

Pinnacaris dentata n. sp.

Tab. II: fig. 4

Derivatio nominis: for the presence of teeth on the upper margin of the rostrum

Holotype: MSNM i10691-10692 (part and counterpart)

Paratypes: MSNM i10693; MSNB 7731; 7693

Type locality: Ponte Giurino, Imagna Valley (Bergamo)

Geological age: U. Norian (?) - L. Rhaetian (?)

Diagnosis: short rostrum with four (?) identical suprarostrals teeth; carapace with two longitudinal carinae in the antennal region; elongated scaphocerite with pointed distal extremity; pereopods I-V with spines longitudinally arranged along the margins; second abdominal somite with subrounded pleura which overlaps that of the first and of the third one; third somite with a marked hump; triangular telson with pointed distal extremity.

Material: we ascribe to the new genus 4 specimens with a length ranging between 3.5 and 6 cm.

MSNB 7731, 7693

MSNM i10691-10692 (part and counterpart), i10693

Description. It is an elongated and rather large caridean (the holotype has a maximum length of 6 cm), with a thin and completely smooth exoskeleton.

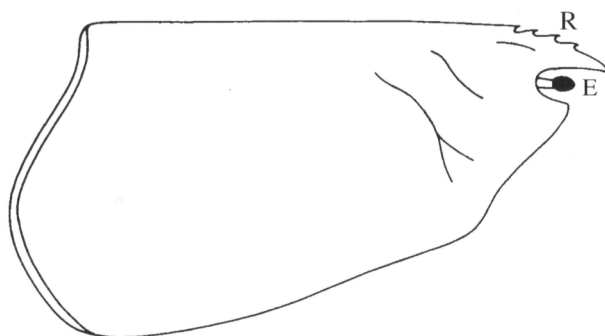


Fig. 18 - *Pinnacaris dentata* n. gen. n. sp., carapace reconstruction, line drawing, based on specimen MSNM i10691

Carapace. The carapace (see Fig. 18), that can be observed in lateral view, is subrectangular and shrinks slightly anteriorly. The dorsal margin is straight. The back margin has a sinuous trend: slightly concave in the upper third, it is backward protuded in the lower third, by creating a slight convexity covering part of the first abdominal somite. The posterior margin is delimited by a marginal carina. The ventral margin is bent. The dorsal margin stretches into a slightly convex rostrum, with a downwards turned point and with four (?) forward protruded identical suprarostrals teeth. At the base of the rostrum there is the clear presence of a short longitudinal carina ending in the inferior third. Below the rostrum, the front margin of the carapace creates a narrow and deep ocular incision delimited by a well marked antennal angle. The anterior margin, below the antennal angle, continues with a slight concavity and joins the inferior margin, thus creating a slight convexity corresponding to a light pterigostomial angle. On the surface of the carapace, in the antennal region, it is possible to observe two longitudinal and parallel carinae. The lower carina is anteriorly bifurcate.

Abdomen. It is well preserved in the holotype, featuring the typical hump of Carideans. All the somites are visible; the second one has a subrounded pleura that overlaps the pleurae of the first and the third somite (see Fig. 19). The VI somite is subrectangular and very elongated. The lower margin of all the somites is delimited by a marginal carina. The telson is triangular with a pointed apex. The uropods are badly preserved.

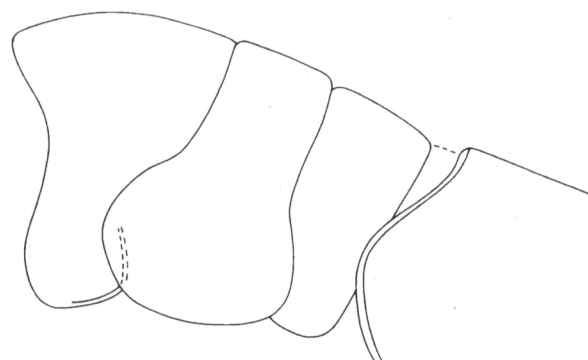
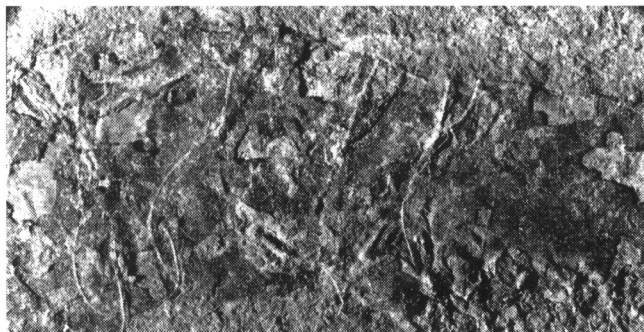


Fig. 19 - *Pinnacaris dentata* n. gen. n. sp., n. cat. MSNM i 10691 I-III abdominal somites, photo and reconstruction (x 6)

Cephalic appendages. They are badly preserved in all specimens, except the elongated, triangular scaphocerite with its pointed apex.

