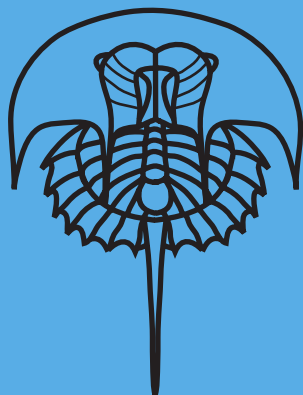




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Part R, Revised, Volume 1, Chapter 8T21:
Systematic Descriptions: Subsection
Thoracotremata

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PART R, REVISED, VOLUME 1, CHAPTER 8T21: SUBSECTION THORACOTREMATA

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Subsection THORACOTREMATA Guinot, 1977

[Thoracotremata GUINOT, 1977, p. 1050]

Female and male gonopores sternal; male gonopore near sternal suture 7/8 or in sternite 8, male gonopod 2 always much shorter than gonopod one. [Emended from DAVIE, GUINOT & NG, 2015, p. 1116.] *Paleocene* (*Danian*)–*Holocene*.

Classification of Ocypodidae based upon SHIH and others (2016). Remaining groups follow DAVIE, GUINOT, and NG (2015).

Superfamily CRYPTOCHIROIDEA Paul'son, 1875

[*nom. transl.* KROPP & MANNING, 1985, p. 954, *pro* Cryptochirinae PAUL'SON, 1875, p. 78]

Diagnosis as for family. *Pliocene*–*Holocene*.

Family CRYPTOCHIRIDAE Paul'son, 1875

[*nom. transl.* RICHTERS, 1880, p. 159, *pro* Cryptochirinae PAUL'SON, 1875, p. 78] [=Lithoscaptidae RICHTERS, 1880, p. 159; =Hapalocarcinidae CALMAN, 1900, p. 49]

Carapace longer than wide, or approximately as long as wide, membranous; front straight, orbits placed at anterior corners, directed anterolaterally; maxillae reduced; antennae small, outside orbits; antennules with large basal article; chelipeds weak, nearly same size as other pereopods; pereopods 2–5 with short, hooked dactyli; pereopods 4 and 5 lacking gills; adult females larger than males, with pleopods on pleonal

somites 2–4; female pleon expanded into brood pouch; adult males may look like larvae; obligate on corals. [Emended from DAVIE, 2002; POORE, 2004, p. 482.] *Holocene*.

Known only from trace fossils in fossil record (KLOMPMAKER, PORTELL, & VAN DER MEIJ, 2016). *Pliocene*: USA (Florida). *Pleistocene*: Cuba, USA (Florida).

Cryptochirus HELLER, 1861, p. 19 [**C. corralliodytes*; M; =*C. rugosus* EDMONDSON, 1933, p. 6, pl. 1, 1] [=Favicola SERÈNE, 1966, p. 396 (type, *Cryptochirus rugosus*, OD)]. Carapace longer than wide, rectangular, ornamented with tubercles, regions well defined. *Holocene*: Indo-West Pacific Ocean, central Pacific Ocean.—FIG. 1, 1. **C. corralliodytes*, Holocene, Pacific Ocean, scale bar 1 mm. [Emended from KROPP, 1990, fig. 1a.]

Superfamily GRAPSOIDEA MacLeay, 1838

[*nom. transl.* DANA, 1851a, p. 247, *pro* Grapsidae MACLEAY, 1838, p. 63]

Carapace quadrate to ovate, usually wider than long but may be approximately as long as wide; carapace usually flattened but may be vaulted; front wide, usually wider than orbits; orbits may be placed at lateral edges of anterior margin of carapace; anterolateral and posterolateral margins commonly confluent but rarely distinguishable from one another, typically with spines anterolaterally; interantennular fossae wide; buccal frame quadrate, third maxillipeds may or may not close it; third maxillipeds may or may not gape when completely closed; male pleon with all somites free or some fused, if fused, sutures usually evident; chelipeds

robust, symmetrical; sternal suture 4/5–7/8 interrupted. [Emended from DAVIE, GUINOT, & NG, 2015, p. 1117.] *Eocene* (*Ypresian*)–*Holocene*.

Family GECARCINIDAE MacLeay, 1838

[Gecarcinidae MACLEAY, 1838, p. 63]

Carapace ovate, wider than long, smooth, widest approximately 40 percent the distance posteriorly; front downturned; orbits rectangular, wide; fronto-orbital width always less than maximum carapace width; anterolateral and posterolateral margins confluent, convex, anterolateral margin entire or with a spine or notch; third maxillipeds leaving gap when closed; male pleon with all somites free. [Emended from DAVIE, GUINOT, & NG, 2015, p. 1117.] *Pliocene*–*Holocene*.

Gecarcinus LEACH, 1814, p. 430 [**Cancer ruricola* LINNAEUS, 1758, p. 626; SD H. MILNE EDWARDS, 1838, pl. 21; =*Ocypode tourlourou* LATREILLE, 1803, p. 36; =*Gecarcinus agricola* REICHENBACH, 1826, p. 230; =*Ocypode rubra* FRÉMINVILLE, 1835, p. 222]. Carapace wider than long, widest in anterior one-third, smooth, regions poorly marked; fronto-orbital width approximately half maximum carapace width; front narrow, downturned; pereiopod 3 longest. *Pleistocene*: Cuba. *Holocene*: Caribbean Sea, Mexico.—FIG. 1,2. **G. ruricola*, USNM 151049, Holocene, Caribbean Sea, scale bar 1 cm (new).

Cardisoma LATREILLE, 1825, p. 685 [**C. guanhumi*; SD H. MILNE EDWARDS, 1838 in 1836–1844, pl. 21] [= *Perigrapsus* HELLER, 1862, p. 522 (type, *P. excelsus*, M, ICZN Opinion 85, 1925, Direction 37, 1956)]. Carapace ovate, flanks high; lateral margins convex, branchial regions strongly inflated; front ~25% carapace width; orbits deep, outer-orbital angle defined by a small spine; gap of maxillipeds rhomboidal, mandibles visible; chelipeds large, larger than any other pereiopods; male and female pleons with all somites free, covering entire space between coxae of fifth pereiopods. *Pliocene*–*Holocene*. *Pliocene*–*Pleistocene*: Costa Rica, Fiji, Puerto Rico, USA. *Pleistocene*: Bahamas, Jamaica, Panama. *Holocene* (fossil): Antigua, Panama. *Holocene*: circumtropical.—FIG. 1,3. **C. guanhumi*, USNM 17714, Holocene, Honduras, scale bar 1 cm (new).

Johngarthia TÜRKAY, 1970, p. 343 [**Gecarcinus planatus* STIMPSON, 1862, p. 234; OD]. Carapace ovate, widest in anterior one-third; protogastric regions well marked; merus of third maxilliped with notch at tip; exopod of merus long, extending beyond the articulation of the ischium and merus of the endopod. [Emended from TÜRKAY, 1970.] *Pleistocene*–*Holocene*. *Pleistocene*: Brazil.

Holocene: Atlantic Ocean, west coastal Mexico, Central America, Colombia.—FIG. 1,4. **J. planata*, MNHN-IU-2000-10951, Holocene, Mexico, scale bar 1 cm (photo by N. Mollaret, MNHN, RECOLNAT ANR-11-INBS-0004).

Family GLYPTOGRAPSIDAE Schubart, Cuesta, & Felder, 2002

[Glyptograpsidae SCHUBART, CUESTA, & FELDER, 2002, p. 31]

Carapace ovate to rectangular; front four lobed; anterolateral margins with three or four pairs of spines; third maxillipeds almost completely covering buccal frame, ischium and merus both broad; chelipeds of males very heterochelous; male pleon with somites 3–5 fused, sutures visible, completely covering space between fifth pereiopods. [Emended from SCHUBART, CUESTA, & FELDER, 2002, p. 31.] *Holocene*.

No fossil representatives.

Glyptograpsus SMITH, 1870, p. 153 [**G. impressus*, p. 154; M; =*G. spinipes* CANO, 1889, p. 241, pl. 7,15] [= *Areograpsus* BENEDICT, 1892, p. 77 (type, *A. jamaicensis*, M)]. Carapace wider than long, widest posterior to midline; regions well defined; front bilobed axially, sinuous; anterolateral margins with four short spines including outer-orbital spine; chelipeds short. *Holocene*: Mexico, Caribbean Sea.—FIG. 1,5. **G. impressus*, USNM 44174, Holocene, Tobago, scale bar 1 cm (new).

Family GRAPSIDAE MacLeay, 1838

[Grapsidae MACLEAY, 1838, p. 63] [= Goniopsinae KOSSMANN, 1877, p. 56; =Leptograpsinae KOSSMANN, 1877, p. 57; =Nautilograpsidae SMIRNOV, 1929, p. 42]

Carapace quadrate or ovate, wider than long, regions moderately to weakly defined, usually smooth; anterolateral and posterolateral margins confluent, usually converging posteriorly, anterolateral margin with spines, lobes, or entire; front wide, strongly downturned anteriorly; carapace usually with transverse ridges posterolaterally; infraorbital ridge absent; orbits usually positioned at anterior corners; maxillipeds 3 not separated by wide rhomboidal gap, without oblique, hairy ridge on merus and ischium; anterolateral corner of merus usually expanded, palp articulating at anterior margin of merus; exopod narrow; sternal suture 4/5–7/8 interrupted; male pleon wide, filling entire space between pereiopods 5, somites free;

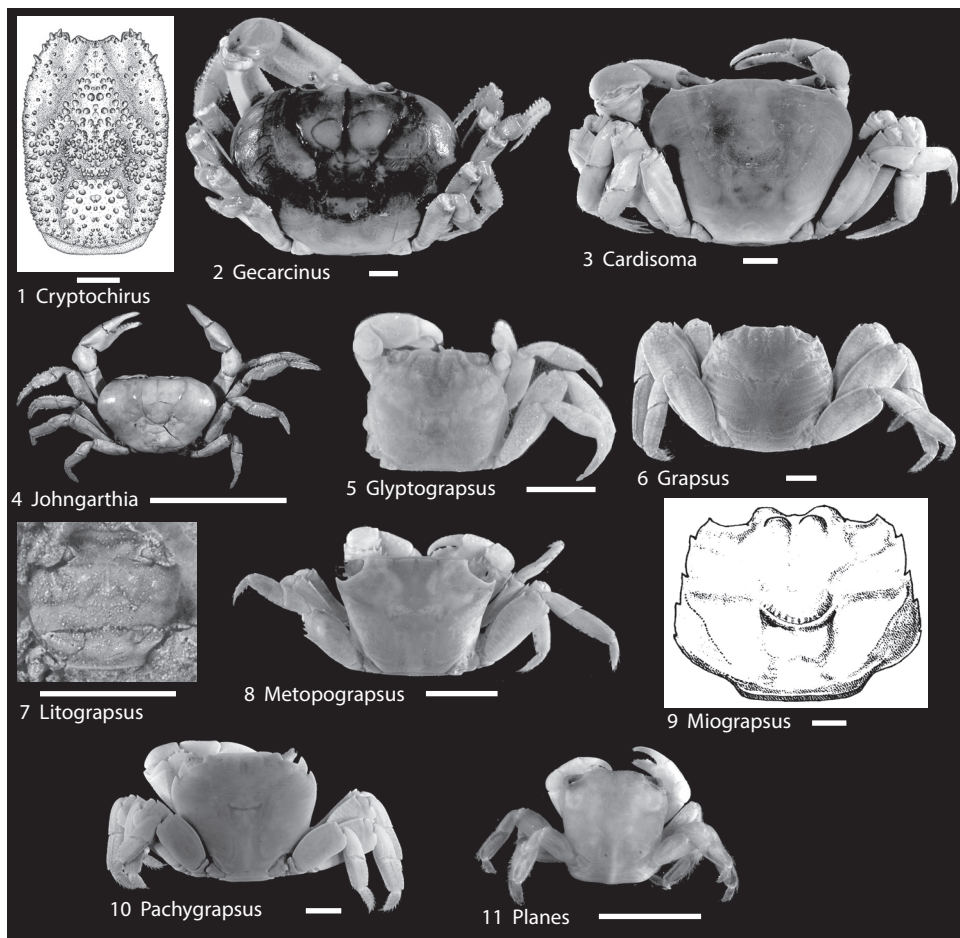


FIG 1. Cryptochiridae, Gecarcinidae, Glyptograpsidae, Grapsidae (p. 1–4).

anterior margin of sterno-pleonal cavity usually reaching thoracic sternite 4; sternal button present in male; male gonopore located on lateral margin of thoracic sternite 8. [Emended from DAVIE, GUINOT, & NG, 2015, p. 1118.] *Eocene* (Priabonian)–*Holocene*.

