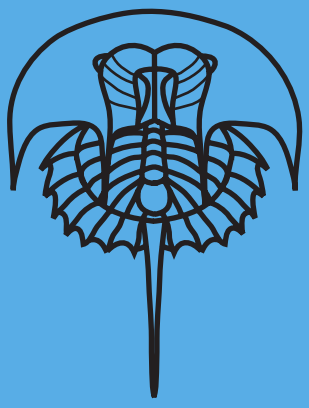

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Part R, Revised, Volume 1: Systematic Descriptions: Suborder Dendrobrachiata

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SYSTEMATIC DESCRIPTIONS: SUBORDER DENDROBRANCHIATA

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Order DECAPODA Latreille, 1802

[Decapoda Latreille, 1802 in 1802–1803, p. 20]

Eucarid malacostracans with first three pairs of thoracic appendages modified as maxillipeds, remaining five pairs forming pereiopods for locomotion, sometimes one or more secondarily lost; usually one or more pairs of pereiopods chelate, usually first pair but sometimes second pair enlarged and stronger; pereiopods mostly without exopods as adults; cephalic appendages include two pairs of antennae, mandibles, and two pairs of maxillae; cephalic and thoracic segments dorsally fused, with carapace enclosing the body dorsally, laterally, and, in dorsoventrally flattened forms, ventrolaterally; pleon usually well developed, terminating in a tail fan formed of uropods and telson, pleon may be reduced and tail fan lost, pleon with paired ventral pleopods, males often with first one or two pairs modified for copulation. [Emended from Davie, 2002, p. 115.] *Upper Devonian* (*Famennian*)*–Holocene.*

Suborder DENDROBRANCHIATA Bate, 1888

[Dendrobranchiata Bate, 1888, p. 217]

Carapace moderately calcified, with rostrum, laterally compressed or cylindrical; eyes stalked, rarely reduced; antennules biramous, with stylocerite; antennae with five segmented peduncle, with scaphocerite; protocephalon composed of ocular plate and epistome; epistome divided by membranous suture; gastric mill well developed; third maxilliped composed of seven segments, pediform; first three pairs of pereiopods usually chelate, generally of similar size; usually five pairs of pereiopods present, sometimes 4 and 5 reduced or absent; pleura of pleonal somite 2 not overlapping that of pleonal somite 1; pleonal somites locked at lateral hinges which are usually exposed in pleonal somites 2, 3, 5, and 6, hidden in somite 4; dendrobranchiate gills; pleopods biramous; first pleopods in males modified into petasma, sometimes with appendix masculina; first pleopods reduced or missing in females, females with thelycum; eggs not carried by females, released directly. [Emended from Pérez Farfante & Kensley, 1997 p. 31; Davie, 2002 p. 116; Tavares & Martin, 2010 p. 100.] *Devonian* (*Famennian*)*–Holocene.*

Superfamily PENAEOIDEA Rafinesque, 1815

[*nom. transl.* Glaessner, 1969, p. 446, *ex* Penedia Rafinesque, 1815, p. 98]

All five pairs of pereiopods well developed; rostrum usually with dorsal rostral spines; carapace with long postrostral carina, hepatic and orbito-antennal groove, antennal spine;

Schweitzer, C. E., R. M. Feldmann, Denis Audo, Sylvain Charbonnier, Alessandro Garassino, Günter Schweigert, & Sergio Sudarsky. 2023. Part R, Revised, Volume 1. Systematic descriptions: Suborder Dendrobrachiata. Treatise Online 174:1–23, 10 fig.

pereiopods 1–3 chelate; at least 11 pairs of gills, pleurobranchs on somite of maxilliped 3, some somites with at least three branchiae on each side; tubercle present on last article of eyestalk; carapace with branchiocardiac keel; pleon with posterior part of pleura overlapping anterior part of succeeding one, pleonal somites 4, 5, and 6 with dorsal carinae, pleonal somite 6 with dorsal posterior spine; telson with lateral movable spines. [Emended from Pérez Farfante & Kensley, 1997, p. 31; Tavares, Serejo, & Martin, 2009, p. 272; Tavares & Martin, 2010, p. 151; Robalino & others, 2016, S2 table.] *Upper Devonian* (*Famennian*)*–Holocene.*

Family ACICULOPODIDAE Feldmann & Schweitzer, 2010

[Aciculopodidae Feldmann & Schweitzer, 2010, p. 630]

Diagnosis as for genus. *Upper Devonian* (*Famennian*).

Aciculopoda Feldmann & Schweitzer, 2010, p. 631 [**A. mapesi,* p. 631, fig. 3; OD]. Carapace laterally compressed, smooth; rostrum axially sulcate, rostral spines absent; pleon with somites 1–5 approximately equal in length, somite 6 longer; telson long, with sharp termination; uropods spatulate; known thoracic appendage flattened, with long, sharp spines oriented at right angles to long axis. [Emended from Feldmann & Schweitzer, 2010, p. 631.] *Upper Devonian* (*Famennian*): USA (Oklahoma).——Fig. 1,*1*. **A. mapesi,* holotype, USNM 540766, scale bar 1 cm (new).

Family AEGERIDAE Burkenroad, 1963

[Aegeridae Burkenroad, 1963, p. 3]

Carapace with long or short rostrum compressed laterally, with one subrostral spine or with several suprarostral and sometimes postrostral spines or no rostral spines at all; hepatic spine present; scaphocerite long; antennular flagella short or long, basal articles not extending anteriorly more than one-third the length of the carapace; antennar flagella long; maxilliped 3 long, usually longer than or as long as pereiopods, with multiple long, thin spines perpendicular to long axis; pereiopods ranging from overall long to overall short; pereiopods 1–3 chelate, may be spinose, 1 to 3 increasing in length posteriorly; pleonal somite 1 overlapping somite 2, somite 1 shorter than other somites; pleura rounded, may be spined or serrate; pleopods with two multiarticulate flagella each; exopodite of uropod with diaresis; telson with at least one pair of movable spines, may have marginal setae distally. [Schweitzer & others, 2014, p. 458.] *Lower Triassic* (*Olenekian*)*–Upper Cretaceous* (*Cenomanian*).

Aeger Münster, 1839, p. 64 [**Macrourites tipularius* Schlotheim, 1822, p. 32, pl. 2,*1*; SD Woods, 1925 in 1925–1931, p. 5]. Rostrum short or long, mostly smooth, sometimes with subrostral spine, usually extending well beyond eye; with postorbital spine; carapace granular; antennular flagella longer than carapace; maxilliped 3 long, with movable spines; pereiopods quite long; pereiopods 1–3 chelate, pereiopods 1 and 2 with movable spines or smooth, pereiopod 3 with short carpus and long manus, chela long and spinose or smooth; pereiopods 4 and 5 achelate; pleonal somite 1 very short; pleopods long, multiarticulate distally. *Middle Triassic–Upper Cretaceous. Middle Triassic* (*Anisian*): China (Yunnan). *Middle Triassic:* Germany. *Upper Triassic* (*Carnian*): Austria. *Upper Triassic* (*Rhaetian*): UK (England). *Lower Jurassic* (*Sinemurian*): Italy, UK (England). *Lower Jurassic* (*Toarcian*): Germany. *Middle Jurassic* (*Callovian*): France. *Upper Jurassic* (*Kimmeridgian–Tithonian*): Germany. *Lower–Upper Cretaceous* (*Albian–Cenomanian*): Mexico (Hidalgo). *Upper Cretaceous* (*Cenomanian, Santonian*): Lebanon.——Fig. 1,*2*. **A. tipularius* (Schlotheim), Tithonian, Germany, scale bar 1 cm (new).

Acanthochirana Strand, 1928, p. 40 [**Udora cordata* Münster, 1839, p. 70, pl. 27,*3–4;* SD Glaessner, 1929, p. 49; replacement name for *Acanthochirus* Oppel, 1862, p. 97 (type, *Udora cordata,* as cited above)]. Carapace with a very long, entire rostrum; postorbital spine present; cervical groove with adjacent hepatic spine; long, oblique branchiocardiac groove; well-defined orbital notch; maxilliped 3 smooth and slightly longer than pereiopods; pereiopods 1–3 with moderate sized chelae; pleonal somite 1 narrower and shorter than somite 2, with a strong anteriorly incurved ventral termination; somite 3 highest, triangular; somites 5 and 6 with lateral keel; uropodal exopod with diaeresis. [Emended from Smith & others 2022, p. 1238.] *Upper Triassic–Upper Cretaceous. Upper Triassic* (*Norian*): Italy. *Lower Jurassic* (*Toarcian*): Germany. *Middle Jurassic* (*Bajocian–Bathonian*): Italy. *Upper Jurassic* (*Tithonian*): Germany. *Upper Cretaceous* (*Cenomanian*): Lebanon.——Fig. 1,*3*. **A. cordata* (Münster), lectotype, BSPG AS VII 706, Tithonian, Germany, scale bar 1 cm (new).

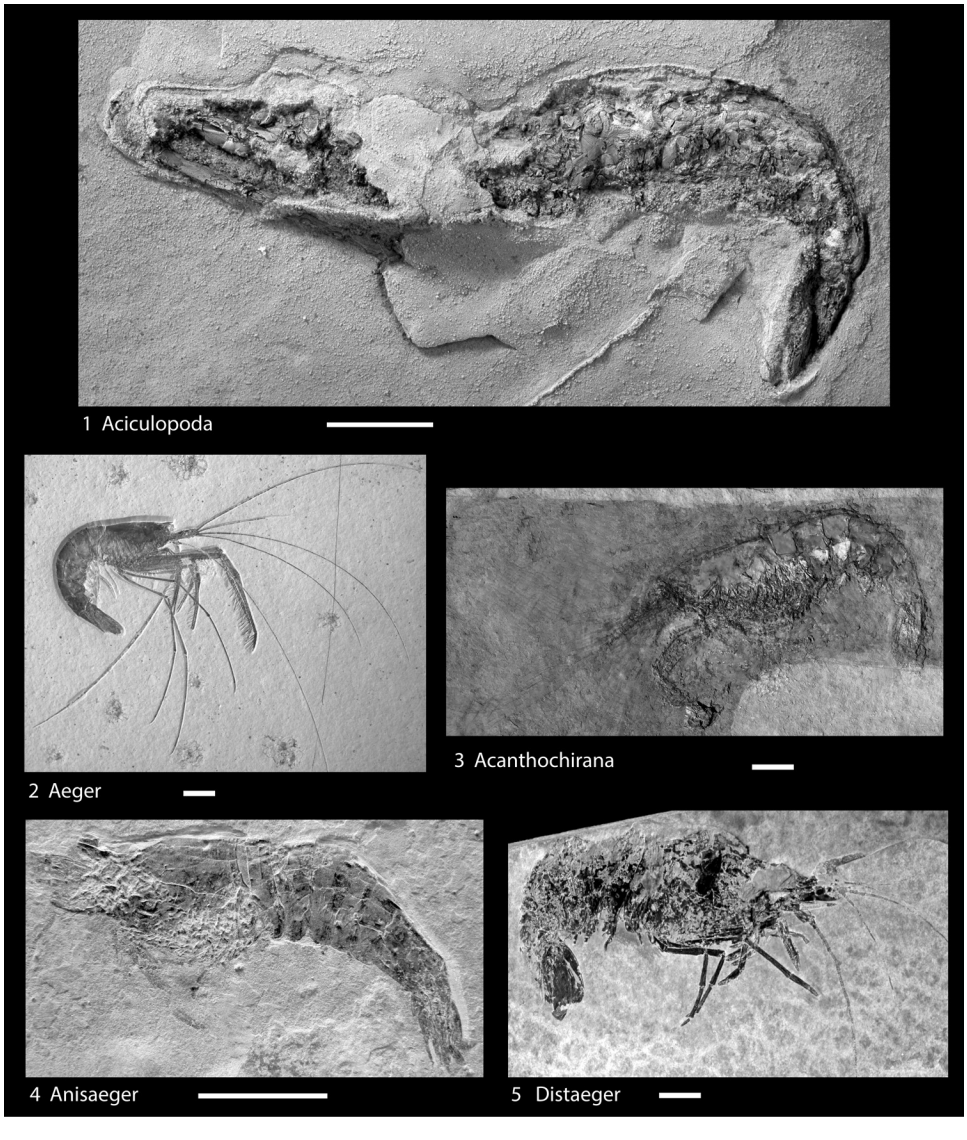

Fig 1. Aciculopodidae, Aegeridae (p. 2–4).

