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PART R, REVISED, VOLUME 1, CHAPTER 8G: SYSTEMATIC DESCRIPTIONS: INFRAORDER POLYCHELIDA

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Infraorder POLYCHELIDA Scholtz & Richter, 1995

[Polychelida SCHOLTZ & RICHTER, 1995, p. 293]

Carapace dorsoventrally flattened, rostrum indistinct; antennal groove absent; with branchial and thoracic median carinae; epistome and carapace not in broad contact. Pleon with axial keel and sharp demarcation between terga and pleura; telson triangular. Antennular stylocerite present; maxilliped 3 dactylus sharp; pereopods 1–4 chelate (KARASAWA, SCHWEITZER, & FELDMANN, 2013, p. 95). *Upper Triassic (Carnian)–Holocene*.

Superfamily ERYONOIDEA De Haan, 1841

[*nom. transl.* GLAESSNER, 1969, p. 468, *pro* Eryonoidea DE HAAN, 1841 in 1833–1850, p. 148]

Description as for infraorder. *Upper Triassic (Carnian)–Holocene*.

Family COLEIIDAE Van Straelen, 1925

[Coleiidae VAN STRAELEN, 1925, p. 131]

Carapace longer than wide or equidimensional, dorsoventrally flattened, rostrum indistinct; antennal groove absent; cervical and branchiocardiac grooves forming lateral indentations, branchiocardiac indentation may be absent (*Tropifer*); with branchial and thoracic median carinae; epistome and carapace not in broad contact. Pleon long, flattened, with axial keel and sharp demarcation between terga and pleura; exopod of uropods with diaeresis. Antennular stylocerite present; third maxilliped dactylus

sharp; pereopods 1–4 chelate (KARASAWA, SCHWEITZER, & FELDMANN, 2013, p. 97). *Upper Triassic (Carnian)–Lower Cretaceous, Upper Cretaceous (?Campanian)*.

Coleia BRODERIP, 1835, p. 201 [**C. antiqua*; M] [= *Archaeastacus* BATE, 1884, p. 308 (type, *A. willemoesi* BATE, 1884, p. 310, M); = *Palaeopolycheles* VON KNEBEL, 1909 [imprint 1907], p. 224 (type, *Eryon longipes* FRAAS, 1855, p. 94, M)]. Carapace long, slender, with deep cervical and branchiocardiac grooves forming lateral indentations; pleon long, flat, and medially keeled; triangular telson; exopodite of uropod with diaeresis. Pereopods 1–4 chelate with dactylus positioned axially. *Upper Triassic (Carnian)–Lower Cretaceous, Upper Cretaceous (?Campanian)*: Japan, *Carnian*; Italy, *Rhaetian*; Germany, *Sinemurian–Toarcian*; Italy, United Kingdom, *Sinemurian*; United Kingdom, Germany, *Pliensbachian*; Russia (Siberia), *Upper Jurassic*; Germany, *Kimmeridgian*; India, *Lower Cretaceous*; Italy, *?Albian*.—FIG. 1, 1a. **C. antiqua*, line drawing of type specimens, Pliensbachian, Lyme Regis (Broderip, 1837, pl. 12, 1–2).—FIG. 1, 1b. *C. longipes* (FRAAS), SMNS 63833, Nusplingen Limestone, Kimmeridgian, Germany, scale bar, 1 cm (new).

Hellerocaris VAN STRAELEN, 1925, p. 154 [**Palaeopolycheles falloti* VAN STRAELEN, 1923, p. 89, fig. 6; OD]. Based on single poorly preserved specimen. Carapace longer than wide, with weak rostral spine and possibly with deep orbital indentations and suprarostal spines; lateral indentations reduced; deep cervical groove; pleon with axial keel. *Middle Jurassic (Callovian)*: France.—FIG. 1, 2. **H. falloti* (VAN STRAELEN), holotype, Collection Gevrey, Université de Grenoble, scale bar, 1 cm (Van Straelen, 1925, pl. 6, 1).