Thoracic appendages. The five pairs of pereopods are badly preserved, and it is impossible to ascertain the form of the chelae. All the pereopods are characterized by the presence of spines longitudinally arranged along the margins.

Abdominal appendages. The five pairs of pleopods are not preserved.

Observations

Caridea - the most abundant among living natantian decapods, with 22 families including more than 170 genera - are quite rare as fossil. Glaessner, 1969 lists nine fossil genera distributed in the families Atyidae de Haan, 1849 (living); Ophloporidae Dana, 1852 (living); Palaemonidae Rafinesque, 1815 (living); Udorellidae Van Straelen, 1924 (extinct); and four genera *incertae sedis* (*Blaculla* Münster, 1839; *Hefriga* Münster, 1839; *Gampsurus* von Der Marck, 1865; *Udora* Münster, 1839). The oldest species listed by Glaessner, 1969 are known from Middle Jurassic. Pinna, 1974 reported two new forms (*Acanthinopus* Pinna, 1974 and *Leiothorax* Pinna, 1974) from the Upper Triassic (Norian) of Cene, N. Italy.

Owing to the bad preservation of our material and

the often imperfect knowledge of the other fossil forms, it is difficult to draw accurate comparisons. There are some differences concerning the structure of the rostrum, the shape of the carapace and of the abdominal somites of *Pinnacaris* if compared to the families Atyidae, Ophlophoridae and Palaemonidae. Such differences stand out also from the comparison with the other living families. The shape of the carapace is similar to that of the family Udorellidae, but there are differences due to the shape of the third somite, to the elongated VI somite, to the presence of carinae on the carapace and to the structure of the rostrum. *Pinnacaris* shows certain affinities with the genus *Udora* Münster, 1839. Common features are the shape of the carapace and the thin and elongated structure of the five pairs of pereopods supplied with spines along the margin. Nevertheless the two genera differ in the structure of the rostrum, in the shape of the third abdominal somite, in the elongated VI somite and in the presence of carinae on the carapace. The type specimen of *Acanthinopus gibbosus* Pinna, 1974 from the Norian of Cene is quite badly preserved and difficult to compare; nevertheless the carapace is more elongated than in *P. n. gen.*, the VI abdominal somite is shorter and the second abdominal pleura is less rounded. For what concerning the other species from Cene, *Leiothorax triasicus* Pinna, 1974, there are differences in the shape of the carapace, which is stockier in the species of Pinna; in the presence of carinae on the carapace of *P. dentata* n. sp.; in the structure of the rostrum, that in our species has four (?) suprarostrals teeth: such teeth are lacking in the holotype of *L. triasicus* Pinna, 1974 (MSNB 3156), as we were able to ascertain after an accurate preparation of the specimen. Owing to the forementioned differences with known taxa, we believe it is correct to ascribe the two examined specimens to a new genus and a new species. On the contrary we lack enough data for a family assignment.

Infraorder Palinura Latreille, 1803
 Superfamily Glypheoidea Winckler, 1883
 Family Mecochiridae Van Straelen, 1925
 Genus *Pseudoglyphea* Oppel, 1861

Pseudoglyphea gigantea n. sp.
 Tab. III: figs. 1,2,3,4

Derivatio nominis: for the big size of the body
 Holotype: MSNM i10678-10679 (part and counterpart)

Paratypes: MSNM i10676; i10680; i10681; i10689-
 i10690 (part and counterpart); MSNB 7554-7558 (part
 and counterpart); 7573; 7561; 7620-7621 (part and
 counterpart); 7624; 7659-7661 (part and counterpart);
 8241; 8348

Type locality: Ponte Giurino, Imagna Valley
 (Bergamo)

Geological age: U. Norian (?) - L. Rhaetian (?)

