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Ypresian (Lower Eocene) crabs (Decapoda, Crustacea) from Belgium

by Joe COLLINS and Richard SMITH

Abstract

Two species of crabs from the Mons-en-Pévèle Sands, Upper Ieper Formation are introduced. *Raninoides glabra* (WOODWARD, 1871) previously unknown from Belgium and *Silvacarcinus laurae* new genus, new species is described.

Key-words: Crustaceans, crabs, Eocene, Ypresian, Belgium.

Résumé

Deux espèces de crabes des Sables de Mons-en-Pévèle, Yprésien supérieur belge, sont présentés ici. *Raninoides glabra* (WOODWARD, 1871) est signalé pour la première fois en Belgique et *Silvacarcinus laurae* nov. gen., nov. sp. est décrit.

Mots-clefs: Crustacés, crabes, Eocène, Yprésien, Belgique.

Introduction

Many Belgian localities have yielded fossil crabs of Ypresian age, but very few of these crustaceans have received attention.

The fauna associated with the Ypresian mammalian remains discovered at Evere and described by SMITH & RUSSELL (1992) contained a number of crustacean carapaces belonging to two species, one of which is referred to *Linuparus* sp. and the others to *Zanthopsis leachii* (DESMAREST, 1822). The study of these decapods brought us to compare them with others found at Forest in an older level of the Mons-en-Pévèle Sands. The crabs of Forest are of two different species, one of which has a superficial resemblance to both *Goniochele angulata* BELL, 1854 and to *Cristella hastata* COLLINS & RASMUSSEN, 1992, yet does not fulfill the generic requirements of either of these genera and a new genus, *Silvacarcinus*, is erected to accommodate it. An almost entire endophragmal system preserved with female sternites of *Silvacarcinus* provides a valuable contribution to our knowledge of the internal skeleton, rarely preserved among fossil crabs.

The other species, *Raninoides glabra*, was described by WOODWARD, 1871 from a single (incomplete) carapace from the London Clay (Ypresian), of Portsmouth, England. Among the new material several carapaces retain better preserved elements of the abdominal sternites than hitherto known (GLAESSNER & WITHERS, 1931) and firmly place this species in Raninoides as recognised by FELDMANN (1991).

Locality - Stratigraphy

The locality is situated in Forest (Brussels) avenue du Globe, in front of the main entrance to the football stadium (Text-fig. 1). The fossils were collected in 1964-1965 when the avenue was made.

The following stratigraphic section, reading from the lowest level, was exposed:

a) very fine micaceous sands, grey beige.
b) irregular bed of *Ditrupa plana*, with an accumulation of *Ostrea cymbula* at several places: 2-15 cm
c) very fine calcareous sands, grey beige, with many little calcareous accumulations: 60-80 cm
d) *Nummulites planulatus* bed, sandy at the upper part, but cemented at the lower half: 50 cm
e) very fine micaceous sands, grey beige: 25 cm
f) brownish crumbling clay: 30 cm
g) very fine micaceous sands, grey beige: 80-100 cm
h) dumped soil.

The crabs described in this paper were found in the *Ditrupa plana* bed and were associated with a rich selachian fauna studied by CASIER (1946) and HERMAN (1974, 1977, 1982, 1984, 1986).

The holotype and paratypes are deposited in the Institut royal des Sciences naturelles de Belgique.

Systematic Palaeontology

Section Podotremata GUINOT, 1977
Subsection Archaeobrachyura GUINOT, 1977
Superfamily RANINOIDEA DE HAAN, 1841