Proeryon BEURLEN, 1928, p. 191 [**Eryon hartmanni* VON MEYER, 1835, p. 329; SD GLAESSNER, 1929b, p. 339]. Ovoid carapace, longer than wide, with broadly V-shaped frontal margin and shallow, lateral orbital indentations; rostrum indistinct, triangular; lateral margins convex, widest posterior to midlength; cervical and branchiocardiac grooves parallel; telson triangular; exopodite of uropod

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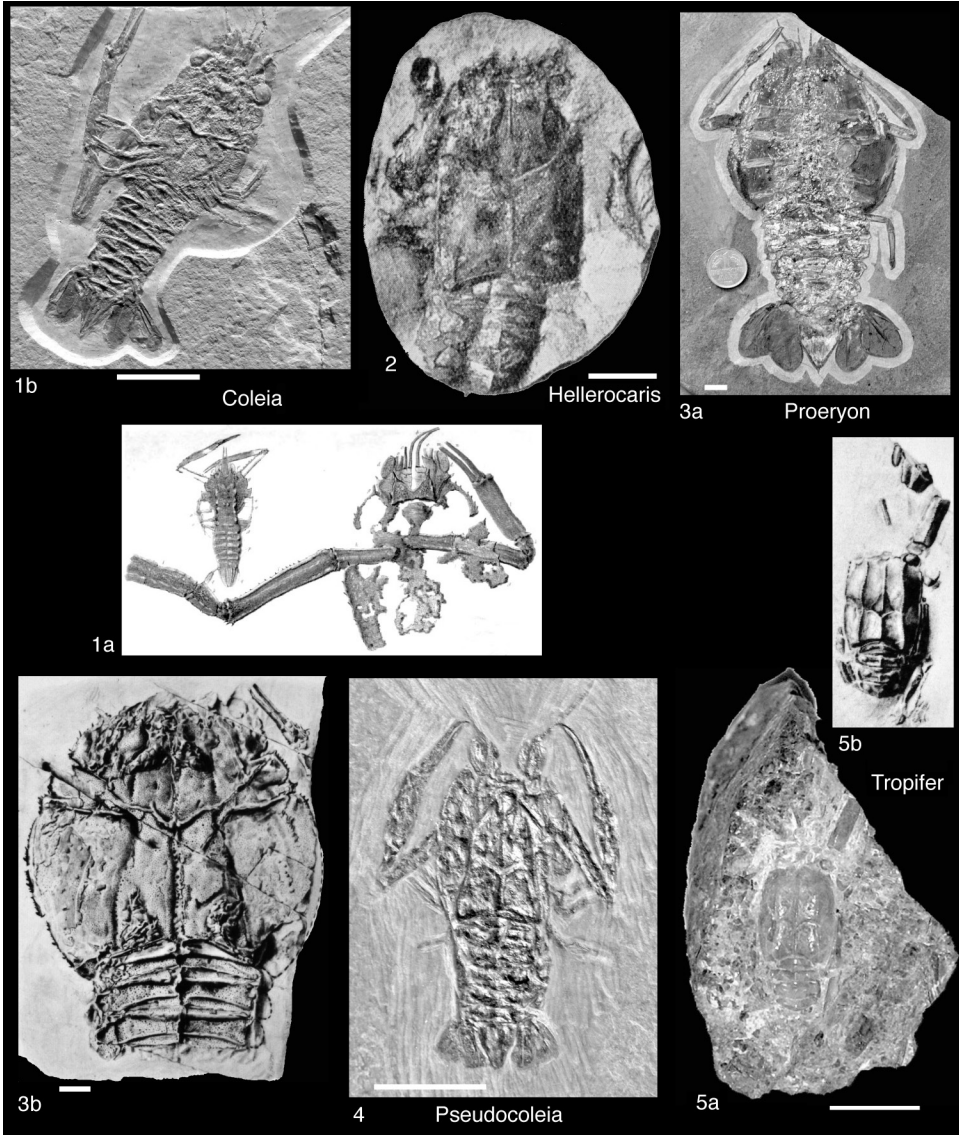


FIG. 1. Coleiidae (p. 1–3).

with diaeresis. *Lower Jurassic–Lower Cretaceous (Hauterivian)*: Germany, *Toarcian*; Russia, *Lower Jurassic*; United Kingdom, *Bathonian*; France, *Callovian*; Germany, *Hauterivian*.—FIG. 1,3a. **P. bartmanni* (VON MEYER), SMNS 64101, *Toarcian*, *Posidonia Shale*, Germany, scale bar, 1 cm (new).—FIG. 1,3b. specimen labeled as holotype of *Proeryon richardsoni* WOODWARD, Cheltenham Town Museum, Holland Collection, scale bar, 1 cm (Woods, 1925 in 1925–1931, pl. 6,2).

