

***Chacellus pacificus*, new species**
(Crustacea, Decapoda, Brachyura, Goneplacidae),
from the continental shelf of the Gulf of California, México

by Michel E. HENDRICKX

Abstract. — During trawling operations on the continental shelf of the Gulf of California, México, a new species of *Chacellus* Guinot was found at four distinct localities. This second species of *Chacellus* is the Pacific representative of the genus; the Atlantic species, *C. filiformis*, was described from the Gulf of México and the East coast of Florida.

Résumé. — Des chalutages le long de la plate-forme continentale du golfe de Californie, Mexique, ont permis de récolter dans quatre localités distinctes une nouvelle espèce du genre *Chacellus* Guinot. Cette deuxième espèce est le représentant pacifique du genre, l'autre étant *C. filiformis*, décrite du golfe du Mexique et de la côte est de la Floride.

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About 20 years ago, a new genus of Goneplacidae was described by GUINOT (1969b) to accommodate a new species of brachyuran crab, *Chacellus filiformis* Guinot, collected off the East coast of Florida and in the Gulf of México.

Although no other species was added to the genus *Chacellus* since it was created in 1969, the fact that most American genera of brachyuran crabs have species on both sides of the continent suggested that a Pacific representative of *Chacellus* might be present on the west coast.

During sampling activities on the continental platform of the Gulf of California, México, aboard the research vessel "El Puma" of the Universidad Nacional Autónoma de México (SIPCO, CORTES and GUAYTEC cruises), a small series of a medium-size goneplacid-like brachyuran crab was collected using semi-commercial otter-trawls. The material was tentatively identified onboard the ship as *Oediplax granulata* Rathbun, 1893, a rather common species in the area, but a closer examination in the Laboratory rapidly indicated that the material collected belonged to the genus *Chacellus* proposed by GUINOT (1969b) for the east coast of America, but was different enough from the type-species to be considered a new species.

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Chacellus pacificus sp. nov.

(Fig. 1 a-d, 2 c-d; pl. I A-B, II B-C)

MATERIAL EXAMINED. — CORTES 1 cruise, station 33, 8.V.1982; 29°55' N-114°21' W, 5 nmi northeast of Punta Willard, Baja California, trawling at 75-80 m depth, green mud : 1 ♂ 27.4 × 38.8 mm (EMU-2610) and 1 ♂ 29.2 × 42.0 mm (MP-B 20616). — CORTES 1 cruise, station 51, 12.V.1982; off Rio Fuerte, Sinaloa, trawling at 56 m, sandy mud : 1 ♂ 19.5 × 27.0 mm (EMU-2611). — SIPCO I cruise, station A2, 23.IV.1981; 22°17' N-106°11' W, off Teacapan, Sinaloa, trawling at 61 m depth, sandy mud : 1 ♂ 16.3 × 23.3 mm (MP-B 20264) and 1 ♂ 17.9 × 25.0 mm (EMU-2612). — GUAYTEC II, station 59, 8.VIII.1987; 29°47' N-114°09' W, off Bahia San Luis Gonzaga, Baja California, trawling at 100-103 m, mud : 1 ♂ 29.1 × 40.7 mm (USNM 237636).

TYPES. — One male from Punta Willard (EMU-2610) is the holotype. The five others males are paratypes. No female specimen available.

DESCRIPTION

Carapace hexagonal, xanthoid, broader than long, posterior part moderately convex, anterior part strongly convex. Surface finely granulate, with granules coarser on antero-lateral edges, teeth and front. Anterior regions moderately marked; hepatic regions strong, elevated anteriorly with a sharp granulate slope toward first and second antero-lateral teeth. Carapace wider at level of third or fourth tooth. A cluster of subhepatic sharp granules below first tooth.

Orbits small, deep; eyestalk short; upper orbital border granulate, with short median and lateral fissures; inner orbital tooth well-defined, subconical, short; lower orbital border with a strong acute inner tooth and a slightly concave outer lobe, both granulated; outer orbital tooth wanting.