Diagnosis: elongated carapace which shrinks slightly
 anteriorly; short rostrum with 5 subrostral teeth; cara-
 pace with cervical, postcervical, branchiocardiac and
 antennal grooves and with two longitudinal carinae in
 the antennal region; 3rd maxilliped short and spine-
 less; pereopods I-III subchelate; I-V abdominal somites
 of even length and triangular shape; VI somite rectan-
 gular; telson subrectangular with rounded distal ex-

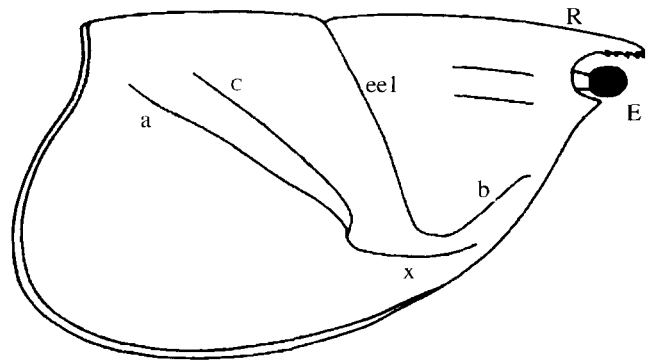


Fig. 20 - *Pseudoglyphea gigantea* n. sp., carapace reconstruction, line drawing

tremity; exopodite of the uropodite with diaeresis.

Material: we ascribe to the new species 183 speci-
 mens in different preservation states; the complete
 specimens have a length ranging between 4 and 7 cm;
 nevertheless the size of the species must be quite big-
 ger, judging by the dimensions of some fragmentary
 remains (see description farther on). The following
 specimens were used for the description:

MSNB 7648, 7561, 7558-7554 (part and counter-
 part), 7624, 7659-7661 (part and counterpart), 7573,
 7620-7621 (part and counterpart), 7562-7702 (part
 and counterpart), 7610, 7684, 8336, 8241, 8348, 8321, 8252

MSNM i10676, i10677, i10678-10679 (part and
 counterpart), i10680, i10681, i10689-10690 (part and
 counterpart)

Description. It is an elongated glypheoid, with a large,
 thin and very granulate exoskeleton: the biggest com-
 plete specimen (MSNB 7571) has a maximum length of
 7 cm; we have a fragmentary specimen (MSNM
 i10676) preserving just cephalic appendages and the
 first pair of pereopods: the propodus of the latter (the
 most easily measurable element) is about 2.5 times
 longer than the propodus of the first pereopod of MSNB
 7571; therefore the size of the species should exceed 15 cm.

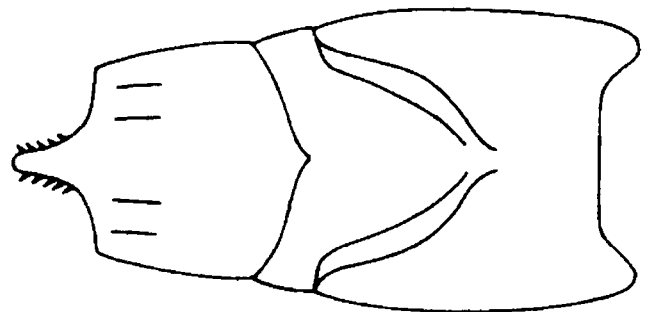


Fig. 21 - *Pseudoglyphea gigantea* n. sp., carapace reconstruction in dorsal view, line drawing

Carapace. The carapace (see Figs. 20, 21), always
 visible just in lateral view, has an elongated shape and
 shrinks slightly anteriorly, as we can clearly see on the
 specimen MSNB 7561. The dorsal margin is straight
 and bends slightly in proximity of the cervical groove.
 The posterior margin is sinuous: it is concave in the
 upper third and forms convexity in the lower third

(MSNB 7561, 7558). The posterior margin is delimited by a marginal carina (MSNB 7561, 7558; MSNM i10689-10690, i10680). The ventral margin has a bent trend. The dorsal margin stretches into a rostrum that is clearly visible on the specimens MSNB 7648, 7620, 8241; MSNM i10689-10690, i10680. The rostrum (see Fig. 22) is well developed, slightly bent downwards, with five subrostral teeth.

