A Stereo-Atlas of Ostracod Shells

edited by J. Athersuch, D. J. Horne, J. W. Neale, and David J. Siveter

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Contributions illustrated by scanning electron micrographs of Ostracoda in stereo-pairs are invited. Format should follow the style set by the papers in this issue. Descriptive matter apart from illustrations should be cut to a minimum; preferably each plate should be accompanied by one page of text only. Blanks to aid in mounting figures for plates may be obtained from any one of the Editors or Editorial Board. Completed papers should be sent to Dr David J. Siveter.

The front cover shows a male right valve of Semicytherura striata (Sars) from intertidal algae collected at Blue Anchor, Somerset SW England. Photograph by Dr J. E. Whittaker, British Museum (Natural History), London.

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LOXOCONCHA PRAEPONTICA PRAEPONTICA

ON LOXOCONCHA PRAEPONTICA PRAEPONTICA

by Caroline A. Maybury & Robin C. Whatley

(Untiversity College of Wales, Aberystwyth)


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ON LOXOCONCHA PRAEPTONICA MAGNA
MAYBURY & WHATLEY subsp. nov.

by Caroline A. Maybury & Robin C. Whatley
(University College of Wales, Aberystwyth)

Loxoconcha praepontica magna subsp. nov.

Holotype: British Museum (Nat. Hist.) no. OS 12871; ♀ LV.
Type locality: Mixed sample, Sample No. 1, Vicarage Pit, St. Erth, Cornwall, England (Nat. Grid Ref. SW 556352); Upper Pliocene.
Derivation of name: Latin, referring to the greater size of this subspecies relative to the nominate subspecies, Loxoconcha praepontica praepontica Maybury & Whatley (Stereo-Atlas Ostracod Shells, 15, 1–4, 1988).

Explanation of Plate 15, 6
Fig. 1, ♀ LV, ext. lat. (holotype, OS 12871, 640 μm long); fig. 2, ♀ RV, ext. lat. (paratype, OS 12872, 640 μm long); fig. 3, ♂ RV, ext. lat. (paratype, OS 12874, 630 μm long).
Scale A (200 μm; × 100), figs. 1–3.

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Loxoconcha praepontica magna (3 of 4)

Figured specimens: British Museum (Nat. Hist.) nos. OS 12871 (holotype, ♀ LV: Pl. 15, 6, fig. 1). OS 12872 (paratype, ♀ RV: Pl. 15, 6, fig. 2), OS 12874 (paratype, ♂ RV: Pl. 15, 6, fig. 3), OS 12873 (paratype, ♀ LV: Pl. 15, 8, fig. 1), OS 12875 (paratype, ♀ RV: Pl. 15, 8, figs. 2–4).
Specimen OS 12872 is from the same sample as the holotype and specimens OS 12873, OS 12874, and OS 12875 are from the type locality and type horizon, Sample Nos. 7, 29 and 13 respectively. See C. Maybury. Taxonomy, Palaeoecology and Biostratigraphy of Pliocene Benthonic Ostracoda from St. Erth and North West France, unpubl. PhD thesis, Univ. Wales, 1, 4–5, 1985 for sample details.

Diagnosis: A medium, punctate, subovate subspecies of Loxoconcha praepontica with a faint reticulation peripherally around free margins, proximal to the flange. Puncta largest medianly which area is also 'wrinkled' due to the development of weak, subhorizontal muri. Sieve plates conspicuous. Internal features as for the genus.

Remarks: This subspecies can be distinguished from Loxoconcha praepontica praepontica by its larger size, its lack of pronounced tumidity posteroventrally and its more regularly ordered ornament of coarser puncta and less prominent reticulum. Both subspecies possess prominent sieve plates and are punctate with weakly developed reticulae. The two subspecies are exclusive to the Upper Pliocene; L. praepontica magna is found in Cornwall and L. praepontica s.s. in NW France.
The differences between L. praepontica Klie and L. praepontica praepontica are outlined in Maybury & Whatley (Stereo-Atlas Ostracod Shells, 15, 1–4, 1988).

Distribution: This subspecies is confined to the Upper Pliocene deposits of St. Erth, Sample Nos. 1, 7, 13–14, 21, 23, 25–29 (see C. Maybury, op. cit. for sample details).

Explanation of Plate 15, 8
Fig. 1, ♀ LV, ext. lat. (paratype, OS 12873, 600 μm long); fig. 2–4, ♀ RV (paratype, OS 12875, 640 μm long); fig. 2, int. lat.; fig. 3, ant. hinge element; fig. 4, post. hinge element.
Scale A (200 μm; × 100), figs. 1, 2; scale B (40 μm; × 244), figs. 3, 4.
ON LOXOCONCHA PARARHOMBOIDEA WHATLEY & MAYBURY sp. nov.

by Robin C. Whatley & Caroline A. Maybury
(University College of Wales, Aberystwyth)

Loxoconcha pararhomboidea sp. nov.


Holotype: British Museum (Nat. Hist.) no. OS 12876; ♀ LV.

Type locality: Mixed sample, Sample No. 1, Vicarage Pit, St. Erth, Cornwall, England (Nat. Grid Ref. SW 556352); Upper Pliocene.

Derivation of name: Latin, because of its close morphological relationship to Loxoconcha rhomboidea (Fischer) (Abh. bayer. Akad. Wiss., 74, 656, 1855).

Figured specimens: British Museum (Nat. Hist.) nos. OS 12876 (holotype, ♀ LV; Pl. 15, 10, fig. 1), OS 12877 (paratype, ♀ RV; Pl. 15, 10, fig. 2), OS 12878 (paratype, ♂ RV; Pl. 15, 10, fig. 3), OS 12879 (paratype, ♀ RV; Pl. 15, 12, fig. 1), OS 12880 (paratype, ♂ LV; Pl. 15, 12, fig. 2), OS 12881 (paratype, ♂ LV; Pl. 15, 12, fig. 3).

Specimens OS 12877 and OS 12878 are from the same sample as the holotype; specimen OS 12879 is from the type locality and type horizon. Sample No. 29 (blue clay) (see C. Maybury.

Explanation of Plate 15, 10

Fig. 1, ♀ LV, ext. lat. (holotype OS 12876, 530μm long); fig. 2, ♂ RV, ext. lat. (paratype OS 12877, 550μm long); fig. 3, ♂ RV, ext. lat. (paratype OS 12878, 600μm long).

Scale A (100μm; ×108), figs. 1–3.

Loxoconcha pararhomboidea (3 of 4)

Figured specimens (cont.): Taxonomy, Palaeoecology and Biostratigraphy of Pliocene Benthonic Ostracoda from St. Erth and North West France, unpubl. PhD thesis, Univ. Wales, 1, 4–5, 1985 for sample details). Specimens OS 12880 and OS 12881 are from a sample of yellow marl, the “cutting” at Palluau II (approx. lat. 46°48’N, long. 1°37’W) 50m SW of the Martineau pit, near Le Pas, NW France; Redonian, Upper Pliocene, (see J.-P. Margerel, Les Foraminifères du Redonien, Systématicque, Répartition stratigraphique, Paléontologie, Nantes, 1, 8–26, 1968 for further details of the Palluau II sample).

Diagnosis: Small to medium in size; like Loxoconcha rhomboidea but smaller, with a narrower posteroventral marginal rim and consistently larger punctae. Oral incurvature slight.

Remarks: The Coralline Crag specimens described by Wilkinson (1980, op. cit.) as L. rhomboidea are conspecific with the present material. The length of the female left valve (543μm) in Wilkinson’s material approaches more closely to that of the new species (470–530μm long) than to L. rhomboidea (585–659μm long. see J. Athersuch and J. E. Whittaker, Stereo-Atlas Ostracod Shells, 3, 81–90, 1976).

British and French Pliocene specimens differ in size. Adult French specimens are always smaller than their British counterparts; a difference likely to have arisen as a consequence of geographical separation. Compare the British specimens illustrated in Pl. 15, 10, figs. 1–3 and Pl. 15, 12, fig. 1 with the French examples in Pl. 15, 12, figs. 2, 3.

Distribution: This species has been recovered from the late Pliocene deposits of St. Erth (Sample Nos. 1–3, 7, 10–11, 13–14, 16, 18, 21, 23, 25–29) and the Redonian (Upper Pliocene) deposits of Apigné (Gîte d’Apigné, Borchole II, Le Temple du Cerisier), Beugnon (Sample No. 2), Le Bosc d’Aubigné, Le Pigeon Blanc, Palluau I, Palluau II and Saint-Jean-la-Poterie (Sample Nos. 1549.11–1549.12, 1549.15), NW France.

Explanation of Plate 15, 12

Fig. 1, ♂ RV, int. lat. (paratype OS 12879, 540μm long); fig. 2, ♀ LV, ext. lat. (paratype OS 12880, 490μm long); fig. 3, ♀ LV, int. lat. (paratype OS 12881, 470μm long).