Anisaeger Schweitzer, Feldmann, Hu, Huang, Zhou, Zhang, Wen, & Xie, 2014, p. 459 [**A. brevirostrus,* p. 461, fig. 3–7; OD]. Carapace small to moderate size, laterally compressed; rostrum short, upturned, and lacking spines to long, upturned, and bearing suprarostral and subrostral spines; pleon with smooth terga and generally rounded pleural terminations; somites 5 and 6 axially keeled; telson sharply pointed, with or without articulated spines; uropodal exopod without diaeresis; maxilliped 3 relatively short, setose or spinose; pereiopods generally short; pereiopods 1–3 with small chelae; pleopods with a pair of annulated terminal processes. [Emended from Schweitzer & others, 2014, p. 459.] *Lower Triassic* (*Olenekian*): USA (Idaho, Nevada). *Middle Triassic* (*Anisian*): China (Yunnan), France.——Fig. 1,*4*. **A. brevirostrus,* holotype, LPI-41833, Anisian, China, scale bar 1 cm (new).

Distaeger Schweitzer, Feldmann, Hu, Huang, Zhou, Zhang, Wen, & Xie, 2014, p. 467 [**D. prodigiosus,* p. 467, fig. 10–11; OD]. Carapace longer than high; rostrum very long, 40% length of carapace, with one basal suprarostral spine

and one subrostral spine at midlength; uropodal exopod with diaeresis; ventral lateral margins of telson with setal pits, appearing to extend entire length of telson; maxilliped 3 approximately as long as pereiopods 1 and 2; pereiopods 1–3 chelate, pereiopod 3 longest, 4 and 5 longer than 1 and 2, pereiopods without spines; pleopods apparently with multiarticulate flagella.[Schweitzer & others, 2014, p. 467.] *Middle Triassic* (*Anisian*): China (Yunnan).——Fig. 1,*5*. **D. prodigiosus,* holotype LPI-41666A, scale bar 1 cm (new).

Family ARISTEIDAE Wood-Mason in Wood-Mason & Alcock, 1891

[*nom. correct. pro* Aristaeina Wood-Mason in Wood-Mason & Alcock, 1891, p. 278, ICZN, Opinion 864, 1969]

Rostrum often sexually dimorphic, elongate in females and juvenile males, short in adult males, usually with three dorsal rostral/postrostral spines and no subrostral spines; carapace without postorbital and pterygostomial spines; always with antennal and branchiostegal spines; rarely with postantennal spine and hepatic spines; sometimes with cervical and postcervical grooves, usually reaching midline if present, or may be very faint and visible only laterally; pleonal somite 3 sometimes with longitudinal carinae, pleonal somites 4–6 always with longitudinal carinae along axis; telson acute, with three or four pairs of movable lateral spines; pereiopods 1–3 chelate; antenna l peduncle may be elongate; pleopods 3–5 biramous. [Emended from Davie, 2002, p. 117.] *Holocene.*

Aristeus Duvernoy, 1840, p. 217 [**Penaeus antennatus* Risso, 1816, p. 96, pl. 2,*6;* OD]. Cuticle smooth or setose; rostrum elongate in females and juvenile males, extending well beyond antennular peduncle, rostrum short in adult males, with two dorsal spines and one postrostral spine; carapace with antennal and branchiostegal spines which each extend into a carina; orbital, postantennal and hepatic spines absent; postrostral carina present, variable in length; cervical groove weak or only visible ventrolaterally; hepatic groove weak; branchiocardiac groove well defined; branchiocardiac carina weak; pleonal somites 2 and 3 with or without carina; carina of somites 6 only present posteriorly; telson with four pairs of movable spines; photophores on pereiopods. [Emended from Pérez-Farfante & Kensley, 1997, p. 32.] *Holocene:* Atlantic Ocean, Indo-Pacific Ocean, Hawaii.——Fig. 2,*1*. *A. antillensis* A. Milne Edwards & Bouvier, 1909, MNHN-IU-2013-18791, Holocene, Caribbean Sea, scale unknown (photo by L. Corbari, MNHN).

Family BENTHESICYMIDAE Wood-Mason in Wood-Mason & Alcock, 1891

[*nom. correct. pro* Benthesicymina Wood-Mason in Wood-Mason & Alcock, 1891, p. 286; ICZN, Opinion 864, 1969]

Cuticle thin, flexible; short rostrum, compressed, forming a crest extending short distance onto dorsal carapace, not extending beyond eyes, three or fewer rostral/postrostral spines, subrostral spines absent; carapace with branchiostegal spine; hepatic spine may be present or absent; postorbital and postantennal spines absent; cervical groove and postcervical grooves present, reaching middorsal line; branchiocardiac and hepatic grooves usually strongly marked; pleonal somites may have carinae, sometimes with a posterior spine; telson usually blunt-tipped, with one to four pairs of lateral movable spines; pereiopods 1–3 with small, thin chelae; pleopods with long flagella. [Emended from Pérez Farfante & Kensley, 1997, p. 56.] *Upper Cretaceous* (*Santonian*)–*Holocene*.

Benthesicymus Bate, 1881, p. 190 [**B. crenatus;* SD Bate, 1888, p. 320]. Carapace thin; short rostrum, barely extending to eye, triangular, compressed, forming a weak crest, with two suprarostral spines; cervical, postcervical, hepatic, and branchiocardiac grooves well-developed; branchiostegal spine sometimes extending as ridge onto carapace; hepatic spine may be present; pleonal somites 4–6 with dorsal keel; telson with four pairs of movable spines, tip sharp. [Emended from Pérez Farfante & Kensley, 1997, p. 59.] *Holocene:* Australia, Indo-Pacific Ocean, eastern Atlantic Ocean.——Fig. 2,*2*. *Benthesiscymus* sp., USNM 1431069, Holocene, French Polynesia, scale unknown (photo by G. Paulay, USNM).

Bentheogennema Burkenroad, 1936, p. 56 [**Gennadas intermedius* Bate, 1888, p. 343; OD]. Carapace cuticle thin; rostrum short, not extending beyond eyestalk, extending as weak crest onto dorsal carapace, with one suprarostral spine, one postrostral spine sometimes present; hepatic spine absent; branchiostegal spine present on marked recession of anterior margin; carapace grooves sometimes with carinae parallel to them; pleonal somite 6 with dorsal keel; telson, blunt tipped, unarmed or with one to four pairs of movable lateral spines. [Emended from Pérez Farfante & Kensley, 1997, p. 57.] ?*Upper Cretaceous* (*Santonian*): Lebanon (based upon very incomplete

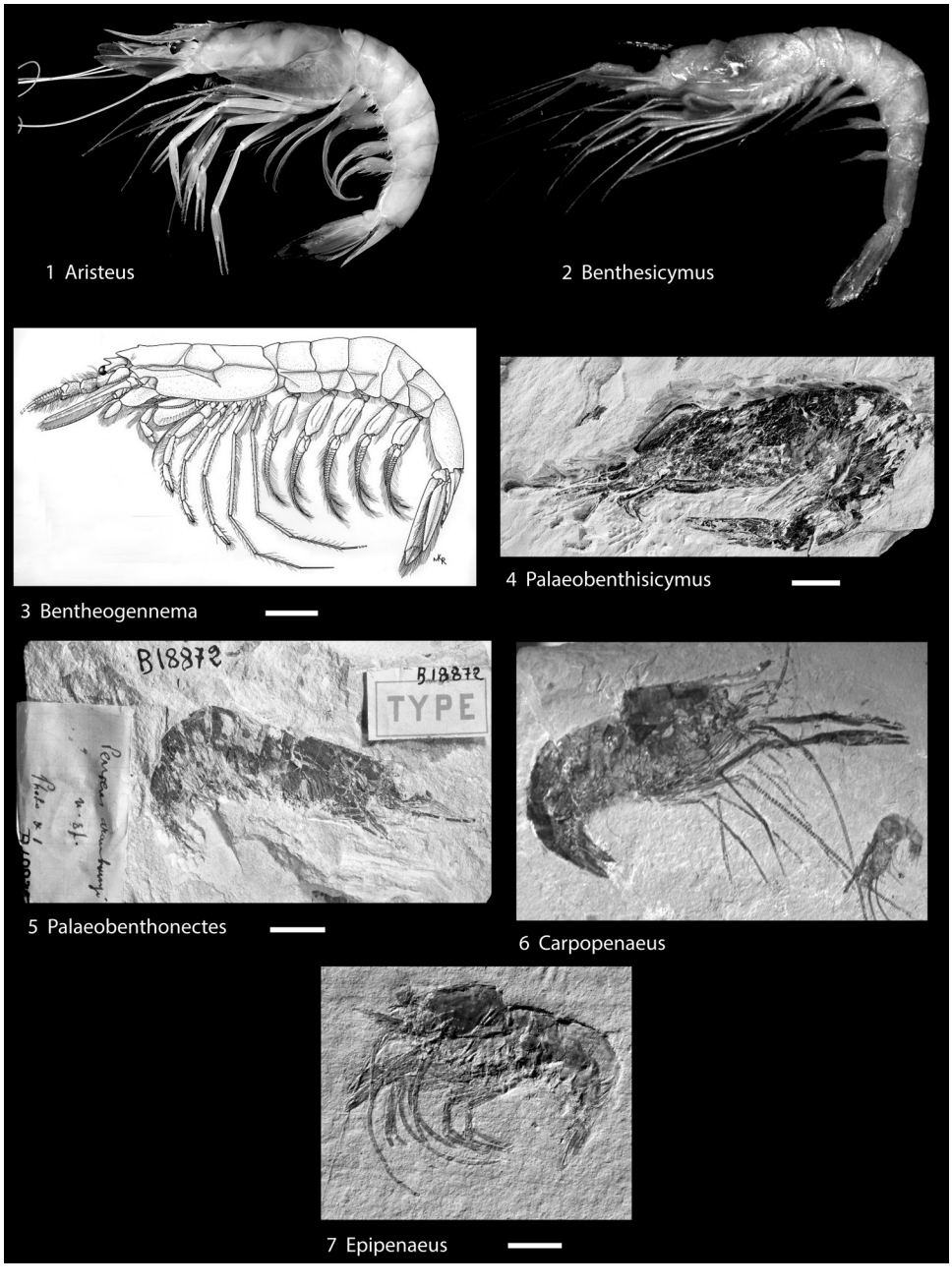

Fig 2. Aristeidae, Benthesicymidae, Carpopenaeidae (p. 4–6).

single specimen). *Holocene:* Pacific Ocean, Indian Ocean.——Fig. 2,*3*. **B. intermedia* (Bate), USNM 1202456, Holocene, North Atlantic Ocean, scale bar 1 cm (drawing from USNM, EZID).

Palaeobenthesicymus Audo & Charbonnier, 2013, p. 340 [**P. libanensis* Brocchi, 1875, p. 609, pl. 21; OD]. Carapace longer than high, with very short rostrum extending as marked crest extending

onto dorsal carapace, crest highest posteriorly; eyes bilobed; cervical, hepatic, and branchiocardiac grooves present; at least one pair of chelae, preserved chelae possess long, slender fingers, fingers at least as long as manus. *Upper Cretaceous* (*Santonian*): Lebanon.——Fig. 2,*4*. **P. libanensis,* neotype, MNHN.F.A30593, scale unknown (photo by C. Lemzaouda, Project RECOLNAT, MNHN).

