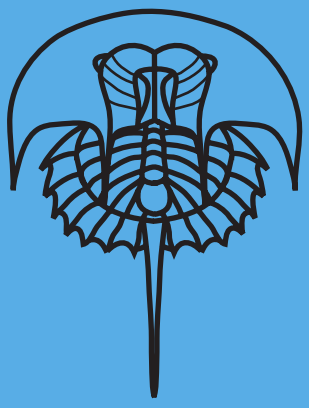

TREATISE ONLINE

Number 153

Part R, Revised, Volume 1, Chapter 8T16: Systematic Descriptions: Superfamilies Trapezioidea and Xanthoidea

Carrie E. Schweitzer, Rodney M. Feldmann, and Hiroaki Karasawa

2021

KU PALEONTOLOGICAL INSTITUTE
The University of Kansas

Lawrence, Kansas, USA
ISSN 2153-4012
paleo.ku.edu/treatiseonline

PART R, REVISED, VOLUME 1, CHAPTER 8T16: SYSTEMATIC DESCRIPTIONS: SUPERFAMILIES TRAPEZIOIDEA AND XANTHOIDEA

Carrie E. Schweitzer,[1] Rodney M. Feldmann,[2] and Hiroaki Karasawa[3]

[[1]Department of Geology, Kent State University at Stark, cschweit@kent.edu; [2]Department of Geology, Kent State University, rfeldman@kent.edu; [3]Mizunami Fossil Museum, Japan, GHA06103@nifty.com]

Classification of Trapezioidea follows Castro, Ng, & Ahyong (2004) and Davie, Guinot, & Ng (2015).

Superfamily TRAPEZIOIDEA Miers, 1886

[*nom. transl.* Števčić, 2005, p. 39, *ex* Trapeziinae Miers, 1886, p. 163]

Carapace variously shaped, ranging from trapezoidal to ovate; frontal margin generally straight, may have lobes or tiny spines; carapace surface smooth or granular, regions not developed; orbits generally widely spaced, placed near position of maximum width of carapace; male pleonal somites 3–5 fused with visible sutures or free. [Emended from Davie, Guinot, & Ng, 2015, p. 1109.] *Eocene* (*Ypresian*)–*Holocene*.

Family DOMECIIDAE Ortmann, 1893

[*nom. transl.* Davie, 2002, p. 152, *ex* Domoeciinae Ortmann, 1893, p. 429]

Carapace hexagonal or ovate, wider than long, maximum carapace length averaging about 80 percent maximum carapace width, position of maximum width about 40 percent the distance posteriorly on carapace; regions poorly defined; front bilobed, sometimes granular or spinose, about half maximum carapace width; orbits shallow, semi-circular, directed forward, fronto-orbital width averaging about 80 percent maximum carapace width; anterolateral margin extending obliquely and distally from outer-orbital corner, often spinose, with one or two spines; basal article of antenna not reaching front; merus of third maxilliped short, much wider than long; "second maxilliped with endopod having propodus and dactylus fused into a very large endite" (Davie, 2002, p. 152); male gonopod 1 stout, sinuous, with blunt tip; male gonopod 2 approximately half the length of gonopod one, thick proximally; male pleon with somites 3–5 fused, sutures may be visible, third somite in some taxa much wider than other somites; chelipeds equal or unequal, usually strongly granular or spinose, merus short; pereiopods 2–5 "with dactylo-propodal articulation formed by rounded prolongation of propodal lateral margin sliding against and beneath a projecting button situated proximally on lateral margin of dactylus" (Davie, 2002, p. 152). [Emended from Davie, 2002, p. 152; Castro, Ng, & Ahyong, 2004, p. 16; Schweitzer, 2005, p. 625.] *Eocene* (*Ypresian*)–*Holocene*.

Domecia Eydoux & Souleyet, 1842, p. 234 [**D. hispida*, p. 235, pl. 2,*5–10;* M] [=*Neleus* Desbonne *in* Desbonne & Schramm, 1867, p. 35 (type, *N. acanthophorus,* M); =*Eupilumnus* Kingsley, 1880, p. 397 (type, *E. websteri,* M)]. Carapace with spinose frontal and anterolateral margins. *Holocene:* Caribbean Sea, eastern Atlantic Ocean, Indo-Pacific Ocean.——Fig. 1,*1. *D. hispida,* holotype MNHN-IU-2014-19856, Holocene, South Atlantic, Sandwich Islands, scale bar, 1 mm (photo, Laura Flamme, MNHN, 2016, RECOLNAT [ANR-11-INBS-0004]).

Cherusius Low & Ng, 2012, p. 59 [**Jonesius minuta* Sankarankutty, 1962, p. 141, fig. 42–45; M; =*Pseudozius triunguiculatus* Borradaile, 1902, p. 243, fig. 44; =*Maldivia gardineri* Rathbun, 1911, p. 233, pl. 19,*5–6;* =*Maldivia galapagensis* Garth,

Schweitzer, C. E., R. M. Feldmann, & Hiroaki Karasawa. 2021. Part R, Revised, Volume 1, Chapter 8T16: Systematic descriptions: Superfamilies Trapezioidea and Xanthoidea. Treatise Online 153:1–42, 16 fig.

1939, p. 22, pl. 8,*1–6*] [=*Jonesius* Sankarankutty, 1962, p. 139, *non Jonesius* Yamaguti, 1959, p. 305 (cestode)]. Carapace hexagonal, not much wider than long; front bilobed; orbit oblique; anterolateral margin with two spines; posterolateral margin longer than anterolateral margin; chelipeds strongly heterochelous. *Oligocene–Holocene. Oligocene* (*Rupelian*): Italy. *Miocene* (*Langhian*): Poland. *Holocene:* Indian Ocean, central Pacific Ocean.——Fig. 1,*3. C. trianguiculatus* (Borradaile), MNHN-IU-2013-530, Holocene, central Pacific Ocean, scale bar, 1 mm (new; photo by T. Y. Chan & C. Lin, 2013, MNHN).

Eomaldivia Müller & Collins, 1991, p. 81 [**E. pannonica,* p. 81, pl. 6,*10,13;* OD]. Carapace subhexagonal, wider than long; front very wide, weakly convex; orbits placed at anterior corners, oblique, rimmed; anterolateral margins nearly parallel, with two or three spines; posterolateral margin concave, converging strongly posteriorly; carapace regions undefined. *Eocene–Miocene. Eocene* (*Ypresian*): Italy. *Eocene* (*Priabonian*): Hungary, Italy. *Miocene* (*Tortonian–Messinian*): Austria.——Fig. 1,*2.* **E. pannonica*, M91.190A, holotype, Priabonian, Hungary, scale bar, 1 cm (new; photo by M. Hyžný, Comenius University, Bratislava, Slovakia).

Palmyria Galil & Takeda, 1986, p. 168 [**Maldivia palmyrensis* Rathbun, 1923, p. 38; OD]. Carapace subhexagonal, regions poorly defined; front bilobed; orbits very shallow, suborbital spine extending beyond upper-orbital margin; anterolateral margins convex, with three spines; posterolateral margins converging strongly posteriorly; chelipeds markedly heterochelous. *Eocene* (*Ypresian*)*–Holocene. Eocene* (*Ypresian*): Italy. *Pleistocene:* Japan. *Holocene:* Madagascar, tropical Pacific Ocean.——Fig. 1,*4. P. palmyrensis,* MNHN-IU-2013-272, Holocene, tropical Pacific Ocean, scale bar, 1 mm (new; photo by T. Y. Chan & C. Lin, 2013, MNHN).

Proticalia De Angeli & Ceccon, 2017, p. 24 [**Tropicalia parva* Beschin, Busulini, Tessier, & Zorzin, 2016, p. 113, pl. 14,*5;* OD] [=*Tropicalia* Beschin, Busulini, Tessier, & Zorzin, 2016, p. 113, *non Tropicalia* Koçak & Kemal, 2008, p. 7 (beetle)]. Carapace ovate, wider than long; front very wide, apparently straight; anterolateral and posterolateral margins merging smoothly, small spines on anterolateral margin, at anterolateral corner, and on posterolateral margin; orbits shallow, rimmed. *Eocene* (*Ypresian*): Italy.——Fig. 1,*5.* **P. parva* (Beschin, Busulini, Tessier, & Zorzin), VR 94467, scale bar, 1 mm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Family TETRALIIDAE Castro, Ng, & Ahyong, 2004

[Tetraliidae Castro, Ng, & Ahyong, 2004, p. 22]

Carapace ovate, posterior margin much narrower than anterior margin, posterolateral margins converging strongly posteriorly; frontal margin straight, with serrations or fine spines; carapace surface smooth, flattened; anterolateral margins with spines in juveniles, entire in adults; chelipeds strongly heterochelous; major chela with curved fingers and inflated propodus, minor chela shorter, with straight fingers, propodus not inflated; male pleon with all somites free. [Emended from Davie, Guinot, & Ng, 2015, p. 1110.] *Eocene* (*Ypresian*)*–Holocene*.

Tetralia Dana, 1851a p. 224 [**Cancer glaberrimus* Herbst, 1790 in 1782–1804, p. 262; M; =*Trapezia serratifrons* Hombron & Jacquinot, 1846 in 1842–1853, pl. 4,*20;* =*Trapezia integra* Latreille, 1825a, p. 696; =*Tetralia laevissima* Stimpson, 1858, p. 35; =*Tetralia saunguineomaculata* Galil & Clark, 1990, p. 375, fig. 4–6b]. Carapace trapezoidal or oval, posterior margin shorter than front; front weakly convex, finely denticulate; antennal furrow indistinct; orbits situated at anterolateral corner, large, entire, with prominent inner orbital corner with prominent lobe heterochelous, palm and fingers of smaller claw narrow and elongate; male pleon with seven distinct somites. *Eocene–Holocene. Eocene* (*Ypresian*): Italy. *Holocene:* Red Sea, Indo-Pacific Ocean.——Fig. 1,*6a–b.* **T. glaberrimus* (Herbst), USNM 1462688, Solomon Islands, South Pacific Ocean; dorsal (*a*) and ventral (*b*) views; scale bars, 1 mm (new).

Eurotetralia De Angeli & Ceccon, 2013, p. 28 [**Trapezia loerentheyi* Müller, 1975, p. 517, pl. 1,*1–2;* OD]. Carapace approximately as wide as long, smooth; front convex, wide; orbits shallow, directed anterolaterally, positioned at position of maximum width of carapace; anterolateral margins parallel, with tiny spines; posterolateral margins weakly concave, converging strongly posteriorly. *Eocene–Oligocene. Eocene* (*Ypresian*): Italy. *Eocene* (*Priabonian*): Hungary, Italy. *Oligocene* (*Rupelian*): Italy.——Fig. 1,*7.* **E. loerentheyi* (Müller), MCV-17-2635, Eocene, Italy, scale bar, 1 mm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Paratetralia Beschin, Busulini, De Angeli, & Tessier, 2007, p. 54 [**P. convexa,* p. 55, pl. 8,*6–8;* OD]. Carapace ovate, wider than long, front wide, nearly straight; orbits placed at anterior corners; anterolateral margins short; posterolateral margins long, concave, converging strongly posteriorly; posterior margin short; carapace strongly vaulted longitudinally, especially in anterior third. *Eocene* (*Ypresian–Priabonian*): Italy.——Fig. 1,*8a–b.* **P. convexa,* holotype, MCZ 1865, Ypresian, Italy; *a*, dorsal carapace; *b*, anterior view; scale bars, 1 cm (new; photos by A. Busulini, Museo di Storia naturale, Venezia, Italy).

Scutata Beschin, Busulini, Tessier, & Zorzin, 2016, p. 123 [**S. eocenica,* p. 123, pl. 15,*9;* OD]. Carapace approximately as wide as long, smooth; front wide,

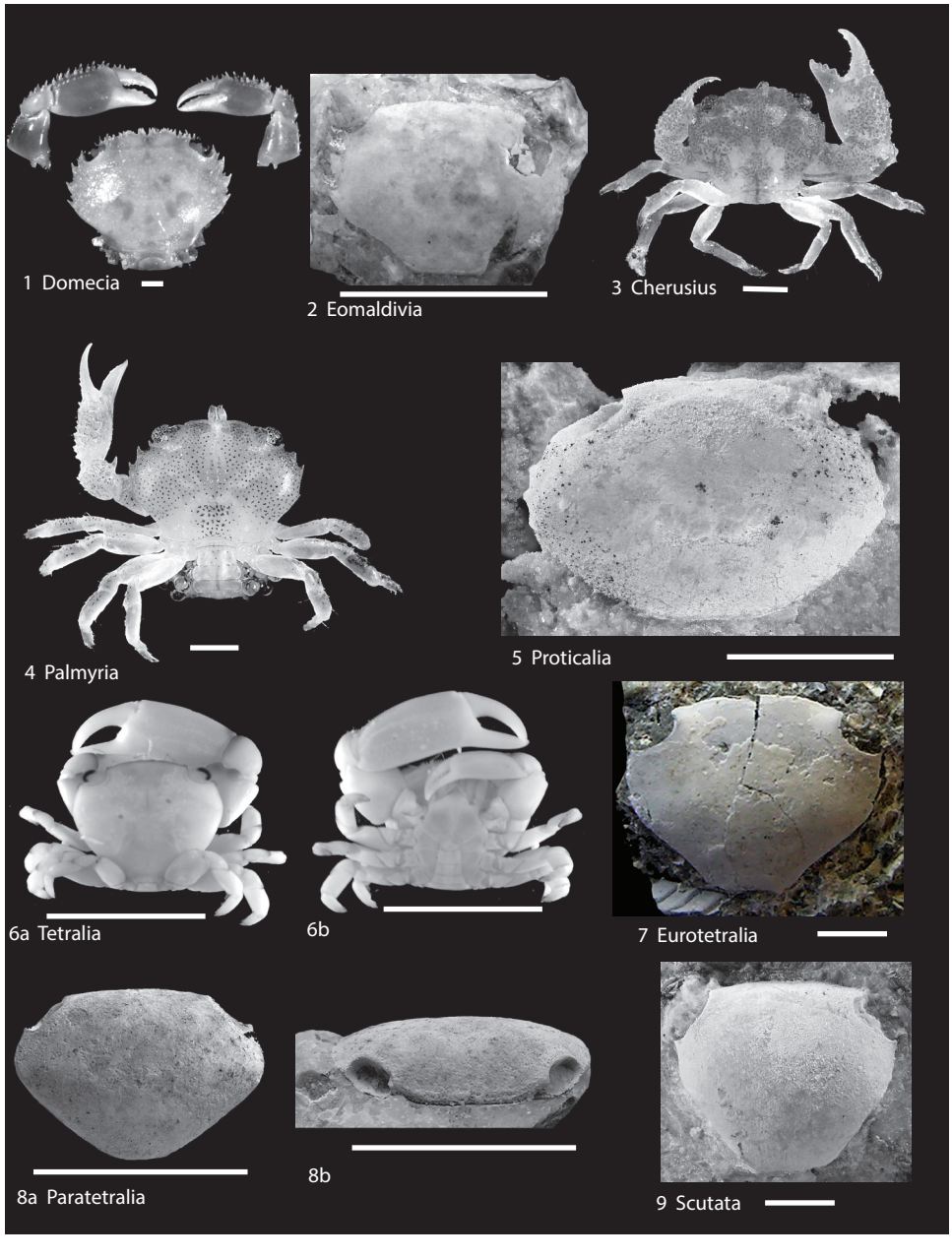

Fig 1. Domeciidae, Tetraliidae (p. 1–4).

straight; orbits shallow, directed anterolaterally, at position of maximum width of carapace, with small outer-orbital spine; anterolateral margins short, parallel; posterolateral margins straight, converging strongly posteriorly. *Eocene* (*Ypresian*): Italy.——Fig. 1,*9. *S. eocenica,* holotype VR 94493, scale bar, 1 mm (new; photo by A. Busulini, Museo di Storia naturale, Venezia, Italy).

Family TRAPEZIIDAE Miers, 1886

[*nom. transl.* Ortmann, 1893, p. 430, *ex* Trapeziinae Miers, 1886, p. 163]

Carapace cordate, not much wider than long, length averaging about 86 percent maximum carapace width, position of maximum width approximately half the distance posteriorly on carapace; carapace regions not defined, flattened, or longitudinally vaulted; front weakly bilobed, four-lobed, serrate, or nearly straight, without median notch, approximately half maximum carapace width; orbits deeply excavated, positioned at corners of frontal margin of carapace, directed anterolaterally, fronto-orbital width about 90 percent or more maximum carapace width; anterolateral margins short, usually oriented nearly perpendicular to frontal margin of carapace or oriented at very high angle to frontal margin, entire or with one or two spines. Basal antennal article slender; efferent channels defined by well-developed endostomial crests; merus of third maxilliped shorter than ischium, approximately as wide as long; endopod of second maxilliped comprised of four separate segments; sternites 1 and 2 fused into triangle, sternal suture 2/3 present or absent; male pleon with somites 3–5 fused with visible sutures or with all somites free; male gonopod 1 slender or stout, sinuous or straight, with pointed or rounded tip; male gonopod 2 stout or slender, curved, tip spoon-shaped; chelae unequal, smooth or weakly granular, merus of cheliped extending beyond carapace margins when folded; pereiopods 2–5 with dactylo-propodal articulation formed by rounded prolongation of propodal lateral margin sliding against and beneath a projecting button situated proximally on lateral margin of dactylus [Emended from Karasawa & Schweitzer, 2006, p. 49.] *Eocene* (*Ypresian*)–*Holocene*.

Subfamily TRAPEZIINAE Miers, 1886

[Trapeziinae Miers, 1886, p. 163]

Carapace flattened; anterolateral margins entire or with one spine; dactyl of pereiopods 2–5 hoof-like; with rows of setae [Emended from Castro, Ng, & Ahyong, 2004, p. 33.] *Eocene* (*Ypresian*)–*Holocene*.

Trapezia Latreille, 1825a, p. 695 [**T. dentifrons* Latreille, 1825a, p. 695; SD Desmarest, 1858, p. 18; ICZN Opinion 1614, 1990; =*Cancer cymodoce* Herbst, 1801 in 1782–1804, p. 22, pl. 51,*5,* ICZN Opinion 1614; =*Grapsillus dentatus* MacLeay, 1838, p. 67; =*T. coerulea* Rüppell, 1830, p. 27, pl. 5,*7;* =*T. hirtipes* Hombron & Jacquinot, 1846 in 1842–1853, pl. 4,*14–16*] [=*Trapecia* Berthold, 1827, p. 599 (type, *Cancer rufopunctatus* Herbst, 1799 in 1782–1804, p. 54, pl. 47,*6*, suppressed under ICZN, 1999, Article 23.9.1); =*Grapsillus* MacLeay, 1838, p. 67 (type, *G. maculatus,* SD Rathbun, 1930, p. 556)]. Carapace trapezoidal or oval, posterior margin shorter than front, front with two large lateral and two smaller medial lobes or teeth with rounded apices; front separated from orbits by distinct antennal furrow; orbits situated at anterolateral corner, large, entire, with prominent inner-orbital corner with prominent lobe; male pleon has somites 3–5 fused; chelipeds subequal; inner margin of merus of cheliped dentate. [Rathbun, 1930, p. 556; Serène, 1984, p. 266.] *Miocene* (*Langhian*)–*Holocene. Miocene* (*Langhian*): Hungary, Japan. *Miocene:* Jamaica. *Pleistocene:* Japan. *Holocene:* Red Sea, Indo-West Pacific Ocean, central-eastern Pacific Ocean.——Fig. 2,*1a–b*. *T. cymodoce* (Herbst), USNM 1291805, Holocene, Indian Ocean; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Archaeotetra Schweitzer, 2005, p. 630 [**A. inornata*, p. 630, fig. 1; OD]. Carapace wider than long, widest about 40% the distance posteriorly; regions poorly defined; front approximately half maximum carapace width, with shallow notch axially; orbits positioned at edges of anterior margin of carapace, fronto-orbital width about 90% carapace width; anterolateral margin short, rimmed. *Eocene. Eocene* (*Ypresian*): Italy. *Eocene:* Mexico (Baja California Sur).——Fig. 2,*2. A. lessinea* De Angeli & Ceccon, 2013, MCV 12/05-I.G.360311, Ypresian, Italy, scale bar, 1 cm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Subfamily QUADRELLINAE Števčič, 2005

[*nom. transl.* Ng, Guinot, & Davie, 2008, p. 185, *ex* Quadrellini Števčić, 2005, p. 41]

Anterolateral margins with one or two spines; frontal margin with axial notch and spines; dactyls of pereiopods 2–5 sharp,

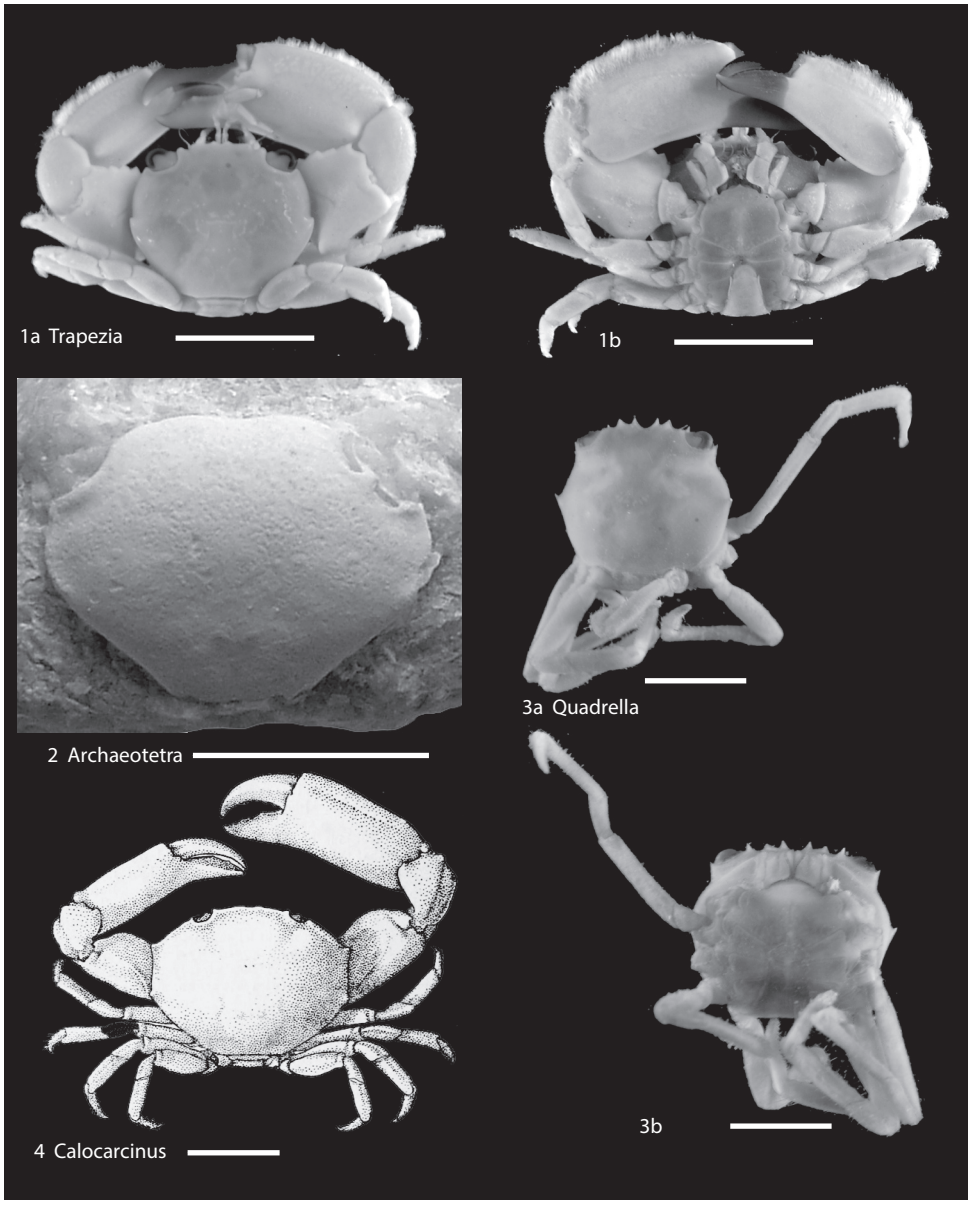

Fig 2. Trapeziidae (p. 4–6).

setose. [Emended from Castro, Ng, & Ahyong, 2004.] *Holocene*.

Quadrella Dana, 1851b, p. 128 [*Q. coronata*, Dana, 1852a, p. 266; M]. As for subfamily. *Holocene:* Pacific Ocean, eastern Africa, Australia.——Fig. 2,*3a–b*. **Q. coronata*, USNM 65318, Holocene, Philippines; dorsal (*a*) and ventral (*b*) views; scale bars, 5 mm (new).

Subfamily CALOCARCININAE Števčič, 2005

[*nom. transl*. Ng, Guinot, & Davie, 2008, p. 185, *ex* Calocarcinini Števčić, 2005, p. 40] [=Philippicarcinini Števčić, 2011, p. 131; =Sphaenomeridini Števčić, 2005, p. 40]

Anterolateral margins with two or more spines; dactyls of pereiopods 2–5 sharp, lacking setae; gonopod 1 stout or slender; gonopod 2 stout or slender, curved or straight, with slender spoon-like or curved tip, variable in length [Emended from Castro, Ng, & Ahyong, 2004.] *Holocene*.

Calocarcinus Calman, 1909, p. 30 [**C. africanus,* p. 31; M]. Gonopod 1 stout; gonopod 2 slender, with curved tip, approximately half the length of gonopod 1. [Emended from Castro, Ng, & Ahyong, 2004.] *Holocene:* Tropical west Pacific Ocean, Indian Ocean; Australia.——Fig. 2,*4*. **C. africanus*, Holocene, Indian Ocean, scale bar, 1 cm (Calman, 1909, p. 32, unnumbered drawing).

Superfamily XANTHOIDEA MacLeay, 1838

[*nom. transl*. Beurlen, 1930, p. 356, *ex* Xanthidae MacLeay, 1838, p. 59]

Classification for Xanthoidea follows Ng, Guinot, & Davie (2008); Schweitzer & others (2010); Lai & others (2011); Thoma, Guinot, & Felder (2014); and Davie, Guinot, & Ng (2015).

Carapace hexagonal, ovate, rectangular, or circular, usually wider than long, maximum length from 66–100 percent maximum carapace width, usually between 75–85 percent, usually widest 40–50 percent the distance posteriorly but two-thirds to three-quarters the distance in most Xanthidae; carapace regions poorly defined to very well defined; front usually bilobed but may be entire or multilobed, frontal width approximately one-quarter to half maximum carapace width; orbits may have two fissures or notches, fronto-orbital width ranging from half to 90+ percent maximum carapace width; anterolateral margin entire or with between two and six spines or lobes excluding outer-orbital spines, anterolateral and posterolateral margins usually distinct from one another, posterolateral margin straight or concave; male gonopod 1 slender; male gonopod 2 short; sternum narrow, sternal sutures 4/5 and 5/6 interrupted, sternal sutures 6/7 and 7/8 complete; pleonal somites free or somites 3–5 fused, sutures may be visible; chelipeds subequal or heterochelous, fingers commonly with black tips. [Emended from Karasawa & Schweitzer, 2006.] *Lower Cretaceous* (*Aptian*)*–Holocene*.

Family LINNAEOXANTHIDAE Števčič, 2005

[*nom. transl*. Thoma, Guinot, & Felder, 2014, *ex* Linnaeoxanthinae Števčić, 2005, p. 45] [=Melybiidae Števčić, 2005, p. 88]

Carapace subhexagonal, wider than long, regions poorly defined, weakly vaulted; anterolateral margins spinose; front strongly axially notched; orbits oblique, directed anterolaterally; upper orbital margin with fissure; chelipeds heterochelous, chelae flattened, spines on upper margin of manus, carpus, and merus; male sternum wide. [Emended from Davie, Guinot, & Ng, 2015, p. 1114.] *Holocene*.

Linnaeoxantho Števčić, 2005, p. 45 [**Pilumnoplax acanthomerus* Rathbun, 1911, p. 237, pl. 18,*13*; OD]. As for family. *Holocene:* Indo-Pacific Ocean.——Fig. 3,*1*. **L. acanthomerus* (Rathbun), paratype, USNM 41353, Holocene, Indian Ocean, scale bar, 1 cm (Rathbun, 1911, fig. 18,*13*).