Pseudocoleia GARASSINO & TERUZZI, 1993, p. 19 [**P. mazzolenii* GARASSINO & TERUZZI, 1993, p. 19, pl. 4,3–4; OD]. Carapace with axial carina extending from posterior margin onto cephalic region; two well-marked lateral carinae cross cephalic region, joining in the anterior third with a transverse, inverted, W-shaped carina; cervical and branchio-cardiac grooves forming lateral notches; cervical groove best developed laterally; postcervical groove developed as V-shaped notch axially. Pleon with

two well-developed lateral carinae; pleurae with rounded terminations and spines; telson subtriangular, exopod of uropod with diaeresis. Pereiopods 1–4 chelate with dactylus positioned adaxially. *Upper Triassic (Norian)*: Italy.—FIG. 1,4. **P. mazzolenii*, holotype, MSNM12467, scale bar, 1 cm (new).

Tropifer GOULD, 1857, p. 361 [**T. laevis* GOULD, 1857, p. 361, fig. 1–3; OD]. Cephalothorax smooth, wider than long; rostrum short, blunt; orbits shallow, directed forward; axial and lateral carinae sharp, granulate, extending full length of carapace; cervical groove well defined from axis to subtle marginal notch; branchiocardiac groove and notch absent; pleon with axial ridge, terga with transverse and longitudinal keels; sharp demarcation between terga and pleura, pleura sharply downturned. *Upper Triassic (Rhaetian)*: United Kingdom.—FIG. 1,5a–b. **T. laevis*; a, holotype, C 3084, Higgins Collection, Bristol's City Museum and Art Gallery, Bristol, scale bar, 1 cm (new; credit: Bristol City Council, photo by Roger Vaughan); b, line drawing (Woods, 1925 in 1925–1931, pl. 2,2).

Family ERYONIDAE De Haan, 1841

[*nom. correct.* DANA, 1852, p. 515, *pro* Eryonidea DE HAAN, 1841 in 1833–1850, p. 148]

Carapace subrectangular or subcircular, dorsoventrally flattened; rostrum indistinct; antennal groove absent; cervical groove moderately deep, extending into lateral indentation, usually with branchiocardiac indentation also; with branchial and thoracic median carinae; epistome and carapace not in broad contact. Pleon flattened, with axial keel and sharp demarcation between terga and pleura; pleura triangular; telson subtriangular; exopod of uropods without diaeresis. Antennular stylocerite present; third maxilliped dactylus sharp; pereiopods 1–4 chelate; pereiopod 5 dactylus achelate (KARASAWA, SCHWEITZER, & FELDMANN, 2013, p. 97). *Upper Triassic (Norian)*–*Lower Cretaceous (Hauterivian)*.

Eryon DESMAREST, 1817, p. 512 [**E. cuvieri*; M; =*Macrourites arctiformis* SCHLOTHEIM, 1822, p. 34]. Subrectangular carapace with longitudinal median carina originating from posterior margin; two narrow carinae extend parallel to median carina; cervical and branchiocardiac grooves absent; deep marginal indentations, carapace margin coarsely serrate. Pleon with triangular pleura; subtriangular telson; exopod of uropod without diaeresis. Chela of pereiopod 1 with dactylus longer than propodus; dactylus usually with distal hook. *Middle Jurassic (Callovian)*–

Lower Cretaceous (Hauterivian): France, *Callovian*; United Kingdom, *Oxfordian*; Germany, *Kimmeridgian*–*Tithonian*; Poland, *Berriasian*–*Hauterivian*.—FIG. 2,1. **E. cuvieri*, specimen from private collection of Helmut Tischlinger, Tithonian, Germany, scale bar, 1 cm (new; photo by H. Tischlinger).

Cycleryon GLAESSNER, 1965, p. 116, *nom. nov. pro* *Cyclocaris* BEURLEN, 1930, p. 372, *non* STEBBING, 1888, p. 664 [**Macrourites propinquus* SCHLOTHEIM, 1822, p. 35; OD]. Subcircular carapace, length about equal to width, with longitudinal median carina originating from posterior margin; two narrow carinae extending parallel to median carina; strong marginal indentations, margin always finely serrate; cervical and branchiocardiac grooves weak. Pleon with axial keel and triangular pleura; subtriangular telson; exopodite of uropod without diaeresis. Chela of pereiopod 1 with dactylus with distal hook and straight propodus. *Upper Jurassic (Kimmeridgian–Tithonian)*: France, Germany.—FIG. 2,2. **C. propinquus* (SCHLOTHEIM), Solnhofen-type limestones, Tithonian, Germany, CM 34359, scale bar, 1 cm (Karasawa, Schweitzer, & Feldmann, 2013, fig. 7B).

