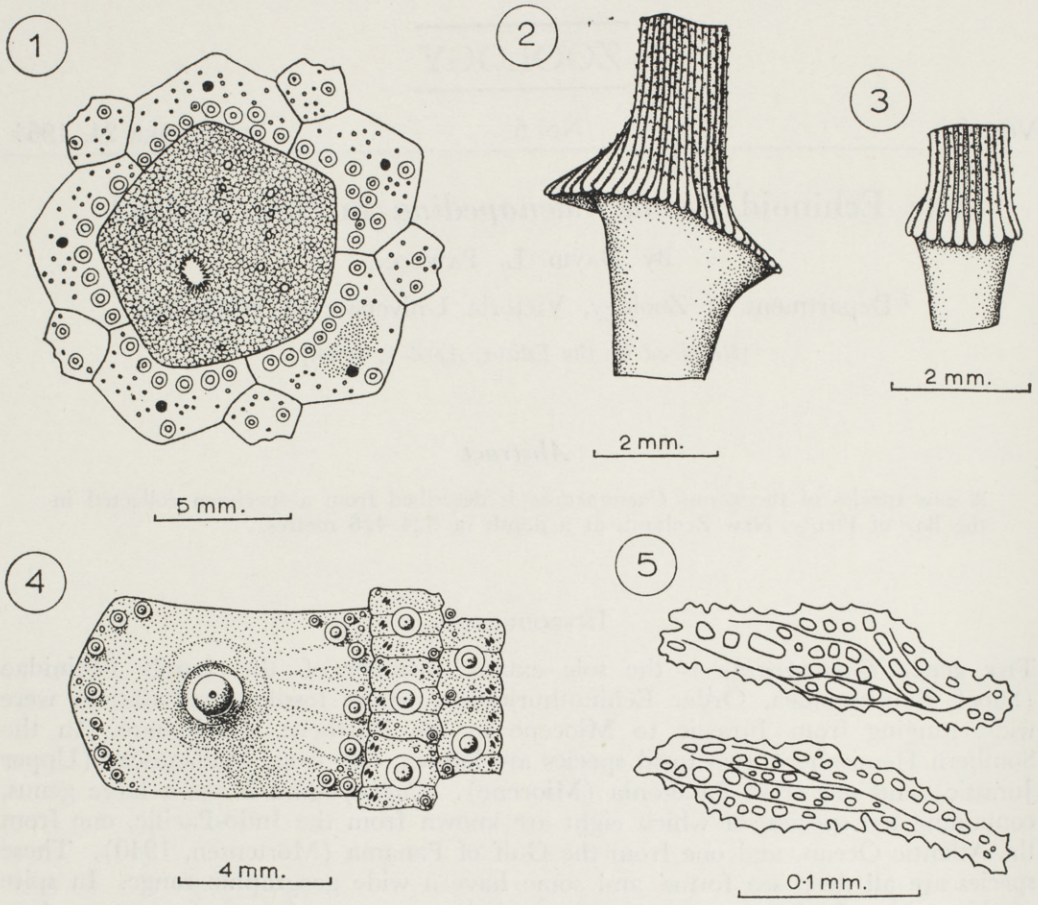
Caenopedina A. Agassiz, 1869

Type Species: *Caenopedina cubensis* A. Agassiz.