Family PANOPEIDAE Ortmann, 1893

[*nom. transl*. Guinot, 1978, p. 276, *ex* Panopaeinae Ortmann, 1893, p. 429]

Carapace hexagonal, transversely ovate, or sometimes circular, wider than long, length/width ranging from 0.70–0.95, position of maximum width 40–50 percent the distance posteriorly on carapace; carapace flattened, regions moderately well marked to weakly defined; front usually bilobed, ranging from 30 to 43 percent maximum carapace width; orbits with two fissures or notches, fronto-orbital width about 60–80

percent maximum carapace width; anterolateral margin entire or with two to four spines excluding outer-orbital spine; anterolateral margins usually distinct from posterolateral margins; sternum narrow or wide, triangular in shape, sometimes comparatively large portion of sternite 8 visible in ventral view; male pleonal somites 1, 2, and 3 usually covering entire space between fifth pereiopods; male pleonal somites 3–5 fused, sutures may be evident; male genital openings coxal or coxo-sternal but penis often lies in a more or less elongate sternal (coxo-sternal) position; male gonopod 1 slender, curved or straight, sometimes with spines or setae, with several, sometimes complex, apical extensions; gonopod 2 short, less than 25 percent length of gonopod 1, curved; chelipeds subequal or heterochelous; with pointed fingers or with spoon-shaped tips, tips may be black; pereiopods 2–5 long, without dactylo-propodal articulation. [Emended from Karasawa & Schweitzer, 2006, p. 47; Davie, Guinot, & Ng, 2015, p. 1114.] *Upper Cretaceous* (*Maastrichtian*)–*Holocene*.

Subfamily EUCRATOPSINAE Stimpson 1871

[Eucratopsinae Stimpson, 1871, p. 151; suppressed as family name under Article 35.5 of ICZN, 1999] [=Prionoplacidae Alcock, 1900, p. 286; =Chasmophorinae Števčić, 2005, p. 54; =Cycloplacinae Števčić, 2005, p. 51; =Malacoplacini Števčić, 2005, p. 51; =Robertsellini Števčić, 2005, p. 52; =Thalassoplacini Števčić, 2005, p. 52]

Carapace wide, quadrilateral or rounded, length about 70–90 percent maximum carapace width, carapace flattened, regions moderately to poorly defined; anterolateral margins usually with two to four spines or lobes excluding outer-orbital spines or entire; front bilobed, about 30–40 percent carapace width; orbits wide, with two fissures or notches, fronto-orbital width 60–80 percent carapace width; large portion of sternite 8 visible in ventral view; male pleon not covering entire space between coxae of fifth pereiopods; male genital openings coxo-sternal; male gonopod 1 with apical extensions; male gonopod 2 short, curved. [Emended from Davie, 2002, p. 374.] *Upper Cretaceous* (*Maastrichtian*)–*Holocene*.

Balcacarcinus Karasawa & Schweitzer, 2006, p. 47 [**Palaeograpsus attenuatus* Bittner, 1875, p. 100, pl. 2,*10;* OD; Schweitzer & Karasawa, 2004, p. 80] [=*Bittneria* Schweitzer & Karasawa, 2004, p. 80, *non Bittneria* Broili, 1904, p. 168 (mollusk)]. Carapace hexagonal, wider than long, length about 85% maximum width; front bilobed, about 35% carapace width; fronto-orbital width about 65% carapace width; anterolateral margins with three or four small spines; posterolateral reentrants present; regions poorly defined; epibranchial regions arcuate, extending from last anterolateral spine to axis; branchial region with transverse ridge, crossing cardiac region. *Eocene* (*Ypresian–Lutetian*): Italy.——Fig. 3,*2.* **B. attenuates* (Bittner), KSU D 89, cast of holotype MBA 663, Eocene, Italy, scale bar, 1 cm (new).

Bittnereus Beschin, Busulini, De Angeli, & Tessier, 2007, p. 43 [**Panopeus vicentinus* Bittner, 1875, p. 93, pl. 2,*7;* OD]. Carapace slightly wider than long, granular, carapace regions well defined; branchial regions differentiated into epi-, meso-, and metabranchial areas. *Eocene* (*Ypresian, Priabonian*): Italy.——Fig. 3,*3. B. vicentinus* (Bittner), MCZ 1851, Eocene, Italy, scale bar, 1cm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Carinocarcinus Lőrenthey, 1898, p. 138 [**C. zitteli,* p. 138, pl. 10,*1;* M]. Carapace wider than long, hexagonal, moderately vaulted longitudinally and flattened transversely; front straight; orbits rimmed, with one weak fissure; with three spines excluding outer-orbital angle; posterolateral reentrants large; carapace surface with two well-developed keels, one extending across epibranchial and mesogastric regions; second across branchial and cardiac regions. *Eocene* (*Lutetian*): Germany, Italy.——Fig. 3,*4.* **C. zitteli,* MCV 04/21, Eocene, Italy, scale bar, 1 cm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Glyphithyreus Reuss, 1859, p. 4 [**G. formosus,* p. 4, pl. 2,*1–3;* OD; =*Plagiolophus wetherelli* Bell, 1858, p. 19, pl. 2,*7–13*] [=*Plagiolophus* Bell, 1858, p. 19 (type, *P. wetherelli,* M, *non* Pomel, 1847, p. 202 [Mammalia])]. Carapace subquadrilateral, wider than long, length approximately three-quarters maximum width, widest in anterior third of carapace; fronto-orbital width approximately two-thirds maximum carapace width; front bilobed, approximately one-third maximum carapace width; upper orbital margin rimmed, with a notch or two fissures; anterolateral margin with four spines including outer-orbital spine; epibranchial region inflated into broad ridge forming convex forward arc; broad transverse ridge on cardiac and metabranchial regions; epibranchial and cardiac/metabranchial ridges separated by deep cavity; posterior end of dorsal carapace depressed to level of cavity separating two branchial ridges; sternum wide,

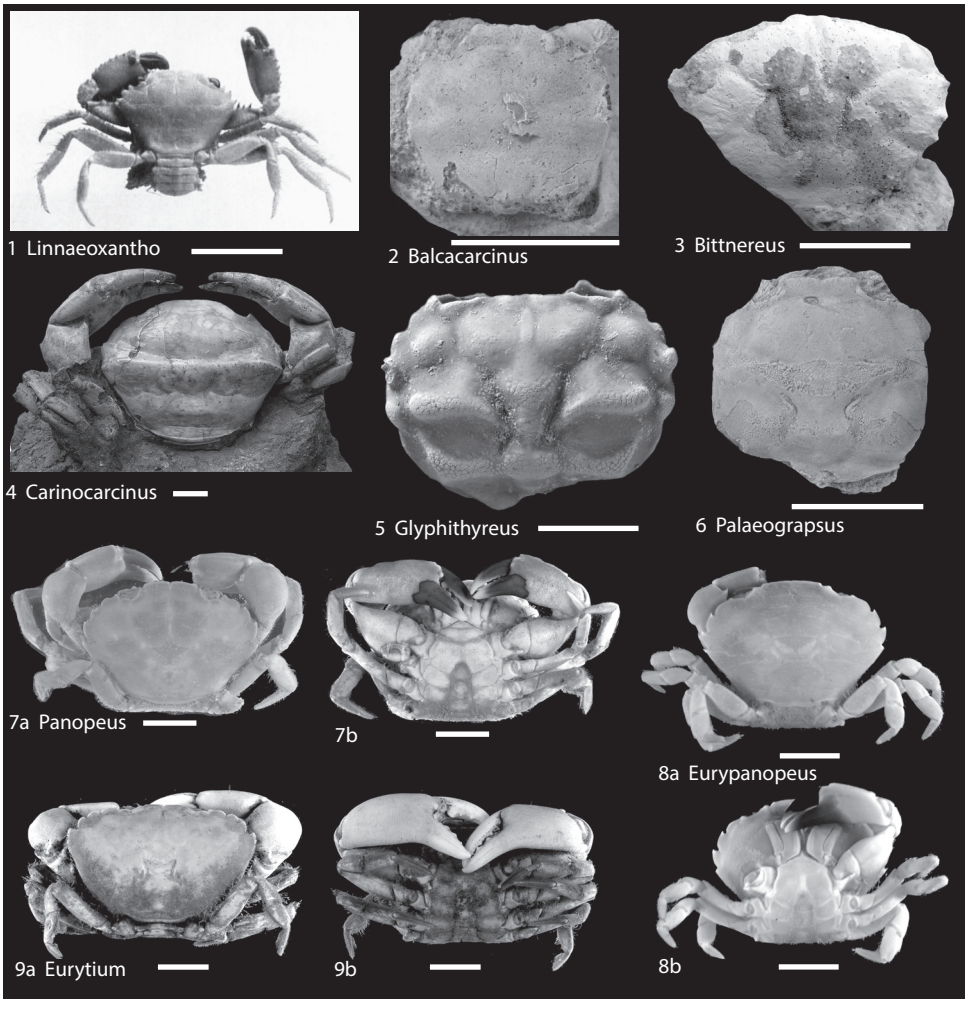

FIG 3. Linnaeoxanthidae, Panopeidae (p. 6–9).

male pleon with somites 3–5 fused. *Upper Cretaceous–Oligocene. Upper Cretaceous* (*Maastrichtian*): Germany. *Paleocene* (*Thanetian*): Pakistan. *Eocene:* Belgium, Italy, Ivory Coast, Nigeria, Pakistan, UK (England). *Oligocene:* Hungary.——FIG. 3,*5. G. bendensis* SCHWEITZER, ODUMODU, & FELDMANN, 2016, holotype CM 59121, Eocene, Nigeria, scale bar, 1 cm (new).

Palaeograpsus BITTNER, 1875, p. 99 [**P. inflatus,* p. 100, pl. 2,*11;* SD GLAESSNER, 1929, p. 295]. Carapace square, not much wider than long, length about 90% maximum width, widest approximately two-thirds the distance posteriorly on carapace; front axially sulcate, about 30% maximum carapace width; orbits circular, rimmed, forward directed; fronto-orbital width approximately two-thirds maximum carapace width; anterolateral and posterolateral margins confluent; anterolateral margin with two small spines; epibranchial and posteriormost mesogastric region swollen, forming a continuous ridge across carapace; cardiac region and central branchial regions inflated to form discontinuous transverse ridge; male pleonal somites 3 and 4 fused, possibly 4 and 5 fused as well. *Eocene* (*Ypresian, Lutetian, Priabonian*): Italy.——FIG. 3,*6. P. inflatus,* KSU D 865, cast of syntype GLW 175/05/0041, Eocene Italy, scale bar, 1 cm (new).

Subfamily PANOPEINAE Ortmann, 1893

[*nom. correct*. BALSS, 1921, p. 62, *pro* Panopaeinae ORTMANN, 1893, p. 429] [=Lophoxanthini ŠTEVČIĆ, 2005, p. 50; =Tetraxanthinae ŠTEVČIĆ, 2005, p. 53]

Carapace hexagonal, transversely ovate, or sometimes circular, wider than long, position of maximum width approximately half the distance posteriorly; front with medial notch, approximately one-third to 40 percent maximum carapace width; orbit rimmed, two fissures or notches; fronto-orbital width about 60–80 percent maximum carapace width; antero-lateral margin entire or with two to four spines excluding outer-orbital spine; anterolateral and posterolateral margins usually distinct from one another; protogastric, hepatic, and branchial regions sometimes with transverse ridges; sternum narrow or wide, sternite 8 sometimes visible in ventral view; male pleonal somites 3–5 fused, sutures may be visible; chelipeds subequal or heterochelous; chelae smooth, manus approximately as long as high, fingers with pointed or spoon-shaped tips, tips may be black; male genital openings coxal or coxo-sternal. [Emended from Karasawa & Schweitzer, 2006, p. 47.] *Eocene* (*Ypresian*)*–Holocene*.

Panopeus H. Milne Edwards, 1834 in 1834–1840, p. 403 [**P. herbstii;* SD by ICZN designation under plenary powers, Opinion 1282, 1984; =*Galene hawaiiensis* Dana, 1852a, p. 232]. Fronto-orbital width to maximum width ratio about 0.40; antero-lateral margin with sharp, well-developed spines; epigastric, protogastric, and epibranchial regions with transverse ridges; otherwise as for family. *Eocene* (*Ypresian*)*–Holocene. Eocene* (*Ypresian*): Italy, Mexico (Chiapas). *Lutetian:* Italy. *Eocene* (*Priabonian*)*:* Hungary, Italy. *Eocene:* Denmark, Italy, USA (Alabama, California, Oregon, Washington). *Oligocene:* USA (Alaska). *Miocene* (*Langhian*): Austria, Hungary, Poland, Spain. *Messinian:* Malta. *Miocene:* Argentina, Brazil, Jamaica, USA (Virginia). *Pliocene:* Fiji, Jamaica. *Pleistocene:* Jamaica, Panama, USA (Maryland, Massachusetts, New Jersey, South Carolina). *Holocene:* Atlantic Ocean, east Pacific Ocean.——Fig. 3,*7a–b*. **P. herbstii,* USNM 1286848, Holocene, Maryland, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Eoacantholobulus Ossó & Domínguez, 2017, p. 603 [**E. oscensis,* p. 604, fig. 1–2; OD]. Carapace wider than long, regions well defined by deep grooves; front deeply axially notched; protogastric regions with arcuate, concave forward, granular ridge; epibranchial regions with sinuous granular ridge; cardiac region wide, with transverse granular ridge; sternites granular. *Eocene* (*Priabonian*): Spain.——Fig. 4,1. **E. oscensis,* holotype MPZ-2017/542, Eocene, Spain, scale bar, 1 cm (new; photo by À. Ossó, Tarragona, Spain).

Eurypanopeus A. Milne-Edwards, 1880 in 1873–1880, p. 318 [**Xantho crenatus* H. Milne Edwards, 1834 in 1834–1840, p. 396; SD Fowler, 1912, p. 394; =*E. peruvianus* A. Milne-Edwards, 1880 in 1873–1880, p. 318]. Carapace ovate-hexagonal, regions sometimes with transverse granular keels; front weakly lobed; orbits small, fronto-orbital width half or more maximum carapace width; anterolateral margins with approximately five lobes including outer-orbital lobe; regions weakly marked; chelae strong, weakly heterochelous; male pleonal somites 3–5 fused with no evidence of sutures; sternite 8 may be visible in ventral view. *Pliocene–Holocene. Pliocene–Pleistocene:* Jamaica. *Holocene:* eastern Pacific Ocean, western Atlantic Ocean.——Fig. 3,*8a–b*. *E. depressus* (Smith, 1869), USNM 6665, Holocene, Virginia, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Eurytium Stimpson, 1862a, p. 56 [**Cancer limosa* Say, 1818 in 1817–1818, p. 446; OD; ICZN Opinion 85, 1925, Direction 37, 1956]. Carapace much wider than long, regions weakly defined, carapace smooth; front bilobed, narrow, about 25–30% maximum carapace width; orbits with two fissures, fronto-orbital width approximately half maximum carapace width; anterolateral margins with five spines including outer-orbital spines, first closely spaced, anterolateral margins much shorter than posterolateral margins; chelipeds very large, heterochelous. *Miocene–Holocene. Miocene:* Cuba, USA (Florida, North Carolina), Puerto Rico. *Miocene–Pliocene:* Colombia. *Pliocene:* Colombia, Venezuela. *Pliocene–Pleistocene:* Jamaica. *Pleistocene:* Panama. *Holocene:* Caribbean Sea, western Mexico, northern South America.——Fig. 3,*9a–b*. **E. limosum* (Say), USNM 75986, Holocene, South Carolina, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 1cm (new).

Hexapanopeus Rathbun, 1898a, p. 273 [**Panopeus angustifrons* Benedict & Rathbun, 1891, p. 373, pl. 22,*3,* pl. 24,*18;* OD]. Carapace distinctly hexagonal, length 75% or more width; regions moderately marked; front projected well beyond orbits, axially notched and with distinct inner-orbital angle; fronto-orbital width 50–75% maximum carapace width; anterolateral margins with five spines including outer-orbital spine, first two fused together, fifth sometimes very small and sometimes nearly positioned on posterolateral margin, anterolateral and posterolateral margins approximately equal in length; chelipeds stout, weakly heterochelous. *Pleistocene:* Jamaica. *Holocene:* western Atlantic Ocean, Caribbean Sea, western Mexico.——Fig. 4,*2a–b*. **H. angustifrons*, USNM 92225, Holocene, Chesapeake Bay, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Laevicarcinus Lőrenthey *in* Lőrenthey & Beurlen, 1929, p. 237 [**L. egerensis,* p. 238, pl. 11,*8;* SD Glaessner, 1929, p. 228]. Carapace wider than

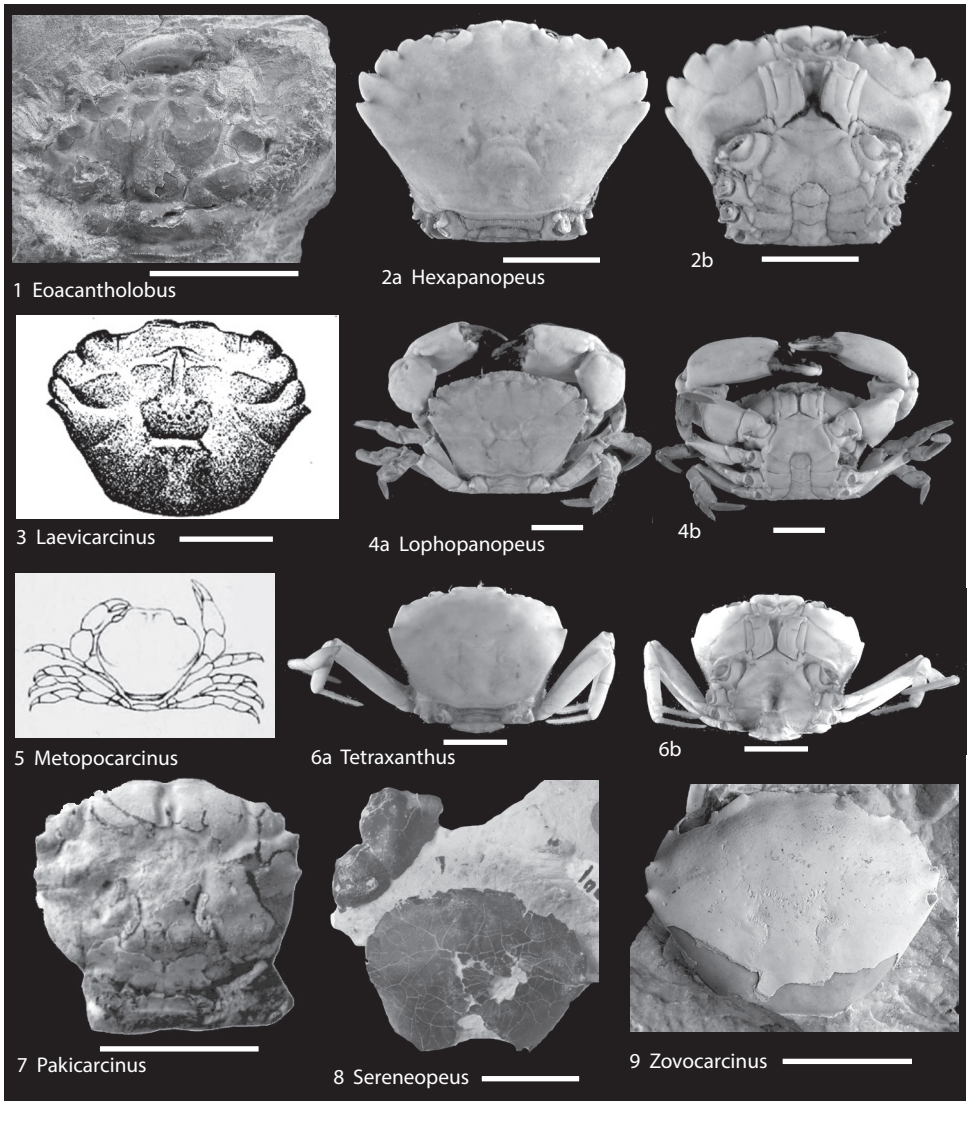

FIG 4. Panopeidae (p. 9–11).

long, distinctly hexagonal; front bilobed; orbits large, with two fissures, fronto-orbital width about 65% carapace width; anterolateral margins shorter than posterolateral margins, with five anterolateral lobes, first two fused together, spines separated by deep fissures; protogastric and hepatic regions with transverse keels. *Eocene. Eocene* (*Ypresian*): Italy. *Eocene* (*Lutetian–Bartonian*): USA (South Carolina). *Eocene* (*Priabonian*): Hungary.——FIG. 4,*3*. **L. egerensis,* Eocene, Hungary, illustrated, scale bar, 1 cm (LŐRENTHEY & BEURLEN, 1929, pl. 11,*8*).

Lophopanopeus RATHBUN, 1898a, p. 272 [**Xantho bella* STIMPSON, 1862b, p. 204, pl. 3,*2;* OD; ICZN Opinion 85, 1925, Direction 37, 1956; =*Xanthodes hemphilli* LOCKINGTON, 1877a, p. 31]. Carapace hexagonal, regions well defined; front sinuous; orbits small, fronto-orbital width approximately half maximum carapace width; anterolateral margin shorter than posterolateral margins, with five spines, first two or three coalesced; small part of sternite 8 visible in ventral view; chelipeds moderate in size, weakly heterochelous. *Miocene:* Jamaica. *Pliocene:* Costa Rica. *Pleistocene:* USA (California). *Holocene:* western USA, Canada, Mexico, Gulf of Mexico.——FIG. 4,*4a–b*. **L. bellus* (STIMPSON), USNM 14970, Holocene, Pacific coastal America,

dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Metopocarcinus Stimpson, 1862b, p. 216 [**M. truncatus,* p. 216, pl. 5,*4;* M; ICZN Opinion 85, 1925, Direction 37, 1956]. Carapace wider than long, anterolateral margins with four weak, blunt lobes; frontal margin over half maximum carapace width; carapace smooth, regions poorly defined; orbits oblique, directed anterolaterally. *Eocene–Holocene. Eocene* (*Lutetian*): Italy. *Holocene:* eastern Pacific Ocean.——Fig. 4,*5*. **M. truncatus*, Holocene, eastern Pacific Ocean, scale unknown (Stimpson, 1862b, pl. 5,*4*).

Tetraxanthus Rathbun, 1898a, p. 275 [**Xanthodes bidentatus* A. Milne-Edwards, 1880 in 1873–1880, p. 353, pl. 53,*5;* M; ICZN Opinion 85, 1925, Direction 37, 1956]. Carapace quadrate, regions not well defined, carapace smooth; front straight; orbits wide, deepest axially and shallowing laterally; anterolateral margin with four small spines including outer-orbital spine; chelipeds stout, chelae subequal. *Miocene–Holocene. Miocene:* Brazil. *Pliocene:* Jamaica. *Holocene:* western Atlantic Ocean.——Fig. 4,*6a–b*. *T. bidentatus* (A. Milne-Edwards), USNM 75396, Holocene, Florida, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

PANOPEIDAE SUBFAMILY UNCERTAIN

Pakicarcinus Schweitzer, Feldmann, & Gingerich, 2004, p. 110 [**Lobonotus orientalis* Collins & Morris, 1978, p. 970, pl. 116,*10–11*, pl. 117,*1*; OD]. Carapace flattened, approximately as wide as long, regions well-defined; front bilobed, with median notch, about 30% carapace width; orbits circular, fronto-orbital width about 60% carapace width; anterolateral margins with five spines including outer-orbital spine; male pleonal somites 3–5 fused, sutures not visible, male pleon entirely filling space between coxae of fifth pereiopods; sternal sutures 2/3 and 3/4 very clear; sternite 8 not visible in ventral view; chelae stout. *Paleocene–Eocene. Paleocene* (*Thanetian*): Pakistan. *Eocene* (*Bartonian*): Pakistan. *Eocene* (*Bartonian–Priabonian*): Australia.——Fig. 4,*7*. **P. orientalus* (Collins & Morris), GSP-UM 3507, Eocene, Pakistan, scale bar, 1 cm (new).

Sereneopeus Collins, 2002, p. 87 [**Panopeus kempi* Quayle & Collins, 1981, p. 752; OD]. Carapace hexagonal, wider than long, length about 80% maximum width, widest at anterolateral corner at approximately midlength; longitudinally moderately vaulted, transversely weakly vaulted; front nearly straight, rimmed, axial notch; orbits directed forward, deep; upper-orbital margin granular, with two short fissures in outer half; outer-orbital spine small; lower orbital margin with visible dorsally; fronto-orbital width approximately two-thirds maximum carapace width; anterolateral margin convex, weakly upturned; with four spines excluding outer-orbital spine of which second and third are most prominent and are directed forward; first and fourth are reduced in size; posterolateral margin straight, entire; regions indistinct; anterior process of mesogastric region lanceolate. *Eocene. Eocene* (*Ypresian*): Italy. *Eocene* (*Lutetian*): UK (England).——Fig. 4,*8*. **S. kempi* (Quayle & Collins), holotype NHMUK In. 61724, Eocene, England (UK), scale bar, 1 cm (new).

Zovocarcinus De Angeli & Garassino, 2014, p. 187 [**Z. muelleri,* p. 188, pl. 1; OD]. Carapace wider than long, smooth, regions poorly defined; front quadrilobed including inner orbital angles, with a transverse ridge parallel to it; orbits shallow; anterolateral margins with four spines, first two shorter; anterolateral margins shorter than posterolateral margins. *Eocene* (*Ypresian*): Italy.——Fig. 4,*9*. **Z. muelleri*, holotype MCZ 3817-IG361673, Eocene, Italy, scale bar, 1 cm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Family PSEUDORHOMBILIDAE Alcock, 1900

[*nom. transl*. Hendrickx, 1998, p. 641, *ex* Pseudorhombilinae Alcock, 1900, p. 286] [=Euphrosynoplacini Števčić, 2005, p. 52; =Chacellini Števčić, 2005, p. 52; =Bathyrhombilini Števčić, 2005, p. 53; =Perunorhombilini Števčić, 2005, p. 53; =Trapezioplacinae Števčić, 2005, p. 53; =Krunorhombilini Števčić, 2011, p. 130; =Scopoliini Števčić, 2011, p. 132]

Carapace hexagonal, wider than long, length/width ranging from 0.72–0.76, position of maximum width about 40–55 percent the distance posteriorly on carapace; carapace flattened, regions moderately well marked to weakly defined; front bilobed, ranging from 26–32 percent maximum carapace width; orbits with two fissures or notches, orbital rim sinuous, convex between fissures, marked protuberance on inner orbital rim; fronto-orbital width about 53–59 percent maximum carapace width; anterolateral margin with three to five spines including outer-orbital spine; sternum wide, sternite 8 visible adjacent to articulation condyle of coxa of fifth pereiopod, visible in posterior or dorsal view; male pleonal somites 1 and 2 not covering entire space between fifth pereiopods, somite 3 usually touching coxa of fifth pereiopod; male pleonal somites 3–5 fused, often weakly, sutures may be quite obvious. [Emended from Karasawa & Schweitzer, 2006, p. 49; Davie, Guinot, & Ng, 2015, p. 1115.] *Miocene–Holocene*.

Nanoplax Guinot, 1967, p. 362 [**Panopeus xanthiformis* A. Milne-Edwards, 1880 in 1873–1880, p. 353, pl. 53,*4;* OD]. Regions well defined; front and orbits rimmed; anterolateral margin with five spines including tiny outer-orbital spine; anterolateral margin shorter than posterolateral margin; sutures between pleonal somites 3–5 not obvious, only suture 3/4 marked. *Pleistocene–Holocene. Pleistocene:* Jamaica. *Holocene:* Caribbean Sea, western Atlantic Ocean.——Fig. 5,*1a–b*. **N. xanthiformis* (A. Milne-Edwards), USNM 1107812, Holocene, Florida; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Pseudorhombila H. Milne Edwards, 1837 in 1834–1840, p. 58 [**Melia quadridentata* Latreille, 1825a, p. 706; OD; ICZN Opinion 85, 1925, Direction 37, 1956]. Regions moderately defined; anterolateral margin with five lobes or spines, broad space between outer orbital spine and first anterolateral spine, first anterolateral spine and outer-orbital spine very small. *Miocene–Holocene. Miocene:* Argentina. *Holocene:* Gulf of Mexico, Caribbean Sea, Colombia.——Fig. 5,*2a–b*. **P. quadridentata*, USNM 267613, Holocene, Caribbean Sea; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Family XANTHIDAE MacLeay, 1838

[Xanthidae MacLeay, 1838, p. 59]

Carapace hexagonal or transversely ovate; carapace length/width falling into two groups, length either about 65–75 percent or 90–100 percent maximum carapace width, widest two-thirds to three-quarters the distance posteriorly except in some Xanthinae and Polydectinae in which position of maximum width is before the midlength; regions usually well defined but dorsal carapace can be smooth; frontal margin bilobed, with axial notch, ranging from 25 to about 40 percent maximum carapace width; fronto-orbital width generally approximately half to two-thirds maximum carapace width; anterolateral margins with between two and six lobes or spines; anterolateral margin well differentiated from posterolateral margin, anterolateral margin often tightly convex; posterolateral margin often concave; epistome with ridges that define efferent branchial canals absent or only on posterior portion of buccal cavity, not intercepting anterior part of buccal frame; sternum narrow, sternite 8 not visible ventrally; male pleon with somites 3–5 fused, sutures may be visible; male genital openings coxal; male gonopod 1 slender, curved or sinuous, simple apex without complex lobes or folds, with long setae distally or subdistally; gonopod 2 short, less than 25 percent length of gonopod 1; cheliped fingers typically black; chelae subequal or heterochelous, may have spoon-shaped tips; chelipeds much stouter than pereiopods 2–5. [Emended from Davie 2002, p. 505; Karasawa & Schweitzer, 2006, p. 50.] *Eocene* (*Ypresian*)*–Holocene*.