Antero-lateral border arched with four marginal teeth, all granulated, second flattened, third and fourth thicker; first tooth small, obtusely triangular, almost conical, pointing forwards, remote from external orbital angle, the space in between granulated; second tooth close to first, much larger and directed forwards, with a convex outer border; both first and second teeth on a level with upper orbital margin, below the third and fourth teeth (frontal view); third tooth largest, acute and directed obliquely forward and slightly upward, separated from second tooth by a distance much greater than that separating second from first and with a convex outer margin; fourth tooth similar to third, about half as large.

Distal border of merus of third maxilliped slightly sinuous, antero-external angle strongly produced. Distal border of ischium very little produced internally, almost straight, not touching the inner proximal side of the merus, hence leaving a small triangular hiatus. Palp coarse.

Chelipeds massive, finely granulated, unequal (in males), largest chela about one and a half times as high as the smallest, its height equal to or a little more than superior margin of manus. Merus with a dorsal row of granules and a blunt superior subterminal angle, not produced as tubercle. Carpus strong, obliquely subquadrate in dorsal view, with a stout and slightly flattened triangular inner tooth; a well-defined sulcus parallel to distal border; clusters of small tubercles arranged in rugae, on outer slope. Inner side of manus (palm) inflated, microscopically granulated; fingers long, pointing, moderately strong and slightly compressed