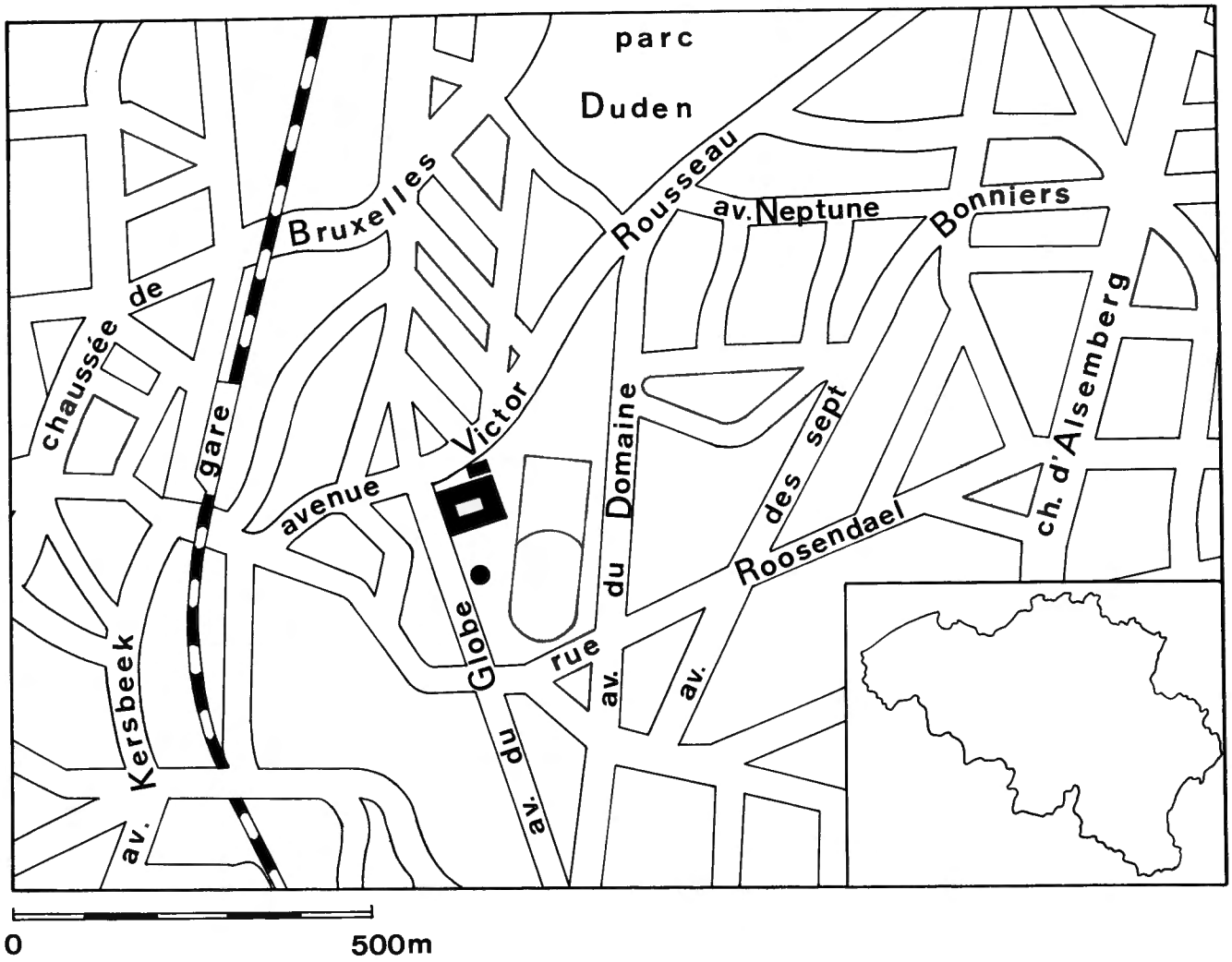

Fig. 1 — Geographic situation of the locality at Forest. The point indicates the exposure.

Family RANINIDAE DE HAAN, 1839
Genus ***Raninoides*** H. MILNE EDWARDS, 1837
Type species. By monotypy *Ranina laevis* LATREILLE, 1825
Raninoides glabra (H. WOODWARD, 1871)
(Plate 1, Figs. 1-5)

1871. *Palaeocorystes glabra* H. WOODWARD, p. 90, figs. 1a, b.
1923. *Palaeocorystes glabra* H. WOODWARD; VAN STRAELEN, p. 120.
1929. *Raninellopsis? glabra* (H. WOODWARD); GLAESSNER, p. 370.
1931. *Laeviranina glabra* (H. WOODWARD); GLAESSNER & WITHERS, p. 485, pl. 21. figs. 2-4.
1981. *Raninoides glabra* (H. WOODWARD): FÖRSTER & MUNDLOS, p. 158.

HOLOTYPE, a carapace, 1215A British Geological Survey Museum, Keyworth, from the Lower Eocene Ypresian (London Clay) of Portsmouth, Hampshire. Two other carapaces are in the Sedgwick Museum, Cambridge.

ADDITIONAL MATERIAL: 11 carapaces and an internal mould from the Ypresian of Forest, Belgium (Text-fig. 1).