Palaeobenthonectes Charbonnier, Audo, Garassino, & Hyžný, 2017, p. 46 [**Penaeus arambourgi* Roger, 1946, p. 27,*18*, pl. 9,*8–9;* OD]. Carapace approximately twice as long as high; rostrum extending almost as far anteriorly as eye, with five suprarostral spines not forming a crest; cervical, postcervical, hepatic, and branchiocardiac grooves present; deep branchiocardiac groove paralleled by carinae; eyes bilobate. [Emended from Charbonnier & others, 2017. p. 46.] *Upper Cretaceous* (*Santonian*): Lebanon.——Fig. 2,*5*. **P. arambourgi* (Roger), lectotype, MNHN.F.B18872, scale bar 1 cm (photo by D. Audo, Project RECOLNAT, MNHN).

Family CARPOPENAEIDAE Garassino, 1994

[Carpopenaeidae Garassino, 1994, p. 13]

Carapace approximately as long as high, with at least one longitudinal carinae, epigastric spine usually present; long upturned rostrum with at least one suprarostral spine; maxilliped 3 well developed; pereiopod 1 very long, merus and carpus very long, chelate; pereiopod 2 with multiarticulate carpus; pereiopods 2 and 3 chelate; pereiopods 4 and 5 long, well developed; exopod of uropod with diaresis; antennular flagellum long. [Emended from Charbonnier & others, 2017, p. 51.] *Upper Jurassic* (*Tithonian*)–*Upper Cretaceous* (*Santonian*).

Carpopenaeus Glaessner, 1945, p. 698 [**C. callirostris,* p. 698, pl. 8,*2,* text-fig. 2; OD, =*Pseudastacus dubertreti* Roger, 1946, p. 40, pl. 5,*3*]. Carapace about as long as high, with one or two longitudinal carinae; epigastric spine usually present; rostrum long, upturned distally, with suprarostral spines and at least one subrostral spine; pereiopod 1 with large chelae; other pereiopods long, slender. [Emended from Charbonnier & others, 2017, p. 52.]. *Upper Cretaceous* (*Cenomanian*, *Santonian*): Lebanon.——Fig. 2,*6*. **C. callirostris,* G.2013.45.1, Cenomanian, Lebanon, scale unknown (new).

Epipenaeus Charbonnier, Audo, Garassino, & Hyžný, 2017, p. 65 [**Carpopenaeus peterbuergeri* Schweigert & Garassino, 2005, p. 493, fig. 2, 3; OD]. Carapace not much longer than high, with one longitudinal carina, epigastric spine strong; rostrum upturned, short, with one suprarostral spine; antennae stout; pereiopod 1 with elongate chela; pereiopods 2 and with multiarticulate carpus, pereiopod 2 longer than 3; pereiopods 4 and 5 slender, achelate. [Emended from Charbonnier & others, 2017, p. 66.] *Upper Jurassic–Upper Cretaceous. Upper Jurassic* (*Tithonian*): Germany. *Upper Cretaceous* (*Cenomanian*): Lebanon.——Fig. 2,*7*. **E. peterbuergeri,* holotype SMNS 65543, Tithonian, Germany, scale bar 1 cm (new).

Family PENAEIDAE Rafinesque, 1815

[*nom. corr. pro* Penedia Rafinesque, 1815, p. 98; ICZN, Direction 15, 1955, p. 70]

Carapace compressed; rostrum well developed, extending up to or beyond eye, sometimes extending beyond antennal peduncle, with five to eleven suprarostral (and sometimes with subrostral) spines; carapace without postorbital spine, usually with antennal and hepatic spines; cervical groove usually ending ventral to dorsal midline; rounded pterygostomial angle; pereiopods 1–3 chelate; posterior pleonal somites with longitudinal carinae; telson with deep median sulcus, sharp, with or without lateral spines or setae. [Emended from Davie, 2002, p. 130; Tavares & Martin, 2010, p. 153.] *Lower Triassic* (*Induan–Olenekian*)–*Holocene*.

Penaeus Fabricius, 1798, p. 385, 408 (ICZN, Opinion 104, 1928, p. 27) [**P. monodon*, p. 408; SD Latreille, 1810, p. 422] [=*Pseudocrangon* Schlüter, 1862, p. 737 (type, *Palaemon tenuicaudus* von der Marck, 1858, p. 258, pl. 6,*2*; M); =*Machaerophorus* von der Marck, 1863, p. 74 (type, *Machaerophorus spectabilis*, p. 74, pl. 14,*5*; source of synonymy Glaessner, 1969)]. Cuticle smooth; rostrum with suprarostral and 2–5 subrostral teeth, extending to midlength of second antennular segment; cervical groove shallow; post-rostral carinae long, reaching posterior margin of carapace; hepatic and antennal spines pronounced, pterygostomial angle rounded; adrostral carina and groove short; gastro-orbital carina short; orbito-antennal groove deep; third pleonal somite with 3 cicatrices; telson unarmed. [Emended from Pérez-Farfante & Kensley, 1997, p. 130.] *Lower Cretaceous* (*Hauterivian–Aptian*): Italy. *Upper Cretaceous* (*Coniacian–Maastrichtian*): Germany. *Maastrichtian:* Tennessee, USA. *Paleocene*: Denmark, India. *Eocene* (*Ypresian*): Italy. *Eocene*: India, Turkey. *Oligocene*: Italy. *Miocene*: Ecuador. *Holocene:* Cosmopolitan.——Fig. 3,*1*. **P. brasiliensis* Latreille, 1817, MNHN-IU-2013-2430, Holocene, French Guiana (photo by L. Corbari, MNHN).

Albertoppelia Schweigert & Garassino, 2004, p. 3 [**A. kuempeli,* p. 3, fig. 1–2; OD]. Rostrum extending beyond eye and antennular peduncle,

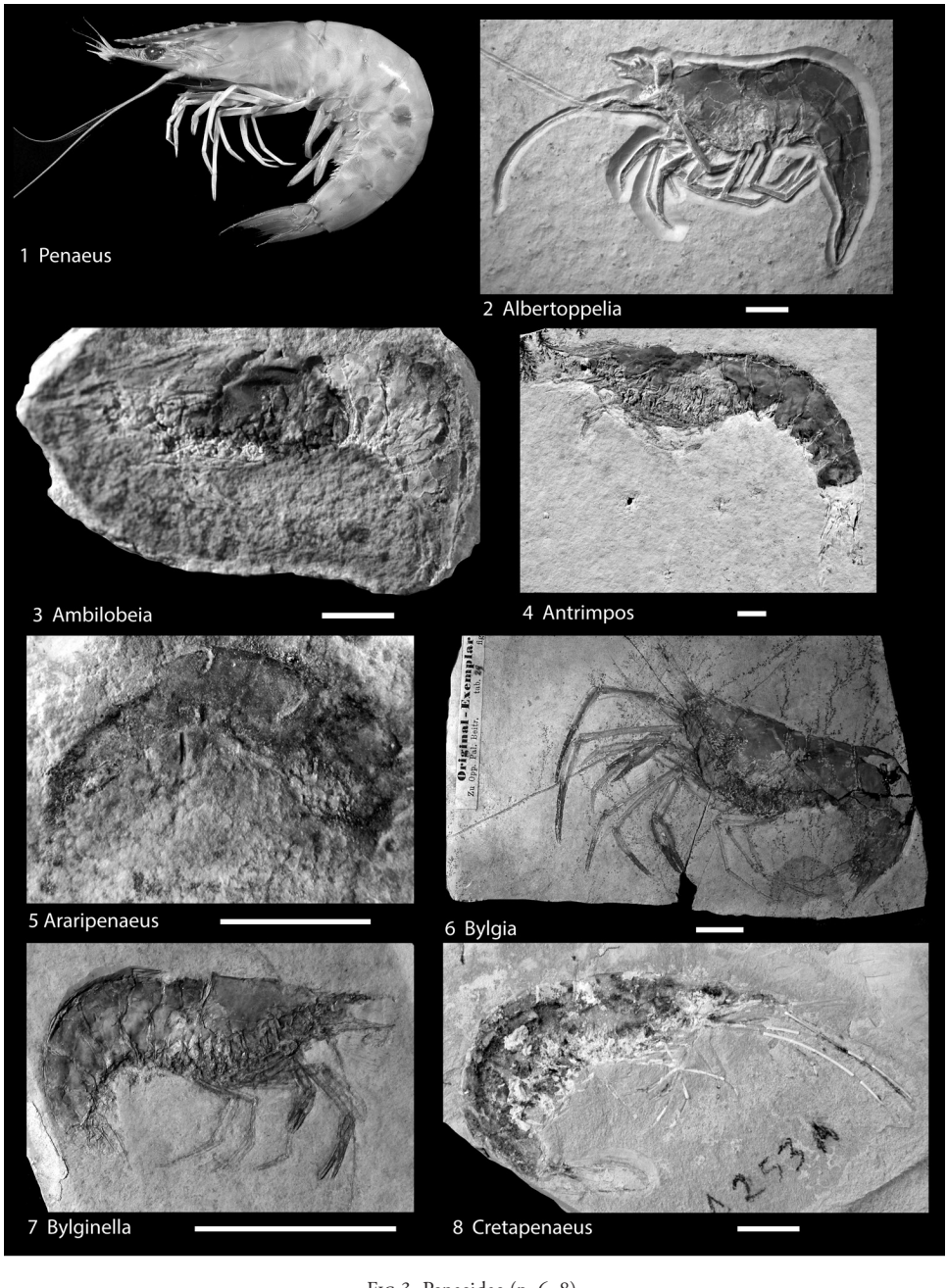

Fig 3. Penaeidae (p. 6–8).

with up to five suprarostral and up to two subrostral spines; up to two postrostral spines present; carapace smooth, height generally three-quarters of length (not including rostrum); pereiopods 1–3 chelate; pereiopods 1–3 progressively increasing in length; pereiopod 1 most robust; maxilliped 3 setose. [Emended from Sudarsky, 2016, p. 18.] *Upper Jurassic* (*Tithonian*): Germany——Fig. 3,*2*. **A. kuempeli,* holotype SMNS 64945, scale bar 1 cm (new).

Ambilobeia Garassino & Pasini, 2002, p. 99 [**A. karojoi,* p. 99, fig. 3–4; OD]. Carapace rounded, rostrum very long, without supra- and subrostral spines, with a large spine at base of rostrum; pereiopods short; pleon short, somites high; pleonal somite 6 elongate. *Lower Triassic* (*Olenekian*)*:* Madagascar.——Fig. 3,*3*. **A. karojoi,* holotype, MSNM i25459, scale bar 1 cm (new).

Antrimpos Münster, 1839, p. 49 [**A. speciosus* Münster, 1839, p. 50, pl. 14,2–3, pl. 17a–17b, fig.1a–c; SD Woods, 1925 in 1925–1931, p. 2]. Carapace highest posteriorly; rostrum with several suprarostral spines and one subrostral spine; several postrostral spines and epigastric spine present; maxilliped 3 possibly with short spines; antennae up to twice length of body; pereiopods 1–3 chelate, 3 stoutest and longest. *Lower Triassic–Upper Jurassic. Lower Triassic* (*Olenekian*): UK (England). *Upper Triassic–Upper Jurassic. Upper Triassic:* Italy. *Upper Jurassic* (*Kimmeridgian–Tithonian*): Germany. *Upper Jurassic* (*Tithonian*): France, Germany.——Fig. 3,*4*. **A. speciosus,* MNHN.F.A33504, Tithonian, Germany, scale bar 1 cm (photo by C. Lemzaouda & P. Loubry, Project RECOLNAT, MNHN).

Araripenaeus Pinheiro, Saraiva, & Santana, 2014, p. 666 [**A. timidus,* fig. 4A–B; OD]. Pleon with six preserved somites, none with spines; somite 6 with sinuous cicatrix, twice as long as other somites. *Lower Cretaceous* (*Albian*): Brazil.——Fig. 3,*5*. **A. timidus,* holotype, MCNHBJ 339, scale bar 1 cm (photo by A. Pinheiro, Universidad Regional do Carira, Crato, Brazil).

