

TREATISE ONLINE

Number 95

Part R, Revised, Volume 1, Chapter 8P:
Systematic Descriptions:
Section Etyoida

Carrie E. Schweitzer, Rodney M. Feldmann,
Hiroaki Karasawa, Ovidiu D. Franțescu, and
Adiël A. Klompmaker

2017

KU PALEONTOLOGICAL
INSTITUTE

The University of Kansas

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

PART R, REVISED, VOLUME 1, CHAPTER 8P: SYSTEMATIC DESCRIPTIONS: SECTION ETYOIDA

CARRIE E. SCHWEITZER,¹ RODNEY M. FELDMANN,² HIROAKI KARASAWA,³
OVIDIU D. FRANȚESCU,⁴ and ADIËL A. KLONPMAKER⁵

¹Department of Geology, Kent State University at Stark, cschweit@kent.edu; ²Department of Geology, Kent State University, rfeldman@kent.edu;
³Mizunami Fossil Museum, Japan, GHA06103@nifty.com; ⁴University of Pittsburgh Bradford, odfl@pitt.edu; ⁵Department of Integrative Biology &
Museum of Paleontology, University of California, Berkeley, adielklonpmaker@gmail.com]

Section ETYOIDA Karasawa, Schweitzer, & Feldmann, 2011

[*nom. transl.* KARASAWA, SCHWEITZER, & FELDMANN, 2011, p. 548, *pro*
Etyidae GUINOT & TAVARES, 2001, p. 509]

Description as for superfamily. *Lower Cretaceous (Barremian)–Eocene (Ypresian)*.

Superfamily ETYOIDEA Guinot & Tavares, 2001

[*nom. transl.* KARASAWA, OHARA, & KATO, 2008, p. 106, *pro* Etyidae
GUINOT & TAVARES, 2001, p. 509]

Carapace wider than long, ovoid to hexagonal; anterolateral margins with spines or nodes; carapace regions well defined or poorly defined; female sternum narrow, deep, sternites 1–3 fused, triangular; sternal sutures 5/6 and 6/7, and 7/8 complete; sternites 7 and 8 directed strongly posterolaterally; spermatheca situated on sternal suture 7/8 or on sternite 7; sternum may be strongly deflexed at sternite 4; pleonal locking mechanism composed of coxae of pereopods 1, placed on sternite 5, or a combination of episternite 5 and coxae of pereopods 1 and 2; male and female pleons with all pleonites free; may have axial swellings or axial groove; coxae 4 and 5 may be nearly perpendicular to plane of carapace; pereopod 5 subdorsal. *Lower Cretaceous (Barremian)–Eocene (Ypresian)*.

Family ETYIDAE Guinot & Tavares, 2001

[Etyidae GUINOT & TAVARES, 2001, p. 509]

Carapace wider than long, length ranging from one-half to two-thirds maximum

carapace width (maximum carapace width measured between bases of spines, if present); position of maximum width 50%–66% the distance posteriorly on carapace; anterolateral margins with 4–7 spines, spines may be small or large, margin generally somewhat shorter than posterolateral margins; fronto-orbital width ranging from 35% to 60% maximum carapace width; posterolateral margin generally concave but may be sinuous; regions generally well defined, ornamented with granules or tubercles of varying sizes or nearly smooth; cervical groove initiating along anterolateral margin from 35% to 50% the distance posteriorly, crossing the midline at about half the distance posteriorly, usually arcing concave forward, then convex forward at base of protogastric region, then concave forward around base of mesogastric region, about half the distance posteriorly; epibranchial region composed of a distal area that embraces last anterolateral spines bounded anteriorly by cervical groove and usually posteriorly by an oblique groove extending posterolaterally from cervical groove and intersecting posterolateral margin (branchial groove 1: bg1); mesobranchial region almost always developed as a more or less oblique ovate region bounded anteriorly by cervical groove, laterally by bg1, and usually axially by another oblique groove extending posterolaterally from cervical groove and intersecting posterolateral margin (branchial groove 2: bg2), bg1 or bg2 always present, usually both; metabranchial region flattened; female sternum narrow, deep;

sternites 1–3 triangular, separated from sternite 4 by suture; sternite 4 with rectangular anterior process, pereopod 1 articulating at intersection between anterior process and episternal projection which is directed laterally and upward at about 45° angle to flat sternal cavity; sternite 5 with large episternal projections directed laterally and upward at about 45° angle to flat sternal cavity, articulating with pereopod 2; sternites 5 and 6 separated by complete suture; sternite 6 with episternal projections directed posterolaterally, articulating with pereopod 3; sternites 7 and 8 directed strongly posterolaterally, wider than long, 8 longer than 7; external opening of spermatheca may be situated entirely on sternite 7, apparently not as part of suture between 7 and 8, transversely ovate, surrounded with granules, anterior and axial edge of sternite 7 raised and rotated ventrally (*Steorrosia*); spermatheca may be situated along sternal suture 7/8 in some taxa (*Etyus*); anterior end of sternite 8 overlapping posterior end of sternite 7; pleon wide in both males and females; all pleonites free; female pleonites wide, covering part of coxae of pereopods; pleonites 1–6 with axial swellings; coxae 1–5 with lateral swellings; pleonites with depressed rim along posterior margin; pleonites 6 twice as long as other pleonites; telson locking into coxae of pereopods 1, with longitudinal groove; posterior margin of pleonites sinuous, with posteriorly directed projection axially; male pleon similar in form to female but narrower and flatter; third maxillipeds longer than wide; in two planes; pereopods decreasing in size posteriorly; coxae of pereopod 1 with abdominal locking mechanism; coxae of pereopod 3 with female gonopores, gonopores situated on ventral surface and close to sternal edge of coxa, position of gonopores just anterior to spermathecal opening; pereopod 5 carried at least subdorsally and possibly fully dorsally, reduced in size compared to other pereopods (SCHWEITZER & others, 2012, p. 130). *Lower Cretaceous (Barremian)–Eocene (Ypresian)*.

