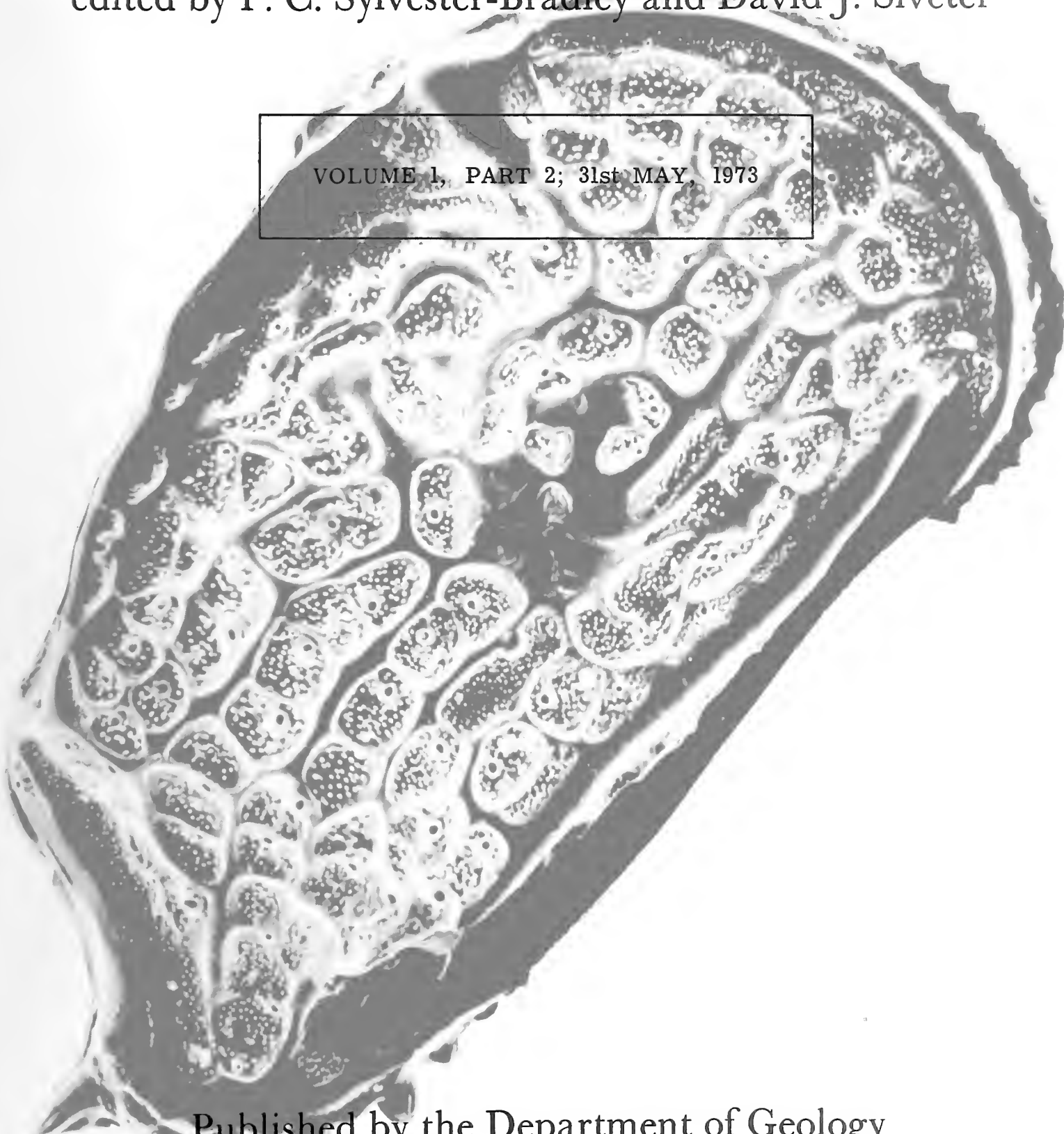


A Stereo-Atlas of Ostracod Shells

edited by P. C. Sylvester-Bradley and David J. Siveter



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Contributions illustrated by scanning electron micrographs of Ostracoda in stereo-pairs are invited. Full instructions may be obtained on request from the Editors. Format should follow the style set by the majority of papers in this issue. The Editors should be consulted for advice before figures for plates are mounted. Descriptive matter apart from illustrations should be cut to a minimum; preferably each plate should be accompanied by one page of text only.

Department of Geology, The University, Leicester.

ACKNOWLEDGEMENTS

The publication of this first volume of the *Stereo-Atlas* has been made possible by the generous financial help of the British Petroleum Company Limited and Shell International Petroleum Company Limited.

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C. F. Casella & Co. Ltd., Regent House, Britannia Walk, London, N1 7ND.
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The scanning electron microscope in the Department of Geology of the University of Leicester was supplied by the Natural Environment Research Council under the terms of Grant No. GR/3/95 for the purpose of micropalaeontological research.

ON *CHRYSOCYTHERE PARADISUS* DORUK sp. nov.
by Neriman Doruk
(University of Leicester, England)

Chrysocythere paradisus sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) IO 5189, ♀ RV.

Type locality: Road cutting 3 km SW of Kuzucubelen, Mersin, Turkey. Approx. long. 34°27'E, lat. 36°48'N. Upper Miocene. Grey, sandy clay, with molluscan shells and abundant foraminifera; presumed moderate depth.

Derivation of name: Latin, "a pleasure garden," from fancied resemblance of ornament to gardens surrounding a fountain.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 5189 (RV: Pl. 1:16:90, fig. 1; Pl. 1:16:92, figs. 2, 3), IO 5190 (LV: Pl. 1:16:90, fig. 2; Pl. 1:16:92, figs. 1, 4). Both from type locality, the base of the section.

Explanation of Plate 1:16:90

Fig. 1, ♀ RV, ext.; fig. 2, ♀ LV, ext.

Scale A (250 µm ; ×97), fig. 1; scale B (250 µm ; ×94), fig. 2.

Diagnosis: Polygonal fossae arranged in radiate groups, like the petals of a flower, surrounding raised, intramural pores, which stand up on pillars.