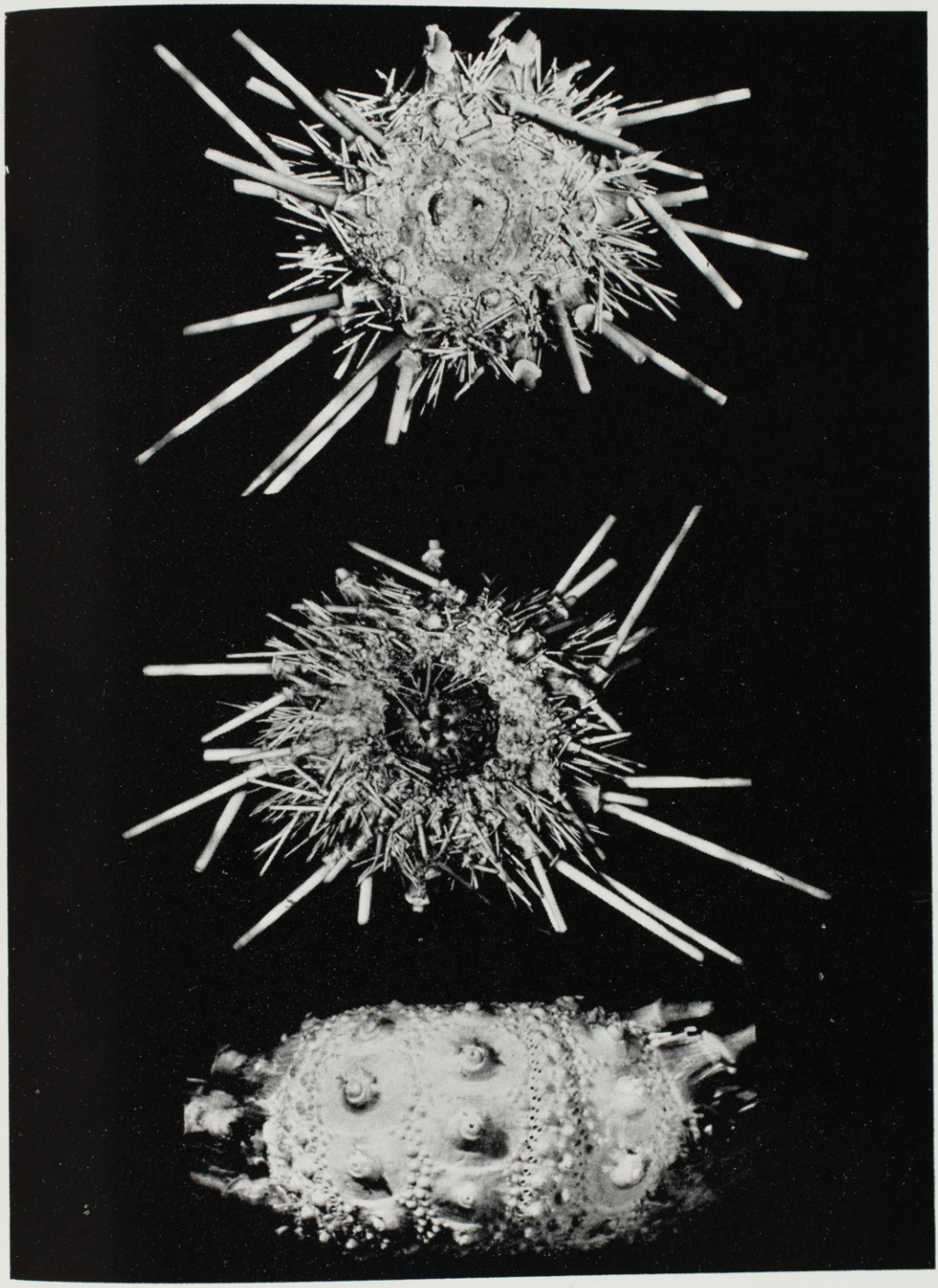
Caenopedina novaezealandiae Pawson. Fig. 1—Apical system. Fig. 2—Milled ring of primary radiole. Fig. 3—Milled ring of secondary radiole. Fig. 4—Ambital interamb plate with adjacent amb plates. Fig. 5—tubefoot deposits.

Caenopedina novaezealandiae n.sp. (Pl. 1, figs. 1–5)

Description. Test circular at the ambitus, flattened aborally, the sides strongly arched. Horizontal diameter 30mm, height 16mm. Apical system 15mm (50% h.d.), peristome 12mm (40% h.d.).

Ambs with fifteen plates to each column. At the ambitus, the ambs are approximately 30% of the width of the interambs. Amb plates trigeminate throughout, the pore pairs arranged in distinct arcs of three. The plate components are of approximately equal size. The middle component of each plate carries a conspicuous large primary tubercle, which has a broad areole. The tubercles are perforate, noncrenulate, in a regular vertical series in each column, decreasing gradually in size adapically. Secondary tubercles small, perforate, placed on the lower admedian edge of each plate, thus forming an inconspicuous zigzag line in the middle of the area. Smaller tubercles are sparingly scattered elsewhere (Fig. 4).

Interambs with a single series of large primary tubercles in each column. The areoles are large and broadly confluent, so that secondary tubercles are confined to the admedian and adradial edges of the interamb plates. Primary and secondary tubercles perforate,



Caenopedina novaezealandiae Pawson, holotype. Upper, aboral aspect; middle, oral aspect; lower, denuded test, lateral aspect.