Etyus LEACH in MANTELL, 1822, p. 97 [**E. martini* MANTELL, 1844, p. 513, fig. 1; SM] [=*Reussia*

M'COY, 1854, p. 120 (type, *R. granosa*, p. 121, fig. 4; SD GLAESSNER, 1969, p. 488; =*E. martini*]. Carapace transversely ovate, wider than long, widest about 60% the distance posteriorly on carapace; orbits circular, directed forward; fronto-orbital width usually half but may be about 35% maximum carapace width; anterolateral margins convex, with 4 or 5 spines, spines may be small and blunt, sharp, or large and rectangular; posterolateral margin concave, about same length or slightly longer than anterolateral margin; axial regions moderately defined, mesogastric region triangular; protogastric and hepatic regions usually well differentiated but may be confluent; branchial regions subdivided into three distinct areas; epibranchial region composed of a distal area that embraces last anterolateral spines bounded anteriorly by cervical groove and posteriorly by bg1; mesobranchial region developed as an oblique ovate region bounded anteriorly by cervical groove, laterally by bg1, and axially by bg2; metabranchial region flattened; cervical groove beginning along anterolateral margin about half the distance posteriorly, arcing concave forward, then convex forward at base of protogastric region, then concave forward around base of mesogastric region usually about half the distance posteriorly; ornamentation usually tubercles but may be granular, granules may be all of one size or with interspersed larger tubercles; sternite 3 and sometimes 4 visible even with pleon in place; spermathecal openings long, ovate, situated posteriorly; all pleonites free in males and females, telson long, triangular (adapted from SCHWEITZER & others, 2012, p. 130). *Lower Cretaceous (Barremian–Albian)*: Japan, *Barremian*; Germany, UK (England), *Albian*.—FIG. 1, 1a. **E. martini*, cast of JSH Collins collection 2367], numbered KSU D 1516, dorsal carapace, Albian, UK, scale bar, 1 cm.—FIG. 1, 1b–c. *E. granulosa* (M'COY, 1854), SM B.22656, Albian, UK; b, dorsal carapace; c, ventral view of female, scale bars, 1 cm (Schweitzer & others, 2012, fig. 3, 6–7).

Etyxanthosia FRAAIJE & others, 2008, p. 199 [**Xanthosia fossa* WRIGHT & COLLINS, 1972, p. 100, pl. 20, 4–6; OD]. Carapace wider than long, about two-thirds as long as wide, widest about 60% the distance posteriorly; front broadly downturned; deep orbits with two wide fissures and an intra-orbital spine; four anterolateral spines including outer-orbital spine, spines large, rectangular at their bases, themselves spinose; carapace regions with particularly large tubercles as ornamentation; protogastric and hepatic regions separated; relatively straight anterolateral margin, about 80% length of posterolateral margin; epibranchial region bearing last anterolateral spine, separated from remainder of flattened branchial region by branchial groove, mesobranchial region directed at an angle and bounded by bg1 and bg2 moderately well developed; sinuous posterolateral margin (adapted from SCHWEITZER & others, 2012, p. 135). *Lower Cretaceous (Albian)–Upper Cretaceous (Cenomanian)*: Spain, *Albian*; UK (England), *Cenomanian*.—FIG.