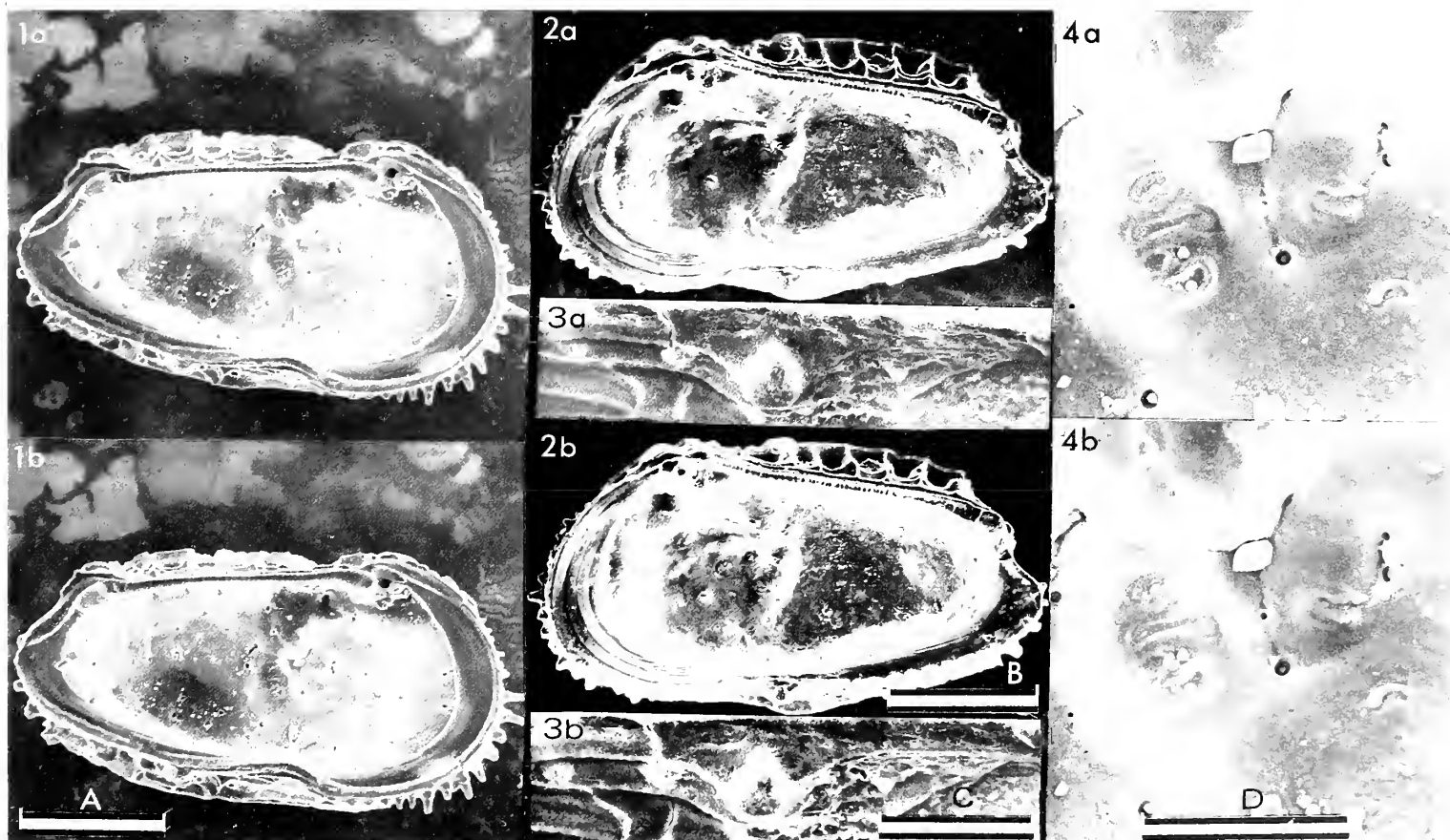
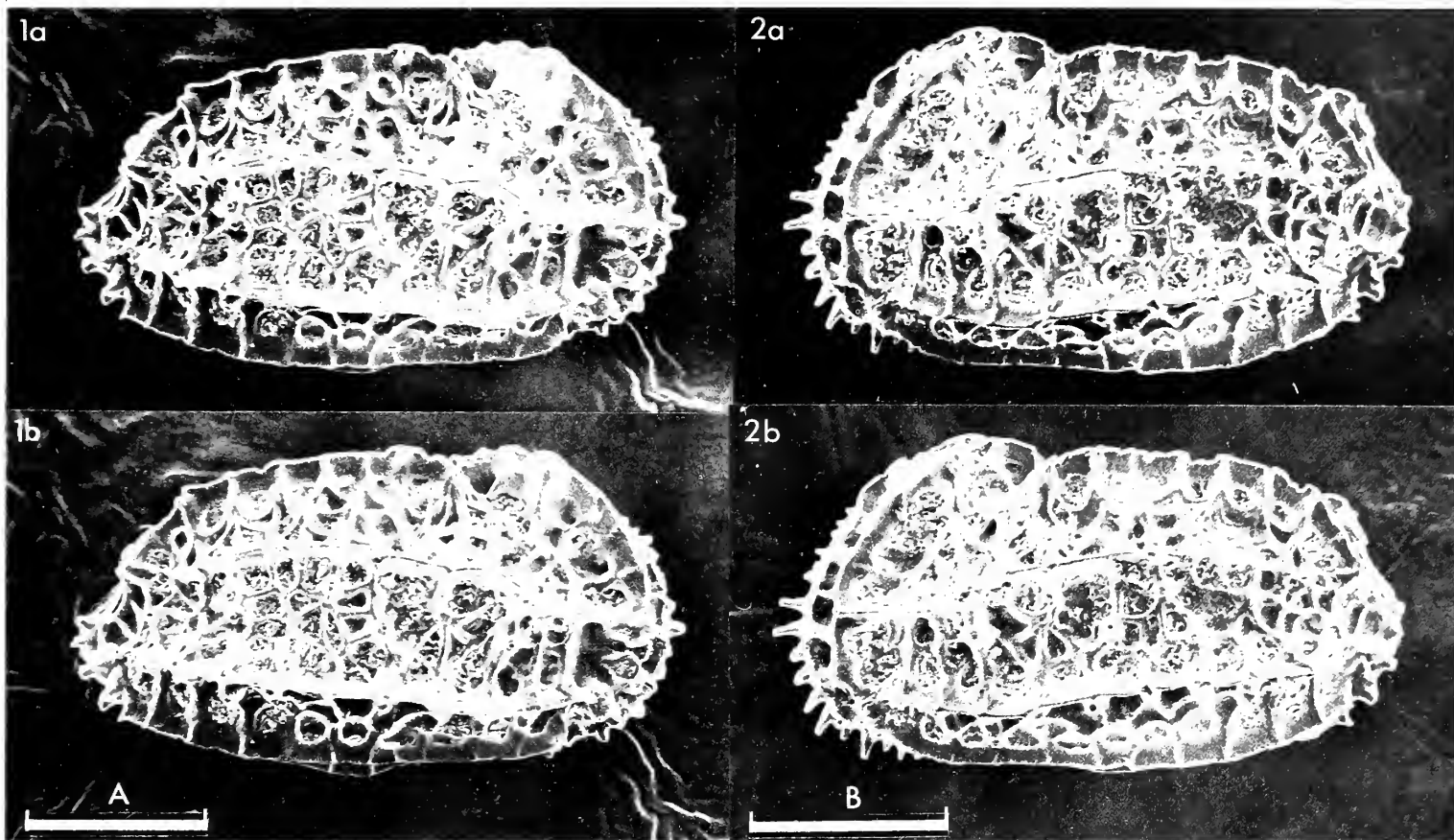
Remarks: Differs from *C. cataphracta* Ruggieri, 1962 (see Sylvester-Bradley & Ruggieri 1973, *Stereo-Atlas of Ostracod Shells*, vol. 1, pt. 1, pp. 31-34) in details of reticulum. Sexual dimorphism distinct, males less high and longer.

Distribution: Middle and Upper Miocene of Mersin and Adana areas, Turkey.

Explanation of Plate 1:16:92

Fig. 1, ♀ LV, int.; fig. 2, ♀ RV, int.; fig. 3, RV, int. vent. knob-like structure; fig. 4, LV, int. musc. sc.

Scale A (250 µm ; ×78), fig. 1; scale B (250 µm ; ×82), fig. 2; scale C (50 µm ; ×434), fig. 3; scale D (100 µm ; ×288), fig. 4.



ON *PROCYTHEREIS TORQUATA* (SKOGSBERG)
by Richard H. Benson
(Smithsonian Institution, Washington, D.C., U.S.A.)

Genus *PROCYTHEREIS* Skogsberg, 1928

Type-species (original designation): *Cythereis (Procythereis) torquata* Skogsberg, 1928

Procythereis torquata (Skogsberg, 1928)

Cythereis (Procythereis) torquata Skogsberg, *Calif. Acad. Sci. Occas. Pap.*, vol. 15, p. 19, pl. 1, fig. 1, pl. 4, fig. 2, text-fig. 1 (1928).

Procythereis torquata (Skogsberg); Benson, *Univ. Kans. Paleont. Contr. Arthro.*, no. 6, p. 28, (1964).

Syntypes: U.S.N.M. 127428 and 127440.

Type locality: Tierra del Fuego, Puerto Condor.

Figured specimens: U.S.N.M. Coll. nos. 190025 (LV: Pl. 1:17:94, fig. 1) 190027 (RV: Pl. 1:17:94, fig. 2), and 190427 (RV: Pl. 1:17:96, figs. 1, 2). All Recent from Tierra del Fuego, Cape Valentyn, Hero station no. 44, depth 270 m, lat. 53°31'S, long. 70°33'W.

Explanation of Plate 1:17:94

Fig. 1, LV ext.; fig. 2, RV ext.

Scale A (250 μ m ; $\times 86$), fig. 1; scale B (250 μ m ; $\times 88$), fig. 2.



Text-fig. 1. Appendages and muscle-scar pattern of *Procythereis torquata*.

Specimen from R/V Eltanin Station 453 (Ref: 477), E coast of Tierra del Fuego; lat. 54°27'S, long. 66°12'W, depth 31 m, coll. 21 January 1963.

1-2. Lt. and rt. partially fused first antennae.

3-5. Thoracic legs, front to rear.

6. *Thaerocytherid* muscle-scar pattern.