DESCRIPTION (Revised from GLAESSNER & WITHERS, 1931):

Carapace about one and a half times long as wide, broadly rounded transversely and slightly convex longitudinally. The orbitofrontal margin is about two thirds of the carapace width. Rostrum and most of the orbital spines are missing. Two notches in the upper orbital margin divide it into three equal parts. A low septum under the inner notch isolates a circular antennal fossa from ovate, moderately deep orbits. Anterolateral margin short, ending at the lateral spine, the base only of which is preserved and this is very wide; it projects at an angle of 48° to the carapace midline and is situated

nearer the outer orbital spine than the widest part of the carapace. Behind the lateral spine the edge is granulated and extends posteriorly as a double row of close granules forming a ridge. A weak postfrontal ridge, concave medially, extends between the lateral spines. Cardiac furrows are clearly marked on the shell about mid-carapace length. Where well preserved there are extremely fine granules in the form of forwardly directed spines which become more prominent anteriorly as even-sized granules, particularly in the postfrontal depression where they tend to form short transverse ridges and definite rows of granules encircle the base of the lateral spine; interspersed are numerous fine pits, sometimes rounded, but often longitudinal.

There is an incipient rounded subhepatic ridge below the lateral spine; granules crowd the tumid pterygostomian process and the finely granulated shallow - concave buccal margins are bounded by a groove.

Diminutive fused 1-3 sternal elements have slightly rounded sides, the rounded anterior part of the 4th element is no wider than that of the 5th element which narrows posteriorly and the somewhat elevated 6th element widens slightly. GLAESSNER & WITHERS (1931, pl. 21, fig. 4) figured a specimen, as *Laeviranina glabra*, from the Ypresian of Portsmouth with a deep median cleft clearly extending the length of the 5th element terminating in a distinct transverse groove separating the flat 4th element, and with the anterior part of the 4th element no wider than that of the 5th; while these features conform by and large, with the sterna of the new specimens, three of the new specimens have the sternal cleft extending as a shallow depression onto the 4th element. This difference in structure could be attributed to sexual dimorphism - with the latter representing the female.

DISCUSSION:

On comparing differences between the sterna of *Raninoides* and *Laeviranina* FELDMANN (1991) drew attention to the sternal median cleft, concluding that a deep cleft extending to the 4th/5th junction (together with a broadly alate anterior part of the 4th element) to be a possible character distinguishing *Laeviranina*, whilst sterna with a cleft which terminated before the 4th/5th articulation might characterize *Raninoides*. As seen above, sternal element 4 of R. glabra is non-alate, whereas the sternal cleft extends to and beyond the 4th /5th juncture and this is possibly a less reliable character distinguishing *Raninoides* from *Laeviranina* the carapaces of which are, as FELDMANN remarks (1991), "not unequivocably distinguishable".

On the same plate GLAESSNER & WITHERS figure (fig. 1b) a specimen as *Laeviranina gottschei* (BÖHM, 1927) showing the anterior part of element 4 similar to that figured as *L. glabra*. It would seem, therefore, that FÖRSTER & MUNDLOS (1982) were correct in refering both species to *Raninoides*.

Raninoides glabra differs from the contemporary species *R. gottschei* from Hemmoor, near Cuxhaven and the Isle of Sheppey and the sandy top beds of the London Clay (= 5th Division of WRIGLEY, 1924) from Tolworth and Oxshott, Surrey and Highgate, London, in having a stronger lateral spine and type of ornament. Contrary to the statement of GLAESSNER & WITHERS (1931), cardiac furrows are also present on *R. gottschei* together with a distinct granular ornament seen on internal moulds.

Section Heterotremata GUINOT, 1977
Superfamily CALAPPOIDEA DE HAAN, 1833
Family CALAPPIDAE DE HAAN, 1833
Genus ***Silvacarcinus*** gen. nov.

DERIVATION OF NAME: *Silva* Latin forest, referring to the Type locality; *carcinus*: crab.

DIAGNOSIS: Carapace hexagonal in outline, a little wider than long with three anterolateral spines; median and lateral carinae are conjoined at the cardiac region by a transverse ridge.

TYPE SPECIES: *Silvacarcinus laurae* sp. nov.

RANGE: Lower Eocene.

Silvacarcinus laurae sp. nov.
(Plate 2, Figs. 1-6; Text-figs. 2-3a,b)

DERIVATION OF NAME: In honour of Mrs Laura SMITH-SIMEONS for many years of patience concerning her husband's palaeontological researches.