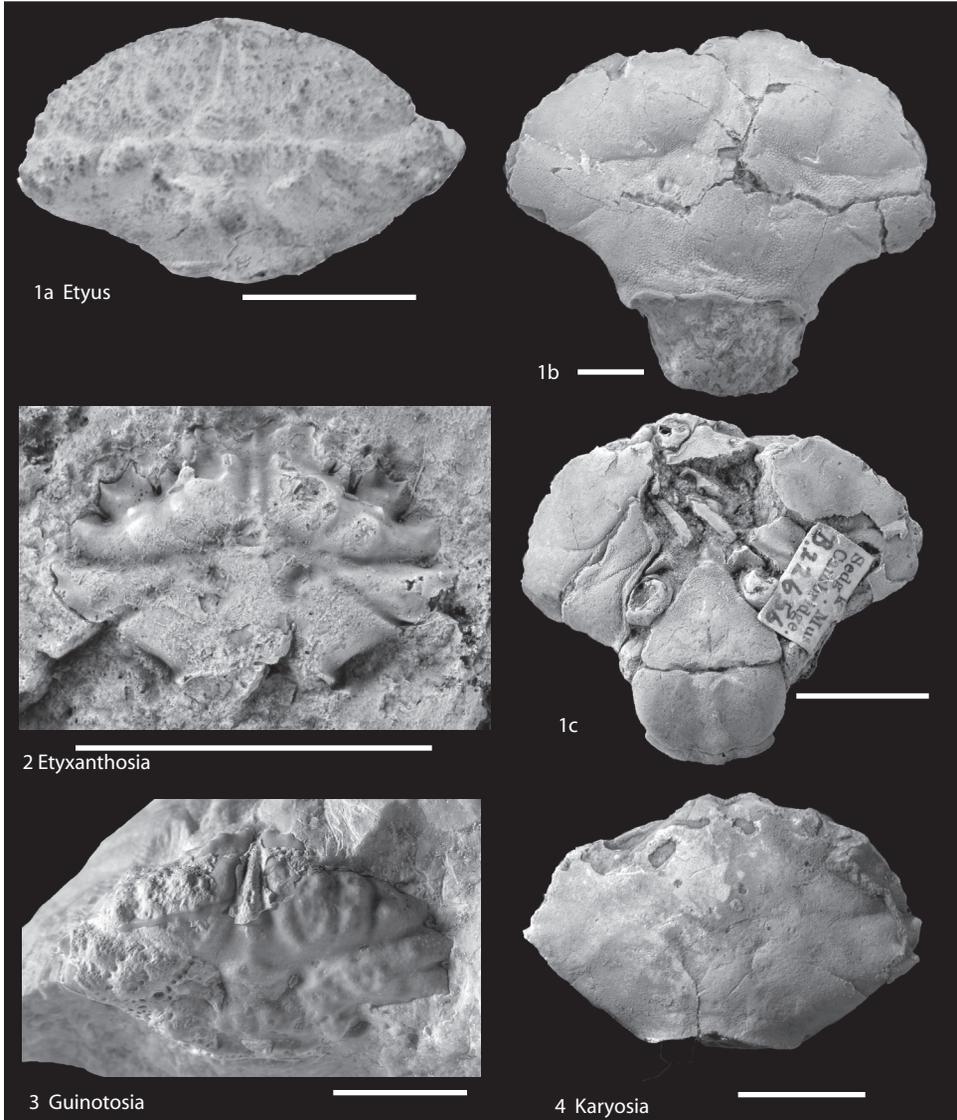


FIG 1. Etyidae (p. 2–4)

1,2. **E. fossa* (WRIGHT & COLLINS, 1972), MAB k.2571, dorsal carapace, Albian, Spain, scale bar, 1 cm (Schweitzer & others, 2012, fig. 5,3).

Guinotosia BESCHIN & others, 2007, p. 30 [**G. tertiaria*, p. 31, pl. 3,1; OD]. Carapace wider than long; front appearing to have 6 lobes, downturned; anterolateral margin appearing to have large triangular spines with rectangular bases; posterolateral margin sinuous; posterior margin weakly concave; protogastric region well separated from hepatic region; hepatic region subdivided; cervical groove overall concave forward, beginning along anterolateral margin about half the distance posteriorly, crossing midline 66% the

distance posteriorly; epibranchial region with 2 large anterolateral spines on margin; oblique mesobranchial region bounded by well-defined bg1 and bg2; carapace regions appear to have been well ornamented (SCHWEITZER & others, 2012, p. 138). *Eocene* (Ypresian): Italy.—FIG. 1,3. **G. tertiaria*, holotype, MCZ 1843, dorsal carapace, scale bar, 1 cm (new, photo by A. De Angeli).

Karyosia SCHWEITZER & others, 2016, p. 10 [**K. apicava*; OD]. Carapace smooth for family, regions poorly defined, length about two-thirds maximum width; widest two-thirds the distance posteriorly; front with axial pair of rounded lobes, extending laterally into straight segment and blunt inner

- orbital angle; fronto-orbital width wide for family, about two-thirds maximum carapace width, orbits shallow axially and deeper laterally; anterolateral margin with four lobate or sharp spines; cervical groove weak but well marked; branchial groove 1 (bg1) of SCHWEITZER & others (2012) weakly developed, defining broadly triangular, smooth epibranchial region; branchial groove 2 (bg2) not developed (SCHWEITZER & others, 2016, p. 10). *Lower Cretaceous (Albian)*: USA (Texas).—FIG. 1,4. **K. apicava*, holotype, TMM NPL 69679, dorsal carapace, scale bar, 1 cm (Schweitzer & others, 2016, fig. 7,1).
- Rolerithosia** COLLINS, VILLIER, & BRETON, 2013, p. 48 [**R. lobulata*; p. 48, fig. 1–3; OD]. Carapace wider than long; fronto-orbital width about half maximum carapace width; protogastric regions very wide; hepatic regions very narrow; epibranchial relatively small; cervical groove composed of straight segments, one extending weakly posteriorly from anterolateral margin, then straight across to bound anterior margin of mesobranchial region, then straight across axis; axial regions not well differentiated transversely, with nodes on uro/metagastric and cardiac regions; mesobranchial region directed almost straight between uro/metagastric and epibranchial regions, bounded by well-defined bg1 and bg2; carapace surface relatively smooth. *Upper Cretaceous (Cenomanian)*: France.—FIG. 2,1. **R. lobulata*, holotype, MHN LM 2010.1.55.2, dorsal carapace, scale bar, 1 cm (adapted from Collins, Villier, & Breton, 2013, fig. 1).
- Secretanella** GUINOT & TAVARES, 2001, p. 541 [**Xanthosia arcuata* SECRETAN, 1964, p. 173, pl. 19, 5–6, pl. 20, 7–8; OD]. Carapace wider than long, length 55%–60% maximum carapace width, widest about half the distance posteriorly on carapace at position of last anterolateral spines; carapace flattened transversely and longitudinally; fronto-orbital width 50%–60% maximum carapace width; anterolateral margins convex, with 5–7 small, sharp spines; posterior margin narrow, 25%–35% maximum carapace width; cervical groove beginning 45%–50% distance along anterolateral margin, curving concave forward for about half width of hepatic region, then strongly convex forward until base of mesogastric region, where it curves concave forward across midline about 50%–60% the distance posteriorly on carapace; branchial region inflated posterior