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Resurrection of *Eumorphia* von Meyer, 1847 and some taxonomical considerations of other mecochirid lobsters (Crustacea, Decapoda, Mecochiridae)

Articles

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Abstract

Mecochirid lobsters (Glypheidea, Mecochiridae) are iconic decapod crustaceans from the Jurassic and Cretaceous. The composition of the family in terms of included genera strongly fluctuated during the twentieth century because of the lack of study of the type specimens, which are herein illustrated. On the basis of the type material of different species housed in German, French, British, and Romanian museums and universities, *Eumorphia* von Meyer, 1847 (type species *Carcinium sociale* von Meyer, 1841) is re-established as a valid mecochirid genus. Six species are considered, including the new species *Eumorphia fabianmuelleri* (Callovian, Germany), and the synonymization of *Romaniacheiros* Frantescu et al., 2018 with *Eumorphia* is proposed. The composition of the revised family Mecochiridae is discussed.

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Non-technical Summary

Decapod crustaceans form an important part of the modern marine fauna. They were also common in the geological past. Mecochirid lobsters are an extinct group characterized by remarkably elongate first legs, which are subchelate and thus ending in a dactyl (unique finger) incurved backward, unlike the true chela (two fingers) of crabs and other crustacean groups. Since the nineteenth century, several genera and species were described in the Jurassic and the Cretaceous. Here we reintroduce the genus *Eumorphia* described by the German paleontologist Herman von Meyer in 1847. It was forgotten for decades and yet it was valid. Five species are placed within *Eumorphia*, and a new species is described from the Middle Jurassic of Germany (geological stage Callovian: about 165 million years ago).

Introduction

Mecochirids are a group of glypheoidan lobsters (Decapoda, Glypheoidea) characterized by remarkable first pereopods, which are distinctly elongate and subchelate. All the recent phylogenetical analyses based on morphological characters (e.g., Karasawa et al., 2013; Charbonnier et al., 2015) found the mecochirids to be the sister group of the glypheids (Glypheidae Winkler, 1881). The first mecochirid species was originally described as *Macrourites longimanatus* von Schlotheim, 1820 from the Late Jurassic of Germany, subsequently reassigned to *Mecochirus* by Germar (1827) (for details, see Garassino and Schweigert, 2006). A century later, the family Mecochiridae was erected by Van Straelen (1925) on the basis of the single genus *Mecochirus*. The generic composition of this family has changed over time from Beurlen (1930) to Schweitzer et al. (2022) (see Table 1). The family encompassed different representatives ranging from the Early Jurassic (Sinemurian) of Italy, with *Mecochirus germari* Garassino, 1996, to the Late Cretaceous (Campanian-Maastrichtian) of Greenland with *Meyeria rostrata* (Collins and Rasmussen, 1992).

Our recent examination of the type material of *Eumorphia socialis* (von Meyer, 1841) has raised a number of issues concerning the synonymy of *Eumorphia* with *Mecochirus* established by Quenstedt (1854) and followed by almost all of the subsequent authors (e.g., Glaessner, 1969; Schweitzer et al., 2010; Feldmann et al., 2015). Indeed, a set of morphological characters (e.g., uropodal exopod without diaeresis, flat dorsal cephalic region limited by carinae) clearly

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Table 1. Composition of the family Mecochiridae Van Straelen, 1925 over the past 100 years

Van Straelen (1925)	Beurlen (1930)	Glaessner (1969)	Förster (1971)	Simpson and Middleton (1985)	Schweitzer et al. (2010)	Karasawa et al. (2013), Feldmann et al. (2015)	Schweitzer et al. (2022)	This work
<i>Mecochirus</i> Germar, 1827	<i>Mecochirus</i>	<i>Mecochirus</i>	<i>Mecochirus</i>	<i>Mecochirus</i>	<i>Mecochirus</i>	<i>Mecochirus</i>	<i>Mecochirus</i>	<i>Mecochirus</i>
	<i>Meyeria</i> M'Coy, 1849	<i>Meyeria</i>	<i>Pseudoglyphea</i>	<i>Meyeria</i>	<i>Meyeria</i>	<i>Meyeria</i>	<i>Meyeria</i>	<i>Meyeria</i>
	<i>Eumorphia</i> von Meyer, 1847	? <i>Selenisca</i>		" <i>Meyerella</i> "	? <i>Selenisca</i>	<i>Selenisca</i>	<i>Selenisca</i>	<i>Eumorphia</i>
	<i>Selenisca</i> von Meyer, 1847	? <i>Praeatya</i>		<i>Pseudoglyphea</i>	? <i>Praeatya</i>	<i>Huhatanka</i>	<i>Huhatanka</i>	? <i>Huhatanka</i>
	? <i>Praeatya</i> Woodward, 1868	<i>Pseudoglyphea</i> Oppel, 1861		<i>Huhatanka</i> Feldmann and West, 1978	<i>Pseudoglyphea</i>	<i>Jabaloya</i>	<i>Jabaloya</i>	<i>Atherfieldastacus</i>
	<i>Scapheus</i> Woodward, 1863				<i>Huhatanka</i>		<i>Atherfieldastacus</i> Simpson in Robin et al., 2016	? <i>Pehuenchia</i>
					<i>Jabaloya</i> Garassino et al., 2009		<i>Pehuenchia</i> Rusconi, 1948	
							<i>Romaniacheiros</i> Frantescu et al., 2018	

distinguishes *Eumorphia* not only from *Mecochirus* but also from the other mecochirid genera. These observations inevitably lead to the reestablishment of *Eumorphia* as a valid genus within the mecochirids. Leading on from this resurrection, several mecochirid lobsters are re-analyzed, and *Romaniacheiros* Frantescu et al., 2018 from the Late Jurassic of Romania is considered to be a junior synonym of *Eumorphia*. New combinations are proposed for three additional species, and one new species is described from the Middle Jurassic of Germany.

Materials

The studied material includes 61 specimens ranging from the Sinemurian to the Albian (Table 2). They correspond to isolated carapaces, sometimes preserved in carbonate or phosphate concretions, and carapaces in conjunction with pleons and/or pereopods, sometimes strongly compressed. The type specimens of each treated species were examined directly or studied by means of high-resolution pictures provided by curators or colleagues.

Table 2. List of species of *Eumorphia* von Meyer, 1847

Mecochiridae Van Straelen, 1925	Age	Distribution	Examined specimens
<i>Eumorphia</i> von Meyer, 1847			
<i>Eumorphia olifex</i> (Quenstedt, 1856) n. comb.	Sinemurian	Germany	1
<i>Eumorphia clypeatus</i> (Carter, 1898) n. comb.	Bathonian	United Kingdom	3
<i>Eumorphia fabianmuelleri</i> new species	Callovian	Germany	4
<i>Eumorphia socialis</i> (von Meyer, 1841)	Callovian	Germany	8
	Callovian	France	7
	Callovian	Russia	6
	Oxfordian	France	1
	Oxfordian	United Kingdom	2
<i>Eumorphia lophia</i> (Frantescu et al., 2018) n. comb.	Tithonian-Kimmeridgian	Romania	1
<i>Eumorphia houdardi</i> (Van Straelen, 1936) n. comb.	Albian	France	28

Anatomical abbreviations. P1–P5, pereopods 1 to 5; s1–s6, pleonal somites 1 to 6.

Repositories and institutional abbreviations. GPIT, Department of Geosciences University of Tübingen, Germany; IGR-PAL, Geological Museum, University of Rennes, France; KSU, Department of Geology, Kent State University, Kent, Ohio, USA; LPBIIIart, Laboratory of Paleontology, Department of Geology and Paleontology, University of Bucharest, Romania; MHNG, Muséum d'histoire naturelle, Genève, Switzerland; MNHN.F, paleontological collection, Muséum national d'Histoire naturelle, Paris, France; SMNS, Stuttgart Natural History Museum, Stuttgart, Germany; UCBL-EM, École Nationale Supérieure des Mines de Paris, collection housed at Université Claude Bernard Lyon 1, Lyon, France; UBGD, geological collection, Université de Bourgogne, Dijon, France.

The published work and nomenclatural acts are registered in ZooBank with the following LSID: urn:lsid:zoobank.org:pub:6A518009-C139-4FF6-8669-C9994A698CC5.

Systematic paleontology

Order **Decapoda** Latreille, 1802
 Infraorder **Glypheidea** Winkler, 1881
 Superfamily **Glypheoidea** Winkler, 1881
 Family **Mecochiridae** Van Straelen, 1925

Type genus. *Mecochirus* Germar, 1827.

Included genera. *Atherfieldastacus* Simpson in Robin et al., 2016—type species *Meyeria magna* M'Coy, 1849; *Eumorphia* von Meyer, 1841—type species *Carcinium sociale* von Meyer, 1841 (junior synonym: *Romaniacheiros* Franțescu et al., 2018—type species *Romaniacheiros lophia* Franțescu et al., 2018); *Huhatanka* Feldmann and West, 1978—type species *Squilla? kiowana* Scott, 1970; *Mecochirus* Germar, 1827—type species *Macrourites longimanatus* von Schlotheim, 1820; *Meyeria* M'Coy, 1849—type species *Astacus ornatus* Phillips, 1829 (junior synonym: *Jabaloya* Garassino, Artal, and Pasini, 2009—type species *Jabaloya aragonensis* Garassino, Artal, and Pasini, 2009); *Pehuenchia* Rusconi, 1948—type species *Pehuenchia tellecheai* Rusconi, 1948.

Preliminary remarks. In the Treatise of Invertebrate Paleontology, Feldmann et al. (2015) included five genera within the Mecochiridae: *Mecochirus*, *Huhatanka*, *Jabaloya*, *Meyeria*, and *Selenisca* von Meyer, 1847 (type species: *Selenisca gratiosa* von Meyer, 1847, by monotypy). However, Charbonnier et al. (2013, p. 36, 79) considered *Selenisca gratiosa* as a subjective synonym of *Glyphea pseudoscyllarus* (von Schlotheim, 1822) and synonymized *Selenisca* with *Glyphea* von Meyer, 1835, providing a detailed discussion to support this synonymy. Robin et al. (2016, p. 12) synonymized *Jabaloya* with *Meyeria* on the basis of the similarity of the groove patterns and introduced *Atherfieldastacus* Simpson in Robin et al., 2016. Later, Franțescu et al. (2018) described the new mecochirid *Romaniacheiros* (Kimmeridgian–Tithonian, Romania), which is here synonymized with *Eumorphia*. Schweitzer et al. (2022) placed *Pehuenchia* Rusconi, 1948 (Tithonian–Berriasian, Argentina) among the mecochirids, following Förster and von Hillebrandt (1984).