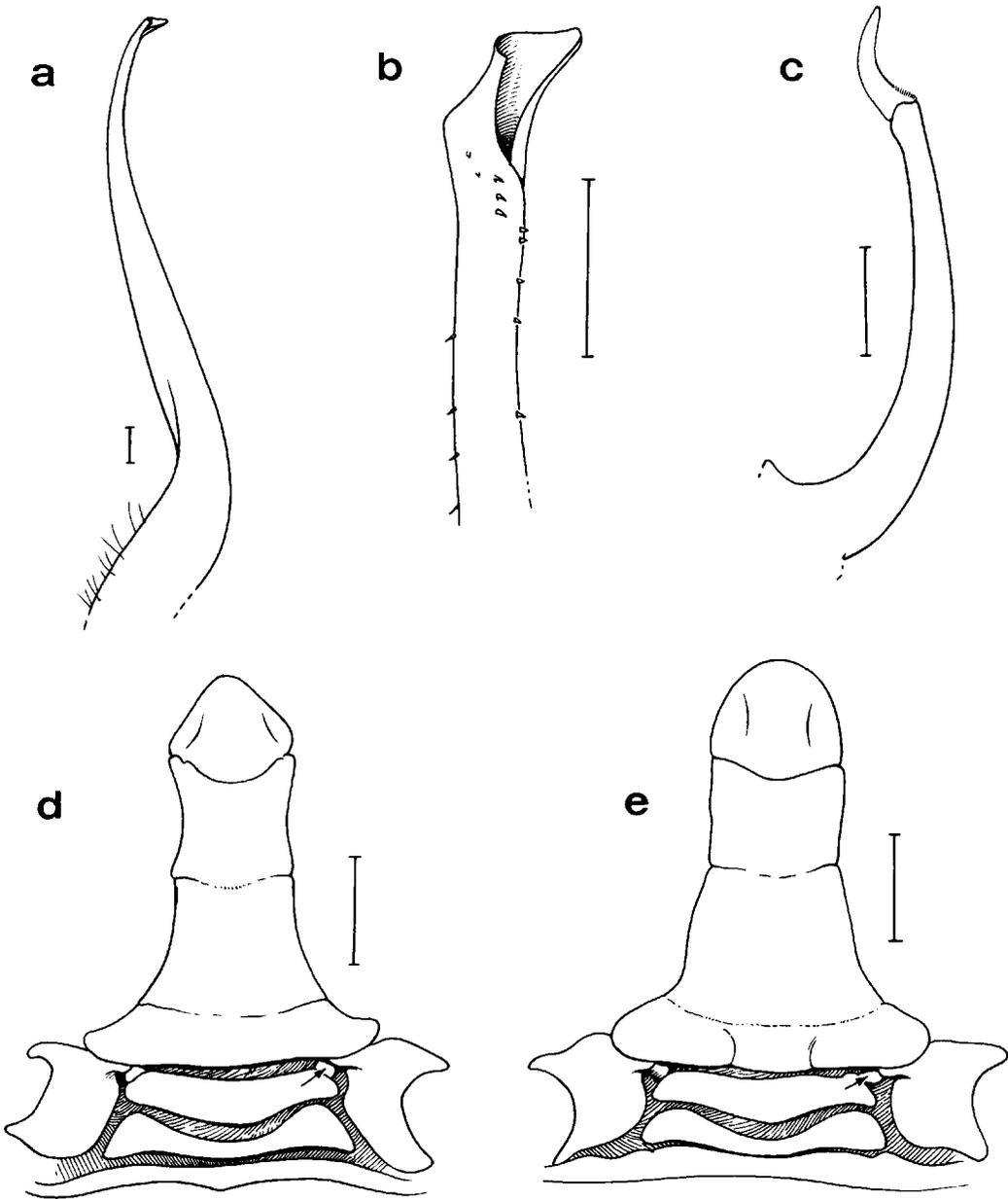


FIG. 1. — *Chacellus pacificus* sp. nov. : a-d, ♂ holotype (EMU-2610), a, first pleopod ; b, tip of first pleopod ; c, second pleopod ; d, abdomen, fifth coxa and sternite 8 (arrow). — *Chacellus filiformis* Guinot : e, ♂ paratype (MP-B 10132), abdomen, fifth coxa and sternite 8 (arrow). Scale : a-c, 0.5 mm ; d-e, 5.0 mm.

laterally, slightly incurving, irregularly toothed with cutting edge of large chela bearing denticles and 2 or 3 strong projecting teeth.

Pereiopods moderately slender, especially when compared to the heavy chelipeds, little flattened, segments oval-triangular in cross-section, granulated dorsally and ventrally, sides almost smooth; dorsal granules of merus strongest, rounded, sometimes even sharp, irregularly arranged. Pubescence well developed on carpus, propodus and dactyl, less dense on merus; dactyl little curved, about same length as propodus; carpus with a shallow longitudinal sulcus, slightly posterior to the dorsal line.

Male abdomen with first and second somites reaching coxa of fifth pereiopod, a very small portion of sternite eight visible between second and third abdominal somites, the latter wider than second, almost as long and with subacute lateral margins. Third to fifth somites fused, sutures little visible; sixth somite longer than wide, sides concave, narrower medially, widest distally; seventh (telson) triangular, sides straight, little upturned, tip rounded. A shallow longitudinal sulcus on sternum, in front of telson.

Male first pleopod long, moderately thick, tapering, slightly curved and with only a few small subterminal spinules in addition to some marginal spinules on distal part; opening subterminal surrounded by a short truncated, slightly deflexed, and incompletely subcylindrical, protective flange. Second pleopod stout, short, about $0.34 \times$ the length of first pleopod, curved and ending in a falciform process showing short pubescence at base.

Colour : This new species is entirely reddish-brown, except for the fingers of the chelae which are black with white tips. The black colour of the immovable fingers continue onto 1/4th of the lower manus.

ETYMOLOGY. — This counterpart of *C. filiformis* is named after the Pacific coast of America where it was collected.

DISTRIBUTION. — The species is so far known only from the Gulf of California, including two localities in the upper-Gulf and two along the east coast.