to convex forward segment of cervical groove; oblique bg1 moderately defined; mesobranchial region sometimes present; sternites poorly preserved, appearing to have a complete sternal suture 5/6; sternites anterior to suture with laterally directed episternites; sternites posterior to suture directed posterolaterally; female pleon wide, first and second pleonites narrow, pleonites widening toward broadly rounded telson, extending to anterior of sternite 4 and beyond coxae of pereopods 1 (adapted from SCHWEITZER & others, 2012, p. 139). *Upper Cretaceous (Cenomanian–Campanian)*: Madagascar, *Albian–Cenomanian*; Czech Republic, ?*Turonian*; ?Germany, USA (Colorado, South Dakota), *Campanian*.—FIG. 2,2a–b. **S. arcuata*, cast of holotype, MNHN R03978 numbered KSU D 1294; a, dorsal carapace; b, ventral view of female, Albian–Cenomanian of Madagascar, scale bars, 1 cm (Schweitzer & others, 2012, fig. 8, 5–6).
- Sharnia** COLLINS & SAWARD, 2006, p. 70 [**S. burnhamensis*, p. 70, pl. 1, 5; OD]. Carapace wider than long, widest near anterolateral corner; anterolateral margin crispate, spined; lateral regions flattened, axial regions inflated; fronto-orbital margin just under half maximum carapace width; orbits bilobed, directed forward and slightly upward; epigastric regions large, with two swellings; mesogastric region with two large nodes posteriorly, protogastric regions small, highly inflated; hepatic region flattened; branchial regions not well differentiated (SCHWEITZER & others, 2012, p. 144). *Eocene (Ypresian)*: UK (England).—FIG. 2,3. **S. burnhamensis*, holotype, BMNH IC.454, scale bar, 1 cm (Schweitzer & others, 2012, fig. 9).
- Steorrosia** SCHWEITZER & others, 2012, p. 138 [**Xanthosia aspera* RATHBUN, 1935, p. 41, pl. 11, 1–5; OD]. Carapace much wider than long, length about half carapace width, position of maximum width at 50%–75% maximum carapace length; carapace regions moderately to well defined by grooves and ornamented by tubercles of varying sizes; front poorly known, appearing to have been nearly straight, not extending much beyond orbits, fronto-orbital width about 40% maximum carapace width; anterolateral margins with between 5 and 7 larger spines and may have smaller tubercles interspersed between them or ornamenting larger spines, spines may be small and sharp or large and rectangular at bases, anterolateral margin broadly convex; posterolateral margin concave; axial regions with three large tubercles in longitudinal row; epibranchial region composed of a distal area that embraces last anterolateral spines bounded anteriorly by cervical groove and posteriorly by bg1; mesobranchial region developed as a more or less oblique ovate region bounded anteriorly by cervical groove, laterally by bg1, and axially by bg2; metabranchial region flattened; cervical groove beginning along anterolateral margin about 35% the distance posteriorly, arcing concave forward, then convex forward at base of protogastric region, then concave forward around base of mesogastric region about 50% the distance posteriorly; female sternum narrow, deep; sternites 1–3 fused, triangular, separated from sternite 4 by grooves; sternite 4 with rectangular anterior process, pereopod 1 articulating at intersection between anterior process and episternal projection which is directed laterally and upward at about 45° angle to flat sternal cavity; sternite 5 with large episternal projections directed laterally and upward at about 45° angle to flat sternal cavity, articulating with pereopod 2; sternite 5 and 6 separated by complete suture; sternite 6 with episternal projections directed posterolaterally, articulating with pereopod 3; sternites 7 and 8 directed strongly posterolaterally, wider than long, 8 longer than 7; external opening of spermatheca