Bylgia Münster, 1839, p. 56 [**B. spinosa* Münster, 1839, p. 57, pl. 21,*1;* SD Oppel, 1862, p. 100]. Carapace short, highest posteriorly; rostrum long, upturned, extending beyond eyes and antennular peduncle, with six to nine suprarostral spines and up to four subrostral spines; pereiopods 1–3 chelate, progressively increasing in length; pereiopod 3 longest; pereiopod 1 generally most robust; pereiopod 1 chela occasionally bulbous; maxilliped 3 adorned with thick grooming setae; pleonal somite 6 higher than long; exopod of uropods with diaresis; tail fan unarmed. [Emended from Sudarsky, 2016, p. 23.] *Upper Jurassic* (*Kimmeridgian–Tithonian*): Germany.——Fig. 3,*6*. **B. spinosa,* holotype, BSPG AS VII 713, scale bar 1 cm (new).

Bylginella Schweigert, Garassino, & Pasini, 2016, p. 12 [**Bylgia hexadon* Münster, 1839, p. 56, pl. 13,*2;* OD]. Carapace short; rostrum long, straight, with several suprarostral spines and one subrostral spine, extending beyond eyes approximately to distal end of antennular peduncle; pereiopods 1–3 chelate, progressively increasing in length; pereiopod 3 longest; pereiopod 1 generally most robust; pleonal somites short, high, somites 1–3 largest and highest; exopod of uropods with diaresis, telson and uropods unarmed. *Upper Jurassic* (*Tithonian*): Germany.——Fig. 3,*7*. **B. hexadon* (Münster), holotype BSPG AS VII 714, scale bar 1 cm (new).

Cretapenaeus Garassino, Pasini, & Dutheil, 2006, p. 10 [**C. berberus*, p. 10, fig. 7–11; OD]. Rostrum extending beyond eye, with suprarostral spines; scaphocerite extending beyond rostrum; all pereiopods long, very slender, appearing to be approximately equal in length; cervical groove weak; antennae and antennules moderately long; exopod of uropod with longitudinal keel, much longer than telson. *Upper Cretaceous* (*Cenomanian*): Morocco.——Fig. 3,*8*. **C. berberus,* holotype, MNHN.F.A24633, scale bar 1 cm (new).

Drobna Münster, 1839, p. 58 [**D. deformis*, p. 58, pl. 20,*2*; SD Glaessner, 1929, p. 138]. Rostrum high, forming a distinctive crest-like structure extending onto dorsal carapace, with several suprarostral spines and postrostral spines, crest becoming higher posteriorly; carapace with hepatic, pterygostomian and branchiocardiac spines as well as branchiocardiac crest; carapace height three-fourths its length; pereiopods unadorned; pereiopods 1–3 chelate, progressively increasing in length; pereiopod 3 longest, pereiopod 1 most robust; pleonal somite 1 narrowest, pleura terminations sharp; exopod of uropod with diaresis; telson and uropods unarmed. [Emended from Sudarsky, 2016, p. 24.] *Upper Jurassic* (*Tithonian*): Germany.——Fig. 4,*1*. **D. deformis,* holotype, BSPG AS VII 716, scale bar 1 cm (new).

Dusa Münster, 1839, p. 71 [**D. monocera* Münster, 1839, p. 71, pl. 20, fig. 3; SD Glaessner, 1929, p. 144] [=*Palaeodusa* Pinna, 1974, p. 21 (type, *P. longipes,* M)]. Rostrum extending beyond eyes but not antennular peduncle, ornamentation variable, always with six to nine suprarostral spines and occasionally up to four subrostral spines; more than four postrostral spines present; carapace ornamentation variable, with pterygostomian spine, shape quadrate to elongate; pereiopods unadorned, first three chelate, progressively increasing in length and robustness, manus bulbous and fingers strongly curved towards each other; pereiopod 3 longest; pleonal somite 1 narrowest, ventral serrations present on pleura; exopod of uropod with diaresis, telson armed with lateral and terminal spines. *Upper Triassic* (*Norian*): Italy. *Upper Jurassic* (*Kimmeridgian–Tithonian*): Germany.——Fig. 4,*2*. **D. monocera,* BSPG AS I 966, Tithonian, Germany, scale bar 1 cm (new).

Eystaettia Schweigert, Garassino, & Pasini, 2016, p. 13 [**Penaeus intermedius* Oppel, 1862, p. 95, pl. 26, fig. 4; OD]. Rostrum not extending beyond eyes, with up to nine suprarostral spines, one or two epigastric spines; carapace unornamented; pereiopods 1–3 chelate, progressively increasing in length; manus longer than fingers; pereiopod 3 longest; uropods setose, exopods diaresis, telson bearing several lateral and terminal setae; males with petasma. *Upper Jurassic* (*Tithonian*): Germany.——Fig. 4,*3*. **E. intermedia* (Oppel), RFC Wintershof 9, scale bar 1 cm (new).

Franconipenaeus Schweigert, Garassino, & Pasini, 2016, p. 16 [**Penaeus meyeri* Oppel, 1862, p. 96, pl. 26,*2–3;* OD]. Antennae very long, much

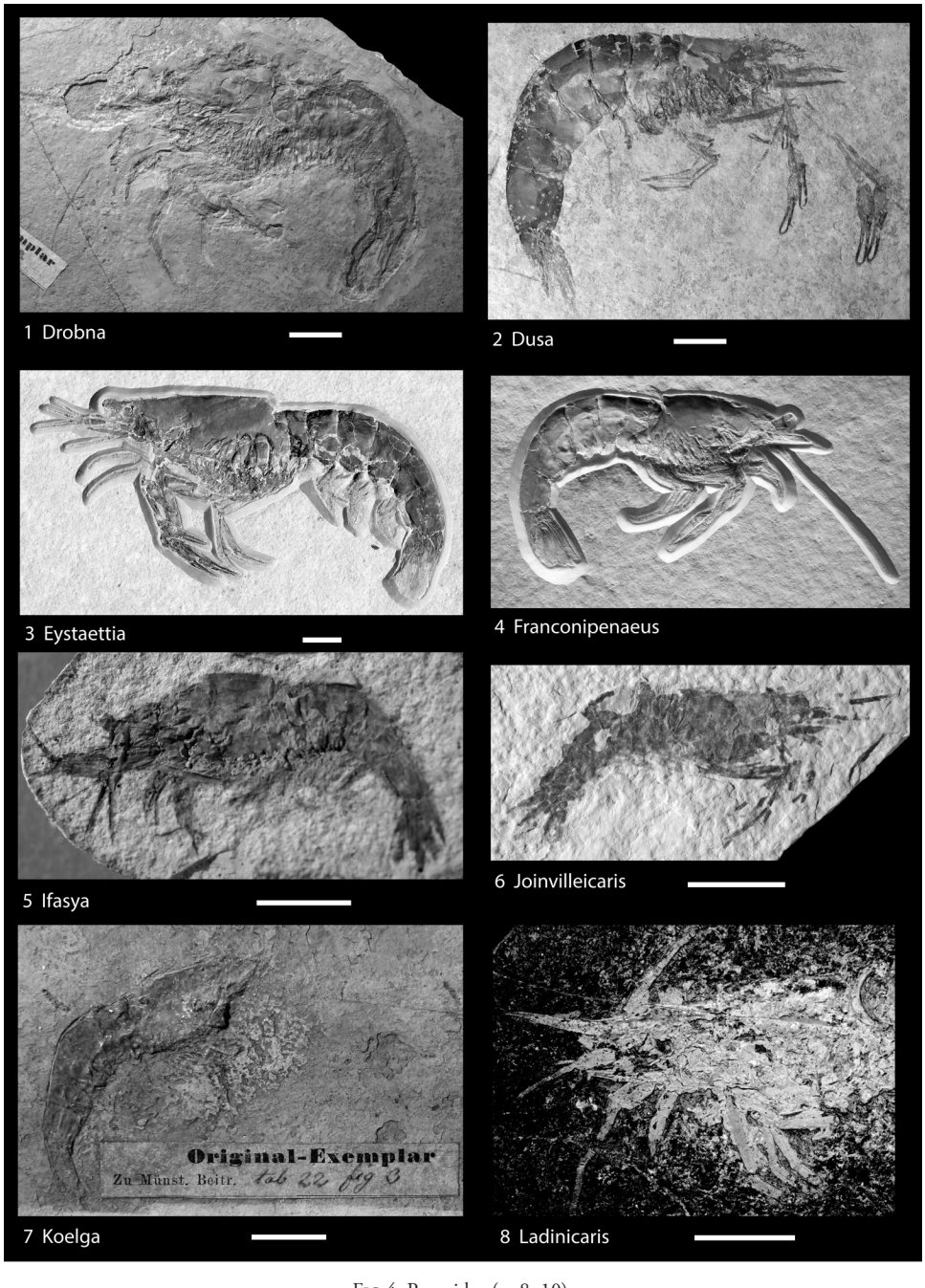

Fig 4. Penaeidae (p. 8–10).

longer than body; rostrum very short, serrate upper margin, serrations extending onto carapace as epigastric spines; carapace with hepatic spine; pereiopods 1–3 chelate, progressively increasing in length, pereiopod 3 longest, pereiopods 1–2 most robust; maxilliped 3 spinose; uropods setose, exopods with diaresis; telson unarmed; pleopods long, male with petasma. *Upper Jurassic* (*Tithonian*): Germany.——Fig. 4,*4*. **F. meyeri* (Oppel), RFC, scale unknown (new).

Ifasya Garassino & Teruzzi, 1995, p. 91 [**I. straeleni,* p. 92, fig. 5–7, 10–16; OD]. Rostrum long, may have subrostral spine, strong crest at base of rostrum; deep hepatic groove and weak branchiocardiac groove, branchiocardiac terminating well anterior to posterior margin; gastro-orbital, hepatic and branchiocardiac spines present; at least two pairs of chelate pereiopods, one much longer, manus long, weakly inflated, fingers very long, posteriormost pereiopods shorter and more slender than anterior; pleonal somite 6 much longer than other somites; telson sharp. [Emended from Garassino & Teruzzi, 1995, p. 91.] *Lower Triassic* (*Induan–Olenekian*): Madagascar.——Fig. 4,*5*. **I. straeleni,* paratype, MSNM i9317, scale bar 1 cm (new).

Joinvilleicaris Charbonnier, Audo, Garassino, & Hyžný, 2017, p. 91 [**J. longirostris,* p. 92, fig. 195–196; OD]. Rostrum very long, reaching well beyond antennal peduncle, with basal suprarostral spines and distal subrostral spines; epigastric and hepatic spines present; pereiopod 3 chelate; uropodal exopod with diaresis. [Emended from Charbonnier & others, 2017, p. 91.] *Upper Cretaceous* (*Cenomanian*): Lebanon.——Fig. 4,*6*. **J. longirostris,* MSNM i26588, scale bar 1 cm (new; photo by G. Teruzzi, Museo Civico di Storia Naturale di Milano, Italy).

Koelga Münster, 1839, p. 60 [**K. curvirostris,* p. 63, pl. 22,*3;* SD Schweigert & Garassino, 2004, p. 12]. Rostrum extending beyond eyes but not antennular peduncle, curved or straight, ornamentation variable, always including supraostral spines; carapace generally unadorned, sometimes with branchiostegal, postantennal or pterygostomian spines; carapace generally approximately half as high as long; pereiopods 1–3 generally chelate, unarmed and progressively increasing in length, pereiopod 3 longest and stoutest; pleonal somite 1 sometimes narrower than the rest, pleonal somite 6 with posterior axial spine; uropodal exopods setose in some species, exopods with diaresis, telson usually unarmed. [Emended from Sudarsky, 2016, p. 28.] *Upper Jurassic* (*Tithonian*): Germany.——Fig. 4,*7*. **K. curvirostris,* holotype, BSPG AS VII 727, scale bar 1 cm (new).

Ladinicaris Pasini, Garassino, Stockar, & Magnani, 2022, p. 343 [**L. sceltrichensis;* OD]. Rostrum very long and stout, one suprarostral spine at base, one ventral rostral spine; antennae robust for group; maxillipeds 3 short, stouter than pereiopods. *Middle Triassic* (*Ladinian*): Switzerland. *Upper Triassic* (*Norian*): Italy.——Fig. 4,*8*. **L. sceltrichensis,* holotype, MCSN 8612, Ladinian, Switzerland, scale bar 1 cm (Pasini & others, 2022, fig. 5A).

