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A NEW PLIOCENE FOSSIL CRAB OF THE GENUS (*Trichopeltarion*) FROM NEW ZEALAND

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ABSTRACT

A new Pliocene species of *Trichopeltarion* is described from concretions of the Greta Siltstone at Motunau Beach, North Canterbury. If the new species is ancestral to *T. fantasticum* Richardson and Dell, it raises considerable doubts regarding the validity of some of the genera recognised in the family Atelecyclidae.

In May 1966, Mr. D. R. Gregg of the Canterbury Museum informed me that an atelecyclid crab was well represented amongst fossil material collected from concretionary boulders derived from the Greta Siltstone at Motunau Beach. Later that year he sent me a large collection of this material for study. The crab proves to be a new species of *Trichopeltarion* almost certainly related to the Recent deepwater *T. fantasticum* Richardson and Dell *Trichopeltarion greggi* n.sp.

Carapace including the comparatively short lateral spines slightly wider than long, broadly rounded, margins set with comparatively evenly developed, branching spines. Outline in front of lateral spines broadly rounded, posterolateral margins almost straight, but outline variable, probably due to varying degrees of compression during fossilisation. Posterior margin slightly emarginate. Surface set with low, simple tubercles which are not grouped into compound tubercles as in *T. fantasticum*. Surface also set with numerous fine, evenly distributed hair pits. Regions reasonably well marked in well preserved specimens, particularly intestinal, cardiac and central gastric regions. Branchial regions not clearly defined. Tubercles grouped into patterns within the regions. Intestinal with a median group, cardiac with a group on each side, urogastric with a centrally arranged loose grouping of tubercles, metagastric with a pair of large tubercles on each side, tubercles rapidly becoming obsolete on mesogastric area. Protogastric bearing hardly any tubercles; hepatic and branchial regions with rather generally distributed, subequally developed tubercles. Front with three flattened spines, the central rather stouter than the laterals. Pre-orbital tooth strong, usually with three rather evenly developed terminal spines. Supra-orbital tooth relatively small with three to four major and some minor spines; post-orbital strong with well developed subsidiary spines. Behind the orbital teeth

there are two closely spaced, well developed compound spines bearing three to five subsidiary cusps. These are followed by some four to eight single strong spines before the lateral spine. Lateral spines relatively weakly developed, little more extensive than the compound spines behind the orbitals, bearing four to seven subsidiary cusps. A single rather variable compound spine on the postero-lateral border behind the lateral spine. Posterior border with short simple spines and tubercles. Orbits wide with complex spiny armature dorsally.

The only well preserved area on any of the specimens available is the dorsal surface of the carapace. Walking legs are preserved to one degree or another in a few of the specimens and one extremely large specimen (carapace length 87mm.) shows the right cheliped greatly enlarged (length 85mm.). Both the cheliped and the carpus have the actual skeletal material abraded off on the exposed faces but the merus apart from the distal end is well preserved. This shows no clear differences from the merus of *fantasticum*.

	<i>Holotype</i>		<i>Paratypes</i>		
Carapace width including lateral spines	71mm.	65mm.	67mm.	69mm.	70mm.
Carapace width without lateral spines	59	57	57	62	63
Carapace length	66	65	65	65	66

Holotype (zfc 36) and paratypes in Canterbury Museum, paratypes in Dominion Museum.

Most specimens of *T. greggi* have been collected from the beach about one mile west of the mouth of the Motunau River. On the map of Wilson (1963) this is close to the lower boundary of the Wanganui series and it is possible that the fossil crabs are being derived from Greta Siltstone of the Taranaki Series (Upper Miocene). Matrix from the holotype was searched unsuccessfully for Foraminifera by Dr N. de B. Hornibrook of the New Zealand Geological Survey. Fleming (in Wilson, 1963:62-3) lists Mollusca from a bed somewhat higher in the sequence, north of the mouth of the Motunau River, which point to an age "no younger than mid Waitotaran" (Upper Pliocene).

The fossil species can be compared most closely with the Recent New Zealand *T. fantasticum* Richardson and Dell, with which it agrees in many particulars. At the same time it differs in a wide range of details:—

1. The carapace is of different proportions and lacks the long lateral spines of *fantasticum*.
2. The tubercles on the carapace are not aggregated to form compound groups in *T. greggi*. This gives a very different appearance to the carapace surface. A much wider area of the anterior surface of the carapace is comparatively free of tubercles.
3. Although the spines along the border of the carapace are arranged very similarly, the detailed arrangement of the subsidiary teeth and cusps is very different. This is most marked in the pre- and supra-orbital spines (Figs 2, 3, 4).



Fig. 7 Holotype of *T. greggi* n. sp.

Fig. 8 Paratype of *T. greggi* n. sp.