Scale A (100μm; ×108), figs. 1–3.
Palmoconcha hornei (1 of 4)


595.337.14 (118.22) (44 : 162.001.47 + 002.48) : 551.35 (26.03) : 552.51

ON PALMOCONCHA HORNEI MAYBURY & WHATLEY sp. nov.
by Caroline A. Maybury & Robin C. Whatley
(University College of Wales, Aberystwyth)

Palmoconcha hornei sp. nov.

Holotype: British Museum (Nat. Hist.) no. OS 12855; ♀ LV.
[Paratypes: British Museum (Nat. Hist.) nos. OS 12856–OS 12860].

Type locality: Shell-rich sand, Le Temple du Cerisier, SW of Rennes (approx. lat. 48°07’ N, long. 1°41’ W), NW France; Redonian. Upper Pliocene.

Derivation of name: In honour of Dr. David Horne in recognition of his studies of the Loxoconchoidea.

Figured specimens: British Museum (Nat. Hist.) nos. OS 12855 (holotype, ♀ LV: Pl. 15, 14, fig. 1), OS 12856 (paratype, ♂ LV: Pl. 15, 14, fig. 2), OS 12857 (paratype, ♀ RV: Pl. 15, 14, fig. 3), OS 12858 (paratype, ♂ RV: Pl. 15, 16, fig. 1), OS 12859 (paratype, ♀ car.: Pl. 15, 16, fig. 2), OS 12860 (paratype, ♂ car.: Pl. 15, 16, fig. 3).

Specimens OS 12856–OS 12858 are from the same sample as the holotype. Specimens OS 12859–OS 12860 are from L’Orchère Pincourt (approx. lat. 47°22’ N, long. 0°43’ W), NW France; Redonian. Upper Pliocene (see J.-P. Margerel. Les Foraminifères du Redonien. Systématique, Répartition stratigraphique, Paléoécologie, Nantes, 1, 8–26. 1968 for further sample details).

Explanation of Plate 15, 14

Fig. 1, ♀ LV, ext. lat. (holotype, OS 12855, 450μm long); fig. 2, ♂ LV, ext. lat. (paratype, OS 12856, 470μm long); fig. 3, ♂ RV, ext. lat. (paratype, OS 12857, 480μm long).
Scale A (100μm: × 135), figs. 1–3.

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Palmoconcha hornei (3 of 4)

Diagnosis: A small, subelliptical species of Palmoconcha with a broadly rounded anterior; caudate posterior; dorsal margin straight in males and female right valve, slightly arcuate in female left valve; ventral margin sinuous. Ornament of concentrically ordered reticulum peripherally and puncta medianly and ventromedially. Marginal rim and eye spot smooth. Inner lamella with broad anterior and narrow posterior vestibula. Selvage in right valve very distal. Flange well developed. Hinge and muscle scars typical of the genus.

Remarks: In external carapace morphology Palmoconcha hornei and P. edentonensis (Swain, 1951) sensu Hazel, 1977 non P. edentonensis (Swain, 1951) (see J. E. Hazel. J. Res. U.S. Geol. Surv., 5 (3), 377, 384, pl. 19, fig. t. 1977), a late Pliocene to early Pleistocene, N American species, are similar in lateral outline and in possessing a concentrically ordered reticulate ornament. The two species differ in size and ornamental detail. The species which Hazel illustrates (length of female left valve approx. 600 μm) is 25% longer than females of P. hornei and possesses concentrically ordered reticulae over its entire lateral surface except for the marginal rim which has a minutely punctate ornament, whereas in P. hornei, the valves are punctate medianly and ventromedially and the marginal rim is smooth.

Distribution: This species has been recovered from the Redonian, Upper Pliocene deposits of Apigné (Gite d’Apigné Borehole II), Le Temple du Cerisier, Bas Briacé, Beugnon (sample nos. 1, 2), Falleron, L’Orchère Pincourt and Le Pigeon Blanc NW France. A single female carapace of P. hornei has also been noted by the authors in a Miocene sample from Pontlevoy, NW France (see J.-P. Margerel op. cit. for the geographical, stratigraphical and sample details of the Redonian material).

Explanation of Plate 15, 16

Fig. 1, ♂ RV, int. lat. (paratype, OS 12858, 460μm long); fig. 2, ♀ car., ext. dors. (paratype, OS 12859, 440μm long); fig. 3, ♂ car., ext. dors. (paratype, OS 12860, 460μm long).
Scale A (100μm: × 135), figs. 1–3.
Genus WEBBYLLA gen. nov.
Type-species: Webbylla cyma sp. nov.

Derivation of name:
In honour of Dr. Barry D. Webby, University of Sydney, Australia.

Diagnosis:
A genus of Drepanellidae with three bulb-like nodes at the dorsal border (N1, N3, N4), and a very weak forth node (N2) more or less completely fused with N1. N1 and N4 are connected ventrally by a crescent-shaped pseudovulum which ends in a blunt protuberance posteroventrally of N4. Anteriorly the pseudovulum continues in front of N1 and terminates near the dorsal border. N2, N3 and the pseudovulum almost completely encircle a more or less distinct muscle spot (=S2) which has a small, oblique sulcal-like continuation to the dorsal border between N1/2 and N3. Shell smooth or reticulate.

Remarks:
The nearest relative of Webbylla is Dominina Burrett & Laurie, 1983 (in Burrett et al., Mem. Ass. Australs. Palaeontol., 1, 1903) from the middle Ordovician of Tasmania. Dominina exhibits similar lobal features and also has a connection between N1 and N4 (op. cit., fig. 15), but its pseudovulum lacks a posterior ventral protuberance and is not present in front of N1 as in the more advanced, upper Ordovician Webbylla.

Explanation of Plate 15, 18

Fig. 1, car., lat. lat. (holotype, SUP 52900, 2.14 mm long); fig. 2, RV, ext. lat. (SUP 52901, 2.34 mm long); fig. 3, car., dors. (SUP 52902, 2.17 mm long).
Scale A (250μm; × 35), figs. 1, 2; scale B (250μm; × 25), fig. 3.

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Webbylla cyma sp. nov.


Holotype: University of Sydney, Australia; Palaeontology (SUP) no. 52900; carapace.
[Paratypes: SUP 52901 – 52906].

Type locality: Billabong Creek, Gunningbland – Parkes, western central New South Wales, Australia, 33° 11.5' S, 147° 59' E; Billabong Creek Limestone, lower Eastonian, upper Ordovician.

Derivation of name: Latin, cyma, young shoot, sprout; alluding to the ends of the pseudovulum.

Figured specimens:
University of Sydney, SUP nos. 52900 (holotype, car.: Pl. 15, 18, fig. 1), 52901 (RV: Pl. 15, 18, fig. 2), 52902 (car.: Pl. 15, 18, fig. 3), 25903 (LV: Pl. 15, 20, fig. 1), 25904 (RV: Pl. 15, 20, fig. 2), 52905 (car.: Pl. 15, 20, fig. 3). All of the figured specimens are from the type locality.

Diagnosis: Species of Webbylla in which the anterior part of the pseudovulum extends anterodorsally to meet the dorsal border. Node N4 more prominent than N3; N2 confluent with N1 and is virtually obsolete. Marginal surface of valve is relatively narrow. Shell surface smooth. Valve length up to 2.34 mm.

Remarks: In an undescribed subspecies of W. cyma from the slightly older Geryong Limestone Member of the Daylesford Limestone, Bowan Park, New South Wales, nodes N3 and N4 are nearly equally strongly developed and the pseudovulum ends a little below the dorsal border.

W. cyma differs from the older W. reticulata Schallreuter & Siveter, 1988 (Stereo-Atlas Ostracod Shells, 15, 21) in being smaller and in having unequally developed N3 and N4, a narrower marginal surface and a pseudovulum which reaches the dorsal border.

The present material is silicified. In nearly all specimens (more than 50 carapaces and 100 single valves) the muscle spot is broken (or not silicified). The reason is unknown; often this part of the shell in palacocopes is stronger than adjacent parts.

Distribution: Known, so far, only from the type locality.

Acknowledgement: We thank Dr. Barry Webby for sending us the material to study.

Explanation of Plate 15, 20

Fig. 1, LV, ext. lat. (SUP 52903, 2.18 mm long); fig. 2, RV, int. lat. (SUP 52904, 2.20 mm long); fig. 3, car., vent. (SUP 52905, 2.06 mm long).
Scale A (250μm; × 35), figs. 1, 2; scale B (250μm; × 25), fig. 3.
Webbylla reticulata sp. nov.

Holotype: University of Sydney, Australia; Palaeontology (SUP) no. 52907; LV.
[Paratypes: SUP 52908–52912].