Knebelia VAN STRAELEN, 1922, p. 983, *nom. nov. pro* *Münsteria* VON KNEBEL, 1909 [imprint 1907], p. 222, *non* EUDES-DESLONGCHAMPS, 1835, p. 61 [**Eryon bilobatus* MÜNSTER, 1839, p. 11, pl. 6,3; M]. Subrectangular carapace, dorsoventrally flattened, with finely dentate margins, weak cervical and branchiocardiac notches; without grooves or longitudinal carinae; posterior margin bilobate in dorsal view, deeply concave axially. Pleon with axial keel and triangular pleura and rounded terminations; triangular telson; exopodite of uropod without diaeresis, rounded. Chela of pereiopod 1 with dactylus with distal hook and straight propodus. *Upper Jurassic (Tithonian)*: Germany.—FIG. 2,3a–b. **K. bilobata* (MÜNSTER); a, lectotype, BSPG AS IV 39, scale bar, 1 cm (new; photo by Martin Nose); b, ventral view, USNM 358160, scale bar, 1 cm (new).

Rosenfeldia GARASSINO, TERUZZI, & DALLA VECCHIA, 1996, p. 33 [**R. triasica* GARASSINO, TERUZZI, & DALLA VECCHIA, 1996, p. 33, fig. 6–10, 17–20; OD]. Subcircular carapace, wider than long; with longitudinal median carina originating from posterior margin; two narrow carinae extending parallel to median carina; cervical and branchiocardiac notches do not extend into grooves; two parallel rows of tubercles located in median portion of cephalic region. Pleon with weak axial keel, rounded, triangular pleura; subrectangular telson; exopodite of uropod without diaeresis. Chela of pereiopod 1 with dactylus with distal hook longer than propodus. [The type species is not well preserved.] *Upper Triassic (Norian)*–*Upper Jurassic (Tithonian)*: Italy, *Norian*; Germany, *Tithonian*.—FIG. 2,4. *R. oppeli* (WOODWARD), Tithonian, Germany, SMNS 66004, scale bar, 1 cm (new).

Soleryon AUDIO & others, 2013, p. 6 [**S. amicalis* AUDIO & others, 2013, p. 6, fig. 3–5; OD].