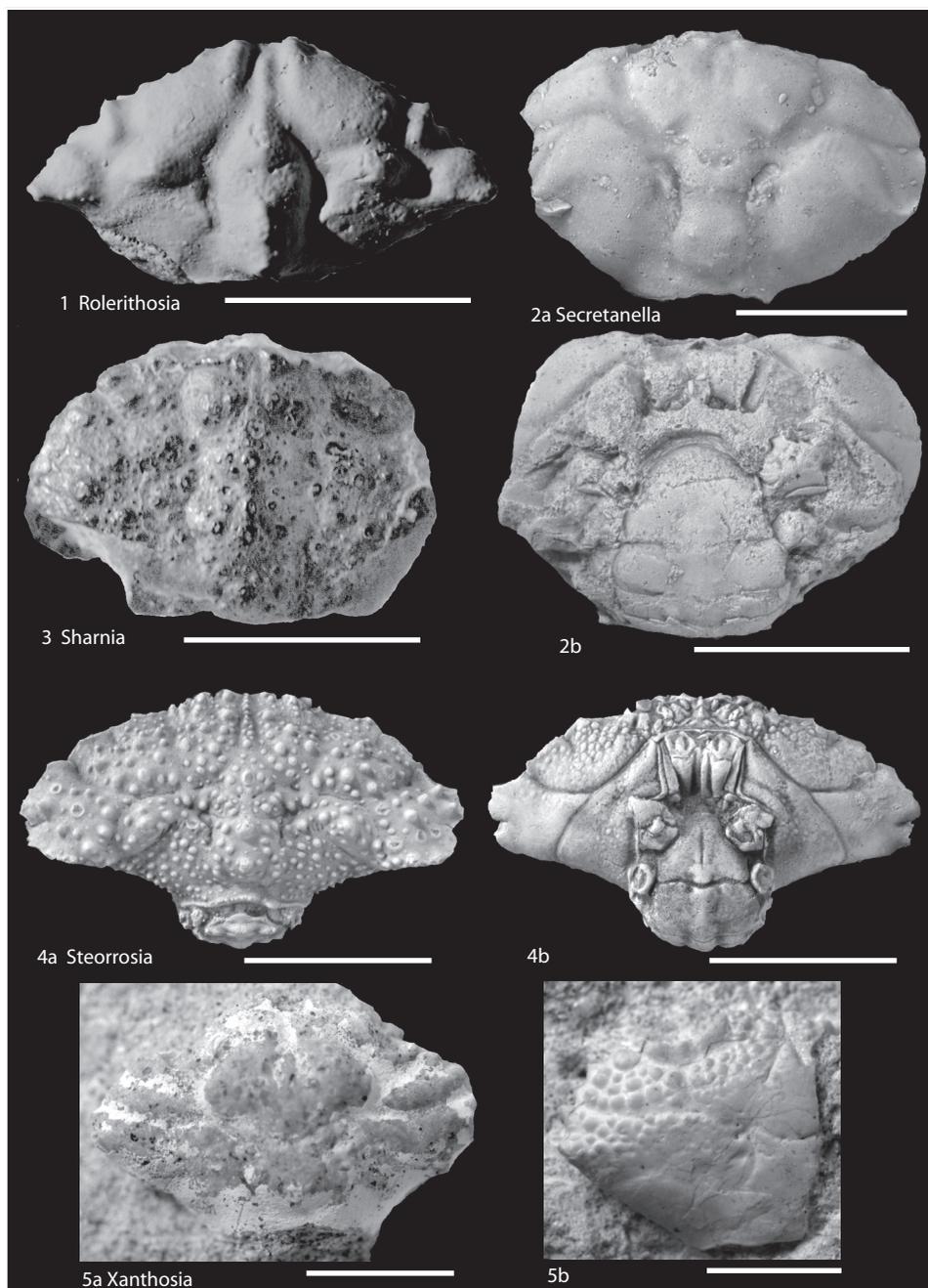


FIG 2. Etyidae (p. 4–6)

situated entirely on sternite 7, apparently not as part of suture between 7 and 8, transversely ovate, surrounded with granules, anterior and axial edge of sternite 7 raised and rotated ventrally; anterior end of sternite 8 overlapping posterior end of sternite 7; pleon wide in both males and females; all pleonites free; female pleonites wide, covering part of coxae of pereopods; pleonites 1–6 with axial swellings; coxae 1–5 with lateral swellings; pleonites with depressed rim along posterior margin; pleonite 6 twice as long as other pleonites; telson locking into coxae of pereopods 1, with longitudinal groove; posterior margin of pleonites sinuous, with posteriorly directed projection axially; male pleon similar in form to female but narrower and flatter; pereopods decreasing in size posteriorly; coxae of pereopod 1 with pleonal locking mechanism; coxae of pereopod 3 with female gonopores, gonopores situated on ventral surface and close to sternal edge of coxa, position of gonopores just anterior to spermatheca; pereopod 5 carried at least subdorsally and possibly fully dorsally, reduced in size compared to other pereopods (adapted from SCHWEITZER & others, 2012, p. 138). *Lower Cretaceous (Albian)–Upper Cretaceous (Cenomanian)*: USA (Texas).—FIG. 2, 4*a–b*. **S. aspera*, USNM 543680, *a*, dorsal carapace; *b*, ventral view of female, Albian, Texas, scale bars, 1 cm (Schweitzer & others, 2012, fig. 6, 1–2).

Xanthosia BELL, 1863, p. 3 [**X. gibbosa*, p. 3, pl. 1, 4–6; SD GLAESSNER, 1929, p. 401]. Carapace transversely ovate, wider than long, length about 58% maximum carapace width, position of maximum width about 60% the distance posteriorly on carapace; front poorly known, axially sulcate; orbits directed forward, fronto-orbital width about 55% maximum carapace width; anterolateral margins nearly straight or slightly convex, with at least five sharp spines; anterolateral margins shorter than posterolateral margins; posterolateral margins sinuous, initially convex, then concave; posterior margins broadly concave; axial regions moderately defined, mesogastric region triangular; protogastric and hepatic regions well differentiated; branchial regions subdivided into three distinct areas; epibranchial region composed of a distal area that embraces last anterolateral spines bounded anteriorly by cervical groove and posteriorly by bg1; mesobranchial region developed as a more or less oblique ovate region bounded anteriorly by cervical groove, laterally by bg1, and axially by bg2; metabranchial region flattened; cervical groove beginning along anterolateral margin about 40% the distance posteriorly, arcing concave forward, then convex forward at base of protogastric region, then concave forward around base of mesogastric region about 55% the distance posteriorly; carapace ornamentation ranging from granular to small tubercles, rarely, as large, spherical swellings; pereopod 5 carried subdorsally; female? abdominal pleonites wide, at least 1–4 free (adapted from SCHWEITZER & others, 2012, p. 131). *Lower Cretaceous (Albian)–Upper Cretaceous (Maastrichtian)*:

France, Switzerland, *Albian*; UK (England), *Cenomanian*; USA (Delaware, New Jersey), *Campanian*; The Netherlands, *Maastrichtian*.—FIG. 2, 5*a*. **X. gibbosa*, syntype, BMNH 36647, Cenomanian, UK, dorsal carapace, scale bar, 1 cm (Schweitzer & others, 2012, fig. 4, 1).—FIG. 2, 5*b*. *X. semiornata* JAGT, COLLINS, & FRAAYE, 1991, holotype, MAB k.0020, Maastrichtian, The Netherlands, dorsal carapace, scale bar, 1 cm (Schweitzer & others, 2012, fig. 4, 3).

Family FELDMANNIIDAE Schweitzer & others, 2012

[Feldmanniidae SCHWEITZER & others, 2012, p. 144]

Carapace wider than long, hexagonal to ovoid outline, fronto-orbital width 60% to 80% maximum width; carapace grooves and regions typically not visible on carapace surface and subtly expressed on molds of interior of carapace; anterolateral margins usually with small spines or nodes; posterior margin generally straight or weakly concave and smooth. Sternum strongly deflexed at about midpoint of sternite 4; sternites 1–3 relatively short, triangular; episternite 4 quadrate, widest part of sternum, separating pereopods 1 and 2; sternites 4 and 5 fused; pleonal locking mechanism may be present on sternite 5 or episternite 5 and coxae of pereopods 1 and 2; sutures 5/6, 6/7, and 7/8 complete, sternite 8 small, strongly deflexed; spermathecal openings in females appearing to be located at axial end of sternite 7 or as an enlargement of suture 7/8, ovate; male gonopores situated very close to axial edge of coxae 5; coxae of pereopods 2–5 closely spaced; coxae 4 and 5 aligned at an angle greater than 70° to plane of carapace; pereopod 5 subdorsal; because of steep angle of sternites 5–8 with 1–4, coxae forming steep arc with dorsal carapace; male and female pleons with all pleonites free, each extending to point of inflection of sternite 4; male pleon straight-sided; female pleon weakly convex, covering entire sternum (adapted from SCHWEITZER & others, 2012, p. 144). *Lower Cretaceous (Albian)–Paleocene (Danian)*.

