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# Decapods from Jurassic (Oxfordian) sponge megafacies of Dobrogea, Romania and reconsideration of *Nodoprosopon* Beurlen, 1928

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With 4 figures and 1 table

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**Abstract:** Examination of Jurassic decapod crustaceans associated with microbialite-siliceous sponge biostromes in Gura Dobrogei, eastern Romania, has yielded a unique association of these organisms. *Goniodromites aliquantulus* new species appears to have inhabited layered sponge biostrome settings only, whereas *Cycloprosopon dobrogea* and *Goniodromites* spp. appear to have inhabited a variety of microbialite-siliceous sponge environments. The genus *Nodoprosopon* is severely restricted to contain only two species, and *Planoprosopon* new genus is erected to embrace *Planoprosopon heydeni* new combination. The latter species is known from Romania only in microbialite-siliceous sponge biostrome habitats. The Goniodromitinae, previously considered as a subfamily of the Prosopidae, is here raised to family status. Revision of the Prosopidae sensu lato is ongoing.

**Key words:** Crustacea, Decapoda, Brachyura, Jurassic, Oxfordian, Romania, sponge bioherm, sponge biostrome.

## 1. Introduction

Whereas Jurassic decapod crustaceans have been previously reported from coral reef environments from Romania (Patrulius 1959), decapods associated with sponge megafacies have been poorly known. Jurassic decapods from Poland are well-known (Patrulius 1966; Collins & Wierzbowski 1985; Müller et al. 2000), and decapods associated with a diverse reef complex of sponges, corals, brachiopods, and pelecypods have been reported from the southeastern Carpathians (Muţiu & Bădăluţă 1971). Field work during the summer of 2005 yielded diverse decapod assemblages from sponge megafacies in eastern Romania. Those associated with cylindrical microbialite-siliceous sponge bioherms have been previously described (Feldmann et al. 2006) and herein decapods associated with microbialite siliceous sponge (with platy corals) biostromes are described for the first time. The assemblages from the two sponge environments differ from one another in composition.

## 2. Geologic setting and localities

The outcrops from which the decapods described here were collected are located near Gura Dobrogei, on the southwest side of the Visterna Valley in Central Dobrogea, southeastern Romania (Fig. 1). They are part of the same microbialite-siliceous sponge complex as the localities at Cheia-Casian, described by Feldmann et al. (2006). These deposits belong to the Visterna Member of the Casimcea Formation of middle Oxfordian (Late Jurassic) age. The middle Oxfordian age for the microbialite-siliceous sponge deposits that crop out in Gura Dobrogei is documen-

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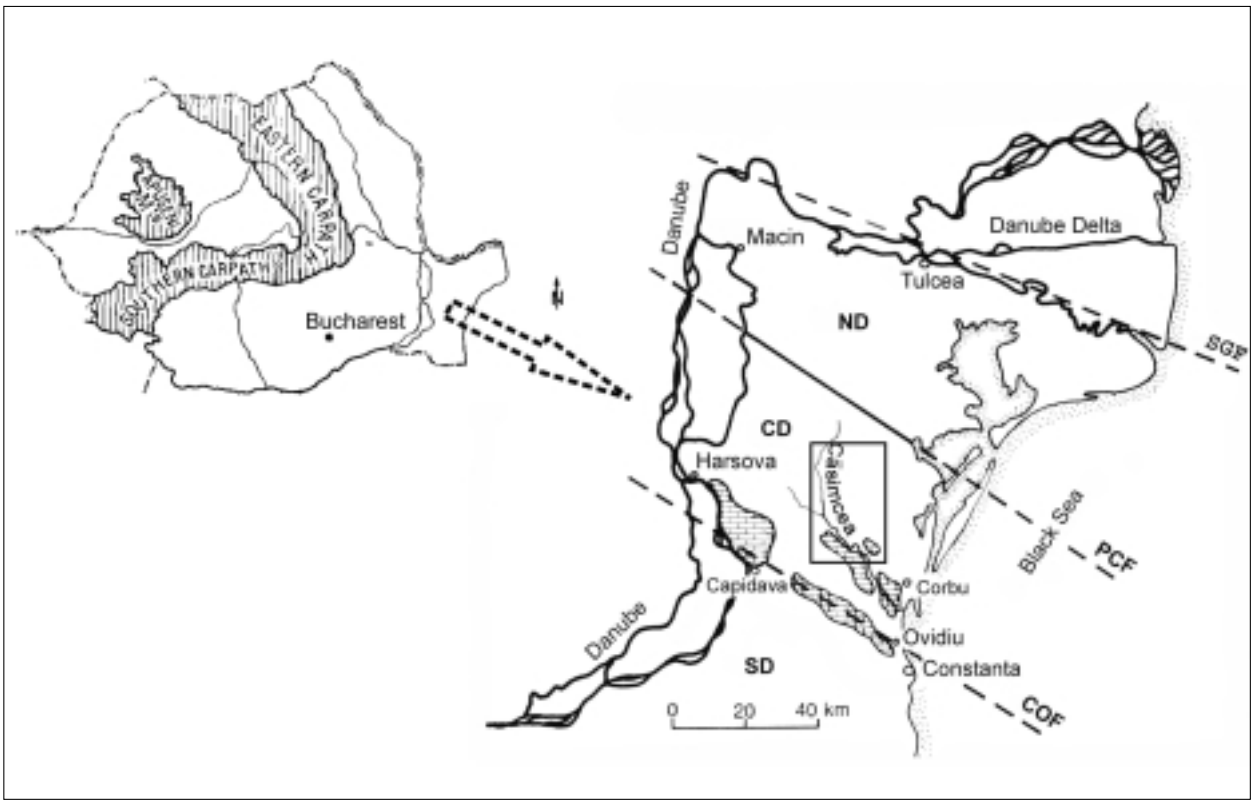


**Fig. 1.** Location map, showing general position of collecting localities in Romania. Area enclosed in rectangle in map on right shows Visterna Valley, where the collecting localities are.

ted by ammonite faunas, especially in west-central Dobrogea (Anastasiu 1898b; Simionescu 1907, 1910; Patrulius & Orghidan 1964; Bărbulescu 1969, 1970, 1974, 1979; Chiriac et al. 1977; Bărbulescu in Dragastan et al. 1998). The biostratigraphy and detailed paleoecological observations of the Visterna Member were outlined by Bărbulescu (1961, 1969, 1970, 1974, 1979). Detailed biofacies analysis was conducted by Herrmann (1994, 1996), and biozonation of the formation was largely defined by Bărbulescu (*in* Dragastan et al. 1998).

The decapod localities are as follows:

WP122: Gura Dobrogei, on a hill side, lat. 44°28'0.03"N, long. 28°28'59.0"E.

WP123: Gura Dobrogei, on a hill side, lat. 44°28'00.1"N, long. 28°28"58.4"E.

WP124: near the other two localities, along the road, near a small train bridge, lat. 44°28'01.2"N, long. 28°28'23.4"E.

## 3. Systematic paleontology

Institutional abbreviations: BSP, Bayerische Staatssammlung für Paläontologie, München, Germany; IGPUW, Institute of Geology and Paleontology, University of Warsaw, Poland; LPBIIIart, Laboratory of Paleontology, Department of Geology and Paleontology, University of Bucharest, Romania; SMNS, Staatliches Museum für Naturkunde, Stuttgart, Germany.

Note bene: The specimens housed in the Museum Tübingen at the University of Tübingen in Germany are cataloged by the publication in which the specimens were mentioned or illustrated. Thus, instead of a catalog number, they are cataloged by author of the publication in which the specimen was described or illustrated, name of publication, year of publication, and illustration number(s), as in the specimen designated as the neotype of *Prosopon heydeni*; it is designated as *Prosopon heydeni* v. Meyer, Quenstedt (author of publication), Jura (for *Der Jura*, the publication), 1857 (year of publication), taf. 95, fig. 36 (for the illustration, in this case pl. 95, fig. 36). We have prefixed the publication information with the words "Museum Tübingen" to make clear where the specimen is housed.