Genus ***Eumorphia*** von Meyer, 1847

1841 *Carcinium* von Meyer, p. 96. Not valid: homonym of *Carcinium* Banks and Solander in Hawkesworth, 1773

(Crustacea, Isopoda) and *Carcinium* von Meyer, 1834 (Crustacea, Copepoda).

1847 *Eumorphia* von Meyer, p. 144. Nomen novum pro *Carcinium* von Meyer, 1841.

1930 *Eumorphia*; Beurlen, p. 372.

2018 *Romaniacheiros* Franțescu et al., p. 48, nov. syn.

2022 *Romaniacheiros*; Schweitzer, Feldmann, and Casadio, p. 294.

Type species. *Eumorphia*: *Carcinium sociale* von Meyer, 1841, by monotypy. *Romaniacheiros*: *Romaniacheiros lophia* Franțescu et al., 2018, by monotypy.

Included fossil species. See Table 2.

Emended diagnosis

Carapace. Subcylindrical carapace slightly compressed laterally, with dorsal midline (separation between right and left parts of the carapace) well visible in branchial region; narrow cephalic region limited by deep, strongly oblique cervical groove; flat dorsal cephalic region limited laterally by sinuous orbital carinae and posteriorly by cervical groove; branchial region with dorsal median carina; anterior margin with well-developed orbital spine at level of orbital carina; sinuous posterior margin; ventral margin of antennal–pterygostomial region strongly convex; relatively elongate, rimmed rostrum, slightly turned downward, lacking supra- and subrostral teeth; rostral carinae extending posteriorly in dorsal cephalic region; postcervical and branchiocardiac grooves directed toward the posterior margin; elongate cardiac groove joined to dorsal margin of carapace; hepatic groove shallow and swinging toward posterior; inferior groove directed posteriorly, not reaching ventral margin; gastro-orbital groove absent.

Pleon. Subrectangular telson.

Thoracic appendages. Subchelate P1–P2; achelate P3–P5; very elongate P1; tronconical P2 propodus.

Pleonal appendages. Uropodal exopod without diaeresis.

Remarks. von Meyer (1841) described *Carcinium sociale* from the Middle Jurassic of Germany. He later proposed the new generic name *Eumorphia* because *Carcinium* was preoccupied (von Meyer, 1847). Quenstedt (1854) synonymized *Eumorphia* with *Mecochirus* on the basis of the very elongate pereopods. His position was followed, with the exception of Beurlen (1930), by all of the subsequent authors (e.g., Oppel, 1862; Van Straelen, 1925; Glaessner, 1929, 1969; Schweitzer et al., 2010; Feldmann et al., 2015), and *Eumorphia* disappeared from the literature.

However, careful examination of the type material of *Eumorphia socialis* (von Meyer, 1841) supplemented by both historical and newly collected specimens lead us to highlight some morphological characters (e.g., uropodal exopod without diaeresis, flat dorsal cephalic region limited by orbital carinae and deep cervical groove, rimmed rostrum) that are not shared with *Mecochirus* or the other mecochirid lobsters. Significantly, the lack of a diaeresis on the uropodal exopods was first noticed by Quenstedt (1854) and figured in his reconstruction; it was also illustrated by Oppel (1862). Later, at the time of the establishment of the family Mecochiridae, Van Straelen (1925, p. 216) stated that the lack of a diaeresis was formerly noticed by von Meyer (1847), Carter (1886), and Krause (1891) and remarked that, if this were really the case, the species cannot belong to *Mecochirus*. He surmised that the diaeresis was present but not visible due to the imperfect preservation of this thin-shelled form and therefore maintained the species in

Mecochirus. This opinion was followed by Glaessner (1969, p. R467), who concurred that the lack of a diaeresis was linked to preservational factors.

However, at least two type specimens of *Eumorphia socialis* clearly show their uropodal exopod to be made of a single element with no diaeresis, as observed in other species (see the following). Moreover, the carapace groove pattern of *Eumorphia* is close to, but different from, the other mecochirid genera. Hence, we suggest a resurrection of *Eumorphia* as a valid genus within the mecochirids.

Franțescu *et al.* (2018) erected *Romaniacheiros* from the Late Jurassic (Kimmeridgian–Tithonian) of Romania, assigning it to the Mecochiridae on the basis of the following characters: carapace longer than high, carinae on cephalic area, deep cervical groove, and weakly incised branchiocardiac groove. The authors considered that *Romaniacheiros* is distinguished from all other mecochirid genera by a median carina on the thoracic region and the presence of one intestinal tubercle. Our recent review of the holotype of *Romaniacheiros lophia* indicates that an elongate cardiac groove, although not reported in the original diagnosis, is indeed present, originating from a very faint postcervical groove and joined to the dorsal margin. Thus, the carapace groove pattern is very close to that of *Eumorphia*. Moreover, the flat dorsal cephalic region limited by orbital carinae, the rimmed rostrum (only the basis is visible), the dorsal median carina in branchial region, and the general outline of the carapace with its sinuous posterior margin are diagnostic characters of *Eumorphia*. In conclusion, on the basis of the morphological characters herein provided, we consider *Romaniacheiros* as a junior synonym of *Eumorphia*.

Eumorphia socialis (von Meyer, 1841)

Figures 1, 2, 3

- 1841 *Carcinium sociale* von Meyer, p. 96.
 1847 *Eumorphia socialis*; von Meyer, p. 144, pl. 19, figs. 2–19.
 1854 *Mecochirus socialis*; Quenstedt, p. 189, pl. 2, figs. 4, 8–11, 14–17.
 1857 *Mecochirus socialis*; Quenstedt, p. 520, pl. 69, figs. 8–11.
 1862 *Mecochirus socialis*; Opperl, p. 81, pl. 22, figs. 2, 3.
 1886 *Mecochirus socialis*; Carter, p. 553.
 1891 *Mecochirus socialis*; Krause, p. 185, pl. 14, fig. 7a–e.
 1925 *Mecochirus socialis*; Van Straelen, p. 215, 383, 395, 410, fig. 105.
 1928 *Mecochirus socialis*; Woods, p. 66, pl. 17, fig. 12.
 1929 *Mecochirus socialis*; Glaessner, p. 251.
 1971 *Mecochirus socialis*; Förster, p. 407.
 1978 *Mecochirus socialis*; Herrick and Schram, p. 10.
 2004 *Mecochirus socialis*; Etter, p. 387.
 2006 *Mecochirus socialis*; Garassino and Schweigert, p. 20.
 2010 *Mecochirus socialis*; Schweitzer *et al.*, p. 20.
 2011 *Mecochirus socialis*; Astrop, p. 118.
 2023 *Eumorphia* sp.; Dadykin and Shmakov, p. 1053, figs 7, 8.

Type material. The material mentioned by von Meyer (1841) was from the collection of Graf (=Count) von Mandelsloh, a fossil collector and amateur geologist, who lived in the town of Urach, southeast of Stuttgart, Germany. The specimens are mostly preserved in small nodules and are very common in the “Callovian claystones”—nowadays called the Ornatenton Formation (Middle Jurassic, middle to late Callovian)—at Dettingen an der Erms, a small town close to Bad Urach, Baden-Württemberg, Germany. The Mandelsloh collection was later purchased by the Stuttgart

museum, and six syntypes, SMNS 29924/1 to 29924/6, are still housed in the paleontological collection. After careful examination, we select specimen SMNS 29924/2 as the lectotype.

Occurrences. *Eumorphia socialis* is widespread and generally abundant in the Callovian of Germany (von Meyer, 1847; Opperl, 1862) and in the Callovian and Oxfordian of Normandy, France (Charbonnier and Gendry, 2013; Pezy and Gendry 2016; Gendry, 2020; present work), and in the Oxfordian of the United Kingdom (Carter, 1886; Woods, 1928; present work).

Description

Carapace. Subcylindrical carapace slightly compressed laterally (lectotype, length: ~11 mm, height: ~5.5 mm) with well-marked dorsal midline in branchial region; narrow cephalic region limited by deep, strongly oblique cervical groove; flat dorsal cephalic region limited laterally by sinuous, tuberculate orbital carinae and posteriorly by cervical groove; branchial region with dorsal median carina; ventral margin of antennal–pterygostomial region strongly convex and rimmed by a row of tubercles; sinuous posterior margin; pointed rostrum, slightly turned downward, rimmed by smooth lateral carinae, slightly extending in cephalic region; anterior margin with well-developed orbital spine at level of orbital carina; deep sinuous cervical joined to antennal groove; parallel postcervical and branchiocardiac grooves steeply inclined, both reaching the upper part of the dorsal margin; elongate cardiac groove joined to dorsal margin of carapace; weak hepatic groove shallow and swinging toward posterior; inferior groove directed posteriorly, not reaching ventral margin; gastro-orbital groove absent; smooth dorsal surface of carapace; smooth surfaces among the carinae in the cephalic region; cardiac and branchial regions covered with small spiny tubercles uniformly arranged.

Pleon. Subrectangular s1 smaller than s2–s5; s2–s5 equal in length; s2–s5 terga and tergopleura divided by thin transverse tuberculate ridge; s1–s5 terga slightly tuberculate; subtriangular s2–s5 tergopleura covered by small tubercles uniformly arranged; ventral margins of s2–s5 tergopleura rimmed by a row of small spines; subrectangular s6 without transverse ridge and covered by small tubercles uniformly arranged; subrectangular telson with rounded distal extremity, longitudinal carinae, and smooth dorsal surface.

Cephalic appendages. Pointed scaphocerite, smooth, with dorsal carina and spiny lateral outer margin (Fig. 3.4, 3.5).

Thoracic appendages. Subchelate P1–P2; achelate P3–P5; very elongate P1 with dorsal rows of tubercles and scattered tubercles; P2 with tronconical propodus; subcylindrical very elongate P2–P3 meri, equal in length, wing-shaped medially and ventrally; dorsal margin of P2–P3 meri rimmed by a row of small spines slightly incurved forward; ventral margin of P2 merus with one single strong spine incurved forward; surface of P2–P3 meri covered by small tubercles uniformly arranged; P3 with tuberculate carpus incomplete distally, reinforced by one longitudinal tuberculate carina.

Pleonal appendages. Uropodal endopod and exopod equal in length and as long as telson, reinforced by longitudinal tuberculate median carina; smooth surface of uropodal endopod and exopod; smooth lateral margin of uropodal exopod; uropodal exopod without diaeresis.