Bretonia SCHWEITZER & others, 2012, p. 148 [**Xanthosia danielae* COLLINS & BRETON, 2009, p. 47, fig. 8–9; OD]. Carapace wider than long; frontal margin about 34% maximum carapace width measured posterior to midlength; fronto-orbital

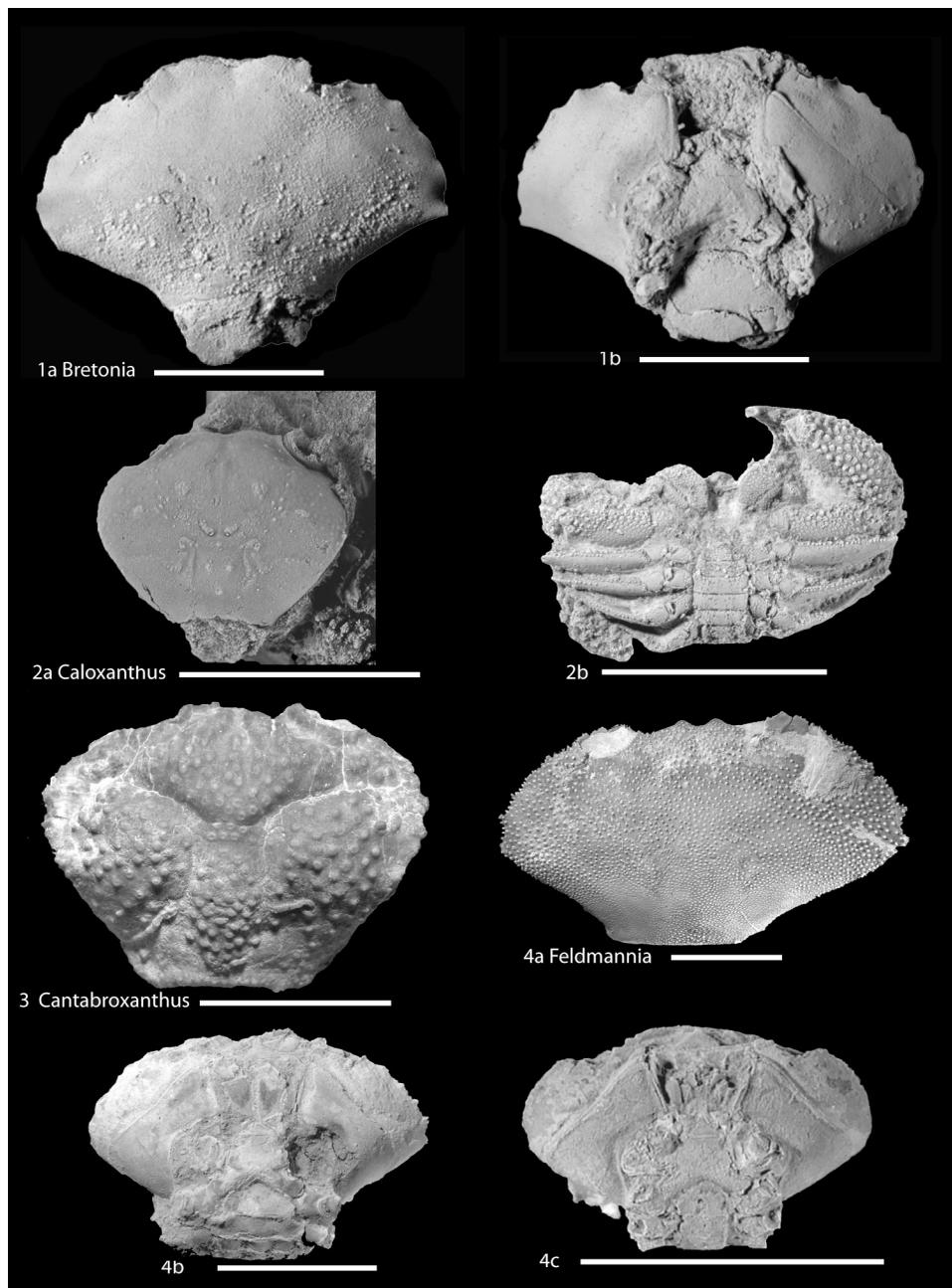


FIG. 3. Family Feldmanniidae (p. 6–8)

margin about 58% maximum width; anterolateral margins convex, bearing 5 short projections; posterolateral margin straight to weakly concave; posterior margin about 37% maximum width, concave. Surface of carapace generally smooth with cardiac region slightly elevated above weakly

vaulted overall surface; carapace grooves indistinct (adapted from Schweitzer & others, 2012, p. 148). *Upper Cretaceous (Cenomanian)*: France.—FIG. 3, 1a–b. **B. danielae*, holotype, MHN LM 2003-1-3798; a, dorsal carapace; b, ventral surface, scale bars, 1 cm (Collins & Breton, 2009, fig. 8B–C).