Order Decapoda Latreille, 1802
Infraorder Brachyura Latreille, 1802
Section Podotremata Guinot, 1977
Superfamily Homolodromioidea Alcock, 1900
Family Prosopidae v. Meyer, 1860

Discussion: The Prosopidae is currently construed as embracing elongate, well-ornamented crabs with well-developed carapace grooves, mostly from the Jurassic and Cretaceous (Glaessner 1969; Müller et al. 2000). Examination of type material of many genera and species of members of the Prosopidae suggests that the family is sorely in need of revision. That process is ongoing; for now, we use the current conception of the family and the genera placed within it.

## Genus *Nodoprosopon* Beurlen, 1928 sensu stricto

Type species: *Prosopon ornatum* v. Meyer, 1860.

Included species: *Nodoprosopon echinorum* Collins in Collins & Wierzbowski, 1985; *N. ornatum*. Questionably *Nodoprosopon angulosum* Wehner, 1988; *N. jocosum* (Étallon, 1861); *N. katholickyi* (Remeš, 1895); *N. langrunensis* (Hée, 1924); *N. personatum* (Quenstedt, 1867); *N. spinigera* (Van Straelen, 1924 [imprint 1925]), and *N. vilsense* (Stolley, 1914).

Diagnosis: Carapace longer than wide, lobate, widest in about mid-branchial region and narrowing anteriorly; rostrum trifid with median spine, cervical groove transverse, straight or weakly concave-forward; mesogastric region narrow, granular, terminating at base of rostrum; orbits apparently located subdorsal to the rostrum; usually at least one spine anterior to intersection of cervical groove with lateral margin; postcervical groove present; branchiocardiac groove bounding lateral margins of cardiac region and converging to separate branchial region into two halves; intestinal region small, flattened.

Material examined: *Prosopon bucculentum* (Wehner, 1988), BSP 1980 XXX 1255, holotype and additional specimens BSP 1987 I 55, SMNS 61670/1, SMNS 61655; *Nodoprosopon circinatum*, IGPUW/C/1/1, holotype; *Nodoprosopon echinorum*, IGPUW/C/1/2, holotype; *Prosopon mirum* Moericke, 1889, BSP AS III 315, interpreted to be the holotype; *Nodoprosopon ornatum* Museum Tübingen, Quenstedt, Jura, 1856-1858, taf. 6, fig. 37, neotype; *Nodoprosopon ornatum* BSP-AS III 317, original specimen illustrated by Moericke (1889); *Nodoprosopon ordinatum*, IGPUW/C/1/6, holotype, and paratype IGPUW/C/1/7; *Prosopon ovale* Moericke, 1889, BSP AS III 311, interpreted to be the holotype; *Prosopon spinosum* v. Meyer, 1842, BSP 1980 XXX 528, neotype; *Prosopon torosum* v. Meyer, 1860, BSP 1881 IX 686, neotype; *Nodoprosopon*? *vilsense* (Stolley, 1914), BSP a1119.

Discussion: In previous work on members of the Prosopidae, we have discovered that the family at all taxonomic levels (family, subfamily, genus, species) is in need of revision. In order to facilitate these needed revisions, we have based our generic diagnoses upon the original description of the type species referred to the various genera within the Prosopidae, because most of the species were originally referred to *Prosopon* and only later referred to other genera. Because many of the type specimens are now lost or destroyed due to wars or having been placed in private collections (P. Müller, G. Schweigert, personal comm.), many of the generic placements have been made based upon specimens long since described and lost.

When Beurlen (1928: 146-147) originally erected *Nodoprosopon*, he said little of use in distinguishing the genus from other prosopids, other than mentioning that it had a "flap-like" rostrum and differentiated hepatic and branchial regions. He designated *Prosopon ornatum* as the type species. The diagnoses of *Nodoprosopon* provided by Glaessner (1933, 1969) do not embrace the type species. Glaessner's original 1933 diagnosis described the carapace as rectangular; it is actually lobate and narrows considerably anteriorly. He described the rostrum as bilobed and lacking a median spine, whereas it is trilobed with a median spine. Much of the confusion has stemmed from the loss of v. Meyer's type material and has been exacerbated by incomplete descriptions and illustrations in which considerable artistic license has at times been taken. For example, we have found that the illustrations of Moericke (1889) are highly variable with regard to their accuracy with respect to the original specimens, currently housed in the Bayerische Staatssammlung für Paläontologie in Munich. These inconsistencies have undoubtedly led to the incredible range of variation among species assigned to *Nodoprosopon* and other genera within the Prosopidae.

To facilitate a preliminary evaluation of *Nodoprosopon*, we have provided a translation of the original description (v. Meyer 1860: 212) of the type species of *Nodoprosopon*, *N. ornatum*. In addition, we have examined the neotype of *N. ornatum*, designated by Wehner (1988), as well as a specimen referred to that species by Moericke (1889). The neotype was collected from the type locality and appears to fit von Meyer's description of the species reasonably well. Moericke's specimen also fits the description quite well. Thus, we have concluded that both specimens conform to v. Meyer's original conception of the species.

Our evaluation of the composition of *Nodoprosopon* is based upon the morphology of the type species, *N. ornatum* (Fig. 2.1, 2.2). We have severely restricted the definition of *Nodoprosopon* because the morphology of the subsequently referred species is highly variable. In fact, the morphology of several species falls outside the range of morphology that can be accommodated within a single brachyuran genus, or even family. Additionally, as mentioned, the early diagnoses of the genus (Beurlen 1928; Glaessner 1933, 1969) were incomplete or inaccurate, thus, necessitating our reliance on the type species. Our work on the genus herein is to be considered preliminary; most of the species at one time referred to *Nodoprosopon* require reassignment which is beyond the scope of this faunal survey (Table 1). That work is in progress (CS and RF).

Herein we include in *Nodoprosopon* one species, *N. echinorum* (Fig. 2.3), other than the type, with confidence. Both species possess a lobate carapace that is widest in the posterior third; a projected, apparently ornamented rostrum;

a straight or weakly concave-forward cervical groove; inflated, granular ornamentation on the gastric and hepatic regions; a postcervical groove; a branchiocardiac groove that borders the cardiac region and converges to separate the branchial region into two halves; and inflated, bulbous branchial regions. *Nodoprosopon echinorum* exhibits the characters that typify the type species of the genus, but it differs from *N. ornatum* in being less elongate longitudinally and having what appears to be shorter branchial regions than *N. ornatum*. However, the branchial regions of *N. echinorum* appear to be broken, so their maximum length is unknown.

Several other species are herein questionably referred to *Nodoprosopon*. Some of the species are either poorly described and illustrated or their type material has not been examined, thus, the questionable referral until we can gain more information. These species include *N. jocosum* (Étallon, 1861); *N. katholickyi* (Remeš, 1895); *N. langrunensis* (Hée, 1924); *N. personatum* (Quenstedt, 1867); *N. spinigera* (Van Straelen, 1924 [imprint 1925]); and *N. vilsense* (Stolley, 1914) (Fig. 2.4). Original descriptive material of *N. jocosum* has not been located as yet. *Nodoprosopon personatum* was described as being reminiscent of the forehead of a human skull (Quenstedt 1867); the illustration (Quenstedt 1857, pl. 95, fig. 35) shows a granular, incomplete specimen with a sulcate rostrum. It also appears to have forward facing orbits; however, examination of the type material would be necessary to confirm such details. Thus, the species remains in *Nodoprosopon*.

*Nodoprosopon katholickyi* was originally referred to *Prosopon* and was only briefly described as possessing a somewhat downturned rostrum; cervical, postcervical, and branchiocardiac grooves; and granular ornamentation (Remeš 1895: 203). The illustration (Remeš 1895, fig. 19) is a simple line drawing. Glaessner (1933) was apparently the first to refer the species to *Nodoprosopon*; he had earlier placed it within *Pithonoton (Goniodromites)* (Glaessner, 1929). Thus, the type material will need to be examined before placement in *Nodoprosopon* can be confirmed.