DIAGNOSIS: As for genus.

MATERIAL: Holotype. A male carapace N° IRScNB-TCCI 6115 and paratypes N° IRScNB-TCCI 6116, IRScNB-TCCI 6117, IRScNB-TCCI 6118, IRScNB-TCCI 6119.

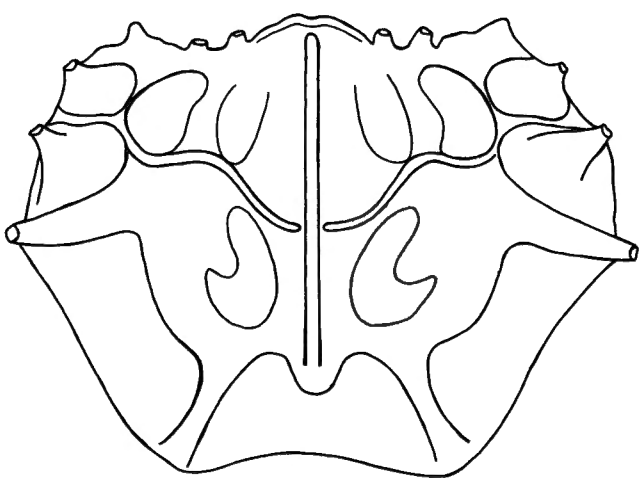

Fig. 2 — Dorsal view of paratype N° IRScNB-TCCI 6119.

DESCRIPTION: Carapace subhexagonal in outline, gently arched in both longitudinal and transverse sections; about one fifth wider than long, widest at the lateral angle a little anterior to midlength. The fronto-orbital margin occupies about a half of the carapace width. The front is slightly produced, its median third being weakly concave and thickened, straight sides slope back to a square inner orbital lobe set in front of the thickened rim, there follows a narrow outer orbital notch and there is a sharp, forwardly curving spine at the external angle. The three lobes thus formed are almost equal in size and are separated by equal distances; they are subtriangular in frontal view. The orbits are moderately deep and ovate, with the upper orbital margins raised. A sharp spine at the lateral angle terminates a ridge forming the epibranchial lobe; between this spine and the external orbital spine are two equidistant smaller ones, the anterior terminating a tumid triangular area on the epigastric lobe, and the posterior a similarly tumid area on the otherwise trapezoidal hepatic region. Slightly concave posterolateral margins have a well rounded edge appearing almost carinate by a depression of the metabranchial lobe; they terminate in a rounded juncture with the lateral dorsal carinae in advance of the posterior margin. The posterior margin, as wide as the front, is bounded by a ridge continuing along the branchiostegites. A low rounded median carina extends from the front to the base of the cardiac region. On either side of this carina the cervical furrow is deep and broadly V-shaped to the outer angles of the poorly defined mesogastric lobe where it turns outwards and is concave for a short distance before curving to the margin. There is a well defined hepatic furrow. Prominent more or less continuous lateral carinae rising between the orbital notches are slightly convergent to the urogastric lobe with which they are connected by a lower transverse ridge, then turn outwards to the posterolateral margins; they carry two low tubercles on the protogastric lobes and one on each mesobranchial lobe. There is an additional tubercle on the protogastric lobe close to the mesogastric lobe. The epibranchial lobe forms a broad, flattened arching ridge from the lateral angle to the subtriangular urogastric lobe and an ovate mesobranchial lobe, traversed by the lateral carina, is tumid medially between the urogastric and cardiac region from which it is separated by a depression. The lingulate cardiac region has a basal tubercle and the rectangular intestinal region is isolated from the lateral carinae. Granules of several diameters crowd the dorsal surface and lateral extremities of the cervical furrow.

The margins of the rather wide buccal cavity are concave and bounded by a ridge, a depression and a stronger ridge. There is a broadly rounded median ridge on the densely granulated pterygostomian processes.

In the male small, inverted-triangular 1st-3rd sternites are partially separated by a groove from trapezoidal 4th sternites which are separated by oblique grooves from the larger rhomboidal 5th sternites; the 6th and 7th sternites are rhomboidal and separated from one another by thinner grooves. A deep abdominal trough occupies the median third. The surface is coarsely granulated distally becoming smooth by the middle of the 6th sternites. The triangular 1st-3rd sternites of the female are contrastingly larger than those of the male and a deeper groove separates the 2nd & 3rd than that separating the 3rd from the 4th sternites; the base of the 3rd is deeply excavated by tumidities on the subtrapezoidal 4th sternites; the 5th-7th are subrectangular in outline and the 6th has a short oblique ridge rising from the coxal margin. The openings of the oviducts, surrounded by a low tumid area, occur close to the midline between the 5th-6th sternites. The surface is densely granulated, becoming smooth towards the midline.