Type locality: About 1 km NE of Quondong Loc, BS5, Bowan Park, western New South Wales, Australia, 33°20' S, 148°56' E (see Semeniuk, V., J. Proc. R. Soc. N.S.W., 103, 16–17, 1970); Bourimble Limestone Member, Daylesford Limestone (upper Gisbornian or lower Eastonian), upper Ordovician.

Derivation of name: With reference to the partly reticulate shell.

Figured specimens: University of Sydney, SUP nos. 52907 (holotype, LV; Pl. 15, 22, fig. 1), 52908 (incomplete LV; Pl. 15, 22, figs. 2–4), 52909 (RV; Pl. 15, 24, fig. 1), 52910 (LV; Pl. 15, 24, fig. 2), 52911 (car.; Pl. 15, 24, fig. 3). All of the figured specimens are from the type locality and all are silicified.

Explanation of Plate 15, 22

Fig. 1. LV, ext. lat. (holotype, SUP 52907, 1.66 mm long). Figs. 2–4, ant. and posterovent. incomplete LV (SUP 52908, 1.64 mm long); fig. 2, ext. lat.; fig. 3, ext. lat. detail of muscle spot and impression of presumed accessory ant. muscle scar; fig. 4, ext. lat., slightly tilted, detail of ventral marginal surface.

Scale A (250µm; ×45), fig. 1; scale B (250µm; ×48), fig. 2; scale C (100µm; ×65), figs. 3, 4.

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Diagnosis: Species of Webbylla in which nodes N3 and N4 are about equally strongly developed and the anterior part of the pseudovellum ends some distance below the valve dorsal border. Valve marginal surface is relatively broad. Reticulation on the pseudovellum and also often on the nodes. Valve length up to 1.77 mm.

Remarks: W. reticulata is smaller than the type-species, W. cyma Schallreuter & Siveter, 1988 (Stereo-Atlas Ostracod Shells, 15, 17) from the younger Billabong Creek Limestone of the Parkes Platform of western New South Wales. It is further distinguished by having nearly equally strongly developed N3 and N4, an anterodorsally shorter pseudovellum, a broader marginal surface and a partly reticulate shell.

An undescribed subspecies of W. cyma from the Geryong Limestone Member of the Daylesford Limestone, which is younger than W. reticulata and older than W. cyma cyma (cf. Webby, B. D. & Morris, D. G., J. Proc. R. Soc. N.S.W. 109, 126, 1976) has an intermediate morphological position between W. reticulata and W. cyma cyma.

W. reticulata exhibits a small, pit-like impression in front of the non-reticulate muscle spot (Pl. 15, 22, figs. 2, 3). Such a feature was observed in Platybolbina ruminca by Schallreuter & Krutta (Stereo-Atlas Ostracod Shells 11, 125, Pl. 11, 126, figs. 1, 3, 1984). It was considered to be the impression of an accessory muscle scar (op. cit., 11, 126).

Distribution: So far known only from the type locality. The drepanellid Pilla piformis Schallreuter & Siveter, 1988 (Stereo-Atlas Ostracod Shells, 15, 25) also occurs there.

Acknowledgement: We thank Dr Barry Webby, University of Sydney, for sending us the material to study.

Explanation of Plate 15, 24

Fig. 1. RV, ext. lat. (SUP 52909, 1.66 mm long); fig. 2, LV, int. lat. (SUP 52910, 1.61 mm long); fig. 3, car., vent. (SUP 52911, 1.34 mm long).

Scale A (250µm; ×50), figs. 1, 2; scale B (250µm; ×40), fig. 3.
ON PILLA PIFORMIS
SCHALLREUTER & SIVETER gen. et sp. nov.

by Roger E. L. Schallreuter & David J. Siveter

(University of Hamburg, West Germany & University of Leicester, England)

Genus PILLA gen. nov.
Type-species: Pilla piformis sp. nov.

Derivation of name: From the Greek Pi; resemblance of the pattern formed by the main nodes and pseudovelum, when turned through 180°, to the sixteenth letter of the Greek alphabet.

Diagnosis: A genus of Drepanellidae with two distinct bulb-like nodes (N1, N4) at the dorsal border and a very weak N2 fused with N1. N1 and N4 connected ventrally by a broad, crescent-shaped lobe-like pseudovelum which posteroventrally of N4 forms a rounded but somewhat pointed protuberance and which anteriorly extends in front of N1 to reach the dorsal border. N3 is lacking.

Remarks: Pilla is distinguished from the Australian genera, Dominina Burrett & Laurie (in Burrett et al., Mem. Ass. Australas. Palaeontols 1, 191, 1983) and Webbylla Schallreuter & Siveter (Stereo-Atlas Ostracod Shells 15, 17, 1988) mainly by the lack of N3. It differs further from Dominina by the

Explanation of Plate 15, 26
Fig. 1. vent. incomplete RV, ext. lat. (holotype, SUP 52913, 1.59 mm long). Figs. 2-3, marginal incomplete RV (SUP 52914, 1.45 mm long): fig. 2, ext. lat.; fig. 3, ext. dors. fig. 4, RV, ext. vent. (SUP 52915, 1.52 mm long).

Scale A (250 μm; × 50); figs. 1, 2; scale B (250 μm; × 30), figs. 3, 4.

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Pilla piformis (3 of 4)

Remarks (cont.): posteroventral protuberance and in having the pseudovelum present anteriorly. Dominina, Webbylla and Pilla are a closely related group of genera within the Drepanellidae. This group exhibits closer affinities to the typical North American representatives of the family such as Drepanella Ulrich, 1890 and Scofieldia Ulrich & Bassler, 1908 than to the European members such as Duplexibollia Schallreuter, 1987.

Pilla piformis sp. nov.

Holotype: University of Sydney, Australia; Palaeontology (SUP) no. 52913; RV.
[Paratypes: SUP 52914–52917].

Type locality: About 1 km NE of Quondong (Loc. BS5), Bowan Park, western New South Wales, Australia, 33° 20' S, 148° 56' E (see Semeniu, V., J. Proc. R. Soc. N.S.W., 103, 16–17, 1970); Bourimbla Limestone Member, Daylesford Limestone (upper Gisbornian or lower Estonian), upper Ordovician.

Derivation of name: As for the genus.

Figured specimens: University of Sydney, SUP nos. 52913 (RV: Pl. 15, 26, fig. 1), 52914 (RV: Pl. 15, 26, figs. 2, 3), 52915 (RV: Pl. 15, 26, fig. 4; Pl. 15, 28, figs. 2–4), 52916 (RV: Pl. 15, 28, fig. 1). All specimens are from the type locality and all are silicified.

Diagnosis: As for genus. Pilla is currently monotypic.

Remarks: The surface reticulation characteristic of this species has, unfortunately, been effaced from parts of some specimens (e.g. Pl. 15, 26, fig. 2; Pl. 15, 28, fig. 1) during preparation.

Distribution: So far known only from the type locality. The drepanellid Webbylla reticulata Schallreuter & Siveter, 1988 (Stereo-Atlas Ostracod Shells, 15, 21) also occurs there.

Acknowledgement: We thank Dr. Barry Webby, University of Sydney, for sending us the material to study.

Explanation of Plate 15, 28
Fig. 1. anterodors. incomplete RV, ext. lat. (SUP 52916, 1.71 mm long). Figs. 2–4, posterodors. incomplete RV (SUP 52915): fig. 2, ext. lat.; fig. 3, ext. lat. obl., detail of reticulation; fig. 4, ext. details of vent. marginal surface.

Scale A (250 μm; × 45), fig. 1; scale B (250 μm; × 50), fig. 2; scale C (50 μm; × 150), fig. 3; scale D (25 μm; × 300), fig. 4.
ON TRICORNINA (BOHEMINA) PARAGRACILIS (BLUMENSTENGEL)

by Gerhard Becker
(University of Frankfurt, West Germany)

Tricornina (Bohemina) paragracilis (Blumenstengel, 1965)

1965 Bohemina paragracilis sp. nov. H. Blumenstengel, Freiberger ForschHft., C 183, 18, pl. 2, figs. 1–6, pl. 14, figs. 1–3, tabs. 1, 6.

1982 Tricornina (Bohemina) paragracilis, Blumenstengel; G. Becker, Palaeontographica A, 178, 146–147, pl. 9, figs. 11–18, tab. 1 (q.v. for full synonymy).

1988 Tricornina (Bohemina) paragracilis, Blumenstengel; G. Becker, Geologisches Jahrbuch Hessen, 116, pl. 1, figs. 1–3, 4a–b, 5a–b, 6–8u, pl. 2, figs. 4c, 5c, 8b–9.

Holotype: Geological Institute, “Bergakademie” of Freiberg, German Democratic Republic, specimen unnumbered; an adult LV.

Type locality: Bohlen, Kahlleite Quarry, German Democratic Republic; shales with limestone nodules, do IIβ, Cheiloceras stage. Upper Devonian. Cephalopod facies, ostracod faunas of Thuringian and entomozaon ecotypes.