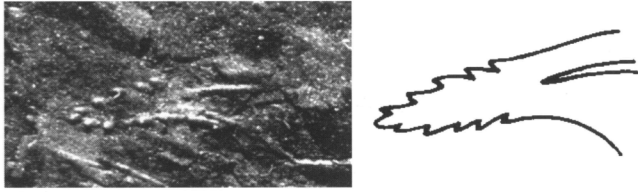


Fig. 22 - *Pseudoglyphea gigantea* n. sp., n. cat. MSNB 7260 rostrum in dorsal view, photo and reconstruction (x 4)

Below the rostrum there is a small and shallow ocular incision delimited, in its lower part, by a light antennal angle. On the surface of the carapace there are four grooves: a very deep cervical groove, a postcervical, a branchiocardiac and an antennal groove. The cervical groove joins the antennal groove, while the postcervical groove, in its lower third, joins the branchiocardiac groove, which continues with the joint of the posterior dorsoventral muscle (MSNB 7558, 7684, 8321, 8241, 8336; MSNM i10681). Moreover it is possible to observe in the antennal region, near the ocular incision, two parallel longitudinal carinae (MSNB 7558, 7571).

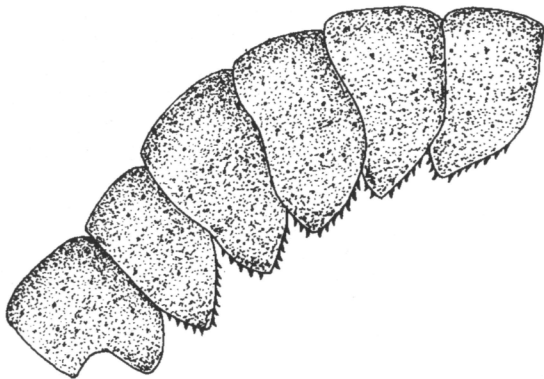


Fig. 23 - *Pseudoglyphea gigantea* n. sp., abdomen reconstruction with ornamentation, line drawing

Abdomen. It is well preserved in certain specimens (MSNB 7561, 7558, 7562, 8252, 8321; MSNM i10678-10679). The somites I-V have even length and triangular shape; the VI somite is rectangular (see Fig. 23). The lower margin of the pleurae of the first five somites has some small spines. The telson has a subrectangular shape, a rounded distal extremity and lateral margins supplied with small spines. As for the tail fan, the endopodite and the exopodite are rounded and not longer than the telson; the endopodite is crossed by a well marked longitudinal middle carina (MSNB 8348);

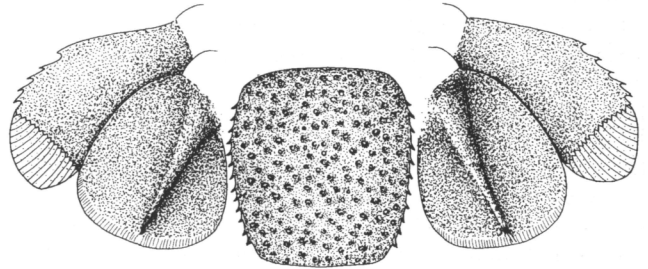


Fig. 24 - *Pseudoglyphea gigantea* n. sp., tail fan of the specimen MSNB 7558 (x 3,3); below reconstruction with ornamentation, line drawing

the exopodite has a straight diaeresis fringed by a row of small spines; the lateral margin of the exopodite is fringed by small spines (see Fig. 24).

Cephalic appendages. The cephalic appendages are usually badly preserved and it is not possible to carry out a complete reconstruction: in the specimen MSNB 7561 it is possible to observe an eye of ovoidal shape; specimen MSNB 7573 preserves the proximal portions of the flagella of the antennulae and of the antennae.

Thoracic appendages. The 3rd maxilliped is short and it is possible to notice the four terminal articula that get proximally longer. None of the articula has spines (MSNM i10677). The five pairs of pereiopods are well preserved in some specimens (MSNB 7561, 7558, 7624, 8336, 8321; MSNM i10678-10679). The first pair (see Fig. 25) is subchelate and it is longer