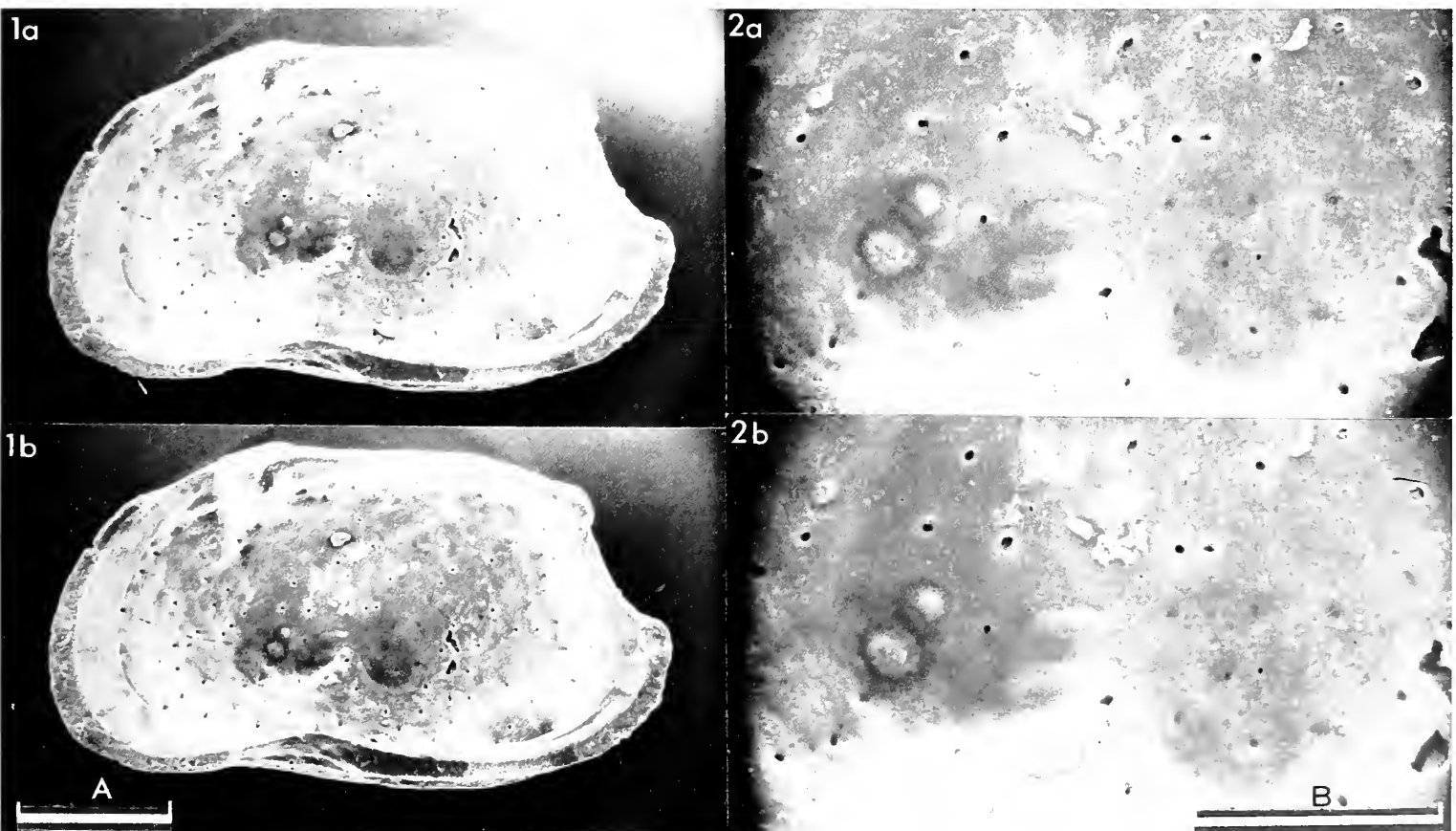
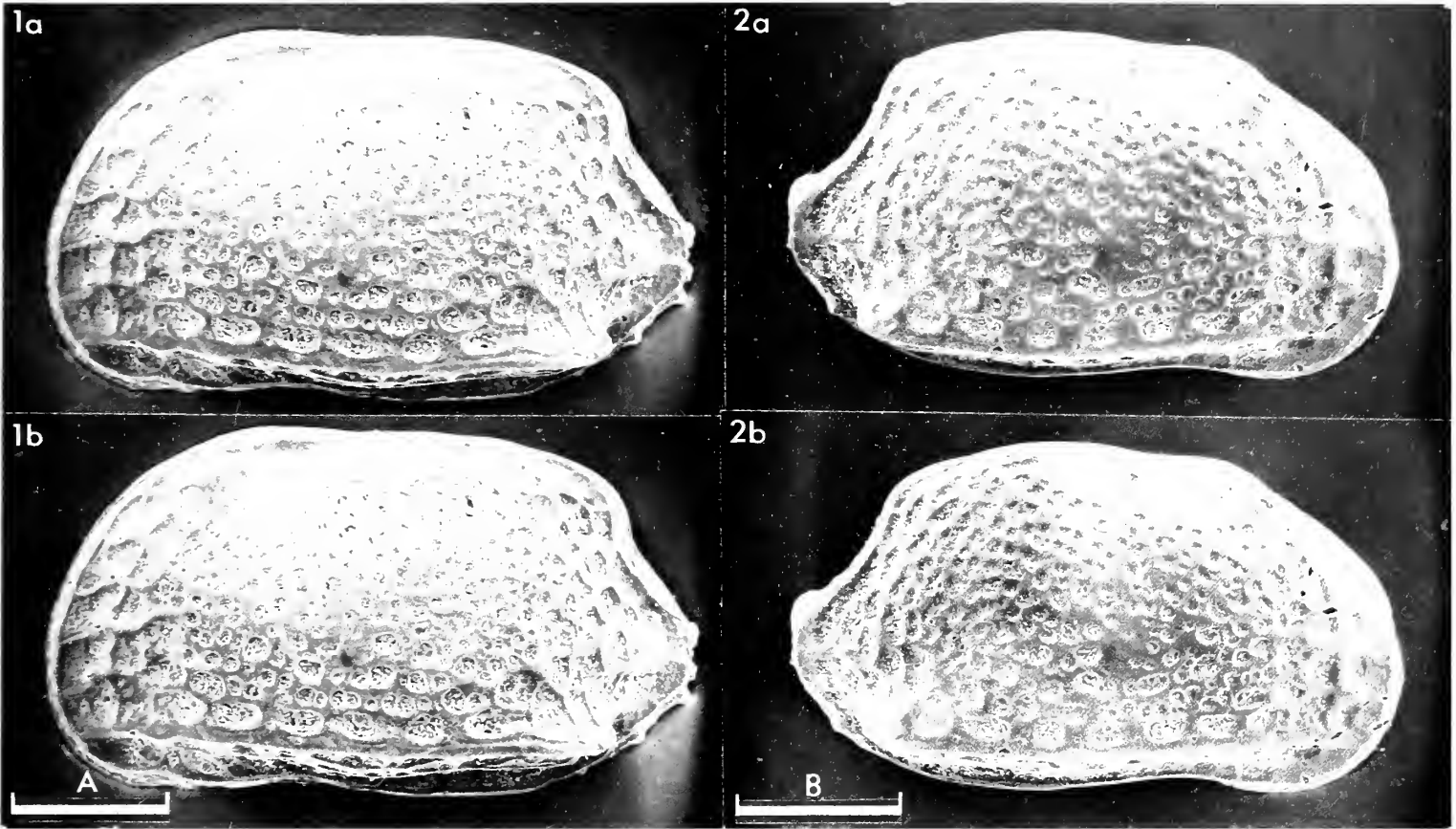
7. Mandible with trifurcate mandibular epipodite.

8. Second antenna with spinning bristle and feeder gland.

Explanation of Plate 1:17:96

Fig. 1, RV int.; fig. 2, int. musc. sc.

Scale A (250 μ m ; $\times 88$), fig. 1; scale B (125 μ m ; $\times 272$), fig. 2.



ON *PROCYTHEREIS IGANDERSSONI* (SKOGSBERG)
by Richard H. Benson
(*Smithsonian Institution, Washington, D.C., U.S.A.*)

Procythereis iganderssoni (Skogsberg, 1928)

Cythereis (*Procythereis*) *iganderssoni* Skogsberg, *Calif. Acad. Sci. Occas. Pap.*, vol. 15, p. 24, pl. 1, fig. 2, text-fig. 2 (1928).

Procythereis iganderssoni (Skogsberg); Hartmann, *Mitt. hamb. zool. Mus. Inst.*, 60, p. 237 (1962).

Procythereis iganderssoni (Skogsberg); Benson, *Univ. Kans. Paleont. Contr. Arthro.*, no. 6, p. 28 (1964).

Explanation of Plate 1:18:98

Fig. 1, LV ext.; fig. 2, RV ext.

Scale A (250 μm ; $\times 105$), figs. 1, 2.