*Nodoprosopon langrunensis* was originally described by Morière (1864) as having a sulcate rostrum and strong granulations in the hepatic region, both of which are features of *Nodoprosopon*. The illustrations of the specimens (Morière 1864, pl. 7, figs. 1-2) show the defined gastric and hepatic regions and granular carapace typical of species of *Nodoprosopon*. It should be noted that at the time of the description, Morière (1864) referred the specimen to *Pithonoton meyeri* Étallon but wondered if it should be considered as a new species. Hée (1924) later erected the species *P. langrunensis* for the specimen of Morière (1864) and added that it had granular ornamentation overall. Glaessner (1933) placed the species within *Prosopon*, and the species was later questionably placed within *Nodoprosopon* by Wehner (1988). Type material must be examined to confirm the placement of this species; for now, the species questionably remains in *Nodoprosopon*.

Stolley (1914) erected the species *Prosopon vilsense* which was questionably placed within *Nodoprosopon* by Glaessner (1933). The description and illustration of the species suggests that this may be a reasonable generic placement. The species was originally described as possessing a much longer than wide carapace that narrows slightly anteriorly; a rostrum with flaps under which the orbits lie; a lateral spine anterior to the cervical groove; deep grooves; well defined gastric and hepatic regions; and strong tubercles on the dorsal carapace. Thus, the species is retained in *Nodoprosopon* until type material can be examined.

Van Straelen (1924 [imprint 1925]) erected the species *Avihomola spinigera*, which was later placed in *Nodoprosopon* by Glaessner (1933). The description of that species suggests that it is nodose and possesses spines on the gastric and hepatic regions; it also suggests that it has a relatively weak branchiocardiac groove which is not typical of other species of *Nodoprosopon*. We refer the species to *Nodoprosopon* until type material can be examined. *Nodoprosopon angulosum* Wehner, 1988, is problematic because the holotype is deposited in a private collection; thus, we were unable to examine original material. A cast of the holotype of *N. angulosum* is illustrated (Wehner 1988, pl. 4, fig. 7), but it is only of a portion of the left side of the carapace; thus, its identity remains questionable.

Several species previously referred to *Nodoprosopon* cannot be retained within that genus, and we herein refer them to *Prosopon* sensu lato, the genus to which they were originally referred. It is important to note that these species probably do not belong to *Prosopon* sensu stricto either; their generic and family placement is currently under consideration along with that of numerous other prosopid taxa (CS and RF). *Prosopon ovale* Moericke, 1889 (Fig. 2.11), is smooth and narrows considerably anteriorly and posteriorly yielding the eponymous oval shape, not typical of *Nodoprosopon*. *Prosopon spinosum* v. Meyer, 1842 (Fig. 2.7), has large, deep, forward-directed orbits not placed subrostrally, which are not seen in *Nodoprosopon*. *Prosopon torosum* von Meyer, 1860 (Fig. 2.10), *P. mirim* Moericke, 1889 (Fig. 2.5), and *N. ordinatum* Collins in Collins & Wierzbowski, 1985 (Fig. 2.6), each possess what appear to be orbital eaves and fissures; even if these are not orbital features, they are present on the anterolateral margin and do not exist in *Nodoprosopon* s. s. These three species are placed herein within *Prosopon* s.l. *Prosopon stotzingense* v. Meyer, 1856, appears to lack the strongly nodose and anteriorly narrowing carapace of species of *Nodoprosopon*. Glaessner (1933) questionably placed it within *Nodoprosopon*; we herein place it within *Prosopon* sensu lato. Unfortunately, for this and all of v. Meyer's species, the type specimens have not been located. *Nodoprosopon circinatum* Collins in Collins & Wierzbowski, 1985 (Fig. 2.9), possesses a much broader carapace anteriorly than do species of *Nodoprosopon* s.s. and the carapace grooves are oriented at different angles than those of *Nodoprosopon* s.s. In addition, in *N. circinatum* the metagastric region is inflated, whereas in *Nodoprosopon* s.s., it is a depressed groove. Thus, *N. circinatum* is placed within *Prosopon* s.l. for now. *Prosopon bucculentum* Wehner, 1988 (Fig. 2.8), has an unusually laterally inflated hepatic and gastric region of the carapace and possesses complex ornamentation on the anterior portion of the carapace, excluding it from *Nodoprosopon*. *Prosopon heydeni* v. Meyer, 1860, is herein referred to a new genus and is discussed below.