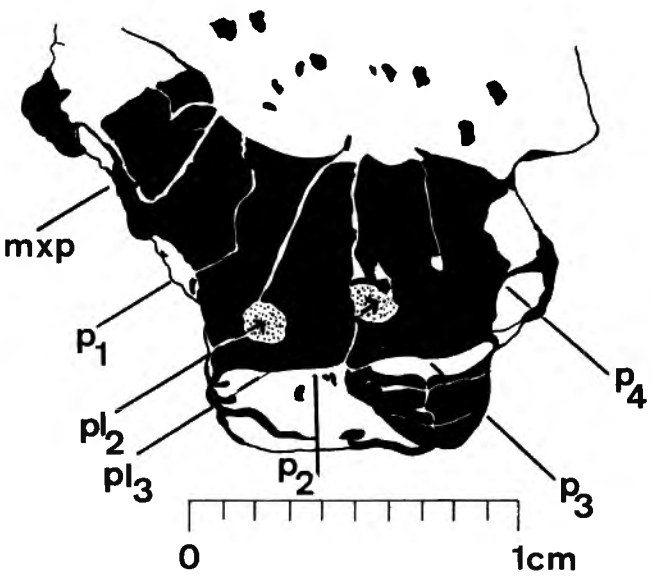

Fig. 3a — Left lateral view of endophragmal skeleton preserved with female sternites, paratype IRScNB-TCCI 6116. mxp, p_1-p_4, epimeral elements for 3rd maxillipeds and 1st to 4th pereiopods; pl_2, pl_3, pleurobranch insertions corresponding to 2nd and 3rd pereiopods.

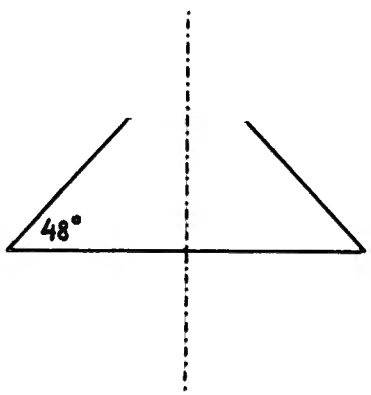

Fig. 3b — Bilateral symmetry of epimeral elements to carapace midline.

An almost entire endophragmal skeleton (Text-fig. 3) preserved with the female sternites shows the epimeral (lateral) elements rising at an angle of 48° to the carapace midline and dorsally occupying about two thirds of the body chamber width. The element for the 3rd maxilliped is trapezoidal in outline with a depression bordering the rather more rectangular element for the cheliped (= 1st pereiopod, P1) which has a median depression. The element corresponding to the 2nd pereiopod is typically triangular and has a weak depression apically, while the elements for the 3rd & 4th pereiopods are trapezoidal. A narrow ridge bounds the basal margin of elements P2-P4 and large (infilled) foramina surrounded by a raised lip, at the anterior bases of elements P2 and P3 mark the insertions for the pleurobranchs.

DISCUSSION:

There is a superficial resemblance to *Goniochele angulata* BELL, 1858, from the London Clay, but the latter differs in having the greatest carapace width further from the front, separation of the cardiac region from the lateral carinae and an ovate intestinal region.

The Lower Cretaceous *Necrocarcinus tricarinatus* BELL, 1863 has a well developed rostrum (WRIGHT & COLLINS, 1972), but in the nature of the carination, other surface ornament and course of the cervical furrow this species has much in common with *S. laurae* and could be seen as its possible ancestral form.

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J.S.H. COLLINS,
8 Shaw's Cottages, Perry Rise,
Forest Hill, SE23 2QN,
England.

RICHARD SMITH,
Laekenveld 6, B-1780 Wemmel,
Belgium.