Grapsus LAMARCK, 1801, p. 150 [**Cancer grapsus* LINNAEUS, 1758, p. 632, AT; =*Grapsus pictus* LAMARCK, 1801, p. 150; =*G. maculatus* H. MILNE EDWARDS, 1853a, p. 167, pl. 6, fig. 1; =*G. ornatus* H. MILNE EDWARDS, 1853a, p. 168; =*C. jumpibus* SWIRE, 1938, p. 30; =*G. altifrons* STIMPSON, 1862, p. 230]. Carapace not much wider than long, flattened, regions moderately defined; branchial regions with transverse ridges; lateral margins with one spine; front approximately half carapace width. [Emended from RATHBUN, 1918, p. 226.] *Pleistocene–Holocene*. *Pleistocene–Holocene* (fossil): Panama.

Holocene: cosmopolitan tropical and subtropical oceans.—FIG. 1, 6. **G. grapsus*, USNM 24052, *Holocene*, Puerto Rico, scale bar 1 cm (new).

Litograpsus SCHWEITZER & KARASAWA, 2004, p. 81 [**Palaeograpsus parvus* MÜLLER & COLLINS, 1991b, p. 140; OD; =*P. bittneri* MÜLLER & COLLINS, 1991a, p. 89, pl. 8, 11–12, 15, non *P. bittneri* MORRIS & COLLINS, 1991, p. 24, fig. 66–67]. Carapace slightly wider than long; front concave, broad, broadly rimmed; fronto-orbital width equal to maximum carapace width; transverse branchial ridges and cardiac region forming nearly continuous ridge across carapace. *Eocene* (Priabonian): Hungary.—FIG. 1, 7. **L. parvus* (MÜLLER & COLLINS), KSU D 147, cast of holotype, M91-227, scale bar 1 cm (new).

Metopograpsus H. MILNE EDWARDS, 1853a, p. 165 [**Cancer messor* FORSKÅL, 1775, p. 88; SD DAVIE, 2002, p. 216]. Carapace semi-circular to rectangular; front very wide, more than half maximum

carapace width, orbits positioned at corners of anterior margin, outer-orbital spine sharp; lateral margins converging posteriorly and rounding into posterior margin; chelipeds short, shorter than other pereopods; male pleonal somites 3–6 fused, portions of sutures visible. *Miocene–Holocene*. *Miocene* (Burdigalian): Austria. *Miocene* (Langhian): Hungary. *Holocene*: Indo-West Pacific Ocean, central Pacific Ocean.—FIG. 1,8. **M. messor* (FORSKÅL), USNM 17643, Holocene, Australia, scale bar 1 cm (new).

Миогрaпсус FLEMING, 1981, p. 103 [**M. papaka*, p. 104, fig. 1–7; OD]. Carapace quadrate, wider than long, regions developed as broad swellings; front with two broad, large lobes separated by broad medial reentrant; orbits shallow, with short outer-orbital spine; lateral margins subparallel, diverging slightly posteriorly, with three or so small spines; posterolateral reentrants long, entire posterior margin wide; chelipeds very short, subequal; female pleon wide, covering most of sternum, with all somites free. *Miocene* (Tortonian): New Zealand.—FIG. 1,9. **M. papaka*, holotype NZGS AR 674, scale bar 1 cm (FLEMING, 1981, fig. 5).

Рaчyгpaпсус RANDALL, 1839, p. 126 [**P. crassipes*, p. 127; SD KINGSLEY, 1880, p. 198] [= *Goniograpsus* DANA, 1851a, p. 249 (type, *G. innotatus*, SD MANNING & HOLTHUIS, 1981, p. 233)]. Carapace quadrate, narrowing posteriorly; front very wide, more than half carapace width; orbits positioned at lateral edges of anterior margin of carapace, outer-orbital spine triangular, directed forward; lateral margin with a spine, otherwise straight; dorsal carapace with transverse ridges; chelipeds with spooned fingertips. *Miocene* (Langhian): Hungary, Poland. *Pleistocene*: Jamaica. *Holocene*: cosmopolitan.—FIG. 1,10. **P. crassipes*, USNM 22879, Holocene, California, USA, scale bar 1 cm (new).

Плaнes BOWDICH, 1825, p. 15 [**P. clypeatus*, p. 15, fig. 3; M; = *Cancer minutus* LINNAEUS, 1758, p. 625, ICZN Opinion 85, 1925, Direction 37, 1956] [= *Nautilograpsus* H. MILNE EDWARDS, 1837 in 1834–1840, p. 89 (type, *C. minutus*, M); = *Nautilograpsoides* SMIRNOV, 1929, p. 24, *nom. nud.*]. Carapace quadrate, approximately as wide as long, smooth; front wide, nearly straight, approximately half carapace width; orbits placed at lateral edges of anterior margin of carapace; lateral margin with small spine, rounding into posterior margin; pereopods flattened. ?*Oligocene*: Russia (North Caucasus). *Holocene*: cosmopolitan.—FIG. 1,11. *P. minutus* (LINNAEUS), USNM 5046, Holocene, Galapagos Islands, scale bar 1 cm (new).

Family LEPTOGRAPSODIDAE

Guinot, Ng, & Rodríguez Moreno, 2018

[Leptograpsodidae GUINOT, NG, & RODRÍGUEZ MORENO, 2018, p. 554]

Carapace wider than long, ovate, widest just anterior to half length; anterolateral margins with strong outer-orbital spine and

three small spines; branchial regions with weak oblique keels; front wide, straight; orbits deep, directed forward; male pleonal somites free. *Holocene*.

Leptograpsodes MONTGOMERY, 1931, p. 452 [**Cyclograpsus octodentatus* H. MILNE EDWARDS, 1837 in 1834–1840, p. 80; OD; = *Leptograpsodes webbhayesi* MONTGOMERY, 1931, p. 452, pl. 25,5, pl. 28,1]. As for family. *Holocene*: Australia.—FIG. 2,1. **L. octodentatus*, Museums Victoria, Holocene, Australia, scale unknown (photo by M. Marmach, Museums Victoria, <https://collections.museumsvictoria.com.au/species/8661>).

Family PERCNIDAE Števcíć, 2005

[*nom. transl.* SCHUBART & CUESTA, 2010, p. 295, *pro* Percnini ŠTEVČIĆ, 2005, p. 127]

Carapace ovate, flattened, longer than wide, narrowing posteriorly; front wide, with spines; anterolateral margins with spines; third maxilliped with small, narrow merus; chelipeds small, short; pleonal somites 3–5 fused in males and females. [Emended from RATHBUN, 1918; DAVIE, GUINOT, & NG, 2015, p. 1118.] *Holocene*.

Percnon GISTEL, 1848, p. viii [**Cancer planissimus* HERBST, 1804 in 1782–1804, p. 3, pl. 59,3; SD RATHBUN, 1918, p. 337; ICZN Opinion 85, 1925, Direction 36, 1956, Direction 37, 1956; = *Plagusia clavimana* LATREILLE, 1806, p. 54; = *Plagusia serripes* LAMARCK, 1818, p. 247; = *Acanthopus tenuifrons* H. MILNE EDWARDS, 1853a, p. 180; = *Percnon demani* WARD, 1934, p. 24] [= *Acanthopus* DE HAAN, 1833 in 1833–1850, p. 29 (type, *Cancer planissimus*, SD RATHBUN, 1918, p. 337), *non Acanthopus* KLUG, 1807, p. 226 (hymenopteran); = *Leiophophus* MIERS, 1876, p. 46, unnecessary replacement name]. As for family. *Holocene*: cosmopolitan subtropical and tropical.—FIG. 2,2. **P. planissimus* (HERBST), USNM 78098, Holocene, Hawaii, scale bar 1 cm (new).

Family PLAGUSIIDAE Dana, 1851

[*nom. transl.* STEBBING, 1908, p. 46, *pro* Plagusinae DANA, 1851a, p. 252] [= *Euchirograpsini* ŠTEVČIĆ, 2005, p. 123; = Percnini ŠTEVČIĆ, 2005, p. 127; = Davusiini ŠTEVČIĆ, 2011, p. 129]

Carapace ovate to quadrate; front with lobes or spines; antennule visible dorsally; infraorbital ridge absent; maxillipeds 3 with reduced exopod lacking flagellum, leaving wide rhomboidal gap when closed, not completely closing buccal frame; anterolateral margins spinose; anterolateral corner not expanded, convex; palp articulating at anteromesial corner of merus; exopod

narrow; male pleon wide, with somites 3–5 or 3–6 fused, sutures may be visible, filling entire space between pereopods 5; anterior margin of sterno-pleonal cavity reaching thoracic sternite 4; sternal button present in male, button rim-like, sternal suture 5/6 with raised rim; male gonopore located on lateral margin of thoracic sternite 8; meri of pereopods usually bearing longitudinal ridges laterally and spines dorsally. *Eocene* (*Ypresian*)–*Holocene*.

Plagusia LATREILLE, 1804, p. 125 [**Cancer depressus* FABRICIUS, 1775, p. 406; M, ICZN Opinion 712, 1964; =*Plagusia sayi* DE KAY, 1844, p. 16; =*Plagusia gracilis* SAUSSURE, 1858, p. 449] [= *Philyra* DE HAAN, 1833 in 1833–1850, p. 5, *non* LEACH, 1817 [in 1814–1817, p. 22]. Carapace ovate, flattened, anterolateral margins with spines; front approximately one-third carapace width, composed of narrow front, very deep antennular fossae; orbits deep; chelae short, shorter than pereopods. [Emended from RATHBUN, 1918.] *Holocene*: cosmopolitan tropical and subtropical.—FIG. 2,3. **P. depressa* (FABRICIUS), USNM 284189, *Holocene*, North Pacific Ocean, scale bar 1 cm (new).

Petrusia BESCHIN, BUSULINI, TESSIER, & ZORZIN, 2016, p. 149 [**P. striata*, p. 150, pl. 20,5; OD]. Carapace quadrate, regions moderately defined, front axially notched, anterolateral margins short, with at least one spine; posterolateral margins longer than anterolateral margins; carapace ornamented with short, scabrous ridges posteriorly. *Eocene* (*Ypresian*): Italy.—FIG. 2,4. **P. striata*, holotype, VR 94549, scale bar 5 mm (new, photo by R. Zorzin, Museo Civico di Storia Naturale di Verona, Italy).

Family SESARMIDAE Dana, 1851

[*nom. transl.* STEBBING, 1908, p. 43, *pro* Sesarminae DANA, 1851a, p. 250] [= *Aratini* ŠTEVČIĆ, 2005, p. 125]

Carapace quadrate, wider than long or approximately as wide as long; front wide, strongly downturned; lateral margins straight, subparallel, may have a few or several spines anterolaterally; regions moderately marked; infraorbital ridge present; third maxillipeds with wide rhomboidal gap when closed, with oblique, hairy ridge on merus and ischium; anterolateral corner of merus not expanded, convex; palp articulating at anterior margin of merus; exopod narrow; male pleon wide, may or may not completely fill entire space between coxae of fifth pereopods; anterior margin of sterno-pleonal cavity reaching thoracic sternite 3; sternal button present or absent in male; male gonopore located on

lateral margin of thoracic sternite 8. *Miocene*–*Holocene*.

Sesarma SAY, 1817 in 1817–1818, p. 76 [**Ocypode reticulatus*, p. 73; M]. Carapace flattened, much wider than long; front straight, lacking axial notch; anterolateral margin with weak anterolateral spine; pereopods 2–5 short; inner surface of manus of chelipeds granular, with crest. *Miocene*: Brazil. *Pleistocene*: Jamaica. *Holocene*: cosmopolitan tropical and subtropical.—FIG. 2,6. **S. reticulatum*, USNM uncataloged, *Holocene*, eastern coastal USA, scale bar 1 cm (new).