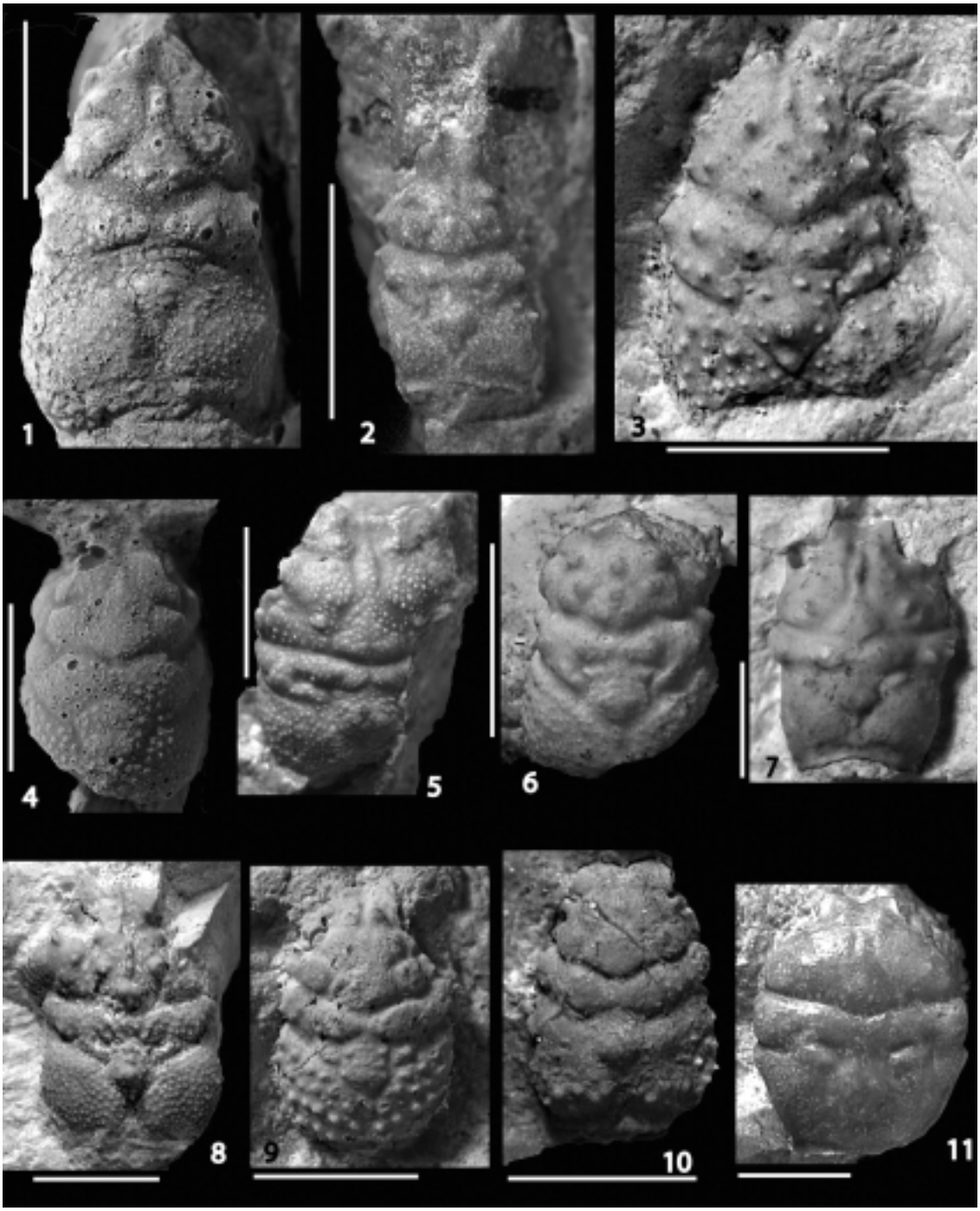


**Fig. 2.** Species currently or at one time referred to *Nodoprosopon*. **1** – *Nodoprosopon ornatum* v. Meyer, 1842 (type species), cast of neotype, Museum Tübingen, Quenstedt, Jura, 1857, pl. 95, fig. 37; **2** – *Nodoprosopon ornatum*, original specimen of Moericke (1889), BSP AS III 317; **3** – *N. echinorum* Collins in Collins & Wierzbowski, 1985, holotype, IGPUW/C/1/2; **4** – *Nodoprosopon*? *vilsense* (Stolley, 1914), cast of BSP a1117, identified by G. Wehner; **5** – *Prosopon mirum* Moericke, 1889, holotype, BSP AS III 315; **6** – *Prosopon ordinatum* (Collins in Collins & Wierzbowski, 1985), holotype, IGPUW/C/1/6; **7** – *Prosopon spinosum* v. Meyer, 1842, neotype, BSP 1980 XXX 528; **8** – *Prosopon bucculentum* (Wehner, 1988), holotype, BSP 1980 XXX 1255; **9** – *Prosopon circinatum* (Collins in Collins & Wierzbowski, 1985), holotype, IGPUW/C/1/1; **10** – *Prosopon torosum* v. Meyer, 1860, neotype, BSP 1881 IX 686; **11** – *Prosopon ovale* Moericke, 1889, holotype, BSP AS III 311. Scale bars = 0.5 cm.

*Nodoprosopon ornatum* (v. Meyer, 1860)
Fig. 2.1, 2.2

1860 *Prosopon ornatum* v. Meyer, p. 212, pl. 23, fig. 25.
1889 *Prosopon ornatum* v. Meyer. – Moericke, p. 60, pl. 6, fig. 15.
1905 *Prosopon ornatum* v. Meyer. – Remeš, p. 36.
1925 *Prosopon ornatum* v. Meyer. – Beurlen, 1925, p. 492.
1928 *Nodoprosopon ornatum* (v. Meyer, 1860). – Beurlen, p. 146-147.
1929 *Nodoprosopon ornatum* (v. Meyer, 1860). – Glaessner, p. 272.
1933 *Nodoprosopon ornatum* (v. Meyer, 1860).– Glaessner, p. 180.
1988 *Nodoprosopon ornatum* (v. Meyer, 1860). – Wehner, p. 47, pl. 3, figs. 3-5.
2000 *Nodoprosopon ornatum* (v. Meyer, 1860). – Müller et al., p. 53, figs. 6, 17G.

Description (translated from German, v. Meyer, 1860, additions from illustrations added in square brackets). – For this beautiful species the cephalothoraxes are known from 6 examples. The length attains almost 0.01, about 0.0065 width [L/W = 1.54] and 0.004 height. The smallest example is only 0.004 long, not quite 0.003 wide, and 0.002 high [units for these measurements are not known]. With the largest examples, all agree perfectly with one another in the distribution of the strong warts, which gives the best evidence for the uniqueness of the species. The maximum width falls in the hind half. The front part does not attain half the length of the cephalothorax. [Rostrum projected anteriorly, axially sulcate.] [Mesogastric region terminating at base of rostrum.] [Lateral margin anterior to cervical groove bearing at least two spines; one spine on lateral margin between cervical and branchiocardiac grooves; one spine on lateral margin posterior to branchiocardiac groove.] The gastric region bears a short spine, which, as in this region generally, appears higher by means of strong warts. The hepatic region exhibits one or perhaps a pair of strong warts posteriorly beside the horizontal protuberance on the gastric region, on the protuberances further toward the outside a similar wart, beyond it on the protuberance in the vicinity of the gastric region again such a wart, whereas a weak spine appears to lie toward the outside. In the region immediately in front of the gastric region lies likewise a no less distinct pair of warts and a weak incision on the edge. Each half of the transverse bands of the genital region exhibits three stronger warts, likewise corresponding to many weakly indicated tubercles. Behind the inner tubercle pair, a weak curved impression is perceptible. Both posterior oblique mounds directed toward the cardiac region are narrow, and apparently a distinct wart sits on the distal end. The cardiac region extends posteriorly in a short spine and usually carries a stronger wart more in the middle. The halves of the branchial region, which themselves on the outer part were shorter than half the length of the cephalothorax, are distinct, but not broadly separated, and having a wart lying outwardly more forwardly [apparently the spine on the lateral margin]. In addition to these strong warts the whole cephalothorax is tightly decorated with small warts. The hind end is decorated distinctly with a rather wide rimmed indentation.

Occurrence: From the upper white Jurakalk of the 'Oerlinger Tal' near Ulm, in Wetzler's Collection.

Discussion: The neotype of the species, designated by Wehner (1988), was collected from the same locality as the original type material. We were unable to locate original material of v. Meyer referable to this species in museums in Germany, Austria, Poland, or the Czech Republic. The search for v. Meyer's material is ongoing. A specimen referred to *Nodoprosopon ornatum* by Moericke (1889) is housed in the collections at Munich; that specimen was collected from the Late Jurassic Štramberk locality in the Czech Republic and was illustrated by Müller et al. (2000, fig. 17G).

*Planoprosopon* new genus
(*Nodoprosopon* Beurlen, 1928 partim)

Type and sole species: *Prosopon heydeni* v. Meyer, 1857, by original designation.

Etymology: The genus name is derived from the Latin *planus*, meaning flat, and *Prosopon*, one of the genera within the family, referring to the dorso-ventrally flattened, thin dorsal carapace of its members. The gender is masculine.

Material examined: *Prosopon heydeni*, neotype, Museum Tübingen, Quenstedt, Jura, 1857, taf. 95, fig. 36; BSP 1957 VI 1240; SMNS 61632.

Diagnosis: Carapace longer than wide, reaching maximum width at about one-quarter the distance posteriorly, maintaining width until about three-quarters the distance posteriorly where carapace narrows; rostrum deeply axially sulcate, with strongly flared lateral margins; protogastric, mesogastric, and hepatic regions well-differentiated; hepatic regions more bulbous than other gastric regions, bearing one lateral spine; cervical groove deep, continuous; postcervical groove weak; branchiocardiac groove at high angle to cervical groove, deep laterally, becoming shallower axially, weakly bounding cardiac region, cardiac region reaching almost to posterior margin, separated from posterior margin by intestinal region; intestinal region wide, much wider than cardiac region, well-marked; cardiac region narrow, small; epibranchial swellings adjacent to cardiac region particularly well-developed.

Discussion: *Prosopon heydeni* was referred to *Nodoprosopon* by Glaessner (1929). The species differs substantially from the type species of *Nodoprosopon*, *N. ornatum*, in possessing a flattened, tabular carapace, whereas *N. ornatum* is globular and bulbous. *Prosopon heydeni* possesses a rectangular carapace that reaches its maximum width at about a quarter the distance posteriorly and maintains that width until about three-quarters the distance posteriorly, whereas *N. heydeni* is widest at about two-thirds the distance posteriorly and narrows considerably anteriorly. *Prosopon heydeni* has distinctively rimmed margins of the rostrum that flare upwards, whereas the rostrum of *N. orna-*