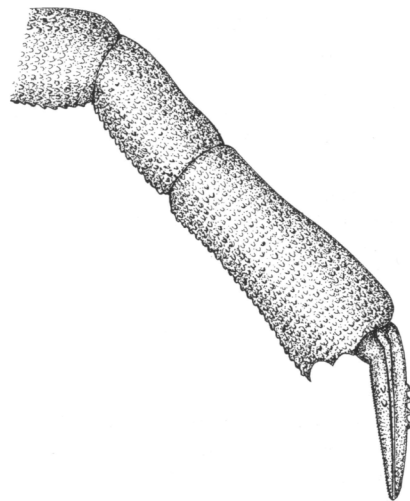


Fig. 25 - *Pseudoglyphea gigantea* n. sp., first pereiopod with ornamentation, line drawing

than the other pairs: the length of the propodus is twice its width; the dactylus is covered by a thin middle carina and the internal margin is saw-toothed. Also the II-III pereopods are subchelate (see Fig. 26): the dactylus of the second pair is covered by a middle

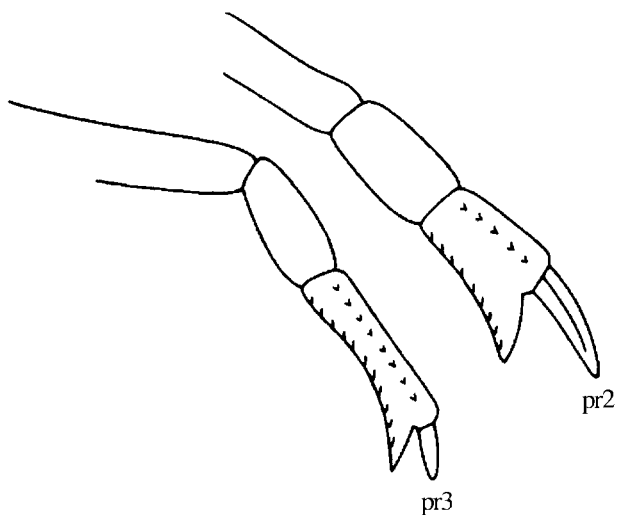


Fig. 26 - *Pseudoglyphea gigantea* n. sp., II-III pair of pereopods, line drawing

carina; the propodus of the third pair is thinner and more elongated than that of the second one. The IV-V pereopods have a terminal dactylus.

Abdominal appendages. The five pairs of pleopods are badly preserved: in some specimens it is possible to observe a subrectangular sympodite to which two multiarticulated short flagella are articulated (MSNB 7558, 7610, 7648, 7562).

Observations

The genus *Pseudoglyphea* Oppel, 1861 is characterized by a toothed rostrum, by a deep cervical groove, by a postcervical and a branchiocardiac groove that become parallel from the middle region of the carapace, by the presence of carinae in the cephalic region, by the I-III pair of pereopods subchelate, by the propodus of the first pair of pereopods, which is half as long as the carapace and finally by the exopodite of the uropodite with diaeresis.

These morphological features can be found in the studied specimens, which are therefore ascribed to the genus *Pseudoglyphea* Oppel, 1861.

The known species of *Pseudoglyphea* that are most similar to *P. gigantea* n. sp. (see Fig. 27) also are from Triassic terrains: *P. spinosa* Assmann, 1927 from the Anisian of Germany, *P. mulleri* Van Straelen, 1936 from the Carnian of Nevada and *P. alpina* Förster, 1971 from the Rhaetian of Austria.

The comparison between the new species and *P. mulleri* is almost impossible because of the bad preservation state of the species of Van Straelen, known only through the posterior portion of the carapace. According to the description of Van Straelen, the only obtainable datum concerns the trend of the grooves, which is similar for the two species. The same is true for a comparison with the species *P. spinosa* (cfr. Förster, 1967); this species shows a different pattern of the postcervical groove, posteriorly bifid, and in the hepatic groove, which is distinct from the joint of the posterior dorsoventral muscle.

P. gigantea n. sp. shares some morphological characteristics in common with *P. alpina* Förster, 1971. The abdomen of the latter species is not preserved, thus allowing comparisons just with the carapace and the first two pairs of pereopods. The common features of