Neosarmatium SERÈNE & SOH, 1970, p. 397 [**Sesarma smithii* H. MILNE EDWARDS, 1853b, p. 149, pl. 9,2; OD]. Carapace wider than long, strongly vaulted longitudinally; front straight, lacking axial notch; anterolateral margin with weak anterolateral spine; manus of chelipeds smooth. *Pleistocene*–*Holocene*. *Pleistocene*: Australia. *Holocene*: Indo-West Pacific Ocean.—FIG. 2,5. **N. smithii* (H. MILNE EDWARDS), USNM 277854, *Holocene*, Palau, scale bar 1 cm (new).

Family VARUNIDAE

H. Milne Edwards, 1853

[*nom. transl.* STEBBING, 1908, p. 41, *pro* Varunacea H. MILNE EDWARDS, 1853a, p. 175]

Front moderately or little deflexed, usually continuous with orbital margin; infraorbital ridge present; maxillipeds 3 moderately or slightly gaping, without oblique, hairy ridge on merus and ischium, usually with longitudinal sulcus; anterolateral corner of merus expanded; palp articulating at anterior margin of merus; exopod usually wide; male pleon rarely filling entire space between pereopods 5; anterior margin of sterno-pleonal cavity reaching thoracic sternite 3; transverse groove usually present on sternite 8; sternal button usually present in male; male gonopore located on inner part of thoracic sternite 8 [KARASAWA & KATO, 2001, p. 268]. *Eocene* (*Ypresian*)–*Holocene*.

Unplaced at subfamily level.

Sakakurapsus KARASAWA, 2018, p. 31 [**S. kogisorum*, p. 31, fig. 1.1–1.4; M]. Small-sized varunid; carapace trapezoidal in outline, widening posteriorly, length ~90% maximum carapace width; fronto-orbital margin ~55% maximum carapace width, weakly rimmed; front narrow, projected forward, with shallow median sulcus; frontal margin composed of gently arched lobes, medially interrupted by shallow V-shaped sulcus; anterior margin divided from lateral margins by subtle notch; orbits small; upper orbital margin entire, slightly concave, continuing to straight, divergent lateral margin of

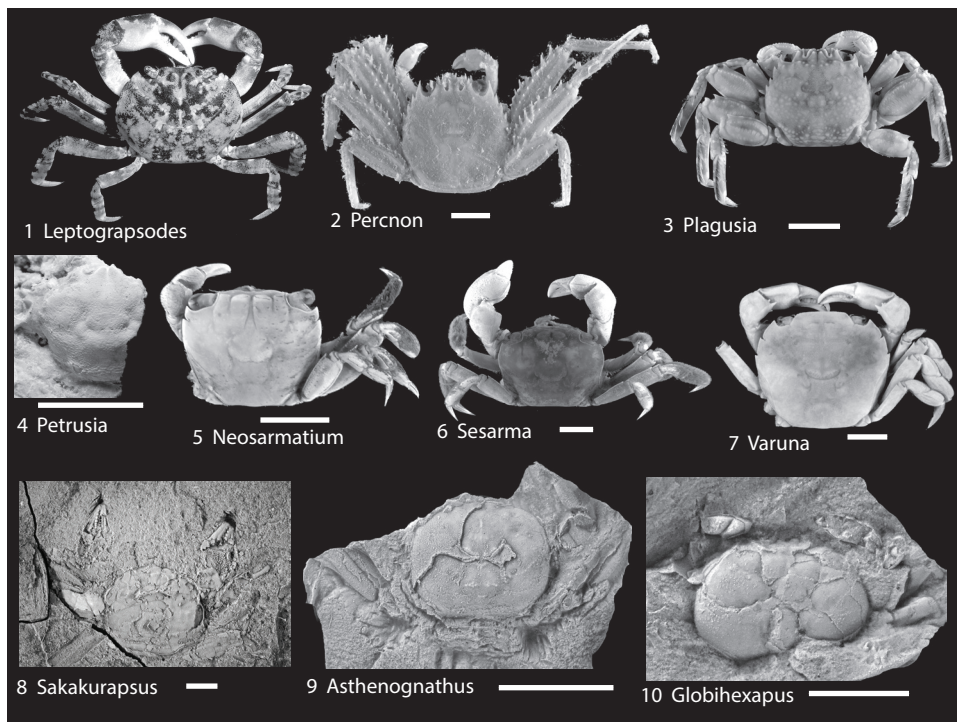


FIG 2. Leptograpsodidae, Percnidae, Plagusiidae, Sesarmidae, Varunidae (Asthenognathinae, Cyclograpsinae, Gaeticinae, Varuninae) (p. 4–8).

front; anterolateral margins gently arched, diverging posteriorly, weakly rimmed; posterolateral margins not confluent with anterolateral margins, strongly sinuous, converging posteriorly; posterior margin slightly wider than fronto-orbital margin, nearly straight, weakly rimmed; dorsal surface smooth, gently convex; regions poorly defined; anterior epigastric regions weakly raised transversely; mesogastric and cardiac regions defined by shallow grooves; other regions not well differentiated; subtle oblique ridge extending to lateral margin forming posterolateral facet; chelipeds equal, similar in shape; both occlusal surfaces of fingers with broadly triangular teeth regularly arranged. *Miocene (Burdigalian)*: Japan.—FIG. 2, 8. **S. kogisorum*, holotype, MFM 39021, scale bar 1 cm (new).

Subfamily ASTHENOGNATHINAE Stimpson, 1858

[*nom. transl.* HILGENDORF & VOSSELER, 1895, p. 846, *pro* Asthenognathidae STIMPSON, 1858, p. 107]

Carapace trapezoidal, wider than long; regions not well defined; front narrowing distally, axially sulcate, strongly deflexed, not extending or extending slightly beyond

orbits; straight frontal margin entirely occupied by orbits; orbits shallow, margin sinuous usually unrimmed; fronto-orbital width approximately half maximum carapace width; lateral margins rimmed; posterolateral reentrant large; posterior margin nearly straight, posterior width approximately two-thirds maximum carapace width; branchial regions typically with crest extending posterioromesially from midpoint of lateral margin; sternite 4 typically without anterior projections; pleonal somites 4–6 in males typically fused. *Oligocene (Rupelian)–Holocene*.

Asthenognathus STIMPSON, 1858, p. 107 [**A. inaequipes*; M]. Carapace trapezoidal to hexagonal, wider than long, length to width ranging from 0.60–0.90; front downturned, bilobed or straight, ~20% maximum carapace width; orbits rimmed, directed forward, fronto-orbital width 0.45–0.70 maximum carapace width, occupying almost entire anterior margin of carapace but short straight segments to either side of it; commonly a granular ridge along lateral margins; posterolateral reentrant well defined, with granular rim; dorsal carapace

typically with oblique, weak ridge extending in approximately the epibranchial area; mesobranchial and cardiac regions moderately defined, remainder of carapace regions poorly defined; all male pleonal somites free, first and second somite short, telson much smaller than somite 6; first gonopod long, very weakly curved along entire length; male pleon extending well beyond sternite 4. *Oligocene–Holocene*. *Oligocene* (*Rupelian*): Italy. *Oligocene–Miocene*: Argentina, USA (Washington). *Miocene* (*Langhian*): Hungary, Japan. *Pliocene*: Italy. *Pleistocene*: Italy, Japan. *Holocene*: northwestern Pacific Ocean, East Africa, Europe.—FIG. 2,9. *A. microspinus* CASADIO & others, 2004, KSU D 263, cast of GHUNLPam 25.062, Oligocene, Argentina, scale bar 1 cm (new).

Globihexapus SCHWEITZER & FELDMANN, 2001, p. 332 [*G. paxillus*, p. 333, fig. 1, 2; OD]. Carapace wider than long, narrowest anteriorly; regions finely and locally granular; ridges parallel to lateral margin composed of tiny, peg-like tubercles; orbits directed obliquely towards axis, rimmed with tiny granules; posterolateral reentrants and posterior margin with granular rim; branchial regions strongly inflated. *Miocene* (*Burdigalian*): Japan. *Miocene*: USA (Oregon).—FIG. 2,10. **G. paxillus*, KSU D 279, cast of paratype USNM PAL 501844, Miocene, Oregon, USA, scale bar 1 cm (new).

Subfamily CYCLOGRAPSIDAE H. Milne Edwards, 1853

[*nom. transl.* KARASAWA & KATO, 2001, p. 268, *pro* Cyclograpsidae H. MILNE EDWARDS, 1853a, p. 191] [=Helicinae KOSSMANN, 1877, p. 57 (preoccupied name); =Paragrapsini ŠTEVČIĆ, 2005, p. 125; =Helicinae SAKAI, TÜRKAY, & YANG, 2006, p. 2]

Front strongly deflexed; infraorbital ridge present; maxillipeds 3 separated by wide rhomboidal gap, with oblique, hairy ridge on merus and ischium; anterolateral corner of merus not expanded, convex; palp articulating at anterior margin of merus; exopod narrow; male pleon not filling entire space between pereopods 5; anterior margin of sterno-pleonal cavity reaching thoracic sternite 3; transverse groove present on sternite 8; sternal button usually absent in male; male gonopore located on inner part of thoracic sternite 8 [KARASAWA & KATO, 2001, p. 268]. *Miocene* (*Langhian*)–*Holocene*.

Austrohelice SAKAI, TÜRKAY, & YANG, 2006, p. 53 [**Helice crassa* DANA, 1851a, p. 252; OD]. Carapace rectangular, wider than long, front broadly bilobed; orbits positioned at edges of anterior margin of carapace, upper orbital margin sinuous; fronto-orbital width approximately equal to maximum carapace width; narrow sinuous ridges on branchial region; lateral margins parallel, with a few

short spines; chelipeds isochelous; telson much narrower than somite 6. *Pliocene–Holocene*: New Zealand.—FIG. 3,1. *Austrohelice manningi* FELDMANN & others, 2008, KSU 893, cast of holotype, CM 1998.171.3, Pliocene, New Zealand, scale bar 1 cm (new).

Cyclograpsus H. MILNE EDWARDS, 1837 in 1834–1840, p. 77 [**C. punctatus*; SD RATHBUN, 1918, p. 325; =*Gnathochasmus barbatus* MACLEAY, 1838, p. 65; =*Cyclograpsus reynaudi* H. MILNE EDWARDS, 1853a, p. 197] [=*Gnathochasmus* MACLEAY, 1838, p. 65 (type, *G. barbatus*; M)]. Carapace roundly quadrate, slightly wider than long; front approximately half carapace width; fronto-orbital width greater than 2/3 carapace width; orbit narrow; anterolateral margin strongly convex, rimmed, usually bearing shallow notches; posterolateral margin subparallel; dorsal surface smooth, flattened posteriorly; regions poorly defined; chelipeds rather massive in male, subequal. *Miocene–Holocene*. *Miocene* (*Aquitanian*): Japan. *Pliocene*: Taiwan. *Holocene*: Indo-West Pacific Ocean, central Pacific Ocean, eastern Pacific Ocean, eastern Atlantic Ocean, southern Africa.—FIG. 3,2. **C. punctatus*, MFM 129121, Holocene, Japan, scale bar 1 cm (new).

Helice DE HAAN, 1833 in 1833–1850, p. 28 [**Ocyrode* (*Helice*) *tridens* DE HAAN, 1835 in 1833–1850, p. 57; M; ICZN Opinion 85, 1925, Direction 37, 1956]. Carapace rectangular, wider than long, widest at midlength; front approximately one-third carapace width; upper orbital margin wide, oblique; anterolateral margin subparallel, with four spines; dorsal surface transversely convex with well-defined regions; branchial region with three oblique ridges; infraorbital ridge composed of many protuberances; eye stalk long; chelae massive. *Miocene–Holocene*. *Miocene* (*Langhian*): Japan. *Holocene*: Indo-West Pacific Ocean.—FIG. 3,3. **H. tridens*, MFM 129123, Holocene, Japan, scale bar 1 cm (new).