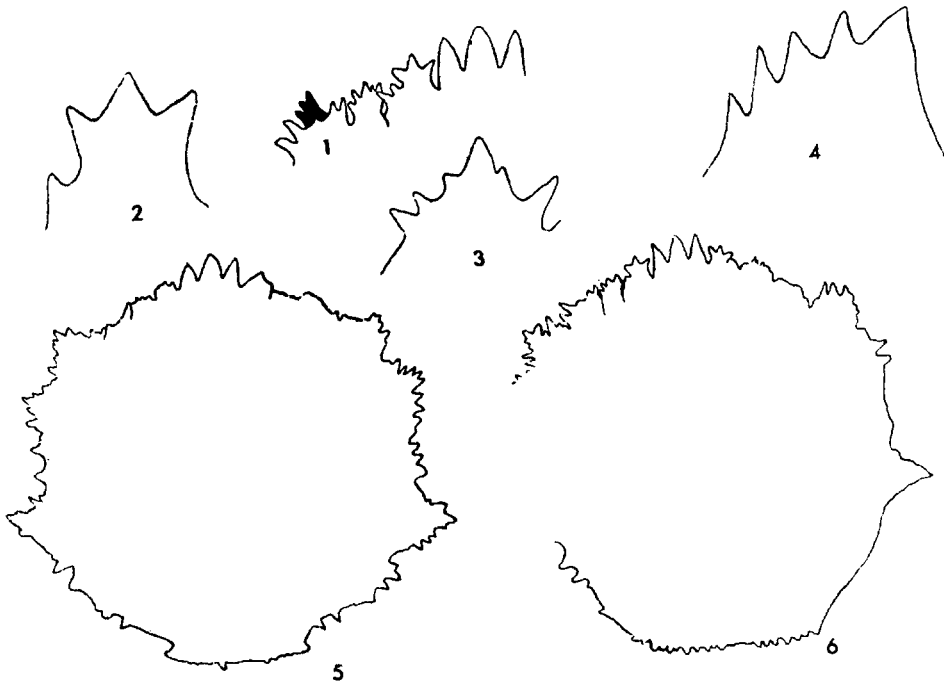


Fig. 1 Orbital spines of *T. greggi* n.sp. (reconstructed area in black).

Fig. 2 Preorbital spine of *T. greggi* n.sp. (Paratype)

Fig. 3 Preorbital spine of *T. fantasticum*

Fig. 4 Preorbital spine of *T. greggi* n. sp. (Paratype)

Figs. 5, 6. Outlines of carapaces of *T. greggi* n. sp. (Fig. 5, holotype, Fig. 6, paratype)

The Recent species is known from Kaipara to Fiordland on the west coast and from the Bay of Plenty to Foveaux Strait and off the Chathams on the east, in depths from 8 to 400 fathoms. It has, however, been most commonly collected from depths beyond the shelf limits.

At Motunau *T. greggi* has been found in association with specimens of *Cancer* which are indistinguishable from the Recent *C. novaezelandiae*. This species is known to occur from the intertidal down to 40 fathoms. The Mollusca listed by Fleming (in Wilson, 1963:62) from Motunau are either typical shelf forms in the Recent fauna or are allied to living shelf species. There is little molluscan evidence for a deeper habitat than mid-shelf, a conclusion strengthened by the presence of *Cancer*.

In view of the obvious similarity between the Pliocene *T. greggi* and the Recent *T. fantasticum*, and the restricted nature of our knowledge of the Tertiary crab fauna of New Zealand, it is tempting to postulate that *T. greggi* is a direct ancestor of *T. fantasticum*. There are, of course, other ways in which *T. fantasticum* could have been added to the New Zealand fauna without arguing for possible descent from a Pliocene ancestor in the same area.

If *T. greggi* does prove to be a direct ancestral form for *T. fantasticum*, some important doubts are raised concerning the validity of generic distinctions within the Atelecyclidae. Rathbun (1930:165) has already incited some doubt about the distinctions between *Peltarion*, *Trichopeltarion* and *Trachycarcinus*. Rathbun (1930:149) distinguished *Peltarion* from the other two genera by the absence of a long lateral spine (the surface of the carapace being smooth or granulose). *Trichopeltarion* was distinguished essentially by being smooth on the carapace except near the margins while *Trachycarcinus* was tuberculate. These are all differences of degree and are therefore subject to re-evaluation as more species become known. Richardson and Dell (1964:146) showed that the differences between *Trichopeltarion* and *Trachycarcinus* were rather arbitrary. The fossil New Zealand species and a Recent Australian species (to be described elsewhere) show that the distinction between long and short lateral spines is also rather arbitrary. The fossil *T. greggi* would on Rathbun's key fit best in *Peltarion*. If *T. greggi* is ancestral to *T. fantasticum* (which seems best classed in *Trichopeltarion*) this would indicate independent evolution from one genus to another. In this case it would seem most logical to include all these forms in *Peltarion*, the diagnosis for which would then need to be expanded to include, 'with or without long lateral spine, the surface smooth or tuberculate'. Examination of a specimen of *Peltarion spinulosum* White shows that while it agrees generally with *Trichopeltarion* in the granulation of the carapace, the structure of the orbital spines, and the relationship of the basal antennal segment to the orbit there are a number of differences. The spinulation along the edge of the carapace is much more subdued in *Peltarion*, as are the orbital spines, the orbits being sunk into the outline of the carapace. In addition the chelipeds are apparently equally developed in males. Although agreeing in general with the chelipeds of *Trichopeltarion* those of *Peltarion* are much more flattened. The writer therefore prefers to unite *Trachycarcinus* with *Trichopeltarion* at this stage, and to keep *Trichopeltarion* separate from *Peltarion*.

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