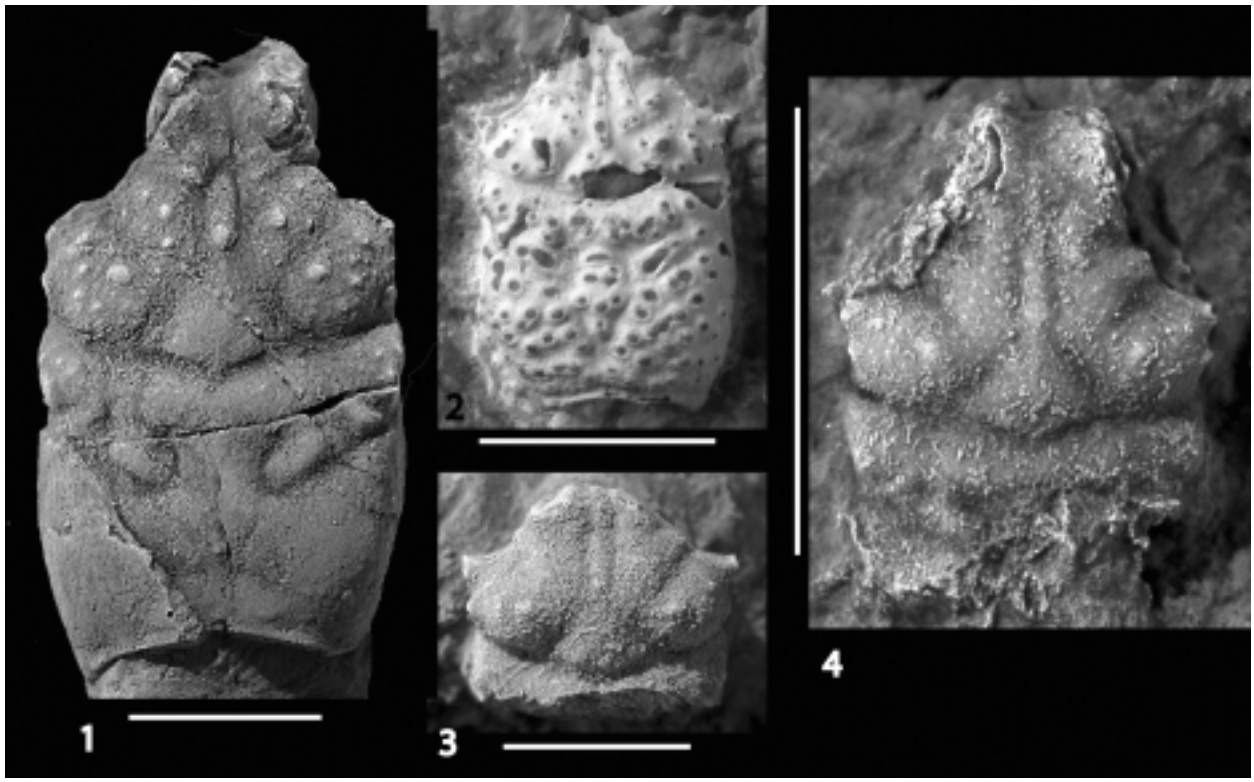


**Fig. 3.** *Planoprosopon heydeni* (von Meyer, 1857) n. comb. **1** – Neotype, Museum Tübingen, Quenstedt, Jura, 1857, pl. 95, fig. 36; **2** – SMNS 61632 with cuticle preserved, note granular ornamentation; **3** – LPB III art 0149, anterior one-third of carapace with characteristic anterolateral spines on hepatic region; **4** – LPB III art 0148, anterior half of carapace showing characteristic flared rims on rostrum. Scale bars = 0.5 cm.

*tum* is trifid. Thus, the new genus is warranted. The flared, sulcate rostrum, rectangular carapace, and wide, well-developed intestinal region differentiate *Planoprosopon* from all other prosopid genera.

*Planoprosopon heydeni* (v. Meyer, 1857)
Fig. 3.1-3.4

1857 *Prosopon heydeni* v. Meyer, p. 556.
1857 *Prosopon heydeni* v. Meyer. – Quenstedt, p. 779, pl. 95, fig. 39.
1860 *Prosopon heydeni* v. Meyer. – v. Meyer, p. 212, pl. 23, figs. 27-28.
1895 *Prosopon heydeni* v. Meyer. – Remeš, p. 202, pl. 3, fig. 17.
1925 *Prosopon heydeni* v. Meyer. – Beurlen, p. 490.
1929 *Nodoprosopon heydeni* (v. Meyer, 1857). – Glaessner, p. 271.
1933 *Nodoprosopon heydeni* (v. Meyer, 1857).– Glaessner, p. 180.
1962 *Nodoprosopon heydeni* (v. Meyer, 1857). – Barczyk, p. 67, pl. 3, fig. 4.
1965 *Nodoprosopon heydeni* (v. Meyer, 1857). – Förster, 147, pl. 2, fig. 3.
1972 *Nodoprosopon heydeni* (v. Meyer, 1857). – Radwański, p. 501, pl. 1, fig. 3.
1980 *Nodoprosopon heydeni* (v. Meyer, 1857). – Barczyk, p. 500, pl. 163, fig. 4.
1985 *Nodoprosopon heydeni* (v. Meyer, 1857). – Collins & Wierzbowski, p. 78, pl. 1, figs. 3-4.
1988 *Nodoprosopon heydeni* (v. Meyer, 1857). – Wehner, p. 41, pl. 2, figs. 5-8.
2000 *Nodoprosopon heydeni* (v. Meyer, 1857). – Müller et al., p. 56, fig. 17E.

Occurrence: V. Meyer's material was collected from the upper white Jura limestone of the 'Oerlinger Tal' near Ulm in Germany; in Wetzler's Collection. The neotype designated by Wehner (1988) was collected from the same locality.

Original description (translated from German, v. Meyer, 1860: 212-213, additions from illustrations added in square brackets). – Among 42 specimens for this species resulted the largest for the cephalothorax 0.009 length, 0.0045 wide, and 0.0025 high [L/W = 2.0]; the smallest examples are 0.003 long and scarcely 0.002 wide [L/W = 1.5] [units for these measurements unknown], whereby they present themselves as more sharply developed than the larger ones. The front end narrows more than in other

species by means of lengthening itself into a flat groove sloping toward the front; [rostrum long, with flared lateral margins forming lateral edges of orbit]. The incised posterior margin is sharp and enclosed with a furrow. The maximum width of the cephalothorax falls in the middle. The posterior part is shorter than the front part. The sharply delimited gastric region is not large and provided with a long spine which ends some distance from the front end of the cephalothorax. The region located at the end of this spine is distinctly incised outwardly. The spine of the gastric region bears a strong wart at the beginning. The hepatic region consists of three longitudinally successive tubercle-formed swellings on each side, of which the front is the weakest and exhibits a distinct mound corresponding to the end of the spine of the gastric region; the middle and hind swelling divides each into an outside and an inner part. Both hind parts bear a wart on each side, of which the inner is stronger, and moreover on the margin lies an even more spine-shaped wart, so that in this zone three warts fall on each side. In the front transverse furrow [cervical groove] one recognizes an indication of a pair of pores; [furrow deep, nearly straight; one strong spine on lateral margin anterior to cervical groove]. The weakly vaulted transverse band of the genital [urogastric] region is clearly bent in toward the back; the posterior pair of mounds directed obliquely toward the cardiac region are also clearly circumscribed. The five-sided cardiac region is wart-formed and inflated in the middle and extends very pointedly hindwards. Both halves of the branchial regions are separated on the dorsal surface and usually a strong wart is supplied in the region situated between the cardiac region and the mound directed toward the cardiac region and a similar wart may be situated somewhat further toward the outside and below, just as I have defined in the illustration. The cephalothorax is moreover uniformly decorated with densely spaced small warts.

There are also examples of this species, whose cephalothorax exhibits itself with an even more dense form. In these the groove with front ended, as well as the branchial regions are somewhat shorter, and the greatest width falls more likely in the inflated branchial regions. These variations do not prevent, however, the diagnosis of the species.

Discussion: V. Meyer's (1860) description of *Prosopon heydeni* is provided here in translation and following is a description of the Jurassic Romanian material that we refer to the species.

Romanian material examined: Two specimens, LPBIIIart 0148 and 0149.

Occurrence: Locality WP123 (see above).

Description of Romanian material: Carapace longer than wide, widest along lateral margins which are parallel, width maintained along entire lateral margin length, except where incised by grooves; carapace very weakly vaulted transversely and longitudinally.

Rostrum long, deeply axially sulcate, lateral margins markedly flared, rostral width measured at base about half maximum carapace width. Remainder of anterior margin concave with small medial spine, margin terminating in long anterolaterally directed spine; concave area forming depression, possibly in which eye could rest as in extant Homolodromiidae. Lateral margins with deep incision where cervical and branchiocardiac grooves intersect it; one small lateral spine anterior to intersection of cervical groove; one spine situated between intersection of cervical and branchiocardiac grooves; remainder of lateral margins and posterior margin unknown.