Libanocaris Garassino, 1994, p. 9 [**L. rogeri,* p. 9, pl. 2,*4*, pl. 3,*1–2*, text-fig. 8–9; OD]. Carapace and pleonal somites high; rostrum extending beyond eyes, with suprarostral spines and several postrostral spines, one epigastric spine; at least one pair of pereiopods long, chelate; somite 2 with rounded pleura overlapping those of somite 1 and 3. [Emended from Charbonnier & others, 2017, p. 79.] *Upper Jurassic–Upper Cretaceous. Upper Jurassic* (*Tithonian*): Germany. *Upper Cretaceous* (*Cenomanian–Santonian*): Lebanon.——Fig. 5,*1*. *L. curvirostra* Charbonnier, Audo, Garassino, & Hyžný, 2017, holotype, MNHN.F.B18888, Santonian, Lebanon, scale bar 1 cm (photo by D. Audo, Project RECOLNAT, MNHN).

Longichela Garassino & Teruzzi, 1993, p. 5 [**L. orobica,* p. 5, pl. 1,*1–2;* OD]. Carapace longer than high; rostrum moderate in length, with numerous tiny suprarostral spines extending onto dorsal carapace as low crest of postrostral spines; at least two pairs of chelate pereiopods, increasing in size posteriorly, with long merus and carpus, pereiopod 1 apparently shortest; chelae with bulbous manus, fingers very long, slender; triangular telson; pleopods with stout basal articles and multiarticulate flagella. *Upper Triassic* (*Norian–Rhaetian*): Italy.——Fig. 5,*2*. **L. orobica,* holotype MSNM i10738, scale bar 1 cm (new).

Macropenaeus Garassino, 1994, p. 7 [**Penaeus incertus* Roger, 1946, p. 28, fig. 19, pl. 1,*5*; OD]. Rostrum long, upturned with five suprarostral spines; proximal suprarostral spines large and strong, distal suprarostral spines small; epigastric spine present; pereiopods 1–3 chelate; uropodal exopod with diaeresis. [Emended from Charbonnier & others, 2017, p. 86.] ?*Lower Cretaceous* (*Barremian*): Tunisia. *Upper Cretaceous* (*Cenomanian*): Lebanon.——Fig. 5,*3*. **M. incertus* (Roger), MSNM i12148, Cenomanian, Lebanon, scale bar 1 cm (new).

Microchela Garassino, 1994, p. 11 [**M. rostrata*, p. 11, pl. 4,*3–4*, pl. 5,*1*, text-fig. 12–13; OD]. Carapace somewhat longer than high; rostrum extending beyond eyes, with several suprarostral spines and a few postrostral spines; pleonal somites high, pereiopods 1–3 apparently with tiny chelae, visible on at least one pair; pereiopods 4 and 5 apparently longer than 1–3; pleonal somite 6 with short posterior axial spine. *Upper Cretaceous* (*Cenomanian*): Lebanon.——Fig. 5,*4*. **M. rostrata,* MSNM i12340, scale bar 1 cm (new).

Oppelicaris Schweigert, Garassino, & Pasini, 2016, p. 18 [**Penaeus latipes* Oppel, 1862, p. 95, pl. 26, *5;* OD]. Carapace much longer than high, rostrum straight, with several suprarostral spines; hepatic and subhepatic spines present; pereiopod 1 short, most robust, pereiopods 2 and 3 longer, chelate, 3 longest; pleonal somite 1 shortest, becoming progressively longer posteriorly; exopod of uropod with diaresis, telson and uropods unarmed. *Upper Jurassic* (*Tithonian*): Germany.——Fig. 5,*5*. **O. latipes* (Oppel), holotype, BSPG AS VII 696, scale bar 1 cm (new).

Pseudobombur Secretan, 1975, p. 332 [**P. nummuliticus,* p. 332, text-fig. 10, pl. 11,*1–3,* pl. 12,*2;* M]. Rostrum long; short carapace with a longitudinal carina posteriorly bifurcated; pleonal somite 1 narrowest, pleonal somite 6 longest. *Eocene* (*Ypresian*): Italy.——Fig. 5,*6*. **P. nummuliticus,* holotype, MCSNV B.103, scale bar 1 cm (photo by I. Tomelleri, MCSNV).

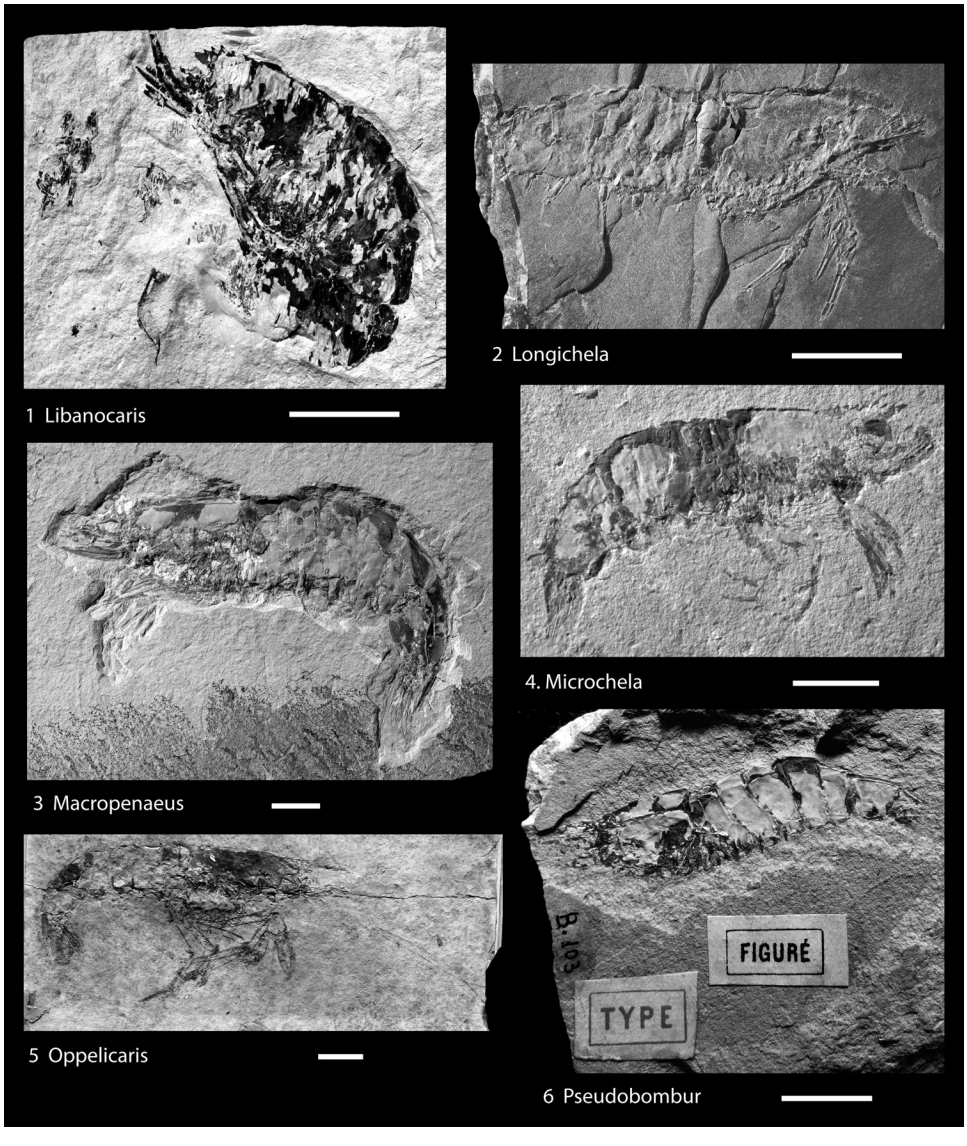

Fig 5. Penaeidae (p. 10).

Pseudodrobna Winkler, 2017, p. 13 [**P. kenngotti;* OD]. Carapace not much longer than high; rostrum long, with three very strong suprarostral spines; one postrostral spine; pereiopod 1 chelate with short fingers; pereiopods 2 and 3 with longer fingers; pleonite 6 with stout dorsal and lateral posterior spines; uropods elongate, narrow, with diaresis; telson narrow, sharp. *Upper Jurassic–Upper Cretaceous. Upper Jurassic* (*Tithonian*): Germany. *Upper Cretaceous* (*Santonian*): Lebanon.——Fig. 6,*1*. **P. kenngoti,* holotype, SMNS 70355, Tithonian, Germany, scale bar 1 cm (new).

Pseudodusa Schweigert & Garassino, 2004, p. 5 [**P. frattigianii,* p. 6, fig. 3–5; OD]. Rostrum extending beyond eyes but not antennular peduncle, curved, with suprarostral and subrostral spines; carapace unarmed, height approximately 75% length; pereiopods 1–3 generally chelate, unarmed and progressively increasing in length; pereiopod 3 extremely long; pereiopods 1–2 shorter and much more robust; exopod of uropods with diaresis, tail fan unarmed. *Upper Jurassic* (*Tithonian*): Germany.——Fig. 6,*2*. **P. frattigianii,* SMNS 67605, scale bar 1 cm (new).

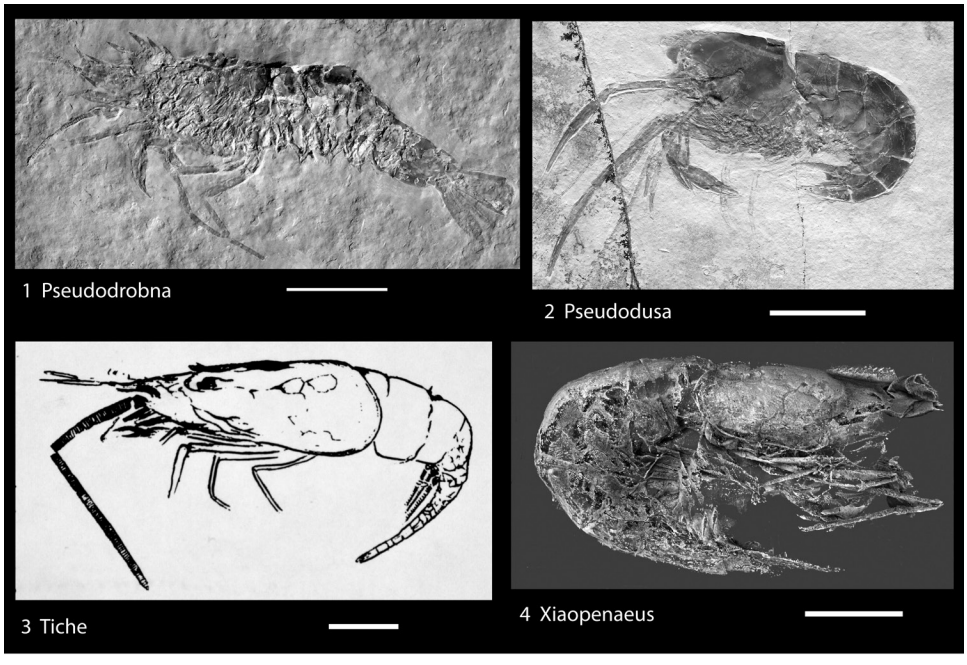

Fig 6. Penaeidae (p. 10–12).

Tiche von der Marck, 1863, p. 75 [**T. astaciformis,* p. 75, pl. 14,*6;* M]. Carapace approximately twice as long as high; two postrostral spines on carapace; antennae with strong flagella; pereiopods poorly preserved; pleopods with multiarticulate flagella. [von der Marck, 1863.] *Upper Cretaceous* (*Coniacian–Maastrichtian*): Germany.——Fig. 6,*3*. **T. astaciformis,* scale bar 1 cm (Glaessner, 1969, fig. 255.1, adapted from Von der Marck, 1863, pl. 14,*6*).