Caloxanthus A. MILNE-EDWARDS, 1863, p. 282 [**C. formosus*, p. 44, illustrations in 1863, pl. 9, 1; M] [= *Carpiliopsis* FISCHER-BENZON, 1866, p. 28 (type, *C. ornata*, p. 28, pl. 2, 1–3; M); = *Creticarcinus* WITHERS, 1928, p. 461 (type, *C. purleyensis*, p. 461, pl. 13, 4–5; M)]. Carapace wider than long, ovoid, cuticular carapace surface densely and coarsely to finely pustulose, with carapace grooves and regions typically less visible on cuticular surface, subtly expressed on internal molds of carapace; anterolateral margins with small nodes; posterior margin generally straight, smooth; epistome triangular, narrow; buccal cavity subsquare; third maxillipeds long; sternum strongly deflexed at about midpoint of sternite 4; sternites 1–3 relatively short, triangular; sternites 1–4 coarsely granular; episternite 4 quadrate, widest part of sternum, separating pereopods 1 and 2; sternites 4 and 5 fused; sutures 5/6, 6/7 complete, and 7/8 appearing complete but obscured axially; spermatheca in females long, ovate, situated on sternal suture 7/8; coxae of pereopods 2–5 closely spaced; coxae 4 and 5 aligned at an angle greater than 70° to plane of carapace; pereopod 5 more slender than pereopods 2–4, carried dorsally over carapace; male and female pleons unfused, each extending to point of inflection of sternite 4; male pleon straight sided; female pleon weakly convex, covering entire sternum (adapted from Schweitzer & others, 2012, p. 148; Klompmaker & others, 2015, p. 143). *Lower Cretaceous (Albian)–Paleocene (Danian)*: Spain, *Albian*; USA (Texas), *Albian–Cenomanian*; UK (England), *Cenomanian*, *Coniacian–Santonian*; France, *Cenomanian–Santonian*; Austria, *Santonian*; Madagascar, *Campanian*; The Netherlands, *Maastrichtian*; Denmark, France, Germany, *Danian*.—FIG. 3, 2a. *C. ornatus* (FISCHER-BENZON, 1866), MAB k3155, dorsal view (adapted from Klompmaker & others, 2011, fig. 6k).—FIG. 3, 2b. *C. americanus* RATHBUN, 1935, USNM 593695, ventral view, Albian, Texas, scale bars, 5 mm (Schweitzer & others, 2012, fig. 11, 2).

Cantabroxanthus OSSÓ & ISA, 2014, p. 486 [**C. loredoensis*, p. 487, fig. 4; OD]. Carapace wider than long, widest about 38% the distance posteriorly at position of penultimate anterolateral spine; orbits broadly rimmed, front not well preserved, fronto-orbital width about 65% maximum carapace width; anterolateral margins with several small spines, posterolateral margin granular; carapace regions well defined, ornamented with large, regularly spaced tubercles; cervical groove deep, arcing convex forward; branchial regions moderately inflated; posterior axial regions well bounded laterally by grooves. *Upper Cretaceous (Cenomanian)*: Spain.—FIG. 3, 3. **C. loredoensis*, holotype, MMCAN/2014/0003, dorsal carapace with serpulid worm epibionts, scale bar, 5 mm (new, photo provided by A. Ossó & F. Vega).

Feldmannia GUINOT & TAVARES, 2001, p. 521 [**Xanthosia wintoni* RATHBUN, 1935, p. 42, pl. 11, 6–8; OD]. Carapace wider than long, hexagonal

outline, carapace surface densely and finely spinose, with carapace grooves and regions typically not visible on cuticular surface and subtly expressed on internal molds; anterolateral margins with small spines; posterior margin generally straight, smooth; sternum strongly reflexed at about midpoint of sternite 4; sternites 1–4 weakly granular; sternites 1–3 relatively short, triangular; episternite 4 quadrate, widest part of sternum, separating pereopods 1 and 2; sternites 4 and 5 fused, sternite 5 with abdominal holding mechanism; sutures 5/6 and 6/7 complete, 7/8 nearly complete; spermathecal opening ovoid, at axial end of sternite 7; coxae of pereopods 2–5 closely spaced; coxae 4 and 5 aligned at an angle greater than 70° to plane of carapace; because of steep angle of sternites 5–8 with 1–4, coxae forming steep arc with dorsal carapace; male and female pleons unfused, each extending to point of inflection of sternite 4; male pleon straight-sided; female pleon weakly convex, covering entire sternum; chelipeds robust, swollen (adapted from Schweitzer & others, 2012, p. 145). *Lower Cretaceous (Albian)*: USA (Texas).—FIG. 3, 4a–c. **F. wintoni*; a, USNM 543684, dorsal carapace; b, USNM 543686, female ventral surface; c, USNM 543688, male ventral surface, scale bars, 5 mm (Schweitzer & others, 2012, fig. 10, 1, 3, 6).

ABBREVIATIONS FOR MUSEUM REPOSITORIES

- BM, BMNH: The Natural History Museum, London, UK
- JSH Collins Collection: London, UK
- KSU D: Decapod Comparative Collection, Department of Geology, Kent State University, Kent, Ohio, USA
- MAB: Oertijdmuseum De Groene Poort, Boxtel, The Netherlands
- MCZ: Museo Civico “G. Zannato” di Montecchio Maggiore (Vicenza), Italy
- MHN LM: Natural History Museum (Musée Vert), Le Mans, France
- MMCAN: Museo Marítimo del Cantábrico of Santander, Cantabria, Spain
- MNH: Museum National d’Histoire Naturelle, Paris, France
- SM: Sedgwick Museum, Cambridge University, Cambridge, UK
- TMM NPL: Texas Memorial Museum, Non-vertebrate Paleontology, Jackson School of Geosciences, The University of Texas at Austin, USA
- USNM: United States National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA

REFERENCES

- Bell, Thomas. 1863. A monograph of the fossil malacostracous Crustacea of Great Britain, Part II, Crustacea of the Gault and Greensand. Palaeontographical Society Monograph London: 1–40, 11 pl.