Explanation of Plate 15, 30

Fig. 1, ♀ RV, ext. lat. (SMF Xe 13950, 825μm long); fig. 2, juv. LV, ext. lat. (SMF Xe 13948, 700μm long); fig. 3, ♀ RV, ext. lat. (SMF Xe 13951, 789μm long).

Scale A (300μm; x 90), figs. 1, 3; scale B (300μm; x 65), fig. 2.

Tricornina (Bohemina) paragracilis (3 of 4)

Figured specimens: “Forschungs-Institut Senckenberg” (SMF). Federal Republic of Germany, nos. SMF Xe 13948 (juv. LV; Pl. 15, 30, fig. 2; Pl. 15, 32, fig. 2), SMF Xe 13950 (♀ RV; Pl. 15, 30, fig. 1; Pl. 15, 30, fig. 1), SMF Xe 13951 (♂ RV; Pl. 15, 30, fig. 3; Pl. 15, 32, fig. 3). Collected by W. Ziegler.

Diagnosis: Tricornina (Bohemina) species with strong lateral spine, subcentrally situated, without noticeably broadened base. Lateral surface smooth to more or less closely spinose. Sexual dimorphism: ornamental extradomicial. Adult tecnomorphs with single adventral ridge or row of denticles; juveniles with additional ornamented adventral field. Heteromorphs with two smooth or dentate adventral ridges.

Remarks: Blumenstengel (1965, op. cit) describes the specimens from E Thuringia as having 1–2, partially dentate adventral ridges. The Rhenish material herein indicates that this “variability” may be due to sexual dimorphism. In tecnomorphic valves from the Sauerland area, adventral denticles are developed, becoming smaller towards the dorsal parts of the valve. The subventral field (of the juveniles only?) shows delicately dentate ripplings (cf. also the greater magnifications in Becker 1988, pl. 1, figs. 6d and 8a). T. paragracilis is believed to be a nectobenthic species.


Explanation of Plate 15, 32

Fig. 1, ♀ RV, vent. obl. (SMF Xe 13950); fig. 2, juv. LV, vent. obl. (SMF Xe 13948); fig. 3, ♀ RV, vent. obl. (SMF Xe 13951).

Scale A (300μm; x 90), figs. 1, 3; scale B (300μm; x 65), fig. 2
ON BRADLEYA NORMANI (BRADY)

by David W. Foster & Roger L. Kaesler

(University of Kansas, Lawrence, Kansas, USA)

Bradleya normani (Brady, 1865)

1865 Cythere normani sp. nov. G. S. Brady. Trans. zool. Soc. Lond., 5, 379–380, pl. 61, figs. 5a–d.
1880 Cythere normani Brady; G. S. Brady. Rep. scient. Results Voy. Challenger, Zoology, 1, 101–102 (pars), pl. 17, figs. 3a–d only (non pl. 26, figs. 4a, b).
1972 Bradleya normani (Brady); R. H. Benson. Smithsonian Contributions to Paleobiology, no. 12, 38–39, fig. 13C. pl. 2, fig. 7, pl. 7, fig. 8.

Lectotype: Designated herein. Hancock Museum, Newcastle-upon-Tyne, England, no. 1,32,32; ♀ right valve, 780 μm long.

[Parallectotype: middle specimen of three on slide no. 2,06,32.]

Type locality: Abrolhos Bank off Brazil (approx. lat. 17°30'S, long. 39°00'W), depth unknown; Recent, marine. Hancock Museum, Newcastle-upon-Tyne, England, no. 1,32,32 (lectotype, ♀ RV: Text-fig. 1d).

Museum of Invertebrate Paleontology, University of Kansas, USA, nos. 1,122,943 (♀ LV, morph 1: Pl. 15, 34, fig. 1; Pl. 15, 36, fig. 3; Text-fig. 1a), 1,122,948 (♀ LV, morph 2: Pl. 15, 34, fig. 2; Text-fig. 1b), 1,122,945 (♀ LV, morph 3: Pl. 15, 34, fig. 3; Text-fig. 1c), 1,122,933 (♀ RV: Pl. 15, 36, fig. 1), 1,122,939 (♀ RV: Pl. 15, 36, fig. 2), 1,122,934 (♀ LV: Pl. 15, 36, fig. 4).

All except lectotype are from Recent sediment, lat. 52°30'–51°5’S, long. 73°55’W, depth 526.7 m, Strait of Magellan, off southern Chile (SE Pacific) from dredge samples collected in 1969 by the junior author aboard N.S.F. RV Hero, cruise 69–5.

Diagnosis: Carapace large, with coarse primary reticulation; some simplification of reticular pattern by reduction of muri and partial fusion of fossae. Muri characteristically foveolate. Subcentral

Explanation of Plate 15, 34

Fig. 1. ♀ LV, morph 1, ext. lat. (1,122,943, 927 μm long); fig. 2. ♀ LV, morph 2, ext. lat. (1,122,948, 905 μm long); fig. 3. ♀ LV, morph 3, ext. lat. (1,122,945, 909 μm long).

Scale A (500 μm; × 58), figs. 1–3.

Stereo-Atlas of Ostracod Shells 15, 35

Bradleya normani (3 of 4)

Diagnosis (cont.): Tubere strongly developed. Ocular ridge weak, posterior median ridge replaced by sublinear box-like arrangement of fossae. Ventrolateral carina with terminal spine, more strongly developed than dorsal carina. Marginal spines concentrated on anteroventral and posteroventral margins. Blind. Appendages unknown.

Remarks: This species is morphologically quite variable. We have identified three morphs, each with a different posteroventral reticular pattern, which are characterized by the specimens illustrated in Pl. 15, 34, figs. 1–3 and detailed in Text-fig. 1. Fossae of morph 1 are surrounded and separated by thick to moderately thick muri. Muri of morph 2 are greatly reduced between three pairs of fossae resulting in partial fusion of the fossae. Morph 3 is characterized by weak muri between two pairs of fossae and a fully fused, much smaller fossa capping the two. The lectotype belongs to morph 2; fossae of the paralectotype are infilled with a matrix that obscures the reduced murae. Males are rare, comprising less than five percent of our collections.

Text-fig 1. Camera-lucida drawing of posteroventral reticular pattern of three morphs and the lectotype of Bradleya normani.

Distribution: Atlantic Ocean, eastern Pacific Ocean, southern oceans; typically found in upper bathyal depths but shallower at high latitudes.

Acknowledgements: We are grateful to R. H. Benson, K. G. McKenzie, J. E. Whittaker, D. J. Horne, and P. S. Davis for their help with various aspects of the research. Our work was partially supported by National Science Foundation grants GA-12472 and GV-25157 and by The University of Kansas General Research Fund, grant 3656-20-0038.

Explanation of Plate 15, 36

Fig. 1. ♀ RV, morph 1, ext. lat. (1,122,933, 873 μm long); fig. 2. ♀ RV, int. lat. (1,122,939, 909 μm long); fig. 3. ♀ LV, ext. lat., detail of posteroventral reticular pattern, morph 1 (1,122,943); fig. 4. ♀ LV, int. lat., detail of muscle-scar pattern (1,122,934).

Scale A (500 μm; × 58), figs. 1, 2; scale B (100 μm; × 290), fig. 3; scale C (100 μm; × 225), fig. 4.
ON RETICULOCOSTA ORNATORETICULATA (REYMENT)

by Richard Reyment

(Department of Historical Geology & Palaeontology, University of Uppsala, Sweden)

Genus RETICULOCOSTA Gründel, 1974

Type-species (by original designation): Veenia (Veenia) ornatoareticulata Reyment, 1963.

Diagnosis: Lateral outline of carapace rectanguoid, with rounded anterior margin and bluntly pointed posterior. Left valves have a weak hinge-car. Lateral surface irregularly reticulate; there is an anterior ridge, anterior of which are coarse reticulations, and a corresponding posterior ridge. There are three lateral ribs, the ventral of which is flat; the ventral and median ribs are arched and unite anteriorly. The indistinct adductor muscle tubercle is located on the median rib. Eye-tubercles prominent, with broad internal sockets (the location of which is visible on the valve-surface as a truncated riblet); the eye-tubercle is joined to the anterior ridge. Dorsal surface of each valve with two rows of coarse reticulations; ventral surface of each with two rows of ovoid reticulations. The anterior and posterior denticulations are stronger in the ventral halves of the margins. Left hinge comprises an anterior socket, pointed postjacent tooth, a smooth median bar, and a partly breached posterior socket. There is an overlapping extension of the left valve immediately in front of the anterior hinge-element. Right hinge with an anterior tooth, a postjacent re-entrant socket, a smooth median furrow, and a stepped and angled posterior tooth. Line of concrescence and inner margin not exactly coincident. Marginal pore-canals numerous and

Explanation of Plate 15, 38

Fig. 1, ♀ car., rt. lat. (PMAf 127, 675μm long); fig. 2, ♀ car., dors. (PMAf 130, 810μm long); fig. 3, ♀ car., lt. lat. (PMAf 126, 655μm long); fig. 4, ♀♀ car., vent. (PMAf 131, 730μm long).