Subfamily ACTAEINAE Alcock, 1898

[Actaeinae Alcock, 1898, p. 78]

Carapace ovate, wider than long, length approximately two-thirds to three-quarters width, widest two-thirds to three-quarters the distance posteriorly; regions well-defined, highly subdivided, usually densely granular; anterolateral margins with three spines excluding outer-orbital spine; male pleonal somites 3–5 fused, sutures may be visible; pereiopods granular or spinose. *Eocene* (*Ypresian*)*–Holocene*.

Actaea de Haan, 1833 in 1833–1850, p. 18 [**Cancer granulatus* Audouin, 1828, p. 268; SD ICZN Opinion 73, 1941, Direction 37, 1956, name preoccupied by *Cancer granulatus* Linnaeus, 1758, p. 627; next available name *Cancer savignii* H. Milne Edwards, 1834 in 1834–1840, p. 378 as per Ng, Guinot, & Davie, 2008, p. 194; ICZN Direction 36, 1956] [=*Anchilops* Gistel, 1848, p. viii, unnecessary replacement name; =*Euxanthodes* Paul'son, 1875, p. 41 (type, *Euxanthodes granulatus,* M)]. Carapace with well-defined regions separated by deep grooves, ornamented with laterally interlocking tubercles that may be mosaic-like, squamiform, spiniform, petaliform, or noduliform; regions sometimes difficult to distinguish; posterolateral margins not very concave; chelipeds and other pereiopods granular or with spines, ornamentation similar to that of dorsal carapace; male pleonal somite 6 with depressions serving as pleonal locking mechanism; sternites 1 and 2 fused with no evidence of suture; sternal suture 3/4 only developed laterally. *Miocene* (*Langhian*)*–Holocene. Miocene* (*Langhian*): Austria, Hungary, Spain. *Miocene* (*Messinian*): Spain. *Miocene:* Iran, Taiwan. *Pleistocene:* Jamaica, Japan, Taiwan. *Holocene:* Mediterranean Sea, Indo-Pacific and Western Atlantic oceans.——Fig. 5,*3a–b*. **A. savignii* (H. Milne Edwards), USNM 76547, Holocene, Australia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Actaeodes Dana, 1851b, p. 126 [**Zozymus tomentosus* H. Milne Edwards, 1834 in 1834–1840, p. 385; M] [=*Cycloblepas* Ortmann, 1894, p. 53 (type, *C.*

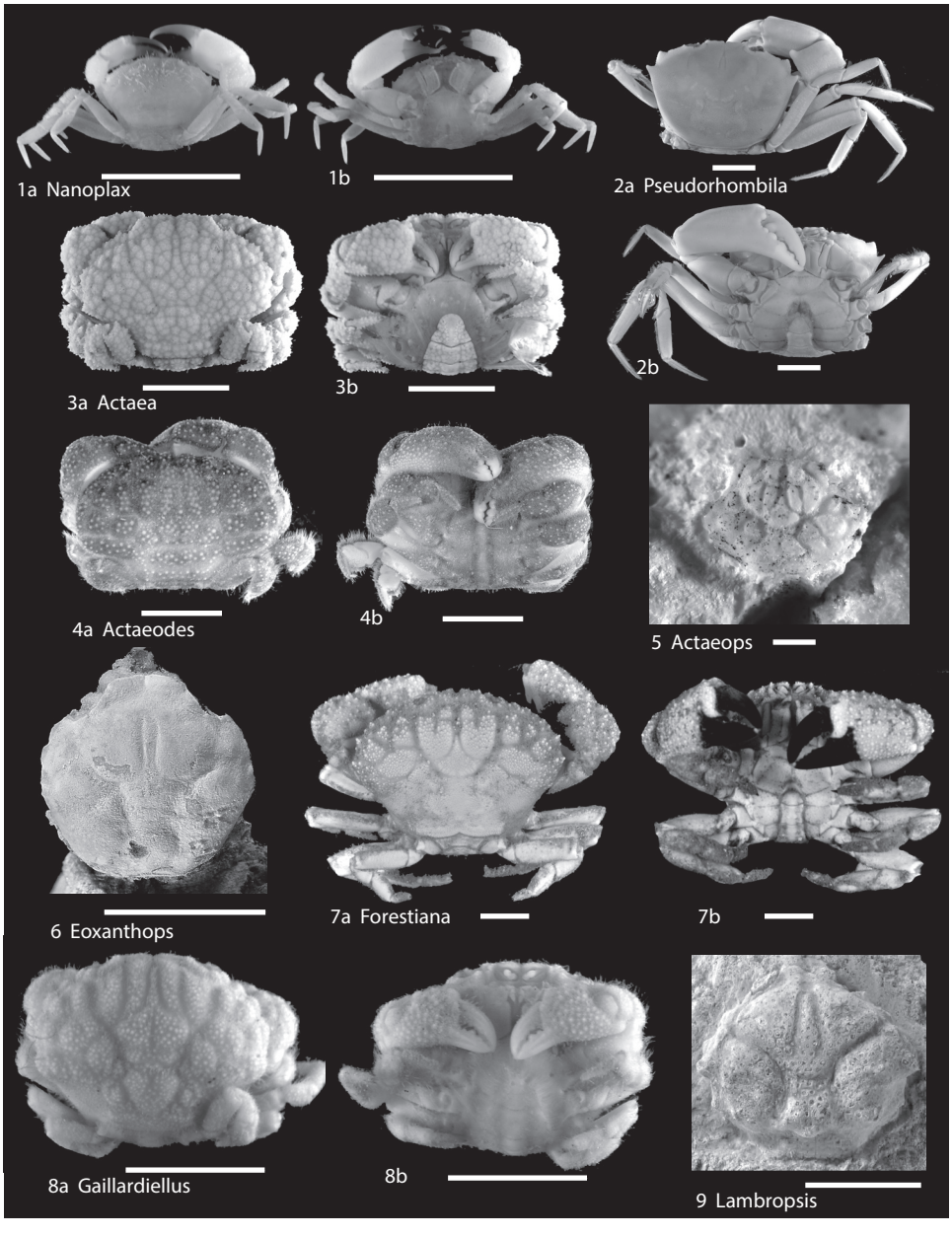

FIG 5. Pseudorhombilidae, Xanthidae (p. 11–14).

semoni, p. 53, pl. 3,*8,* M)]. Carapace regions well defined, ornamented with tubercles, anterolateral margin with five nodose spines including outer-orbital spine, weakly projecting; chelipeds and other pereiopods granular; male pleonal somite 6 with depressions serving as pleonal locking mechanism; sternites 1 and 2 fused; sternites 3 and 4 with suture laterally and groove medially; sternite 4 with swellings parallel to lateral margins, short axial groove visible anterior to telson. *Pliocene–Pleistocene:* Guam, Marshall Islands. *Pleistocene:* Taiwan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——FIG. 5,*4a–b*. **A. tomentosus* (H. MILNE EDWARDS), USNM 184537, Holocene, Guam (UST); dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Actaeops Portell & Collins, 2004, p. 122 [**A. frontalis,* p. 122, fig. 2,*7;* OD]. Carapace wider than long; regions well defined; fronto-orbital width broad, 65% maximum carapace width; epigastric regions large, spherical; protogastric region subdivided into two longitudinal lobes. *Miocene:* Jamaica.——Fig. 5,*5*. **A. frontalis*, holotype UF 106750, Miocene, Jamaica, scale bar, 1 cm (new; photo by R. Portell, Florida Museum of Natural History, Gainesville, Florida, USA).

Eoxanthops Beschin, Busulini, Tessier, & Zorzin, 2016, p. 126 [**E. scutatus,* p. 126, pl. 16,*6;* OD]. Carapace approximately as wide as long, front protrudes well beyond orbits, broadly triangular; orbits shallow, directed anterolaterally; regions moderately developed, anterolateral margins with blunt spines. *Eocene* (*Ypresian*): Italy.——Fig. 5,*6*. **E. scutatus*, holotype VR 94531, Eocene, Italy, scale bar, 1 cm (new; photo by C. Beschin, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Forestiana Guinot & Low, 2010, p. 67 [**Xantho depressus* White, 1848, p. 225; OD; replacement name *pro Forestia* Guinot, 1976, p. 260 (type, *Xantho depressus* White, 1848; OD, *non Forestia* Trinchese, 1881, p. 122 [mollusk])]. Carapace transversely oval; dorsal surface ornamented with small granules, gently convex anteriorly with well-defined regions, flattened posteriorly; anterolateral margin short with four poorly developed teeth or lobes; thoracic sternum without sternal suture 3/4 marked by median granular line; the sternite 4 with longitudinal furrow visible in front of the telson. *Holocene* (fossil): Taiwan. *Holocene:* Indo-Pacific Ocean, northwestern Australia.——Fig. 5,*7a–b*. *Forestiana* sp., USNM 1149546, Holocene, South Pacific Ocean; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Gaillardiellus Guinot, 1976, p. 252 [**Cancer* (*Aegle*) *rüppellii* Krauss, 1843, p. 28, pl. 1,*1;* OD; =*Aegle rugata* White, 1847a, p. 15; =*Actaea pilosa* Stimpson, 1858, p. 31]. Carapace ovate, wider than long, regions well defined, granular; anterolateral margins long, strongly convex, longer than posterolateral margins, with four projections not including outer-orbital projection; pereiopods densely granular; male pleonal somites 3–5 fused, no visible sutures; sternites 1 and 2 fused; sternal suture 2/3 and 3/4 complete, bounded by granules anteriorly. *Pleistocene–Holocene. Pleistocene:* Taiwan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——Fig. 5,*8a–b*. **G. rueppelli* (Krauss), USNM 1462690, Holocene, Philippines; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Heteractaea Lockington, 1877b, p. 97 [**H. pilosus;* M; =*Pilumnus lunatus* H. Milne Edwards & Lucas, 1843, p. 20, pl. 9,*2*]. Carapace wider than long; regions moderately well defined, ornamented with large tubercles, sometimes dense; front straight, orbits thickly rimmed; anterolateral margins with spines, sometimes alternating long and short. *Pliocene–Holocene. Pliocene:* Panama. *Pliocene–Pleistocene:* Costa Rica, Panama. *Holocene:* Caribbean Sea, western Mexico.——Fig. 6,*1a–b*. *H. lunata* (H. Milne Edwards & Lucas), USNM 139751, Holocene, North Pacific Ocean; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Lambropsis Lőrenthey, 1907, p. 211 (German version 1909, p. 123, misspelled *Lampropsis*) [**L. wanneri* Lőrenthey, 1907, p. 213, pl. 1,*1;* M]. Carapace wider than long, length 80% maximum width; front axially sulcate; frontal width 26% maximum width; orbits transversely ovate with two small supraorbital protuberances, a larger outer orbital spine, and a blunt suborbital spine; fronto-orbital width 51% maximum width; anterolateral margin with three spines, last one largest; posterolateral margin convex anteriorly and bearing a single spine, becoming concave where it meets straight posterior margin; regions well delimited; protogastric region very large, intestinal region depressed; cervical groove deep, continuous; surface with blunt nodes or spines. *Eocene:* Egypt.——Fig. 5,*9*. **L. wanneri,* cast KSU D 402 of holotype SMNS 67894, scale bar, 1 cm (new).

Paractaea Guinot, 1969, p. 241 [**Xantho rufopunctatus* H. Milne Edwards, 1834 in 1834–1840, p. 389; OD]. Carapace ovate; regions well defined, separated by very deep, wide grooves, granular; protogastric and hepatic regions with oblong, longitudinal swellings; swellings on posterior carapace regions more equant; pereiopods with large swellings, granular; sternum rectangular, sternites 1 and 2 fused, sternal suture 2/3 complete, sternal suture 3/4 complete, concave forward. *Pleistocene–Holocene. Pleistocene:* Barbados, Taiwan. *Holocene:* Cosmopolitan tropical.——Fig. 6,*2a–b*. **P. rufopunctata* (H. Milne Edwards), USNM 1183553, Holocene, Guam; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Phlyctenodes A. Milne-Edwards, 1862a, p. 60 [**P. tuberculosus,* p. 61, pl. 7,*1;* SD Glaessner, 1929, p. 313]. Carapace ovate, wider than long, carapace regions poorly defined; front with six swellings including inner-orbital angle; orbits strongly rimmed, directed weakly anterolaterally, entire; anterolateral margins moderately convex, with several small swellings or spines, posteriormost anterolateral spine extending onto carapace as weak ridge; anterior carapace with large tubercles more or less arranged into rows parallel to carapace margins, posterior carapace relatively smooth; posterolateral margin weakly convex. *Eocene* (*Ypresian–Priabonian*). *Eocene* (*Ypresian*): France, Hungary, Italy. *Lutetian:* France, Hungary, Italy. *Bartonian:* Hungary, Italy. *Priabonian:* Hungary, Italy.——Fig. 6,*3*. *P. krenneri* Lőrenthey, 1897, KSU D 154, cast of holotype MAFI E 9301, Eocene, Hungary, scale bar, 1 cm (new).

Pseudophlyctenodes Busulini, Tessier, & Beschin, 2006, p. 358 [**Phlyctenodes hantkenii* Lőrenthey, 1897, p. 154; OD; see ICZN Article 33.4.]. Carapace wider than long; front straight, orbits shallow; anterolateral margin strongly convex, with numerous small spines, much longer than posterolateral margin; carapace regions well defined,

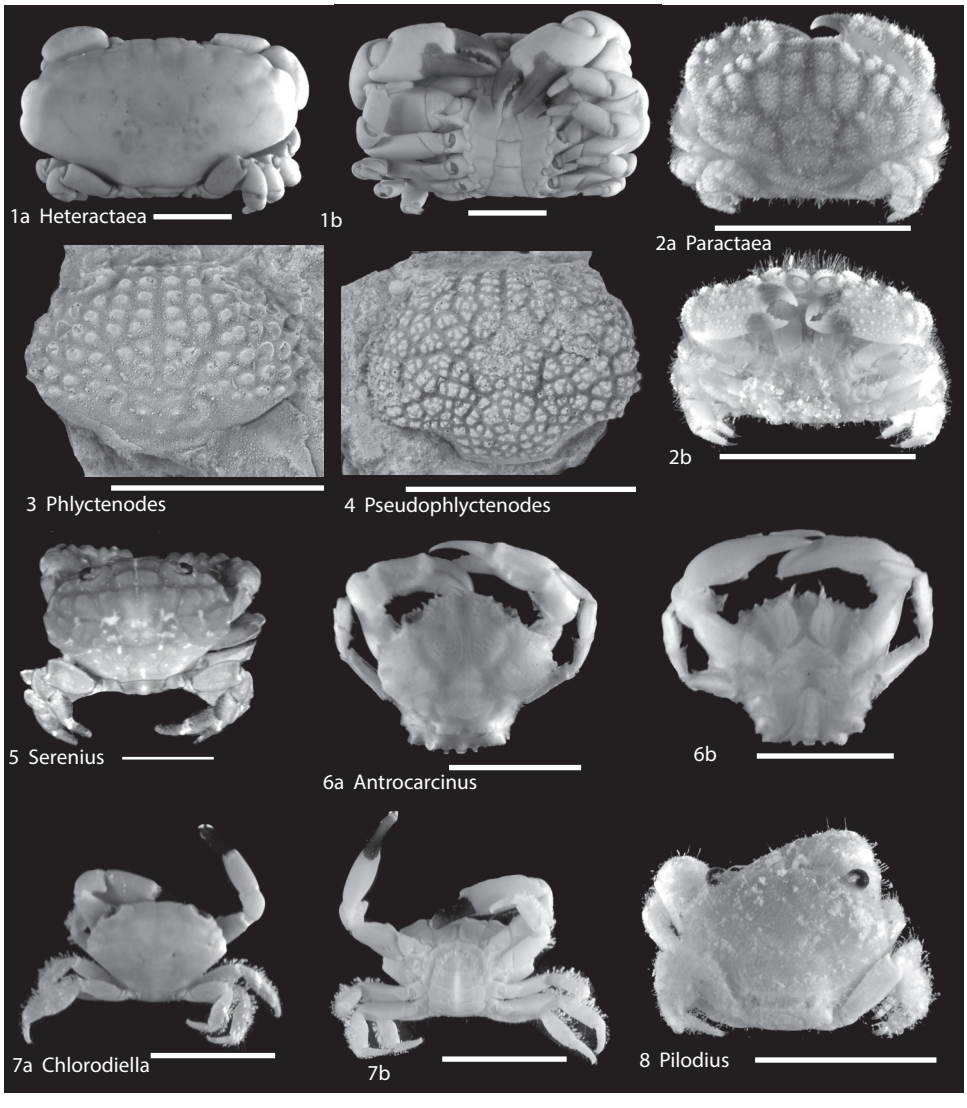

FIG 6. Xanthidae (p. 14–16).

subdivided into numerous small subregions, densely granular. *Eocene* (*Lutetian, Priabonian*): Hungary, Italy.——FIG. 6,*4*. **P. hantkenii* (LŐRENTHEY), KSU D 144, cast of holotype MAFI E322, Eocene Hungary, scale bar, 1 cm (new).

Serenius GUINOT, 1976, p. 272 [**Zozymus pilosus* A. MILNE-EDWARDS, 1867, p. 271; OD]. Carapace ovate, wider than long; front convex, axially notched; orbits broadly rimmed; anterolateral margins tightly convex, with four spines or lobes excluding outer-orbital angle; regions well marked and ornamented with large scabrous, forward-directed tubercles, similar ornamentation on pereiopods. *Holocene* (fossil): Taiwan. *Holocene:* Indo-Pacific Ocean.——FIG. 6,*5*. *S. kuekenthali* DE MAN, 1902, USNM 1467332, Holocene, Papua New Guinea, scale bar, 1 cm (new).

Subfamily ANTROCARCININAE Ng & Chia, 1994

[Antrocarcininae NG & CHIA, 1994, p. 702]

Carapace hexagonal, regions well defined, cardiac region especially inflated and transversely widened; intestinal region rectangular; anterolateral margin with three blunt spines, posterolateral margin may have

anterior spine; sternal suture 2/3 distinct, sternal suture 3/4 deep, interrupted axially; male pleonal somites fused but sutures remain. *Holocene*.

Antrocarcinus Ng & Chia, 1994, p. 707 [**A. petrosus,* p. 707, fig.1–4, 10A; OD]. Carapace markedly hexagonal, angular, approximately one-third wider than long; front deeply axially notched; anterolateral margins with four or so spines, posterolateral margin with one spine just posterior to anterolateral corner; cardiac region wide; pereiopods 3–5 with strong triangular spines on carpus; pleon with transverse ridges on somites 2–5. *Holocene:* New Caledonia, South Pacific Ocean.——Fig. 6,*6a–b*. **A. petrosus,* USNM 268704, Holocene, New Caledonia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily CHLORODIELLINAE Ng & Holthuis, 2007

[Chlorodiellinae Ng & Holthuis, 2007, p. 22; ICZN Opinion 2204, 2008]

Carapace wider than long, length approximately two-thirds to three-quarters maximum carapace width, widest two-thirds to three-quarters the distance posteriorly; regions range from well marked to poorly defined; anterolateral margin with two to four spines excluding outer-orbital spines, longer than posterolateral margin; front broadly bilobed and with small inner-orbital projections, not extending beyond orbits; fingers with spoon-shaped tips. *Eocene–Holocene*.

Chlorodiella Rathbun, 1897, p. 157 [**Cancer niger* Forskål, 1775, p. 89; SD ICZN Opinion 2204, 2008; =*Cancer clymene* Herbst, 1801 in 1782–1804, p. 41, pl. 52,*6;* =*Chlorodius nebulosus* Dana, 1852a, p. 214; =*Chlorodius depressus* Heller, 1861a, p. 338]. Carapace hexagonal, wider than long; fronto-orbital margin approximately half greatest width; front approximately one-third greatest width, with four weakly defined lobes; two upper orbital fissures indistinct or absent; anterolateral margin bearing four lobes or spines, some extending onto carapace in broad ridges; dorsal surface slightly convex, usually smooth; regions faintly or not defined; chelipeds and chelae long, outer surface smooth or granular; basal article of the antenna with outer anterolateral angle not elongate and orbital hiatus open; antennal flagellum folded freely in orbital hiatus; male pleopod 1 with subapical setae strong and directed posteriorly or fine and weakly developed. *Eocene–Holocene. Eocene:* Italy. *Miocene* (*Burdigalian*): Spain. *Miocene* (*Langhian*): Austria, Hungary, Poland, Spain. *Serravallian:* Spain. *Miocene:* Jamaica, Java. *Pliocene:* Fiji. *Pleistocene:* Japan, Taiwan. *Holocene:* Indo-West Pacific Ocean, eastern Pacific Ocean, West Indes.——Fig. 6,*7a–b*. **C. nigra,* USNM 1138270, Holocene, Solomon Islands; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Cyclodius Dana, 1851b, p. 126 [**Cyclodius ornatus* Dana, 1852b, p. 80; SD ICZN Opinion 73, 1941, Direction 37, 1956; =*Chlorodius obscurus* Jacquinot & Lucas, 1846 in 1842–1853, p. 26, pl. 3,*4*; =*Chlorodius monticulosus* Dana, 1852a, p. 206] [=*Phymodius* A. Milne-Edwards, 1863, p. 283 (type, *Chlorodius ungulatus* H. Milne Edwards, 1834 in 1834–1840, p. 400, pl. 16,*6–8;* SD Rathbun, 1930, p. 294)]. Carapace wider than long; front with four lobes; orbits broadly rimmed; protogastric regions long, bilobed longitudinally; anterolateral margins longer than posterolateral margins, with five spines including outer-orbital spine; gastric regions longer than branchial regions; basal article of the antenna with outer anterolateral angle not elongate and orbital hiatus open; antennal flagellum folded freely in orbital hiatus. *Pleistocene–Holocene. Pleistocene:* Jamaica, Japan, Sarawak, Taiwan. *Holocene:* Caribbean Sea, Indo-Pacific Ocean.——Fig. 7,*1a–b*. **C. obscurus*, USNM 91628, Holocene, South Pacific; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Pilodius Dana, 1851b, p. 126 [**Pilodius pubescens* Dana, 1852a, p. 217; SD Serène, 1984, p. 233] [=*Chlorodopsis* A. Milne-Edwards, 1873, p. 227 (type, *C. melanochirus,* p. 228; SD ICZN Opinion 73, 1941, Direction 37, 1956)]. Carapace hexagonal, wider than long; front-orbital margin approximately three-quarters greatest width; frontal margin smooth or spinose, approximately one-third greatest width; upper orbital margin with two fissures; anterolateral margin bearing four to five spines including outer-orbital spine, sometimes with supplementary spines; dorsal surface slightly convex, usually granular, with well-defined regions; chelipeds long, outer surface granular or spinose; pereiopods also granular or spinose; basal article of antenna with outer anterolateral angle more or less elongate and lodged into orbital hiatus which it can completely obstruct; antennal flagellum extends out of orbital hiatus. *Miocene–Holocene. Miocene* (*Burdigalian*): Japan. *Miocene* (*Langhian*): Austria, Hungary, Spain. *Miocene* (*Tortonian*): Austria, Hungary, Spain. *Pliocene–Pleistocene:* Marshall Islands. *Pleistocene:* Taiwan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——Fig. 6,*8*. **P. pubescens*, USNM 1184888, Holocene, North Pacific, scale bar, 1 cm (new).

Subfamily CYMOINAE Alcock, 1898

[*nom. transl.* Takeda, 1976, p. 70, *ex* Cymoida Alcock, 1898, p. 78]

Carapace subcircular or oval, approximately as long as wide; front medially

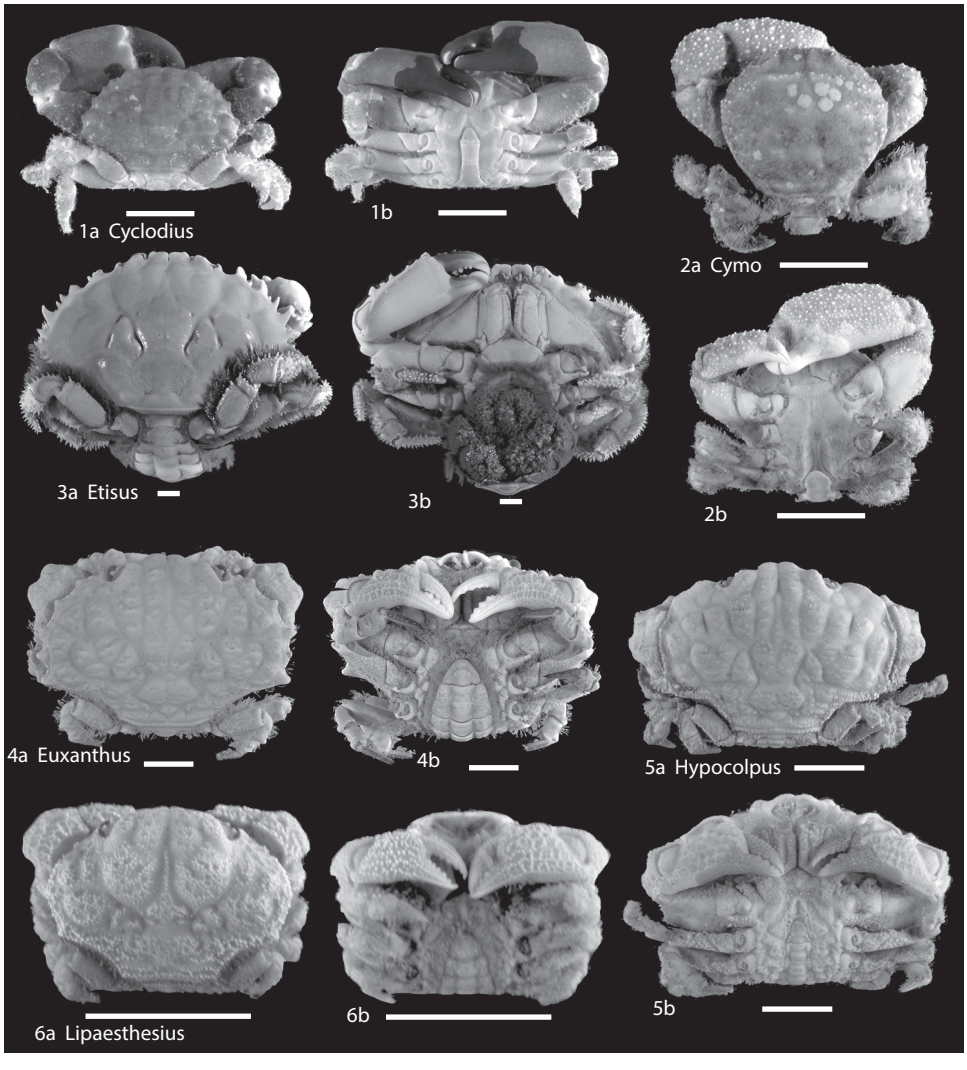

FIG 7. Xanthidae (p. 16–18).

notched, with several spines approximately half greatest width; regions poorly defined; anterolateral margins nearly straight, with weak projections, longer than posterolateral margins; posterolateral margins nearly straight; male pleon with somites 3–5 fused; cheliped unequal, dissimilar. *Pleistocene–Holocene.*

Cymo DE HAAN, 1833 in 1833–1850, p. 22 [**Pilumnus andreossyi* AUDOUIN, 1826, p. 86; M; ICZN Opinion 73, 1941, Direction 37, 1956]. As for subfamily. *Pleistocene:* Japan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——FIG. 7,*2a–b.* **C. andreossyi* (AUDOUIN), USNM 13919, Holocene, Japan; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily ETISINAE Ortmann, 1893

[Etisinae ORTMANN, 1893, p. 429]