Xiaopenaeus Xing, Liu, McKellar, Luque, Li, Wang, Yi, Sun, Wang, & Audo, 2021, p. 1722 [**X. electrinus;* OD]. Carapace slightly longer than high; rostrum approximately two-thirds as long as the carapace, with at least three infrarostral spines and more than 20 suprarostral spines, suprarostral spines extending onto the carapace; epigastric spine absent; carapace cuticle thin and glabrous; tergopleura of pleonites 1–5 subtriangular; pleonite 6 longer than high; pereiopod 1 with a rather large claw; all pereiopods slender, approximately as long as carapace. [Emended from Xing & others, 2021, p. 1724.] *Upper Cretaceous* (*Cenomanian*): Myanmar.——Fig. 6,*4*. **X. electrinus,* 3D model of paratype LYAM-217, scale bar 2 mm. [Emended from Xing & others, 2021, supplementary figure S3d.]

Family SICYONIIDAE Ortmann, 1898

[*nom. transl.* Pérez Farfante, 1978, *ex* Sicyoninae Ortmann, 1898, p. 1121, spelling corrected in ICZN, Direction 54, 1956]

Rostrum short, with suprarostral and apical spines, without subrostral spines, not extending beyond antennular peduncle, may have postrostral spines; carapace without postorbital and pterygostomial spines, sometimes with antennal spine; cervical groove weak or absent; hepatic carina weak, branchiocardiac carina present but may be weak; pleon with transverse grooves, often with tubercles; telson with fixed spines; antennules with short flagella; maxilliped 3 as long as pereiopods; pereiopods 3 and 5 longer than 1, 2, and 4, all pereiopods short, slender, 1–3 chelate. [Emended from Davie, 2002, p. 160.] *Upper Cretaceous* (*Coniacian–Maastrichtian*)*–Holocene*.

Sicyonia H. Milne Edwards, 1830, p. 339, *nom. conserv*. ICZN Opinion 382, 1956 [**S. sculpta,* p. 340; SD E. Desmarest, 1858, p. 42] [=*Ruvulus* De Natale, 1850, p. 2, (type, *Sicyonia sculpta,* OD); =*Synhimantites* Boeck, 1864, p. 189 (type, *Synhimantites typicus* Boeck, 1864, M); =*Eusicyonia* Stebbing, 1914, p. 25, replacement name for *Sicyonia*]. As for family. *Upper Cretaceous–Holocene. Upper Cretaceous* (*Coniacian–Maastrichtian*): Germany. *Holocene:* Cosmopolitan, tropical.——

Fig. 7,*1. S. typica* Boeck, 1864, USNM 254823, Holocene, Caribbean Sea, scale bar 1 cm (new).

Family SOLENOCERIDAE Wood-Mason, 1891

[*nom. transl.* Pérez Farfante, 1978, *ex* Solenocerina Wood-Mason in Wood-Mason & Alcock, 1891, p. 275; ICZN Opinion 611, 1961]

Rostrum laterally compressed, short, rarely reaching beyond antennular peduncle, suprarostral spines usually present, usually three or more, subrostral spine usually absent; two to four dorsal spines present, extending almost to cervical groove, postorbital or postantennal spine present; hepatic spine present; antennal spine usually present; orbital, branchiostegal and pterygostomal spines present or absent; cervical groove deep, reaching or almost reaching dorsal midline; pleon carinate, pleonal somite 6 not longest somite; telson sharp, usually with pair of spines, sometimes with movable spines, rarely without spines; ocular scale present; prosartema long or short; petasma open or semi-open; male pleopod 2 with appendix masculina, appendix interna; thelycum open. [Emended from Pérez Farfante & Kensley, 1997, p. 157; Davie, 2002, p. 163; Robalino & others, 2016, p. 16.] *Lower Cretaceous* (*Aptian–Albian*)*–Holocene.*

Solenocera Lucas, 1849, p. 300 [**Peneus siphonoceros* Philippi, 1840, p. 190, p. 4, fig. 2; M, ICZN Opinion 611, 1961] [=*Parasolenocera* Wood-Mason in Wood-Mason & Alcock, 1891, p. 276 (type, *P. annectens,* M); =*Transolenocera* Burkenroad, 1934, p. 69 (type, *Solenocera maldivensis* Borradaile, 1910, p. 258, OD)]. Carapace smooth or sparsely setose; rostrum short, not extending beyond antennular peduncle, laterally compressed, with suprarostral spines; carapace with orbital spine present or absent; postorbital, antennal and hepatic spines present; cervical groove deep, reaching or nearly reaching dorsal midline; hepatic groove deep, hepatic carina present; telson with posterolateral spines. *Holocene:* Cosmopolitan.——Fig. 7,*2. S. pectinata* (Bate, 1888), MNHN-IU-2013-639, Holocene, Papua New Guinea, scale unknown (photo by T.-Y. Chan & C.W. Lin, MNHN).

Archeosolenocera Carriol & Riou, 1991, p. 145, [**A. straeleni* Carriol & Riou, 1991, p. 146, pl. 1,*1–3,* pl. 2,*1–3,* text-fig. 1; OD; =*Antrimpos kiliani* Van Straelen, 1923, p. 84; ="*Antrimpos*" *secretaniae* Carriol & Riou, 1991, p. 151]. Carapace ovate; rostrum short, may have two or so dorsal rostral spines, no subrostral spines; no postrostral spines; short antennal spine present; short pterygostomial spine; postantennal spine small but present; antennal groove deep, hepatic groove deep; hepatic spine strong; cervical groove very weak, intersection on cervical groove and antennal groove just anterior to intersection of antennal groove and hepatic groove; cervical groove ending well ventral to midline, straight; pleonal somites large, somites 1, 2 and 3 at least with large posteroventral flange on pleura overlapping next somite; axial crest apparently on somites 5 and 6; telson long, narrow, sharp; uropods extending beyond length of telson; endopod and exopod of uropods with axial groove; antennal scale extending well beyond tip of rostrum; pereiopods 1–3 chelate, with tiny chelae, pereiopods 4 and 5 extremely long, slender; pleopods with long endopods and exopods, very narrow, with multiarticulate flagella. *Middle Jurassic* (*Callovian*): France.——Fig. 7,*3.* **A. straeleni,* paratype, MNHN.F.R61835, scale bar 1 cm (photo by P. Massicard, MNHN, Project RECOLNAT).

Priorhyncha Alencar, Pinheiro, Saraiva, Oliveira, & Santana, 2018, p. 496 [**P. feitosa;* OD]. Rostrum long, extending just beyond eye, with numerous serrate suprarostral spines; carapace with cervical groove, antennal spine; pleon with well-developed pleura; pleopods slender. [Emended from Alencar & others, 2018, p. 496.] *Lower Cretaceous* (*Aptian–Albian*): Brazil.——Fig. 7,*4.* **P. feitosa,* holotype, MPSC 2489, scale bar 1 mm (photo by W. Santana, Universidade do Sagrado Coração-USC, Bauru, SP, Brazil).

PENAEOIDEA Family Indeterminate

Gladiocaris Garassino, Pasini, Schweigert, & Charbonnier, 2023, p. 3 [**Antrimpos germanicus* Brandt & Schulz, 2013, p. 71, fig. 7–10; OD]. Rostrum long, weakly arcuate, extending approximately to length of scaphocerite, with a keel basally on upper surface; antennal groove and antennal and hepatic spines present; pereiopods 1–3 chelate; exopod of uropods with diaresis. [Emended from Garassino & others, 2023, p. 3.] *Middle Triassic* (*Ladinian*): Germany.——Fig. 7,*5.* **G. germanicus* (Brandt & Schulz), holotype, NME 13/06, scale bar 1 cm (photo by M. Schultz, Großenlüder, Germany).

Superfamily SERGESTOIDEA Dana, 1852

[*nom transl.* Holthuis in Glaessner, 1969, p. 450, *ex* Sergestidae Dana, 1852b, p. 13]

Carapace laterally compressed; rostrum shorter than eyestalk; antennules with ventral flagellum modified or absent; pereiopod 1 may have reduced chelae; pereiopods 4 and

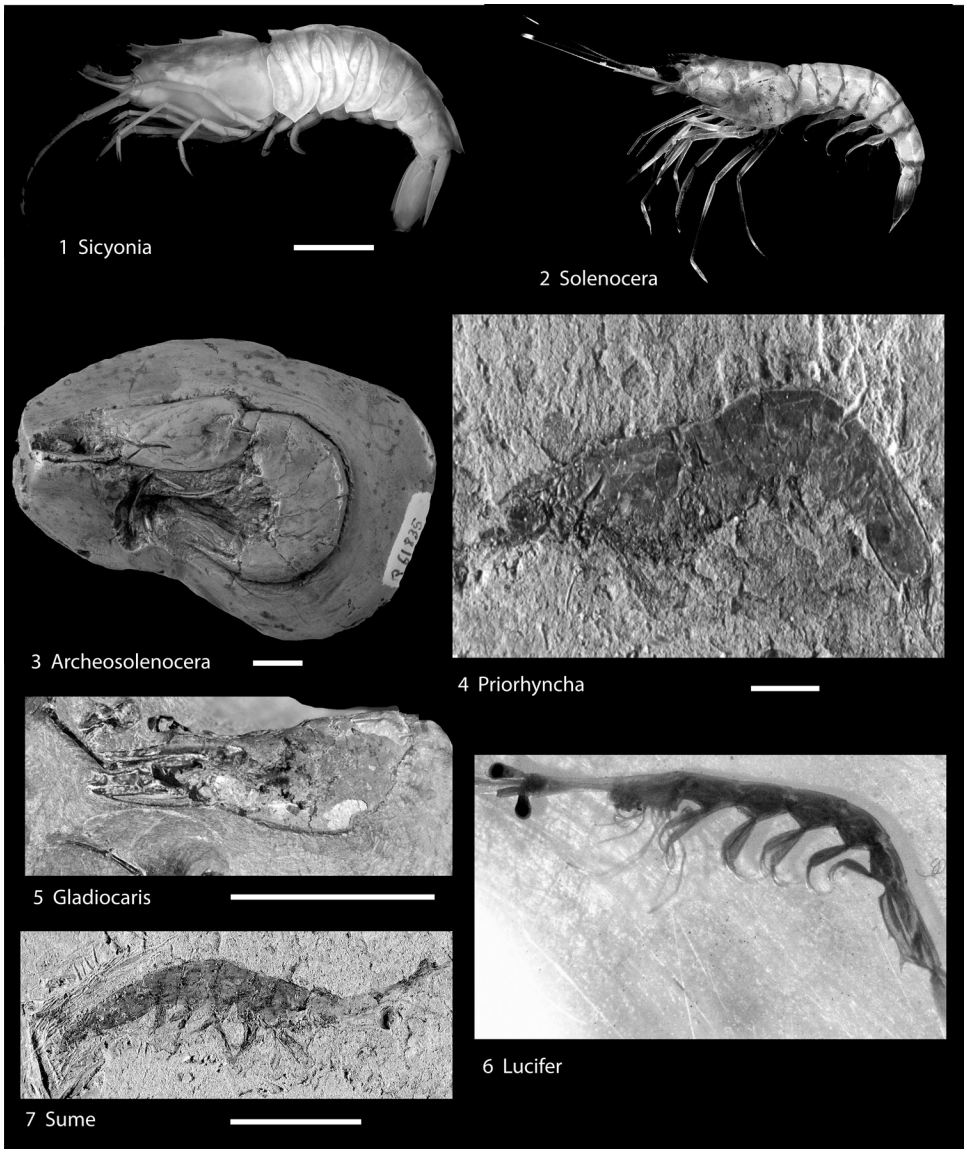

Fig 7. Sicyoniidae, Solenoceridae, Penaeoidea (family indeterminate), Luciferidae (p. 12–15).

5 usually reduced or absent. [Emended from Pérez Farfante & Kensley, 1997 p. 182; Robalino & others, 2016, p. 14.] *Lower Cretaceous* (*Aptian–Albian*)*–Holocene*.