Syntypes: U.S.N.M. 127417

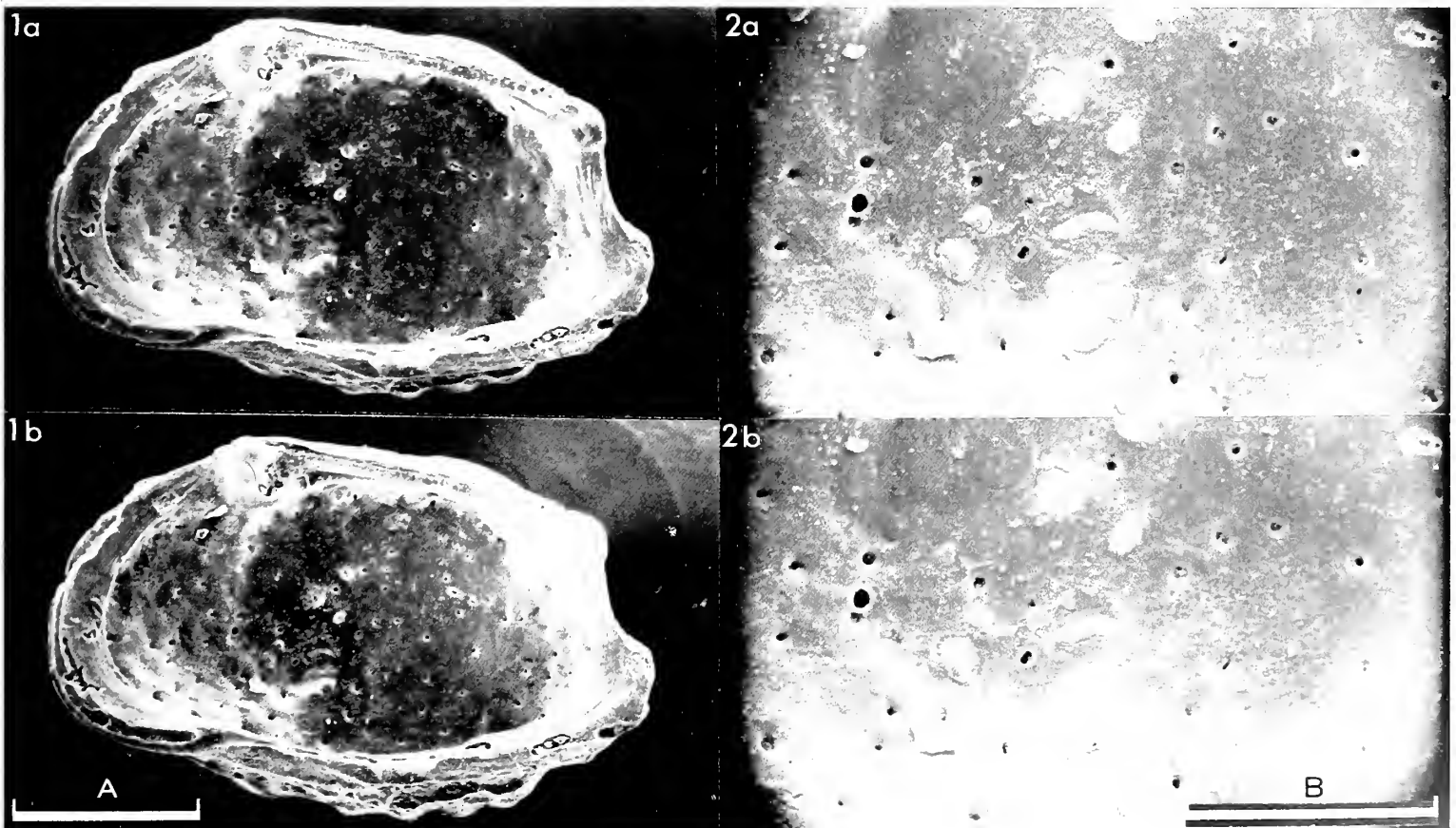
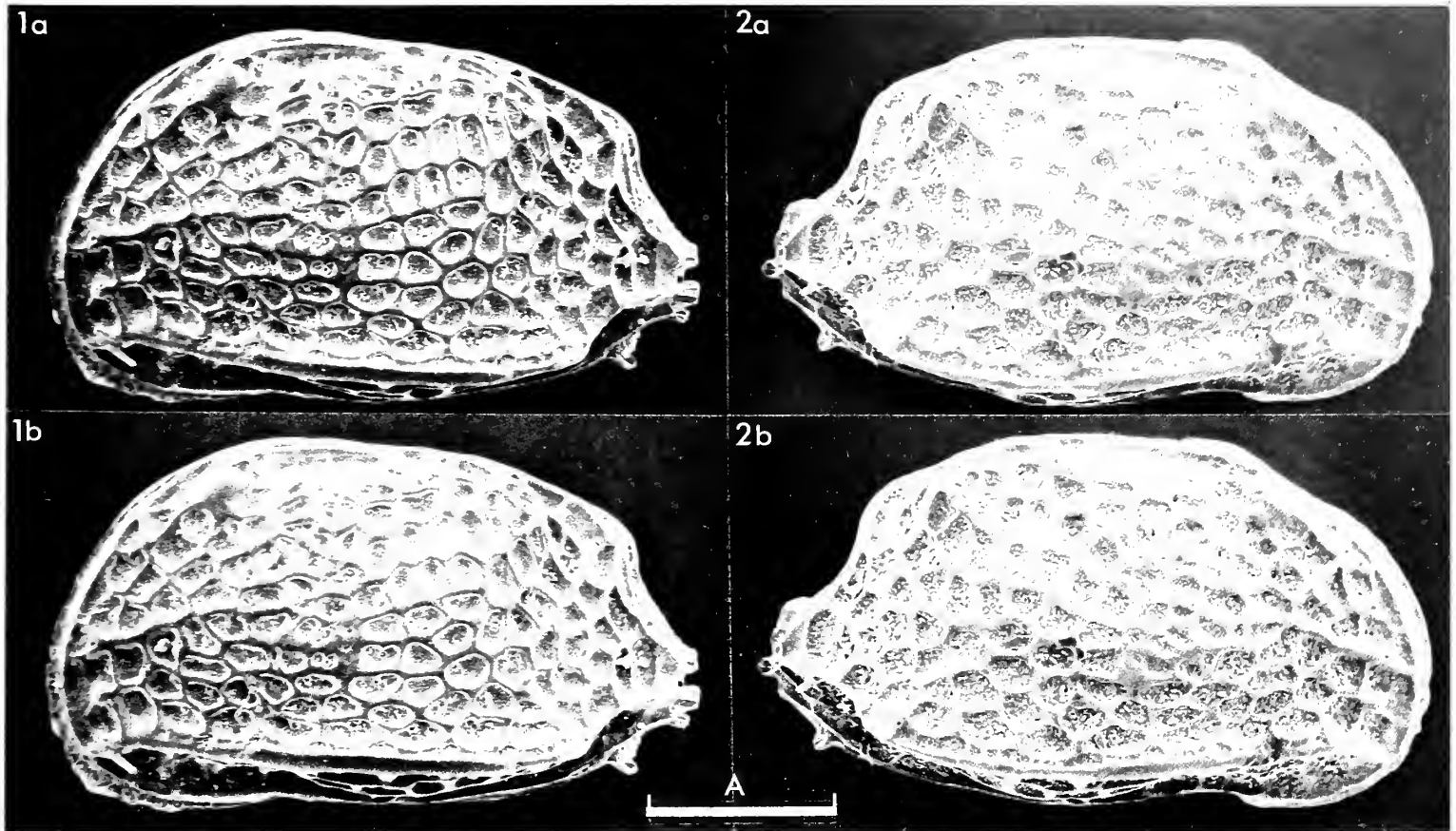
Type locality: Tierra del Fuego, Cape Valentyn.

Figured specimens: U.S.N.M. Coll. nos. 190019 (LV: Pl. 1:18:98, fig. 1), Recent from Tierra del Fuego, Fortesque Bay, Hero station 48, depth 22 m; lat. 53°41'S, long. 72°0'45"W. 190026 (RV: Pl. 1:18:98, fig. 2) and 190554 (RV: Pl. 1:18:100, figs. 1, 2), both Recent from Tierra del Fuego, Cape Valentyn, Hero station 44, depth 270 m; lat. 53°31'S, long. 70°33'W.

Explanation of Plate 1:18:100

Fig. 1, RV int.; fig. 2, int. musc. sc.

Scale A (250 μm ; $\times 107$), fig. 1; scale B (125 μm ; $\times 280$), fig. 2.



ON *PATTERSONCYPRIS MICROPAPILLOSA* BATE
by R. H. Bate
(*British Museum (Natural History), London*)

Genus *PATTERSONCYPRIS* Bate, 1972

Type-species (original designation): *Pattersonocypris micropapillosa* Bate, 1972

Pattersonocypris micropapillosa Bate, 1972

Pattersonocypris micropapillosa sp. nov. R. H. Bate, *Palaeontology*, vol. 15, pt. 3, p. 381, pls. 66-71 (1972).

Holotype: Brit. Mus. (Nat. Hist.) IO 4680, ♀ carapace.

Type locality: Santana Formation (Aptian/Albian), Serra do Araripe, Ceará, Brazil.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 4693 (♀ car.: Pl. 1:19:102, fig. 1), IO 4707 (♀ : Pl. 1:19:102, figs. 2, 3), IO 4714 (♀ : Pl. 1:19:104, fig. 1), IO 4708 (♀ car.: Pl. 1:19:104, fig. 2; Pl. 1:19:106, fig. 3), IO 4710 (♂ car.: Pl. 1:19:106, fig. 1), IO 4718 (♀ car.: Pl. 1:19:106, fig. 2), IO 4692 (♀ car.: Pl. 1:19:108, fig. 1), IO 5027 (♀ car.: Pl. 1:19:108, figs. 2-3). All from the type locality.

Explanation of Plate 1:19:102

Fig. 1, ♀ car., RV & furca.; fig. 2, ♀ antennules, antennae with swimming setae, mandible & maxilla; fig. 3, ♀ showing appendages.

Scale A (250 µm ; ×73), fig. 1; scale B (100 µm ; ×175), fig. 2; scale C (250 µm ; ×100), fig. 3.

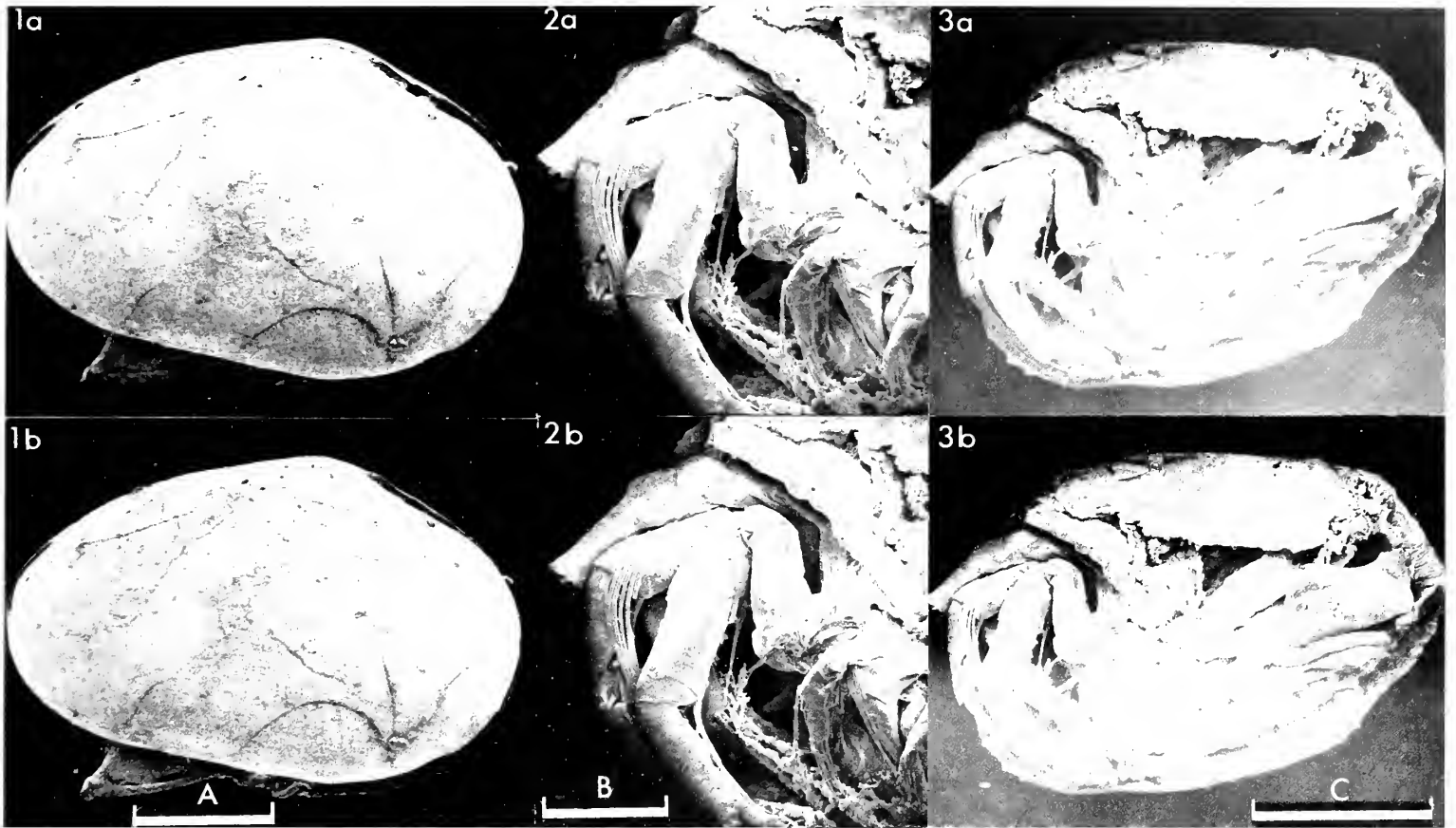
Diagnosis: *Pattersonocypris* having very small papillae on ventral surface.