Miosesarma KARASAWA, 1989, p. 24 [**M. japonica*, p. 24, pl. 3,10–13; M]. Carapace rectangular, length approximately three-fourths its width, widest at midlength; front one-fourth carapace width; upper orbital margin wide, sinuous; anterolateral margins nearly straight, almost parallel, with four teeth; posterolateral margin sinuous; dorsal surface smooth, moderately convex; regions well defined; mesobranchial lobe with ridge extending from fourth anterolateral tooth; metabranchial lobe with weak ridge parallel to posterolateral margin; infraorbital ridge present with prominence laterally; male pleon narrow; chelipeds dissimilar in both sexes; female chelae much smaller than male; propodus slender, elongate. *Miocene* (*Aquitanian–Langhian*): Japan.—FIG. 3,4. **M. japonica*, MFM 9173, Miocene, Japan, scale bar 1 cm (new).

Subfamily GAETICINAE Davie & Ng, 2007

[Gaeticinae DAVIE & NG, 2007, p. 259] [=Gopkittsakini *nom. corr.* NG, 2012, p. 62, *pro* Gopkittsakini ŠTEVČIĆ, 2011, p. 129; =Brankocleistostomidae ŠTEVČIĆ, 2011, p. 127]

Carapace wider than long; front wide; orbits deep, placed at lateral edges of anterior margin of carapace; third maxillipeds with narrow gape when completely closed, no setose crest on merus and ischium; completely closing buccal frame; sternum with deep longitudinal groove anterior to pleon; male pleonal somites 3–6 fused, sutures visible. *Miocene–Holocene*.

Gaetice GISTEL, 1848, p. x (10) [**Grapsus (Platynotus) depressus* DE HAAN, 1835 in 1833–1850, p. 34; M] [= *Grapsus (Platynotus)* DE HAAN, 1833 in 1833–1850, p. 5, non *Platynotus* FABRICIUS, 1801, p. 138 (coleopteran); = *Goetice* GISTEL, 1848, p. x, replacement name for *Grapsus (Platynotus)*; = *Platygrapsus* STIMPSON, 1858, p. 50, unnecessary replacement name for *Grapsus (Platynotus)*; = *Gaetice* RATHBUN in STIMPSON, 1907, p. 128; = *Gaetice* TESCH, 1918, p. 84; (*Gaetice* GISTEL, 1848 accepted under ICZN Article 33.2.3.1, see NG, GUINOT, & DAVIE, 2008, p. 230)]. Carapace rectangular, wider than long, smooth; front wide, orbits directed slightly anterolaterally, anterolateral margins short, posterolateral margins much longer, marked posterolateral reentrant. [Emended from DAVIE & NG, 2007.] *Holocene*: northwestern Pacific Ocean.—FIG. 3,5. **G. depressus* (DE HAAN), USNM 54492, Holocene, Japan, scale bar 1 cm (new).

Sestrostoma DAVIE & NG, 2007, p. 265 [**Acmaeopleura balssi* SHEN, 1932, p. 155, pl. 6, 1–2; OD]. Carapace ovate, longer than wide, smooth, regions poorly defined; frontal margin convex, bilobed; orbits shallow; anterolateral and posterolateral margins confluent; posterior margin straight; chelipeds stout. *Miocene–Holocene*. *Miocene*: Japan. *Pleistocene*: Japan. *Holocene*: Japan, China.—FIG. 3,6. **S. balssi* (SHEN), MFM, Holocene, Japan, scale bar 1 cm (new).

Subfamily THALASSOGRAPSINAE

Davie & Ng, 2007

[Thalassograpsinae DAVIE & NG, 2007, p. 258]

Carapace smooth, flattened, regions moderately defined; front wide, downturned, less than half carapace width, bilobed, separated from orbits by groove; orbits opening anterolaterally, with a suborbital crest that provides a stridulating structure with merus of cheliped; anterolateral margins with three spines excluding outer-orbital spines; third maxillipeds with no gape when closed, merus and ischium with no longitudinal sulcus; chelipeds subequal; sternal suture 3/4 not visible; medial groove in sternites 7 and 8 wide; male pleonal somites 5 and 6 fused, suture present. *Holocene*.

Thalassograpsus TWEEDIE, 1950, p. 133 [**Brachynotus harpax* HILGENDORF, 1892, p. 38; OD]. As for family. *Holocene*: Indo-West Pacific Ocean.—FIG. 3,7. **T. harpax* (HILGENDORF), USNM 57446, Holocene, Taiwan, scale bar 1 cm (new).

Subfamily VARUNINAE

H. Milne Edwards, 1853

[*nom. transl.* ALCOCK, 1900, p. 288, *pro* Varunacea H. MILNE EDWARDS, 1853a, p. 175] [= *Pseudograpsinae* KOSSMANN, 1877, p. 57; = *Orognathini* ŠTEVČIĆ, 2011, p. 131]

Carapace rectangular, anterolateral and posterolateral margin confluent, nearly straight to convex, anterolaterally with 1–4 spines; regions moderately to poorly marked; surface smooth, flattened or strongly vaulted; front downturned, less than half carapace width; orbits positioned at anterior corners of carapace, suborbital crest straight, long; third maxillipeds without setose crest, with small gape when closed, completely closing buccal frame; chelipeds isochelous; male pleon with all somites free. *Eocene (Ypresian)–Holocene*.

Varuna H. MILNE EDWARDS, 1830, p. 511 [**Cancer litteratus* FABRICIUS, 1798, p. 342; M, ICZN Opinion 85, 1925, Direction 37, 1956; = *Varuna tomentosa* PFEFFER, 1889, p. 30] [= *Trichopus* DE HAAN, 1835 in 1833–1850, p. 32 (type, *Cancer litteratus*; M)]. Carapace quadrangular, slightly wider than long; dorsal surface flattened, punctate, with well-defined regions; posterolateral facet well defined by ridge extending from the last anterolateral tooth toward the base of pereopod 5; frontal margin slightly convex, straight, slightly produced, a little more than half greatest carapace width; anterolateral margin subcristate with three teeth; posterolateral margins not sharply demarcated from anterolateral margin, concave at branchial region, distinctly converging; chelipeds equal; propodi and dactyli of pereopods flattened, generally for swimming; male pleon broadly triangular. [Emended from NARUSE & others, 2004.] *Holocene*: Indo-West Pacific Ocean, east coastal Africa.—FIG. 2,7. **V. littorata* (FABRICIUS), USNM 123512, Holocene, Taiwan, scale bar 1 cm (new).

Brachynotus DE HAAN, 1833 in 1833–1850, p. 5 [**Goneplax sexdentatus* RISSO, 1827, p. 13; M, ICZN Opinion 712, 1964] [= *Heterograpsus* LUCAS, 1846, p. 18 (type, *H. sexdentatus*; M); = *Shurebus* VERANY, 1846, p. 7 (type, *S. genuensius*, p. 7; M)]. Carapace wider than long, flattened; front bilobed, wide; fronto-orbital width occupying entire anterior margin of carapace; lateral margins subparallel, anterolaterally with three spines excluding outer-orbital spine, posterolaterally rounded; posterior margin narrow. *Eocene–Holocene*. *Eocene (Ypresian, Priabonian)*: Italy. *Oligocene (Rupelian)*:

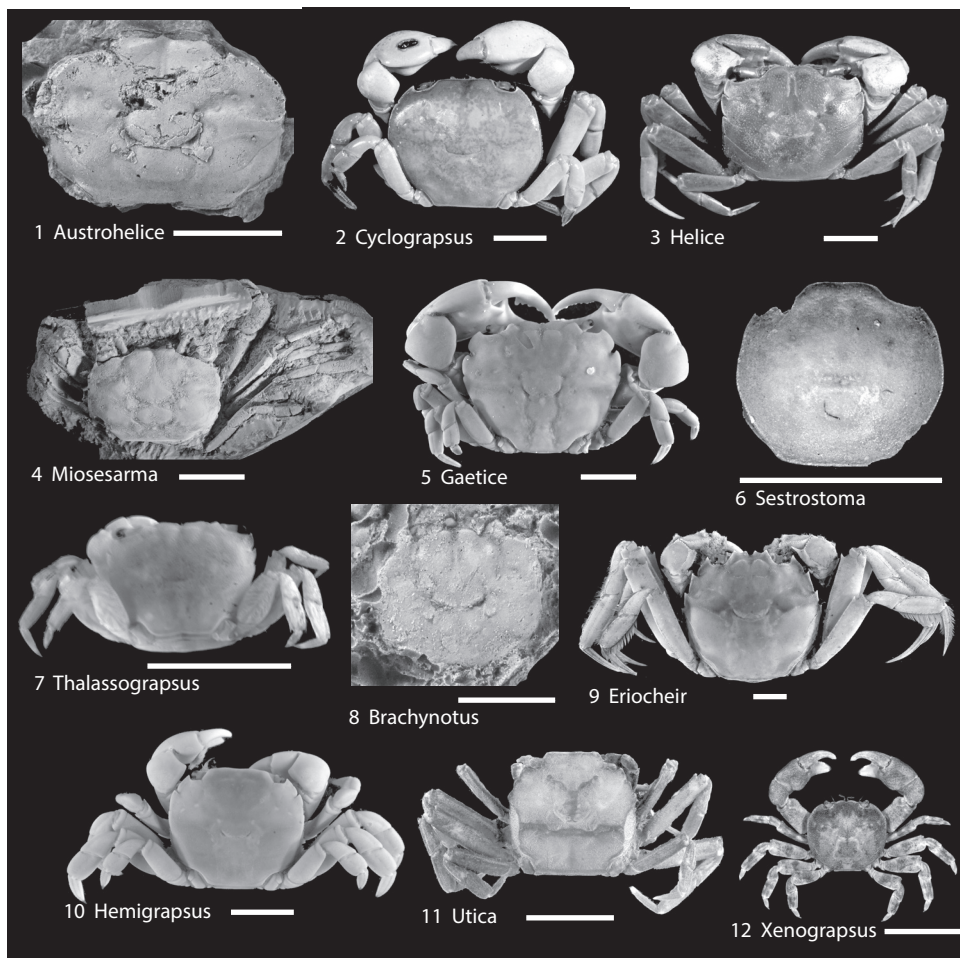


FIG 3. Varunidae (Cyclograpsinae, Gaeticinae, Thalassograpsinae, Varuninae), Xenograpsidae (p. 7–10).

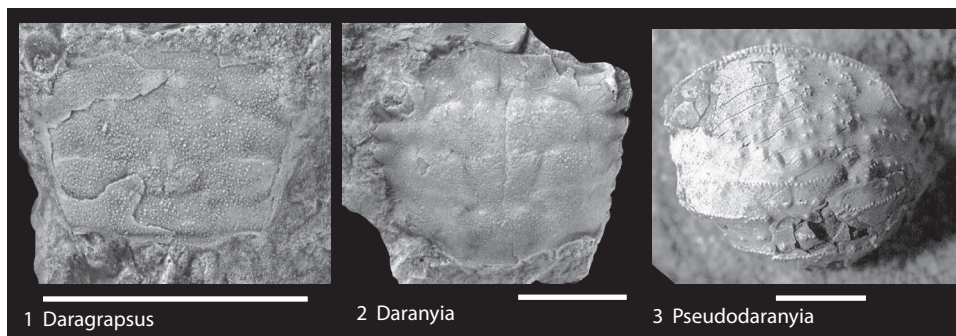
Italy. *Miocene* (Langhian): Hungary. *Holocene*: Mediterranean, Atlantic coastal North Africa, southern Europe.—FIG. 3,8. *Brachynotus februaryi* MÜLLER, 1974, KSU D 1762, cast of paratype, M.86.523, Langhian, Hungary, scale bar 5 mm (new).

Eriocheir DE HAAN, 1835 in 1833–1850, p. 32 [**Grapsus* (*Eriocheir*) *japonicus* DE HAAN, 1835 in 1833–1850, p. 59, pl. 17; M] [= *Eriocheirus* H. MILNE EDWARDS, 1853a, p. 176, incorrect spelling]. Carapace hexagonal, as long as wide, widest at almost midlength; front-orbital margin wide; frontal margin straight or four-lobed; anterolateral margin convergent anteriorly with three or four teeth; dorsal surface convex with well defined regions; epigastric lobe well marked; chelae with hairs on inner and outer surfaces. *Eocene–Holocene*. *Eocene*: Japan. *Holocene*: fresh to brackish waters in Japan, Taiwan, Korea, China, Europe, North America.—FIG. 3,9. *E. sinensis* H. MILNE

EDWARDS, 1853b, USNM 59229, Holocene, China, scale bar 1 cm (new).