Epigastric region elongate, weakly inflated, merging with weakly inflated protogastric regions. Mesogastric region with long anterior process extending to base of rostrum; region widened posteriorly, well-defined laterally and posteriorly. Cervical groove continuous, deep, slightly sinuous. Metagastric region weakly inflated, weakly defined laterally by being subtly inflated above adjacent regions. Urogastric region defined laterally by weak, arcuate, anterior extension of branchiocardiac groove. Remainder of axial regions very poorly preserved or unknown.

Hepatic region broadly inflated, ovate; ornamented with large, granular swellings. Epibranchial region moderately inflated, especially laterally; defined anteriorly by cervical groove and posteriorly by branchiocardiac groove. Branchiocardiac groove deepest laterally, becoming less deep axially, appearing to be continuous with an anteriorly directed, arcuate extension defining lateral margins of urogastric region.

Remainder of carapace and appendages unknown.

Measurements: Measurements (in mm) taken on Romanian specimens of *Planoprosopon heydeni*: LPBIIIart0149, maximum carapace width = 7.1; rostral width = 3.6. LPBIIIart0148, maximum carapace width = 4.0; rostral width = 2.2; carapace length > 5.0.

Discussion: The specimens referred to *Planoprosopon heydeni* are each incomplete, but they exhibit key features of the genus including a long rostrum with flared lateral margins; mesogastric regions terminating at the base of the rostrum; a deep, straight cervical groove; granular ornamentation; a postcervical groove; and a rectangular carapace. They also exhibit key features of the species, including a small spine followed by a much larger anteriorly-directed spine forming an area into which the eye could rest. The new specimens also exhibit the very deep, nearly straight cervical groove seen in *P. heydeni*.

## Superfamily Homolodromioidea Alcock, 1900
## Family Goniodromitidae Beurlen, 1932
## (= Pithonotinae Glaessner, 1933)

Diagnosis (translated from Glaessner 1933: 180). – Lateral margins often well-defined, rostrum not strongly projected forward and bilobed or trilobed; grooves equally developed or cervical groove better developed; lacking a hepatic groove; weak carapace ornamentation.

Discussion: Beurlen (1932: 57) erected the Goniodromitidae, placing in association the genera *Goniodromites*, *Cyclothyreus*, and *Cycloprosopon*. Glaessner (1933) later

diagnosed his equivalent subfamily Pithonotinae and placed within it *Pithonoton* v. Meyer, 1842; *Goniodromites* Reuss, 1859; and *Coelopus* and later added several more genera (Glaessner 1969). It is beyond the scope of this paper to evaluate all of the genera that have been referred to the subfamily; however, we recognize it as sufficiently distinct to place it at the family level, including for now the two genera *Goniodromites* and *Pithonoton*. The characters listed by Glaessner (1933) are sufficiently distinct from members of the Prosopidae to warrant placement in a distinct family. Evaluation of the generic content of the Goniodromitidae is ongoing (CS and RF).

## Genus *Goniodromites* Reuss, 1859

(*Goniodromites* Reuss, 1859, p. 69, pl. 24, figs. 4-6; *Iberihomola* Van Straelen, 1940, p. 3, pl. 1, fig. 5).

Type species: *Goniodromites bidentatum* Reuss, 1859.

Other species: *Goniodromites aliquantulus* new species; *G. bourgeati* Van Straelen, 1925 [imprint 1925]; *G. dentatum* Lőrenthey in Lőrenthey & Beurlen, 1929; *G. etalloni* (Gemmellaro, 1870), as *Prosopon*; *G. gibbosum* Étallon, 1857; *G. globosum* (Remeš, 1895), as *Prosopon*; *G. incisum* Van Straelen, 1924 [imprint 1925]; *G. laevis* (Van Straelen, 1940), as *Iberihomola*; *G. polyodon* Reuss, 1859; *G. revili* Van Straelen, 1924 [imprint 1925]; *G. scarabaeus* Wright & Wright, 1950; *G. serratum* Beurlen, 1929; *Goniodromites* sp. Forms A-C in Feldmann et al. (2006). List modified after Glaessner (1929, 1933).

Material examined: *Goniodromites polyodon* Reuss, 1859, holotype, Geologische Bundesanstalt Wien no. 2359.

Diagnosis: Carapace somewhat longer than wide, as long as wide, or wider than long, maximum width ranging from 85 to 105 percent maximum length, narrowing anteriorly and posteriorly, reaching maximum width at position of intersection of cervical groove with lateral margin or at outer-orbital spine, about 30 percent the distance posteriorly on carapace. Front bilobed, frontal margins continuous with orbital margin, orbital margin can be serrate, orbital margin at about 45-50 degree angle to axis, outer orbital angle a well-developed spine; lateral margin with spines; dorsal carapace ornamented with tubercles anteriorly and scabrous rows of tubercles or small spines posteriorly. Cervical groove strongly developed, continuous across axis, lateral segment at 80-85 degree angle to axis. Branchiocardiac groove strongly developed laterally, less-strongly developed axially, continuous across axis, lateral segments merging posterior to cardiac region and continuing to intersect with posterior margin. Epigastric regions spherical, small; mesogastric region best defined posteriorly, anterior process often only developed near epigastric regions; cardiac region inflated; epibranchial region defined by cervical and branchiocardiac grooves (Feldmann et al. 2006: 9).

Discussion: The genus was recently discussed at length (Feldmann et al. 2006). They provided translations of the original descriptions of *Pithonoton marginatum* v. Meyer, 1842, the type species of *Pithonoton*, as well as *Goniodromites bidentatus* Reuss, 1859, and *G. serratus* Beurlen, 1929, the former of which is the type species of *Goniodromites*. Feldmann et al. (2006) differentiated *Goniodromites* from *Pithonoton* based upon the serrated orbital margin, spined anterolateral margin, more obliquely directed orbits, generally wider carapace, and more strongly narrowing dorsal carapace in *Goniodromites*. We concur with this differentiation, and investigation of the two genera is ongoing (CS and RF).

### *Goniodromites aliquantulus* new species

Fig. 4.1

Etymology. – The trivial name is derived from the Latin word *aliquantulus*, meaning little, small, referring to the very small size of the known individual of the species.

Holotype: The holotype is LPBIIIart 0150.

Occurrence: Locality WP123 (see above).

Diagnosis: Carapace tiny, longer than wide; orbits formed as shallow, concave depressions; outer-orbital angle produced into short, blunt, anterolaterally directed projection; lateral margins converging posteriorly; with one small, blunt spine anterior to intersection of cervical groove with margin; possibly blunt protuberances between intersection of cervical and branchiocardiac grooves with margin; two small tubercles posterior to intersection of branchiocardiac groove with margin, remainder of lateral margin entire.

Description: Carapace longer than wide, widest at position of outer-orbital angle, narrowing considerably posteriorly, moderately vaulted transversely and longitudinally. Front unknown; orbits long, orbital margins diverging posteriorly, oriented at about 45 degree angle to axis, orbits formed as shallow, concave depressions into which eyes could rest; outer-orbital angle produced into short, blunt, anterolaterally directed projection. Lateral margins converging posteriorly; with one small, blunt spine anterior to intersection of cervical groove with margin; possibly blunt protuberances between intersection of cervical and branchiocardiac grooves with margin; two small tubercles posterior to intersection of branchiocardiac groove with margin, remainder of lateral margin entire. Posterior margin rimmed, nearly straight, about half maximum carapace width.