REMARKS

The type material of *C. pacificus* was compared with the paratype of *C. filiformis* held at the Paris Muséum (ex USNM 92162, MP-B 10132) and with the description provided by GUINOT (1969b : 722, figs. 135, 136, pl. 4 (*recte* 5); 1971 : 1082). This new species differs from the only other species of the genus, *C. filiformis*, by several characteristics (see table 1). The most evident pertain to the male abdomen, which terminates in a triangular somite (telson) and is more concave and proportionally narrower in midlength (somites 3-5) in *C. pacificus*. The male first pleopod is stouter (although still slender in comparison with other genera) and with a slightly but clearly deflexed tip in the new species. In dorsal view, the proposed new species can be separated from *C. filiformis* using the following characters : front with a much wider outer notch; the regions well-marked anteriorly, especially the hepatic region which presents an abruptly sloping frontal edge. *Chacellus pacificus* is also slightly wider than *C. filiformis*. Width-length ratio varies from 1.33 to 1.38 for the Atlantic species (calculated from data provided by GUINOT, 1969b for the material examined) and from 1.38 to 1.44 for the Pacific species.

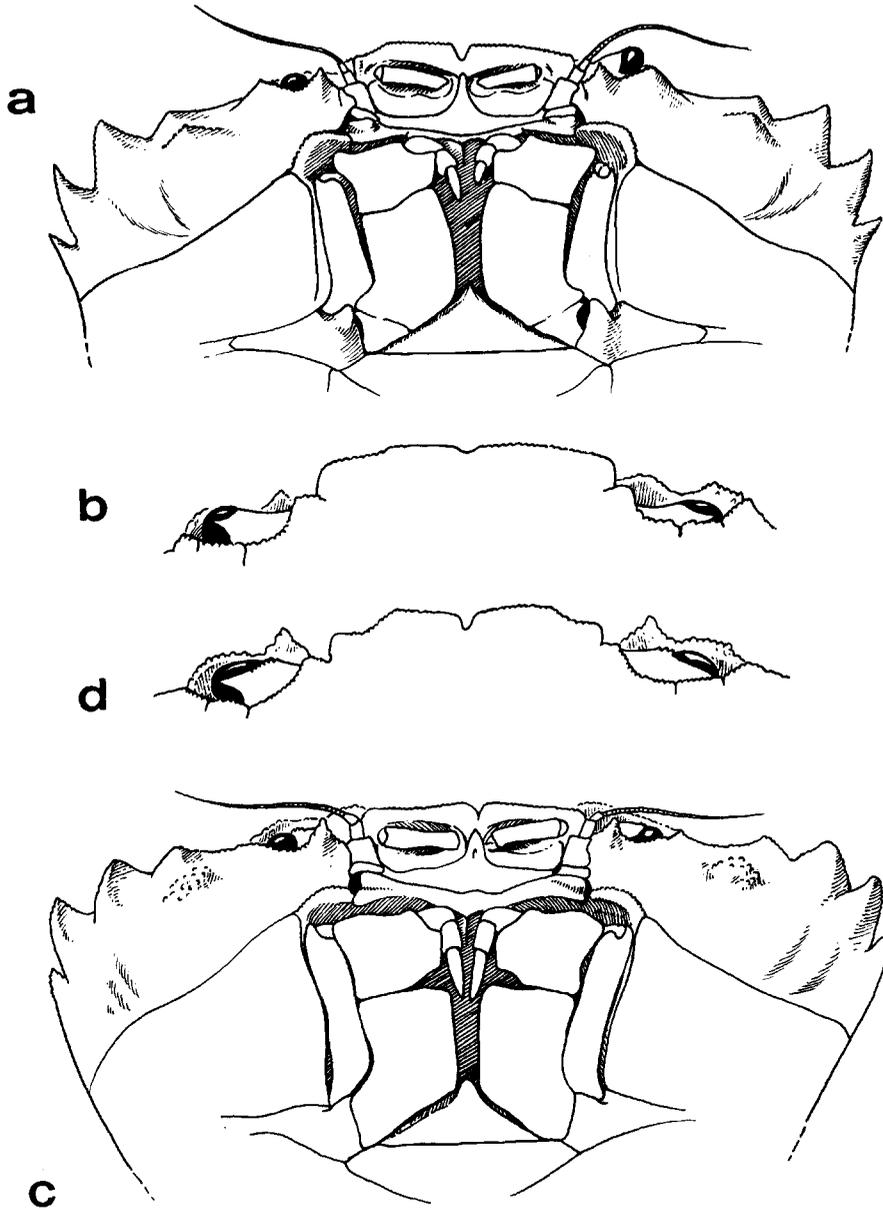


FIG. 2. — *Chacellus filiformis* Guinot : a-b, ♂ paratype (MP-B 10132), a, frontal and buccal regions; b, dorsal view of front and orbits (antennal articles omitted). — *Chacellus pacificus* sp. nov. : c-d, ♂ paratype (MP-B 20264), d, frontal and buccal regions; c, dorsal view of front and orbits (antennal articles omitted). Fig. a reproduced from an unpublished figure by D. GUINOT, Laboratoire de Zoologie (Arthropodes), MNHN, Paris.

TABLE 1. — Main differences between *Chacellus pacificus* sp. nov. and *C. filiformis* Guinot (males only).

	<i>C. pacificus</i>	<i>C. filiformis</i>
1. Carapace	Regions well-defined anteriorly. Hepatic region much higher, stronger, with an abruptly sloping frontal edge. Granules on frontal and antero-lateral margins weak Subhepatic cluster of granules below first tooth. Front strongly emarginated laterally.	Regions ill-defined anteriorly. Hepatic region lower, although strong, with a gently sloping frontal edge. Granules on margins coarser. Subhepatic tubercle below first tooth. Front almost straight, with a shallow lateral notch.
2. Orbit	Suborbital inner tooth sharp, subconical. Inner orbital tooth stout, well defined.	Suborbital inner tooth obtusely triangular. Inner orbital tooth wanting, reduced to an angle.