Carapace transversely hexagonal, wider than long; dorsal surface convex, smooth or finely granular, with moderately defined regions; front bilobed or four-lobed, usually protruded anteriorly, well separated from

supraorbital angle; anterolateral margin with four to eight triangular spines excluding outer-orbital spine; male pleonal somites 3–5 fused; chelipeds large, subequal, with rounded, spoon-shaped occlusal surfaces of tips of fingers; basal antennal article with outer anterolateral lobe within orbital hiatus; antennal flagellum outside orbit. *Eocene* (*Ypresian*)*–Holocene.*

Etisus H. Milne Edwards, 1834 in 1834–1840, p. 410 [**Cancer dentatus* Herbst, 1785 in 1782–1804, p. 186, pl. 11,*66;* SD Glaessner, 1929, p. 168] [=*Etisodes* Dana, 1851b, p. 126 (type, *E. frontalis,* SD Ward, 1932, p. 245)]. As for subfamily. *Eocene–Holocene. Eocene* (*Ypresian, Priabonian*): Italy. *Miocene* (*Langhian*): Austria, Hungary. *Pliocene:* Fiji, Java. *Pliocene–Pleistocene:* Marshall Islands. *Pleistocene:* Japan, Taiwan. *Holocene:* Indo-West Ocean, central Pacific Ocean.——Fig. 7,*3a–b*. *E. splendidus* Rathbun, 1906, USNM 94506, Holocene, central Pacific Ocean; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily EUXANTHINAE Alcock, 1898

[*nom. transl*. Takeda, 1976, p. 70, *ex* Euxanthoida Alcock, 1898, p. 77] [=Ladomedaeidae Števčić, 2005, p. 35; =Pilomedaeini Števčić, 2013, p. 188]

Carapace hexagonal, wider than long, regions well defined; front quadrilobed; orbits rimmed; anterolateral margin strongly convex, longer than posterolateral margin; posterolateral margin concave; subhepatic cavity may be present, may continue dorsally to form hole in anterolateral margin; sternum often with longitudinal grooves; chelipeds subequal, carpus, manus, and dactyli fitting against carapace; walking legs lay into concave posterolateral margin. *Miocene* (*Burdigalian*)*–Holocene.*

Euxanthus Dana, 1851b, p. 125 [**E. sculptilis* Dana, 1852b, p. 75; SD Guinot-Dumortier, 1960, p. 164; =*Cancer huonii* Jacquinot & Lucas, 1853 in 1842–1853, p. 16, pl. 4,*1*] [=*Melissa* Strahl, 1861, p. 103 (type, *Cancer melissa* Herbst, 1801 in 1782–1804, p. 7, pl. 51,*1,* absolute tautonymy) =*Euxanthopsis* Rathbun, 1897, p. 166, unnecessary replacement name; =*Euryetisus* Cano, 1889, p. 200, pl. 7,*9–10* (type, *E. deplanatus,* SD ICZN Opinion 85, 1925, Direction 37, 1956)]. Subhepatic cavities absent; carapace smooth or granular, strongly vaulted longitudinally; anterolateral margin strongly convex, much longer than posterolateral margin, last anterolateral spine extending onto carapace in weak rim; maximum width 75% the distance posteriorly. *Holocene* (fossil): Taiwan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——Fig. 7,*4a–b*. **E. sculptilis,* USNM 156007, Holocene, Micronesia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Hypocolpus Rathbun, 1897, p. 164 [**Cancer sculptus* H. Milne Edwards, 1834 in 1834–1840, p. 376; M (preoccupied name, *Cancer sculptus* Herbst, 1794 in 1782–1804, p. 153, pl. 37,*4*); =*Melissa diverticulata* Strahl, 1861, p. 103, replacement name *pro C. sculptus* H. Milne Edwards] [=*Hypocoelus* Heller, 1861b, p. 7 (type, *C. sculptus* H. Milne Edwards, M, *non Hypocoelus* Latreille, 1834, p. 125)]. Carapace trapezoidal, much wider than long; front quadrilobed; anterolateral margin with numerous small spines on larger lobes, crispate; posterolateral margin strongly concave, with tiny spines; dorsal surface strongly convex, densely granular; subhepatic cavity present; regions well defined, subdivided; chelipeds equal; pereiopods short, broad, folded against posterolateral margin. *Pleistocene–Holocene. Pleistocene:* Japan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——Fig. 7,*5a–b*. **H. diverticulatus* (Strahl) USNM 17794, Holocene, Indian Ocean; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Lipaesthesius Rathbun, 1898b, p. 584 [**L. leeanus*, p. 585; M; ICZN Opinion 85, 1925, Direction 37, 1956; =*Medaeus rugosus* Boone, 1927, p. 201]. Carapace wider than long, widest approximately half to 75% the distance posteriorly; front broadly convex, projected beyond orbits; orbits small; anterolateral margins strongly convex, sinuous, with tiny spines; posterolateral margins strongly concave, granular; dorsal carapace with weakly defined regions, ornamented with vermiculiform granular sinuous patterns that are also present on pereiopods and sternum. *Pliocene–Holocene. Pliocene:* Fiji. *Holocene:* eastern Pacific Ocean.——Fig. 7,*6a–b*. **L. leeanus,* USNM 284196, Holocene, Gulf of California, Mexico; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Medaeops Guinot, 1967, p. 366 [**Leptodius granulosus* Haswell, 1882, p. 61; OD; =*Xantho macgillivrayi* Miers, 1884, p. 211, pl. 20,*C;* =*Lophopanopeus japonicus* Rathbun, 1898a, p. 272; =*Lophoxanthus erosus* Parisi, 1916, p. 181, fig. 4]. Carapace transversely hexagonal, wider than long; front nearly straight, medially notched; anterolateral margin usually bearing four weak spines; posterolateral margin nearly straight; dorsal surface convex or flattened, with scabrous granulated ridges; subhepatic cavity absent; regions well defined; chelipeds weakly unequal; pereiopods short, broad, not folded against posterolateral margin; male pleon broad, telson short. *Miocene–Holocene. Miocene* (*Burdigalian*): Japan. *Holocene:* Indo-West Pacific Ocean.——Fig. 8,*1a*. **M. granulosus* (Haswell), USNM 70896, Holocene, Australia, dorsal view, scale bar, 1 cm (new).——Fig. 8,*1b. M. megamiensis* Karasawa, 1993, MFM 83040, holotype, Miocene, Japan, dorsal view, scale bar, 1 cm (new).

Medaeus Dana, 1851b, p. 125 [**M. ornatus* Dana, 1852b, p. 76; M; ICZN Opinion 712, 1964] [=*Stimpsonia* Števčić, 2005, p. 134 (type, *Pilumnus spinulifer* Rathbun, 1898b, p. 585, pl. 42,*6–8,* OD)]. Carapace hexagonal, not much wider than long; front sinuous, medially notched; orbits directed anterolaterally; anterolateral margin usually bearing four thick, tuberculated spines excluding outer-orbital angle; posterolateral margin nearly straight; dorsal surface convex with well-defined regions; subhepatic cavity absent; chelipeds subequal; pereiopods not folded against posterolateral margin; sternum narrow; male pleon long, telson short. *Miocene* (*Langhian*)*–Holocene. Miocene* (*Langhian*): Japan. *Miocene:* Java, Fiji. *Pliocene:* Fiji. *Holocene:* west-central Pacific Ocean, eastern Pacific Ocean.——Fig. 8,*2a–b*. **M. ornatus,* USNM 39523, Holocene, Hawaii, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Monodaeus Guinot, 1967, p. 369 [**Xantho couchii* Bell in Couch, 1851, p.14; OD; =*Xantho tuberculatus* Bell, 1852 in 1844–1852, p. 359]. Carapace transversely hexagonal, regions well defined, granular, some with transverse ridges of granules; anterolateral margins with four sharp spines; posterolateral margins straight; chelipeds unequal; walking legs thin; male pleon short; sternum with axial groove. *Miocene–Holocene. Miocene* (*Langhian*): Spain. *Pliocene* (*Piacenzian*)*–Pleistocene:* Italy. *Holocene:* Atlantic Ocean, Indian Ocean.——Fig. 8,*3a–b*. **M. couchii* (Bell in Couch), USNM 123220, Holocene, North Atlantic Ocean; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily GARTHIELLINAE Mendoza & Manuel-Santos, 2012

[Garthiellinae Mendoza & Manuel-Santos, 2012, p. 33]

As for genus. *Holocene*.

Garthiella Titgen, 1986, p. 56 [**Chlorodopsis aberrans* Rathbun, 1906, p. 859, fig. 20; OD]. Carapace wider than long; front deeply axially notched, with some spines; anterolateral margin with four long spines excluding outer-orbital angle, carapace with large granules anteriorly; chelae with large granules on manus and carpus. *Holocene:* Pacific Ocean.——Fig. 8,*4*. **G. aberrans* (Rathbun), USNM 29434, Holocene, Hawaii, USA (scale bar, 1 cm (Rathbun, 1906, fig. 20).

Subfamily GLYPTOXANTHINAE Mendoza & Guinot, 2011

[Glyptoxanthinae Mendoza & Guinot, 2011, p. 30]

As for genus. *Miocene* (*Langhian*)*–Holocene*.

Glyptoxanthus A. Milne-Edwards, 1879 in 1873–1880, p. 253 [**Actaea erosa* Stimpson, 1862a, p. 51; SD Rathbun, 1930, p. 263]. Dorsal carapace, sternum, pleon, and pereiopods ornamented with vermiculiform ornamentation comprised of fused granules; subhepatic cavities absent; front deflexed below level of orbits; orbits deep; anterolateral margins with four lobes. [Emended from Mendoza & Guinot, 2011, p. 30.] *Miocene* (*Langhian*)*–Holocene. Miocene* (*Langhian*): Spain. *Holocene:* Atlantic Ocean, Caribbean Sea, western Mexico.——Fig. 8,*5a–b*. **G. erosus,* USNM 168866, Holocene, North Carolina, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily KRAUSSIINAE Ng, 1993

[Kraussiinae Ng, 1993, p. 135]

Carapace ovate, not much wider than long, moderately vaulted longitudinally and transversely; regions weakly defined anteriorly, undefined posteriorly, entire carapace ornamented with short transverse scabrous ridges; frontal margin quadrilobed, with tiny serrations overall; anterolateral margin very strongly convex, serrate; posterolateral margin strongly concave; sternum long, sternal sutures 2/3 and 3/4 complete; male pleonal somites 3–5 fused, fitting into episternites of sternites 7; chelipeds stout, short; walking legs short, with curved, flattened dactyli. *Holocene*.

Kraussia Dana, 1852c, p. 120 [**Corystes* (*Platyonichus) rugulosus* Krauss, 1843, p. 26, pl. 1,*5;* M; =*Trichocera porcellana* Adams & White, 1849, p. 59; =*K. proporcellana* Ward, 1934, p. 10, pl. 1,*7*]. *Holocene:* east Africa, Indo-Pacific Ocean, central Pacific Ocean.——Fig. 8,*6a–b*. **K. rugulosa* (Krauss), USNM 102946, Holocene, central Pacific Ocean; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily LIOMERINAE Sakai, 1976

[*nom. transl*. Serène, 1984, p. 45, *ex* Liomeroida Sakai, 1976, p. 390]

Carapace ovate, much wider than long, carapace smooth, granular or rugose, regions well or poorly marked; anterolateral margins entire or with weak spines; front weakly bilobed; chelipeds subequal or weakly unequal, fixed finger lacking tooth on occlusal surface; walking legs subcylindrical to flattened. *Eocene* (*Ypresian*)*–Holocene*.

Liomera Dana, 1851b, p. 124 [**Carpilius cinctimanus* White, 1847b, p. 336, pl. 2,*3;* M, ICZN Opinion 85, 1925, Direction 37, 1956; =*Liomera lata* Dana, 1852b, p. 73; =*L. cocosana* Boone, 1927, p. 184,

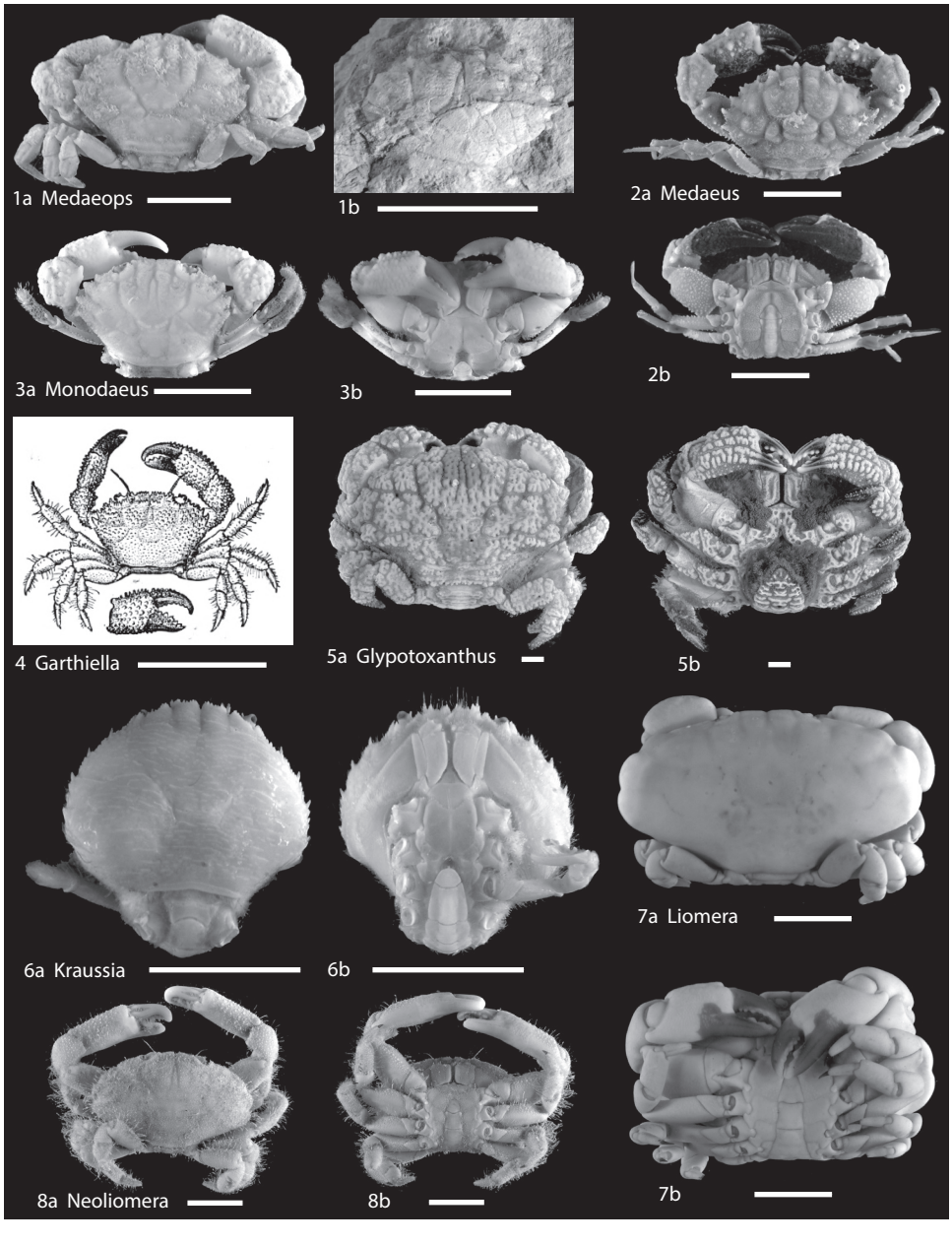

FIG 8. Xanthidae (p. 18–21).

fig. 63] [=*Carpilodes* DANA, 1851b, p. 126 (type, *C. tristis* DANA, 1852b, p. 77, M); =*Carpiloxanthus* A. MILNE-EDWARDS, 1862b, p. 3 (type, *C. vaillantianus,* M); =*Actaeopsis* LANCHESTER, 1900, p. 741 (type, *Carpiliodes pallidus* BORRADAILE, 1900, p. 586, pl. 40,*3,* M); *non Actaeopsis* CARTER, 1898, p. 35 (type, *A. wiltshirei,* p. 35, pl. 2–3, M)].

[DANA (1851b) erected the genus *Liomera* and mentioned in a footnote that the genus included *Carpilius cinctimanus* WHITE, 1847b. DANA (1852b) later erected the species *Liomera lata*. According to ICZN Opinion 85, Direction 37, *Liomera cinctimana* is the type species by monotypy. *Liomera lata* was later recognized as a junior synonym of

L. cinctimana by Serène (1984), and Rathbun (1930) synonymized *Liomera cocosana* with *L. cinctimana*.] Carapace very broad, ovate, vaulted transversely and longitudinally, point of maximum width more than half the distance posteriorly on carapace; front narrow, obliquely deflexed, medially notched; orbit small, with two fissures; anterolateral margin tightly convex, usually with four broad, rounded lobes separated by grooves extending onto carapace; posterolateral margin strongly convergent, weakly concave; regions well defined in anterior half, regions subdivided. *Miocene–Holocene. Miocene* (*Messinian*): Italy. *Pliocene:* Fiji. *Pleistocene:* Japan, Taiwan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean, Pacific coastal Central America.——Fig. 8,*7a–b. *L. cinctimana* (White), USNM 6593, Holocene, Australia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Neoliomera Odhner, 1925, p. 25 [**Zozymus pubescens* H. Milne Edwards, 1834 in 1834–1840, p. 384; OD]. Dorsal carapace wider than long, ovate, surface somewhat flattened transversely; regions usually poorly defined, especially posteriorly; anterolateral margin tightly convex, usually with four broad, rounded lobes separated by grooves extending onto carapace; posterolateral margin strongly convergent, weakly concave. *Eocene* (*Ypresian*)*–Holocene. Eocene* (*Ypresian, Priabonian*): Italy. *Miocene* (*Langhian*): Spain. *Pliocene:* Japan, Taiwan. *Pleistocene:* Japan, Taiwan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——Fig. 8,*8a–b. *N. pubescens* (H. Milne Edwards), USNM 99140, Holocene, USA (Hawaii); dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Neomeria Hu & Tao, 1996, p. 108 [**Carpilodes lelingae* Hu, 1981, p. 65, pl. 3,*1–2;* OD]. Carapace wider than long, widest approximately three-quarters the distance posteriorly; carapace regions and subregions very well defined by deep grooves; front axially notched, otherwise straight; anterolateral margin longer than posterolateral margin; posterolateral margin at very low angle to posterior margin. *Pliocene:* Taiwan.——Fig. 9,*1. *N. lelingae* (Hu), NMNS002163-F007939, Pliocene, Taiwan, scale bar, 1 cm (new; photo by K. S. Lee, National Museum of Natural Science, Taiwan, & T.-Y. Chan, National Taiwan Ocean University).

Subfamily POLYDECTINAE Dana, 1851

[Polydectinae Dana, 1851b, p. 127] [=Melioida Alcock, 1898, p. 177; =Lybioida Serène, 1965, p. 26]

Carapace approximately as wide as long, circular to quadrate; regions poorly defined, smooth; front nearly straight; anterolateral margins short, shorter than posterolateral margins, with three or so blunt spines; posterolateral margins long, straight; chelipeds isochelous, fingers long, slender, occlusal surfaces with sharp spines, adapted to holding anemones; sternum narrow; pleonal somites 1 and 2 visible in dorsal view. *Miocene–Holocene*. Only unnamed fossil representatives.

Polydectus H. Milne Edwards, 1837 in 1834–1840, p. 145 [**Cancer cupulifer* Latreille in Milbert, 1812, p. 273; M; =*Pilumnus cupulifer* Latreille, 1825a, p. 124, ICZN Opinion 85, 1925, Direction 36, 1956, Direction, 37, 1956; =*Polydectus villosus* Dana, 1852b, p. 81]. Carapace very densely setose, chelae adapted for holding anemones. *Holocene:* Indo-Pacific Ocean, Red Sea.——Fig. 9,*2. *P. cupulifer* (Latreille in Milbert), USNM 29580, Holocene, Hawaii, USA, scale bar, 1 cm (new).

Lybia H. Milne Edwards, 1834 in 1834–1840, p. 431 [**Grapse tessellatus* Latreille in Milbert, 1812, p. 275; M; ICZN Opinion 85, 1925, Direction 36, 1956, Direction 37, 1956] [=*Melia* Latreille in Berthold, 1827, p. 255 (type, *G. tessellatus,* M) preoccupied by *Melia* Bosc, 1813, p. 233; =*Prolybia* Ward, 1933, p. 386 (type, *P. australensis,* p. 386, pl. 21,*3–4,* M]. Carapace hexagonal, slightly wider than long; front-orbital margin about 75% greatest width; frontal margin nearly straight; orbit shallow; anterolateral margin with four lobes or a single spine; dorsal surface rather depressed with poorly defined regions; chelipeds slender, shorter than pereiopods. *Miocene* (*Burdigalian*)*–Holocene. Miocene* (*Burdigalian*): Japan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——Fig. 9,*3a–b. *L. tesselata* (Latreille in Milbert), USNM 41350, Holocene, Solomon Islands; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily SPEOCARCININAE Števčić, 2005

[*nom. transl.* Ng, Guinot, & Davie, 2008, p. 201, *ex* Speocarcinidae Števčić, 2005, p. 54]

As for genus. *Eocene–Holocene*.

Speocarcinus Stimpson, 1862a, p. 58 [**S. carolinensis,* p. 59, pl. 1,*1–3;* M; ICZN Opinion 85, 1925, Direction 37, 1956]. Carapace rectangular, wider than long; front bilobed, nearly straight; orbits small, deeper axially than laterally; anterolateral margins short, with four spines excluding outer-orbital margin; posterolateral margin longer than anterolateral margin; posterior margin long, straight; carapace region weakly developed; male pleonal somites 3–5 fused, male gonopod 1 slender; male gonopod 2 short; chelipeds and walking legs short. *Eocene* (*Ypresian*)*–Holocene. Eocene* (*Ypresian–Lutetian*): Italy. *Miocene:* California, USA. *Holocene:* Gulf of Mexico, western Mexico and Central America, eastern South America.——Fig. 9,*4a–b. *S. carolinensis,* USNM 45951, Holocene, Florida; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

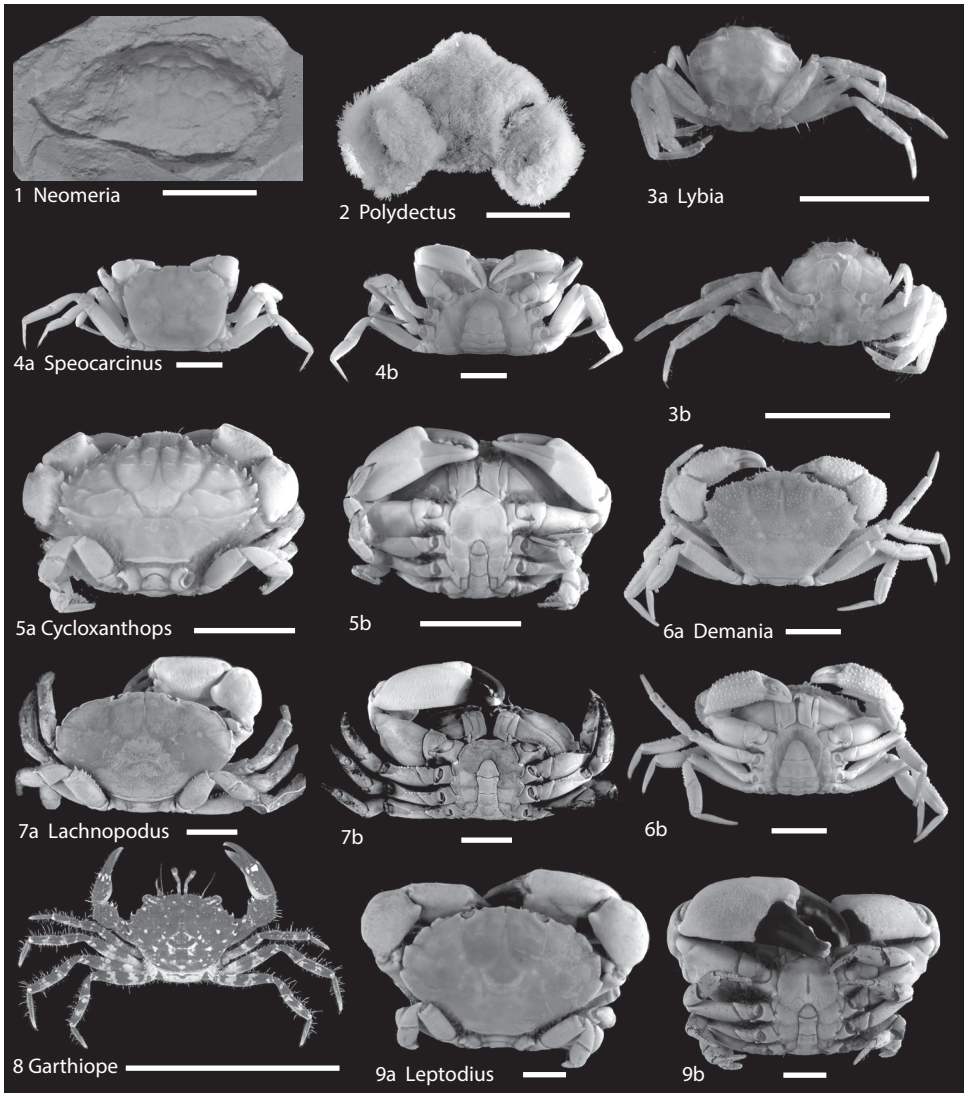

FIG 9. Xanthidae (p. 21–23).

Subfamily XANTHINAE MacLeay, 1838

[*nom. transl.* DANA, 1851b, p. 124, *ex* Xanthidae MACLEAY, 1838, p. 59] [=Xanthodioida ALCOCK, 1898, p. 78; =Coralliopinae ŠTEVČIĆ, 2005, p. 41; =Eucratodinae ŠTEVČIĆ, 2005, p. 46; =Gonopanopeini ŠTEVČIĆ, 2005, p. 49; =Liagorini ŠTEVČIĆ, 2005, p. 44; =Megametopinae ŠTEVČIĆ, 2005, p. 46; Micropanopeini ŠTEVČIĆ, 2005, p. 50; =Paraxanthini ŠTEVČIĆ, 2005, p. 43; =Orphnoxanthini ŠTEVČIĆ, 2005, p. 44; Camilohelleriini ŠTEVČIĆ, 2011, p.129; =Nanocassiopini ŠTEVČIĆ, 2013, p. 187]

Carapace wider than long; regions well or poorly defined, granular or smooth; anterolateral margins convex, generally with four or five anterolateral spines but may have as many as ten; posterolateral margins concave; front straight, with median notch and lateral fissure separating front from orbits; basal article of antennae wide, short; antennal flagellum within orbit; chelipeds large, heterochelous or isochelous, smooth, granular or spinous; sternite 4 long, male telson only covering posterior half. *Eocene* (*Ypresian*)–*Holocene*.

Cycloxanthops Rathbun, 1897, p. 164 [**Xantho sexdecimdentatus* H. Milne Edwards & Lucas, 1843, p. 15, pl. 7,*2;* OD; replacement name *pro Cycloxanthus* A. Milne-Edwards, 1863, p. 278, *non* H. Milne Edwards in d'Archiac, 1850, p. 304]. Carapace not much wider than long, regions weakly defined; orbits small, with two fissures; anterolateral margins long, convex, with nine anterolateral spines excluding outer-orbital spine; posterolateral margins concave, shorter than anterolateral margins; chelae large, smooth; sternum obovate, widest anteriorly, narrowing posteriorly; sternal suture 3/4 entire, sternite 4 with axial groove that is not continuous with sternopleonal cavity. *Pliocene–Holocene. Pliocene:* Fiji. *Pleistocene:* USA (California). *Holocene:* Pacific coastal Central America, Japan.——Fig. 9,*5a–b*. *C. vittatus* (Stimpson, 1862b), USNM 3208, Holocene, Panama; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Demania Laurie, 1906, p. 396 [**D. splendida,* p. 397, pl. 1,*8,* pl. 2,*1;* M]. Carapace transversely oval or hexagonal; front bilobed or nearly straight, medially notched, not extending beyond supraorbital angle; anterolateral margin convex, with four spines or projections, sometimes granulate; posterolateral margin convex, approximately same length as anterolateral margin; dorsal surface convex, with large tuberculate, rarely granular; regions well defined and divided into subregions; chelipeds subequal with tubercular outer surface; fingers of larger chelipeds with pointed tips. *Miocene–Holocene. Miocene:* Iran, Taiwan. *Pliocene:* Java, Taiwan. *Pleistocene:* Philippines, Taiwan, Vanuatu. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——Fig. 9,*6a–b*. *Demania garthi* Guinot & Richer de Forges, 1981, USNM 256529, Holocene, Tuamotu Archipeligo, French Polynesia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Garthiope Guinot, 1990, p. 470 [**Micropanope spinipes* A. Milne-Edwards, 1880 in 1873–1881, p. 326, pl. 54,*3;* OD]. Carapace wider than long, hexagonal, flattened or weakly vaulted, regions weakly defined, sometimes with transverse ridges; orbits with two fissures; anterolateral margin with three spines not including outer-orbital spines, shorter or as long as posterolateral margin; posterolateral margin nearly straight; sternal suture 2/3 complete; sternal suture 3/4 indicated at the lateral margins only; male pleopods 1 incurved dorsoventrally, subdistally with corneous spines; male pleopods 2 short. *Pliocene–Holocene. Pliocene–Pleistocene:* Jamaica. *Holocene:* Caribbean Sea, western Atlantic Ocean.——Fig. 9,*8*. **G. spinipes* (A. Milne-Edwards), ULLZ 7516, Holocene, Caribbean Sea, scale bar, 1 cm (new; photo by D. L. Felder, University of Louisiana at Lafayette, USA).