Protogastric regions weakly inflated. Mesogastric region moderately defined anteriorly and posteriorly, weakly inflated posteriorly, maximum mesogastric width about 44 percent maximum carapace width. Cervical groove deep, complete, nearly straight laterally and deeply concave axially. Metagastric and urogastric region poorly defined by postcervical groove; postcervical groove extending about half the distance laterally from midline, deepest distally, nearly indistinct across axis. Branchiocardiac groove deepest laterally, becoming weaker axially, complete. Cardiac region weakly inflated; intestinal region not defined. Hepatic regions flattened. Epibranchial region well-defined by cervical and branchiocardiac grooves anteriorly and

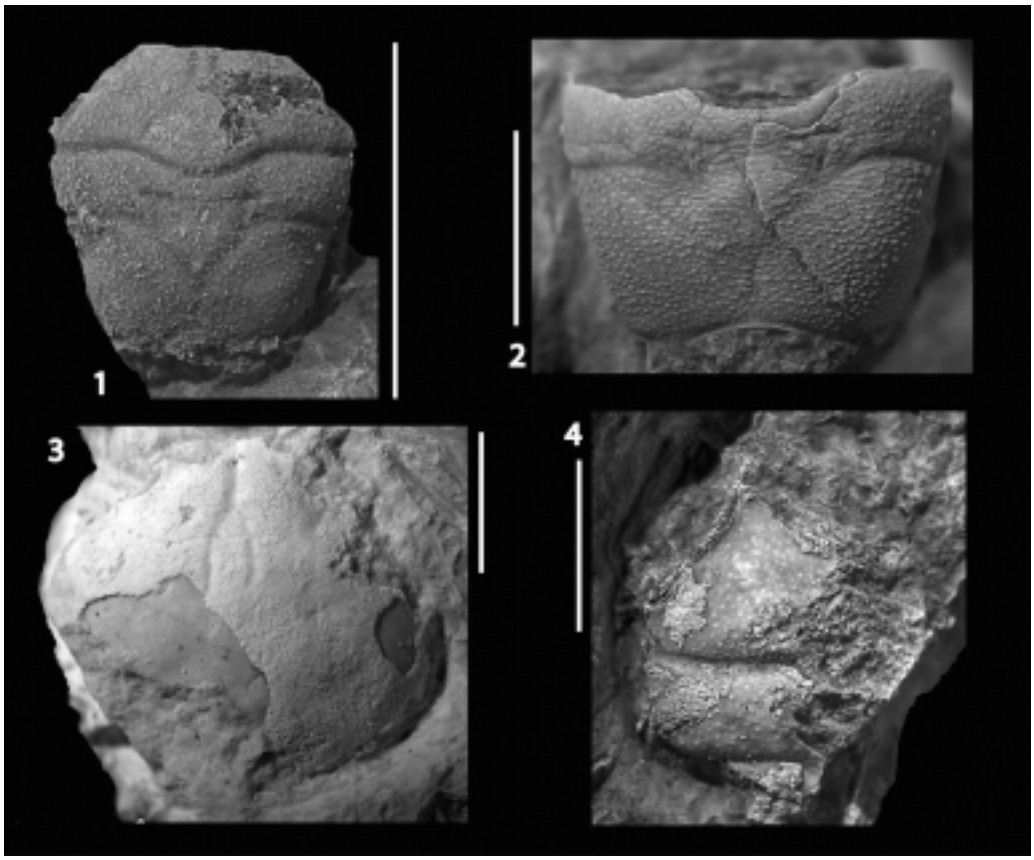


**Fig. 4.** Decapoda Brachyura. **1** – *Goniodromites aliquantulus* n. sp., LPB III art 0150, dorsal carapace; **2** – *Goniodromites* sp. indeterminate, LPB III art 0152, posterior half of carapace, note excellent preservation of cuticle and ornamentation; **3** – *Cycloprosopon dobrogea* Feldmann et al., 2006, LPB III art 0153, incomplete dorsal carapace; **4** – Brachyura family, genus, and species indeterminate, LPB III art 0154, anterior half of carapace, note deep, parallel cervical and branchiocardiac grooves. Scale bars = 0.5 cm.

posteriorly respectively. Remainder of branchial region undifferentiated, slightly depressed just posterior to branchiocardiac groove.

Measurements: Measurements (in mm) taken on specimens of *Goniodromites aliquantulus*: LPBIIIart0150, carapace length > 4.6; maximum carapace width = 4.1; maximum mesogastric width = 1.8; posterior width = 2.1.

Discussion: The specimen is referred to a new species for several reasons. The tiny anterolateral spines along the inter-groove area; the blunt, short spine at the outer-orbital angle; and the small spines on the lateral margins of the branchial regions are all features that do not appear in other species of *Goniodromites*. Other species of *Goniodromites* have long, well developed outer-orbital or lateral spines; these include *G. bidentatum*, *G. polyodon*, *G. serratum*, and *G. dentatus*. *Goniodromites etalloni* has a long, forward directed outer-orbital spine, which *G. aliquantulus* lacks. In addition, the specimen is very much smaller than other species of *Goniodromites* and other specimens recovered from the same localities and other microbialite-siliceous sponge facies very near to the type locality for *G. aliquantulus*; this might suggest that it could be a juvenile. It is quite common for juveniles to exhibit different ratios of various dorsal carapace aspects from adults, in both primitive and more derived brachyuran groups (Wright & Collins 1972; Guinot 1989; Schweitzer & Feldmann 2000). However, *G. aliquantulus* retains dorsal carapace ratios similar to that of much larger species and specimens. This suggests that it is not a juvenile of one of the larger forms found at Gura Dobrogei or recovered from other microbialite-siliceous sponge bioherms in Dobrogea, Romania, termed forms A-C (Feldmann et al. 2006).

*Goniodromites* sp. indet.
Fig. 4.2

Material examined: Two incomplete specimens, LPBIIIart 0151 and 0152.

Occurrence: Specimen LPBIIIart 0151 was recovered from locality WP123, and LPBIIIart 0152 was collected from locality WP122 (see above).

Description of material: Lateral margin with one small spine anterior and one small spine posterior to intersection of branchiocardiac groove with lateral margin of carapace, remainder of lateral margin entire. Posterior margin with smooth rim, concave centrally. Postcervical groove extending about half the distance laterally from midline, deep laterally, very weak axially. Branchiocardiac groove deep laterally, becoming shallower axially, very shallow around margins of cardiac region. Cardiac region weakly inflated, intestinal region centrally depressed, branchial regions uniformly inflated. Posterior portion of carapace ornamented with discrete tubercles or very short, scabrous rows of tubercles.

Measurements: Measurements (in mm) taken on specimens of *Goniodromites* sp. indet.: LPBIIIart 0152, carapace width measured just anterior to intersection of branchiocardiac groove with lateral margin of carapace = 10.8; posterior width = 5.0. LPBIIIart 0151, maximum carapace width 8.8; mesogastric width = 4.0.

Discussion: The most complete of the new specimens retains cuticle; thus, the nature of the carapace ornamentation can be observed. The small spines on the lateral margins and the relatively well-developed postcervical groove suggest that these specimens might be referable to *Goniodromites* Form A of Feldmann et al. (2006). However, because the specimens are so incomplete, we refer them to *Goniodromites* sp. indet. Future collecting at the Gura Dobrogei localities may yield more specimens that might make a more specific placement possible.

## Superfamily Dromioidea de Haan, 1833
## Family Dynomenidae Ortmann, 1892
## Genus *Cycloprosopon* Lőrenthey in Lőrenthey & Beurlen, 1929

Type species: *Cycloprosopon typicum* Lőrenthey in Lőrenthey & Beurlen, 1929.

Other species: *Cycloprosopon complanatiforme* (Moericke, 1889); *C. dobrogea* Feldmann et al., 2006; *C. latum* (Moericke, 1889); *C. reussi* (Gemmellaro, 1870); *C. tithonium* (Gemmellaro, 1870); possibly *C. rotundum* Beurlen, 1925. The original specimen of *C. latum* (Moericke, 1889, pl. 6, fig. 20) is one of only two of his illustrated specimens that are now lost; the remainder are housed at the Bayerische Staatssammlung für Paläontologie, Munich. The other that is lost is his illustrated specimen of *Pithonoton marginatum* v. Meyer, 1842 (Moericke 1889, pl. 6, fig. 22).

Diagnosis: As in Feldmann et al. (2006).

Discussion: Feldmann et al. (2006) recently reviewed the genus and its geologic record. At the time they discussed *Cycloprosopon*, Feldmann et al. (2006) did not have access to the original descriptions and illustrations of *C. reussi* and *C. tithonium*. Examination of the descriptions and illustrations of Gemmellaro (1870) confirms placement of those two species within *Cycloprosopon*. Both species are ovate, not much wider than long, and lack well-defined dorsal carapace grooves (Gemmellaro 1870, pl. 2, figs. 52-57). These are diagnostic features of the genus.