Scale A (100μm; x 90), figs 1, 3; scale B (100μm; x 75), fig 2; scale C (100μm; x 100), fig. 4.

Stereo-Atlas of Ostracod Shells 15, 39

Diagnosis (cont.): simple. Central muscle field with four scars in a vertical row and an anterior v-shaped scar. Sexual dimorphism strong: males longer and lower than females. Late juvenile instars regularly reticulated and indistinctly ribbed.

Remarks: Reticulocosta resembles Repandocosta Hazel, 1967 in many respects, such as shape and mode of reticulation, but differs in details of the curved ribbing and in having a less prominent adductor muscle tubercle and smooth hinge elements. Mosaeleberis Deroo, 1966, is also quite similar but lacks an anterior ridge.

Distribution: Early Paleocene of Nigeria and the Maastrichtian of Ghana. Possibly also occurs in the Santonian of South Africa. Reticulocosta ornatoareticulata (Reyment, 1963)

1963 Veenia (Veenia) ornatoareticulata sp. nov., R. A. Reyment, Stockh. Contr. Geol., 10, 188, pl. 2, fig. 6, pl. 6, figs. 1a–c, pl. 16, fig. 7, Text-fig. 49.

1974 Reticulocosta ornatoareticulata (Reyment); J. Gründel, Freiberger ForschHft., C 298, 88, fig. 5.

1981 Mosaeleberis ornatoareticulata (Reyment); R. A. Reyment, Bull. geol. Inst. Univ. Uppsala, NS 9, 63, pl. 8, fig. 12, pl. 9, fig. 8.

Holotype: Geological Department, University of Stockholm, no. GI0 1132; a carapace.

Type locality: Subsurface of western Nigeria. Araromi borehole (approx. lat. 06° 35' N, long. 04° 55' E) at a depth of 1454 ft; in the Araromi Shale, early Paleocene.

Figured specimens: Palaeontological Museum, University of Uppsala, Sweden, nos. PMAf126 (♀ car.: Pl. 15, 38, fig. 3), PMAf127 (♀ car.: Pl. 15, 38, fig. 1), PMAf128 (♂ RV: Pl. 15, 40, figs. 1, 3, 4, 6), PMAf129 (♀ LV: Pl. 15, 40, figs. 2, 5, 6), PMAf130 (♂ car.: Pl. 15, 38, fig. 2), PMAf131 (♀ car.: Pl. 15, 38, fig. 4). All from the type locality and horizon.

Diagnosis: The proportion of males to females in this species does not have the normal Mendelian sex-ratio, there being 24.5 - 37.4% of males in the samples available for study.

Distribution: Maastrichtian to early Paleocene of West Africa.

Explanation of Plate 15, 40

Fig. 1, 3, 4, ♂ RV (PMAf128, 835μm long); fig. 1, int. lat.; figs. 3, 4, details of anterior and posterior hinge elements. Figs. 2, 5, 6, ♀ LV (PMAf129, 680μm long); fig. 2, int. lat.; figs. 5, 6, details of posterior and anterior hinge elements.

Scale A (100μm; x 75), fig. 1; scale B (100μm; x 90), fig. 2; scale C (100μm; x 150), figs. 3–6.
ON QUADRACYTHERE KEENI SLIPPER sp. nov.

by Ian J. Slipper
(City of London Polytechnic, England)

**Quadracythere keeni** sp. nov.

1977 *Quadracythere diversinodosa* (Lienkenklaus); M. C. Keen, in: F. M. Swain (ed.), Stratigraphic Micropaleontology of Atlantic Basin and Borderlands, Develop. Palaeont. Stratigr., Amsterdam, 6, 488, pl. 2, fig. 6.

1978 *Quadracythere nodosa* Haskins; M. C. Keen, in: R. H. Bate & E. Robinson (eds), A Stratigraphical Index of British Ostracoda, Geol. J. Spec. Issue, 8, 420, pl. 11, fig. 17: non pl. 11, figs. 14, 16.

**Holotype:** British Museum (Nat. Hist.) no. OS 13044; ♀ carapace.

[Paratypes: British Museum (Nat. Hist.) nos. OS 13045 – 13047].

**Type locality:** Northern end of Whitecliff Bay, Isle of Wight, Hampshire, England (lat. 50° 40' N. long. 1° 05' W); Oyster bed, base of the Bembridge Marls Member, Bouldnor Formation, Solent Group, Oligocene.

**Derivation of name:** After Dr. M. C. Keen, in recognition of his studies of Tertiary ostracods.

**Figured specimens:** British Museum (Nat. Hist.) nos. OS 13045 (paratype, ♀ car.: Pl. 15, 42, figs. 1, 2), OS 13044 (holotype, ♀ car.: Pl. 15, 42, figs. 3, 4), OS 13047 (paratype, ♀ RV: Pl. 15, 44, figs. 1–3), OS 13046 (paratype, ♀ car.: Pl. 15, 44, fig. 4).

All collected by the author from the type horizon and locality.

**Diagnosis:** Species of *Quadracythere* with ornament of irregular fossae and tuberculate muri surrounding the main anterocentral tubercle where the carapace attains greatest inflation. Ventral margin strongly sinuous in left valve, weakly so in right valve. Very prominent, curved ventrolateral carina partly overhanging ventral margin, curving strongly upwards posteriorly. Dorsolateral muri coalesce posterdorsally in an angular projection. Posterior hinge tooth in right valve robust with obscure lobation.

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**Explanation of Plate 15, 42**

Figs. 1, 2, ♀ car. (paratype, OS 13045, 580μm long); fig. 1. lt. lat.; fig. 2. car. dors., figs. 3, 4, ♀ car. (holotype, OS 13044, 600μm long); fig. 3. lt. lat.; fig. 4. car. dors. Scale A (100μm: × 100), figs. 1–4.

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**Explanation of Plate 15, 44**

Figs. 1–3, ♀ RV (paratype, OS 13047, 550μm long); fig. 1. int. lat.; fig. 2. ant. hinge element; fig. 3. post. hinge element; fig. 4. ♀ car. vent. (paratype, OS 13046, 540μm long). Scale A (100μm: × 100), figs. 1, 4; scale B (100μm: × 200), figs. 2, 3.

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**Remarks:** This species, from the basal Oligocene, Isle of Wight, was initially referred to *Q. diversinodosa* (Lienkenklaus, 1894) (Z. dt. geol. Ges., 46, 212–213, pl. 15, fig. 1a–d) by Keen (1977 op. cit.) who used it to define zone 13a (early Oligocene) in his zonation of the NW European Tertiary. In a revised zonation, Keen (1978, op. cit.) excluded zone 13a, referring his specimens instead to the Eocene species *Q. nodosa* Haskins, 1971 (Revue Micropaléont., 14, 155, pl. 2, figs. 21–28). Comparison of the present material with type specimens of *Q. nodosa* and *Q. diversinodosa* (see D. J. Horne & I. J. Slipper, Stereo-Atlas Ostracod Shells, 15, 45–48, 1988) has shown that the three are distinct (see Text-fig. 1 for comparative outlines). Keen’s Oligocene form is accordingly described herein as a new species, *Q. keeni*; it is most easily recognised by the strongly curved ventrolateral carina, which overhangs the ventral margin. It follows that Keen’s original zone 13a may be considered valid (early Oligocene, represented by the Bembridge Marls in southern England).

**Distribution:** Early Oligocene (Keen 1978, op. cit.); possibly restricted to the Bembridge Marls Member of the Hampshire Basin, southern England.

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Text-fig. 1. Comparative outlines of carapaces (lt. lat. and dors. views) of: a, *Q. keeni*; b, *Q. diversinodosa*; c, *Q. nodosa*. All drawn from type material.
ON QUADRACYTHERE NODOSA HASKINS

by David J. Horne & Ian J. Slipper
(City of London Polytechnic, England)

Quadracythere nodosa Haskins, 1971

1971 Quadracythere nodosa sp. nov. C. Haskins, Revue Micropaléont., 14, 155, pl. 2, figs. 21–28.
1978 Quadracythere nodosa Haskins; M. C. Keen, in: R. H. Bate & E. Robinson (eds.), A Stratigraphical Index of British Ostracoda, Geol. J. Spec. Issue, 8, 420, pl. 11, figs. 14, 16; non pl. 11, fig. 17.


Type locality: Alum Bay, Isle of Wight, Hampshire, England, approx. lat. 50°40' N, long. 01°34' W; Barton Clay Formation, Barton Group, late Eocene.