Additional examined material. Seven specimens (IGR-PAL-145588–145594, Gendry collection) from the Callovian and one specimen (IGR-PAL-145587, Gendry collection) from the

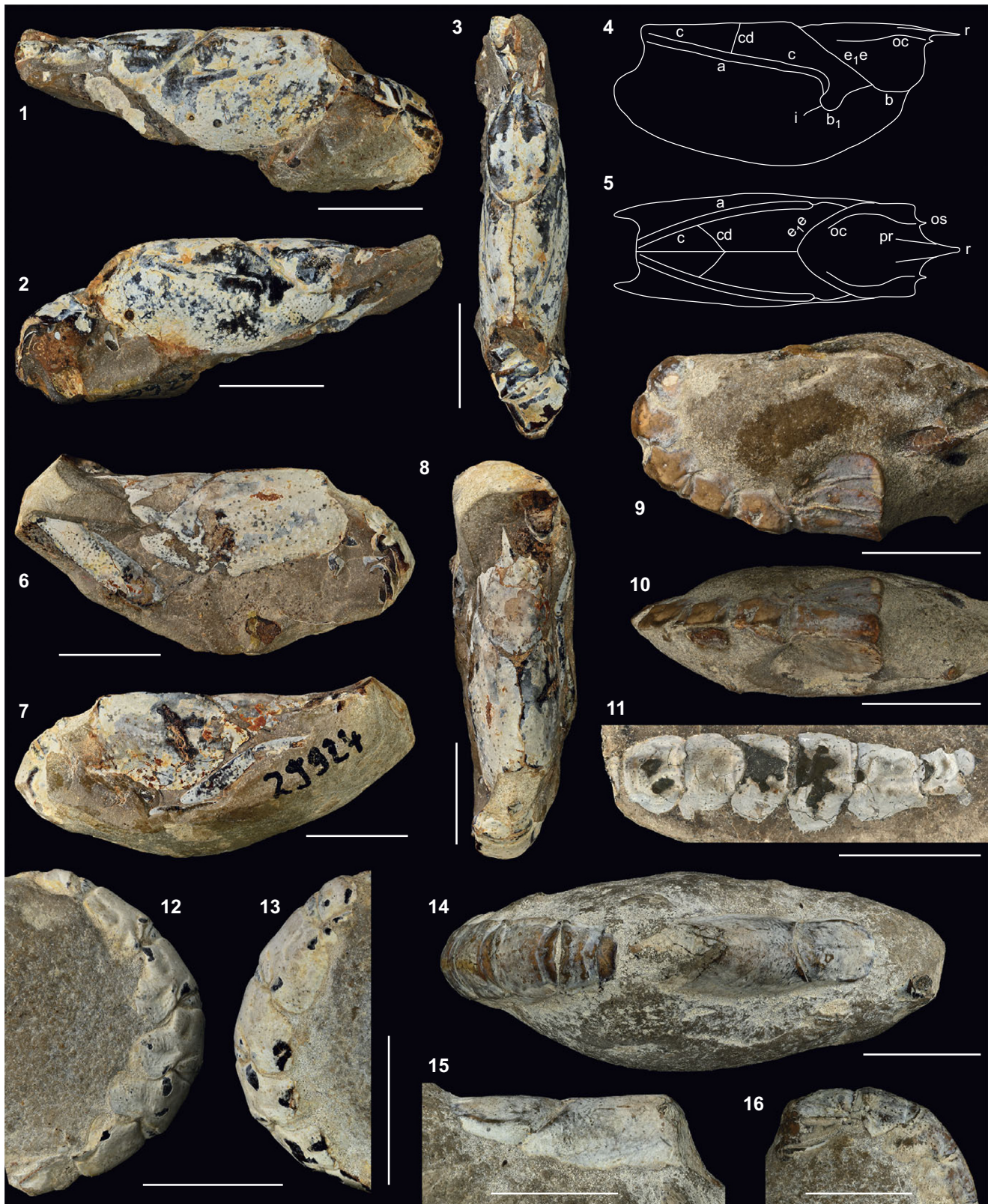


Figure 1. Type material of *Eumorphia socialis* (von Meyer, 1841) from the Middle Jurassic (Callovian) of Dettingen an der Erms near Bad Urach, Baden-Württemberg, Germany. (1–3) Lectotype herein designated SMNS 29924/2, carapace and first pleonal somites: (1) left lateral view, (2) right lateral view, and (3) dorsal view. (4, 5) Interpretative line drawings of carapace groove pattern: (4) right lateral view and (5) dorsal view. (6–8) Paralectotype SMNS 29924/1, carapace and fragments of pleon and pereiopods: (6) left lateral view, (7) right lateral view, and (8) dorsal view. (9, 10) Paralectotype SMNS 29924/4, pleon and tail fan: (9) right lateral view and (10) dorsal view. Note the lack of diaeresis on uropodal exopod. (11) Paralectotype SMNS 29924/3, pleon, dorsal view. Note the tergopleuron with spiny ventral margin. (12, 13) Paralectotype SMNS 29924/5, pleon: (12) left lateral view and (13) right lateral view. (14–16) Paralectotype SMNS 29924/6: (14) carapace and pleon in dorsal view, (15) carapace in left lateral view, and (16) tail fan in right lateral view. a = branchiocardiac groove; b = antennal groove; b₁ = hepatic groove; c = postcervical groove; cd = cardiac groove; e₁e = cervical groove; i = inferior groove; oc = orbital carina; os = orbital spine; pr = postrostral carina; r = rostrum. Photographs: G. Schweigert. Line drawings: S. Charbonnier. Scale bars = 5 mm.

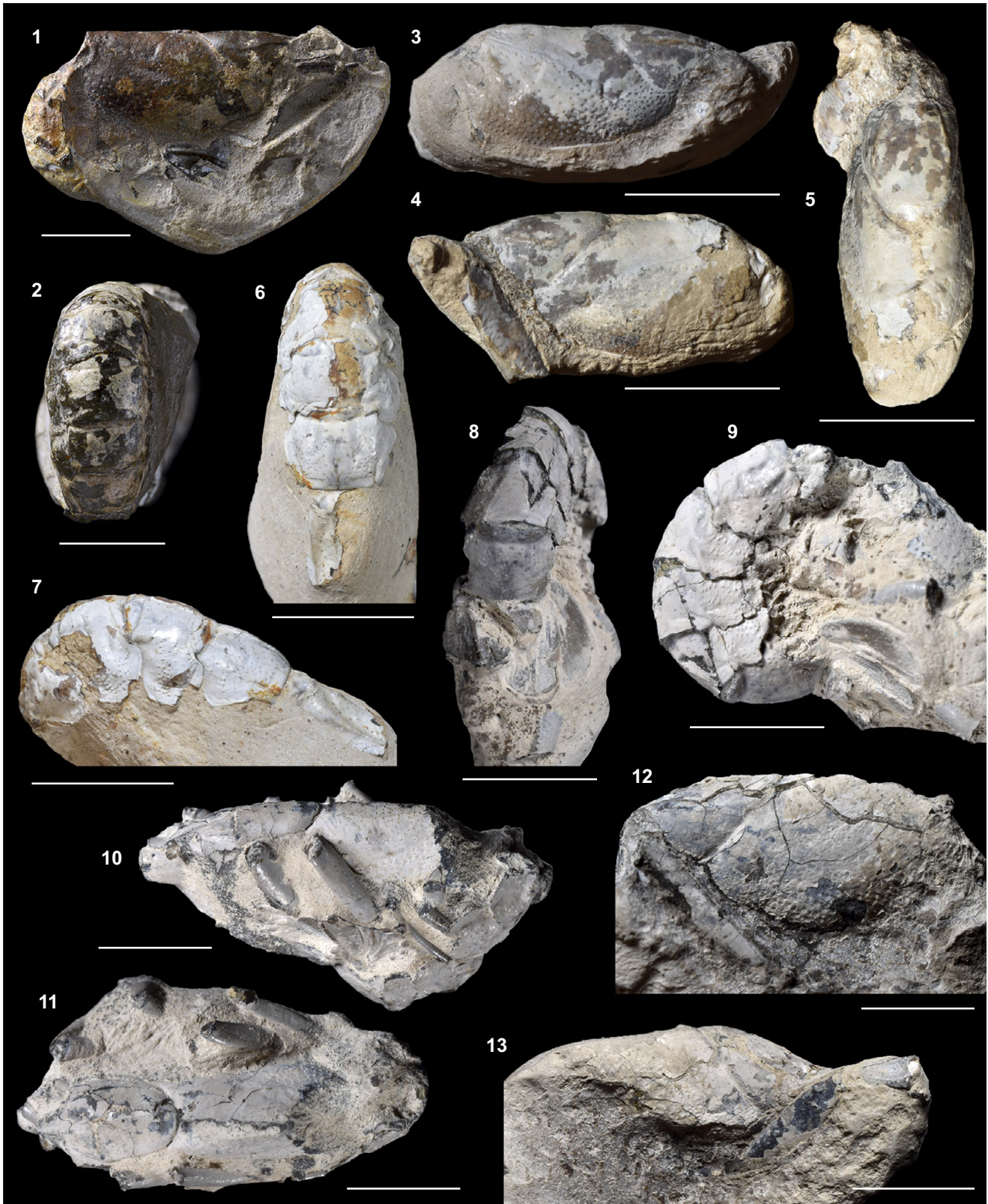


Figure 2. *Eumorphia socialis* (von Meyer, 1841) from the Callovian of Germany (1, 2), the Oxfordian of Weymouth, Dorset, United Kingdom (3–7), and the Callovian of Villers-sur-Mer, Normandy, France (8–13). (1) Carapace MNHN.F.A87788, right lateral view. (2) Pleon MNHN.F.A87789, dorsal view. (3–5) Carapace IGR-PAL-145585: (3) right lateral view, (4) left lateral view, and (5) dorsal view. (6, 7) Pleon IGR-PAL-145586: (6) dorsal view and (7) left lateral view. (8, 9) Pleon and tail fan IGR-PAL-145593: (8) dorsal view and (9) right lateral view. Note the uropodal exopod without diaeresis. (10, 11) carapace and fragments of pereopods IGR-PAL-145592: (10) left lateral view and (11) dorsal view. Note the flat dorsal cephalic region. (12) Carapace IGR-PAL-145588, left lateral view. (13) Carapace IGR-PAL-145589, right lateral view. Photographs: (1, 2) L. Cazes; (3–13) D. Gendry. Scale bars = 5 mm.