Herein we place *Cycloprosopon* within the Dynomenidae rather than the Prosopidae where it has historically been placed, based upon its possession of a rounded carapace, cervical groove that is more strongly developed than the branchiocardiac groove, triangular front, frontal groove extending from the rostrum toward the mesogastric region, and orbits that are positioned oblique to the axis. All of these features are typical for the family (McLay 1999; Schweitzer et al. 2003). *Cycloprosopon* is much more similar to members of the Dynomenidae than to species of *Prosopon*, the nominate genus of the Prosopidae, which are bulbous, granular, and have deep, well-developed grooves and lack the oblique orbits of *Cycloprosopon*. Evaluation of the Prosopidae is ongoing, but it is clear that *Cycloprosopon* should be removed from the family.

### *Cycloprosopon dobrogea* Feldmann, Lazăr, & Schweitzer, 2006
### Fig. 4.3

2006 *Cycloprosopon dobrogea* Feldmann, Lazăr, & Schweitzer, p. 16, fig. 3.10.

Material examined: One specimen, LPBIIIart 0153.

Occurrence: Locality WP124 (see above).

Description of material: Carapace ovate, generally smooth. Front appearing produced well beyond orbits, axially sulcate, sulcus extending posteriorly, diverging around anterior process of mesogastric region; mesogastric region terminating well before rostrum. Epigastric regions weakly inflated.

Discussion: The specimen here referred to *Cycloprosopon dobrogea* is quite fragmental. However, it exhibits some key characteristics suggesting that it is referable to the species. The smooth, ovate carapace; axially sulcate front; mesogastric region terminating well before the front; and axial sulcus diverging to bound the axial projection of the mesogastric region all suggest placement in *Cycloprosopon*. The anteriorly projecting front and weakly inflated epigastric regions are defining characters for *C. dobrogea*; thus, we are confident in placing the specimen in that species. It appears that the species lived in a variety of microbialite-siliceous sponge habitats during Jurassic time in what is now Romania.

### Family, genus, and species indeterminate
### Fig. 4.4

Material examined: One specimen, LPBIIIart 0154.

Occurrence: Locality WP122 (see above).

Description of material: Carapace longer than wide; lateral margins roughly parallel to one another between

**Table 1.** All species at one time referred to *Nodoprosopon* and their current placement. Ages are primarily based on Glaessner (1929).

| Species | Current Placement | Generic Age | Reference |
|---|---|---|---|
| *Prosopon ornatum* v. Meyer, 1842 (type) | *Nodoprosopon* | Late Jurassic | Beurlen (1928); Glaessner (1929; 1933) |
| *Nodoprosopon echinorum* Collins in Collins and Wierzbowski, 1985 | *Nodoprosopon* | Late Jurassic | Collins & Wierzbowski (1985) |
| *Nodoprosopon angulosum* Wehner, 1988 | *Nodoprosopon*? | Late Jurassic | Wehner (1988); herein |
| *Pithonoton langrunensis* Hée, 1924 | *Nodoprosopon*? | Middle Jurassic | Wehner (1988) |
| *Prosopon katholickyi* Remeš, 1895 | *Nodoprosopon*? | Late Jurassic | Glaessner (1933) |
| *Prosopon jocosum* Étallon, 1861 | *Nodoprosopon*? | Late Jurassic | Glaessner (1933) |
| *Prosopon personatum* Quenstedt, 1867 | *Nodoprosopon*? | Late Jurassic | Glaessner (1933) |
| *N. spinigera* (Van Straelen, 1924 [imprint 1925]) | *Nodoprosopon*? | Late Jurassic | Glaessner (1933) |
| *Prosopon vilsense* Stolley, 1914 | *Nodoprosopon*? | Middle Jurassic | Herein |
| *Oxythyreus armatus* Blaschke, 1911 | *Tithonohomola* Glaessner, 1933 | Late Jurassic | Glaessner (1933) |
| *Nodoprosopon circinatum* Collins in Collins & Wierzbowski, 1985 | *Prosopon* sensu lato | Late Jurassic | Herein |
| *Prosopon fraasi* Moericke, 1889 | *Laeviprosopon* Glaessner, 1933 | Late Jurassic | Glaessner (1933) |
| *Prosopon hebes* v. Meyer, 1840 | *Prosopon* sensu stricto | Middle Jurassic | Schweigert (2006) |
| *Prosopon heydeni* v. Meyer, 1860 | *Planoprosopon* new genus | Late Jurassic | Herein |
| *Prosopon mirim* Moericke, 1889 | *Prosopon* sensu lato | Late Jurassic | Herein |
| *Nodoprosopon ordinatum* Collins *in* Collins & Wierzbowski, 1985 | *Prosopon* sensu lato | Late Jurassic | Herein |
| *Prosopon ovale* Moericke, 1889 | *Prosopon* sensu lato | Late Jurassic | Herein |
| *Prosopon spinosum* v. Meyer, 1842 | *Prosopon* sensu lato | Late Jurassic | Herein |
| *Prosopon torosum* v. Meyer, 1860 | *Prosopon* sensu lato | Late Jurassic | Herein |
| *Nodoprosopon bucculentum* Wehner, 1988 | *Prosopon* sensu lato | Late Jurassic | Herein |
| *Prosopon stotzingense* v. Meyer, 1860 | *Prosopon* sensu lato | Late Jurassic | Herein |

position of outer-orbital spine and intersection of branchiocardiac groove with lateral margin; moderately vaulted longitudinally and transversely.

Rostrum long, triangular, tip broken. Orbits long, very weakly concave, rimmed; outer-orbital angle produced into short, anterolaterally directed spine. Lateral margin concave posterior to outer-orbital spine to position of intersection of cervical groove with lateral margin; becoming straight posterior to intersection of cervical groove with lateral margin to position of intersection of branchiocardiac groove with lateral margin; short, laterally-directed spine just posterior to intersection of cervical groove with lateral margin. Carapace anterior to cervical groove and between cervical and branchiocardiac grooves undifferentiated. Cervical groove deep, strong, complete; branchiocardiac groove deep, strong, complete; grooves parallel to one another. Carapace posterior to branchiocardiac groove unknown.

Measurements: Measurements (in mm) taken on LPBII-Iart 0154: maximum carapace width = 6.4; carapace length >8.0.

Discussion: The specimen is fragmental, but has several diagnostic features including deep, parallel cervical and branchiocardiac grooves; a lack of defined axial regions; a small but clear outer-orbital spine; and a constriction in the lateral margin where the cervical groove intersects it. Unfortunately, the specimen is too fragmental to identify but seems to have affinities with either the Goniodromitidae or the Dynomenidae.

## 4. Paleoecology

Although the localities at Gura Dobrogei are part of the same formation as those in the Cheia Valley, the microbialite-siliceous sponge structures and the crab faunas are quite different at the two areas. In the Cheia Valley, the microbialite-siliceous sponge bioherms form cylindrical structures up to 30 m high (Feldmann et al. 2006) that supported a decapod fauna within the bioherm itself, in the central core of the bioherm, and in the inter-bioherm talus. That decapod fauna includes one species of *Cycloprosopon*, *C. dobrogea*, also found in the microbialite-siliceous sponge biostromes at Gura Dobrogei. The other decapods found in the cyclindrical microbialite-siliceous sponge bioherms at Cheia include three different morphological forms of the genus *Goniodromites*, one species of *Pithonoton*, and two types of chelae that could not be correlated with dorsal carapace material.

At Gura Dobrogei, the microbialite-siliceous sponge structures occur as layered biostromes. The decapod fauna is comprised of two species of *Goniodromites*, one of which is new and not present at the Cheia localities and the larger of which may be similar to Form A from Cheia; *Planoprosopon heydeni* which is not known from Cheia; some indeterminate claws and carapace fragments (LPBIIIart 0155-0157); and one shared species of *Cycloprosopon* as mentioned above. Thus, there are several taxa that are not shared between the two areas. This suggests that the microbialite-siliceous sponge structures at the two different areas, because of their differing geometries, offered different niches and opportunities for decapod crustaceans, leading to the observed disparity between the faunas. Work in progress on coralline reef decapods from the Carpathians in Romania document high diversity among the Decapoda as opposed to the relatively low diversity found in the microbialite-siliceous sponge structures.

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