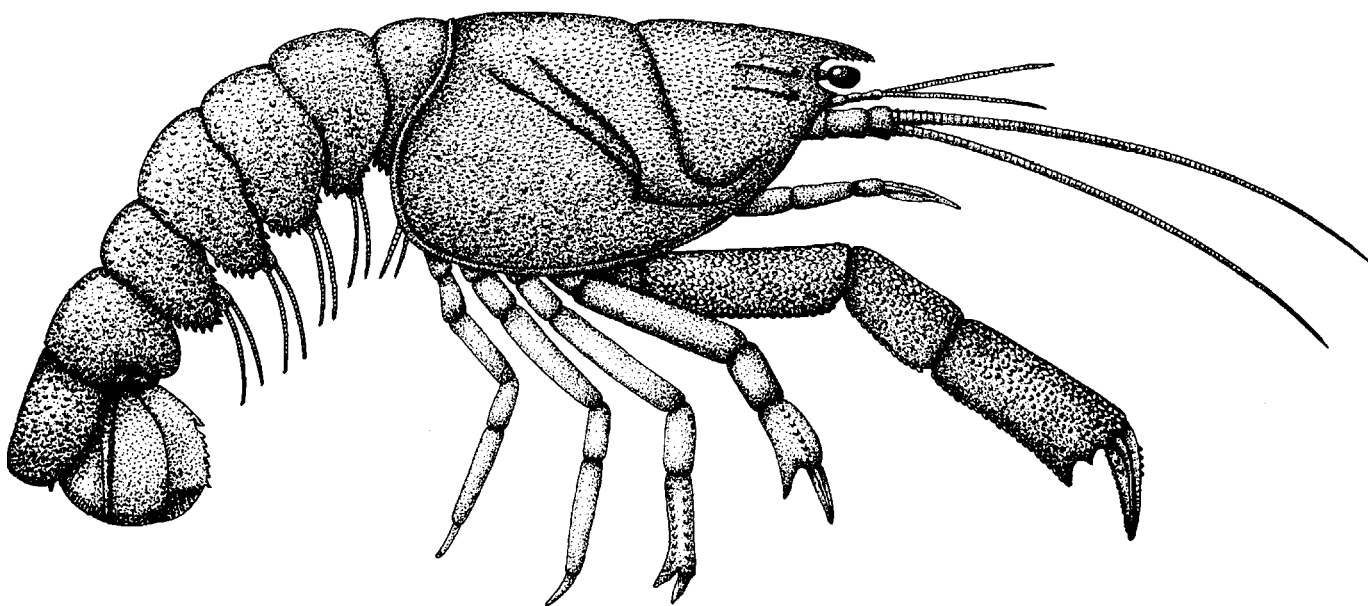


Fig. 27 - *Pseudoglyphea gigantea* n. sp., reconstruction

the two species are the parallel postcervical and branchiocardiac grooves, the propodus of the first pair of pereiopods, which is half as long as the carapace, and the second pair of pereiopods subchelate. Nevertheless the new species is different from *P. alpina* Förster, 1971 because of the structure of the rostrum, which features five subrostral teeth without suprarostal teeth in *P. gigantea* n. sp., and an upper crest without subrostral teeth in the Austrian species; also different is the morphology of the propodus of the first pair of pereiopods (see Fig. 28).

A noticeable characteristic is represented in *P. gigantea* n. sp. by the third pair of pereiopods. In the species already known in the literature, it is never pre-

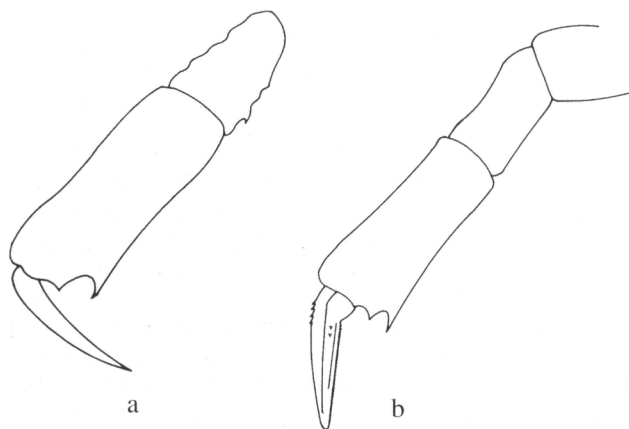


Fig. 28 - *Pseudoglyphea alpina* Förster, 1971 (a) and *Pseudoglyphea gigantea* n. sp. (b), first pereiopods