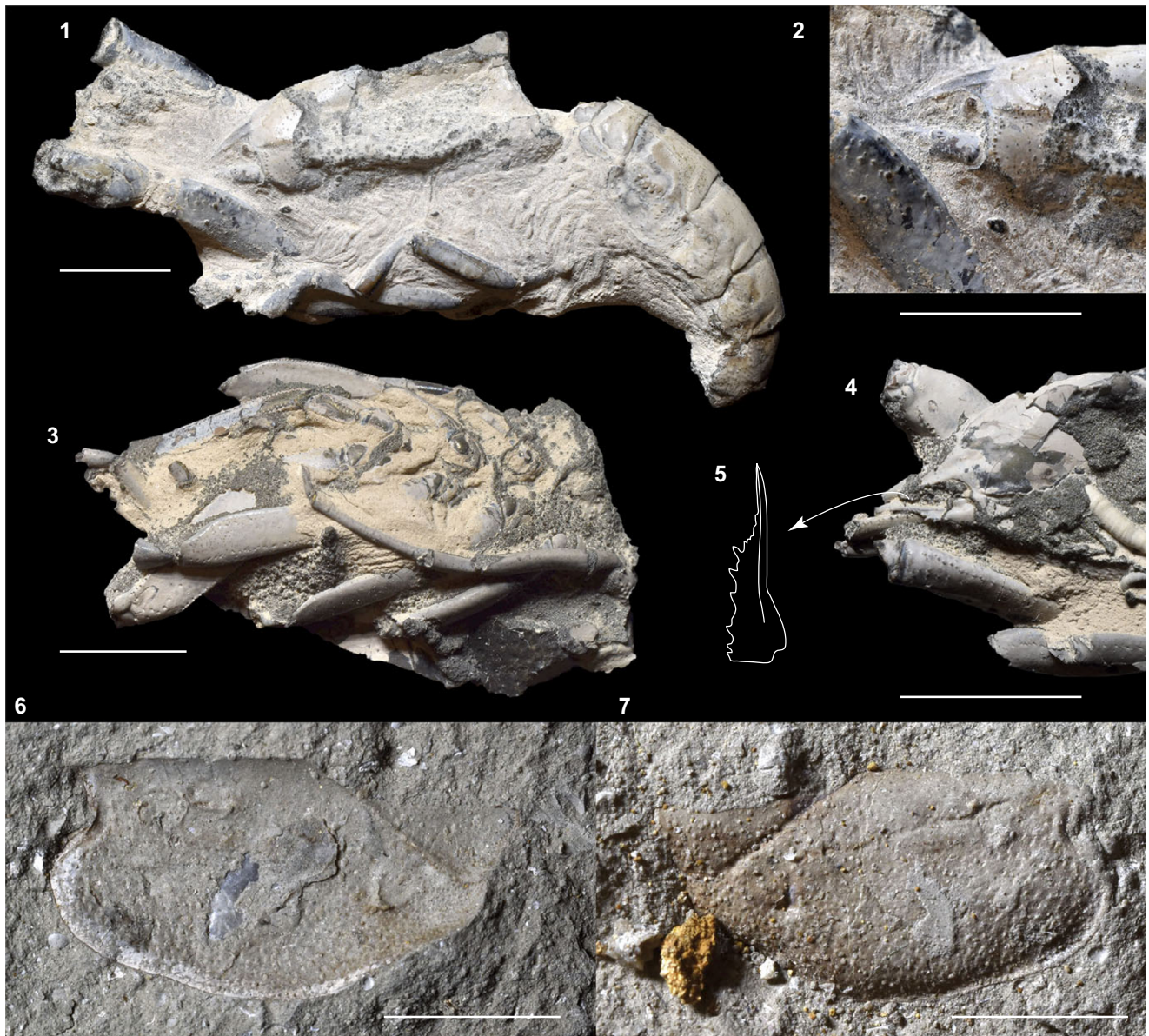


Figure 3. *Eumorphia socialis* (von Meyer, 1841) from the Callovian (1–5) and Oxfordian (6, 7) of Villers-sur-Mer, Calvados, Normandy, France. (1, 2) Subcomplete specimen IGR-PAL-145590: (1) left lateral view and (2) close-up of anterior cephalic region. (3–5) Specimen IGR-PAL-145591: (3) ventral view showing set of pereopods, (4) close-up of anterior cephalic region, and (5) line drawing of spiny scaphocerite. (6, 7) Carapace IGR-PAL-145587 (part and counterpart) collected at top of Marnes de Villers Formation. Photographs: D. Gendry. Scale bars = 5 mm.

Oxfordian of Villers-sur-Mer, Normandy. Two specimens (IGR-PAL-145585, 145586, Bara collection) from the Oxfordian of Weymouth, Dorset, United Kingdom. Two specimens (MNHN.F. A87788, A87789) from Germany.

Remarks. Dadykin and Shmakov (2023) reported *Eumorphia* sp. from the Callovian of Russia. This last occurrence is a very recent discovery and due to the review of one of the authors (S.C.). A careful examination of the figured specimens led us to identify the specimens as representatives of *Eumorphia socialis*, thus widely extending the paleogeographic distribution of the species to the east of Europe.

Eumorphia olifex (Quenstedt, 1856) n. comb.
Figure 4.1–4.3

- 1856 *Mecochirus olifex* Quenstedt, p. 89, pl. 11, fig. 17.
- 1862 *Mecochirus olifex*; Oppel, 81, pl. 22, fig. 1.
- 1925 *Mecochirus olifex*; Van Straelen, p. 214, 383, 392, 402.
- 1928 *Mecochirus olifex*; Beurlen, p. 142.
- 1929 *Mecochirus olifex*; Glaessner, p. 251.
- 1971 *Mecochirus olifex*; Förster, p. 406.
- 1996 *Mecochirus olifex*; Garassino, p. 349.
- 2004 *Mecochirus olifex*; Etter, p. 387.
- 2006 *Mecochirus olifex*; Garassino and Schweigert, p. 20.
- 2010 *Mecochirus olifex*; Schweitzer et al., p. 20.
- 2011 *Mecochirus olifex*; Pagani et al., p. 149.

Type material. Holotype by monotypy GPIT-PV 51267, 51268 (part and counterpart) from Dußlingen, near Tübingen, Baden-

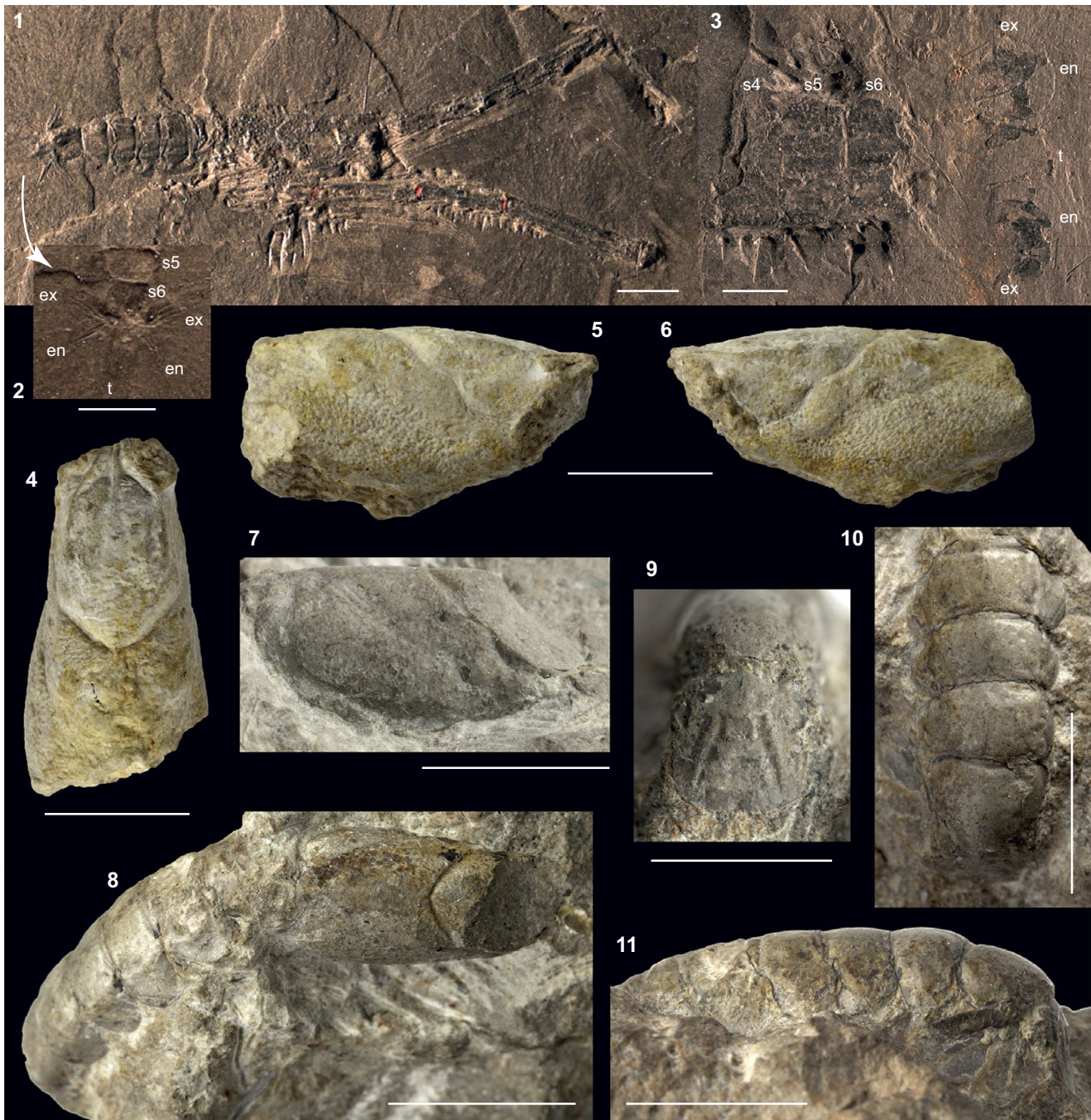


Figure 4. (1–3) *Eumorphia olifex* (Quenstedt, 1856) n. comb. from the Sinemurian of Dußlingen, near Tübingen, Baden-Württemberg, Germany. (1, 2) Holotype GPIT-PV 51267-51268 (part and counterpart): (1) dorsal view and (2) close-up of tail fan. Note the uropodal exopod without diaeresis. (3) Pleon and tail fan GPIT-PV 51269, dorsal view. (4–11) Type material of *Eumorphia clypeatus* (Carter, 1898) n. comb. from the Bathonian of Northampton, Northamptonshire, United Kingdom. (4–6) Paralectotype SM 3230, carapace: (4) dorsal view, (5) right lateral view, and (6) left lateral view. (7–11) Lectotype herein designated SM 3231: (7) carapace, right lateral view; (8) carapace and pleon, dorsal view; (9) telson, dorsal view; (10) pleon, dorsal view; (11) pleon and tail fan, left lateral view. Note uropodal exopod without diaeresis. Photographs: (1–3) J. Werneburg; (4–11) M. Riley. Scale bars = 5 mm.

Württemberg, Germany. The specimen was collected in the Early Jurassic (late Sinemurian), “Ölschiefer” (oil shale) of the Arietenkalk Formation.