Lachnopodus Stimpson, 1858, p. 30 [**L. rodgersi;* M] [=*Lioxantho* Alcock, 1898, p. 90 (type, *L. tumidus* Alcock, 1898, p. 90, SD Ward, 1942a, p. 93)]. Carapace regions poorly defined, smooth or granular; orbits very small, directed forward; anterolateral margin strongly convex, approximately as long as posterolateral margin, first two anterolateral spines blunt, spines 3 and 4 sharp; posterolateral margin concave; chelipeds strongly heterochelous. *Miocene–Holocene. Miocene* (*Messinian*): Algeria. *Pliocene–Pleistocene:* Taiwan. *Holocene:* Indo-West Pacific Ocean and central Pacific Ocean, Australia, Red Sea.——Fig. 9,*7a–b*. *L. tahitensis* de Man, 1889, USNM 94547, Holocene, Raroia, French Polynesia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Leptodius A. Milne-Edwards, 1863, p. 283 [**Chlorodius exaratus* H. Milne Edwards, 1834 in 1834–1840, p. 402; M; ICZN Opinion 85, 1925, Direction 37, 1956; =*Cancer inaequalis* Olivier, 1791, p. 166; =*Cancer inaequalis* Audouin, 1826, p. 86; =*Actaeodes lividus* Paul'son, 1875, p. 35 (English edition)]. Carapace transversely oval, wider than long; front nearly straight, medially notched, not extending beyond supraorbital angle; anterolateral margin strongly convex, usually bearing four spines, longer than posterolateral margin; posterolateral margin weakly concave; dorsal surface convex anteriorly, flat in posterior half; regions well defined and subdivided; chelipeds subequal with smooth outer surface; fingers of larger chelipeds with strongly hollowed occlusal surface of tips; gonopod 1 of male with short subdistal spines, elongate apical lobe, and fungiform tubercles *Miocene* (*Burdigalian*)*–Holocene. Miocene* (*Burdigalian*): Japan. *Miocene:* Jamaica. *Holocene:* Indo-West Pacific Ocean and central Pacific Ocean, western Mexico, Caribbean Sea.——Fig. 9,*9a–b*. *L. exaratus* (H. Milne Edwards), USNM 98805, Holocene, Australia, dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Liagore De Haan, 1833 in 1833–1850, p. 19 [**Cancer* (*Liagore*) *rubromaculatus* de Haan, 1833 in 1833–1850, p. 19; M; ICZN Opinion 85, 1925, Direction 37, 1956]. Carapace wider than long, ovate, smooth, regions poorly defined to undefined; front nearly straight with weak medial notch; orbits shallow; anterolateral margins entire or with weak spines, shorter than posterolateral margins; posterolateral margins nearly straight or weakly convex; chelipeds strong, approximately same in size. *Pleistocene–Holocene. Pleistocene:* Philippines, Taiwan. *Holocene:* Indo-West Pacific Ocean.——Fig. 10,*1a–b*. **L. rubromaculata* (de Haan), USNM 26250, Holocene, Japan; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Macromedaeus Ward, 1942a, p. 92 [**M. punctatus,* p. 92, pl. 5,*8;* OD; =*Xantho nudipes* A. Milne-Edwards, 1867, p. 266]. Carapace transversely oval, wider than long, position of maximum width more than half the distance posteriorly on carapace; front nearly straight, medially notched, not extending beyond supraorbital angle; anterolateral margin strongly convex, usually with more than four spines; dorsal surface convex anteriorly, flat in posterior half; regions well defined and subdivided in anterior two-thirds, granular; chelipeds subequal with strongly tubercular outer surfaces; fingers of

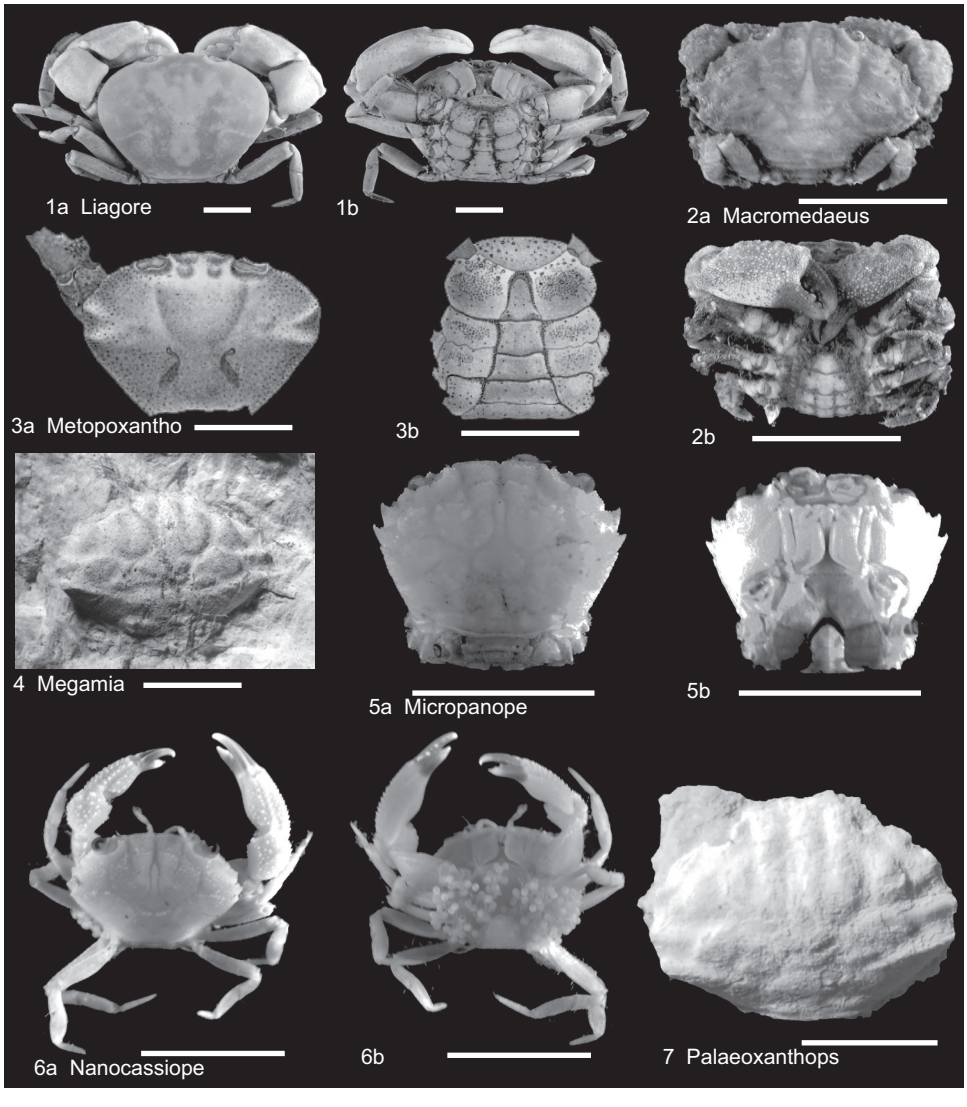

FIG 10. Xanthidae (p. 23–25).

larger chelipeds with excavated occlusal surface of tips. *Pleistocene–Holocene. Pleistocene:* Japan. *Holocene:* Indo-West Pacific Ocean and central Pacific Ocean.——FIG. 10,*2a–b*. *M. distinguendus* (DE HAAN, 1835 in 1833–1850), USNM 1410501, Holocene, South Korea; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Megamia KARASAWA, 1993, p. 64 [**M. anaglypta,* p. 64, pl. 15,*3;* OD]. Carapace transversely oval, much wider than long; front bilobed; orbit inclined posteriorly; dorsal surface convex; regions well defined and subdivided by deep grooves. *Miocene (Burdigalian):* Japan.——FIG. 10,*4*. **M. anaglypta,* holotype MFM 83026, Miocene, Japan, scale bar, 1 cm (new).

Metopoxantho DE MAN, 1904, p. 255 [**M. martini*, p. 257, pl. 9,*1;* M]. Carapace wider than long, regions poorly defined; anterolateral margins with two or three blunt spines; front quadrilobed; male pleonal somites 3–5 appearing to be fused but with evident sutures. *Pleistocene:* Indonesia (Celebes).——FIG. 10,*3a–b*. **M. martini*, Pleistocene, Sulawesi, Indonesia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (de Man, 1904, pl. 9,*1* and *1c*).

Micropanope STIMPSON, 1871, p. 139 [**M. sculptipes,* p. 140; M; ICZN Opinion 85, 1925, Direction 37, 1956; =*M. pugilator* A. MILNE-EDWARDS, 1880 in 1873–1880, p. 326, pl. 54] [=*Aldrovandia* ŠTEVČIĆ, 2005, p. 133 (type, *M. taylori* GARTH,

1986, p. 3, fig. 2, OD); =*Aristotelopanope* Števčić, 2005, p. 133 (type, *M. ashcrafti* Garth, 1986, p. 5, fig. 3, OD); =*Helleria* Števčić, 2005, p. 133 (type, *M. manteri* Garth, 1986, p. 2, fig. 1, OD)]. Carapace, hexagonal, wider than long, regions moderately defined, often ornamented with large tubercles anteriorly; fronto-orbital width 75% or more maximum carapace width; front bilobed; anterolateral margin short, shorter than posterolateral margin, with four spines excluding outer-orbital spine; posterolateral margin nearly straight; posterior margin wide, sinuous; sternal sutures 2/3 and 3/4 entire, sternite 4 with longitudinal groove anterior to sternopleonal cavity. *Miocene–Holocene. Miocene–Pleistocene:* Jamaica. *Pliocene:* Panama. *Holocene:* Atlantic Ocean, central-eastern Pacific Ocean.——Fig. 10,*5a–b*. **M. sculptipes,* USNM 60777, Holocene, Florida, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 5 mm (new).

Nanocassiope Guinot, 1967, p. 355 [**Xanthodes melanodactylus* A. Milne-Edwards, 1868, p. 60, pl. 17,*1–3;* OD]. Carapace hexagonal, wider than long; fronto-orbital margin approximately two-thirds greatest width; front weakly bilobed, not extending beyond supraorbital angle; anterolateral margin convex, short, shorter than posterolateral margin, with four spines excluding outer-orbital spine; posterolateral margin straight or slightly convex; dorsal surface convex, granular anteriorly; regions well defined; chelipeds subequal with granulated outer surface; fingers of larger chelipeds with pointed tips. *Eocene* (*Ypresian*)*–Holocene. Eocene* (*Ypresian*): Italy. *Pleistocene:* Japan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean, eastern Pacific Ocean, central Atlantic Ocean, eastern Atlantic Ocean.——Fig. 10,*6a–b*. **N. melanodactyla* (A. Milne-Edwards), USNM 127166, Holocene, Equatorial Guinea; dorsal (*a*) and ventral (*b*) views; scale bars, 5 mm (new).

Palaeoxanthops Karasawa, 1993, p. 62 [**P. minutus,* p. 62, p. 16,*1,4,8;* OD]. Carapace hexagonal, slightly wider than long, widest about 80% the distance posteriorly; frontal margin straight, medially notched; orbit small, inclined posteriorly; anterolateral margin convex, much longer than posterolateral margin, with four laterally directed spines, last extending onto dorsal carapace as oblique ridge; posterolateral margin at very low angle to posterior margin; dorsal surface convex anteriorly, nearly flat posteriorly; regions well defined, subdivided. *Miocene* (*Burdigalian*): Japan.——Fig. 10,*7*. **P. minutus,* holotype MFM 83044, Miocene, Japan, scale bar, 5 mm (new).

Paraxanthias Odhner, 1925, p. 85 [**Xanthodes notatus* Dana, 1852a, p. 178; OD]. Carapace transversely oval or hexagonal, wider than long; front weakly bilobed, not extending beyond supraorbital angle; anterolateral margin convex with four well separated spines, approximately as long as posterolateral margin; posterolateral margin straight or weakly concave; dorsal surface convex, smooth; regions well defined, subdivided, ornamented with very large tubercles, especially anteriorly; chelipeds subequal with very coarsely tubercular outer surface; fingers of larger chelipeds with pointed tips; sternal suture 3/4 developed as a notch laterally and obsolete elsewhere**,** sternite 4 with a longitudinal groove extending anteriorly from sternopleonal cavity. *Miocene–Holocene. Miocene* (*Burdigalian*): Japan. *Holocene:* Indo-West Pacific Ocean, Panama, east Atlantic Ocean.——Fig. 11,*1a–b*. **P. notatus* (Dana), USNM 1136711, Holocene, Hawaii, USA; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Paraxanthodes Guinot, 1968, p. 723 [**Micropanope obtusidens* Sakai, 1965, p. 103, fig. 2c, 3e–f; OD]. Carapace hexagonal, wider than long; front nearly straight, medially notched, not extending beyond supraorbital angle; anterolateral margin convex with four well-separated spines; dorsal surface convex with granulated ridges; regions well marked and subdivided into areolae by deep grooves; chelipeds subequal with granulated outer surface; fingers of larger chelipeds with pointed tips. *Pleistocene–Holocene. Pleistocene:* Japan. *Holocene:* western Pacific Ocean, central Pacific Ocean, Australia.——Fig. 11,*2a–b*. *P. cumatodes* (MacGilchrist, 1905), USNM 268716, Holocene, New Caledonia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Xanthias Rathbun, 1897, p. 165 [**Xanthodes granosomanus* Dana, 1852b, p. 75; SD Serène, 1984, p. 191; =*Xantho lamarckii* H. Milne Edwards, 1834 in 1834–1840, p. 391; =*Xantho cultrimanus* White, 1848, p. 225] [=*Xanthodes* Dana, 1852b, p. 75, *non Xanthodes* Guenée, 1852, p. 209 (Lepidoptera)]. Carapace transversely oval or hexagonal, not much wider than long; front-orbital margin usually wide, approximately one-half to two-thirds greatest width; front weakly bilobed, not extending beyond supraorbital angle; anterolateral margin convex, usually bearing four weak lobes, sometimes bearing well-defined teeth, shorter than posterolateral margin; dorsal surface convex, smooth, rarely granular; regions usually weakly defined or not defined; chelipeds subequal; fingers of larger chelipeds with pointed tips. *Miocene–Holocene. Miocene:* Malaysia (Sabah). *Pleistocene:* Taiwan. *Holocene:* Indo-West Pacific Ocean.——Fig. 11,*3a–b*. *X. lamarckii* (H. Milne Edwards), USNM 91644, Holocene, American Samoa; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Xantho Leach, 1814 in 1813–1814, p. 430 [**Cancer incisus* Leach, 1814 in 1813–1814, p. 391; M; ICZN Opinion 423, 1956; =*Cancer hydrophilus* Herbst, 1790 in 1782–1804, p. 266, pl. 21,*124;* =*Cancer floridus* Montagu, 1808, p. 85, pl. 2,*1*] [=*Salax* Gistel, 1848, p. XI (type, *C. incises,* M)]. Carapace wider than long, ovate-hexagonal; front axially notched, otherwise straight; orbits small; anterolateral margins long, strongly convex, with four lobes or spines excluding outer-orbital spine, last extending onto carapace in weak ridge; posterolateral margins weakly concave; regions weakly defined; chelipeds more or less isochelous. *Miocene* (*Burdigalian*)*–Holocene. Miocene* (*Burdigalian–Serravallian*): Spain. *Miocene* (*Langhian*): Austria, Hungary,

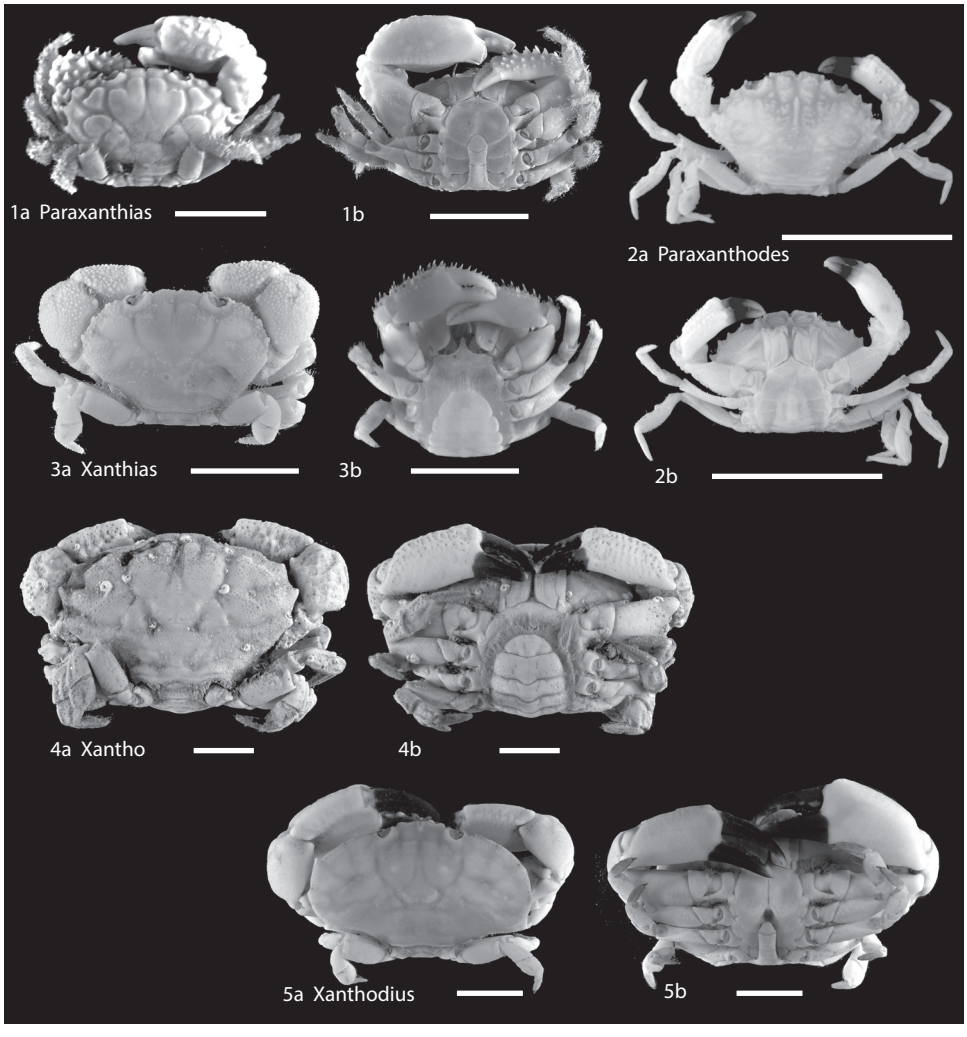

FIG 11. Xanthidae (p. 25–26).

Poland, Spain. *Miocene* (*Messinian*): Malta, Italy. *Miocene:* Italy. *Pliocene:* Fiji. *Pleistocene:* Italy. *Holocene* (fossil): Spain. *Holocene:* Indo-Pacific Ocean, Mediterranean Sea, eastern Atlantic Ocean.——FIG. 11,*4a–b*. *X. hydrophilus* (HERBST), USNM 6547, Holocene, Channel Islands (UK); dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Xanthodius STIMPSON, 1862a, p. 52 [**X. sternberghii;* M; ICZN Opinion 85, 1925, Direction 37, 1956; =*Xanthodius hebes* STIMPSON, 1862b, p. 208; =*Actaeodes mexicanus* LOCKINGTON, 1877c, p. 42] [=*Olivioxantho* ŠTEVČIĆ, 2005, p. 134 (type, *Xantho denticulatus* WHITE, 1848, p. 225, OD)]. Carapace ovate, wider than long; front extending moderately beyond orbits; orbits closely spaced; anterolateral margins tightly convex, with broad lobes or numerous small spines; posterolateral margin concave; carapace regions moderately defined, smooth; sternal suture 2/3 complete; sternal suture 3/4 only developed on margins; sternite 4 very long, with axial fissure extending anteriorly from sterno-pleonal cavity but not continuous with it; chelipeds strongly heterochelous. *Miocene–Holocene. Miocene:* Fiji. *Holocene:* eastern Pacific Ocean, Caribbean Sea, Atlantic Ocean.——FIG. 11,*5a–b*. **X. sternberghii,* USNM 1462691; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily ZALASIINAE Serène, 1968

[Zalasiinae SERÈNE, 1968, p. 62]

[=Trichiidae DE HAAN 1839 in 1833–1850, pl. H, pl. 29,*4, nom. correct*. ORTMANN, 1893, p. 419, *pro* Trichidea DE HAAN, 1839 in 1833–1850, pl. H (preoccupied name); =Banareiini ŠTEVČIĆ, 2005, p. 47]

Carapace ovate, wider than long to approximately as long as wide, regions moderately to poorly defined; anterolateral margins convex, usually with four spines but may be entire, last spine usually extending onto dorsal carapace as ridge; posterolateral margin shorter than anterolateral margin, concave; chelipeds small, subequal, fingers narrow, sometimes crossing at tips; third maxilliped may be highly modified. *Pleistocene–Holocene*.

Zalasius Rathbun, 1897, p. 166 [**Trichia dromiaeformis* de Haan, 1839 in 1833–1850, pl. H; M] [=*Trichia* de Haan, 1839 in 1833–1850, pl. H (type, *T. dromiaeformis*, *non Trichia* Hoffmann, 1790, p. 1 [protist]); =*Macneillena* Iredale, 1930, p. 175, unnecessary replacement name]. Carapace regions well defined, inflated, granular, covered with short setae; anterolateral margin convex. [Emended from Poore, 2004, p. 476.] *Pleistocene–Holocene. Pleistocene:* Japan. *Holocene:* Indo-West Pacific Ocean.——Fig. 12,*1a–b*. **Z. dromiaeformis* (de Haan), USNM 306878, Holocene, Japan; dorsal (*a*) and ventral (*b*) views, note that setae are removed from half of the specimen; scale bars, 1 cm (new).

Banareia A. Milne-Edwards, 1869, p. 168 [**B. armata;* M; ICZN Opinion 73, 1941] [=*Banareiopsis* Ward, 1936, p. 7 (type, *B. australis,* p. 7, pl. 3,*1–3,* OD)]. Carapace transversely oval, wider than long, vaulted transversely and longitudinally; front bilobed; anterolateral margin convex, granulate, with four lobes; dorsal surface strongly convex; regions well defined, more or less projected, evenly granular, subdivided into areolae by smooth furrows; buccal cavity quadrangular, broader; chelipeds similar with outer surface covered with granules or spines. *Pleistocene:* Japan, Taiwan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean, Caribbean Sea.——Fig. 12,*2a–b*. **B. armata,* USNM 78437, Holocene, Australia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Subfamily ZOSIMINAE Alcock, 1898

[*nom. correct*. Takeda, 1976, p. 70, *pro* Zozymoida Alcock, 1898, p. 77]

Carapace not much wider than long, ovate, strongly convex longitudinally and transversely; anterolateral margins strongly convex, rounded or developed into a ridge or crest, with four lobes or spines excluding outer-orbital spine or entire; posterolateral margin concave; chelipeds subequal, with keel on upper surface of manus; at least one genus poisonous. *Miocene–Holocene*.

Zosimus Leach *in* Desmarest, 1823, p. 228 [**Cancer aeneus* Linnaeus, 1758, p. 630; M; =*Cancer floridus* Herbst, 1783 in 1782–1804, p. 132, pl. 53,*39;* =*Cancer Amphitrite* Herbst, 1801 in 1782–1804, p. 5, pl. 53,*1*] [=*Cancer* (*Aegle*) de Haan, 1833 in 1833–1850, p. 17 (type, *C. aeneus,* M); =*Zozymus* H. Milne Edwards, 1834 in 1834–1840, p. 383 (incorrect spelling)]. Carapace ovate, wider than long, carapace regions well marked, ornamented with large, lobate, scabrous tubercles; front quadrilobed; anterolateral margin convex, somewhat longer than posterolateral margin, with three broad lobes and one small lobe at anterolateral corner; posterolateral margin concave; chelipeds concave on inner surface so as to nest against anterior margin of carapace. *Pliocene–Holocene. Pliocene–Pleistocene:* Taiwan. *Holocene:* Indo-West Pacific Ocean, central Pacific Ocean.——Fig. 12,*6a–b*. **Z. aeneus* (Linnaeus), USNM 94523, Holocene, French Polynesia; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Atergatis de Haan, 1833 in 1833–1850, p. 17 [**Cancer integerrimus* Lamarck, 1818, p. 272; SD ICZN Opinion 73, 1941, Direction 37, 1956; =*Atergatis subdivisus* White, 1848, p. 224]. Carapace transversely oval, regions poorly defined, smooth or punctate; anterolateral margin strongly convex, bearing fine, weak crests, essentially without spines, may be weakly lobed; posterolateral margin concave; pereiopods 2–5 short, flattened. *Miocene–Holocene. Miocene:* Taiwan. *Pliocene:* Fiji, Japan. *Pleistocene:* Japan, Taiwan. *Holocene:* Indo-West Ocean, central Pacific Ocean.——Fig. 12,*3a–b*. *A. floridus* (Linnaeus, 1767), USNM 1149533, Holocene, Samoa; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Atergatopsis A. Milne-Edwards, 1862a, p. 43 [**Carpilius signatus* Adams & White, 1849, p. 37, pl. 10,*1;* M; ICZN Opinion 85, 1925, Direction 37, 1956; =*A. flavomaculatus* A. Milne-Edwards, 1865, p. 254, pl. 12,*1;* =*Atergatis frauenfeldi* Heller, 1861a, p. 311, pl. 1,*10*]. Carapace ovate, anterolateral margins strongly convex, crispate, orbits small, circular; posterolateral margins very weakly concave. *Pleistocene–Holocene. Pleistocene:* Taiwan. *Holocene:* Indo-West Pacific Ocean.——Fig. 12,*4a–b*. **A. signatus* (Adams & White), USNM 1468086, Holocene, Philippines; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Platypodia Bell, 1835, p. 336 [**Xantho granulosus* Rüppell, 1830, p. 24, pl. 5,*3*, pl. 6,*18;* SD Rathbun, 1930, p. 246; =*Cancer limbatus* H. Milne Edwards, 1834 in 1834–1840, p. 377, pl. 16,*14;* =*Platypodia keelingi* Tweedie, 1950, p. 114, pl. 16a] [=*Lophactaea* A. Milne-Edwards, 1862a, p. 43 (type, *X. granulosus,* OD); =*Paraplatypodia* Ward, 1942b, p. 42 (type, *P. morini,* OD)]. Carapace fan-shaped, wider than long, widest about 75% the distance posteriorly; front broadly bilobed, convex; orbits rimmed; anterolateral margins with four lobes or spines excluding outer-orbital angle, very convex, longer than posterolateral margin; posterolateral margin concave; chelipeds concave on inner surface so as to nest against anterior margin of carapace. *Pleistocene–Holocene. Pleistocene:* Taiwan. *Holocene:* Indo-Pacific Ocean, Red Sea.——Fig. 12,*5a–b*. **P.*

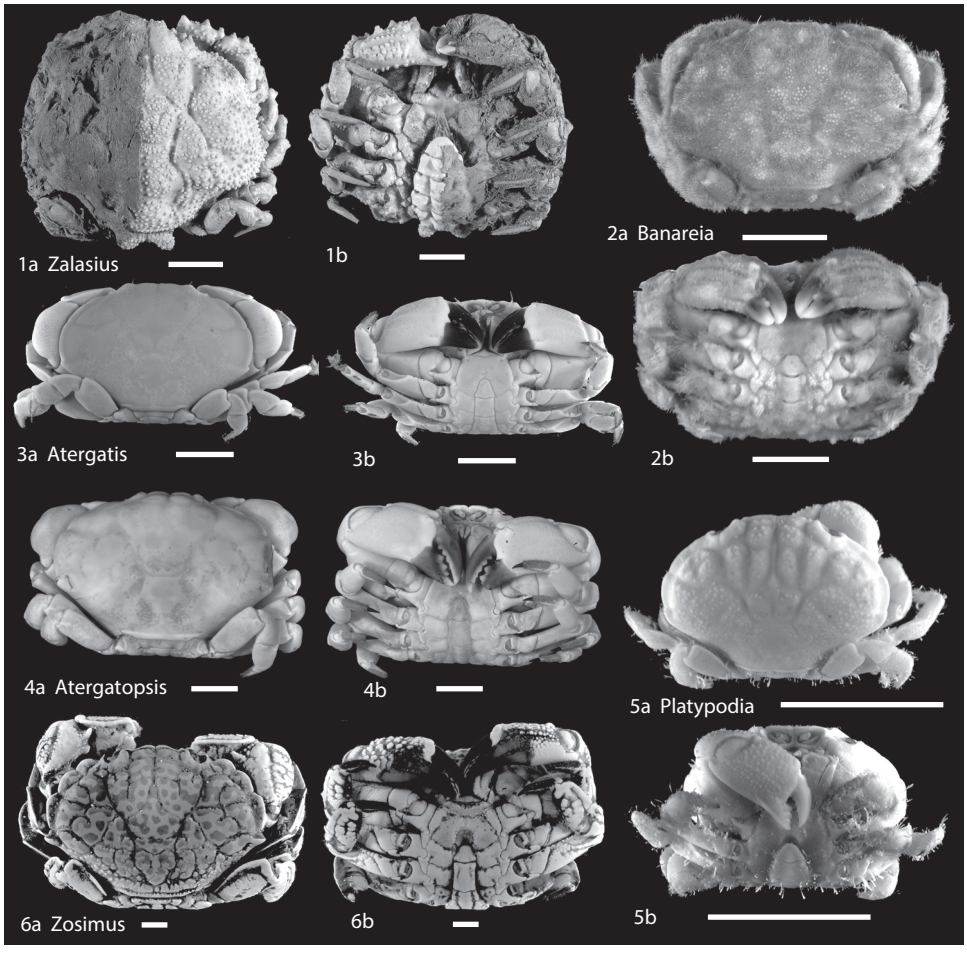

FIG 12. Xanthidae, Superfamily Xanthidea *incertae sedis* (p. 26–27).

granulosa, USNM 1291888, Holocene, Republic of Seychelles; dorsal (*a*) and ventral (*b*) views; scale bars, 1 cm (new).