Remarks: All figured specimens were obtained during the acetic acid treatment of fish skeletons from two calcareous nodules. The ostracods were released from the calcareous nodules because the calcium carbonate of the shells had been altered to calcium phosphate. Similarly the excellent preservation of the soft tissue is due to their mineralisation soon after death; there is no evidence of decay. The assignment of *Pattersonocypris* to the Cyprididae on details of the carapace shape, hinge and muscle scars is confirmed by the soft part anatomy, especially that of the 1st. thoracic appendage which is adapted proximally for pushing food into the mouth and distally terminates in an inwardly turned hook. Unlike modern cyprids, however, this terminal hook is present in the female as well as in the male. In modern cyprids the male uses the hooks to grasp the female during mating; the hook prevents him from sliding off the posterodorsal part of her carapace. That the female also possesses thoracic hooks might indicate that she also used these in mating, suggesting a probable venter to venter position, currently unknown amongst freshwater ostracods but recorded for some marine species. Apart from the terminal hook of the 1st. thoracic appendage being present in the female the remaining anatomy is typical of the family which has undergone little change since Lower Cretaceous times.

Explanation of Plate 1:19:104

Fig. 1, ♀ , branchial plate; fig. 2, ♀ , upper lip, mandibles, maxillae, 1st. thoracic appendages.

Scale A (100 µm ; ×350), fig. 1; scale B (100 µm ; ×400), fig. 2.



Explanation of Plate 1:19:106

Fig. 1, ♂ car., copulatory appendage; fig. 2, ♀ car., antennules, antennae; fig. 3, ♀ car., 2nd. and 3rd. thoracic appendages.

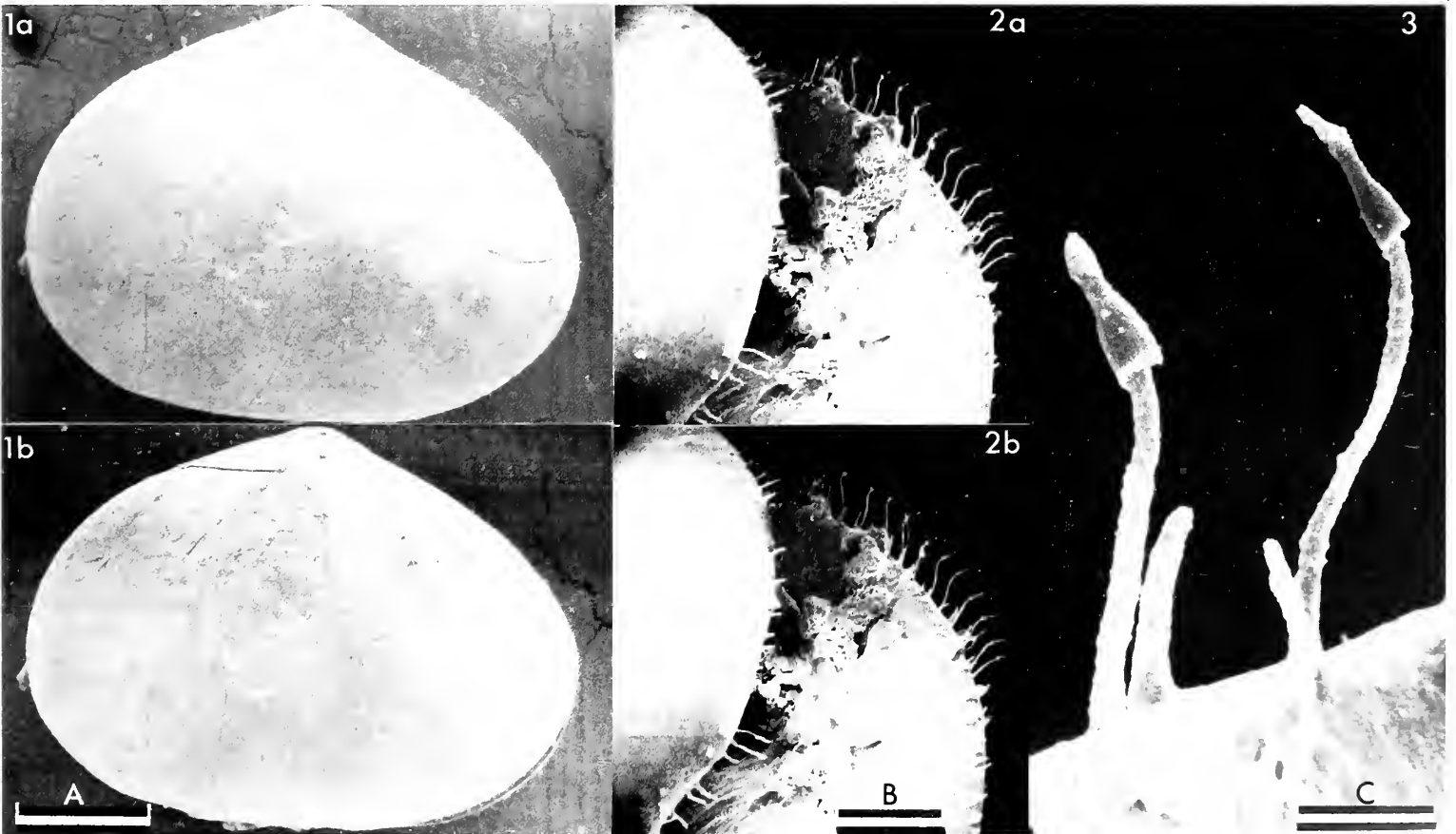
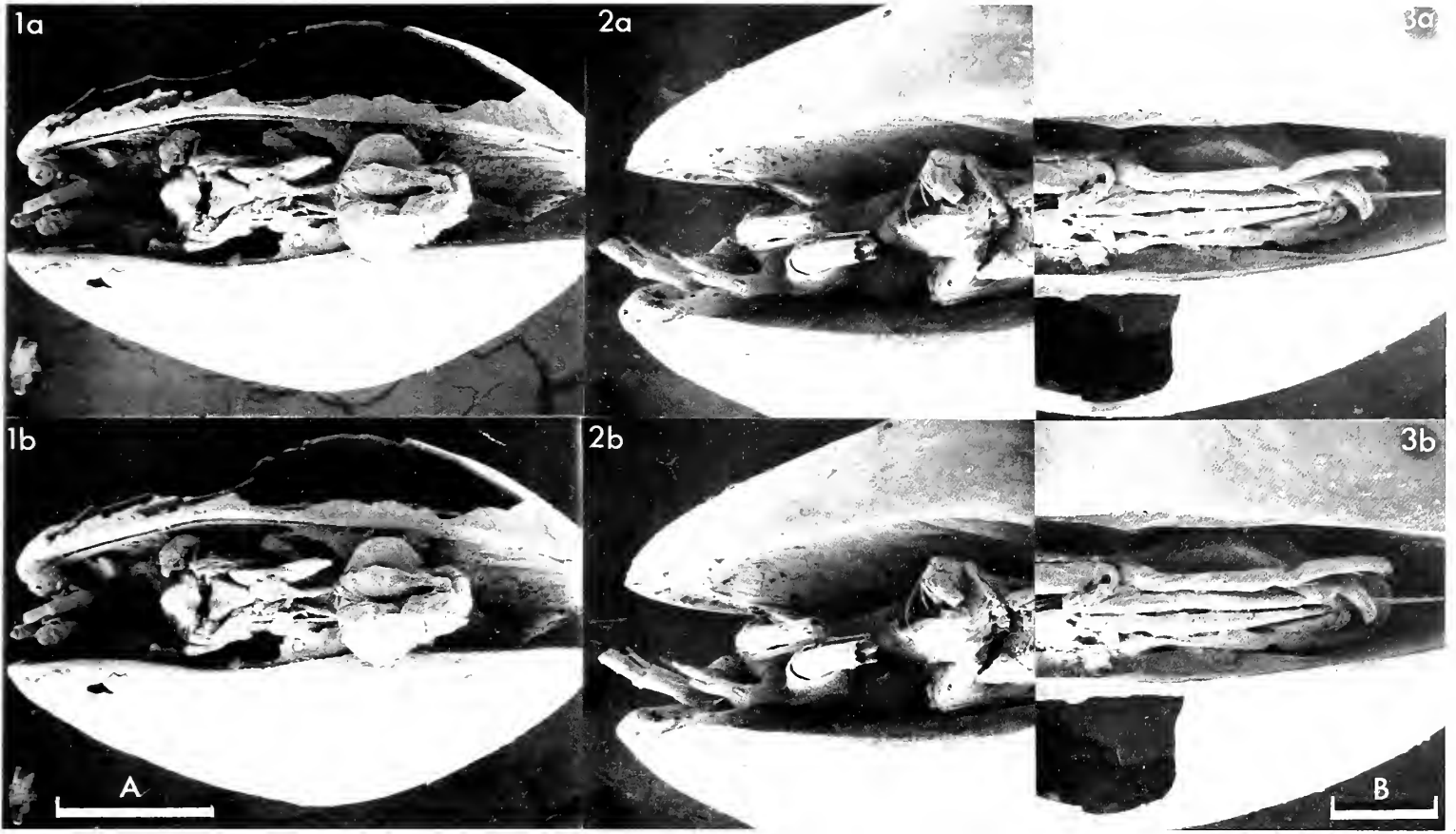
Scale A (250 μm ; ×80), fig. 1; scale B (100 μm ; ×150), figs. 2, 3.