Description

Carapace. Carapace poorly preserved (length: ~10 mm); narrow cephalic region limited by deep, strongly oblique cervical groove; flat dorsal cephalic region; rostrum poorly preserved, basally rimmed by

lateral carinae; hepatic groove shallow and probably swinging toward posterior; all regions uniformly covered by strong granules.

Pleon. Subrectangular s1 smaller than s2–s5; s2–s5 equal in length; s6 longer than the other pleonal somites; s2–s5 terga and tergopleura divided by thin transverse ridge; smooth s1–s5 terga; rounded s2–s5 tergopleura, globally smooth, with smooth ventral margins; smooth, subrectangular s6; subrectangular telson with rounded distal extremity.

Cephalic appendages. Voluminous eyes; multi-articulated flagellum of antenna or antennule preserved.

Thoracic appendages. Very elongate subchelate P1, with carpus and propodus bearing longitudinal rows of spines; pointed and arcuate dactylus, about half as long as propodus.

Pleonal appendages. Uropodal endopod and exopod equal in length and as long as telson, reinforced by longitudinal, smooth median carina; uropodal endopod and exopod with smooth surface; uropodal exopod without diaeresis.

Additional examined material. One specimen GPIT-PV 51269 from the type locality.

Remarks. Van Straelen (1925, p. 214) noted that the sole specimen studied by Quenstedt (1856) can be assigned to *Mecochirus* only on the basis of its elongate P1 since the strongly flattened carapace does not preserve the grooves and carinae. Although Schweitzer et al. (2010) listed this species within *Mecochirus*, Pagani et al. (2011, p. 149) raised some doubts about its systematic validity due to the lack of the main morphological characters of the genus. Indeed, the elongate subchelate P1 is typical of all mecochirid genera.

Careful examination of the holotype and one additional historical specimen (GPIT-PV 51269) lead us to highlight some morphological characters (uropodal exopod without diaeresis, flat dorsal cephalic region) diagnostic of *Eumorphia*. The presence of a diaeresis on uropodal exopod was highlighted by Van Straelen (1925, p. 214), but this is clearly a mistake. Indeed, the tail fan is well preserved in both available specimens, and the lack of a diaeresis is evident, which is consistent with the drawing produced by Oppel (1862, pl. 22, fig. 1). In conclusion, we tentatively propose the new combination *Eumorphia olifex* (Quenstedt, 1856) n. comb. This species is the oldest member of the genus and one of the oldest mecochirid lobsters together with *Mecochirus germari* Garassino, 1996 (Sinemurian, Osteno, Italy).

***Eumorphia clypeatus* (Carter, 1898) n. comb.**

Figure 4.4–4.11

- 1898 *Gebia clypeatus* Carter, p.16, pl. 1, fig. 2.
- 1925 *Upogebia clypeatus*; Van Straelen, p. 309, 386, 407.
- 1928 *Mecochirus clypeatus*; Woods, p. 65, pl. 17, figs 8–10.
- 1960 *Mecochirus clypeatus*; Glaessner, p. 10.
- 1969 *Mecochirus clypeatus*; Kennedy et al., p. 552.
- 1971 *Mecochirus clypeatus*; Förster, p. 407.
- 1971 *Mecochirus clypeatus*; Sellwood, p. 589.
- 2002 *Mecochirus clypeatus*; Collins, p. 82.
- 2004 *Mecochirus clypeatus*; Etter, p. 387.
- 2010 *Mecochirus clypeatus*; Schweitzer et al., p. 20.
- 2023 *Mecochirus clypeatus*; Charbonnier et al., p. 682.

Type material. After Carter (1898, p. 16), the type material was originally composed of 11 syntypes housed in the Woodwardian Museum (now Sedgwick Museum), in Mr. T. J. George's collection, and in Carter's own collection. Three syntypes are still housed at the Sedgwick Museum: SM J3230 (figured by Carter, 1898, pl. 1, fig. 2a,b), SM J3231 (figured by Carter, 1898, pl. 1, fig. 2c–e), and SM J3232 (figured by Woods, 1928, pl. 17, fig. 10a,b). They were collected in the Middle Jurassic (Bathonian) from Northampton, Northamptonshire, UK. Specimen SM 3231 is herein selected as the lectotype. Specimens SM 3230 and 3232 are paralectotypes.

Description

Carapace. Subcylindrical carapace slightly compressed laterally (length: ~10 mm, height: ~5.6 mm); narrow cephalic region limited by deep, strongly oblique cervical groove; flat dorsal cephalic region limited laterally by sinuous, tuberculate orbital carinae and posteriorly by cervical groove; orbital carinae fused to lateral rostral margins; large rostrum (not preserved distally) with basal median carina; dorsal median carina in branchial region; ventral margin of antennal–pterygostomial region strongly convex; sinuous posterior margin; deep sinuous cervical joined to antennal groove; parallel postcervical and branchiocardiac grooves steeply inclined, both reaching the upper part of the dorsal margin; elongate cardiac groove joined to dorsal margin of carapace; weak hepatic groove shallow and swinging toward posterior; inferior groove directed posteriorly, not reaching ventral margin; gastro-orbital groove absent; cephalic region with pits; cardiac, hepatic, and branchial regions covered with numerous small pits.

Pleon. Subrectangular s1 smaller than s2–s5; s2–s5 equal in length; s6 longer than the other pleonal somites; s2–s5 terga and tergopleura divided by thin transverse ridge; smooth s1–s5 terga with a few pits; rounded s2–s5 tergopleura, globally smooth, with smooth ventral margins; smooth, subrectangular s6 without transverse ridge; subrectangular telson with rounded distal extremity, longitudinal carinae diverging posteriorly, one axial pair of tubercles, and smooth dorsal surface.

Thoracic appendages. Subchelate P1, very elongate, with carpus and propodus uniformly covered with small granules; pointed dactylus, about half as long as propodus.

Pleonal appendages. Uropodal endopod and exopod equal in length and as long as telson, reinforced by longitudinal, smooth median carina; uropodal endopod and exopod with smooth surface; smooth lateral margin of uropodal exopod; uropodal exopod without diaeresis.

Remarks. Woods (1928) was the first to clearly identify this species as a mecochirid lobster and to place it in *Mecochirus*. He was followed by all of the subsequent authors until Charbonnier et al. (2023). However, the review of type specimens has revealed several morphological characters diagnostic of *Eumorphia*: the narrow cephalic region limited by deep, strongly oblique cervical groove, with flat dorsal area limited by orbital carinae, the sinuous posterior margin, and the uropodal exopod without diaeresis. We note that the flat dorsal cephalic region was already highlighted by Woods (1928, p. 65) as “shield-like on the dorsal surface.” In conclusion, we propose the new combination *Eumorphia clypeatus* (Carter, 1898) n. comb. This species is the only one with a carapace covered by small pits.

***Eumorphia fabianmuelleri* new species.**

Figure 5.1–5.6

Type material. Holotype SMNS 70665-1 and three paratypes SMNS 70665-2, 70665-3, and 70665-4 collected in the Ornatenton Formation (lower Callovian, Koenigi Zone; corresponding to bed 3 in section “Schleptruper Egge,” published by Lange, 1973) of the former clay pit “Frettberg” NW Bramsche, Lower Saxony, Germany (geographic coordinates: 52°25'19.8"N, 7°55'29.2"E).

Diagnosis. *Eumorphia* with three cephalic carinae (orbital, gastro-orbital, and antennal).