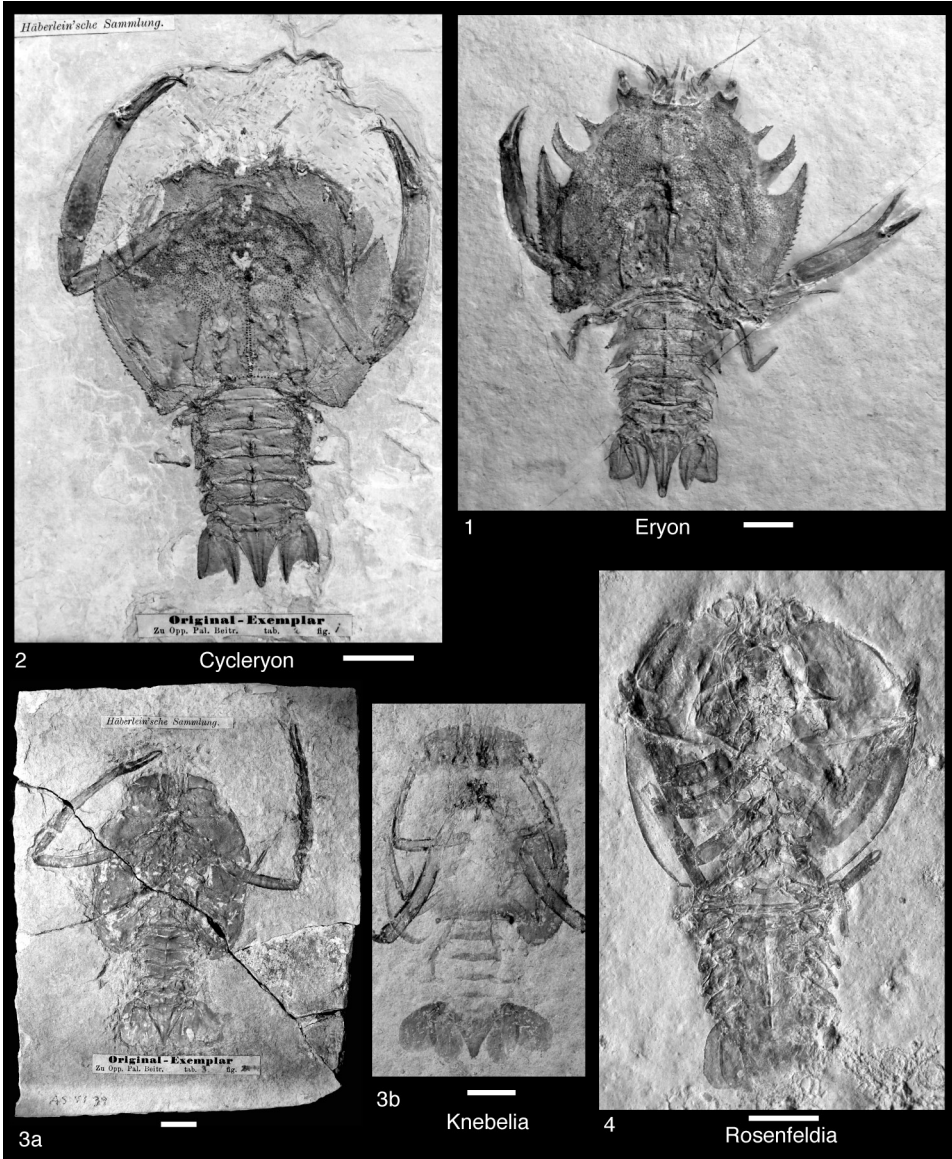


FIG. 2. Eryonidae (p. 3).

Carapace rounded-trapezoidal, about as wide as long; anterior margin concave, eyes and orbits small; cervical groove and post-cervical grooves deep, extending into lateral notches; median carina, branchial carinae subparallel to median carina; lateral margins of branchial regions sinuous, with spines of alternating sizes; telson with blunt tip; pleura with discontinuous axial keel. *Upper Jurassic Oxfordian–Tithonian*: France, *Oxfordian*; France, Germany, *Kimmeridgian–Tithonian*.—FIG. 3a–b. **S. amicalis*; a, holotype, part, MNHL.20271902;

b, counterpart, upper *Kimmeridgian*–lower *Tithonian*, France, MNHL.20015598, scale bars, 1 cm (new, courtesy of D. Audo and S. Charbonnier, MNHN).

Family PALAEOPENTACHELIDAE Ah Yong, 2009

[Palaeopentachelidae AHYONG, 2009, p. 380]

Carapace dorsoventrally flattened, front axially sulcate bounded by prominent inner

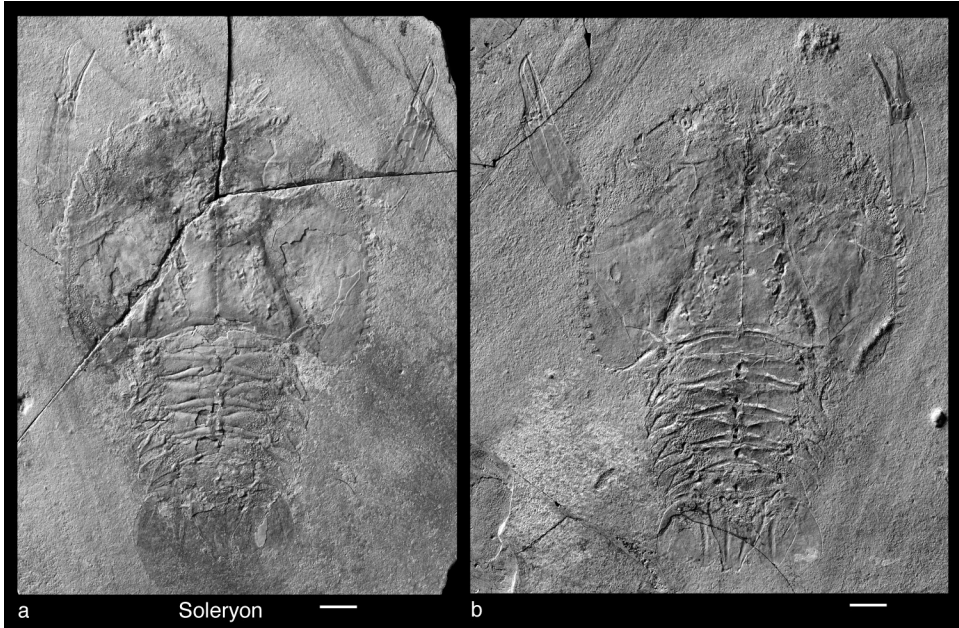


FIG. 3. Eryonidae (p. 3–4).