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PLATE 1

Figs. 1-5 — *Raninoides glabra* (H. WOODWARD, 1871); fig. 1,dorsal view of carapace N° IRScNB-TCCI 6120; fig. 2,ventral view of N° IRScNB-TCCI 6120 showing sternites 1-6; fig. 3,ventral view of N° IRScNB-TCCI 6123 showing sternites 1-5; fig. 4, dorsal view of carapace N° IRScNB-TCCI 6121; fig. 5, ventral view of N° IRScNB-TCCI 6122 showing sternites 1-6.

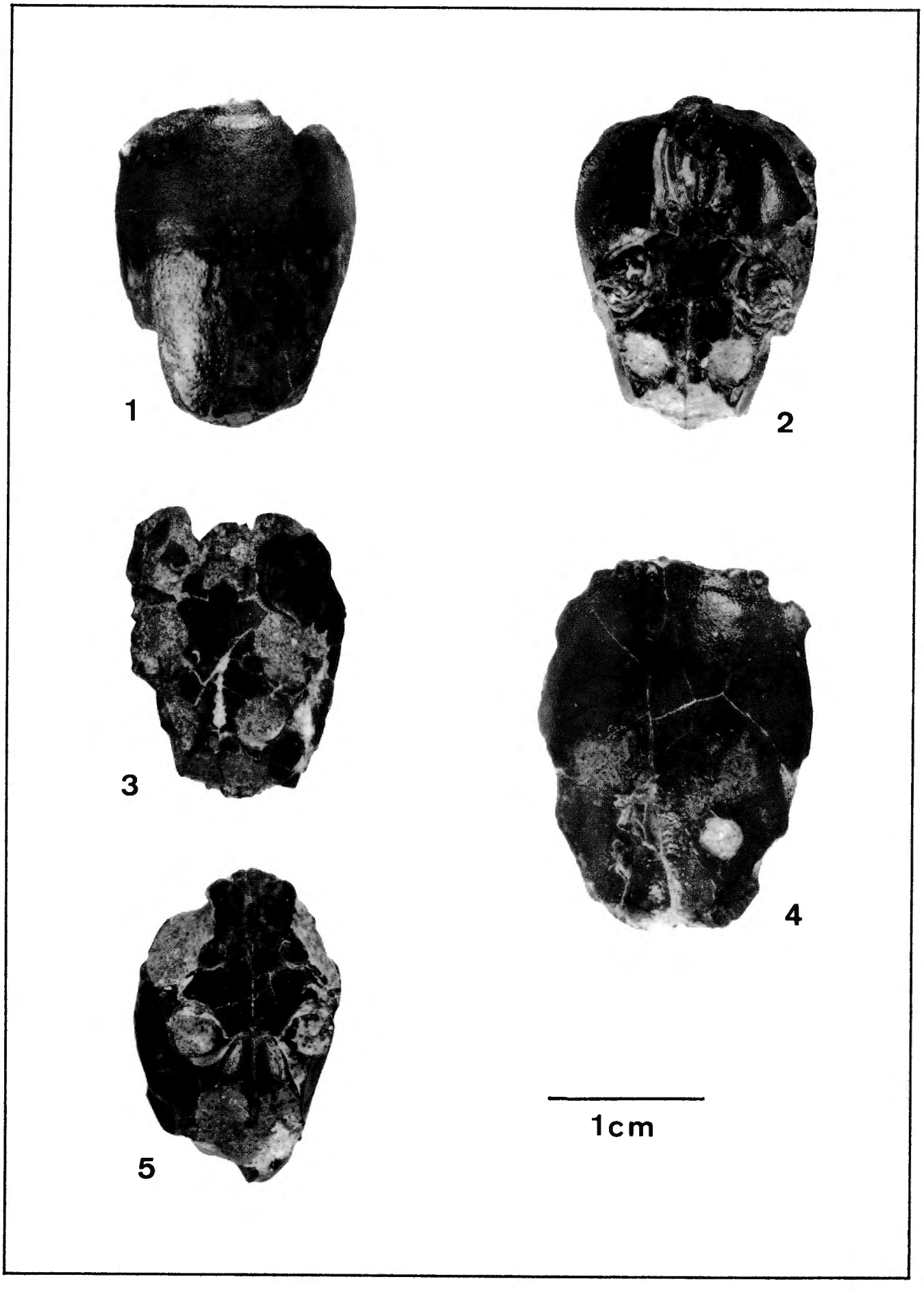
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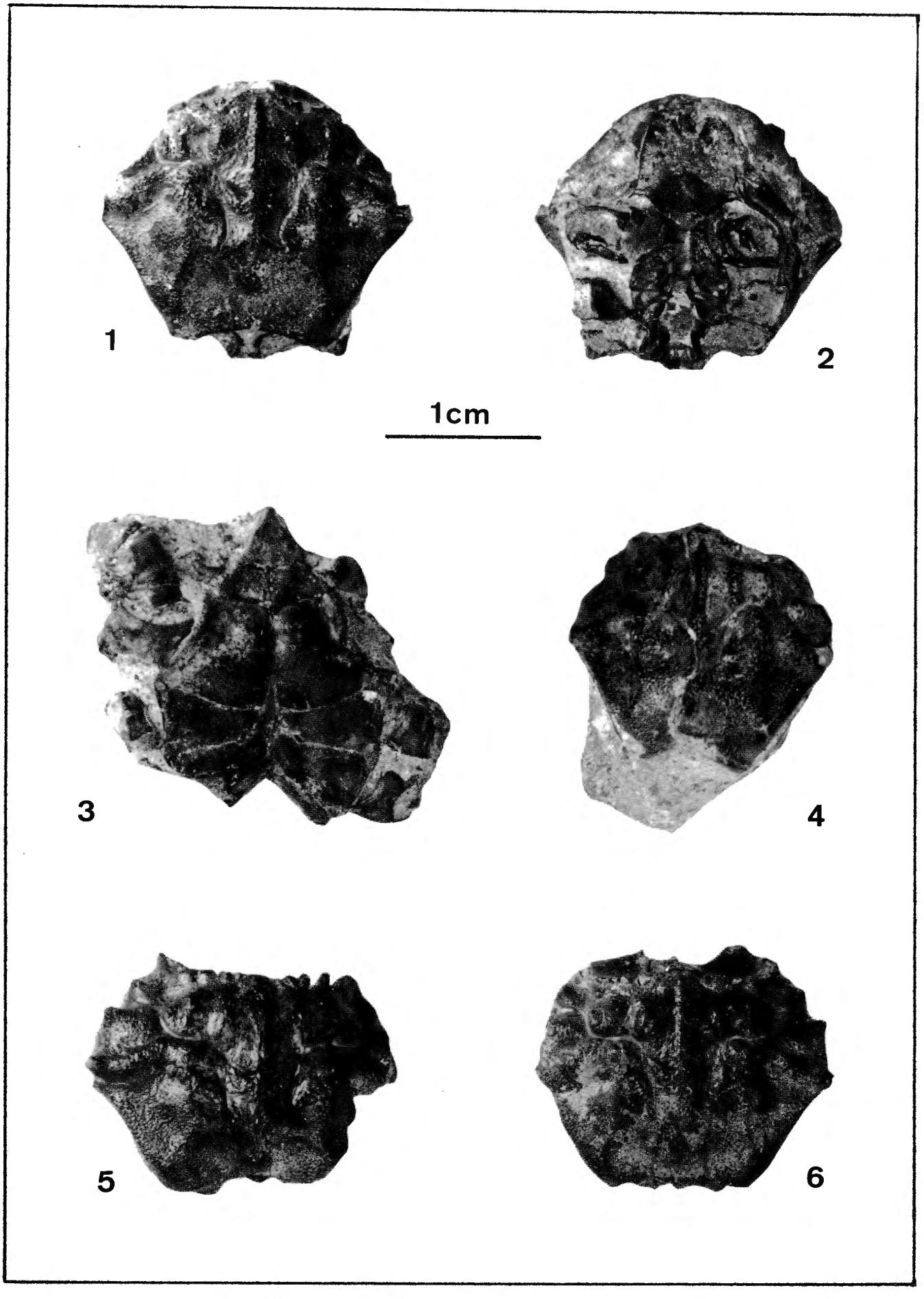
PLATE 2

Figs. 1-6 — *Silvacarcinus laurae* gen. nov., sp. nov.; fig. 1, dorsal view of holotype N° IRScNB-TCCI 6115; fig. 2, ventral view of holotype showing details of male sternites; fig. 3, ventral view of paratype N° IRScNB-TCCI 6116 showing details of female sternites with the openings of the oviducts between the 5th/6th sternites; fig. 4, dorsal view of paratype N° IRScNB-TCCI 6117; fig. 5, dorsal view of paratype N° IRScNB-TCCI 6118; fig. 6, dorsal view of paratype N° IRScNB-TCCI 6119.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