Hemigrapsus DANA, 1851b, p. 288 [**H. crassimanus*; SD RATHBUN, 1918, p. 264] [= *Lobograpsus* A. MILNE-EDWARDS, 1869, p. 173 (type, *Cyclograpsus crenulatus* H. MILNE EDWARDS, 1837 in 1834–1840, p. 80; SD RATHBUN, 1918, p. 264)]. Carapace wider than long, rectangular; front narrow, less than half carapace width; anterolateral margins with two or three spines excluding outer orbital spines; carapace with ridge extending onto dorsal carapace from posterolateral margin; chelipeds equal or subequal, generally large. *Pleistocene*: USA (California). *Holocene*: North Atlantic Ocean, Pacific Ocean.—FIG. 3,10. *Hemigrapsus nudus* (DANA, 1851a), USNM 55250, Holocene, California, scale bar 1 cm (new).

Utica WHITE, 1847, p. 85 [**Utica gracilipes*, p. 86; M, ICZN Opinion 85, 1925, Direction 37, 1956]. Carapace approximately as wide as long; front wide, straight; orbits directed anterolaterally, placed at

FIG 4. *Grapsoidea incertae sedis* (p. 10).

anterior edges of carapace; anterolateral margins with spines; posterolateral margins more or less parallel; protogastric and mesogastric regions with Y-shaped ridge pattern and concave forward keel at base of Y; transverse keel on branchial and cardiac region; female pleon very wide. *Pleistocene*: Australia. *Holocene*: Indo-Pacific Ocean, Red Sea.—FIG. 3,11. **U. gracilipes*, USNM 123506, *Holocene*, Taiwan, scale bar 1 cm (new).

Family XENOGRAPSIDAE Ng, Davie, Schubart, & Ng, 2007

[Xenograpsidae NG, DAVIE, SCHUBART, & NG, 2007, p. 236]

Carapace equant, approximately as long as wide, smooth, with transverse ridge posterolaterally, regions poorly defined; front bilobed; orbits deep, semi-circular, not extending to edge of anterior margin of carapace; anterolateral and posterolateral margins confluent, weakly convex; posterolateral reentrant well-developed; posterior margin straight; epigastric regions weakly inflated; chelipeds short, subequal; third maxillipeds not leaving gape when closed, completely closing buccal frame; male pleon with all somites free; male gonopore only narrowly separated from coxa of fifth pereopod. *Holocene*.

Xenograpsus TAKEDA & KURATA, 1977, p. 100 [**X. novaecinsularis*, p. 100, fig. 6b, 6c, 7, 8; M]. As for family. *Holocene*: Japan, Marianas, Taiwan, New Zealand; hydrothermal vent or volcanic islands).—FIG. 3,12. *X. testudinatus* NG, HUANG, & HO, 2000, *Holocene*, Taiwan, scale bar 5 mm (photo by N. K. Ng, accessed through WoRMS [www.marinespecies.org/aphia.php?p=taxdetails&cid=444836]).

GRAPSOIDEA *incertae sedis*

Daragrapsus MÜLLER & COLLINS, 1991a, p. 88 [**D. trispinosus*, p. 88, pl. 7, 9, 10, 12–14; OD]. Carapace rectangular, wider than long; front extremely wide, over half the carapace width, orbits placed at edges of anterior edges of carapace, deep, directed anterolaterally; lateral margins subparallel, with a few spines; posterolateral reentrants large; posterior margin short. *Eocene–Oligocene*. *Eocene* (*Priabonian*): Hungary, Italy. *Oligocene* (*Rupelian*): Italy.—FIG. 4,1. **D. trispinosus*, KSU D 80, cast of holotype, M.91.209, *Priabonian*, Hungary, scale bar 1 cm (new).

Daranyia LÖRENTHEY, 1901, p. 333 [**D. granulata*, p. 334, pl. 1,3; M]. Carapace rectangular, wider than long; front wide; fronto-orbital width occupying maximum carapace width; lateral margins subparallel, with spines along entire length; some regions defined as broad swellings. *Eocene* (*Priabonian*): Hungary, Italy. *Eocene*: Italy.—FIG. 4,2. **D. granulata*, KSU D 148, cast of holotype, MAFI E298, *Eocene*, Hungary, scale bar 1 cm (new).

Pseudodaranyia TESSIER, BESCHIN, BUSULINI, & DE ANGELI, 1999, p. 99 [**P. carinata*, p. 99, pl. 2,4–5; OD]. Carapace subquadrate; front long, convex, granular, without notches or spines; orbits situated on the anterolateral angle; lateral margins with at least four spines; dorsal surface with granular transverse keels of various extension; ornamentation with sparse granules, sometimes collected in groups. *Eocene* (*Lutetian*): Italy.—FIG. 4,3. **P. carinata*, holotype, MCZ 1599, scale bar 1 cm (new, photo by A. De Angeli, Associazione Amici del Museo Zannato, Montecchio Maggiore, Vicenza, Italy).

Superfamily OCYPODOIDEA Rafinesque, 1815

[*nom. transl.* STIMPSON, 1858, p. 39, *pro* Ocypodia RAFINESQUE, 1815, p. 96]

Carapace globular, rectangular or pentagonal, usually wider than long but may be longer than wide; may be vaulted or flat-

tened; usually anterolateral and posterolateral margins confluent, may have spines anterolaterally; front narrow, widening anteriorly; orbits very wide, fronto-orbital width occupying entire anterior carapace width; eyestalks very long; third maxilliped usually closing buccal frame; male pleonal somites usually all free; commonly pouch present leading into branchial cavity between bases of either pereopods 3 and 4 or 2 and 3; sternum broad. *Miocene (Aquitanian)–Holocene*.

Family CAMPTANDRIIDAE Stimpson, 1858

[Camptandriidae STIMPSON, 1858, p. 52]

Carapace wider than long or longer than wide; anterolateral and posterolateral margins weakly differentiated, anterolateral margin with spines; carapace regions moderately defined; third maxillipeds with merus as long as or longer than ischium; male gonopods strongly recurved; male pleonal somites 3–5 with some fusion, sutures usually visible. *Miocene (Burdigalian)–Holocene*.

Camptandrium STIMPSON, 1858, p. 52 [**C. sexdentatum*, p. 53; M]. Carapace hexagonal, flattened, much wider than long, surface finely granular, transverse crests present; front narrow, less than one-third fronto-orbital width, bilobed; epigastric crests distinct; anterolateral margins with three spines; male pleon with somites 2–5 fused, somite 5 narrow; chelae in males large, chelae in females and juvenile males small. [Emended from TAN & NG, 1999, p. 194.] *Holocene*: Indo-West Pacific Ocean.—FIG. 5,1. **C. sexdentatum*, Holocene, Thailand, scale bar approximately 1 cm (photo by M. Nattapat [www.crabdatabase.info]).

Paracleistostoma DE MAN, 1895, p. 580 [**P. depressum*; SD GUINOT & CROSNIER, 1963, p. 608]. Carapace ovate, wider than long, flattened; front projected beyond deep, wide orbits, outer-orbital spines short; epigastric regions inflated; transverse ridges on protogastric region; anterolateral and posterolateral margins poorly differentiated, entire; male pleonal somites 2–5 fused, sutures visible; chelipeds subequal. *Miocene–Holocene. Miocene (Burdigalian)*: Austria. *Holocene*: Indo-West Pacific Ocean.—FIG. 5,2. **P. depressum*, USNM 170870, Holocene, China, scale bar 5 mm (new).

Family DOTILLIDAE Stimpson, 1858

[Dotillidae STIMPSON, 1858, p. 44] [=Scopimeridae ALCOCK, 1900, p. 290; =Lazarocleistostomidae ŠTEVČIČ, 2011, p. 127]

Carapace globular; orbits obliquely extending posteriorly; front narrow or wide; anterolateral margins with spine excluding outer-orbital spine; third maxillipeds closing buccal frame; chelipeds weakly heterochealous or isochelous; pouch between pereopods 2 and 3; meri of some pereopods may have tympanum. *Holocene*.

Dotilla STIMPSON, 1858, p. 44 [**Cancer sulcatus* FORSKÅL, 1775, p. 92; M; =*Dotilla affinis* ALCOCK, 1900, p. 365] [=*Doto* DE HAAN, 1835 in 1833–1850, p. 24, type, *C. sulcatus*, non *Doto* OKEM 1807, p. 1168, polychaete]. Carapace with narrow front which widens slightly distally, carapace widest in posterior three-quarters, outer-orbital angle with small laterally directed spine; male pleon with somites 4 and 5 not modified. *Holocene*: Indo-Pacific, Indian Ocean.—FIG. 5,3. **D. sulcata* (FORSKÅL), USNM 137195, Holocene, Indian Ocean, scale bar 5 mm (new).

Family HELOECIIDAE H. Milne Edwards, 1852

[*nom. transl.* SCHUBART, CANNICCI, VANNINI, & FRATIN, 2006, p. 195, *pro* Heloeciaceae H. MILNE EDWARDS, 1852, p. 153] [=Heloeciinae *nom. correct.* FIELDER & GREENWOOD, 1985, p. 244, *pro* Heloeciinae TÜRKAY, 1983, p. 108]

Carapace trapezoidal, narrowing posteriorly, flanks high; regions poorly marked; anterolateral margins very short, posterolateral margins much longer; front very narrow, downturned; third maxilliped completely closing buccal frame; chelipeds equal, much smaller in females than males; pouch leading into branchial chamber between pereopods 3 and 4; sternum narrowing posteriorly, male genital opening coxo-sternal. *Holocene*.

Heloecius DANA, 1851a, p. 248 [**H. inornatus*; M; =*Gelasimus cordiformis* H. MILNE EDWARDS, 1837, in 1834–1840, p. 53; =*H. areolatus* HELLER, 1862, p. 521; =*H. signatus* HESS, 1865, p. 19]. As for family. *Holocene*: Australia.—FIG. 5,4. **H. cordiformis*, USNM 113552, Holocene, Tasmania, scale bar 1 cm (new).

Family MACROPHTHALMIDAE Dana, 1851

[Macrophthalmidae DANA, 1851a, p. 248]

Carapace wider than long, usually widest at outer-orbital angles; rectangular, flattened, regions usually moderately defined; anterolateral and posterolateral margins

confluent, anterolaterally with spines or entire; front narrow; third maxilliped may not completely close buccal frame, merus shorter than ischium; chelipeds subequal; no pouch between pereopods; male pleon with all somites free. *Miocene (Aquitanian)–Holocene*.

Subfamily ILYOGRAPSINAE

Števcíć, 2005

[Ilyograpsinae ŠTEVČIĆ, 2005, p. 129]

Carapace quadrate, regions poorly defined; front moderately wide; lateral margins with two or three spines; postfrontal ridge present; chelipeds shorter than other pereopods. *Holocene*.

Ilyograpsus BARNARD, 1955, p. 25 [**I. rhizophorae*, p. 26, fig. 8; M]. As for subfamily. *Holocene*: Indo-West Pacific Ocean.—FIG. 5,5. **I. rhizophorae*, scale bar 5 mm [Emended from BARNARD, 1955, fig. 8a.]

Subfamily MACROPHTHALMINAE

Dana, 1851

[Macrophthalminae DANA, 1851a, p. 248]

Carapace wider than long, regions moderately defined; anterolateral and posterolateral margins confluent, anterolaterally with spines; front narrow, T-shaped; third maxilliped may not completely close buccal frame, merus shorter than ischium; chelipeds longer than other pereopods, tips of fingers of pereopods spoonlike. *Miocene (Aquitanian)–Holocene*.

Mutiple subgenera are known for *Macrophthalmus* (seven according to NG, GUINOT, & DAVIE, 2008). We have included those that occur in the fossil record.