3. Third maxilliped	Distal border of ischium almost straight, little produced internally, this side not in contact with merus.	Distal border of ischium strongly produced to meet merus.
4. Cheliped	Inner tooth of carpus triangular, wide. Manus of large chela 1 ½ times as high as manus of small chela.	Inner tooth of carpus conical. Manus of large chela not markedly unequal.
5. Abdomen	Sixth segment longer than wide; sides strongly concave. Seventh segment triangular; sides almost straight.	Sixth segment squarish; sides almost straight. Seventh segment semi-oval; sides convex.
6. First pleopod	Stout on the proximal half, slender on the distal half. Tip deflexed, truncated.	Slender throughout its length. Tip not deflexed, slim.

In what concerns the habitat, *C. filiformis* has been collected between 180 and 240 m, on the upper edge of the continental slope, while *C. pacificus* was found in a considerably shallower environment, between 61 and 103 m depth. Environmental data indicate that the new species is associated with muddy bottom, relatively low temperatures and dissolved oxygen concentrations (table 2), but do not seem to share the low-oxygen environment endured by some other species of decapod crustaceans at similar depths in the Gulf of California (HENDRICKX, 1985, 1986).

The discovery of a second species of *Chacellus* permits corroboration of the characteristics proposed for the genus by GUINOT (1969b). Dorsally, the two species are strikingly similar, were it not for the shape of the front and the regions of the carapaces which are much more clearly marked in *C. pacificus*. In the latter species, the carapace is a little wider than in *C.*

filiformis. The configuration of the antennal region is also similar in both species. The relative position and size of the first abdominal somites, the sternal plates and coxae is typical for the genus, with a tiny part of sternite 8 visible between the lateral margin of the second abdominal somite and the fifth coxa this tiny part of sternite 8 is widely separated from the visible part of sternite 7 by the subacute lateral margin of the third abdominal somite. This area also displays the most obvious differences between the two species, *C. pacificus* having a narrower abdomen than *C. filiformis* and a clearly different telson.

TABLE 2. — Environmental data based on collections of *Chacellus pacificus* in the Gulf of California (temperature and dissolved oxygen measured at bottom level).