Superfamily XANTHOIDEA MacLeay, 1838, *incertae sedis*

Actaeites MÜLLER & COLLINS, 1991, 70 [**A. lobatus,* p. 70, pl. 4,*9–10;* OD]. Carapace rectangular, wider than long, length about 83% maximum width; regions moderately defined; anterolateral margins short, with at least three blunt spines; posterolateral margins long, convex. *Eocene* (*Ypresian*)–*Oligocene. Eocene* (*Ypresian, Priabonian*): Italy. *Oligocene* (*Rupelian*): Italy.——FIG. 13,*1. *A. lobatus*, Italy, scale bar, 5 mm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Actaeopsis CARTER, 1898, p. 35 [**A. wiltshirei,* p. 35, pl. 2,*3;* M]. Carapace hexagonal, moderately vaulted transversely and longitudinally, wider than long, length about 82% carapace width; orbits with two fissures, fronto-orbital width approximately half maximum carapace width; anterolateral margin with four or five spines; posterolateral margin with two or three spines; posterior margin approximately half maximum carapace width; carapace regions well defined by deep grooves, highest point of regions granular. *Lower Cretaceous* (*Aptian*): UK (England).——FIG. 13,*2. *A. wiltshirei*, Aptian, England, UK, scale bar, 1 cm (Carter, 1898, pl. 2,*3*).

Alponella BESCHIN, BUSULINI, TESSIER, & ZORZIN, 2016, p. 142 [**A. paleogenica,* p. 143, pl. 19,*1;* OD] [=*Corallioplax* BESCHIN, BUSULINI, TESSIER, & ZORZIN, 2016, p. 144 (type, *C. exigua,* p. 144, pl. 19,*2–3,* OD)]. Carapace approximately as wide as long, moderately vaulted transversely; front projected well beyond orbits, axially sulcate, more or less straight, downturned distally; orbits directed anterolaterally, with wide rim; anterolateral margins

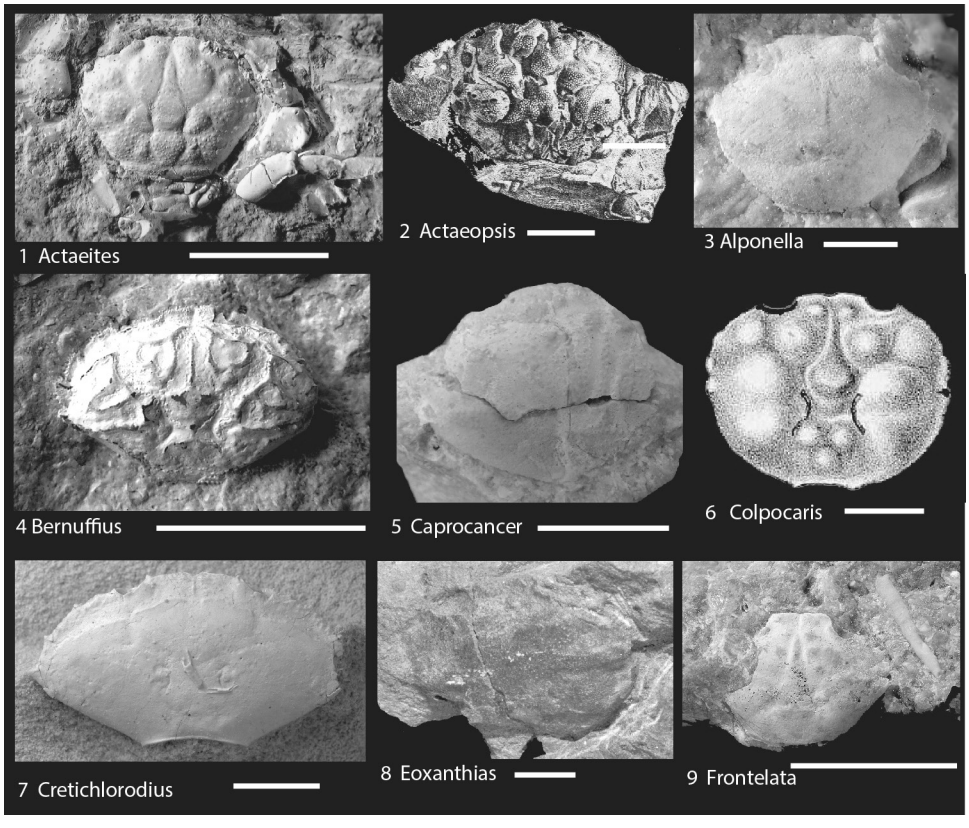

FIG 13. Superfamily Xanthidea *incertae sedis* (p. 27–30).

parallel to one another; posterolateral margins much longer, convex; carapace smooth. *Eocene* (*Ypresian*): Italy.——FIG.13,*3*. **A. paleogenica,* holotype VR 94537, Eocene, Italy, scale bar, 1 cm (new; photo by R. Zorzin, Museo Civico di Storia Naturale di Verona, Italy).

Bernuffius DE ANGELI, GARASSINO, & CECCON, 2010, p. 165 [**B. ornatus,* p. 165, fig. 12; OD]. Carapace ovate, wider than long; anterolateral margins with broad spines; carapace regions with vermiform ridges. *Oligocene* (*Rupelian*): Italy.——FIG. 13,*4*. **B, ornatus,* holotype MCZ 3133-I.G. 336866, Oligocene, Italy, scale bar, 1 cm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Caprocancer MÜLLER & COLLINS, 1991, p. 84 [**C. altus,* p. 84, pl. 8,*1–3;* OD]. Carapace ovate, surface granular. *Eocene* (*Priabonian*): Hungary.——FIG. 13,*5*. **C. altus*, holotype M.91.204, scale bar, 1 cm (new; photo by M. Hyžný, Comenius University, Bratislava, Slovakia).

Colpocaris VON MEYER, 1862, p. 163 [**C. bullata,* p. 163, pl. 16,*15;* M]. Carapace ovate to subcircular, length about 80% maximum width; regions defined as broad swellings; front broadly bilobed; orbits directed forward; anterolateral margins with approximately three blunt swellings following a long, straight segment; posterolateral margin convex; posterior margin concave, short. *Eocene:* Switzerland.——FIG. 13,*6*. **C. bullata,* scale bar, 1 cm (von Meyer, 1862, pl. 16).

Cretichlorodius FRAAYE, 1996a, p. 293 [**C. enciensis,* p. 293, fig. 2,*1*–2.*2;* OD]. Carapace wider than long, fan-shaped; front with a few blunt projections; orbits small, with a closed fissure; anterolateral margins directed weakly anterolaterally, with two small spines near anterolateral corner, posterolateral margins convex; posterior margin concave, short; dorsal surface with ridges parallel to entire anterior and anterolateral margins of carapace. *Upper Cretaceous* (*Maastrichtian*): The Netherlands.——FIG. 13,*7*. **C. enciensis,* holotype MAB k.0014, scale bar 1 cm (new).

Eoxanthias HU & TAO, 1996, p. 116 [**E. keelonicus,* p. 116, pl. 58,*8;* OD]. Carapace ovate, smooth. Based on an incomplete specimen. *Miocene:* Taiwan.——FIG. 13,*8*. **E. keelonicus*, holotype NMNS 002163-F007784, scale bar, 1 cm (new; photo by T.-Y. Chan, National Taiwan Ocean University).

Frontelata BESCHIN, BUSULINI, TESSIER, & ZORZIN, 2016, p. 100 [**F. spinacomposita,* p. 100, pl. 13,*1–2;* OD]. Carapace hexagonal, wider than long, flat, with

smooth surface; front wide, lamellar, protruding beyond orbits, bearing median groove and straight margin with median notch; orbits large with two fissures; anterolateral margins convex with four bifid spines (excluding outer orbital angle); posterolateral margins convergent, slightly longer than anterolateral margin; posterior margin as wide as front; dorsal regions weakly inflated, defined by wide, shallow grooves; epigastric lobes with carinated swellings; protogastric lobes convex with three circular swellings; mesogastric lobe long, triangular; cardiac region inflated, triangular, with weak anterior transverse ridge; epibranchial lobes long, with convex ridge from medial epibranchial swelling to fourth anterolateral spine. [Emended from Beschin, Busulini, Tessier, & Zorzin, 2016, p. 100.] *Eocene* (*Ypresian*): Italy.——Fig. 13,*9*. **F. spinacomposita,* holotype VR 94175, scale bar, 1 cm (new; photo by R. Zorzin, Museo Civico di Storia Naturale di Verona, Italy).

Haydnella Müller, 1984, p. 90 [**H. steiningeri,* p. 90, pl. 80,*3–5,* pl. 81,*1–4;* OD]. Carapace ovate, wider than long, length about 75% maximum width; regions moderately defined, granular; front bilobed, axially notched, about 35% maximum carapace width; orbits rimmed, directed anterolaterally, fronto-orbital width about 70% maximum carapace width; anterolateral margins shorter than posterolateral margins, with five small spines including outer-orbital spines; posterolateral margin convex; posterior margin straight, wide; protogastric and hepatic regions long, branchial regions short. *Eocene* (*Ypresian*)–*Miocene. Eocene* (*Ypresian*): Italy. *Oligocene* (*Rupelian*): Italy. *Miocene* (*Langhian*): Austria, France, Hungary, Poland. *Miocene* (*Serravallian*): France, Hungary. *Miocene* (*Messinian*): Italy. *Miocene:* Mexico (Chiapas).——Fig. 14,*1*. **H. steiningeri,* KSU 98, cast of M86.449, Langhian–Serravalian, Hungary, scale bar, 2 cm (new).

Megaxantho Vega, Feldmann, García-Barrera, Filkorn, Pimentel, & Avendaño, 2001, p. 325 [**M. zoque,* p. 326, fig. 5; OD]. Carapace ovate, wider than long, regions poorly defined; orbits with two fissures; anterolateral margins with at least four broad lobes separated by fissures; chelipeds strongly heterochelous, with proximal molariform tooth on occlusal surface of movable finger; sternum ovate, sternal suture 3/4 apparently a depression. *Upper Cretaceous* (*Maastrichtian*): Mexico (Chiapas).——Fig. 14,*2*. **M. zoque,* holotype IHNCH-3421, scale bar, 1 cm (Vega & others, 2001, fig. 5,*1*).

Muelleroplax Schweitzer, Feldmann, Garassino, Karasawa, & Schweigert, 2010, p. 4 [**Eoplax minima* Müller & Collins, 1991, p. 85, pl. 8,*6–7;* OD] [=*Eoplax* Müller & Collins, 1991, p. 85, *non Eoplax* Ashby & Cotton, 1936, p. 510 (mollusk)]. Carapace ovate, smooth, not much wider than long, length about 88% maximum width; front broad, convex, about 45% maximum carapace width; orbits rimmed, small, fronto-orbital width about 64% maximum carapace width; anterolateral margins short, much shorter than posterolateral margins; posterolateral margins long, straight; carapace regions undefined, smooth. *Eocene. Eocene* (*Ypresian*): Italy. *Eocene* (*Priabonian*): Hungary.——Fig. 14,*3*. **M. minima* (Müller & Collins), holotype M.91.219, Priabonian, Hungary, scale bar, 1 cm (new; photo by M. Hyžný, Comenius University, Bratislava, Slovakia).

Nogarolia Beschin, Busulini, De Angeli, & Tessier, 1994, p. 183 [**N. mirabilis,* p. 184, pl. 7; OD]. Carapace hexagonal, wider than long, length about 80% maximum width; front with eight spines including inner-orbital spine and broad median incision, about 35% maximum carapace width; orbits large, with two fissures, fronto-orbital width about 60% maximum carapace width; anterolateral margins with five long, anteriorly directed spines including outer-orbital spine; regions weakly defined; surface smooth; chelae very large, with one keel on upper margin of manus; external surface of manus smooth. *Eocene* (*Lutetian*): Italy.——Fig. 14,*4*. **N. mirabilis,* holotype MCZ 1420, scale bar, 1 cm (new; photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Paraxanthosia Müller & Collins, 1991, p. 75 [**P. budensis,* p. 75, pl. 4,*12–14;* OD]. Carapace ovate, wider than long; carapace regions weakly developed, mesogastric and epibranchial regions most obvious; anterolateral margins with at least three small spines. *Eocene* (*Priabonian*): Hungary, Italy.——Fig. 14,*5*. **P. budensis,* KSU 95, cast of holotype M91.168, Priabonian, Hungary, scale bar, 1 cm (new).

Pilumnomimus Müller & Collins, 1991, p. 75 [**P. planidentatus,* p. 75, pl. 5,*5,8,10;* OD]. Carapace ovate, wider than long, smooth, regions undefined, length about 60% maximum carapace width; anterolateral margins with at least four triangular spines; posterolateral margins straight or slightly convex; posterior margin wide. *Eocene. Eocene* (*Ypresian*): Italy. *Eocene* (*Priabonian*): Hungary.——Fig. 14,*6*. **P. planidentatus,* Priabonian, Hungary, scale bar, 1 cm (new).

Pregeryona Hu & Tao, 1996, p. 100 [**P. taiwanica,* p. 100, pl. 46,*1–2,6,9–10,13,16,18;* OD]. Carapace rectangular, wider than long; axial regions weakly defined; anterolateral margins short, with at least one spine. *Miocene:* Taiwan.——Fig. 15,*1*. **P. taiwanica,* NMNS 002163-F007754, scale bar, 1 cm (new; photo by T.-Y. Chan, National Taiwan Ocean University).

Prochlorodius Müller & Collins, 1991, p. 78 [**P. ellipticus,* p. 78, pl. 5,*11,* pl. 6,*4 7,17;* OD]. Carapace ovate, wider than long, length about 70% maximum width; front nearly straight; orbits broad, directed anterolaterally, rimmed axially, rim diminishing laterally; fronto-orbital width about 75% maximum carapace width; anterolateral margins short, with a few small spines; posterolateral margins longer, weakly convex; carapace smooth, regions undefined. *Eocene. Eocene* (*Ypresian, Priabonian*): Italy. *Eocene* (*Priabonian*): Hungary.——Fig. 15,*2*. **P. ellipticus,* KSU D 1009, Priabonian, Hungary, scale bar, 1 cm (new).

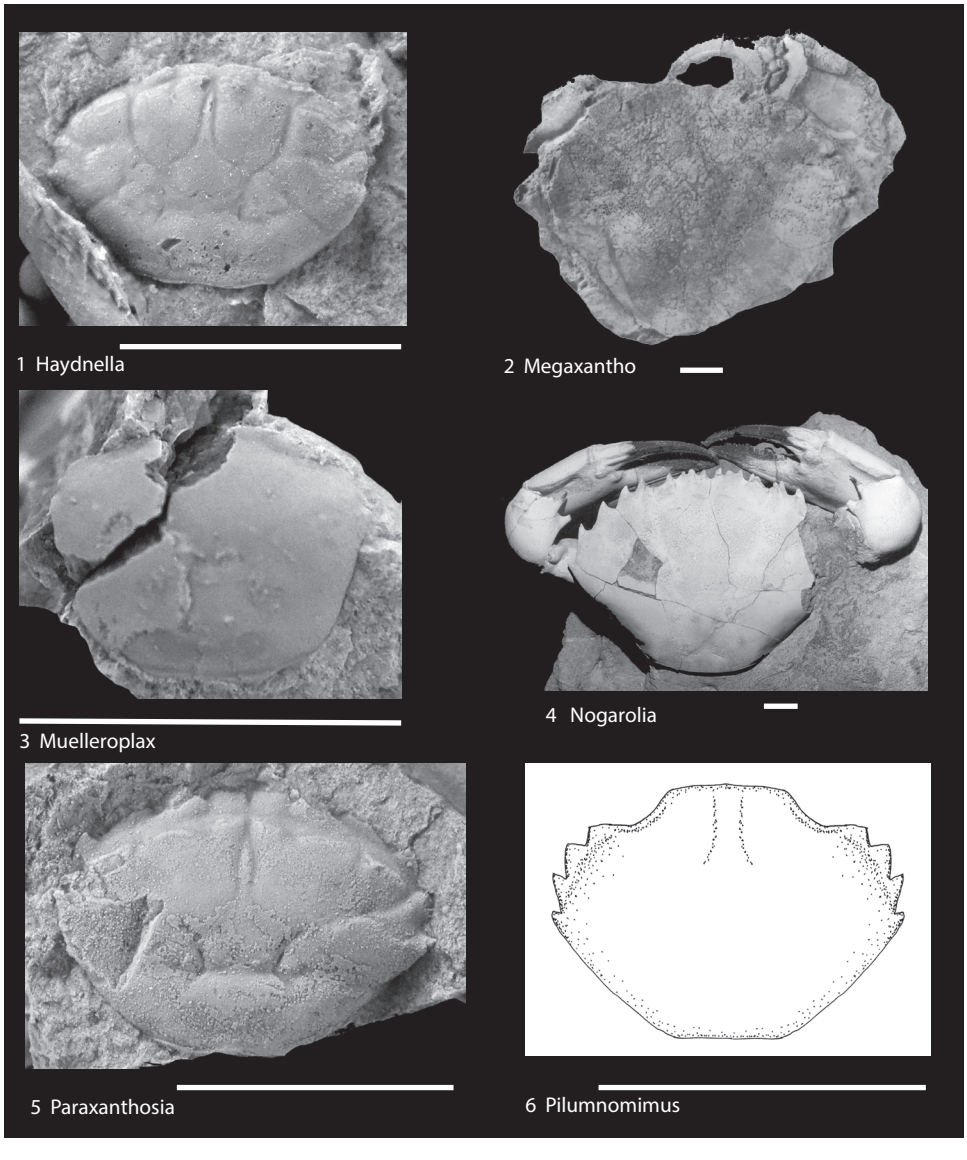

FIG 14. Superfamily Xanthidea *incertae sedis* (p. 30).

Sculptoplax MÜLLER & COLLINS, 1991, p. 90 [**S. rigida,* p. 90, pl. 8,*13;* OD]. Carapace hexagonal; grooves very deep; front axially notched; orbit rimmed, with two open fissures. *Eocene* (*Priabonian*): Hungary, Italy.——FIG. 15,*3*. **S. rigida,* holotype M.91.228A, Priabonian, Hungary, scale bar, 5 mm (new; photo by M. Hyžný, Comenius University, Bratislava, Slovakia).

Syphaxiella SCHWEITZER, DWORSCHAK, & MARTIN, 2011, p. 362 [**Syphax crassus* A. MILNE-EDWARDS, 1864, p. 56, A. MILNE-EDWARDS, 1863, pl. 9,*6;* OD, replacement name *pro Syphax* A. MILNE-EDWARDS, 1864, p. 55, *non Syphax* KOCH & BERENDT, 1854, p. 77 (arachnid)]. Carapace ovate, wider than long, length about 80% maximum carapace width; regions defined as broad swellings; front broadly bilobed, orbits directed anterolaterally, rimmed, fronto-orbital width about 65% maximum carapace width; anterolateral margins short, with three blunt spines excluding outer-orbital spine; posterolateral margin convex, posterolateral reentrant large; posterior margin straight; epibranchial region

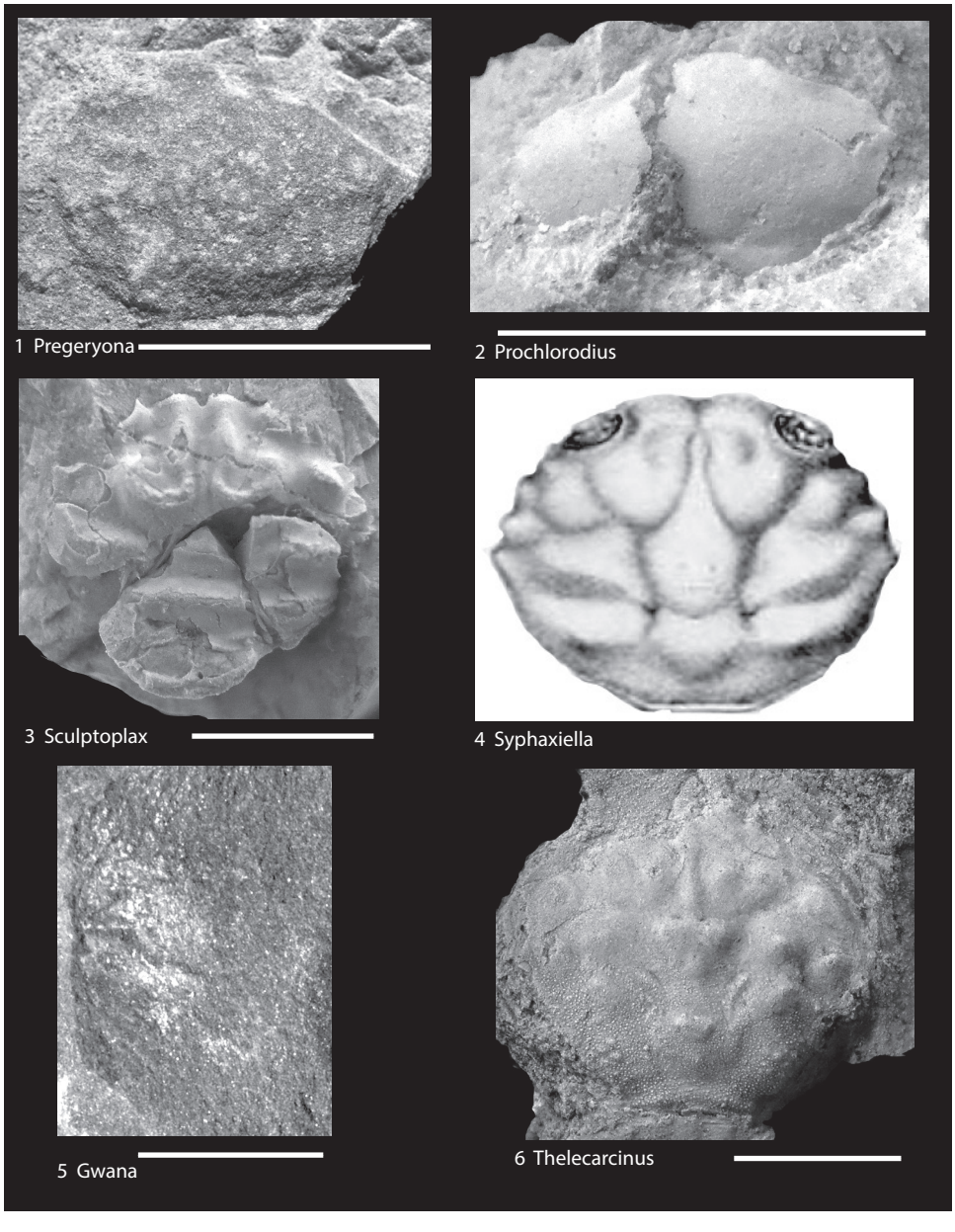

FIG 15. Superfamily Xanthidea *incertae sedis* (p. 30–33).

and branchial region with broad transverse ridges. ?*Eocene:* France.——FIG. 15,*4.*S. crassa* (A. MILNE-EDWARDS), scale unknown (A. Milne-Edwards, 1863, pl. 9,*6*).

Gwana SCHWEITZER, DWORSCHAK, & MARTIN, 2011, p. 361 [**W. minuta* HU & TAO, 1996, p. 120, pl. 59,*10,12;* OD, replacement name *pro Wanga* HU & TAO, 1996, p. 120, *non Wanga* CHEN, 1943, p. 20 (mollusk)]. Carapace circular, axial regions well defined; front projected beyond orbits. *Oligocene:* Taiwan.——FIG. 15,*5.* **G. minuta,* NMNS 002163-F007785, scale bar, 1 cm (new; photo by T.-Y. Chan, National Taiwan Ocean University).

Thelecarcinus BÖHM, 1891, p. 42 [**T. gumbeli,* p. 43, pl. 1,*3;* M]. Carapace wider than long, length about 82% maximum width; front with four

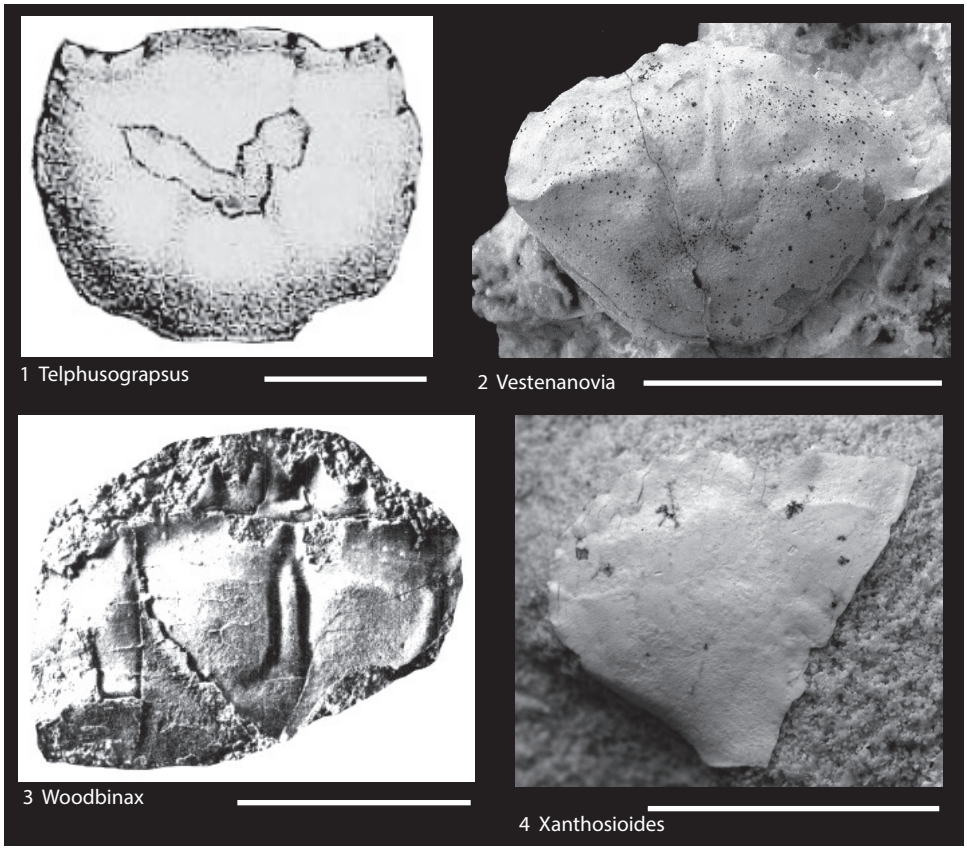

FIG 16. Superfamily Xanthidea *incertae sedis* (p. 33–34).

spines; orbits projected forward; anterolateral margins with numerous small spines; posterolateral margin weakly concave; posterior margin narrow, concave; protogastric region with two tubercles; branchial regions with tubercles roughly arranged into rows. *Upper Cretaceous* (*Maastrichtian*): Germany.——FIG. 15,*6. *T. gumbeli,* KSU D 581, cast of holotype BSP 1873 III F503, scale bar, 1 cm (new).