orbital spines; antennal groove absent; with narrow, U-shaped, deeply incised, dorsal orbits; eyes well developed; cervical groove only present medially, indistinct; branchiocardiac groove absent; with branchial and thoracic median carinae; without median carina anterior to cervical groove; posterior margin of carapace much wider than pleon; epistome and carapace not in broad contact; carapace surface coarsely pustulose. Pleon with axial spines and sharp demarcation between terga and pleura; pleonal pleura 2 and 3 similar, pleuron 2 not overlapping 1; uropodal exopods without diaeresis; telson triangular. Antennular stylocerite present; maxilliped 3 dactylus sharp; pereopods 1–4 [5?] chelate; first pereopod with long dactylus, both fingers with occlusal surfaces with spines (KARASAWA, SCHWEITZER, & FELDMANN, 2013, p. 98). *Upper Jurassic (Kimmeridgian)–Paleogene (Oligocene)*.

Palaeopentacheles VON KNEBEL, 1909 [imprint 1907], p. 225 [**Eryon roettenbacheri* MÜNSTER, 1839, p. 13, pl. 7,2; M]. Description as for family. *Upper Jurassic (Kimmeridgian)–Paleogene (Oligocene)*:

Germany, *Kimmeridgian–Tithonian*; USA (Washington), *Oligocene*.—FIG. 4*a–b*. **P. roettenbacheri* (MÜNSTER); *a*, Tithonian, Germany, BSP AS I 993, scale bar, 1 cm (Karasawa, Schweitzer, & Feldmann, 2013, fig. 7A); *b*, reconstruction (Glaessner, 1969, fig. 275,2).

Family POLYCHELIDAE Wood-Mason, 1875

[Polychelidae WOOD-MASON, 1875, p. 132]

Carapace longer than wide, dorsoventrally flattened; rostrum indistinct; deep orbital indentations, eyes reduced; antennal groove absent; cervical groove deep; with branchial and thoracic median carinae; lateral margins denticulate or spinose; epistome and carapace not in broad contact. Pleon with axial keel and sharp demarcation between terga and pleura; telson subtriangular; exopod of uropods without diaeresis. Antennular stylocerite present; maxilliped 3 dactylus sharp; pereopods 1–4 chelate; fingers on pereopod 1 with long, needle-like denticles; pereopod 5 may be chelate (KARASAWA, SCHWEITZER, & FELDMANN, 2013, p. 98). *Middle Jurassic (Callovian)–Holocene*.

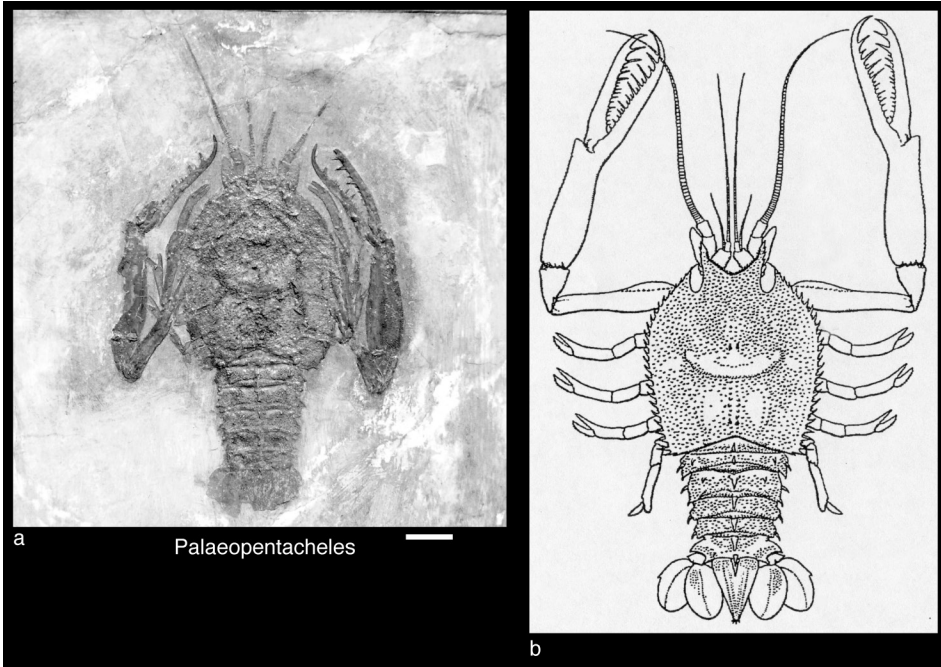


FIG. 4. Palaeopentacheles (p. 5).