Explanation of Plate 15, 46
Fig. 1, LV, ext. lat. (holotype, HU.14.T.6.2288, 500μm long); fig. 2, LV, int. lat. (paratype, HU.14.T.6.2302, 520μm long); fig. 3, RV, int. lat. (paratype, HU.14.T.6.2298, 530μm long).

Quadracythere nodosa (3 of 4)

Diagnosis: Species of Quadracythere with ornament of tuberculate muri forming coarse reticulation surrounding the main anterocentral tubercle where the carapace attains greatest inflation. Ventral margin weakly convex in left valve, sinuous in right valve. Dorsal margin of left valve with slight arch between prominent anterior and posterior cardinal angles, evenly curved in right valve. Anterior marginal area with distinct fossae. Ventrolateral carina weakly curved upwards posteriorly. Raised dorsolateral muri coalesce posterodorsally in a projection. Weak posterior hinge tooth in right valve with obscure lobation.

Remarks: Q. nodosa is similar to Q. diversinodosa (Lienenlaus, 1894 (Z. dt. geol. Ges., 46, 212–213, pl. 15, fig. 1a–d). Type material of the latter was kindly loaned to us by Dr S. Ritzkowsky (Institut und Museum für Geologie und Paläontologie, Göttingen). The holotype (illustrated by B. Moos, Geol. Jb., 82, pl. 1, fig. 10, 1963), is poorly preserved, but comparison with toptotypes shows significant differences: Q. diversinodosa has a straighter dorsal margin, less regular anterior marginal fossae, and is larger (670μm long). Q. nodosa sensu Keen (op. cit. pl. 11, fig. 17) is now assigned to Q. keeni Slipper, 1988 (Stereo-Atlas Ostracod Shells, 15, 41–44).

Distribution: Late Eocene, Hampshire Basin, southern England.

Explanation of Plate 15, 48
Fig. 1, RV, ext. lat. (paratype, HU.14.T.6.2298, 550μm long); figs. 2, 3, car. (paratype, HU.14.T.6.2289, 500μm long); fig. 2, car. dors.; fig. 3, car. vent.

Scale A (100μm; ×110), figs. 1–3.
ON TIMIRIASEVIA UPTONI TIMBERLAKE sp. nov.

by Simon Timberlake
(Sedgwick Museum, University of Cambridge)


Holotype: British Museum (Nat. Hist.) no. OS 12992; Q LV.


Figured specimens: British Museum (Nat. Hist.) nos. OS 12992 (holotype, Q LV : Pl. 15, 50, fig. 1), OS 12993 (paratype, Q RV : Pl. 15, 50, fig. 2), OS 12994 (paratype, Q LV : Pl. 15, 52, fig. 1), OS 12995 (paratype, Q RV : Pl. 15, 52, fig. 2), OS 12996 (paratype, Q car. : Pl. 15, 54, fig. 1), OS 12997 (paratype, Q car. : Pl. 15, 54, fig. 2), OS 12998 (paratype, Q car. : Pl. 15, 54, fig. 3), OS 12999 (paratype, Q car. : Pl. 15, 56, fig. 7), OS 13000 (paratype, Q LV : Pl. 15, 56, fig. 1), OS 13001 (paratype, Q RV : Pl. 15, 56, fig. 2), OS 13002 (paratype, Q LV : Pl. 15, 56, fig. 3), OS 13003 (paratype, Q RV : Pl. 15, 56, figs. 4, 5), OS 13004 (paratype, A-2 juv. RV : Pl. 15, 56, fig. 6).

The paratypes are from the same (T6A) as the holotype or from sample T5B1; both pale grey marly clay, respectively 31–38 and 46–53 cm below the base of the Lower Cornbrash Limestone at the type locality.

Explanation of Plate 15, 50
Fig. 1, Q LV, ext. lat. (holotype, OS 12992, 615μm long); fig. 2, Q RV, ext. lat. (paratype, OS 12993, 655μm long).

Scale A (100μm; x 140), figs. 1, 2.

Stereo-Atlas of Ostracod Shells 15 (3) 51

Diagnosis: A moderate sized Timiriasevia species; strongly dimorphic – females larger than males, carapace ovate (male) or truncate pyriform (female) in dorsal view. Valves semicircular to elongate triangular in lateral view. Posteroventral inflation in female valves; truncated posterior in males. Sulcus along dorsal margin of carapace. Ventral surface planar. Valves strongly ornamented with sub-concentric costae in reduced numbers and more widely spaced than is typical for the genus; marked development of horizontal keel in ventrolateral region; strongly noded. Hinge lophodont; prominent median element, shorter terminal elements. Wide accommodation groove in larger left valve. Radial pore canals short, straight and simple, up to 35 anteriorly. Inner margin and line of concrescence do not coincide.

Remarks: Although differences in the strength of costate ornamentation are slight, variations in the strength of noding are more obvious within the sample population (99 valves and carapaces). Some variability in valve outline and carapace shape, independent of sexual dimorphism and similar to that illustrated by Clements in T. mackerowi Bate (Stereo-Atlas Ostracod Shells, 2, 117–124, 1974) was also observed. Only one A-1 and one A-2 specimen were recovered. T. mackerowi differs on account of its weaker costate ornament and lack of ventrolateral keel, but the positions of nodes and pattern of ornamentation are similar in both species.

Timiriasevia sp. A of Bate, 1965 (Palaeontologica, 8, 758, pl. 3) possesses a ventrolateral keel but is lozenge shaped, smaller, and un-noded. T. epidiiformis Mandelstam, 1947 from the middle Jurassic of the Mangyshlak Peninsula, U.S.S.R. (All-Union Petro-lith. Scientific Res. Geol. Prosp. Inst. 5, 6, 22–24) is similarly lozenge shaped but lacks a ventrolateral keel. T. principalis Lyubimova, 1956, from the upper Cretaceous of Mongolia (Tritóv. line. neft. nauchno-issled. geol.—razv. Inst. [VNIGRI]), 93, 129, 130, pl. 24, figs. 1a, b) is a larger and more weakly ornamented species similarly lacking a ventrolateral keel. T. humilis Zhong, 1964 and T. shensiensis Zhong, 1964, from the middle Jurassic of Shensi Province, China (Acta Pal. Sinica, 12, 457, pl. 2, figs. 14–16, 456, pl. 2, figs. 1–7) are both weakly ornamented. T. digitalis Govindan, 1975, from the Kota Limestone of India (Palaeontologica, 18, 207–216, pl. 13), is strongly costate.

Explanation of Plate 15, 52
Fig. 1, Q LV, ext. lat. (paratype, OS 12994, 615μm long); fig. 2, Q RV, ext. lat. (paratype, OS 12995, 580μm long).

Scale A (100μm; x 155), figs. 1, 2.
Stereo-Atlas of Ostracod Shells 15, 53

Timiriasevia ichtyopum (5 of 8)

Remarks (cont.): yet is larger and lacks a keel. Timiriasevia sp. I of Brenner, 1976, from the Spanish Wealden (Palaeontographica, Abt. A, 152, 113–201), is a keeled species although otherwise not similarly ornamented. Timiriasevia sp. of Malz (Senckenberg. leh., 66, 311, pl. 8, figs. 88–90) from the lower Bajocian of Sardinia is similar though less elongate and with a smaller keel. Timiriasevia sp. I of Rohr (op. cit.) appears to be conspecific with T. ichtyopum although further examination needs to be made. Similarities between the last two species and T. ichtyopum might suggest an evolutionary lineage from the lower Bajocian to upper Bathonian.

Distribution: Confirmed occurrence only from the type locality and horizon where it occurs in association with other oligohaline-mesohaline ostracods including Timiriasevia triangularis Timberlake (Stereo-Atlas Ostracod Shells 15, 57–68, 1988). T. sp. I of Rohr occurs in a middle Bathonian horizon within a limestone and lignite sequence at Les Grands Causses, southern France.

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Table 1. Measurements on specimens from sample T5BI (type locality), N = no. of specimens; x = mean; SD = standard deviation; for dimensions L, M and H see Text-fig. 1.

Explanation of Plate 15, 54

Fig. 1 ♀ car., ext. dors. (paratype, OS 12996, 645μm long); fig. 2, ♀ car., ext. vent. (paratype, OS 12997, 665μm long); fig. 3, ♂ car., ext. dors. (paratype, OS 12998, 580μm long).

Scale A (100μm; × 100), fig. 1; scale B (100μm; × 110), figs. 2, 3.

Explanation of Plate 15, 55

Text-fig. 1. Outline of adult ♂ RV with measured dimensions (Table 1) indicated.

Text-fig. 2. Muscle scar pattern, RV int. lat.

Text-fig. 3. Positions of nodes on: a, ♀ car. dors.; b, ♀ LV.