Family LUCIFERIDAE De Haan, 1849

[*nom. corr*. Dana, 1852a–1853, p. 639, *pro* Leuciferidea De Haan, 1849 in 1833–1850, p. 242; see ICZN Opinion 864, 1969 and Pérez Farfante & Kensley, 1997]

Rostrum short, sharp; carapace compressed laterally, with postorbital, pterygostomial, and hepatic spines, labrum widely separated from antennae and eyes; abdominal somite 6 in male bearing two ventral processes; telson with two pairs of lateral spines, strong ventral protuberance present in male; pereiopods 1 and 2 without chelae; pereiopod 3 with

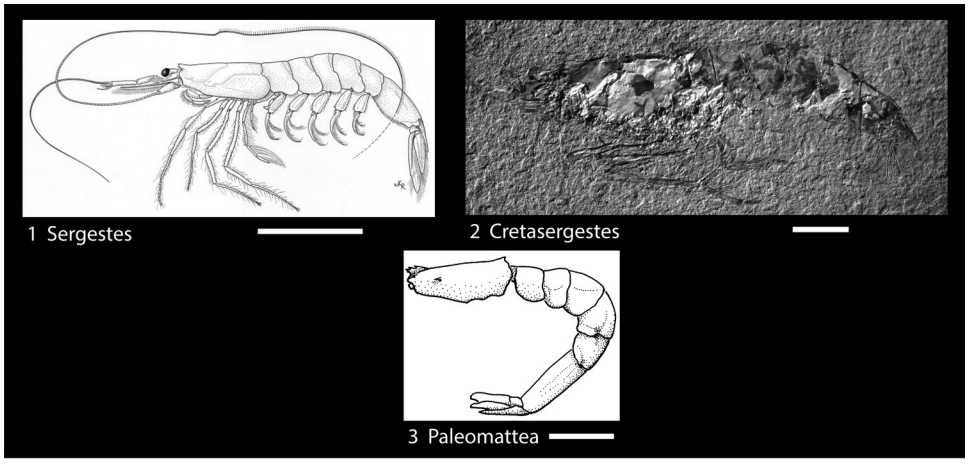

Fig 8. Sergestidae (p. 15–16).

subchela, distal end of propodus bearing strong, curved spines and serrated setae; pereiopods 4 and 5 absent in both sexes. [Emended from Vereshchaka, Oleson, & Lunina, 2016. p. 23.] *Lower Cretaceous* (*Aptian–Albian*)*–Holocene.*

Lucifer Thompson, 1829, p. 58 [**Leucifer typus* H. Milne Edwards, 1837 in 1834–1840, p. 469; SD H. Milne Edwards, 1837 in 1834–1840, ICZN Opinion 864, 1969]. Sixth pleonal somite with curved ventral processes in males; telson with ventral protuberance in male; eyestalks long, conical. [Emended from Vereshchaka, Oleson, & Lunina, 2016, p. 23.] *Holocene:* Cosmopolitan.——Fig. 7,*6*. **L. typus,* Holocene, Brazil (new).

Sume Saraiva, Pinheiro, & Santana, 2018, p. 461 [**S. marcosi,* p. 462, fig. 3.2, 3.3, 4; OD]. Eyestalks of moderate length, not reaching the end of scaphocerite; pleonal pleura overlapping protopods of pleopods, forming a rounded projection medially on somites 2 to 4; pleopods long. [Emended from Saraiva, Pinheiro, & Santana, 2018, p. 461.] *Lower Cretaceous* (*Aptian–Albian*): Brazil.——Fig. 7,*7*. **S. marcosi*, holotype LPU 1250A, scale bar 5 mm (photo by W. Santana, Universidade do Sagrado Coração- USC, Bauru, SP, Brazil).

Family SERGESTIDAE Dana, 1852

[Sergestidae Dana, 1852b, p. 13]

Carapace compressed laterally; cuticle soft; rostrum shorter than eyestalks or absent; supraorbital and hepatic spines sometimes present; antennal, branchiostegal and pterygostomial spines absent; cervical groove may be deep, moderate, or absent; pereiopods 1–3 or 2–3 chelate, chelae tiny; pereiopods 4 and 5 usually reduced or absent; ventral antennular flagellum modified in males; pleon with posterior portion of pleura covering anterior portion of succeeding pleura. [Emended from Pérez Farfante & Kensley, 1997 p. 185; Davie, 2002, p. 153.] *Lower Cretaceous* (*Aptian–Albian*)*–Holocene*.

Sergestes H. Milne Edwards, 1830, p. 348 [**S. atlanticus,* p. 349; M] [=*Acheles* Cocco, 1832, p. 204 (type, *A. arachnipodus,* M)]. Rostrum short, barely extending beyond anterior margin of carapace, sharp or rounded, may have supraorbital spine; supraorbital and hepatic spines present or absent; cervical groove deep, reaching dorsal midline; postcervical groove present or absent, reaching dorsal midline; branchiocardiac carina usually present; hepatic carina sometimes present; telson without lateral spines; pereiopods long, slender, pereiopod 1 achelate, pereiopods 2 and 3 with tiny chelae; pereiopods 4 and 5 without dactyls; pereiopods setose. [Emended from Pérez Farfante & Kensley, 1997, p. 194.] *Holocene:* Cosmopolitan.——Fig. 8,*1*. **S. atlanticus,* Holocene, Atlantic Ocean, scale bar 1 cm (photo from USNM, EZID [http://n2t.net/ark:/65665/m31cd2b01c-011e-4c49-994d-a6c9b565d9af].

Cretasergestes Garassino & Schweigert, 2006, p. 71 [**C. sahelalmae,* p. 71, fig. 1–3; OD]. Carapace with short rostrum extending weakly beyond anterior margin of carapace, sharp, without supra or subrostral spines; carapace lacking supraorbital and hepatic spines, with well-developed cervical groove; telson with strong carina; pereiopods 1–3 with small chelae; pereiopods 4 and 5 shorter than pereiopod 3, pereiopod 4 longer than pereiopod

5. [Emended from Garassino & Schweigert, 2006, p. 71.] *Upper Cretaceous* (*Cenomanian*): Lebanon.——Fig. 8,*2*. **C. sahelalmae,* MSNM i26594, scale bar 1 cm (new).

Paleomattea Maisey & De Carvalho, 1995, p. 5 [**P. deliciosa,* p. 5, fig. 3A–F; M]. Rostrum short, with three small spines; carapace with small supraorbital and hepatic spines; abdominal somite 6 very long, approximately three times as long as others; pleopods elongate. [Emended from Maisey & De Carvalho, 1995, p. 5; Saraiva, Pralon, & Gregati, 2009, p. 73.] *Lower Cretaceous* (*Aptian–Albian*): Brazil.——Fig. 8,*3*. **P. deliciosa,* line drawing of holotype AMNH 44985, scale bar 1 mm (adapted from Maisey & De Carvalho, 1995, fig. 3B, reproduced with permission of Maisey and AMNH).

PENAEOIDEA *incertae sedis*

Carinacaris Garassino, 1994, p. 8 [**C. teruzzii,* p. 8, pl. 2,*1–3,* text-fig. 7; OD]. Rostrum extending beyond eyes, with several suprarostral spines; carapace becoming higher posteriorly; with three pairs of carinae, pair of longitudinal carinae paralleling dorsal axis, two pairs of oblique carinae positioned anteriorly, arcuate, concave anteriorly; pereiopods long, pereiopod 3 longest; antennae may be very long. *Upper Cretaceous* (*Cenomanian*): Lebanon.——Fig. 9,*1*. **C. teruzzii,* MSNM i12587, scale bar 1 cm (new).

Casertanus Bravi, Garassino, Bartiromo, Audo, Charbonnier, Schweigert, Thévenard, & Longobardi, 2014, p. 90 [**C. sabellicus;* OD]. Rostrum short, blunt, with one suprarostral spine; carapace with heptic spine, cervical groove deep; telson without movable spines; all pereiopods achelate, pereiopods 4 and 5 shorter than 1–3. *Middle Jurassic* (*Bathonian–Bajocian*): Italy.——Fig. 9,*2*. **C. sabellicus*, CSMNF 22001d, scale bar 1 cm (new).

Eopabdehus Garassino, Bahrami, Yazdi, & Vega, 2014, p. 46 [**E. babaheydariensis,* p. 48, fig. 4A–C; OD]. Carapace much longer than high; rostrum apparently long, upturned at distal end, with several basal suprarostral spines; pleon appearing penaeoid, somite 6 long, possibly with longitudinal keel extending from proximal upper corner to middle of distal margin; pereiopods appearing to be slender. *middle–upper Eocene:* Iran.——Fig. 9,*3*. **E. babaheydariensis,* holotype, EUIC 101400, scale bar 1 cm (new, photo by F. Vega, Universidad Nacional Autonoma de Mexico, Ciudad de México, Mexico).

Eogordonella Garassino, Bahrami, Yazdi, & Vega, 2014, p. 48 [**E. iranianiensis,* p. 48, fig. 4D–I; OD]. Carapace longer than high; apparently short rostrum, carapace possibly with keels; posterior pleonal somites with longitudinal keels; pereiopods slender. *middle–upper Eocene:* Iran.——Fig. 9,*4*. **E. iranianiensis,* holotype, EUIC 10142, scale bar 1 cm (new; photo by F. Vega, Universidad Nacional Autonoma de Mexico, Ciudad de México, Mexico).

Hakelocaris Garassino, 1994, p. 10 [**H. vavassorii,* p. 10, pl. 3,*3–4;* pl. 4,*1–2;* text-fig. 10; OD]. Rostrum long, with five suprarostral spines; carapace high; anterior epigastric spine present; pereiopods relatively short, pereiopods 1–3 chelate; exopods of uropods without diaresis. [Emended from Charbonnier & others, 2017, p. 78.] *Upper Cretaceous* (*Cenomanian*): Lebanon.——Fig. 9,*5*. **H. vavassorii,* holotype, MSNM i12248, scale bar 1 cm (new).

Homelys von Meyer, 1862, p. 172 [**H. minor,* p. 172, pl. 19,*3–8;* M] [=*Homelys* von Meyer, 1844, p. 331, *nom. nud.*]. Antennule shorter than antennae, antenna with scaphocerite; pleonal somites approximately the same size as one another, no evidence of pleonite 2 overlapping pleonite 1; chelae not perceptible on pereiopods, apparently absent or more likely not preserved. [Emended from translation of von Meyer, 1862, p. 172 and figures.] *Miocene:* Germany.——Fig. 9,*6*. **H. minor,* BSPG AS I 971, scale bar 1 cm (new).

Mexicania Garassino, Vega, Calvillo-Canadell, Cevallos-Ferriz, & Coutiño, 2013, p. 265 [**M. grijalvaensis,* p. 266, fig. 3G–H; OD]. Carapace approximately as long as high, dorsal and ventral margins convex; pleonal somites high, possibly with some sculpture, pleon overall short; at least two pairs of chelae, one pair with stout fingers, another pair with bulbous manus and short fingers. *Upper Cretaceous* (*Cenomanian*): Mexico (Chiapas).——Fig. 9,*7*. **M. grijalvaensis,* holotype, IHNFG-4716, scale bar 1 cm (new; photo by F. Vega, Universidad Nacional Autonoma de Mexico, Ciudad de México, Mexico).

Micropenaeus Bravi & Garassino, 1998, p. 152 [**M. tenuirostris,* p. 153, fig. 23; OD]. Rostrum apparently short, with suprarostral spines; carapace becoming higher posteriorly; eye large, extending beyond rostrum; pleon strongly arched at somite 3, somite 6 strongly elongate (possibly juvenile?). *Lower Cretaceous* (*Albian*): Italy.——Fig. 9,*8*. **M. tenuirostris,* line drawing of holotype M21833 (Bravi & Garassino, 1998, fig. 23).

Mokaya Garassino, Vega, Calvillo-Canadell, Cevallos-Ferriz, & Coutiño, 2013, p. 266 [**M. changoensis,* p. 266, fig. 4A–D; OD]. Carapace longer than high, rostrum appearing to be much reduced; hepatic carina; third maxillipeds and/or pereiopods slender, anteriormost appendages with long, thin spines; pleon penaeoid. *Upper Cretaceous* (*Cenomanian*): Chiapas, Mexico.——Fig. 10,*1*. **M. changoensis,* holotype, IHNFG 4702, scale bar 1 cm (new; photo by F. Vega, Universidad Nacional Autonoma de Mexico, Ciudad de México, Mexico).