Antarcticheles AGUIRRE-URRETA & others, 1990, p. 158 [**A. antarcticus* AGUIRRE-URRETA & others, 1990, p. 159, fig. 2; OD]. Oval carapace, longer than wide, flattened, axial regions elevated, well defined; granulate lateral margin with two small indentations; orbital notches with lateral projections; conspicuous median dorsal keel extending from front to posterior margin; distinct postorbital carinae; cervical, postcervical, and branchiocardiac grooves present; pleonal somites with a median longitudinal carina and divided by a diagonal groove that extends from dorsal carina on anterior border obliquely to posterolateral ends. *Upper Jurassic (Tithonian)*: Antarctic Peninsula. —FIG. 5, 1. **A. antarcticus*, cast of holotype, CIRGEO 1248 numbered KSU D 135, scale bar, 1 cm (Karasawa, Schweitzer, & Feldmann, 2013, fig. 7F).

Willemoesiocaris VAN STRAELEN, 1925, p. 128 [**Palaeopentacheles ovalis* VAN STRAELEN, 1923, p. 88, fig. 5; M]. Subrectangular carapace with frontal margin bearing short rostrum and lateral spines; cervical and branchiocardiac grooves well developed; axial carina absent but lateral carinae well developed; orbital emarginations rounded; lateral margins convex and denticulate. *Middle Jurassic (Callovian)*: France. —FIG. 5, 2. **W. ovalis* (VAN STRAELEN), holotype, scale bar, 1 cm (Van Straelen, 1925, pl. 3, 2).

Family TETRACHELIDAE Beurlen, 1930

[Tetrachelidae BEURLEN, 1930, p. 339]

Carapace almost quadrangular with orbital emarginations, dorsoventrally flattened, rostrum indistinct; antennal groove absent; cervical and branchiocardiac grooves strongly marked and V-shaped, extending to median; postcervical groove connected with cervical and branchiocardiac grooves; branchial and thoracic median carinae present; epistome and carapace not in broad contact. Pleon with axial keel and sharp demarcation between terga and pleura; telson subrectangular; exopod of uropods with diaeresis. Antennular stylocerite present; maxilliped 3 dactylus sharp; pereopods 1–4 chelate; pereopod 5 unknown (KARASAWA, SCHWEITZER, & FELDMANN, 2013, p. 98). *Upper Triassic (Carnian)*.