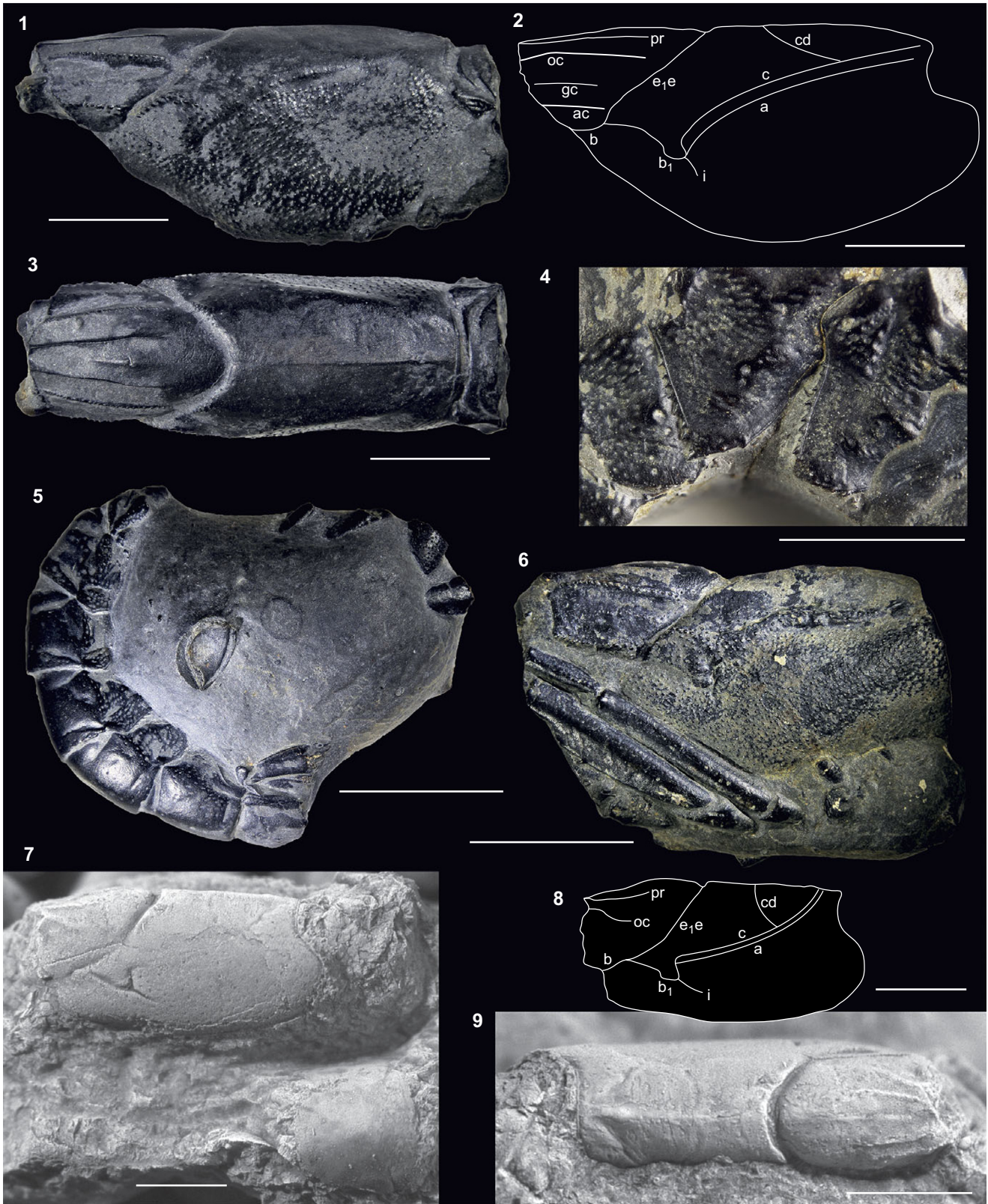


Figure 5. (1–6) Type material of *Eumorphia fabianmuelleri* n. sp. from the Callovian of NW Bramsche, Lower Saxony, Germany. (1–3) Holotype SMNS 70665-1, carapace: (1) left lateral view, (2) line drawing, and (3) dorsal view. (4) Paratype SMNS 70665-2, close-up of tergopleura. (5) Paratype SMNS 70665-4, pleon and tail fan, right lateral view. (6) Paratype SMNS 70665-3, carapace and pereiopods, left lateral view. (7–9) *Eumorphia lophia* (Frantescu *et al.*, 2018) n. comb. from the Kimmeridgian–Tithonian of Cernatului Valley, Săcele, Romania, holotype LPBillart 169, carapace and probable isolated telson: (7) left lateral view, (8) line drawing, and (9) dorsal view. a = branchiocardiac groove; ac = antennal carina; b = antennal groove; b₁ = hepatic groove; c = postcervical groove; cd = cardiac groove; e₁e = cervical groove; gc = gastro-orbital carina; i = inferior groove; oc = orbital carina; pr = postrostral carina. Photographs: (1–6) F. Müller; (7, 9) courtesy C. Schweitzer. Line drawings: S. Charbonnier. (1–6) Scale bars = 5 mm; (7–9) scale bars = 2 mm.

Description

Carapace. Subcylindrical carapace slightly compressed laterally (length: ~18 mm, height: ~9 mm), with dorsal midline well marked in branchial region; narrow cephalic region limited by deep, strongly oblique cervical groove, with three cephalic carinae; slightly sinuous, tuberculate orbital carina; weakly marked tuberculate gastro-orbital carina; straight, tuberculate antennal carina; flat dorsal cephalic region limited laterally by orbital carinae and posteriorly by cervical groove; branchial region with dorsal median carina; ventral margin of antennal–pterygostomial region strongly convex; sinuous posterior margin; rostrum not preserved but rimmed by smooth postrostral carinae extending posteriorly in cephalic region; short median carina between the postrostral carinae; well-developed orbital spine at level of orbital carina; deep sinuous cervical joined to antennal groove; parallel postcervical and branchiocardiac grooves steeply inclined, both reaching the upper part of the dorsal margin; elongate cardiac groove joined to dorsal margin of carapace; weak hepatic groove shallow and swinging toward posterior; inferior groove directed posteriorly, not reaching ventral margin; gastro-orbital groove absent; smooth dorsal surface of carapace; smooth surfaces among the carinae in the cephalic region; cardiac region covered with some small spiny tubercles; hepatic, pterygostomial and branchial regions densely covered with spiny tubercles uniformly arranged.

Pleon. Subrectangular s1 smaller than s2–s5; s2–s5 equal in length; s2–s5 terga and tergopleura divided by thin transverse tuberculate ridge; s1–s5 terga globally smooth but with some scattered small tubercles; subtriangular s2–s5 tergopleura covered by small tubercles uniformly arranged; s2–s5 tergopleura margins rimmed by a row of small spines; subrectangular s6 without transverse ridge, globally smooth but with some scattered small tubercles uniformly arranged; subrectangular telson with smooth dorsal surface.

Thoracic appendages. P1 not preserved; P2–P3 partially preserved; only P4–P5 basis preserved; subcylindrical P2–P3 meri very elongate equal in length, wing-shaped medially and ventrally; dorsal margin of P2–P3 meri rimmed by a row of small spines slightly incurved forward; ventral margin of P2 merus with one single strong spine incurved forward; surface of P2–P3 meri covered by small tubercles uniformly arranged; P3 carpus tuberculate, incomplete distally, reinforced by a longitudinal tuberculate carina.

Pleonal appendages. Uropodal endopod and exopod partially preserved, both having same length of telson; uropodal endopod and exopod with smooth surface; uropodal exopod with smooth lateral margin; uropodal exopod without diaeresis.

Etymology. The specific epithet honors Fabian Müller, who collected the studied specimens.

ZooBank. LSID: urn:lsid:zoobank.org:act:B5833E71-B976-4684-9241-B4AB5FD45D9F

Remarks. The type specimens show morphological characters diagnostic of *Eumorphia*: the carapace groove pattern, the narrow cephalic region limited by deep, strongly oblique cervical groove, with flat dorsal area limited by orbital carinae, the sinuous posterior margin, and the uropodal exopod without diaeresis. Compared with all the other species of *Eumorphia*, *Eumorphia fabianmuelleri* n. sp. is the only one with three cephalic carinae.

Eumorphia lophia (Frăntescu et al., 2018) n. comb.

Figure 5.7–5.9

2018 *Romaniacheiros lophia* Frăntescu, Feldmann et al., p. 49, 50, fig. 2.

Type material. Holotype by monotypy LPBIIIart 169 from the Late Jurassic (Kimmeridgian-Tithonian) of Cernatului Valley, Săcele, Romania.

Emended description

Carapace. Subcylindrical carapace slightly compressed laterally (length: ~6.4 mm, height: 3.3 mm); narrow cephalic region limited by deep, strongly oblique cervical groove; flat dorsal cephalic region limited laterally by sinuous, tuberculate orbital carinae and posteriorly by cervical groove; branchial region with dorsal median carina with distal intestinal tubercle; ventral margin of antennal–pterygostomial region strongly convex; sinuous posterior margin; rostrum not preserved but rimmed by smooth postrostral carinae extending posteriorly in cephalic region; short median granular carina between the postrostral carinae; anterior margin broken; deep sinuous cervical joined to antennal groove; parallel postcervical and branchiocardiac grooves steeply inclined, both reaching the upper part of the dorsal margin; elongate, arcuate cardiac groove joined to dorsal margin of carapace; weak hepatic groove shallow and swinging toward posterior; inferior groove directed posteriorly, not reaching ventral margin; gastro-orbital groove absent; smooth cephalic region; branchial region smooth dorsally, becoming pitted ventrally, below branchiocardiac groove.

Pleon. subrectangular telson with rounded distal extremity and smooth dorsal surface, proximal margin with short, oblique fissures laterally; axial region with probable tubercle.

Remarks. The review of the holotype led us to modify the original description. We evidence herein the elongate cardiac groove, originating from a very faint postcervical groove and joined to the dorsal margin. The carapace groove pattern in general is diagnostic of *Eumorphia*. The “subdorsal” and “supraorbital” carinae in the cephalic region are reinterpreted as, respectively, postrostral carinae (extending from a rostrum, herein not preserved) and orbital carinae delimiting a flat dorsal cephalic area, typical of *Eumorphia*. The dorsal median carina in the branchial region is also a generic character of *Eumorphia*, and the intestinal tubercle should be considered as merely a specific character. We also reinterpret the pleonal tergopleuron as a subrectangular telson, typical of mecochirid lobsters. In conclusion, we propose the new combination *Eumorphia lophia* (Frăntescu et al., 2018) n. comb.

Eumorphia houdardi (Van Straelen, 1936) n. comb.

Figure 6

1936 *Mecochirus houdardi* Van Straelen, p. 5, pl. 1, figs. 3, 4.

1955 *Mecochirus houdardi*; Veiga Ferreira, p. 119.

2010 *Mecochirus houdardi*; Schweitzer et al., p. 20.

2010a *Mecochirus houdardi*; Breton, p. 222, fig. 150c.

2010b *Mecochirus houdardi*; Breton, p. 13, fig. 2c.

2015 *Meyeria houdardi*; Breton et al., p. 57, 59, figs. 1, 2.

2021 *Meyeria houdardi*; Charbonnier et al., p. 4.

Type material. Holotype UBGD.000269 (Houdard collection, by original designation of Van Straelen, 1936, pl. 1, figs 3, 4) from the Early Cretaceous (early Albian) of Pargny-sur-Saulx, Marne, Grand Est, France. At least 22 paratypes (Houdard collection; J. Thomas, personal communication, 2024) from the Albian of Pargny-sur-Saulx (Marne, France) and Moëslains (Haute-Marne, France) are



Figure 6. *Eumorphia houdardi* (Van Straelen, 1936) n. comb. from the Albian of Pargny-sur-Saulx, Marne, France. (1, 2) Holotype UBGD.000269, carapace and fragments of pleon and pereopods: (1) right lateral view and (2) left lateral view. (3, 4) Specimen MNHN.F.A28991: (3) right lateral view and (4) left lateral view. (5, 6) Specimen MNHN.F.A28993: (5) right lateral view and (6) left lateral view. (7, 8) Specimen MNHN.F.A28992: (7) dorsal view and (8) ventral view. Note uropodal exopod without diaeresis. Photographs: (1, 2) J. Thomas; (3–8) L. Cazes. Scale bars = 5 mm.

also housed at the Université de Bourgogne, Dijon, France. Two paratypes (MHNG-GEPI-68616a, b) from the Albian of Sainte-Croix (Canton of Vaud, Switzerland) are housed at the Geneva Museum. Other paratypes are also probably housed in the paleontological collections of the Neuchâtel University, Switzerland (not checked).

Original description. Carapace relatively wide; deep, narrow cervical groove; weak branchiocardiac groove; postcervical groove not joined to dorsal margin; hepatic groove absent; narrow antennal groove; cephalic region with spiny carinae; rounded s1, s2 pleura (literal translation from Van Straelen, 1936).

Emended description (Breton *et al.*, 2015)

Carapace. Subcylindrical carapace, twice longer than high, weakly compressed laterally; ovoid-shaped spatulate rostrum;

median carina with very short spines, extending behind an anterior depression; raised lateral margins of rostrum with 4–6 spines forward directed; a row of 6–7 spines extending obliquely in front of cervical groove; serrate anterior margin; cervical region covered with small spiny tubercles; pterygostomial region covered with small tubercles and slightly depressed anteriorly; branchial region covered with small tubercles; deep, wide cervical groove intercepting dorsal margin with an angle of 45°; parallel postcervical and branchiocardiac grooves, the former wider than the latter; both grooves do not reach the dorsal margin; branchiocardiac groove joined to a deep hepatic groove anteriorly.