Cruise	Station	Date	Depth (m)	Temperature (°c)	Oxygen (ml/l)	Sediments (%)		
						Sand	Silt	Clay
SIPCO I	A 2	23.IV.81	61-62	14.5	0.44	29	30	41
CORTES I	33	08.V.82	75-80	16.0	3.10	02	46	53
CORTES I	51	12.V.82	56	16.4	1.57	26	62	12
GUAYTEC II	59	08.VIII.87	100-103	—	—		mud	

As stated by GUINOT (1969b : 722), *Chacellus* presents an almost cyclometopous organization, with the male opening coxal but a small portion of sternite 8 not covered by the second abdominal somite (= “disposition catamétope... primitive”; see GUINOT, 1969a : 244). This organization found in both species, associated with a rather xanthoid facies (shape of the abdomen, claw and carapace) should place *Chacellus* at an intermediate level, rather away from the Goneplacidae and closer to the Xanthidae.

Closely related species of Brachyuran crabs occurring on opposite sides of the American continent have sometimes been prematurely considered analogous species. In several cases, this designation of “cognate” or “geminate” species was corrected, in the following years, by the discovery in Pacific waters of new species that are in every detail better counterpart of the Atlantic species (e.g. GARTH, 1946 : 614; 1959 : 124).

In the case of *C. pacificus* it would seem erroneous to designate this new species as the cognate of *C. filiformis*. Morphological differences, especially those relating to the male abdomen and the frontal and buccal regions, are judged too significant. If only two species of *Chacellus* were to be found along the coast of America, one would then be forced to admit that these two species (i.e. their gene pool) have been separated for a period of time sufficient to have become specifically very distinct from each other, to such a point that they no longer represent cognate species.

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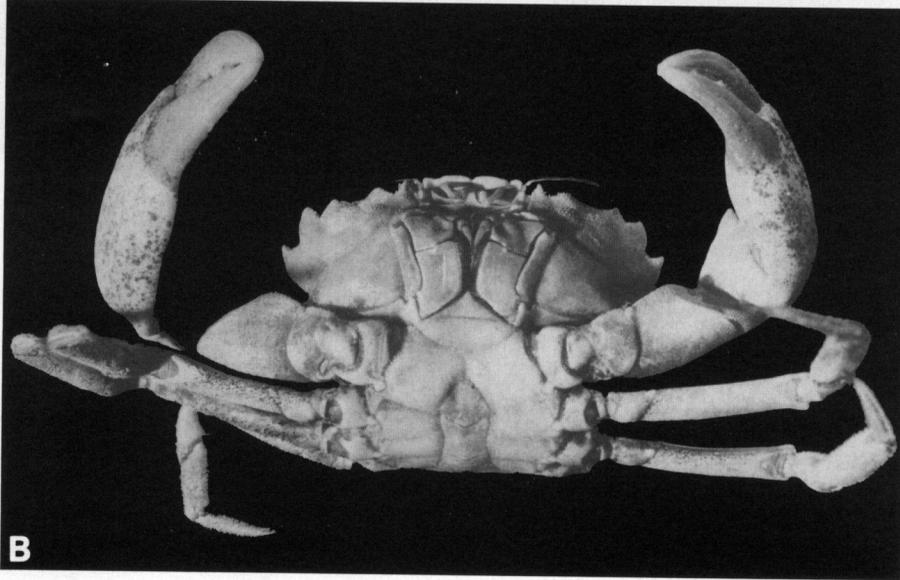
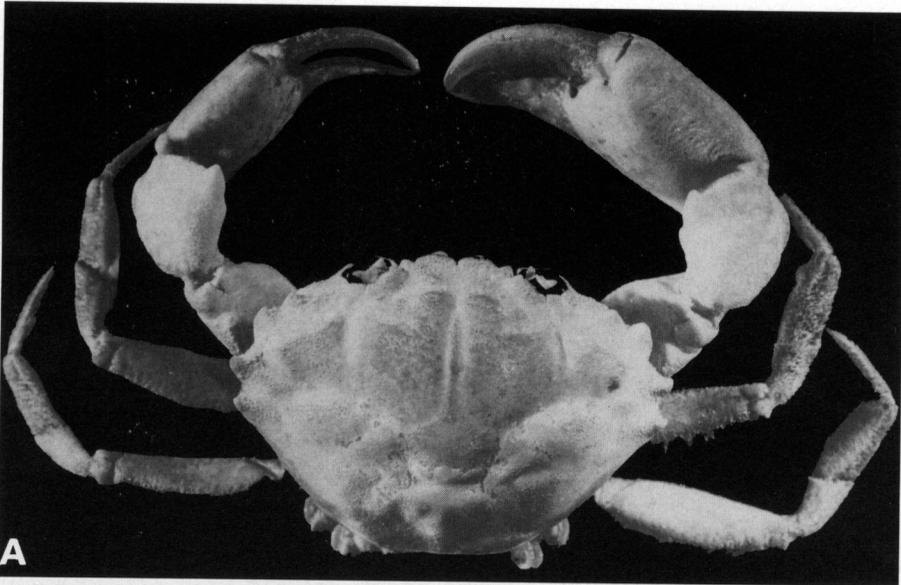