Remarks (contd.): Perhaps the most remarkable preservation is that found in specimen IO 5027, a female carapace, in which the sensory setae are still preserved. Little or no work has been undertaken on the marginal setae of living ostracods which makes it difficult to comment on the significance of the conical terminal caps. Close examination of the terminal caps reveals fine striae extending around the cap (Pl. 1:19:108). This emphasises the incredible fineness of detail which has survived for 100 million years.

Explanation of Plate 1:19:108

Fig. 1, ♀ car., LV; figs. 2, 3, ♀ car., anterior marginal setae with terminal caps.

Scale A (250 μm ; ×73), fig. 1; scale B (25 μm ; ×600), fig. 2; scale C (3 μm ; ×6400), fig. 3.



ON *MUTILUS RETIFORMIS* (TERQUEM)
by G. Ruggieri and P. C. Sylvester-Bradley
(University of Palermo, Italy and University of Leicester, England)

Genus *MUTILUS* Neviani, 1928

Type-species (designated by Ruggieri, 1956): *Cythereis (Mutilus) laticancellata* Neviani, 1928 [=*Cythere retiformis* Terquem, 1878, fid. Ruggieri, 1956]

Mutilus retiformis (Terquem, 1878)

Cythere retiformis sp. nov. Terquem, *Mém. Soc. géol. Fr.*, ser. 3, vol. 1, p. 116, pl. 13, figs. 16a-d (1878).

Cythereis (Mutilus) laticancellata sp. nov. Neviani, *Memorie Accad. pont. Nuovi Lincei*, ser. 2, vol. 11, p. 93, pl. 2, figs. 66-68 (1928).

Mutilus (Mutilus) retiformis (Terquem); Ruggieri, *Atti. Soc. ital. Sci. nat.*, vol. 95, pp. 169-171, figs. 2-3 (1956).

Mutilus retiformis (Terquem); Sissingh, *Bull. Micropaleontol. Utrecht*, vol. 6, p. 124, pl. 9, fig. 12 (1972).

Explanation of Plate 1:20:110

Figs. 1-3 RV: fig. 1, ext. lat.; fig. 2, ext. vent.; fig. 3, ext. dors. obl. Fig. 4, LV ext. lat.

Scale A (500 μm ; $\times 72$), figs. 1, 4 (length of both specimens, 800 μm); scale B (500 μm ; $\times 68$), figs. 2, 3.

Type specimens: Natural History Museum, Paris [fid. *Catalogue of Ostracoda*, Ellis & Messina].

Type locality: Upper Pliocene or Lower Quaternary, Rhodes, Greece.

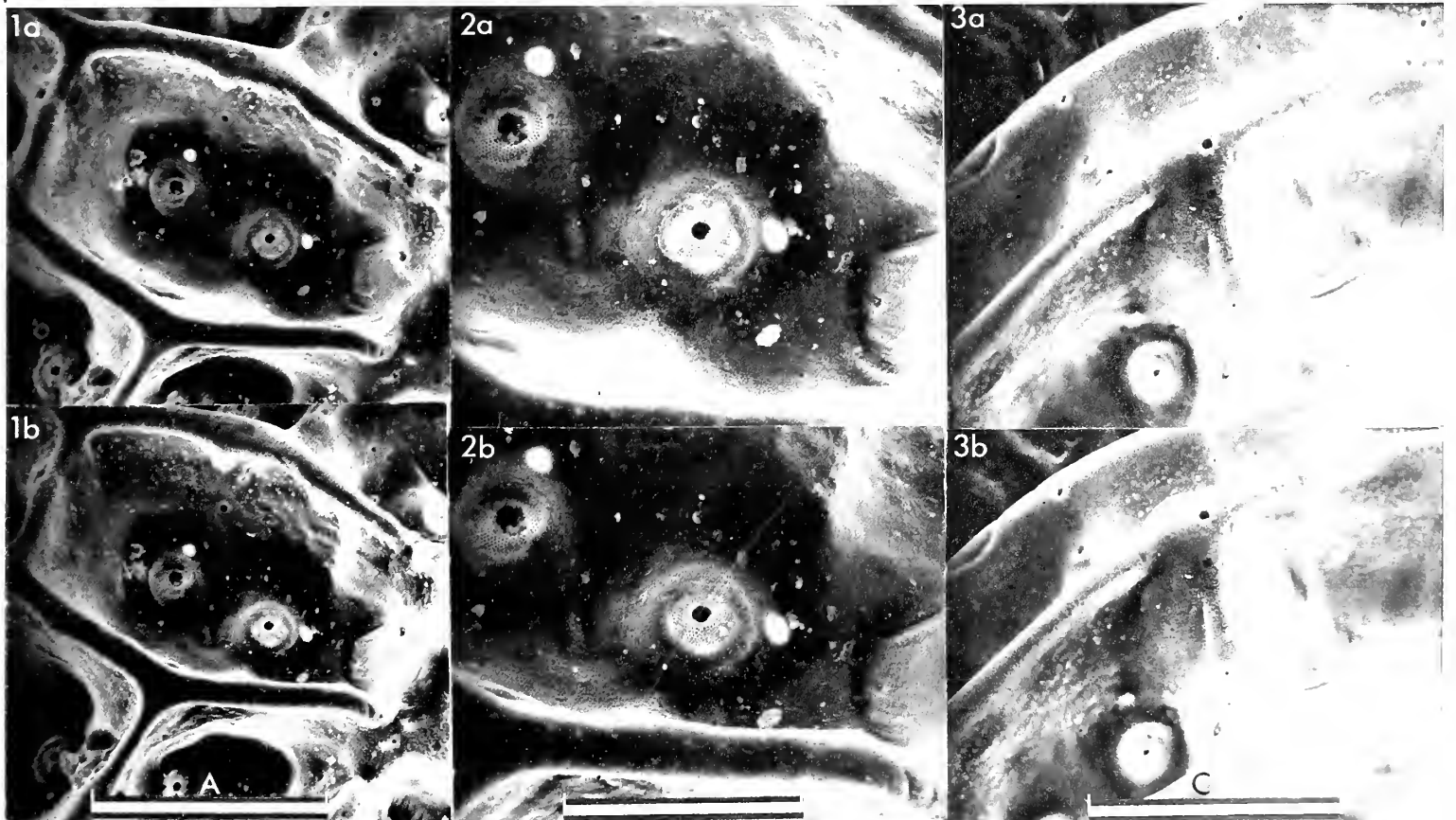
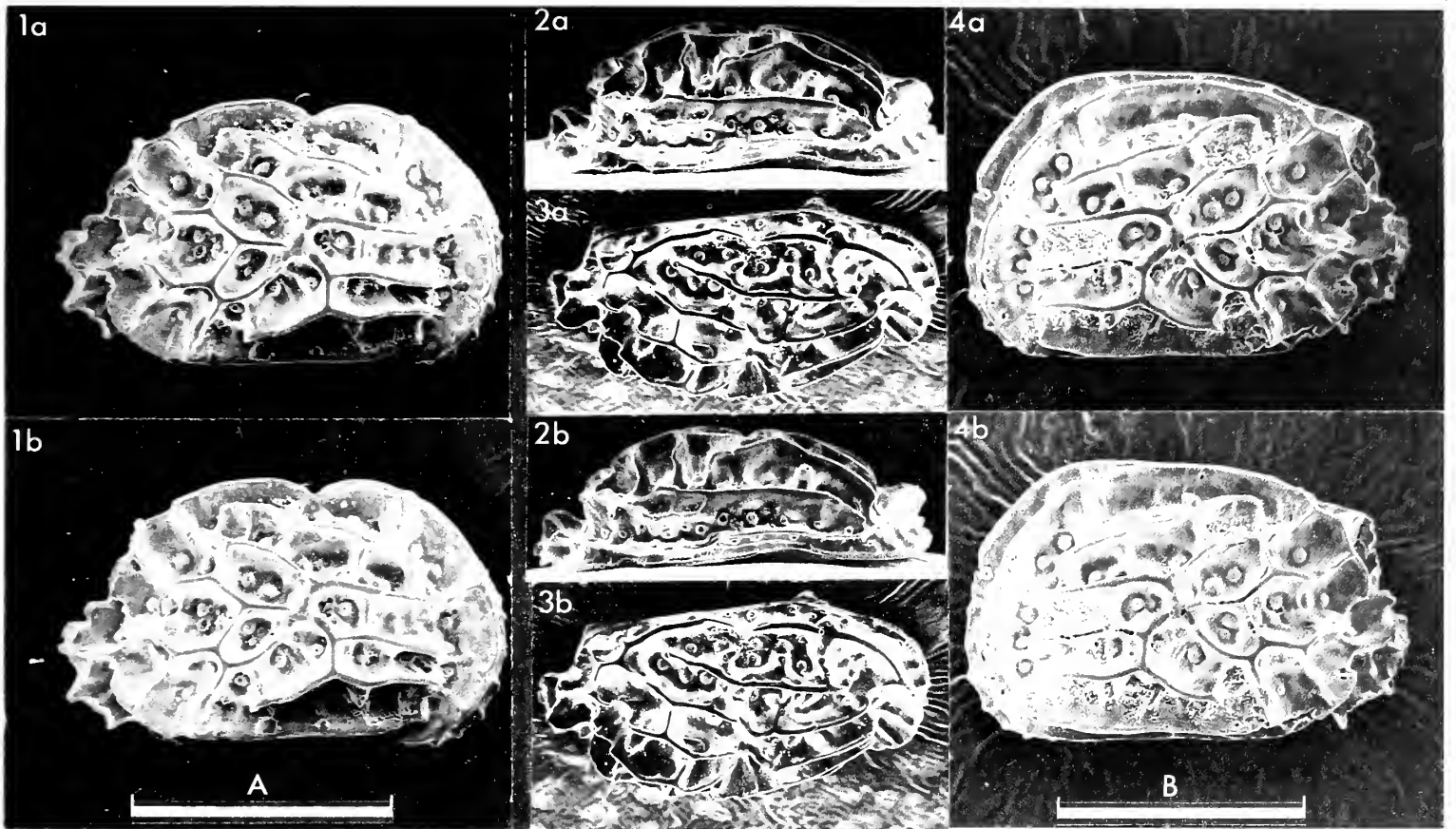
Figured specimens: Brit. Mus. (Nat. Hist.) IO 5546 (RV: Pl. 1:20:110, figs. 1-3; Pl. 1:20:112, figs. 1, 2), IO 5547 (LV: Pl. 1:20:110, fig. 4; Pl. 1:20:112, fig. 3), IO 5548 (LV: Pl. 1:20:114, figs. 1, 5, 6; Pl. 1:20:116, figs. 1-4), IO 5549 (RV: Pl. 1:20:114, figs. 2-4). All specimens from Middle Pliocene (grey marls) of River Modione, near Portanna, (Trapani, Sicily), long. 12°50'E, lat. 37°22'N (coll. G. Ruggieri).