Pleon. Cylindrical pleon longer than carapace; s1–s6 terga and tergo-pleura covered with small tubercles; s1–s6 terga and tergo-pleura divided by a deep transverse groove; triangular s1 tergo-pleuron; rounded s2 tergo-pleuron covering s1 and s3 tergo-pleura; smooth s2–s4 tergo-pleura; rectangular telson; lateral margins of

telson with 2–3 spines backward directed; dorsal surface of telson covered with tubercles arranged randomly and a pair of strong spines located axially.

Cephalic, thoracic, and pleonal appendages poorly preserved.

Additional examined material. MNHN.F.A28991, A28992, A28993 (Franzin collection), collected from the type locality; UCBL-EM 80240 (Terquem collection) from Auxerre, Yonne, Bourgogne, Franche-Comté, France; UCBL-EM 80241 from the type locality.

Remarks. Van Straelen (1936) included his new species in *Mecochirus* and was followed by all the subsequent authors until Breton (2010a,b). Later, on the basis of 24 specimens, Breton et al. (2015) provided a careful and precise description of the small carapace (holotype, length: 11.0 mm, height: 5.8 mm), highlighting the presence of the cardiac groove, typical of *Meyeria*, to which this species was assigned. However, the review of the holotype and additional historical and new specimens has revealed several morphological characters diagnostic of *Eumorphia*: narrow cephalic region limited by deep, strongly oblique cervical groove, with flat dorsal area limited by orbital carinae, dorsal median carina in branchial region, sinuous posterior margin, and uropodal exopod without diaeresis. In conclusion, we propose the new combination *Eumorphia houdardi* (Van Straelen, 1936) n. comb. This species is unique in possessing a carapace uniformly covered by small granules.

Discussion and conclusions

Although the general review of the family Mecochiridae is beyond the scope of this paper, the reinstatement of *Eumorphia* as a valid genus raises some questions about the other mecochirid genera, especially *Huhatanka* and *Pehuenchia*.

Feldmann and West (1978) described *Huhatanka* from the Lower Cretaceous (Albian) Kiowa Formation (Kansas, USA). According to their diagnosis, the branchiocardiac groove being weak or absent distinguishes *Huhatanka* from both *Meyeria* M'Coy, 1849 and *Mecochirus* Germar, 1827. The review of some photographs of *H. kiowana* (KSU 2144, 3768, 3770, 3771, courtesy R. Feldmann, 2023) clearly shows the elongate cardiac groove and the postcervical and branchiocardiac grooves parallel to each other and directed toward the posterior margin, and the flat dorsal cephalic area limited by tuberculate carinae. We note that although the cardiac groove was not reported in the original diagnosis, it was clearly figured by Feldmann and West (1978, figs 1, 2) and more recently by Bahrami et al. (2020, fig. 6a–h). On the basis of all these characters, we might consider *Huhatanka* as a junior synonym of *Eumorphia*, but unfortunately the tail fan is not preserved and the presence or absence of a diaeresis on the uropodal exopod—a strong character supporting the inclusion in *Eumorphia*—cannot be verified.

The second species recently described—*Huhatanka australis* Schweitzer, Feldmann, and Casadio, 2022—originates from the Berriasian–Valanginian of Argentina. It also shows some characters compatible with *Eumorphia*: flat dorsal cephalic area limited by orbital carinae and with postrostral carinae extending in cephalic region (“subaxial and postorbital keels” in the original publication) and carapace groove pattern very close because, in our opinion, the postcervical and cardiac grooves seem to be present (see posterior part of carapace figured by Schweitzer et al., 2022, fig. 3a,b). However, the tail fan is similarly not preserved and the presence

or absence of a diaeresis on the uropodal exopod—a strong character supporting the inclusion in *Eumorphia*—cannot be currently checked.

Rusconi (1948) described *Pehuenchia* from the Late Cretaceous of Argentina. We concur with Schweitzer et al. (2022), who placed it among the mecochirids, following Förster and von Hillebrandt (1984). After careful examination of photographs (courtesy C. Schweitzer, 2024) of the strongly flattened holotype of *Pehuenchia tellecheai* Rusconi, 1948, we think that the diaeresis on the uropodal exopod is lacking and that the ventral margin of pleonal somites is rimmed by spines; these characters could be compatible with *Eumorphia*. Conversely, the wrinkled surface of pleonal somites is also reminiscent of the very ornamented pleon in *Meyeria ornata* (Phillips, 1829). As stated by Schweitzer et al. (2022), the absence of a well-preserved carapace prevents a clear generic assignment of this mecochirid lobster.

In conclusion, we highlight that all the species of *Eumorphia* are very small-sized with a carapace length no more than 20 mm. This diminutive size should be also considered as a diagnostic character of this mecochirid lobster genus. The current study is not an exhaustive monograph of the genus, and it is likely that other species of *Eumorphia* may be scattered in the old literature or forgotten in some museum drawers. However, it is a starting point for further studies of this unusual genus of mecochirids.

Acknowledgments. This paper is dedicated to Rodney Feldmann, whose scientific legacy lives up to the achievement of the pioneers of paleocarcinology. We thank the reviewer D. Audo (MNHN, CR2P) and the guest editor O. Franțescu (University of Pittsburgh, Bradford). We warmly thank L. Cazes and P. Loubry (MNHN, CR2P) for the photographs, C. Schweitzer and R. Feldmann (Kent State University, USA), M. Riley (Sedgwick Museum, Cambridge, UK), and I. Werneburg (University of Tübingen, Germany) for sharing photographs, E. Robert (Université Claude Bernard Lyon 1, France), J. Thomas (Université de Bourgogne, Dijon, France), and L. Cavin (Muséum d'histoire naturelle de Genève, Switzerland) for access to the type material and historical specimens.

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Competing interests. The authors declare none.

References

- Astrop, T.I., 2011, Phylogeny and evolution of Mecochiridae (Decapoda: Reptantia: Glypheoidea): an integrated morphometric and cladistic approach: *Journal of Crustacean Biology*, v. 31, p. 114–125.
- Bahrami, A., Yazdi, M., González-León, O., Serrano-Sánchez, M., and Vega, F.J., 2020, Crustacea (Isopoda, Anomura, Brachyura) from the Cretaceous of Soh area (NW Isfahan) Central Iran: *Boletín de la Sociedad Geológica Mexicana*, v. 72, n. A271019.
- Beurlen, K., 1928, Die Decapoden des Schwäbischen Jura mit Ausnahme der aus den oberjurassischen Plattenkalken stammenden: *Palaeontographica*, v. 70, p. 115–278.
- Beurlen, K., 1930, Nachträge zur Decapodenfauna des schwäbischen Jura. I. Neue Decapodenfunde aus dem Posidonienschiefer von Holzmaden: *Neues Jahrbuch für Mineralogie, Geologie, und Paläontologie (B)*, v. 64, p. 219–234.
- Breton, G., 2010a, Le contenu paléontologique. Les Crustacés, in Colleté, C., ed., *Stratotype Albien*: Paris, Muséum national d'Histoire naturelle; Mèze, Biotope; Orléans, BRGM, p. 221–230.
- Breton, G., 2010b, Crustacés et Brachiopodes de l'Albien et le contenu paléontologique de l'Albien de l'Aube, in Colleté, C., ed., *Stratotype Albien*: Paris, Muséum national d'Histoire naturelle; Mèze, Biotope; Orléans, BRGM (CD-ROM), p. 1–93.