Explanation of Plate 15, 56

Fig. 1, ♀ LV, int. lat. (paratype, OS 13000, 580μm long); fig. 2, ♀ RV, int. lat. (paratype, OS 13081, 545μm long); fig. 3, ♂ LV, int. lat. (paratype, OS 13082, 555μm long); fig. 4, ♂ RV, int. lat. (paratype, OS 13083, 495μm long); fig. 5, ♂ RV, int. muscle scars (paratype, OS 13083); fig. 6, A-2 juv. RV, ext. lat. (paratype, OS 13084, 340μm long); fig. 7, ♂ car., ext. vent. (paratype, OS 12999, 550μm long).

Scale A (100μm; × 80), figs. 1–4; scale B (50μm; × 280), fig. 5; scale C (100μm; × 90), fig. 6; scale D (100μm; × 110), fig. 7.
Stereo-Atlas of Ostracod Shells 15, 54

Timiriasevia uptoni (6 of 8)

Stereo-Atlas of Ostracod Shells 15, 56

Timiriasevia uptoni (8 of 8)
ON TIMIRIASEVIA TRIANGULARIS TIMBERLAKE sp. nov.

by Simon Timberlake
(Sedgwick Museum, University of Cambridge)

Timiriasevia triangularis sp. nov.

Holotype: British Museum (Nat. Hist.) no. OS 12979; ♀ LV.
[Paratypes: nos. OS 12980–12991, OS 13065–13080].

Type locality: SE section of old clay pit near the 'Round House', Tarlton, Cirencester, Gloucestershire, England (Nat. Grid Ref. SO 970000); non-marine band in Forest Marble Clay. Pale grey marly clay, 23–53cm below base of the Lower Cornbrash Limestone, Bathonian, middle Jurassic.

Derivation of name: Latin, alluding to the shape of the valves.

Figured specimens: British Museum (Nat. Hist.) nos. OS 12979 (holotype, ♀ LV: Pl. 15, 58, fig. 1), OS 12980 (paratype, ♀ RV: Pl. 15, 58, fig. 2), OS 12981 (paratype, ♂ LV: Pl. 15, 60, fig. 1), OS 12982 (paratype, ♀ RV: Pl. 15, 60, fig. 2), OS 12983 (paratype, ♀ car.: Pl. 15, 62, fig. 1), OS 12984 (paratype, ♀ car.: Pl. 15, 62, fig. 2), OS 12985 (paratype, ♂ car.: Pl. 15, 62, fig. 3), OS 12986 (paratype, ♀ LV: Pl. 15, 64, fig. 6), OS 12987 (paratype, ♂ RV: Pl. 15, 64, fig. 1), OS 12988 (paratype, ♀ LV: Pl. 15, 64, figs. 3, 5), OS 12989 (paratype, ♂ RV: Pl. 15, 64, fig. 2), OS 12990 (paratype, ♂ LV: Pl. 15, 64, fig. 4), OS 12991 (paratype, ♂ A–1 juv. car.: Pl. 15, 66, fig. 1), OS 13065 (paratype, ♂ A–1 juv. car.: Pl. 15, 66, fig. 2), OS 13066 (paratype, ♂ A–1 juv. RV: Pl. 15, 66, fig. 3), OS 13067 (paratype, ♂ A–1 juv. RV: Pl. 15, 66, fig. 4), OS 13068 (paratype, ♂ A–2 juv. car.: Pl. 15, 66, fig. 5), OS 13069 (paratype, ♂ A–2 juv. car.: Pl. 15, 66, fig. 6), OS 13070

Explanation of Plate 15, 58
Fig. 1, ♀ LV, ext. lat. (holotype, OS 12979, 560µm long); fig. 2, ♂ RV, ext. lat. (paratype, OS 12980, 580µm long).
Scale A (100µm; ×160), figs. 1, 2.

Stereo-Atlas of Ostracod Shells 15, 59

Timiriasevia triangularis (3 of 12)

Figured specimens (cont.):
(paratype, ♀ A–2 juv. LV: Pl. 15, 66, fig. 7), OS 13071 (paratype, ♂ A–2 juv. LV: Pl. 15, 66, fig. 8), OS 13072 (paratype, ♀ A–3 juv. car.: Pl. 15, 68, fig. 1), OS 13073 (paratype, ♂ A–3 juv. car.: Pl. 15, 68, fig. 2), OS 13074 (paratype, ♂ A–3 juv. RV: Pl. 15, 68, fig. 3), OS 13075 (paratype, ♂ A–3 juv. RV: Pl. 15, 68, fig. 4), OS 13076 (paratype, ♀ A–4 juv. LV: Pl. 15, 68, fig. 5), OS 13077 (paratype, ♀ A–4 juv. LV: Pl. 15, 68, fig. 6), OS 13078 (paratype, ♀ A–5 juv. RV: Pl. 15, 68, figs. 7, 9), OS 13079 (paratype, ♂ A–5 juv. RV: Pl. 15, 68, fig. 8), OS 13080 (paratype, ♂ A–5 juv. car.: Pl. 15, 68, fig. 10).

The paratypes are from the same sample (T5BI) as the holotype or from sample T6A, both pale grey marly clay, respectively 46–53 and 31–38cm below the base of the Lower Cornbrash Limestone at the type locality.

Diagnosis: A strongly dimorphic Timiriasevia species: females larger than males, carapace ovate (male) or pyriform (female) in dorsal view, with a strong posteroventral inflation beyond the outer margin in the latter. Valves subtriangular in lateral view; greatest height at or near mid-length in male, behind mid-length in female. Valves of both sexes have pronounced anterior marginal flanges. Left valve larger than right. Valves weakly ornamented with ‘finger print’ striations sub-concentric to valve margins, slightly stronger in ventral and posterior regions and more developed in females than males. Hinge simple, lophodont: short median and posterior elements, longer anterior element. Inner margin and line of concrescence do not coincide anteriorly or posteriorly. Radial pore canals few, short, straight and simple.

Explanation of Plate 15, 60
Fig. 1, ♂ LV, ext. lat. (paratype, OS 12981, 535µm long); fig. 2, ♂ RV, ext. lat. (paratype, OS 12982, 525µm long).
Scale A (100µm; ×160), figs. 1, 2.
Timiriasevia triangularis (5 of 12)

Table 1. Measurements on specimens from sample TSBI (type locality and horizon). N = no. of specimens; \( \bar{x} = \) mean; SD = standard deviation; for explanation of dimensions L, M, H, G, and W see Text-figs. 2, 3. A = valves; B = carapaces.

**Remarks:** Significant variations in the strength of the ornament were observed in the sample populations; at low magnification some valves appeared almost smooth. Apart from sexual dimorphism there is some minor variability in carapace shape plus a wide size range of adult individuals (see Table 1). All juvenile instars down to A–6 appear to exhibit precocious sexual dimorphism, distinguishable on instar diagrams (Text-fig. 1) and from details of shape and position of maximum width and height in valves and carapaces. As a rule, maximum height and width are behind mid-length in proto-females, at or near mid-length in proto-males. Throughout ontogeny proto-males are

**Explanation of Plate 15, 62**

Fig. 1. \( \varphi \) car., dors. (paratype, OS 12983, 675 \( \mu \)m long); fig. 2. \( \varphi \) car., vent. (paratype, OS 12984, 630 \( \mu \)m long); fig. 3. \( \sigma \) car., dors. (paratype, OS 12985, 515 \( \mu \)m long).

Scale A (100 \( \mu \)m; \( \times \)100), figs. 1, 2; scale B (100 \( \mu \)m; \( \times \)115), fig. 3.

Stereo-Atlas of Ostracod Shells 15, 63

**Timiriasevia triangularis (7 of 12)**

**Remarks (cont.):** Slightly higher than females; length and width are not dimorphic until the A–1 instar, at which point the proto-female becomes distinctly longer and more inflated than the proto-male.


**Distribution:** Known only from the type locality and horizon, where it occurs with *T. mackerrowi*, *T. uppstoni* Timberlake (*Stereo-Atlas Ostracod Shells*, 15, 49–56, 1988), an unnamed *Timiriasevia* sp., *Therosynoeicum kirtlingtonensis* Bate, *Bisulcocypris anglica* Bate, plus a number of darwinulaceans and cypridacean ostracods, charophytes and non-marine gastropods; marine-brackish elements are also present. *T. mackerrowi* and *T. triangularis*, along with *Therosynoeicum kirtlingtonensis*, are the most certainly auctochnous species. The salinity range represented is probably oligohaline-mesohaline.

**Explanation of Plate 15, 64**

Fig. 1. \( \varphi \) RV, int. lat. (paratype, OS 12987, 555 \( \mu \)m long); fig. 2. \( \sigma \) RV, int. lat. (paratype, OS 12989, 505 \( \mu \)m long); fig. 3. \( \varphi \) LV, int. lat. (paratype, OS 12988, 640 \( \mu \)m long); fig. 4. \( \sigma \) LV, int. lat. (paratype, OS 12990, 510 \( \mu \)m long); fig. 5. \( \varphi \) LV, detail of muscle scars (paratype, OS 12988); fig. 6. \( \sigma \) car., vent. (paratype, OS 12986, 540 \( \mu \)m long).