Diagnosis: Sub-quadrate in lateral outline with wide, deep polygonal fossae.

Explanation of Plate 1:20:112

Figs. 1-2 RV ext. lat. to show normal pore canals; fig. 3, LV ext. lat. to show eye tubercle.

Scale A (100 μm ; $\times 330$), fig. 1; scale B (50 μm ; $\times 660$), fig. 2; scale C (100 μm ; $\times 350$), fig. 3.



Remarks: Van Morkhoven (1963, *Post-Palaeozoic Ostracoda*, vol. 2, p. 138) claimed that *Cythere retiformis* Terquem was "conspicuously different in outline and not identical" to *Cythereis laticancellata* Neviani, and thought that *C. retiformis* might be a junior synonym of *Cythere normani* Brady, 1866. He was placing too much reliance on the rough sketches of Neviani and he was wrong about *C. normani*, for this species belongs to the genus *Bradleya* (Benson 1972, *Smithson. Contr. Paleobiol.*, no. 12, pp. 38-39, text-fig. 13c; pl. 1, fig. 7; pl. 7, fig. 8) and it does not occur in either the Pliocene of Vallebchiaia (the type locality of *C. laticancellata*), or (so far as we know) in the Island of Rhodes (the type locality of *C. retiformis*) whereas *M. retiformis* as here interpreted is abundant in both localities.

Explanation of Plate 1:20:114

Figs. 1, 5, 6, LV int. lat.; figs. 2-4, RV int. lat.; with details of terminal elements of hinge.

Scale A (500 μm ; $\times 70$), figs. 1, 2 (length of both specimens, 820 μm); scale B (20 μm ; $\times 210$), figs. 3-6.

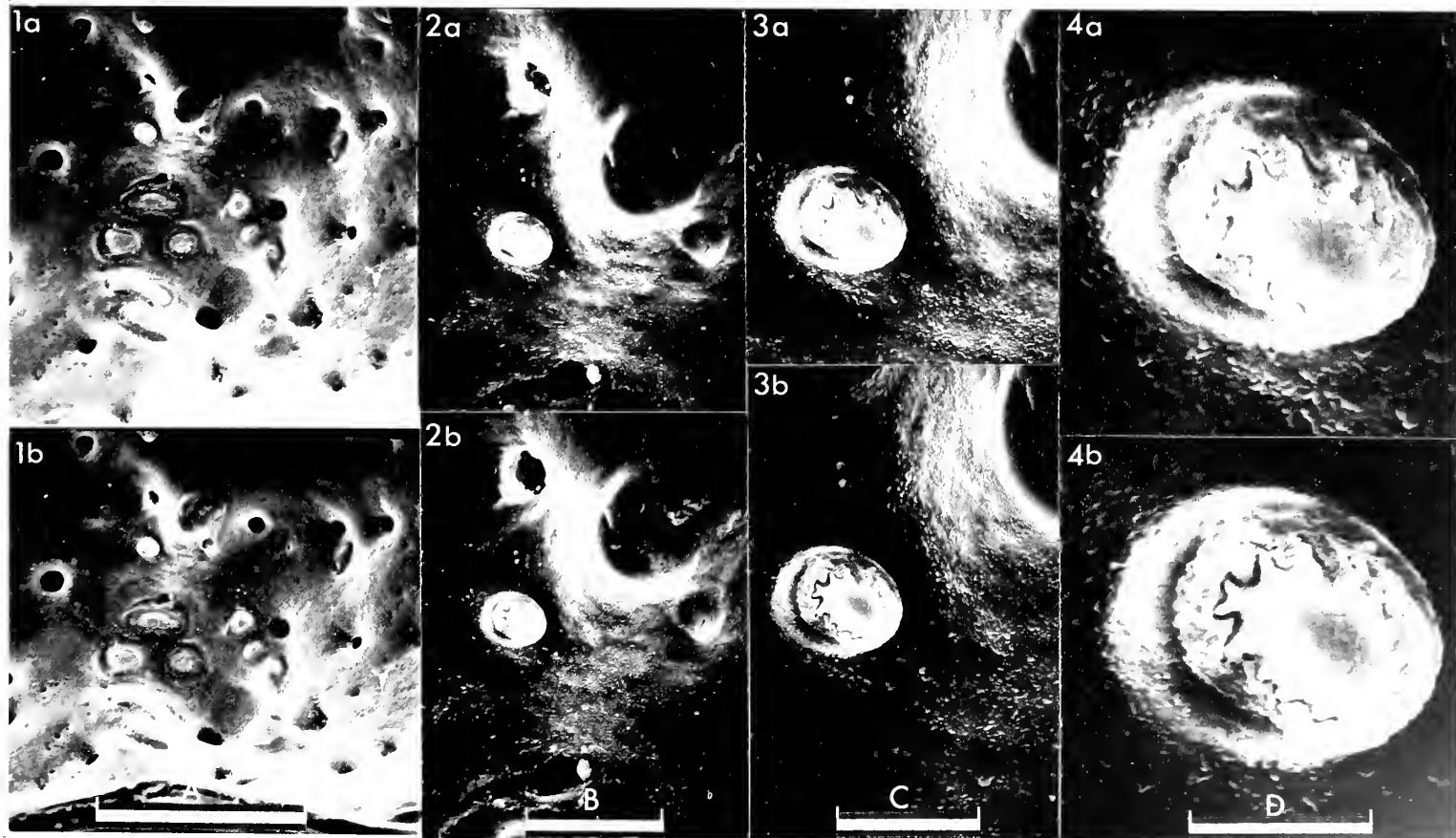
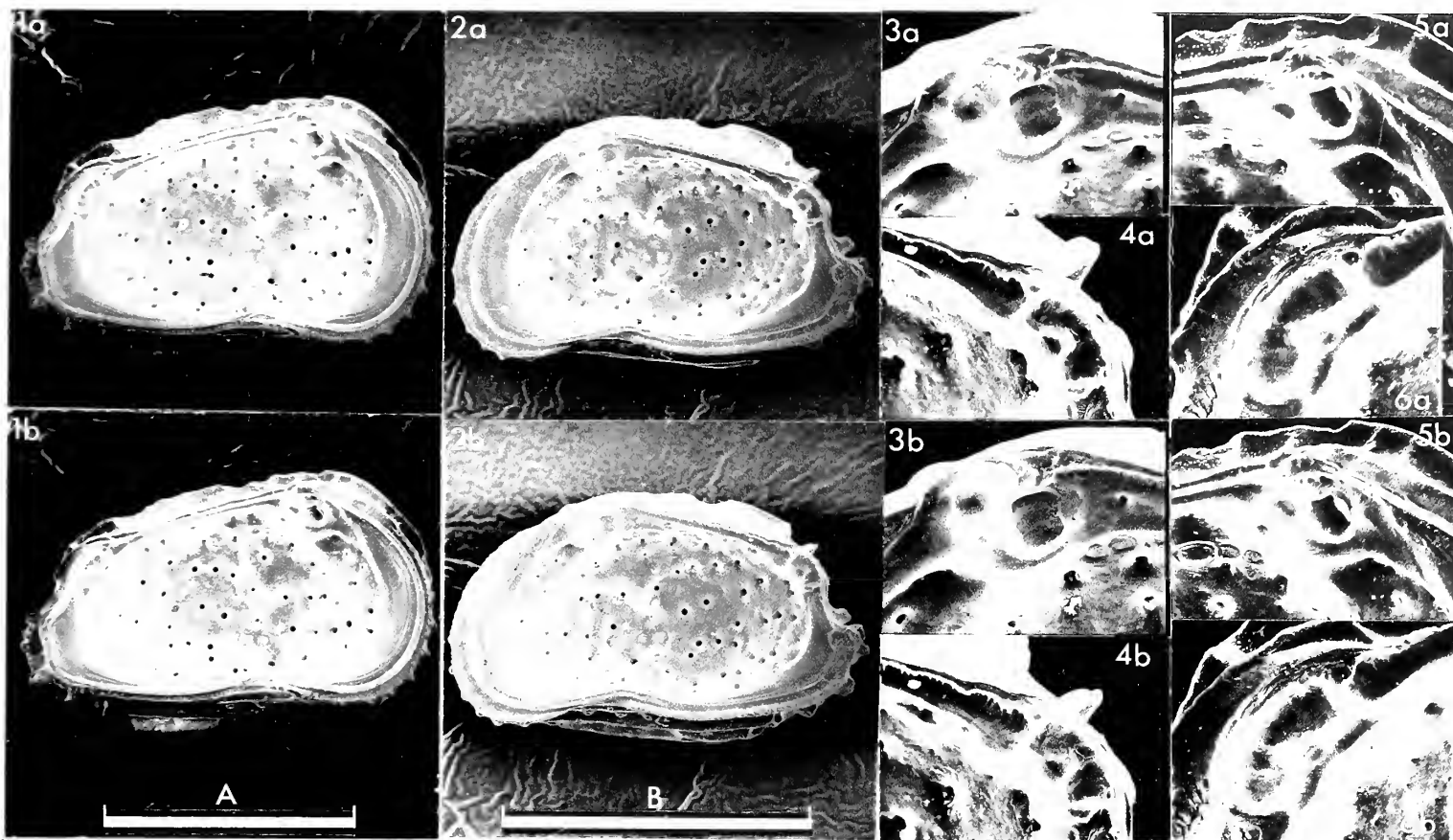
Remarks (contd.): Sissingh (1972, *op. cit.*, p. 124) suggested that what he termed "tubular normal pore canals" should be given special diagnostic weight in the generic definition. The figures we give of the normal pore canals show that the sieve plates terminate in bosses which rise from the sola of each fossa (Pl. 1:20:112, figs. 1, 2). We doubt whether these are properly described as "tubular normal pore canals." Pores also terminate higher chimney-like structures between some of the fossae which border the dorsal and ventral margins (Pl. 1:20:110, figs. 1-4), but these appear to be relicts of intramural pores that have survived the degeneration of the transverse muri. We have been unable to determine whether or not they contain sieve plates.