- Breton, G., Néraudeau, D., and Dépré, E., 2015, Mecochiridae (Crustacea, Decapoda, Glypheidea) de l'Albien et du Cénomani de France: *Annales de Paléontologie*, v. 101, p. 55–64.
- Carter, J., 1886, On the decapod crustaceans of the Oxford Clay: *Quarterly Journal of the Geological Society*, v. 42, p. 542–559.
- Carter, J., 1898, A Contribution to the palaeontology of the decapod Crustacea of England: *The Quarterly Journal of the Geological Society of London*, v. 54, p. 15–44.
- Charbonnier, S., and Gendry, D., 2013, Les crustacés: *Fossiles Revue française de Paléontologie*, v. 4, p. 74–75.
- Charbonnier, S., Garassino, A., Schweigert, G., and Simpson, M., 2013, A worldwide review of fossil and extant glypheid and litogastrid lobsters (Crustacea, Decapoda, Glypheidea): *Mémoires du Muséum national d'Histoire naturelle, Paris*, v. 205, p. 1–304.
- Charbonnier, S., Audo, D., Barriol, V., Garassino, A., Schweigert, G., and Simpson, M., 2015, Phylogeny of fossil and extant glypheid and litogastrid lobsters (Crustacea, Decapoda) as revealed by morphological characters: *Cladistics*, v. 31, p. 231–249.
- Charbonnier, S., Audo, D., Garassino, A., Simpson, M., Gèze, R., and Azar, D., 2021, A new species of mecochirid lobster, *Meyeria libanotica* (Decapoda, Glypheidea), from the Barremian (Early Cretaceous) of Lebanon: *Annales de Paléontologie*, v. 107, n. 102470.
- Charbonnier, S., Gilardet, R., Garassino, A., and Odin, G.P., 2023, A new species of mecochirid lobster from the Late Cretaceous of France, preserved with its eggs: *Geodiversitas*, v. 45, no. 23, p. 681–688.
- Collins, J.S.H., 2002, A taxonomic review of British decapod Crustacea: *Bulletin of the Mizunami Fossil Museum*, v. 29, p. 81–92.
- Collins, J.S.H., and Rasmussen, H.W., 1992, Upper Cretaceous–Lower Tertiary decapod crustaceans from west Greenland: *Grønlands Geologiske Undersøgelse, Bulletin*, v. 162, p. 1–46.
- Dadykin, I.A., and Shmakov, A.S., 2023, New findings of Decapoda (Crustacea) in the Callovian of the Ryazan region (Central European Russia): *Journal of Paleontology*, v. 97, p. 1049–1069.
- Etter, W., 2004, Decapod crustaceans from the Middle Jurassic Opalinus Clay of northern Switzerland, with comments on crustaceans taphonomy: *Eclogae geologicae Helveticae*, v. 97, p. 381–392.
- Feldmann, R.M., and West, R.R., 1978, *Huhatanka*, a new genus of lobster (Decapoda: Mecochiridae) from the Kiowa Formation (Cretaceous: Albian) of Kansas: *Journal of Paleontology*, v. 52, p. 1219–1226.
- Feldmann, R.M., Schweitzer, C.E., and Karasawa, H., 2015, Part R, Revised, Volume 1, Chapter 8I: Systematic descriptions: infraorder Glypheidea: *Treatise Online*, v. 68, <https://doi.org/10.17161/to.v0i0.5028>.
- Förster, R., 1971, Die Mecochiridae, eine spezialisierte Familie der mesozoischen Glypheoidea (Crustacea, Decapoda): *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, v. 137, p. 396–421.
- Förster, R., and von Hillebrandt, A., 1984, Das Kimmeridge des Profeta-Jura in Nordchile mit einer *Mecochirus-Favreina*-Vergesellschaftung (Crustacea, Decapoda – Ichnogenus): *Mitteilungen der Bayerischen Staatssammlung für Paläontologie und Historische Geologie*, v. 24, p. 67–84.
- Franțescu, O.D., Feldmann, R.M., Schweitzer, C.E., Lazăr, I., and Stoica, M., 2018, New lobsters and lobster-like decapods (Crustacea) from the Jurassic and Cretaceous of Romania: *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, v. 287, p. 45–60.
- Garassino, A., 1996, The family Erymididae Van Straelen, 1924 and the superfamily Glypheoidea Zittel, 1885 in the Sinemurian of Osteno in Lombardy (Crustacea, Decapoda): *Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale in Milano*, v. 13, p. 333–373.
- Garassino, A., and Schweigert, G., 2006, The Upper Jurassic Solnhofen decapod crustacean fauna: review of the types from old descriptions. Part I. Infraorders Astacidea, Thalassinidea, and Palinura: *Memorie della Società italiana di Scienze naturali e del Museo civico di Storia naturale di Milano*, v. 34, p. 3–44.
- Garassino, A., Artal, P., and Pasini, G., 2009, *Jabaloya aragonensis* n. gen., n. sp. (Crustacea, Decapoda, Mecochiridae) and *Cedrillosia jurassica* n. gen., n. sp. (Crustacea, Decapoda, Glypheidae) from the Upper Jurassic of Teruel Province (Aragón, Spain): *Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale in Milano*, v. 150, p. 197–206.
- Gendry, D., 2020, Les crustacés fossiles: découvertes d'hier et d'aujourd'hui. Actes du premier colloque de l'APVSM, "Paléontologie et Archéologie en Normandie", 5–6 octobre 2019: *Bulletin de l'Association paléontologique de Villers-sur-Mer*, v. 2020, p. 73–76.
- Germar, E.F., 1827, Über die Versteinerungen von Solenhofen. *Keferstein's Deutschland geognostisch-geologisch dargestellt*, v. 4, p. 89–110.
- Glaessner, M.F., 1929, Crustacea Decapoda, in Pompeckj, J.F., ed., *Fossilium Catalogus, I: Animalia*, Pars 41, p. 1–464.
- Glaessner, M.F., 1960, The fossil decapod Crustacea of New Zealand and the evolution of the order Decapoda: *New Zealand Geological Survey Paleontological Bulletin*, v. 31, p. 3–63.
- Glaessner, M.F., 1969, Decapoda, in Moore R.C., ed., *Treatise on Invertebrate Paleontology*, Part R, Arthropoda 4, Volume 2: Boulder, Colorado, Geological Society of America (and University of Kansas Press), p. R400–R533, R626–R628.
- Hawkesworth, J., 1773, An account of the voyages undertaken by the order of His present Majesty for making discoveries in the Southern Hemisphere and successively performed by Commodore Captain Wallis, Captain Carteret, and Captain Cook, in the Dolphin, the Swallow, and the Endeavour, drawn up from the journals kept by the several commanders, and from the papers of Joseph Banks: London, Strahan, W. and Cadell, T.
- Herrick, E.M., and Schram, F.R., 1978, Malacostracan crustacean fauna from the Sundance Formation (Jurassic) of Wyoming: *American Museum Novitates*, v. 2652, p. 1–12.
- Karasawa, H., Schweitzer, C.E., and Feldmann, R.M., 2013, Phylogeny and systematics of extant and extinct lobsters: *Journal of Crustacean Biology*, v. 33, p. 78–123.
- Kennedy, W.J., Jakobson, M.E., and Johnson, R.T., 1969, A *Favreina-Thalassinoides* association from the Great Oolite of Oxfordshire: *Palaeontology*, v. 12, p. 549–554.
- Krause, P.G., 1891, Die Decapoden des norddeutschen Jura: *Zeitschrift der Deutschen Geologischen Gesellschaft*, v. 43, p. 171–225.
- Lange, W., 1973, Ammoniten und Ostreen (Biostratigraphie, Ökologie, Zoogeographie) des Callovium/Oxfordium-Grenzbereichs im Wiehengebirge: *Münstersche Forschungen zur Geologie und Paläontologie*, v. 27, p. 1–209.
- Latreille, P.A., 1802, *Histoire naturelle, générale et particulière des crustacés et des insectes*. Tome 3: Paris, Dufart, 468 p.
- M'Coy, F., 1849, On the classification of some British fossil Crustacea with notices of new forms in the university collection at Cambridge: *Annals and Magazine of Natural History*, v. 4, p. 161–179, 330–335.
- Oppel, A., 1861, Die Arten der Gattungen Glyphea und Pseudoglyphe: *Jahreshefte des Vereins für Vaterländische Naturkunde in Württemberg*, v. 17, p. 108–111.
- Oppel, A., 1862, Ueber jurassische Crustaceen: *Palaeontologische Mittheilungen aus dem Museum des königlich Bayerischen Staates*, v. 1, p. 1–120.
- Pagani, M.A., Damborenea, S.E., Manceñido, M.O., and Ferrari, S.M., 2011, New early Jurassic decapod crustacean from Patagonia (Chubut province), Argentina: *Palaeontologische Zeitschrift*, v. 85, p. 143–154.
- Pezy, J.-P., and Gendry, D., 2016, A re-examination of the decapod fauna from the Upper Bathonian of Ranville (Calvados, France): *6th Symposium on Mesozoic and Cenozoic Decapod Crustaceans*, June 2016, Villers-sur-Mer, France, <https://doi.org/10.13140/RG.2.1.3700.6966>.
- Phillips, J., 1829, *Illustrations of the Geology of Yorkshire*: York, Thomas Wilson and sons, 192 p.
- Quenstedt, F.A., 1854 [imprint 1850], Ueber *Mecochirus* im braunen Jura bei Gammelshausen und einige andere Krebse: *Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg*, v. 6, p. 186–197.
- Quenstedt, F.A., 1856–1858, *Der Jura*: Tübingen, Laupp, 842 p.
- Robin, N., Charbonnier, S., Merle, D., Simpson, M.I., Petit, G., and Fernandez, S., 2016, Bivalves on mecochirid lobsters from the Aptian of the Isle of Wight: Snapshot on an Early Cretaceous palaeosymbiosis: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 453, p. 10–19.
- Rusconi, C., 1948, Nuevo plesiosaurio, pez y langostas del mar Jurásico de Mendoza: *Revista Museum Historia Natural Mendoza*, v. 11, p. 3–12.
- Schweitzer, C.E., Feldmann, R.M., Garassino, A., Karasawa, H., and Schweigert, G., 2010, Systematic list of fossil decapod crustacean species: *Crustaceana Monographs*, v. 10, p. 1–222.

- Schweitzer, C.E., Feldmann, R.M., and Casadio, S.**, 2022, Revision of Decapoda (Glypheidea, Axiidea) from the Upper Jurassic–Lower Cretaceous of Argentina: *Annals of Carnegie Museum*, v. 87, p. 291–307.
- Scott, R.W.**, 1970, Paleocology and paleontology of the Lower Cretaceous Kiowa Formation, Kansas: *University of Kansas Paleontological Contributions*, v. 52, p. 1–94.
- Sellwood, B.W.**, 1971, A *Thalassinoides* burrow containing the crustacean *Glyphea udressieri* (Meyer) from the Bathonian of Oxfordshire: *Palaeontology*, v. 14, p. 589–591.
- Simpson, M.I., and Middleton, R.**, 1985, Gross morphology and the mode of life of two species of lobster from the Lower Cretaceous of England: *Meyeria ornata* (Phillips) and *Meyerella magna* (M'Coy): *Transactions of the Royal Society of Edinburgh: Earth Sciences*, v. 76, p. 203–215.
- Van Straelen, V.**, 1925, Contribution à l'étude des crustacés décapodes de la période jurassique: *Mémoires de la Classe des Sciences de l'Académie royale de Belgique*, v. 7, p. 1–462.
- Van Straelen, V.**, 1936, Crustacés décapodes nouveaux ou peu connus de l'époque crétacique: *Bulletin du Musée royal d'Histoire naturelle de Belgique*, v. 12, no. 45, p. 1–50.
- Veiga Ferreira, O.**, 1955, Sur la présence du genre *Mecochirus* dans le Crétacé portugais: *Comunicações dos Serviços Geológicos de Portugal*, v. 36, p. 117–122.
- von Meyer, H.**, 1834, Krebse im bunten Sandstein: *Museum Senckenbergianum*, v. 1, p. 293–295.
- von Meyer, H.**, 1835, Briefliche Mittheilungen: Neues Jahrbuch für Mineralogie, Geognosie, *Geologie und Petrefaktenkunde*, v. 1835, p. 328–329.
- von Meyer, H.**, 1841, Briefliche Mittheilungen: Neues Jahrbuch für Mineralogie, Geognosie, *Geologie und Petrefaktenkunde*, v. 1840, p. 96.
- von Meyer, H.**, 1847, *Selenisca* und *Eumorphia*, zwei Krebse aus der Oolithgruppe Württemberg's: *Palaeontographica*, v. 1, p. 141–148.
- von Schlotheim, E.F.**, 1820, *Die Petrefaktenkunde auf dem jetzigen Standpunkte durch die Beschreibung seiner Sammlung versteinierter und fossiler Überreste des Thier- und Pflanzenreichs der Vorwelt erläutert*: Gotha, Becker, 457 p.
- von Schlotheim, E.F.**, 1822, Beiträge zur näheren Bestimmung der versteinerten und fossilen Krebsarten. Nachträge zur Petrefaktenkunde: Gotha, Becker, p. 17–37.
- Winkler, T.C.**, 1881, Étude carcinologique sur les genres "*Pemphix*", "*Glyphea*" et "*Araeosternus*": *Archive du Musée Teyler, Série 2*, v. 1, p. 73–124.
- Woods, H.** 1925–1931, *A Monograph of the Fossil Macrurous Crustacea of England*: London, Palaeontographical Society, 122 p.
- Woodward, H.**, 1863, On a new Macrurous crustacean (*Scapheus ancylochelis*) from the Lias of Lyme Regis: *Quarterly Journal of the Geological Society of London*, v. 19, p. 318–321.
- Woodward, H.**, 1868, Third Report on the Structure and Classification of the Fossil Crustacea. Report of the Thirty-Seventh Meeting of the British Association for the Advancement of Science; held at Dundee in September 1867: London, John Murray, p. 44–47.