Scale A (100 \( \mu \)m; \( \times \)90), fig. 1; scale B (100 \( \mu \)m; \( \times \)80), figs. 2, 3, 4; scale C (50 \( \mu \)m; \( \times \)190), fig. 5; scale D (100 \( \mu \)m; \( \times \)115), fig. 6.
Timiriasevia triangularis (6 of 12)

Timiriasevia triangularis (8 of 12)
Text-fig. 1. Ontogeny of *T. triangularis*; all left valves. $\bigcirc = \sigma$; $\bullet = \varphi$; sample T5BI.

Stereo-Atlas of Ostracod Shells 15. 65

Text-fig. 1. Adult $\sigma'$ RV ext. lat. in transmitted light showing muscle scars, normal pores and marginal pore canals; measured dimensions (Table 1) indicated.

Examination of Plate 15, 66

Fig. 1, $\varphi$ A-1 juv. car., dors. (paratype, OS 12991, 450$\mu$m long); fig. 2, $\sigma'$ A-1 juv. car., dors. (paratype, OS 13065, 400$\mu$m long); fig. 3, $\varphi$ A-1 juv. RV, ext. lat. (paratype, OS 13066, 420$\mu$m long); fig. 4, $\sigma'$ A-1 juv. RV, ext. lat. (paratype, OS 13067, 360$\mu$m long); fig. 5, $\varphi$ A-2 juv. car., dors. (paratype, OS 13068, 330$\mu$m long); fig. 6, $\sigma'$ A-2 juv. car., dors. (paratype, OS 13069, 340$\mu$m long); fig. 7, $\varphi$ A-2 juv. LV, ext. lat. (paratype, OS 13070, 340$\mu$m long); fig. 8, $\sigma'$ A-2 juv. LV, ext. lat. (paratype, OS 13071, 330$\mu$m long).

Scale A (100$\mu$m; ×100), figs. 1-8.

Stereo-Atlas of Ostracod Shells 15. 67

Text-fig. 2. Adult $\sigma'$ RV ext. lat. in transmitted light showing muscle scars, normal pores and marginal pore canals; measured dimensions (Table 1) indicated.

Examination of Plate 15, 68

Fig. 1, $\varphi$ A-3 juv. car., dors. (paratype, OS 13072, 285$\mu$m long); fig. 2, $\sigma'$ A-3 juv. car. dors. (paratype, OS 13073, 290$\mu$m long); fig. 3, $\varphi$ A-3 juv. RV, ext. lat. (paratype, OS 13074, 275$\mu$m long); fig. 4, $\sigma'$ A-3 juv. RV, ext. lat. (paratype, OS 13075, 290$\mu$m long); fig. 5, $\varphi$ A-4 juv. LV, ext. lat. (paratype, OS 13076, 245$\mu$m long); fig. 6, $\sigma'$ A-4 juv. LV, ext. lat. (paratype, OS 13077, 245$\mu$m long); fig. 7, $\varphi$ A-5 juv. RV, ext. lat. (paratype, OS 13078, 195$\mu$m long); fig. 8, $\sigma'$ A-5 juv. RV, ext. lat. (paratype, OS 13079, 195$\mu$m long); fig. 9, $\varphi$ A-5 juv. RV, vent. (paratype, OS 13078, 195$\mu$m long); fig. 10, $\sigma'$ A-5 juv. car., dors. (paratype, OS 13080, 205$\mu$m long).

Scale A (100$\mu$m; ×120), figs. 1-4; scale B (100$\mu$m; ×140), figs. 5-10.

Text-fig. 3. Outline of adult $\varphi$ car.; measured dimensions (Table 1) indicated.

Text-fig. 4. Muscle scar pattern, $\sigma'$ RV int. lat.
595.337.14 (44.161.003.47) : 551.351 + 552.54

Amphioxiphthalmycthere oertlii (1 of 4)

ON AMPHIEXOPHTHALMOCYTHERE OERTLI (BABINOT)

by J. F. Babinot & J. P. Colin  
(Université de Provence, Centre St. Charles, Marseille & Esso Research, Bégles, France)

Genus AMPHIEXOPHTHALMOCYTHERE Grünedel, 1975  
Type-species (by original designation): Exophthalmycthere oertlii Babinot, 1971

Diagnosis: Medium-sized carapace, flattened; posterior end acuminate in the upper half of valve height. Valve surface reticulate with strongly developed nodes and spines. Prominent nodes occur especially at the posterodorsal angle and (two) along the ventral margin. Eye tubercle well developed; subcentral tubercle more or less well developed; hinge amphiidont (heterodont/slightly hemiamphidont). Marginal zones moderately wide without vestibulum.

Remarks: The type-species has been originally assigned to the late Jurassic/early Cretaceous genus Exophthalmycthere Triebel, 1938 on the basis of the overall shape, ornamentation and prominent eye-tubercle. In fact this genus is more rectangular, less ornamented (absence of strong nodes and long spines) and the anterior tooth on the right valve is crenulate. The early Cretaceous genus Parexophthalmycthere Oertli, 1959, has no subcentral tubercle, its ornamentation is less developed and its hinge has more crenulate elements. We therefore think that Amphioxiphthalmycthere should be considered as a genus, not a subspecies of Parexophthalmycthere Oertli, 1959. Moreover, it belongs to the family Trachyleberididae, not the Progonocythereidae as previously suggested; it is related to the genus Navarracythere Colin & Rodriguez-Lázaro, also from the north Tethyan Cretaceous (see Stereo-Atlas Ostracod Shells 13 (13), 63-66. 1986).

Explanation of Plate 15, 70

Fig. 1, ♂ car., ext. lt. lat. (EPR-E 23458, 720 μm long); fig. 2, ♀ car. ext. rt. lat. (EPR-E 23459, 720 μm long); fig. 3, ♂ car. ext. dors. (EPR-E 23460, 730 μm long).  
Scale A (100 μm; × 86), figs. 1-3.

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Amphioxiphthalmycthere oertlii (Babinot, 1971)

1959 Cythereis sp. H. J. Oertli, Palaeont.  Z., 33, 4, 246, pl. 32, fig. 9.
1965 Cythereis sp. 1 Oertli; P. Saint-Marc, Thesis Univ. Paris, 156, pl. 22, fig. 10, pl. 19, fig. 20.
1971 Exophthalmycthere oertlii n.sp. J. F. Babinot, Rev. Micropaléontol., 13, 4, 237, pl. 1, figs. 1, 2.
1971 Parexophthalmycthere oertlii (Babinot) (sic); R. Damotte, Rev. Micropaléontol., 14, 1, 18, pl. 3, figs. 19a-d.
1975 Parexophthalmycthere (Amphioxiphthalmycthere) oertlii (Babinot); J. Grünedel, Freiberger ForschHft; C 304, 34, fig. 2.
1980 Parexophthalmycthere (Amphioxiphthalmycthere) oertlii (Babinot); J. F. Babinot, Trav. Lab. Géol. hist. Paléontol. Univ. Provence, 10, 119, pl. 15, figs. 4-10.
1985 Amphioxiphthalmycthere oertlii (Babinot); J. P. Colin & R. Damotte, Cretaceous Research, 6, 158, fig. 1.

Holotype: Université de Provence, Marseille, Laboratoire de Stratigraphie et Paléontologie, no. HCE7; carapace.

Type-locality: La Bédue, 3 km S of Le Camp-du-Castellet, Var. SE, France; approx. lat. 47° 55' N, long. 3° 45' E. Late Cenomanian, upper Cretaceous. In marly limestone with benthic larger foraminifera (alveolinds), oysters and organic matter.

Figured specimens: Esso Production Research-European, Béziers, France, nos. 23458 (♂ car.: pl. 15, 70 fig. 1), 23459 (♀ car.: pl. 15, 70, fig. 3), 23460 (♂ car.: pl. 15, 70, fig. 5), 23461 (♀ LV: pl. 15, 72, fig. 1), 23462 (♂ RV: pl. 15, 72, fig. 1), 23463 (♀ car.: pl. 15, 72, fig. 3).  
All the figured specimens are from the late Cenomanian of the type-locality.

Diagnosis: As for the genus (monotypic).

Distribution: Known only from Cenomanian inner neritic deposits of southern France (Provence, Touraine, Aquitaine Basin, Languedoc) and the Iberian Peninsula (northern Spain, Portugal).

Explanation of Plate 15, 72

Fig. 1, ♀ LV, int. lat. (EPR-E 23461, 720 μm long); fig. 2, ♂ RV, int. lat. (EPR-E 23462, 690 μm long); fig. 3, ♀ car. vent. (EPR-E 23463, 755 μm long).  
Scale A (100 μm; × 86), figs. 1-3.

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