Telphusograpsus LŐRENTHEY, 1902, p. 114 [**T. laevis,* p. 115, pl. 2,*2–3;* M]. Carapace approximately as wide as long; front straight; orbits wide, with two fissures, fronto-orbital width occupying nearly entire carapace width; lateral margins convex, with three short spines anteriorly; posterolateral reentrant large; posterior margin straight. *Eocene* (*Priabonian*): Hungary.——FIG. 16,*1 *T. laevis,* scale bar, 1 cm (Lőrenthey, 1902, pl. 2,*2*).

Vestenanovia BESCHIN, BUSULINI, & TESSIER, 2015, p. 75 [**V. carinata,* p. 75, pl. 4,*4–5;* OD]. Carapace wider than long, transversely ovate; regions poorly defined, axial regions best defined; front with four blunt spines excluding inner orbital projection; orbital rim entire; anterolateral margin with four projections excluding outer-orbital projection, first two developed as long projections, posterior two developed as spines; epibranchial ridge arcuate, sinuous, sharp. *Eocene* (*Ypresian, Priabonian*): Italy.——FIG. 16,*2. *V. carinata,* holotype MCZ 3671, Ypresian, Italy, scale bar, 1 cm (new; photo by G. Tessier, Museo Civico di Storia Naturale, Venice, Italy).

Woodbinax STENZEL, 1952, p. 215 [**W. texanus,* p. 216, pl. 59,*11;* OD]. Carapace flattened; front with at least four spines; orbits with two fissures; outer-orbital angle with small, sharp spine; protogastric regions with transverse ridge marking anterior border. *Upper Cretaceous* (*Cenomanian*): USA (Texas).——FIG. 16,*3. *W. texanus,* USNM 108226, scale bar, 1 cm (Stenzel, 1952, pl. 59, *11*).

Xanthosioides COLLINS & BRETON, 2009, p. 49 [**Xanthosia delicata* FRAAYE, 1996b, p. 274, pl. 1,*1;* M]. Carapace ovate, flattened transversely and longitudinally, length approximately half maximum carapace width, regions very poorly defined; orbits with two closely spaced, long, closed fissures; transverse crest situated on anterior portion of protogastric region; four or five small anterolateral

spines. *Upper Cretaceous* (*Maastrichtian*): The Netherlands.——Fig. 16,*4*. **X. delicata* (Fraaye), holotype MAB k1960, scale bar, 1 cm (new).

ABBREVIATIONS FOR MUSEUM REPOSITORIES

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

CM: Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA

GLW: Geological Survey of Austria, Vienna, Austria

GSP-UM: Geological Survey of Pakistan-University of Michigan, Islamabad, Pakistan and Ann Arbor, Michigan, USA

IHNCH: Instituto de Historia Natural de Chiapas, Tuxtla Gutiérrez, Chiapas, Mexico

KSU D: Decapod Comparative Collection, Department of Geology, Kent State University, Kent, Ohio, USA

M: Hungarian Natural History Museum, Budapest, Hungary

MAB k: Oertijdmuseum, Boxtel, The Netherlands

MAFI: Földani Intézet (Hungarian Geological Survey), Budapest, Hungary

MBA: Humboldt-Universitat zu Berlin Museum, Berlin, Germany

MCV: Museo Civico "D. Dal Lago" di Valdagno, Vicenza, Italy

MCZ: Museo Civico "G. Zannato" di Montecchio Maggiore, Vicenza, Italy

MFM: Mizunami Fossil Museum, Mizunami, Gifu, Japan

MNHN: Muséum National d'histoire naturelle, Paris, Crustacean Collection, France

MPZ: Natural Science Museum University of Zaragoza, Spain

NMNS: National Museum of Natural Science, Taiwan, Republic of China

SMNS: Staatliches Museum für Naturkunde, Stuttgart, Germany

UF: Florida Museum, University of Florida, Gainesville, Florida, USA

ULLZ: University of Louisiana at Lafayette Zoological decapod crustacean collection, Lafayette, LA, USA

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

VR: Museo di Storia naturale di Verona, Italy

REFERENCES

Adams, Arthur, & Adam White. 1849. Crustacea, Part II. *In* A. Adams, ed., The Zoology of the Voyage of H.M.S. Samarang; under the command of Captain Sir Edward Belcher, C.B., F.R.A.S., F.G.S., during the years 1843–1846. Reeve, Benham & Reeve. London. 66 p., pl. 7–13.

Alcock, Alfred. 1898. The family Xanthidae: the Brachyura Cyclometopa, Part I: Materials for a carcinological fauna of India, No. 3. Journal of the Asiatic Society of Bengal 67:67–233.

Alcock, Alfred. 1900. Materials for a carcinological fauna of India, No. 6. The Brachyura Catometopa, or Grapsoidea. Journal of the Asiatic Society of Bengal, 69(2)(3):279–456.

d'Archiac, Adolphe. 1850. Histoire des Progrès de la Géologie de 1834 a 1849, Vol. 3. Société Géologique de France. Paris. 624 p.

Ashby, Edwin, & B. C. Cotton. 1936. South Australia fossil chitons. Records of the South Australia Museum 5:509–512.

Audouin, Victor. 1826. Explication sommaire des planches de Crustacés de l'Égypte et de la Syrie, publiées par Jules-César Savigny, Membre de l'Institut; offrant un exposé des caractères naturels des genres avec la distinction des espèces, *In* Description de l'Égypte, Histoire naturelle. C. L. F. Panckoucke. Paris. Vol. 1, Part 4. p. 77–98.

Audouin, Victor. 1828. Explication sommaire des planches de Crustacés de l'Égypte et de la Syrie, publiées par Jules-César Savigny, Membre de l'Institut; offrant un exposé des caractères naturels des genres avec la distinction des espèces, *In* Description de l'Égypte, Histoire naturelle, Zoologie. Animaux Invertébrés (suite). C. L. F. Panckoucke, Paris. 28:249–290.

Balss, Heinrich. 1921. Crustacea VI: Decapoda Anomura (Paguridae) und Brachyura (Dromiacea bis Brachygnatha I.). Beiträge zur Kenntnis der Meeresfauna Westafrikas 3:39–67.

Bell, Thomas. 1835. Observations on the genus *Cancer* of Dr. Leach (*Platycarcinus*, Latr.,), with descriptions of three new species. Transactions of the Zoological Society of London 1:335–342, pl. XLVII.

Bell, Thomas. 1844–1852. A History of the British Stalk-Eyed Crustacea. John Van Voorst. London. 386 p. Published in parts. See Manning & Holthuis, 1981, for years of publication.

Bell, Thomas. 1858. A Monograph of the Fossil Malacostracous Crustacea of Great Britain. Part I, Crustacea of the London Clay. Palaeontographical Society, London 10:i–viii, p. 1–44, pl. 1–11. Issued April 1858 for the year 1856.

Benedict, J. E., & M. J. Rathbun. 1891. The genus Panopeus. Proceedings of the United States National Museum 14:355–383, pl.19–24.

Berthold, A. A. 1827. Latreille's natürliche Familien der Thierreichs aus dem Französischen mit Anmerkungen und Zusätzen von Dr. Arnold Adoph Berthold. Landes-Industrie Comptoir. Weimar. 606 p.

Beschin, Claudio, Alessandra Busulini, Antonio De Angeli, & Giuliano Tessier. 1994. I crostacei eocenici della Cava «Boschetto» di Nogarole Vicentino (Vicenza, Italia settentrionale). Lavori—Società Veneziana di Scienze Naturali 19:159–215.

Beschin, Claudio, Alessandra Busulini, Antonio De Angeli, & Giuliano Tessier. 2007. I Decapodi dell'Eocene inferiore di Contrada Gecchelina (Vicenza, Italia settentrionale) (Anomura e Brachiura). Museo di Archeologia e Scienze Naturali "G. Zannato", Montecchio Maggiore (Vicenza) 2007:9–76.

Beschin, Claudio, Alessandra Busulini, & Giuliano Tessier. 2015. Nuova segnalazione di crostacei associai a coralli nell'Eocene inferiore dei Lessini orientali (Vestenanova–Verona). Lavori. Società Veneziana di Scienze Naturali 40:47–109.

Beschin, Claudio, Alessandra Busulini, Giuliano Tessier, & Roberto Zorzin. 2016. I crostacei associati a coralli nell'Eocene inferiore dell'area di Bolca (Verona e Vicenza, Italia nordorientale). Memorie del Museo Civico di Storia Naturale di Verona, series 2, Sezione Scienze della Terre 9:1–189.

Beurlen, Karl. 1930. Vergleichende Stammesgeschichte Grundlagen, Methoden, Probleme unter besonderer Berücksichtigung der höheren Krebse. Fortschritte in der Geologie und Paläontologie 8:317–586.

Bittner, Alexander. 1875. Die Brachyuren des vicentinischen Tertiärgebirges. Denkschriften der Kaiserlichen Akademie der Wissenschaften (Mathematisch-Naturwissenschaftliche Klasse) 34:63–105, pl. 1–5.

Böhm, Johannes. 1891. Die Kreidebildungen des Fürbergs und Sulzbergs bei Siegsdorf in Oberbayern. Palaeontographica 38:1–106, pl. 1–5.

Boone, Lee. 1927. The Littoral Crustacean Fauna of the Galapagos Islands. Part I: Brachyura. Department of Tropical Research Contribution No. 249. Zoologica, Scientific Contributions of the New York Zoological Society 8(4):127–288.

Borradaile, L. A. 1900. On some crustaceans from the South Pacific. Part IV. The crabs. Proceedings of the General Meetings for Scientific Business of the Zoological Society of London for the year 1900:568–595, pl. XL–XLII.

Borradaile, L. A. 1902. Marine Crustaceans, III: The Xanthidae and some other crabs. The Fauna and Geography of the Maldive and Laccadive Archipelagoes 1(3):237–271, fig. 41–60.

Bosc, L. A. G. 1813. Essay historique sur les crustacés de la mer de Nice; par M. Rizzo (Extrait d'un rapport fait à l'institut par M. Bosc). Nouveau Bulletin des Sciences, par la Société Philomatique 66:233–234.

Broili, Ferdinand. 1904. Die Fauna Pachycardientuffe der Seiser Alp (mit Ausschluss der Gastropoden und Cephalopoden). Palaeontographica 50(4–5):145–227.

Busulini, Alessandra, Giuliano Tessier, & Claudio Beschin, 2006. The genus Phlyctenodes A. Milne Edwards, 1862 (Crustacea: Decapoda: Xanthidae) in the Eocene of Europe. Revista Mexicana de Ciencias Geológicas 23(3):350–360.

Calman, W. T. 1909. On a new crab taken from a deep-sea telegraph-cable in the Indian Ocean. Annals and Magazine of Natural History (series 8) 3(13): 30–33.

Cano, Gavino. 1889. Viaggio della R. Corvetta Vettor Pisani attorno al globo. Crostacei Brachiuri ed Anomuri. Bollettino della Società di Naturalisti in Napoli (serie I) 3(2):169–268, pl. 7.

Carter, James. 1898. A contribution to the palaeontology of the decapod Crustacea of England. The Quarterly Journal of the Geological Society of London 54:15–44, pl. I–II.

Castro, Peter, P. K. L. Ng, & S. T. Ahyong. 2004. Phylogeny and systematics of the Trapeziidae Miers, 1886 (Crustacea: Brachyura), with the description of a new family. Zootaxa 643:1–70.

Chen, S.-F. 1943. Two new genera, two new species, and two new names of Chinese Melaniidae. The Nautilus 57:19–21, pl. 6.

Collins, J. S. H. 2002. A taxonomic review of British decapod Crustacea. Bulletin of the Mizunami Fossil Museum 29:81–92.

Collins, J. S. H., & Gerard Breton. 2009. New crabs (Crustacea, Decapoda) from the Cenomanian stratotype (Western Paris Basin, France). Bulletin of the Mizunami Fossil Museum 35:43–50.

Collins, J. S. H., & S. F. Morris. 1978. New Lower Tertiary crabs from Pakistan. Palaeontology 21:957–981.

Couch, R. Q. 1851. Notice of a crustacean, new to Cornwall. Transactions of the Natural History and Antiquarian Society of Penzance 2:13–14.

Dana, J. D. 1851a. On a new genus of Crustacea in the collection of the U.S. Exploring Expedition. American Journal of Science and Arts (2)11(34):223–224.

Dana, J. D. 1851b. On the classification of the Cancroidea. American Journal of Science and Arts (2)12(34):121–131.

Dana, J. D. 1852a in 1852–1853. Parts I and II, Crustacea. U.S. Exploring Expedition During the Years 1838, 1839, 1840, 1841, 1842, under the Command of Charles Wilkes, U.S.N., 13. C. Sherman. Philadelphia. 1618 p., 1 map, 96 pl. (in separate folio atlas).

Dana, J. D. 1852b. Crustacea Cancroidea Corystoidea. Conspectus Crustaceorum quae in Orbis Terrarum circumnavigatione, Carolo Wilkes e classe Reipublicae Foederatae duce, lexit et descripsit. Proceedings of the Academy of Natural Sciences in Philadelphia 6:73–86.

Dana, J. D. 1852c. On the classification of the Crustacea Corystoidea. American Journal of Science and Arts (2)13(34):119–121.

Davie, P. J. F. 2002. Crustacea: Malacostraca: Eucarida (Part 2): Decapoda Anomura, Brachyura. *In* A. Wells & W. W. K. Houston, eds., Zoological Catalogue of Australia 19.3B. CSIRO Publishing. Melbourne. 641 p.

Davie, P. J. F., Danièle Guinot, & P. K. L. Ng. 2015. Systematics and classification of Brachyura. *In* Peter Castro, P. J. F. Davie, Danièle Guinot, F. R. Schram, & J. C. von Vaupel Klein, eds., Treatise on Zoology: Anatomy, Taxonomy, Biology. The Crustacea, Vol. 9, Part C. Brill NV. Leiden. p. 1049–1130.

De Angeli, Antonio, & Loris Ceccon. 2013. Tetraliidae and Trapeziidae (Crustacea, Decapoda, Brachyura) from the early Eocene of Monte Magrè (Vicenza, NE Italy). Atti della Società italiana di Scienze Naturali e del Museo civico di Storia naturale in Milano 154: 25–40.

De Angeli, Antonio, & Loris Ceccon. 2016. *Montemagralia lata* n. gen., n. sp., nuovo crostaceo Trapeziidae (Decapoda, Brachyura) dell'Eocene dei Monti Lessini orientali (Vicenza, Italia settentrionale). Lavori—Società Veneziana di Scienze Naturali 41: 129–136.

De Angeli, Antonio, & Loris Ceccon. 2017. Contributo ai crostacei decapodi dell'Eocene inferiore dei Monti

Lessini orientali (Italia nordorientale). Natura Vicentina 20:5–38.
De Angeli, Antonio, & Alessandro Garassino. 2014. A new genus and species of panopeid crab, *Zovocarcinus muelleri* (Decapoda, Brachyura), from the Eocene of Zovo di Bolca, Verona (northeast Italy). Scripta Geologica 147:185–191.
De Angeli, Antonio, Alessandro Garassino, & Loris Ceccon. 2010. New report of the coral-associated decapods from the "Formazione di Castelgomberto" (early Oligocene) (Vicenza, NE Italy). Atti della Società italiana di Scienze Naturali e del Museo civico di Storia naturale in Milano 151(II):145–177.
Desbonne, Isis, & Alphonse Schramm. 1867. Brachyures. Crustacés de la Guadeloupe, d'après un manuscript du Docteur Isis Desbonne compare avec les échantillons de Crustacés de sa collection et les dernières publications de MM. Henri de Saussure et William Stimpson, Premiere partie. Imprimerie du Governement. Basse-Terre. 60 p., 8 pl.
Desmarest, A. G. 1823. Crustacés Malacostracés. *In* Dictionnaire des Sciences Naturelles, vol. 28. F. G. Levrault et Le Normant. Strasbourg & Paris. p. 138–425.
Desmarest, Eugène. 1858. Crustacés, Mollusques, Zoophytes. *In* Jean Chenu, ed., Encyclopédie d'Histoire Naturelle ou Traité complet de cette Science. Marescq et Compagnie. Paris. 312 p., 40 pl.
Eydoux, Fortuné, & L. F. S. Souleyet. 1842. Crustacés, Voyage autour du Monde exécuté pendant les Années 1836 et 1837 sur la Corvette La Bonite, Zoologie, vol. 1, part 2. Bertrand. Paris. p. 219–272, 5 pl.
Forskål, Petrus. 1775. Descriptiones Animalium, Avium, Amphibiorum, Piscium, Insectorum, Vermium: Quae in Itinere Orientali Observavit Petrus Forskål. Mölleri. Copenhagen. 164 p.
Fowler, H. W. 1912. Part II. The Crustacea of New Jersey. Annual Report of the New Jersey State Museum 1911:29–650, 150 pl.
Fraaye, R. H. B. 1996a. A new Tethyan migrant: *Cretachlorodius enciensis* n. gen., n. sp. (Crustacea, Decapoda), from the Maastrichtian type area. Journal of Paleontology 70:293–296.
Fraaye, R. H. B. 1996b. Late Cretaceous swimming crabs: Radiation, migration, competition, and extinction. Acta Geologica Polonica 46:269–278.
Galil, B. S., & P. F. Clark. 1990. Crustacea Decapoda: Notes on trapeziid crabs from New Caledonia including descriptions of two new species. *In* A. Crosnier, ed., Résultats des Campagnes MUSORSTOM, 6. Mémoires du Museum national d'Histoire naturelle (A) 145:369–388.
Galil, B. S., & Masatsune Takeda. 1986. Resurrection of the genus *Jonesius* and establishment of a new genus: Commensal crabs associated with corals from the Indo-Pacific Ocean. Bulletin of the National Science Museum, Tokyo (series A) 12(4):163–171.
Garth, J. S. 1939. New brachyuran crabs from the Galapagos Islands. Allan Hancock Pacific Expeditions first series 5(2):9–29, 10 pl.
Garth, J. S. 1986. New species of xanthid crabs from early Hancock Expeditions. Occasional Papers of the Allan Hancock Foundation (new series) 4:1–14.
Gistel, Johannes. 1848. Naturgeschichte des Thierreichs für Höhere Schulen. Hoffman'scher Verlags-Buchhandlung. Stuttgart. v–xvi + 216 p., 32 pl.
Glaessner, M. F. 1929. Crustacea Decapoda. *In* F. J. Pompeckj, ed., Fossilium catalogus, 1: Animalium vol. 41. W. Junk. Berlin. p. 1–464.
Guenée, Achille. 1852. Noctuélites III. *In* J. B. A. D. de Boisduval & A. Guenée, eds., Histoire naturelle des Insectes. Species général des Lépidoptères, vol. 7. Libraire Encyclopédique de Roret. Paris. 442 p.
Guinot-Dumortier, Danièle. 1960. Révision des genres *Euxanthus* Dana et *Hypocolpus* Rathbun (Crust. Decap. Brach.). Mémoires du Muséum National d'Histoire Naturelle, nouvelle série, Série A, Zoologie 10(2):153–218, 12 pl.
Guinot, Danièle. 1967. Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyoures. II. Les anciens genres *Micropanope* Stimpson et *Medaeus* Dana. Bulletin du Muséum National d'Histoire Naturelle, Paris (2) 39(2):345–374.
Guinot, Danièle. 1968. Recherches préliminaires sur les groupements naturels chez les Crustacés Décapodes Brachyoures. IV. Observations sur quelques genres de Xanthidae. Bulletin du Muséum National d'Histoire Naturelle, Paris (2) 39(4):695–727.
Guinot, Danièle. 1969. Sur divers Xanthidae notamment sur *Actaea* De Haan et *Paractaea* gen. nov. (Crustacea Decapoda Brachyura). Cahiers du Pacifique 13:223–267, fig. 1–36.
Guinot, Danièle. 1976. Constitution de quelques groupes naturels chez les Crustacés Décapodes Brachyoures. I. La superfamille des Bellioidea Dana et trois sous-familles de Xanthidae (Polydectinae Dana, Trichiinae De Haan, Actaeinae Alcock). Mémoires du Muséum National d'Histoire Naturelle, Paris (A)97:1–308, pl. 1–19.
Guinot, Danièle. 1977. Propositions pour une nouvelle classification des Crustacés Décapodes Brachyoures. Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences Paris (D) 285:1049–1052.
Guinot, Danièle. 1978. Principes d'une classification evolutive des Crustacés Décapodes Brachyoures. Bulletin Biologique de la France et de la Belgique, 112:209–292.
Guinot, Danièle. 1990. Établissement du genre *Garthiope* gen. nov., ses relations avec le genre *Coralliope* Guinot, 1967, et leurs affinités avec les Trapeziidae sensu lato (Crustacea Decapoda Brachyura). Bulletin du Muséum National d'Histoire Naturelle, (A, Zoologie) (Biologie et écologie animaux) 12(2):469–487.
Guinot, Danièle, & M. E. Y Low. 2010. *Forestiana* nom. nov., a replacement name for *Forestia* Guinot, 1976 (Crustacea: Brachyura: Xanthidae), preoccupied by *Forestia* Trinchese, 1881 (Mollusca: Calmidae: Nudibranchia). Zootaxa 2489:67–68.
Guinot, Danièle, & Bertrand Richer de Forges. 1981. Crabes de profondeur, nouveaux ou rares, de l'Indo-Pacifique (Crustacea, Decapoda, Brachyura) (Première partie). Bulletin du Muséum national d'Histoire naturelle (Series 4) Section A 2(4):1113–1153, pl. I–VII.

Haswell, W. A. 1882. Catalogue of the Australian stalk- and sessile-eyed Crustacea. The Australian Museum. Sydney. 324 p., 4 pl.

de Haan, Wilhelm. 1833–1850. Crustacea. *In* P. F. von Siebold, ed., Fauna Japonica sive Descriptio Animalium, quae in Itinere per Japoniam, Jussu et Auspiciis Superiorum, qui summum in India Batava Imperium Tenent, Suscepto, Annis 1823–1830 Collegit, Notis, Observationibus et Adumbrationibus Illustravit. J. Müller et Co. Leyden. p. i–xvii, i–xxxi, ix–xvi, p. 1–243, pl. A–J, L–Q, 1–55, circular graph 2.

Heller, Camil. 1861a. Beiträge zur Crustaceen-Fauna des Rothen Meeres. Sitzungsberichte der Bayerischen Akademie der Wissenschaften zu München, Mathematisch-Physikalischen Klasse 43:297–374.

Heller, Camil. 1861b. Synopsis der im rothen Meere vorkommenden Crustaceen. Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien 9(3):3–32.

Hendrickx, M. E. 1998. A new genus and species of "goneplacid-like" brachyuran crab (Crustacea: Decapoda) from the Gulf of California, Mexico, and a proposal for the use of the family Pseudorhombilidae Alcock, 1900. Proceedings of the Biological Society of Washington 111:634–644.

Herbst, J. F. W. 1782–1804. Versuch Einer Naturgeschichte der Krabben und Krebse Nebst Einer Systematischen Beschreibung ihrer Verschiedenen Arten, Vol. 1–3. G. A. Lange & J. C. Fuessly. Berlin & Zürich. 274 p., pl. 1–21 (vol. 1, 1782–1790); i–viii, iii, iv +1–225 p., pl. 22–46 (vol. 2, 1791–1796); 1–66 p., pl. 47–52 (vol. 3, 1799–1804).

Hoffmann, D. G. F. 1790. Vegetabilia Cryptogama, Vol. 2. J. J. Palm. Erlangen. p. 1–34, pl. I–VIII.

Hombron, J. B., & H. Jacquinot. 1842–1853. Atlas, Crustacés. *In* Zoologie. Voyage au Pôle Sud et dans l'Océanie sur les crevettes l'Astrolabe et la Zélée; execute par ordre du Roi pendent les années 1837–1838–1839–1840, sous le commandement de M. J. Dumont-D'Urville, Capitaine de vaissau. Gide et J. Baudry. Paris. pl. 1–9.

Hu, C.-H. 1981. Studies on Cenozoic fossil crabs from Taiwan Island. Proceedings of the Geological Society of China 24:56–74, pl. 1–4.

Hu, C.-H., & H.-J. Tao. 1996. Crustacean fossils of Taiwan. Ta-Jen Printers. Taipei, Taiwan, Republic of China. 228 p., 28 pl.

ICZN (International Commission on Zoological Nomenclature). 1925. Opinion 85. Ninety-eight generic names in Crustacea placed in the Official List of generic names. Smithsonian Miscellaneous Collections 73(3):13–18.

ICZN (International Commission on Zoological Nomenclature). 1941. Opinion 73. Five generic names in Crinoidea, eighty-six generic names in Crustacea, and eight generic names in Acarina, placed in the Official List of Generic Names. Smithsonian Miscellaneous Collections 73(1):23–31.

ICZN (International Commission on Zoological Nomenclature). 1956. Direction 36. Addition to the "Official List of Specific Names in Zoology" (a) of the specific names of the type species of one hundred and seventy genera of the Order Decapoda (Class Crustacea), the names of which were placed on the "Official List of generic names in Zoology" in the period up to the end of 1936 and (b) of the specific names currently treated as senior subjective synonyms of the names of the type species of nine other such genera. Opinions and Declarations rendered by the International Commission on Zoological Nomenclature 1(D.1):1–46.

ICZN (International Commission on Zoological Nomenclature). 1956. Direction 37. Completion of the entries relating to the names of certain genera of the Order Decapoda (Class Crustacea) placed on the "Official List of Generic Names in Zoology" in the period up to the end of 1936. Opinions and Declarations rendered by the International Commission on Zoological Nomenclature 1(D.2):49–82.

ICZN (International Commission on Zoological Nomenclature). 1956. Opinion 423. Addition to the Official List of Generic Names in Zoology of the generic name *Xantho* [Leach], [1814] (Class Crustacea, Order Decapoda) and validation under the Plenary Powers of the family-group name Xanthinae Dana, 1851. Opinions and Declarations rendered by the International Commission on Zoological Nomenclature 14(7):197–214.

ICZN (International Commission on Zoological Nomenclature). 1964. Opinion 712. Forty-seven genera of decapod Crustacea: placed on the Official List. Bulletin of Zoological Nomenclature 21:336–351.

ICZN (International Commission on Zoological Nomenclature). 1984. Opinion 1282. *Panopeus* H. Milne Edwards, 1834 (Crustacea, Decapoda): designation of type species. Bulletin of Zoological Nomenclature 41(4):225–226.

ICZN (International Commission on Zoological Nomenclature). 1990. Opinion 1614. *Trapezia* Latreille, 1828 (Crustacea, Decapoda): conserved. Bulletin of Zoological Nomenclature 47(3):228.

ICZN (International Commission on Zoological Nomenclature). 1999. International Code of Zoological Nomenclature. Fourth Edition. International Trust for Zoological Nomenclature. London. 306 p.

ICZN (International Commission on Zoological Nomenclature). 2008. Opinion 2204 (Case 3394). Etisus H. Milne Edwards, 1834 and Chlorodiella Rathbun, 1897 (Crustacea: Decapoda: Brachyura): conserved. Bulletin of Zoological Nomenclature 65:225–226.

Iredale, Tom. 1930. Some notable name changes. The Australian Zoologist 6(2):175.

Jacquinot, C. H., & Hippolyte Lucas. 1842–1853. Voyage au Pole Sud et dans l'Océanie sur les Corvettes Astrolabe et la Zélée, Zoologie, 3, Crustaces. E. Thunot et Co. Paris. p. 1–107. Plates in separate volume, pl. 1–9.

Karasawa, Hiroaki. 1993. Cenozoic decapod Crustacea from southwest Japan. Bulletin of the Mizunami Fossil Museum 20:1–92, 24 pl.

Karasawa, Hiroaki, & C. E. Schweitzer, 2004. Revision of the genus *Glyphithreus* Reuss, 1859 (Crustacea: Decapoda: Brachyura: Xanthoidea) and recognition of a new genus. Paleontological Research 8(3): 143–154.