Macrophthalmus (Macrophthalmus) LATREILLE in DESMAREST, 1823, p. 249 [**Goneplax transversus* LATREILLE, 1818, p. 3, pl. 297; M] [= *Palaeoplax* A. MILNE-EDWARDS & BROCCHI, 1879, p. 114, *Goneplax* [sic] *incerta* DESMAREST, 1822, p. 104, pl. 8,9; SD GLAESSNER, 1929, p. 300]. Carapace wider than long, widest at position of outer-orbital spines, flattened; lateral margins with narrow spines; frontal width ~30% or less maximum carapace width, may be T-shaped; third maxilliped does not close buccal frame; chelipeds subequal. *Miocene–Holocene*. *Miocene (Langhian–Serravallian)*: Hungary, Poland. *Pleistocene*: Australia, Indonesia (Celebes), China, Japan. *Holocene*: Indo-Pacific Ocean.—FIG. 5,6.

Macrophthalmus (M.) convexus STIMPSON, 1858, KSU 321, Holocene, Japan, scale bar 1 cm (new). **Euplax** H. MILNE EDWARDS, 1852, p. 160 [**E. leptophthalmus*, p. 160; SD RATHBUN, 1918, p. 423] [= *Cyphoplax* HAIME, 1855, p. 750 (type, *Goneplax impressa* DESMAREST, 1817, p. 504, M)]. Carapace subquadrate, slightly wider than long, widest at posterolateral angle; dorsal surface granular without longitudinal branchial ridges; front narrow; outer-orbital angle small, blunt; lateral margins converging anteriorly and posteriorly with three broad anterolateral teeth. *Pleistocene*: Japan. *Holocene*: western Pacific Ocean, India (Chilka Lake).—FIG. 5,7. **E. leptophthalmus*, MFM 142124-2, Pleistocene, Japan, scale bar 1 cm (new). **Hemiplax** HELLER, 1865, p. 40 [**H. hirtipes*, p. 40, pl. 4, 3; M; = *Cleistostoma? hirtipes* JACQUINOT & LUCAS, 1853 in 1842–1853, p. 68, pl. 6,3]. Carapace wider than long, granular; front wide; lateral margins with broad-based spines; male pleon wide. *Pliocene–Holocene*. *Pliocene–Pleistocene*: New Zealand. *Holocene*: Australia, New Zealand.—FIG. 5,8. **H. hirtipes*, MFM 129122, Holocene, Australia, scale bar 1 cm (new).

Macrophthalmus (Mareotis) BARNES, 1967, p. 203 [**Ocypode (Macrophthalmus) japonica* DE HAAN, 1835 in 1833–1850, p. 54, pl. 7,1, pl. 15,2; OD]. Carapace somewhat wider than long; granular; front narrow; with broad spines on anterolateral portion of lateral margins; male pleon narrow. *Miocene–Holocene*. *Miocene (Langhian)*: Japan. *Pliocene–Pleistocene*: Japan. *Pleistocene*: Brunei, Taiwan. *Holocene*: Indo-Pacific Ocean.—FIG. 5,9. **M. (M.) japonicus* (DE HAAN), MFM129124, Holocene, Japan, scale bar 1 cm (new).

Macrophthalmus (Venitus) BARNES, 1967, p. 203 [**Goneplax latreillei* DESMAREST, 1822, p. 99, pl. 9,1–4; OD; = *Macrophthalmus desmaresti* LUCAS, 1839, p. 567, pl. 20; = *Macrophthalmus serratus* ADAMS & WHITE, 1848, p. 51; = *Macrophthalmus polleni* HOFFMANN, 1874, p. 19, pl. 4,27–30; = *Macrophthalmus laniger* ORTMANN, 1894, p. 746, pl. 23,15]. Carapace 1.3–1.4 times wider than long; granular, without longitudinal branchial ridges; front narrow; lateral margin convergent posteriorly, with three triangular, well-developed anterolateral teeth. *Pleistocene–Holocene*. *Pleistocene*: Japan, Sabah, Guam, USA. *Holocene*: Indo-West Pacific Ocean.—FIG. 5,10. **M. (V.) latreillei* (DESMAREST), MFM142418, Holocene Japan, scale bar 1 cm (new).

Subfamily TRITODYNAMINIINAE

Števcíć, 2005

[*nom. transl.* NG, GUINOT, & DAVIE, 2008, p. 238, *pro* Tritodynamini ŠTEVČIĆ, 2005, p. 117]

Carapace trapezoidal, wider than long, regions poorly defined; anterolateral and posterolateral margins confluent, posterolateral reentrant well developed; front narrow;

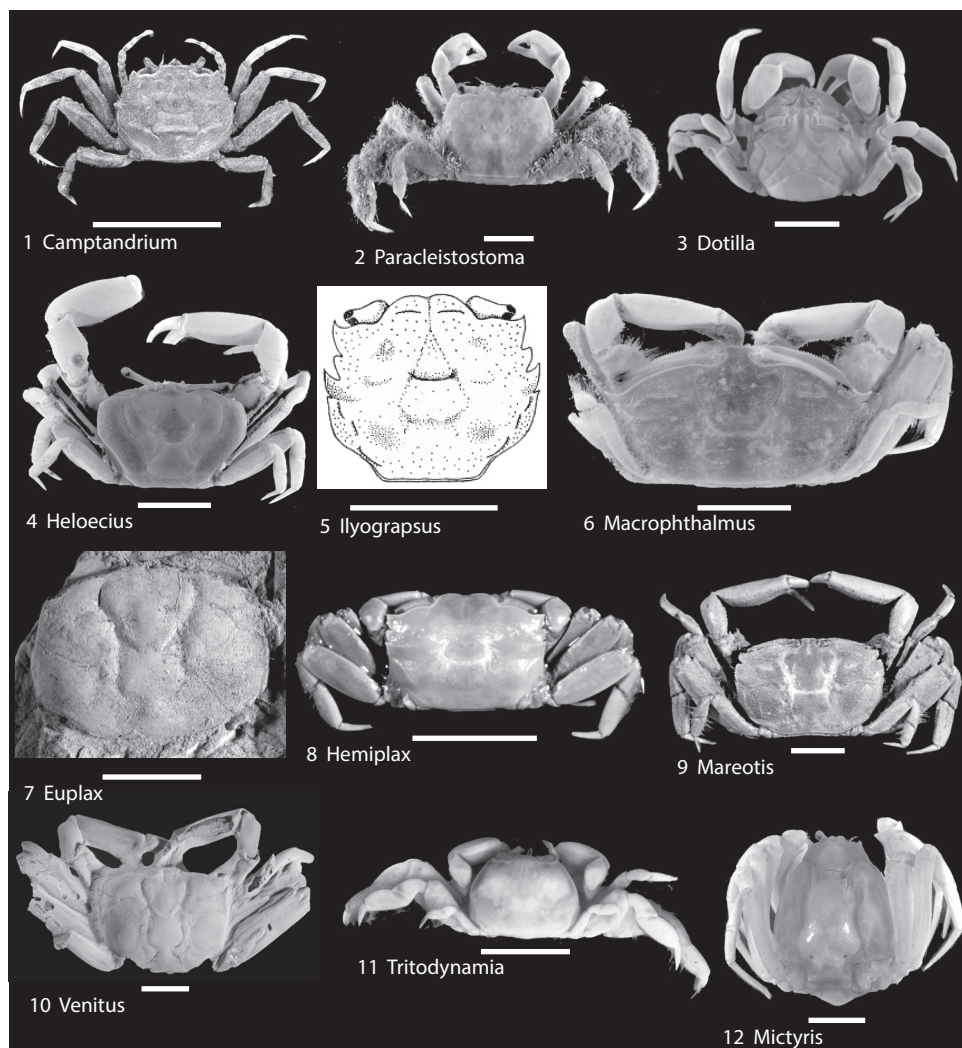


FIG 5. Camptandriidae, Dotillidae, Heloeciidae, Macrophthalmidae (Ilyograpsinae, Macrophthalminae, Tritodynamiinae), Mictyridae (p. 11–13).

third maxillipeds not completely covering buccal frame, ischium shorter than merus. *Miocene* (Langhian)–*Holocene*.

Tritodynamia ORTMANN, 1894, p. 692 [**T. japonica*, p. 693, pl. 23,5; M]. As for subfamily. *Miocene* (Langhian): Hungary. *Pleistocene*–*Holocene*. *Pleistocene*: Japan. *Holocene*: northwestern Pacific Ocean.——
FIG. 5,11. *T. horvathi* NOBILI, 1905, KSU D 319, *Holocene*, Japan, scale bar 1 cm (new).

Family MICTYRIDAE Dana, 1851

[Mictyridae DANA, 1851a, p. 247]

Carapace longer than wide, flanks high; cervical and branchiocardiac grooves deep; orbits with small outer-orbital spine; third maxillipeds completely closing buccal frame; chelipeds subequal; male pleon with all somites free, wide, similar to that of female. *Holocene*.

No fossil representatives.

Mictyris LATREILLE, 1806, p. 40 [**M. longicarpus* LATREILLE, 1806, p. 41; M]. As for family. *Holocene*:

Indo-West Pacific Ocean.—FIG. 5,12. **M. longicarpus*, USNM 17044, Holocene, Australia, scale bar 1 cm (new).

Family OCYPODIDAE Rafinesque, 1815

[*nom. correct.* MACLEAY, 1838, p. 63, *pro* Ocypodia RAFINESQUE, 1815, p. 96; ICZN Opinion 712, 1964]

Carapace quadrilateral, wider than long, narrowing posteriorly; regions poorly to well defined; anterolateral and posterolateral margins generally confluent; front narrow, downturned; fronto-orbital width greater than half maximum carapace width; third maxilliped completely closing buccal frame; chelipeds unequal in males, typically markedly so, usually equal or subequal in females; branchial pouch between bases of pereopods 3 and 4; sternum wide posteriorly, narrowing anteriorly in males, small portion of sternite 8 visible; male pleon usually with somites 4–6 or 5–6 fused. [Emended from SHIH & others, 2016, p. 145.] *Miocene (Langhian)–Holocene*.

Subfamily OCYPODINAE Rafinesque, 1815

[*nom. correct.* Dana, 1851a, p. 247, *pro* Ocypodia RAFINESQUE, 1815, p. 96; ICZN Opinion 712, 1964] [=Ucainae DANA, 1851a, p. 252]

Carapace quadrilateral, wider than long, narrowing slightly posteriorly; regions poorly defined; anterolateral and posterolateral margins generally confluent; front narrow, downturned; fronto-orbital width greater than 90 percent maximum carapace width; third maxilliped completely closing buccal frame; branchial pouch between bases of pereopods 3 and 4; all pleonal somites in males free. [Emended from SHIH & others, 2016, p. 145.] *Miocene (Langhian)–Holocene*.

Note: many subgenera are used for extant *Uca* (see NG, GUINOT, & DAVIE, 2008); the fossil entry is for *Uca sensu lato*.

Ocypode WEBER, 1795, p. 92 [**Cancer ceratophthalmus* PALLAS, 1772, p. 83, pl. 5,7–8; SD LATREILLE, 1810, p. 422; ICZN Opinion 712, 1964; =*Cancer caninus* HERBST, 1782 in 1782–1804, p. 78; =*O. urvillei* GUÉRIN, 1831, p. 9, pl.1,1; =*O. macleayana* HESS, 1865, p. 17, pl. 6,8] [=*Monolepis* SAY, 1817 in 1817–1818, p. 155 (type, *M. inermis*, SD FOWLER, 1912, p. 457); =*Ceratophthalma* MACLEAY, 1838, p. 64 (type, *Cancer cursor* LINNAEUS, 1758, p. 625; M);

=*Parocypoda* NEUMANN, 1878, p. 26 (type, *C. ceratophthalmus*, M)]. Carapace regions poorly defined, carapace quadrate, cornea occupying entire ventral portion of eyestalk; pereopods relatively short. *Miocene–Holocene*. *Miocene*: Argentina, Brazil. *Pliocene (Piacenzian)*: Italy. *Pliocene*: Morocco. *Pleistocene*: Spain (Mallorca), USA (Florida). *Holocene*: cosmopolitan, tropical, subtropical.—FIG. 6,1. **O. ceratophthalmus*, USNM 43392, Holocene, Caribbean Sea, scale bar 1 cm (new).