Photo: M. D. King.

non-crenulate. The areoles of the primary tubercles have a series of weak ridges extending from some secondary tubercles towards the primary tubercle. These ridges are more conspicuous on some plates than on others, and are more commonly present on the adradial side of the primary tubercle than on the admedian side. The median interamb suture is bordered by a conspicuous zigzag row of numerous secondary tubercles, and there is also a continuous row of secondary tubercles at the adradial edge of each column (Fig. 4).

The apical system is large (50% h.d.), dicyclic, oculars all widely exsert. The genital pores are small, the madreporite compact. The genital plate carrying the madreporite is not conspicuously enlarged. The periproctal edge of the ring of genital plates is pentagonal in shape, bordered by a ring of closely aggregated tubercles. Some tubercles are placed outside this ring, and on three of the genital plates there is a single tubercle near the genital pore. Smaller tubercles which apparently carried pedicellariae are scattered on ocular and genital plates. The ocular plates characteristically have two tubercles, one to each side of the ocular pore. The periproct is covered by a large number of small plates, and carries fifteen scattered tubercles. The anal aperture is slightly excentric, posteriorly placed (Fig. 1).

Primary radioles are long (the longest is 31mm +), slender, smoothly tapering, longitudinally striated, densely clothed in small spinelets. The milled ring is broad, conspicuous, approximately twice the diameter of the spine at the base (Fig. 2). Secondary radioles long (up to 11mm), tapering, longitudinally striated, carrying numerous spinelets. The milled ring is conspicuous, but not as large in proportion as that of the primary radioles, nor as elegantly shaped (Fig. 3).

The spicules in the tubefeet are very closely packed perforated plates of average length 0.2mm, which have spinose marginal projections and a ridged surface (Fig. 5).

The test is white, light brownish green near the apical system. The apical system is conspicuous, uniformly green, the tubercles lighter in colour; periproct grey. Primary radioles have broad, poorly defined bands of colour, the colours being definitely lighter on the oral sides of the radioles. Radioles green for approximately the first 10mm of their length, darker green near the base. Following this there are bands of white, green and reddish brown in no particular order, the bands being up to 5mm wide. Secondary radioles are white, sometimes faintly tinged with green at the tips.

MATERIAL EXAMINED. 4/8/1963, 16 miles south-east of Mayor Island, Bay of Plenty, 180–240 fathoms, prawn net, 1 specimen.

HOLOTYPE: The holotype is lodged in the collection of the Dominion Museum, Wellington, New Zealand. Dimensions: horizontal diameter 30mm; height 16mm.

REMARKS: *Caenopedina novaezealandiae* appears to be related to the species *C. indica* (De Meijere) of the Malay region and to *C. mirabilis* (Doderlein) from Japanese waters. Differences in test, apical system and colour characters can be used to separate these three species.

The ambs are narrow in *C. novaezealandiae*, being only 30% the width of the interambs, whereas in *C. indica* and *C. mirabalis* they are broader (40% and 50% respectively). The areoles of the primary tubercles are striated in *C. novaezealandiae* and in *C. mirabilis*, but not conspicuously so in *C. indica* (Mortensen, 1940).

In the apical system, the tuberculation of the genital plates in *C. novaezealandiae* resembles that in *C. indica,* both species having a ring of closely aggregated tubercles near the periproctal edge. However, *C. novaezealandiae* has some tubercles outside this ring, while *C. indica* usually has none. *C. mirabilis* on the other hand has numerous tubercles scattered over the genital plates. The periproct carries tubercles in *C. novaezealandiae,* but periproctal tubercles are lacking in *C. indica.* The colour of the apical system in *C. novaezealandiae* is a most distinctive green, while in *C. indica* and *C. mirabilis* it is usually reddish brown.

When considered together, these distinguishing features seem to justify the erection of a new species to accommodate the New Zealand specimen. Future investigations and a richer material should give a better indication of the variability of this species, and of *C. indica* and *C. mirabilis*. If the concept of a polytypic species gains ground in the Echinoidea, then *C. novaezealandiae* and *C. indica* may eventually come to be regarded as subspecies of *C. mirabilis*. For the present, however, it is preferable to regard the differences that exist between *C. novaezealandiae* and the other two species as specific, and not subspecific.

Literature Cited

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