PLATE I. — A, B, *Chacellus pacificus* sp. nov., holotype (EMU-2610).

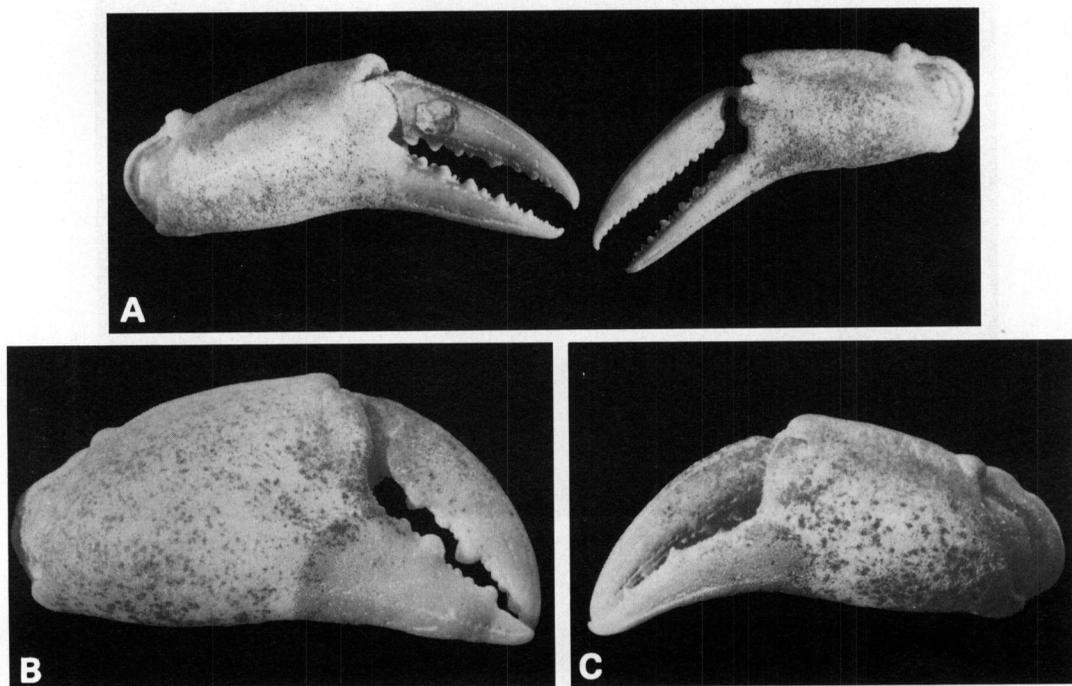


PLATE II. — A, *Chacellus filiformis* Guinot, 1969, holotype (USNM 91435), courtesy of D. GUINOT, Laboratoire de Zoologie (Arthropodes), MNHN, Paris. B, C, *Chacellus pacificus* sp. nov., holotype (EMU-2610).