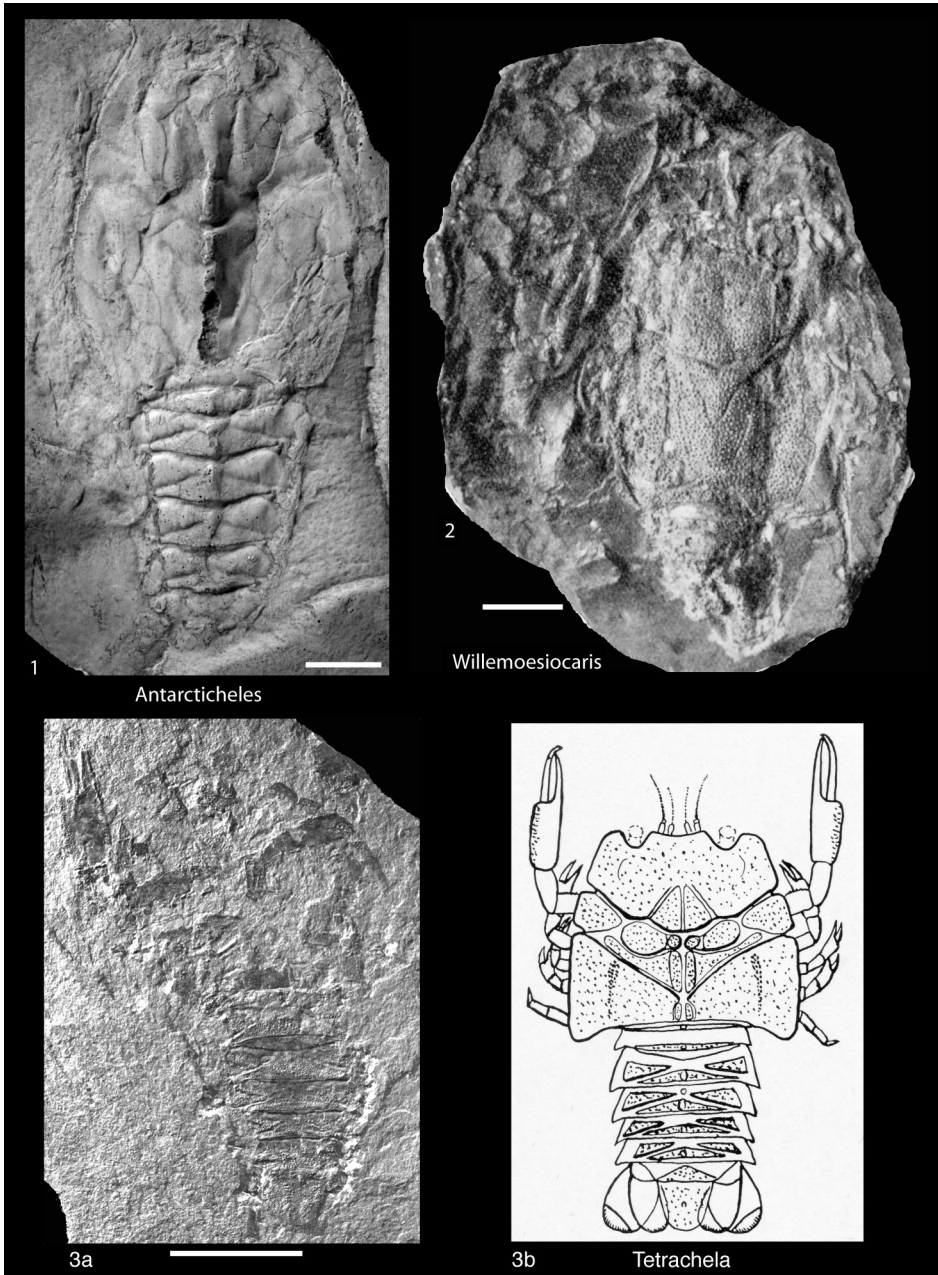


FIG. 5. Polychelidae and Tetrachelidae (p. 6–8).

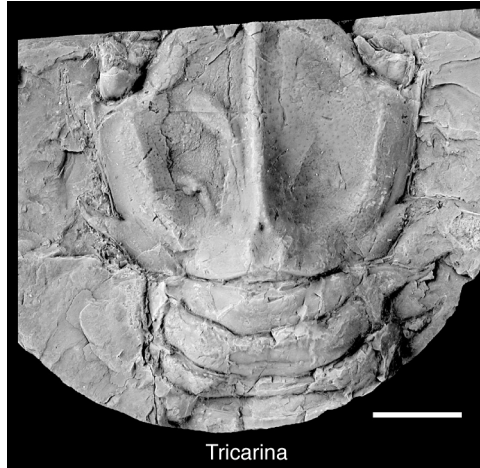


FIG. 6. Tricarinidae (p. 8).

Tetrachela REUSS, 1858, p. 5 [**Bolina raibлана* BRONN, 1858, p. 22, pl. 4, 1–3; M]. Characters as for family. *Upper Triassic (Carnian)*: Europe.—FIG. 5, 3a–b. **T. raibлана* (BRONN); a, Raibl Shale, Italy, MCZ 6252/2, scale bar, 1 cm (new); b, line drawing, scale bar, 1 cm (Glaessner, 1929a, pl. 9, 1).

Family TRICARINIDAE Feldmann & others, 2007

[Tricarinidae FELDMANN & others, 2007, p. 405]

Carapace dorsoventrally flattened; front broad, projected beyond bases of antennae; anterolateral and posterolateral corners with spines; rostrum indistinct; orbits and eyes undeveloped; antennal groove absent; lacking cervical groove and other transverse grooves; with branchial and thoracic median carinae. Pleon lacking axial keel but with sharp demarcation between terga and pleura; antennae arising near anterolateral corners (KARASAWA, SCHWEITZER, & FELDMANN, 2013, p. 98). *Lower Cretaceous (Barremian–Aptian)*: Iran.

Tricarina FELDMANN & others, 2007, p. 405 [**T. gadvanensis* FELDMANN & others, 2007, p. 406, fig. 2; OD]. Description as for family. *Lower Cretaceous (Barremian–Aptian)*: Iran.—FIG. 6. **T. gadvanensis*, holotype, CM 54197, scale bar, 1 cm (Karasawa, Schweitzer, & Feldmann, 2013, fig. 7C).

ABBREVIATIONS FOR MUSEUM REPOSITORIES

BSP, BSPG: Bayerische Staatsammlung für Paläontologie und Geologie München (Munich), Germany
 CIRGEO: Centro de Investigaciones en Recursos Geológicos, Buenos Aires, Argentina
 CM: Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA
 KSU D: Kent State University Decapod Comparative Collection, Kent, Ohio, USA
 MCZ: Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
 MSNM: Museo di Storia Naturale di Milano, Italy
 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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