- 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.
- Collins, J. S. H., & Gérard 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., & Jeff Saward. 2006. Three new genera and species of crabs from the Lower Eocene of London Clay of Essex, England. Bulletin of the Mizunami Fossil Museum 33:67–76.
- Collins, J. S. H., Loïc Villier, & Gérard Breton. 2013. A new etyid crab (Crustacea, Decapoda) from the Cenomanian of France. Bulletin of the Mizunami Fossil Museum 39:47–49.
- Fischer-Benzon, Rudolf von. 1866. Über das relative Alter des Faxoe-Kalkes und über die in demselben vorkommenden Anomuren und Brachyuren. Schweis'sche Buchhandlung. Kiel. 31 p.
- Fraaije, R. H. B., B. W. M. van Bakel, J. W. M. Jagt, & P. Artal, 2008. New decapod crustaceans (Anomura, Brachyura) from mid-Cretaceous reefal deposits at Monte Orobe (Navarra, northern Spain), and comments on related type-Maastrichtian material. Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, (Sciences de la Terre) 78:193–208.
- Glaessner, M. F. 1929. Crustacea Decapoda. In F. J. Pompeckj, ed., Fossilium catalogus 1: Animalium, (41). W. Junk. Berlin. 464 p.
- Glaessner, M. F. 1969. Decapoda. In R. C. Moore, ed., Treatise on Invertebrate Paleontology. Part R, Arthropoda 4, vol. 2. The Geological Society of America & The University of Kansas Press. Boulder & Lawrence. p. 400–533, 626–628.
- Guinot, Danièle, & Marcos Tavares. 2001. Une nouvelle famille de crabes du Crustacés et la notion de Podotremata Guinot, 1977 (Crustacea, Decapoda, Brachyura). Zoosystema 23:507–546.
- Jagt, J. W. M., J. S. H. Collins, & R. H. B. Fraaye. 1991. A new late Maastrichtian xanthid crab from southern Limburg (the Netherlands). Cretaceous Research 12:553–560.
- Karasawa, Hiroaki, Masaaki Ohara, & Hisayoshi Kato. 2008. New records for Crustacea from the Arida Formation (Lower Cretaceous, Barremian) of Japan. Boletín de la Sociedad Geológica Mexicana 60:101–110.
- Karasawa, Hiroaki, C. E. Schweitzer, & R. M. Feldmann. 2011. Phylogenetic analysis and revised classification of podotrematous Brachyura (Decapoda) including extinct and extant families. Journal of Crustacean Biology 31:523–565.
- Klomp maker, A. A., Pedro Artal, B. W. M. van Bakel, R. H. B. Fraaije, & J. W. M. Jagt. 2011. Etyid crabs (Crustacea, Decapoda) from mid-Cretaceous reefal strata of Navarra, Northern Spain. Palaeontology 54:1199–1212.
- Klomp maker, A. A., Matúš Hyžný, & S. L. Jakobsen. 2015. Taphonomy of decapod crustacean cuticle and its effect on the appearance as exemplified by new and known taxa from the Cretaceous–Danian crab Caloxanthus. Cretaceous Research 55:141–151.
- Mantell, G. A. 1822. The Fossils of the South Downs; Or Illustrations of the Geology of Sussex. Lupton Relfe. London. 327 p., 42 pl.
- Mantell, G. A. 1844. Medals of Creation. H. G. Bohn. London. 1016 p., 6 pl.
- M'Coy, Frederick. 1854. On some new Cretaceous Crustacea. Annals and Magazine of Natural History (2)14:116–122.
- Milne-Edwards, Alphonse. 1863. Monographie des Crustacés de la famille Cancériens. Annales des Sciences Naturelles, (Zoologie) (4) 20 [1863]: 273–324, pl. 5–12.
- Ossó, Àlex, & Manuel Díaz Isa. 2014. *Cantabroxanthus loredoensis* new genus, new species (Decapoda, Brachyura, Etyoidea) from the Middle Campanian of Loredo, Ribamontán al Mar, (Cantabria, northern Spain). Boletín de la Sociedad Geológica Mexicana 66:438–489.
- Rathbun, M. J. 1935. Fossil Crustacea of the Atlantic and Gulf Coastal Plain. Geological Society of America (Special Paper) 2:i–viii, 1–160.
- Schweitzer, C. E., R. M. Feldmann, Ovidiu Franțescu, & Adiël Klomp maker. 2012. Revision of Etyidae Guinot and Tavares, 2001 (Crustacea: Brachyura). Journal of Paleontology 86:129–155.
- Schweitzer, C. E., R. M. Feldmann, Alessandro Garasino, Hiroaki Karasawa, & Günter Schweigert. 2010. Systematic list of fossil decapod crustacean species. Crustaceana Monographs, 10. Brill. Leiden. 222 p.
- Schweitzer, C. E., R. M. Feldmann, W. L. Rader, & Ovidiu Franțescu. 2016. Early Cretaceous (Albian) decapods from the Glen Rose and Walnut formations of Texas, USA. Bulletin of the Mizunami Fossil Museum 42:1–22.
- Secretan, Sylvie. 1964. Les Crustacés du Jurassique supérieur et Crétacé de Madagascar. Mémoires du Muséum National d'Histoire Naturelle, Paris 156:1–223.
- Withers, T. H. 1928. New Cretaceous crabs from England and Syria. Annals and Magazine of Natural History (10)2:457–461, pl. 13.
- Wright, C. W., & J. S. H. Collins. 1972. British Cretaceous crabs. Palaeontographical Society Monographs 126(533):1–113.