Karasawa, Hiroaki, & C. E. Schweitzer. 2006. A new classification of the Xanthoidea *sensu lato* (Crustacea: Decapoda: Brachyura) based on phylogenetic analysis and traditional systematics and evaluation of all fossil Xanthoidea *sensu lato.* Contributions to Zoology 75(1/2):23–73.

Kingsley, J. S. 1880. On a collection of Crustacea from Virginia, North Carolina, and Florida, with a revision of the genera of Crangonidae and Palaemonidae. Proceedings of the Academy of Natural Sciences of Philadelphia 31(3):383–427, pl. 14.

Koçak, A. Ö., & Muhabbet Kemal. 2008. *Tropicalia* nom. nov., a replacement name for pre-occupied genus name from South America (Scarabaeidae, Coleoptera). Centre for Entomological Studies Ankara Miscellaneous Papers 145:7–8.

Koch, C. L., & G. C. Berendt. 1854. Die im Bernstein befindlichen Crustaceen, Myriapoden, Arachniden und Apteren. *In* G. C. Berendt, ed., Die im Bernstein befindlichen organischen Reste der Vorwelt, Band 1, 2. Abtheilung, I–IV. Nicolai. Berlin. 124 p., 17 pl.

Krauss, Ferdinand. 1843. Die Südafrikanischen crustacean. Schweizerbart'sche. Stuttgart. 68 p., 4 pl.

Lai, J. C. Y., S. T. Ahyong, M.-S. Jeng, & P. K. L. Ng. 2009. Are coral-dwelling crabs monophyletic? A phylogeny of the Trapezioidea (Crustacea: Decapoda: Brachyura). Invertebrate Systematics 23:402–408.

Lai, J. C. Y., J. C. E. Mendoza, Danièle Guinot, P. F. Clark, & P. K. L. Ng. 2011. Xanthidae MacLeay, 1838 (Decapoda: Brachyura: Xanthoidea) systematics: A multi-gene approach with support from adult and zoeal morphology. Zoologischer Anzeiger 250:407–448.

Lamarck, J. B. P. A. 1818. Histoire naturelle des animaux sans vertébrés, présentant les caractères généraux et particuliers de ces animaux, leur distribution, leurs classes, leurs familles, leurs genres, et la citation des principales espèces qui s'y rapportent; précédée d'une introduction offrant la détermination des caractères essentiels de l'animal, sa distinction du végétal et des autres corps naturels, en n, l'exposition des principes fondamentaux de la zoologie, vol. 5. Verdière. Paris. p. 1–612.

Lanchester, W. F. 1900. On a collection of crustaceans made at Singapore and Malacca. Part I. Crustacea Brachyura. Proceedings of the general meetings for scientific business of the Zoological Society of London 1900:719–770, pl. 44–47.

Latreille, P. A. 1812. Crustacés et Insectes. *In* J. Milbert, ed., Voyage pittoresque à l'Ile-de-France, au Cap de Bonne-Espérance et à l'Ile de Ténérife, vol. 2. Le Normant. Paris. p. 270–280.

Latreille, P. A. 1825a. Entomologie, ou Histoire Naturelle des Crustacés, des Arachnides et des Insectes. *In* Genre de Crustacés. Encyclopédie Méthodique. Histoire Naturelle, Vol. 10. Agasse. Paris. 832 p.

Latreille, P. A. 1825b. Familles naturelles du règne animal: Exposées succinctment et dans un ordre analytique, avec l'indication de leurs genres. J. B. Baillière. Paris. 570 p.

Latreille, P. A. 1834. Distribution méthodique et naturelle des genres de diverses tribus d'insectes coléoptères, de la famille des *Serricornes*, par M. Latreille, member de l'Académie des Sciences, president honoraire de la Société Entomologique de France, professeur-administrateur au Muséum d'Histoire Naturelle. Annales de la Société entomologique de France 3:113–170.

Laurie, R. D. 1906. Report on the Brachyura collected by Professor Herdman, at Ceylon, in 1902. Report to the Government of Ceylon on the Pearl Oyster Fisheries of the Gulf of Manaar, Part V. Supplementary Reports XL:349–432.

Leach, W. E. 1813–1814. Crustaceology. *In* D. Brewster, ed., The Edinburgh Encyclopaedia, vol. 7. Blackwood. Edinburgh. p. 383–437, pl. 221.

Linnaeus, Carolus, von. 1758. Systema Naturae per Regna Tria Naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Editio 10, reformata, vol. 1. Laurentii Salvii. Holmiae (Stockholm). 823 p.

Linnaeus, Carolus, von. 1767. Systema Naturae per Regna tria Naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis, Editio 12, vol. 1(2). Laurentii Salvii. Holmiae (Stockholm). p. 533–1327.

Lockington, W. N. 1877a. Remarks on the Crustacea of the Pacific Coast, with descriptions of some new species. Proceedings of the California Academy of Sciences 2(1):28–36.

Lockington, W. N. 1877b. Remarks on the Crustacea of the West Coast of North America, with a catalogue of the species in the Museum of the California Academy of Sciences. Proceedings of the California Academy of Sciences 2(1):94–108.

Lockington, W. N. 1877c. Description of seventeen new species of Crustacea. Proceedings of the California Academy of Sciences 2(1):41–48.

Lőrenthey, Imre (see also Emerich Loőrenthey). 1897. Adatok Magyarország harmadkorú rák-faunájához. Mathematikai és Természettudományi Értesito 15: 149–169.

Lőrenthey, Emerich. 1898. Über die Brachyuren der palæontologischen Sammlung des bayerischen Staates. Természetrajzi Füzetek 21:134–152, pl. 10–11.

Lőrenthey, Emerich. 1902. Neuere Beiträge zur Tertiären Dekapodenfauna Ungarns. Mathematisch und Naturwissenschaftliche Berichte aus Ungarn, 18:98–120, pl. 1–2.

Lőrenthey, Imre (see also Emerich Lőrenthey). 1907. Palaeontologiai tanulmányok a harmadkorú rákok köréből. V. Adatok Egyptom eocenkori rákfaunájához. Mathematikai és Természettudományi Közlemények 29(2):195–242, pl. 1–2.

Lőrenthey, Emerich. 1909. Beiträge zur Kenntnis der Eozänen Dekapodenfauna Ägyptens. Mathematischen und Naturwissenschaftlichen Berichte aus Ungarn 24:106–152, pl. 1–2. [Hungarian version published in 1907.]

Lőrenthey, Emerich (see also Imre Lőrenthey), & Karl Beurlen. 1929. Die fossilen Decapoden der Länder der Ungarischen Krone. Geologica Hungarica (Palaeontologica) 3:1–421, 16 pl., 12 tables.

Low, M. E. Y., & P. K. L. Ng. 2012. The decapod crustaceans described by C. Sankarankutty, and a replacement name for *Jonesius* Sankarankutty, 1962

(Crustacea: Brachyura: Domeciidae), preoccupied by *Jonesius* Yamaguti, 1959 (Cestoda, Cyclophyllidea: Hymenolepididae). Zootaxa 3363:59–62.

MacGilchrist, A. C. 1905. Natural history notes from the R.I.M.S. 'Investigator', Capt T. H. Heming, R.N. (retired), commanding. Series III, No. 6: An account of the new and some of the rarer decapod Crustacea obtained during the surveying seasons 1901–1904. Annals and Magazine of Natural History 15(87):233–268.

MacLeay, W. S. 1838. On the brachyurous decapod Crustacea brought from the Cape by Dr. Smith. *In* A. Smith, Illustrations of the Annulosa of South Africa. Consisting Chiefly of Figures and Descriptions of the Objects of Natural History Collected During an Expedition into the Interior of South Africa, in the years 1834, 1835, and 1836. Fitted out by 'The Cape of Good Hope Association for Exploring Central Africa.' Smith, Elder and Company. London. p. 53–71, 2 pl.

de Man, J. G. 1889. Ueber einige neue oder seltene indopacifische Brachyuren. Zoologische Jahrbücher, Abteilung für Systematik, Geographie und Biologie der Thiere 4(2):409–452, pl. 9–10.

de Man, J. G. 1902. Die von Herrn Professor Kükenthal im Indischen Archipel gesammelten Dekapoden und Stomatopoden. Ergebnisse einer Zoologischen Forschungsreise in den Molukken und Borneo. Sonderabdruck aus den Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft 25(3):467–929, pl. 19–27.

de Man, J. G. 1904. Beschreibung einiger Brachyuren Krebse aus post-tertiären Schichten der Minahassa, Celebes. Sammlungen des Geologischen Reichsmuseums in Leiden (1) 7:254–277, pl. 9–10.

Manning, R. B., & L. B. Holthuis. 1981. West African brachyuran crabs (Crustacea: Decapoda). Smithsonian Contributions to Zoology 306:1–379.

Mendoza, J. C. E., & Danièle Guinot. 2011. Revision of the genus *Glyptoxanthus* A. Milne-Edwards, 1879, and establishment of Glyptoxanthinae nov. subfam. (Crustacea: Decapoda: Brachyura: Xanthidae). Zootaxa 3015:29–51.

Mendoza, J. C. E., & M. R. Manuel-Santos. 2012. Revision of *Garthiella* Titgen, 1986 (Crustacea: Decapoda: Brachyura: Xanthidae), with description of a new subfamily and a new species from the Central Philippines. Zootaxa 3446:32–48.

Miers, E. J. 1884. Crustacea. *In* Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert' 1881–2. Part 1. Collections from Melanesia. Taylor & Francis. London. p. 178–322, pl. XVIII–XXXIV.

Miers, E. J. 1886. Report on the Brachyura collected by H.M.S. Challenger during the years 1873–1876. *In* C. W. Thomson & J. Murray, eds., Report of the Scientific Results of the Voyage of H. M. S. Challenger during the years 1873–1876 (Zoology). Johnson Reprints. New York. p. 1–362.

Milbert, J. G. 1812. Crustacés et Insectes. *In* Voyage Pittoresque a l'Ile-de-France, au Cap de Bonne-Espérance et a l'Ile de Ténérife. Vol. 2. A. Nepveu. Paris. p. 270–280.

Milne-Edwards, Alphonse. 1862a. Monographie des Crustacés de la famille Cancériens. Annales des Sciences Naturelles (Zoologie) (4)18:31–85, pl. 1–10.

Milne-Edwards, Alphonse. 1862b. Faune carcinologique de l'île de la Réunion. *In* Louis Maillard, Appendix F, Notes sur l'île de la Réunion. Dentu. Paris. p. 1–16.

Milne-Edwards, Alphonse. 1863. Monographie des Crustacés de la famille Cancériens. Annales des Sciences Naturelles (Zoologie) (4)20:273–324, pl. 5–12.

Milne-Edwards, Alphonse. 1864. Monographie des Crustacés de la famille Cancériens. Annales des Sciences Naturelles (Zoologie) (5)1:31–88, pl. 1–10.

Milne-Edwards, Alphonse. 1865. Études zoologiques sur les Crustacés Récents de la famille des Cancériens. Nouvelles Archives du Muséum d'Histoire Naturelle 1:177–308, pl. XI–XIX.

Milne-Edwards, Alphonse. 1867. Descriptions de quelques espèces nouvelles de Crustacés Brachyoures. Annales de la Societé Entomologique de France 4:263–288.

Milne-Edwards, Alphonse. 1868. Observations sur la faune carcinologique des Iles du Cap-Vert. Nouvelles archives du Muséum d'Histoire naturelle 4:49–68, pl. 16–18.

Milne-Edwards, Alphonse. 1869. Description d'un nouveau genre de Crustacé Cancérien. Annales de la Société Entomologique de France (4) 9:167–169, pl. 8.

Milne-Edwards, Alphonse. 1873. Recherches sur la faune carcinologique de la Nouvelle-Calédonie. Pt. 2. Groupe des Cyclométopes Neptunes. Nouvelles Archives du Museum d'Histoire Naturelle Paris 9:155–332, pl. 4–18.

Milne-Edwards, Alphonse. 1873–1880. Études sur les Xiphosures et les Crustacés de la région Mexicaine. Mission Scientifique au Mexique et dans l'Histoire de la Faune de l'Amérique Centrale et du Mexique. Imprimerie Nationale. Paris. Part 5. 368 p., 61 pl.

Milne Edwards, Henri. 1834–1840. Histoire Naturelle des Crustacés, Comprenant l'Anatomie, la Physiologie, et la Classi Cation de Ces Animaux. 3 vol. Imprimerie et Fonderie de Fain (vol. 1–2); Imprimerie de Fain & Thunot (vol. 3). Paris. 468 p. (vol. 1, 1834); 532 p. (vol. 2, 1837); 638 p. + 32 p. (atlas), 42 pl. (vol. 3, 1840).

Milne Edwards, Henri, & Hippolyte Lucas. 1843. Crustacés. *In* A. d'Orbigny, ed., Voyage dans l'Amerique méridionale (le Brésil, la république orientale de l'Uruguay, la république Argentine, la Patagonie, la république du Chili, la république de Bolivia, la république du Pérou), exécutée pendant les années 1826, 1827, 1828, 1829, 1830, 1831, 1832 et 1833. Vol. 6 (1). P. Bertrand. Paris. p. 1–37, pl. 1–17.

Montagu, George. 1808. Description of several marine animals found on the South Coast of Devonshire. Transactions of the Linnean Society of London, 9:81–114, pl. II-VIII.

Montagu, George. 1815. Descriptions of several new or rare animals, principally marine, discovered on the South Coast of Devonshire. Transactions of the Linnean Society 11:1–26, pl. 1–5.

Müller, Pál. 1975. *Trapezia* (Crustacea Decapoda) a Magyar eocénből és miocénből. *Trapezia* (Crustacea

Decapoda) dans l'Eocène et le Miocène de Hongrie. Földtani Közlöny 105:516–523, pl. 1–2.

Müller, Pál. 1984. Decapod Crustacea of the Badenian. Geologica Hungarica (Palaeontologica) 42:1–317, pl. 1–97.

Müller, Pál, & J. S. H. Collins. 1991. Late Eocene coral-associated decapods (Crustacea) from Hungary. Contributions to Tertiary and Quaternary Geology 28(2–3):47–92, pl. 1–8.

Ng, P. K. L. 1993. Kraussiinae, a new subfamily for the genera *Kraussia* Dana, 1852, *Palapedia*, new genus, and *Garthasia*, new genus (Crustacea: Decapoda: Brachyura: Xanthidae), with descriptions of two new species from Singapore and the Philippines. Raffles Bulletin of Zoology 41(1):133–157.

Ng, P. K. L., & D. G. B. Chia. 1994. The genus *Glyptocarcinus* Takeda, 1973, with descriptions of a new subfamily, two new genera and two new species from New Caledonia (Crustacea: Decapoda: Brachyura: Xanthidae). Raffles Bulletin of Zoology 42(3):701–730.

Ng, P. K. L., & L. B. Holthuis, 2007. Case 3394, *Etisus* H. Milne Edwards, 1834 and *Chlorodiella* Rathbun, 1897 (Crustacea, Decapoda, Brachyura): Proposed conservation of the generic names by suppression of the generic name *Clorodius* A. G. Desmarest, 1823. Bulletin of Zoological Nomenclature (ICZN) 64:19–24.

Ng, P. K. L., Danièle Guinot, & P. J. F. Davie. 2008. Systema Brachyurorum: Part I. An annotated checklist of extant brachyuran crabs of the world. Raffles Bulletin of Zoology, (supplement) 17:1–286.

Odhner, Teodor. 1925. Monographierte Gattungen der Krabben-Familie Xanthidae. I. Göteborgs Kungliga Vetenskaps-och Vitterhets-Samhalles Handlingar 29(1):1–92, pl. 1–5.

Olivier, G.-A. 1791. Crabe. *In* Encylopedie Methodique. Histoire Naturelle. Insectes. Vol. 6. Panckoucke. Paris. p. 136–182.

Ortmann, A. E. 1893. Abtheilung: Brachyura (*Brachyura genuina* Boas), II. Unterabtheilung: Cancroidea, 2. Section: Cancrinea, 1. Gruppe: Cyclometopa. Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und zur Zeit im Strassburger Museum aufbewahrten Formen, VII. Theil. Zoologische Jahrbücher, Systematik, Geographie und Biologie der Thiere 7:411–495, pl. 17.

Ortmann, A. E. 1894. Crustaceen. *In* Richard Semon, ed., Zoologische Forschungsreisen in Australien und dem malayischen Archipel. Gustav Fischer. Jena. p. 1–80, 3 pl.

Ossó, Àlex, & J. L. Domínguez. 2017. A new genus and new species of decapod crustacean (Decapoda: Brachyura: Panopeidae) from the early Priabonian (Late Eocene) of the central Pyrenees of Huesca (Aragón, Spain), with remarks on its habitat and ecology. Journal of Crustacean Biology 37:602–607.

Parisi, Bruno. 1916. I decapodi Giapponesi del Museo di Milano. IV. Cyclometopa. Atti della Società Italiana di Scienze naturali e del Museum Civico di Storie Naturale di Milano 55:153–191, pl. 7–11.

Paul'son, Otton. 1875. Studies on the Crustacea of the Red Sea with notes regarding other seas. Part 1. Podophthalmata and Edriophthalmata (Cumacea). S. V. Kul'zhenko. Kiev. 164 p., 21 pl. [Translation published for The National Science Foundation, Washington, D. C. and Smithsonian Institution, U.S.A., by the Israel Program for Scientific Translations, 1961.]

Pomel, Auguste. 1847. Note critique sur les caractères et les limites du genre Palaeotherium. Archives des Sciences Physique et Naturelle, Genève 5:200–207.

Poore, G. C. B. 2004. Marine Decapod Crustacea of Southern Australia. A Guide to Identification. Museum Victoria. Melbourne. i–ix + 574 p.

Portell, R. W., & J. S. H. Collins. 2004. Decapod crustaceans of the Lower Miocene Montpelier Formation, White Limestone Group of Jamaica. Cainozoic Research 3(1–2):109–126.

Quayle, W. J., & J. S. H. Collins. 1981. New Eocene crabs from the Hampshire Basin. Palaeontology 24(4):733–758, pl. 104–105.

Rathbun, M. J. 1897. A revision of the nomenclature of the Brachyura. Proceedings of the Biological Society of Washington 11:153–167.

Rathbun, M. J. 1898a. The Brachyura of the Florida Keys and the Bahamas in 1893. Bulletin from the Laboratories of Natural History of the State University of Iowa 4(3):250–294, pl. 1–9.

Rathbun, M. J. 1898b. The Brachyura collected by the U. S. Fish Commission steamer Albatross on the voyage from Norfolk, Virginia, to San Francisco, California, 1887–1888. Proceedings of the United States National Museum 21:567–616, pl. 41–44.

Rathbun, M. J. 1906. The Brachyura and Macrura of the Hawaiian Islands. U.S. Fish Commission Bulletin for 1903 (3):829–930, pl. 3–24.

Rathbun, M. J. 1911. No. XI. Marine Brachyura. *In* The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of J. Stanley Gardiner, Volume 3. Transactions of the Linnean Society of London (series 2) Zoology 12(2):191–261, pl. 15–20.

Rathbun, M. J. 1923. Descriptions of new species of crabs from Palmyra Island. The Bishop Museum Bulletin 5:38–40.

Rathbun, M. J. 1930. The cancroid crabs of America of the families Euryalidae, Portunidae, Atelecyclidae, Cancridae and Xanthidae. United States National Museum Bulletin 152:xvi + 609 p., 230 pl.

Reuss, A. E. 1859. Zur Kenntnis fossiler Krabben. Denkschriften der Kaiserlichen Akademie der Wissenschaften Wien 17:1–90, pl. 1–24.

Rüppell, Eduard. 1830. Beschreibung und Abbildung von 24 Arten kurzschwänzigen Krabben, also Beitrag zur Naturgeschichte des Rothen Meeres. H. L. Brönner. Frankfurt am Main. 28 p., 6 pl.

Sakai, Tune. 1965. On two new genera and five new species of xanthoid crabs from the collection of His Majesty the Emperor of Japan made in Sagami Bay. Crustaceana 8:97–106.

Sakai, Tune. 1976. Crabs of Japan and the adjacent seas. 3 vol. Kodansha Ltd. Tokyo. xxix + 773 p. fig. 1–379 (English text); p. 1–16, 251 pl. (plates volume); p. 1–461 (Japanese text).

Sankarankutty, Cheruparambil. 1962. On Decapoda Brachyura from the Andaman and Nicobar Islands: 2. Family Xanthidae. Journal of the Marine Biological Association of India 4:121–150.

Say, Thomas. 1817–1818. An account of the Crustacea of the United States. Journal of the Academy of Natural Sciences of Philadelphia 1(1–2):57–63, 65–80, pl. 4, 97–101, 155–160, 161–169 (all 1817), 235–253, 313–316, 317–319, 374–380, 381–401, 423–458 (all 1818).

Schweitzer, C. E. 2005. The Trapeziidae and Domeciidae (Decapoda: Brachyura: Xanthoidea) in the fossil record and a new Eocene genus from Baja California Sur, Mexico. Journal of Crustacean Biology 25(4):625–636.

Schweitzer, C. E., P. C. Dworschak, & J. W. Martin. 2011. Replacement names for several fossil Decapoda. Journal of Crustacean Biology 31:361–363.

Schweitzer, C. E., R. M. Feldmann, Alessandro Garassino, Hiroaki Karasawa, & Günter Schweigert. 2010. Systematic list of fossil decapod crustacean species. Crustaceana Monographs 10:1–222.

Schweitzer, C. E., R. M. Feldmann, & P. D. Gingerich, 2004. New decapods (Crustacea) from the Eocene of Pakistan and a revision of *Lobonotus* A. Milne Edwards, 1864. University of Michigan, Contributions from the Museum of Paleontology 31(4):89–118.

Schweitzer, C. E., & Hiroaki Karasawa, 2004. Revision of *Amydrocarcinus* and *Palaeograpsus* (Decapoda: Brachyura: Xanthoidea) with definition of three new genera. Paleontological Research 8(1):71–86.

Serène, Raoul. 1965. Guide for curators of brachyuran collections in Southeast Asia. Applied Scientific Research Corporation of Thailand. Bangkok. 65 p.

Serène, Raoul. 1968. Prodromus for a check list of the (nonplanctonic) marine fauna of Southeast Asia: The Brachyura of the Indo-West Pacific region. *In* Fourth Regional Meeting of Marine Science Experts in East and Southeast Asia. Special Publication. Singapore National Academy of Science. Singapore. p. 33–113.

Serène, Raoul. 1984. Xanthoidea, Xanthidae et Trapeziidae: Crustacés Décapodes Brachyoures de l'Océan Indien Occidental et de la Mer Rouge. Faune Tropicale 24. Editions de l'ORSTOM, Institut Français de Recherche Scientifique pour le Développement en Coopération. Paris. 349 p., 48 pl.

Smith, S. I. 1869. Notes on new or little known species of American cancroid Crustacea. Proceedings of the Boston Society of Natural History 12:274–289.

Stenzel, H. B. 1952. Decapod crustaceans from the Woodbine Formation of Texas. *In* L. W. Stephenson, ed., Larger Invertebrate Fossils of the Woodbine Formation (Cenomanian) of Texas. Geological Survey Professional Paper 242:212–217, pl. 59.

Števčić, Zdravko. 2005. The reclassification of brachyuran crabs (Crustacea: Decapoda: Brachyura). Natura Croatica 14 (supplement) (1):1–159.

Števčić, Zdravko. 2011. Addition to the reclassification of brachyuran crabs (Crustacea: Decapoda: Brachyura), Part I. New Taxa. Natura Croatica 20:125–139.

Števčić, Zdravko. 2013. Addendum to the reclassification of brachyuran crabs (Crustacea: Decapoda: Brachyura), Part II: Classification scheme. Natura Croatica 22:181–188.

Stimpson, William. 1858. Prodromus descriptionis animalium evertebratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit. Pars IV. Crustacea Cancroidea et Corystoidea. Proceedings of the Academy of Natural Sciences of Philadelphia 10:29–37.

Stimpson, William. 1862a. Notes on North American Crustacea, No. 1. Annals of the Lyceum of Natural History of New York 7:49–93, pl. 1. Published separately in 1859, p. 3–47.

Stimpson, William. 1862b. Notes on North American Crustacea, in the Museum of the Smithsonian Institution. No. II. Annals of the Lyceum of Natural History of New York 7 (1862):176–246, pl. 2,5. Published separately in 1860, p. 49–118, pl. 2–3.

Stimpson, William. 1871. Preliminary report on the Crustacea dredged in the Gulf Stream in the Straits of Florida, by L. F. de Pourtalès, Assist., U. S. Coast Survey. Part I. Brachyura. Bulletin of the Museum of Comparative Zoology 2(1–5):109–160.

Stimpson, William. 1907. Report on the Crustacea (Brachyura and Anomura) collected by the North Pacific Exploring Expedition, 1853–1856. Smithsonian Miscellaneous Collections 49:1–240, 26 pl.

Strahl, J. C. 1861. Carcinologische Beiträge. A. Ueber die Dekapodengattung Euxanthus Dana. B. Ueber Cancer Panope Herbst. Archiv für Naturgeschichte 27:101–106.

Takeda, Masatsune. 1976. Studies on the Crustacea Brachyura of the Palau Islands, III. Xanthidae (1). Researches on Crustacea 7:69–99, pl. 9–11.

Thoma, B. P., Danièle Guinot, & D. L. Felder. 2014. Evolutionary relationships among American mud crabs (Crustacea: Decapoda: Brachyura: Xanthoidea) inferred from nuclear and mitochondrial markers, with comments on adult morphology. Zoological Journal of the Linnean Society 170:86–109.

Titgen, R. H. 1986. Hawaiian Xanthidae (Decapoda: Brachyura) II. Description of *Garthiella*, new genus, with a redescription of *G. aberrans* (Rathbun, 1906). Proceedings of the Biological Society of Washington 99:56–60.

Trinchese, Salvatore. 1881. Breve descrizione del nuovo genera *Forestia*. Rendiconto dell'Accademia delle Scienze Fisiche e Matematiche, Sezione della Societá Reale di Napoli, dell'Accademia Reale Delle Scienze di Napoli (4)20:121–122.

Tweedie, M. W. F. 1950. The fauna of the Cocos-Keeling Islands, Brachyura and Stomatopoda. Bulletin of the Raffles Museum 22:105–148.

Vega, F. J., R. M. Feldmann, Pedro García-Barrera, Harry Filkorn, Francis Pimentel, & Javier Avendaño. 2001. Maastrichtian Crustacea (Brachyura: Decapoda) from the Ocozocuautla Formation in Chiapas, southeast Mexico. Journal of Paleontology 75:319–329.

Von Meyer, Hermann. 1862. Tertiaere Decapoden aus den Alpen, von Oeningen und dem Taunus. Palaeontographica 10:147–178, pl. 16–19.

Ward, Melbourne. 1932. The true crabs of the Capricorn Group, Queensland. Part 1. Xanthidae. The Australian Zoologist 7(3):237–255.

Ward, Melbourne. 1933. New genera and species of marine Decapoda Brachyura. The Australian Zoologist 7(5):377–394, pl. XXI–XXIII.

Ward, Melbourne. 1934. Notes on a collection of crabs from Christmas Island, Indian Ocean. Bulletin of the Raffles Museum 9:5–26, pl. I–III.

Ward, Melbourne. 1936. Crustacea Brachyura from the coasts of Queensland. Memoirs of the Queensland Museum 11(1):1–13.

Ward, Melbourne. 1942a. Notes on the Crustacea of the Desjardins Museum, Mauritius Institute, with descriptions of new genera and species. Bulletin of the Mauritius Institute, Port Louis 2(2):49–113, pl. 5–6.

Ward, Melbourne. 1942b. A new genus and eight new species of Brachyura from Mauritius and the Chagos Archipeligo. Bulletin of the Mauritius Institute, Port Louis 2(2):39–48, pl. 2–4.

White, Adam. 1847a. List of the specimens of Crustacea in the collection of the British Museum. British Museum. London. 143 p.

White, Adam. 1847b. Descriptions of a new genus and five new species of Crustacean. *In* J. B. Jukes, ed., Narrative of the surveying voyage of H.M.S. Fly, commanded by Captain F. P. Blackwood, R. N. in Torres Strait, New Guinea, and other islands of the Eastern Archipelago, during the years 1842–1846: together with an excursion into the interior of the eastern part of Java, vol. 2. T. & W. Boone. London. p. 335–338, pl. 2.

White, Adam. 1848. Short Descriptions of new or little known decapod Crustacea. Proceedings of the Zoological Society of London 15(1897):222–228.

Yamaguti, Satyu. 1959. Systema Helminthum. Volume II. The Cestodes of Vertebrates. Interscience. New York. 860 p., 70 pl.