Rauna Münster, 1839, p. 78 [**R. angusta* Münster, 1839, p. 79, pl. 28,*10*; SD Glaessner, 1929, p. 372]. Carapace much longer than high, possibly with longitudinal keels; rostrum with suprarostral spines; pleonal somite 6 possibly with cicatrix; pereiopods very long, slender; pleopods long. *Upper Jurassic* (*Tithonian*): Germany.——Fig. 10,*2*. **R. angusta,* BSPG AS VII 726, scale bar 1 cm (new).

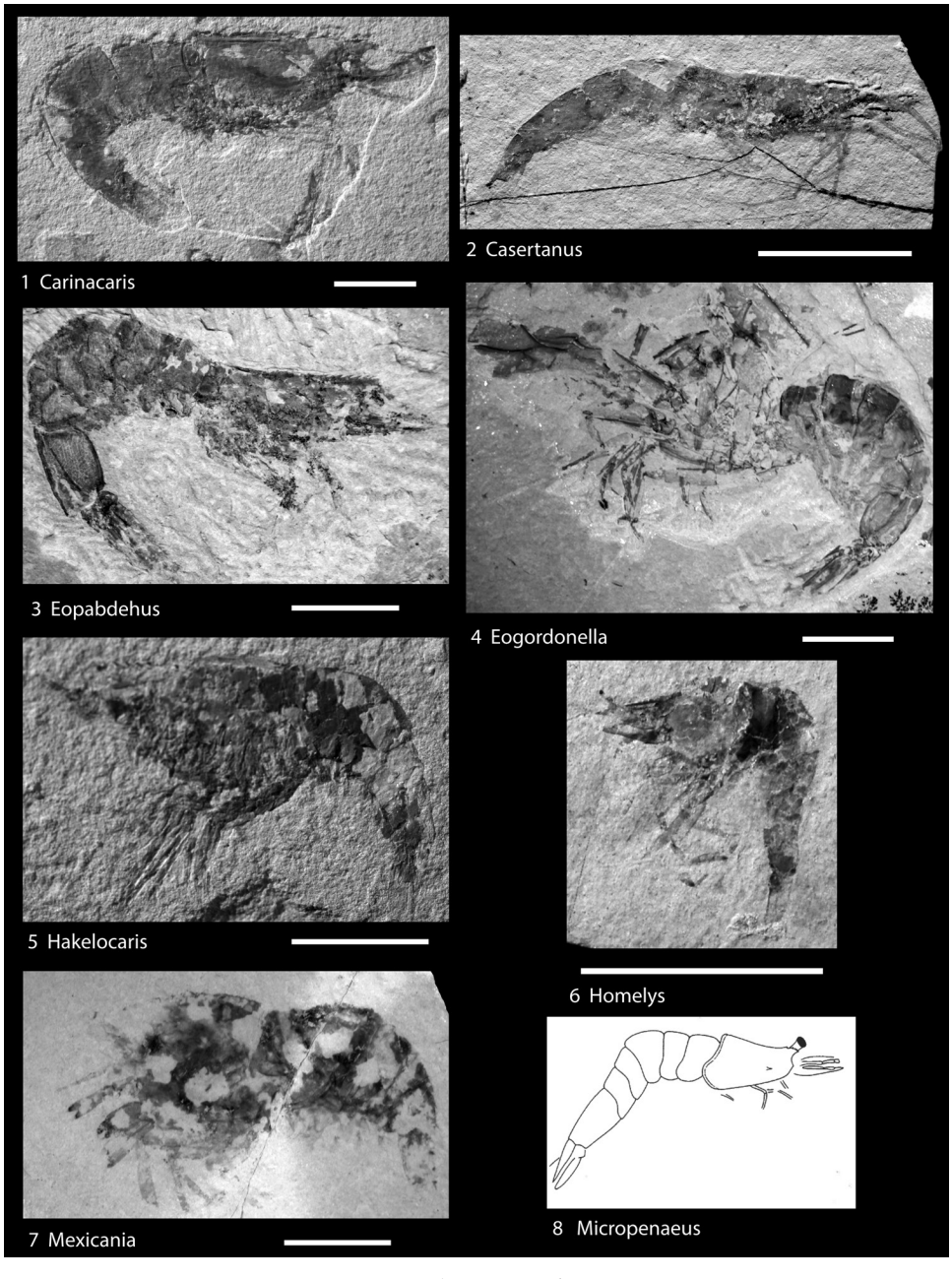

Fig 9. Penaeoidea *incertae sedis* (p. 16).

Satyrocaris Garassino & Teruzzi, 1994, p. 293 [**Satyrus cristatus* Garassino & Teruzzi, 1993, p. 9, pl. 1,*4,* pl. 2,*1–2,* text-fig. 12–14; OD] [=*Satyrus* Garassino & Teruzzi, 1993, p. 9, *non Satyrus* Latreille & Godart, 1819, p. 11 (Lepidodoptera)]. Carapace higher posteriorly; rostrum apparently short; pereiopods thin; pleopods very long. *Upper Triassic* (*Norian*): Italy.——Fig. 10,*3*. **S. cristatus* (Garassino & Teruzzi), line drawing of holotype, MSNB 8190 (drawing by G. Chiozzi, MSNM, reproduced with permission from MSNM).

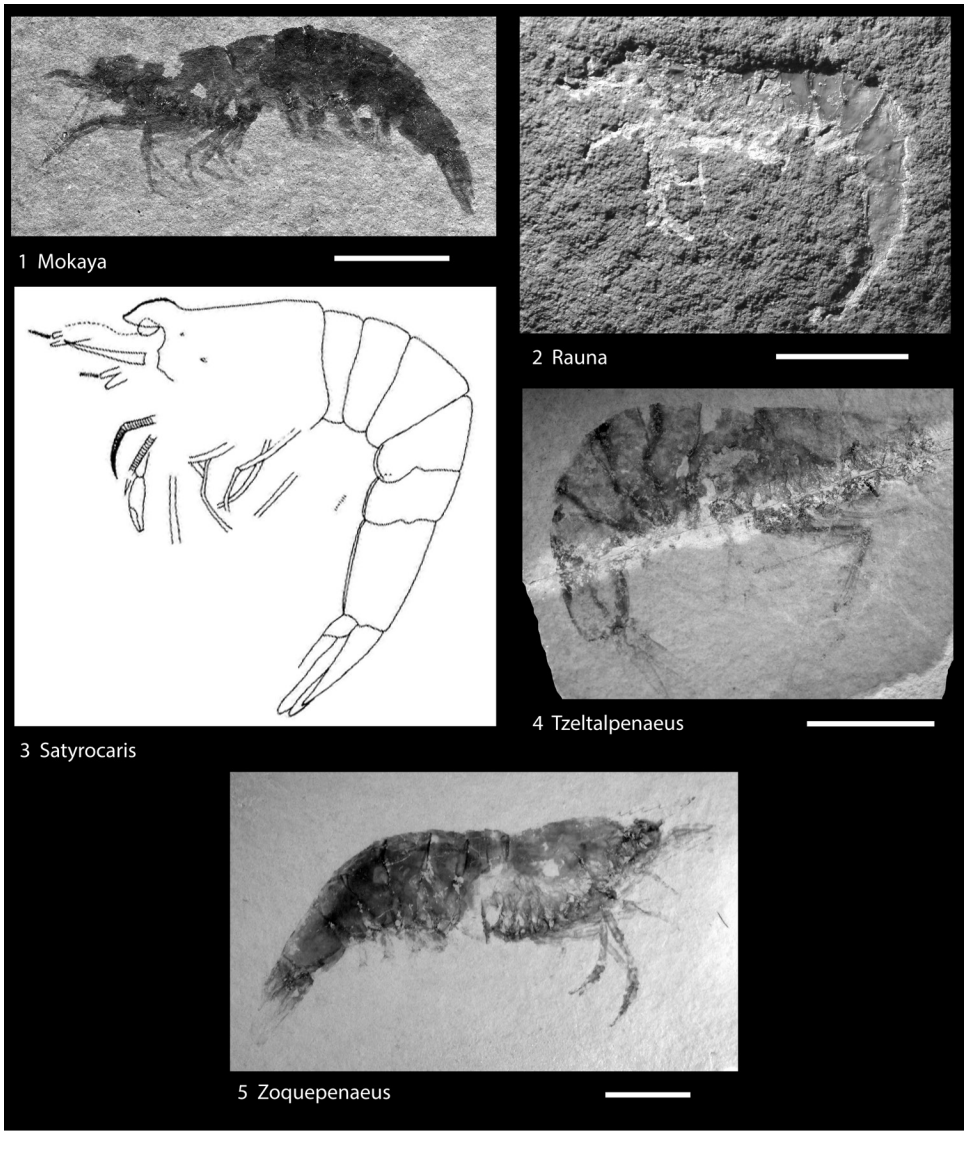

Fig 10. Penaeoidea *incertae sedis* (p. 16–18).

Tzeltalpenaeus Garassino, Vega, Calvillo-Canadell, Cevallos-Ferriz, & Coutiño, 2013, p. 265 [**T. exilichelatus,* p. 265, fig. 3D–F; OD]. Carapace longer than high; pleon penaeoid, somite 2 and 3 with triangular ventral terminations; pereiopods slender. *Upper Cretaceous* (*Cenomanian*): Mexico (Chiapas).——Fig. 10,*4*. **T. exilichelatus,* holotype, IHNFG-4717, scale bar 1 cm (new; photo by F. Vega, Universidad Nacional Autonoma de Mexico, Ciudad de México, Mexico).

Zoquepenaeus Garassino, Vega, Calvillo-Canadell, Cevallos-Ferriz, & Coutiño, 2013, p. 263 [**Z. spinirostratus,* p. 263, fig. 3A–C; OD]. Rostrum extending beyond eyes, with at least suprarostral spine, rostrum slightly upturned; carapace longer than high; pleon penaeoid; pereiopods slender, possibly at least two pairs chelate. *Upper Cretaceous* (*Cenomanian*): Mexico (Chiapas).——Fig. 10,*5*. **Z. spinirostratus,* holotype, IHNFG-4714, scale bar 1 cm (new; photo by F. Vega, Universidad Nacional Autonoma de Mexico, Ciudad de México, Mexico).

ABBREVIATIONS OF MUSEUM REPOSITORIES

AMNH: American Museum of Natural History, New York, New York

BSP, BSPG: Bayerische Staatsammlung für Paläontologie und Geologie München (Munich), Germany

CSMNF: Museo di Paleontologia (Centro Museale-Centro Musei delle Scienze Naturali e Fisische), Università degli Studi di Napoli "Federico II", Italy

EUIC: University of Isfahan, I.R. Iran

G: Palaeobiology collections, National Museums Scotland, Edinburgh, Scotland, UK

IHNFG: Museo Eliseo Palacios Aguilera, SEMAHN, Calzada de los Hombres Ilustres S/N: Colonia Centro, Tuxtla Gutiérrez, Chiapas, México

LPI: Invertebrate Paleontology Collection, Chengdu Institute of Geology and Mineral Resources, Chengdu, Sichuan Province, China

LPU: Laboratório de Paleontologia da Universidade Regional do Cariri, Brazil

LYAM: Longyin Amber Museum, Kunming, China

MCNHBJ: Museu de Ciências Naturais e de História Barra do Jardim, Brazil

MCSN: Museo Cantonale di Storia Naturale, Lugano, Switzerland

MCSNV: Museo Civico di Storia Naturale, Verona, Italy

MNHN.IU: Muséum national d'Histoire naturelle, Paris, Crustacean Collection, France

MNHN.F: Muséum national d'Histoire naturelle, Paris, Collection de Paléontologie, France

MPSC: Museu de Palaeontologia Plácida Cidade Nuvens, Santana do Cariri, Ceará, Brazil

MSNB: Museo di Scienze Naturali di Bergamo, Italy

MSNM: Museo Civico di Storia Naturale di Milano, Italy

NME: Naturkundemuseum Erfurt, Germany.

RFC: Roger Frattigiani Collection, Germany

SMNS: Staatliches Museum für Naturkunde, Stuttgart, Germany

USNM: United States National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA

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