Afruca CRANE, 1975, p. 116 [**Gelasimus tangeri* EYDOUX, 1835, p. 1; OD]. Dorsal carapace ornamented with tubercles; fixed finger with keel on ventral margin, manus with large tubercles. [Emended from EYDOUX, 1835, pl. 17.] *Pliocene–Holocene*. *Pliocene*: Spain. *Holocene*: eastern Atlantic Ocean.—FIG. 6,2. **A. tangeri* (EYDOUX), drawing, no scale given (Eydoux, 1835, pl. 7,17).

Uca LEACH, 1814, p. 430 [**Cancer major* HERBST, 1782 in 1782–1804, p. 83; M, ICZN Opinion 712, 1964]. Carapace large for subfamily, adult major chelipeds very large, ornamented with tubercles on manus; female chelae small. *Miocene–Holocene*. *Miocene (Langhian)*: Spain. *Miocene*: Brazil. *Pliocene*: Honduras, USA (California). *Pliocene–Pleistocene*: Panama. *Pleistocene*: Honduras, India, USA (Delaware, New Jersey, Texas). *Holocene*: cosmopolitan.—FIG. 6,3. **U. major* (HERBST), USNM 210461, Holocene, Caribbean Sea, scale bar 1 cm (new).

Subfamily GELASIMINAE Miers, 1886

[*nom. transl.* SHIH & others, 2016, p. 149, *pro* Gelasimidae MIERS, 1886, p. viii]

Carapace wider than long; fronto-orbital width greater than 90 percent maximum carapace width; males with all pleonal somites free or with somites 4–6 at least partly fused. [Emended from SHIH & others, 2016, p. 149.] *Pleistocene–Holocene*.

Gelasimus LATREILLE, 1817, p. 517 [**Cancer vocans* LINNAEUS, 1758, p. 626; SD H. MILNE EDWARDS, 1841 in 1836–1844, pl. 18,1; =*G. marionis* DESMAREST, 1823, p. 243; =*G. nitidus* DANA, 1851a, p. 248; =*G. cultrimanus* WHITE, 1847, p. 84] [=*Latuca* BOTT, 1973, p. 317 (type, *Mesuca (Latuca) neocultrimana* BOTT, 1973, p. 317); =*Mesuca* BOTT, 1973, p. 316 (type, *Cancer tetragonon* HERBST, 1790 in 1782–1804, p. 257, pl. 20,110); =*Thalassuca* CRANE, 1975, p. 75 (type, *Cancer tetragonon*)]. Carapace surface without posterolateral striae; front narrow, eyestalks slender; adult male chelipeds very large, right-handed, outer surface of manus with large tubercles; all male pleonal somites free. [Emended from SHIH & others, 2016, p. 151.] *Holocene*: Indo-West Pacific Ocean.—FIG. 6,4. **G. vocans* (LINNAEUS), USNM unnumbered, Holocene, Singapore, scale bar 1 cm (new).

Leptuca BOTT, 1973, p. 324 [**Gelasimus stenodactylus* H. MILNE EDWARDS & LUCAS, 1843, p. 26, pl. 11,2;

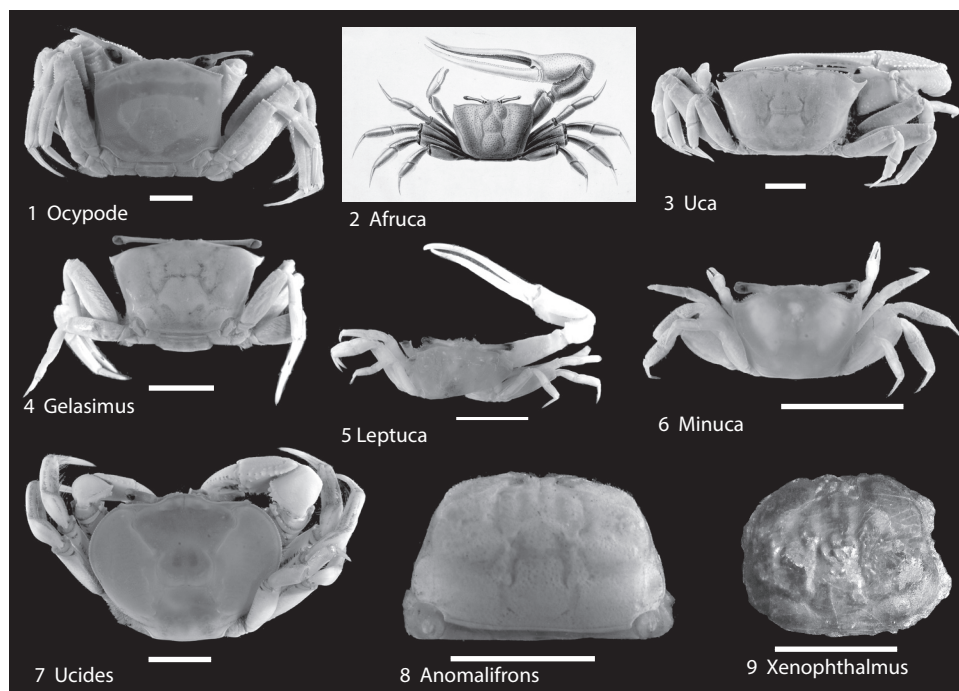


FIG 6. Ocypodidae (Ocypodinae, Gelasiminae, Ucidinae), Xenophthalmidae (Anomalifrontinae, Xenophthalminae) (p. 14–16).

OD] [= *Celuca* CRANE, 1975, p. 211 (type, *Uca deichmanni* RATHBUN, 1935, p. 51, OD); = *Planuca* BOTT, 1973, p. 324 (type, *Uca thayeri* RATHBUN, 1900a, p. 134, pl. 8, 1–2, OD); = *Boboruca* CRANE, 1975, p. 109 (type *U. thayeri*, OD)]. Carapace with no or up to two posterolateral keels; front wide; adult male chelipeds right or left handed, fixed finger of major chela may have ventral keel; male pleonal somites free or 4–6 fused. [Emended from SHIH & others, 2016, p. 153.] *Pleistocene–Holocene*. *Pleistocene*: USA (Texas). *Holocene*: western Atlantic Ocean, eastern Pacific Ocean.—FIG. 6, 5. **L. stenodactyla* (H. MILNE EDWARDS & LUCAS), USNM 138826, Holocene, Nicaragua, scale bar 1 cm (new).

Minuca BOTT, 1954, p. 160 [**Gelasimus mordax* SMITH, 1870, p. 135, pl. 2, 3, pl. 4, 4; OD]. Carapace with two posterolateral keels; front wide; male pleonal somites free; adult male may be right or left handed, fixed finger of major chela without ventral keel. [Emended from SHIH & others, 2016, p. 154.] *Pleistocene*: USA (Delaware, New Jersey). *Holocene*: western Atlantic Ocean, eastern Pacific Ocean.—FIG. 6, 6. **M. mordax* (SMITH), USNM 138590, Holocene, Caribbean Sea, scale bar 1 cm (new).

Subfamily UCIDINAE Števcíć, 2005

[Ucidinae ŠTEVČIĆ, 2005, p. 131]

Carapace distinctly ovate, narrowing posteriorly, flanks high; front narrow, downturned;

carapace regions moderately defined; fronto-orbital width 50–65 percent maximum carapace width; lateral margins with keel anteriorly; posterior margin narrow, wider than frontal margin; third maxilliped not completely covering buccal cavern; pouch between bases of pereopods absent; male pleonal somites 5–6 fused. [Emended from SHIH & others, 2016, p. 159.] *Holocene*.

Ucides RATHBUN, 1897, p. 154 [**Cancer cordatus* LINNAEUS, 1763, p. 414; OD; = *Cancer uca* LINNAEUS, 1767, p. 1041; = *Ocypode fossor* LATREILLE, 1803 in 1802–1803, p. 38; = *Uca pilosipes* GILL, 1859, p. 43] [= *Uca* LATREILLE, 1819, p. 96 (type, *C. uca*, junior homonym of *Uca* LEACH, 1814, p. 430); = *Oedipleura* ORTMANN, 1897, p. 334, replacement name for *Uca* LATREILLE, 1819]. As for family. *Holocene*: western Atlantic Ocean, eastern Pacific Ocean.—FIG. 6, 7. **U. cordatus* (LINNAEUS), USNM 47860, Holocene, Brazil, scale bar 1 cm (new).

Family XENOPHTHALMIDAE Stimpson, 1858

[Xenophthalmidae STIMPSON, 1858, p. 53]

Carapace trapezoidal, flanks high; merus and ischium of third maxilliped same length;

chelipeds smaller than other pereiopods; all male pleonal somites free, pleon narrow in males and females. *Pliocene–Holocene*.

Subfamily ANOMALIFRONTINAE

Rathbun, 1931

[Anomalifrontinae RATHBUN, 1931a, p. 84]

Carapace small, rectangular, front and orbits narrow; Epistome narrow, anterior portion of buccal frame not extending to base of antennular fossa. *Holocene*.

Anomalifrons RATHBUN, 1931a, p. 85 [*A. lightana*, p. 85, pl. 13,37–39; OD]. As for subfamily. *Holocene*: China, Philippines, Malaysia.—FIG. 6,8. *A. lightana*, USNM 59732, Holocene, China, scale bar 5 mm (new).

Subfamily XENOPHTHALMINAE

Stimpson, 1858

[*nom. transl.* Alcock, 1900, p. 288, *pro* Xenophthalmidae STIMPSON, 1858, p. 53]

Carapace trapezoidal, flanks high; orbits dorsal, with longitudinal slits extending dorsally at right angles to frontal margin; merus and ischium of third maxilliped same length; epistome absent, anterior portion of buccal frame extending to base of antennular fossa; chelipeds smaller than other pereiopods; all male pleonal somites free, pleon narrow in males and females. *Pliocene–Holocene*.

Xenophthalmus WHITE, 1846, p. 177 [*X. pinnotheroides*, p. 178, pl. 2,2; M, ICZN Opinion 85, 1925, Direction 37, 1956]. Carapace trapezoidal, flanks high; orbits dorsal, with longitudinal slits extending dorsally at right angles to frontal margin; merus and ischium of third maxilliped same length; epistome absent, anterior portion of buccal frame extending to base of antennular fossa; chelipeds smaller than other pereiopods; all male pleonal somites free, pleon narrow in males and females. *Pliocene*: Brunei. *Holocene*: Indo-West Pacific Ocean.—FIG. 6,9. *X. subitus* MORRIS & COLLINS, 1991, holotype, NHMUK BM In. 62097, Pliocene, Brunei, scale bar 5 mm (new).

Superfamily PINNOTHEROIDEA De Haan, 1833

[*nom. transl.* ŠTEVČIĆ, 2005, p. 116, *pro* Pinnotheridea DE HAAN, 1833 in 1833–1850, p. 5]

Classification of Pinnotheroidea follows DAVIE, GUINOT, and NG (2015) and THEIL, CUESTA, and FELDER (2016).

Carapace ovate or round, usually weakly calcified; front narrow, orbits small; anterolateral margins entire or with tiny spines; antennae and antennules small, inter-antennular septum reduced or absent; third maxilliped male pleon narrow; female pleon broad, may be especially so. *Paleocene (Danian)–Holocene*.

Family APHANODACTYLIDAE

Ahyong & Ng, 2009

[Aphanodactylidae AHYONG & NG, 2009, p. 34] [=Gustavini ŠTEVČIĆ, 2011, p. 129]

Carapace small, rectangular to ovate, sexually dimorphic, smooth or with fine setae, regions poorly to not defined; orbits small, outer-orbital angle blunt or sharp, front downturned, bilobed; chelipeds equal, smooth; pereiopod 3 longest, pereiopod 5 shortest; male pleon with somites all free or 4–6 fused; third maxilliped with small merus not fused to ischium. Associated with polychaete tube worms. [Emended from AHYONG & NG, 2009, p. 34.] *Holocene*.

Selwynia BORRADAILE, 1903, p. 430 [*S. laevis*, p. 432, fig. 112: M] [=Aphanodactylus TESCH, 1918, p. 283 (type, *A. sibogae*, p. 283, pl. 18,2; M)]. Carapace much wider than long, smooth, front narrow; walking legs extremely short. *Holocene*: Indo-West Pacific Ocean.—FIG. 7,1. *S. laevis*, USNM 243935, Holocene, Hawaii, scale bar 1 cm (new).