served; in the new species it is subchelate and it has not a terminal dactylus like, for instance, *Mecochirus* Germar, 1827 (according to the description of *Mecochirus longimanatus* by Van Straelen, 1925, pag. 221). No other genus of the family has a similar feature, while within the superfamily Glypheoidea it can be found in the Glypheidae in the genus *Paralitogaster* Glaessner, 1969 (nom. subst. pro *Aspidogaster* Assman, 1927 according to Glaessner, 1969, p. R626) and in the Pemphicidae, genus *Pemphix* von Meyer, 1840. However the general morphological features lead us to exclude the possibility that the new species belongs to Pemphicidae, while as for the genus *Paralitogaster* the differences with *Pseudoglyphea* are in our opinion quite slight: in *Pseudoglyphea* the gastro-orbital groove is well developed, while in *Paralitogaster* it is not present; moreover in *Pseudoglyphea* the length of the carapace is twice the length of the propodus of the first pair of pereiopods, while in *Paralitogaster* the length of the carapace is thrice that of the propodus (according to Förster, 1967 and Förster, 1971); the reconstruction of the carapace of *Pseudoglyphea* carried out by Förster, 1971 is based on the species *P. etalloni* Oppel, 1862 from the Upper Sinemurian of the Ardennes. In *P. gigantea* n. sp. some of these differences are less marked: for example, the gastrorbital furca is absent. The comparisons among the different fossil forms of *Pseudoglyphea* are nevertheless very difficult - as it often happens for fossil decapod crustaceans - both because of the fragmentary nature of the specimens on which many species are described and because of the different preservation modalities in the fossiliferous deposits. Even though in this work we follow the classifi-

cation proposed by Glaessner, 1969 for glypheoids, we believe that the relationships among the different known forms, both at generic and at family level, need to be further checked.

Superfamily Palinuroidea Latreille, 1803

Family Palinuridae Latreille, 1802

Genus *Archaeopalinurus* Pinna, 1974

Archaeopalinurus levis Pinna, 1974

Tab. IV: figs. 1,2

Material: 8 mostly incomplete specimens.

MSNB 7569 a-b, 7567-7566 (part and counterpart), 8352

MSNM i10747, i10866, i10740

Description. It is a dorsoventrally flattened decapod crustacean of small size (the total length of our specimens ranges between 2 and about 5 cm).

Carapace. It is partly preserved only in one specimen (MSNM i10747) where it is translated; it is possible to observe a rather homogeneous granular ornamentation along all the exposed surface; the posterior margin is very convex.

Abdomen. Only one specimen (MSNM i10747) preserves the abdomen and the open tail fan. The first abdominal somite is shorter than the others; the II-V somites have a rectangular shape and the same size; the VI somite, still rectangular, is longer than the preceding ones. The tail fan was only badly preserved in the specimens from the Norian of Cene described by Pinna, 1974, and is here described for the first time (see Fig. 29). The uropods have a very much rounded and fringed external margin; the diaeresis of the exopodite is delimited by a middle transversal carina ending with a spine on the external margin; on the distal third of the exopodite there are some small granulate or spiny longitudinal carinae (see Fig. 29). The

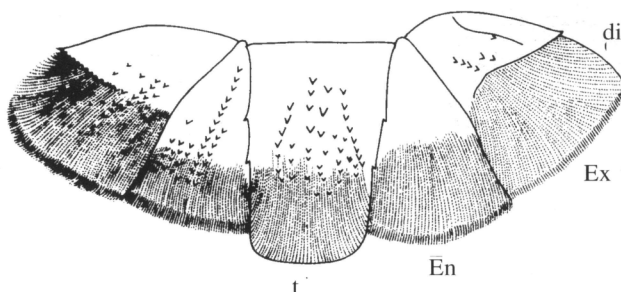
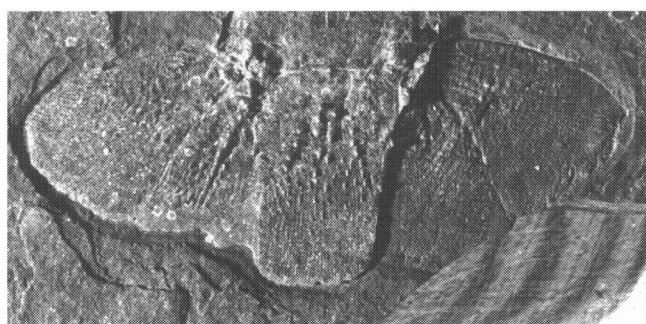


Fig. 29 - *Archaeopalinurus levis* Pinna, 1974, n. cat. MSNM i10747 tail fan, photo and reconstruction (x 3,8)