Family PINNOTHERIDAE

De Haan, 1833

[*nom. correct.* BELL, 1845, p. 119, *pro* Pinnotheridea DE HAAN, 1833 in 1833–1850, p. 5]

Carapace ovate or round, usually weakly calcified; front narrow, orbits small; anterolateral margins entire or with tiny spines; antennae and antennules small, inter-antennular septum reduced or absent; third maxilliped with large merus and small ischium fused to merus; male pleon narrow; female pleon broad, may be especially so. Usually commensal; hosts variable. *Paleocene (Danian)–Holocene*.

Subfamily PINNIXINAE Števcíć, 2005

[*nom. transl.* THEIL, CUESTA, & FELDER, 2016, p. 17 *pro* Pinnixini ŠTEVČIĆ, 2005, p. 117] [=Glassellini *nom. corr.* THEIL, CUESTA, & FELDER, 2016, p. 17, *pro* Glassellini ŠTEVČIĆ, 2005, p. 117]

Carapace wider than long, weakly sclerotized, regions poorly defined, pereopod 4 longest, pereopods unornamented. [Emended from THEIL, CUESTA, & FELDER, 2016, p. 17.] *Miocene* (Serravallian–Tortonian)–Holocene.

Pinnixa WHITE, 1846, p. 177 [**Pinnotheres cylindricum* SAY, 1818 in 1817–1818, p. 452; M, ICZN Opinion 85, 1925, Direction 37, 1956] [= *Tubicola* LOCKINGTON, 1877, p. 55 (type, *T. longipes*; M)]. Carapace much wider than long, firmly calcified; front narrow, axially grooved; orbit ovate or circular; third maxillipeds with large merus and small ischium; chelipeds moderate in size; third pereopod longest of all walking legs, fourth stoutest; pleon in males and females with all somites free. *Miocene*–Holocene. *Miocene* (Serravallian–Tortonian): USA (California). *Miocene*: Chile, Sabah, Sarawak. *Pliocene*: Brunei, Chile. *Pleistocene*: Philippines. *Holocene*: North, Central, and South America, Indo-Pacific Ocean.—FIG. 7,2. **P. cylindrica* (SAY), USNM 1278462, Holocene, Florida, scale bar 5 mm (new).

Subfamily PINNIXULALINAE Theil, Cuesta & Felder, 2016

[Pinnixulalae THEIL, CUESTA, & FELDER, 2016, p. 23]

Carapace wider than long, well sclerotized, regions distinct, ornamented with tubercles and setae; chelipeds small, slender; pereopods long, slender, heavily ornamented, pereopod 4 longest, pereopods 2 and 5 shortest; male pleon elongate, somites becoming shorter toward telson, telson ovate. [Emended from THEIL, CUESTA, & FELDER, 2016, p. 23.] *Holocene*.

Pinnixulala THEIL, CUESTA, & FELDER, 2016, p. 23 [**Pinnixa valerii* RATHBUN, 1931b, p. 262, fig. 1–2; OD]. As for subfamily. *Holocene*: Central America.—FIG. 7,3. **P. valerii* (RATHBUN), USNM 70889, Holocene, Ecuador, scale bar 1 cm (new).

Subfamily PINNOTHERELINAE Alcock, 1900

[Pinnotherelinae ALCOCK, 1900, p. 294] [=Alarconiini ŠTEVČIĆ, 2005, p. 117]

Carapace much wider than long, transversely ovate, with posterolateral reentrant; eyestalks short; third maxilliped with ischium smaller than merus, merus and ischium not completely fused. [Emended from DAVIE, 2002, p. 431.] *Holocene*.

Pinnotherelia H. MILNE EDWARDS & LUCAS, 1843, p. 24 [**P. laevigata*, p. 25, pl. 11,1; M]. Carapace wider than long, widest anteriorly, smooth, cardiac region defined by lateral grooves; front ~40% maximum carapace width, downturned; sternum flat. [Emended from RATHBUN, 1918, p. 180.] *Holocene*: South Pacific Ocean.—FIG. 7,4. **P. laevigata*, USNM 40445, Holocene, Peru, scale bar 1 cm (new).

Subfamily PINNOTHERINAE De Haan, 1833

[Pinnotheridea DE HAAN, 1833 in 1833–1850, p. 5] [=Disodactylidae SMITH, 1870, p. 172; =Parapinnixini ŠTEVČIĆ, 2005, p. 118]

Carapace usually rounded, approximately as long as wide; third maxilliped with merus and ischium fused; pereopods slender, weak, pereopod 4 not longer than other pereopods. *Paleocene* (Danian)–Holocene.

Pinnotheres BOSCH, 1802, p. 239 [**Cancer pisum* LINNAEUS, 1767, p. 1039; SD LATREILLE, 1810, p. 422, ICZN Opinion 85, 1925, Direction 45, 1956; for an extensive list of synonyms see NG, GUINOT, & DAVIE, 2008] [= *Pinnotheres* LATREILLE, 1802 in 1802–1803, junior homonym of *Pinnotheres* BOSCH, 1802, ICZN Direction 45, 1956; = *Pinnozoea* AIKAWA, 1933, p. 246 (type, *C. pisum*; SD SCHMITT, MCCAIN, & DAVIDSON, 1973, p. 37)]. Female larger than males; carapace poorly calcified in females; rounded; lateral margins convex, regions undefined; front narrow, downturned in females, may be projected in males; orbits circular, smaller in females than males; chelipeds short; all pleonal somites in males and females free, pleon in females large, may be larger than sternum. *Oligocene*–Holocene. *Oligocene*: France. *Paleogene*: Chile. *Holocene*: cosmopolitan.—FIG. 7,5. **P. pisum* (LINNAEUS), USNM 16233, Holocene, New Zealand, scale bar 5 mm (new).

Pharkidodes FELDMANN, SCHWEITZER, CASADIO, & GRIFFIN, 2011, p. 109 [**P. agele*, p. 111, fig. 12; OD]. Carapace quadrate, maximum width ~90% maximum length; front deeply sulcate, downturned, weakly convex; orbits ovoid with narrow, beaded rims; anterolateral margin with finely beaded rim; carapace regions not strongly inflated, defined by distinctly wrinkled groove patterns; chelipeds with rows of tiny spines on upper and lower surfaces. [Emended from FELDMANN & others, 2011.] *Miocene*: Argentina.—FIG. 7,6. **P. agele*, holotype, CADIC PI 148, Miocene, Argentina, scale bar 5 mm (FELDMANN & others, 2011, fig. 12A).

Pinnaxodes HELLER, 1865, p. 67 [**P. hirtipes*, p. 68, pl. 6,2; OD, ICZN Opinion 85, 1925, Direction, 37, 1956]. Carapace circular, widest in anterior half; orbits small, closely spaced; male pleon generally narrowing anterior to telson. *Pleistocene*: Japan.

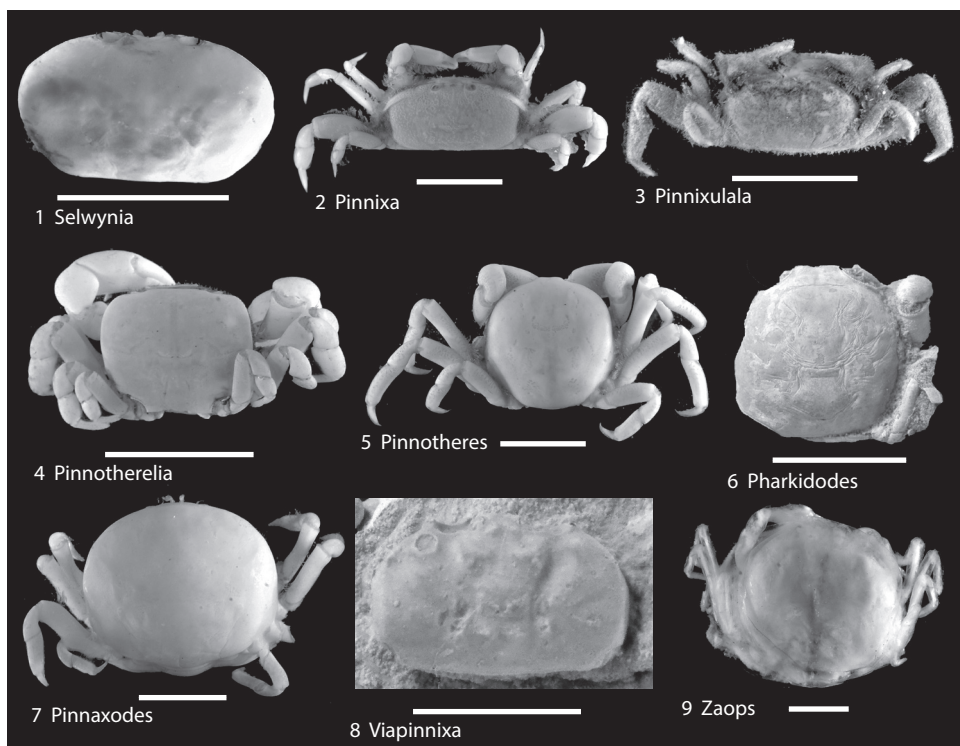


FIG. 7. Aphanodactylidae, Pinnotheridae (Pinnixinae, Pinnixulalinae, Pinnotherelinae, Pinnotherinae) (p. 16–18).

Holocene: western Atlantic, southeastern and north-western Pacific.—FIG. 7,7. *P. floridensis* WELLS & WELLS, 1961, USNM 1997348, Holocene, Florida, USA, scale bar 5 mm (new).

Viapinnixa SCHWEITZER & FELDMANN, 2001, p. 340 [**Pinnixa* (*Palaeopinnixa*) *nodosa* COLLINS & RASMUSSEN, 1992, p. 40, fig. 22; OD]. Carapace wider than long, widest at approximately midlength, rounded-rectangular in shape; regions distinct, defined by broad, shallow grooves; rostrum narrow, flared, extending well beyond orbits; orbits wide, upper margin sinuous; fronto-orbital width to maximum width ratio ~0.70; lateral margins rounded, unrimmed, with small, blunt antero-lateral spine; posterior margin nearly straight; posterior width to maximum width ratio ~0.78; fronto-orbital width to posterior width ratio ~0.90; posterolateral corner with reentrant. *Paleocene* (*Danian*): Greenland, USA (Texas). *Thanetian*: Mexico (Coahuila). *Eocene* (*Ypresian*): Mexico (Chiapas).—FIG. 7,8. **V. nodosa* (COLLINS & RASMUSSEN), holotype, MGUH 21.614, Paleocene, Greenland, scale bar 1 cm (new).

Zaops RATHBUN, 1900b, p. 590 [**Pinnotheres depressum* SAY, 1817 in 1817–1818, p. 68; OD; =*Pinnotheres ostreus* SAY, 1817, p. 67]. Carapace rounded; first pereopod of females largest, manus widening distally, movable finger curved; pereopods 2–5

similar, dactyli long, straight; carapace thin; mature female pleon very large, extending beyond margins of carapace; males with wide mani, dactyli longer, curved. *Pliocene*: USA (Virginia). *Holocene*: northwestern Atlantic Ocean, northeast Pacific Ocean.—FIG. 7,9. *Z. ostreum* (SAY), USNM 1291842, Holocene, Florida, USA, scale bar 5 mm (new).

ABBREVIATIONS FOR MUSEUM REPOSITORIES

CADIC: Centro Austral de Investigaciones Científicas, Paleontología Invertebrados, Ushuaia, Tierra del Fuego, Argentina

CM: Canterbury Museum, Christchurch, New Zealand

GHUNLPam: Cátedra de Geología Histórica, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de La Pampa, Santa Rosa, Argentina

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

M: Hungarian Natural History Museum, Budapest, Hungary

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

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

MFM: Mizunami Fossil Museum, Mizunami, Gifu, Japan
MGUH: Geologisk Museum, University of Copenhagen, Copenhagen, Denmark
MNHN: Crustacean Collection, Muséum National d'histoire naturelle, Paris, France
NHMUK: Palaeontology Collections, The Natural History Museum, London, UK
NZGS AR: New Zealand Geological Survey, Lower Hutt, New Zealand
USNM: United States National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA
VR: Museo di Storia naturale di Verona, Italy
WoRMS: World Register of Marine Species. Available from <http://www.marinespecies.org> at VLIZ.

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