The stellar scars on the internal tubercles that lie to the posterior of the mandibular fulcrum (Pl. 1:20:116, figs. 1-4) are found also in other species of the genus. We suggest the term "stellar tubercle" for this feature. Two stellar tubercles are developed on each valve, both lying to the posterior of the mandibular fulcrum, one dorsally and one ventrally situate, and forming with the mandibular fulcrum an isosceles triangle (Pl. 1:20:114, figs. 1, 2; Pl. 1:20:116, fig. 1).

Explanation of Plate 1:20:116

Figs. 1-4 LV int. lat. to show musc. sc., mandibular fulcrum, vent. stellar tubercle.

Scale A (100 μm ; $\times 280$), fig. 1; scale B (20 μm ; $\times 980$), fig. 2; scale C (10 μm ; $\times 1960$), fig. 3; scale D (5 μm ; $\times 5000$), fig. 4.



ON *MUTILUS KEIJI* RUGGIERI
by Neriman Doruk
(University of Leicester, England)

Mutilus keiji Ruggieri, 1962

Mutilus (Mutilus) keiji G. Ruggieri, *Paleontogr. ital.*, vol. 56, mem. 2, p. 36, pl. 4, figs. 5-7 (1962).

Holotype: Istituto di Geologia e Paleontologia, Palermo (OCR, Sl. no. 1339), ♀, carapace.

Type locality: Enna, Italy. Approx. lat. 37°34'N, long. 14°17'E. Tortonian. Grey sandy clay with abundant foraminifera, and *Ostrea*, *Chlamys*, *Balanus* and echinoderm shells.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 4937 (RV: Pl. 1:21:118, fig. 1; Pl. 1:21:120, fig. 2), IO 4938 (LV: Pl. 1:21:118, fig. 2), IO 4939 (LV: Pl. 1:21:120, figs. 1, 3). All from a road cutting between Babatorun and Com, Turkey; 1 km SW of Babatorun. Uppermost Miocene. IO 4937 and IO 4939 from the base; IO 4938 4 m from the base of the section. Yellow sandstone with abundant foraminifera and molluscan shell fragments, presumed shallow marine (littoral). Approx. long. 36°15'E, lat. 36°04'N.

Explanation of Plate 1:21:118

Fig. 1, ♀ RV, ext.; fig. 2, ♂ LV, ext.

Scale A (250 µm ; ×123), fig. 1; scale B (250 µm ; ×118), fig. 2.

Diagnosis: Surface reticulate, fossae large, deep.

Remarks: Always three frontal scars, 5-6 adductor scars, with undivided or divided ventromedian scars (see text-fig. 1, and Pl. 1:21:120, fig. 3). Posterior marginal spines: 3-9; anterior marginal spines: 8-18. Sexual dimorphism: males more elongate.
Distribution: Tortonian, Italy (Ruggieri 1962); Upper Miocene in Tarsus and Antakya regions of Turkey.

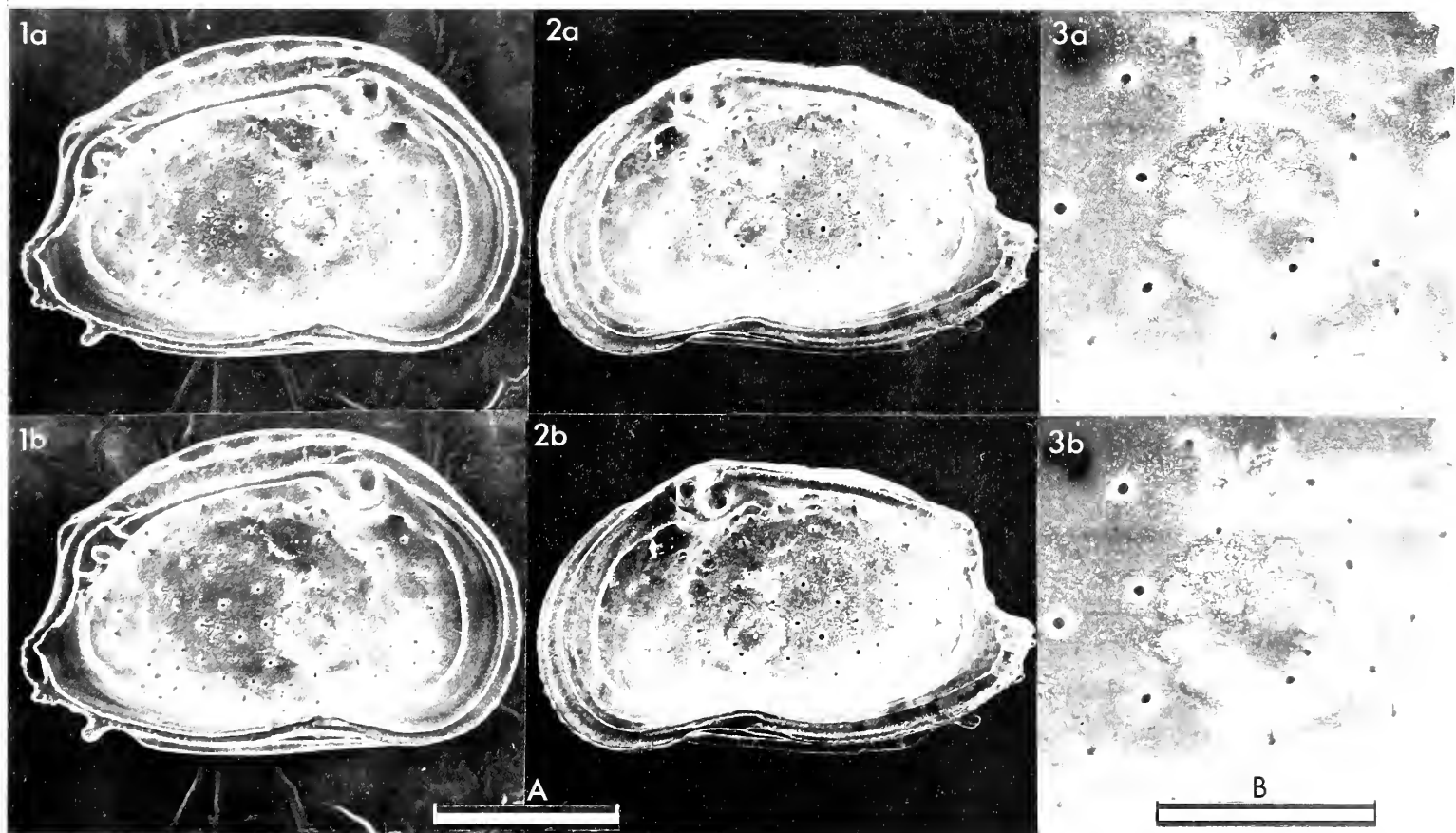
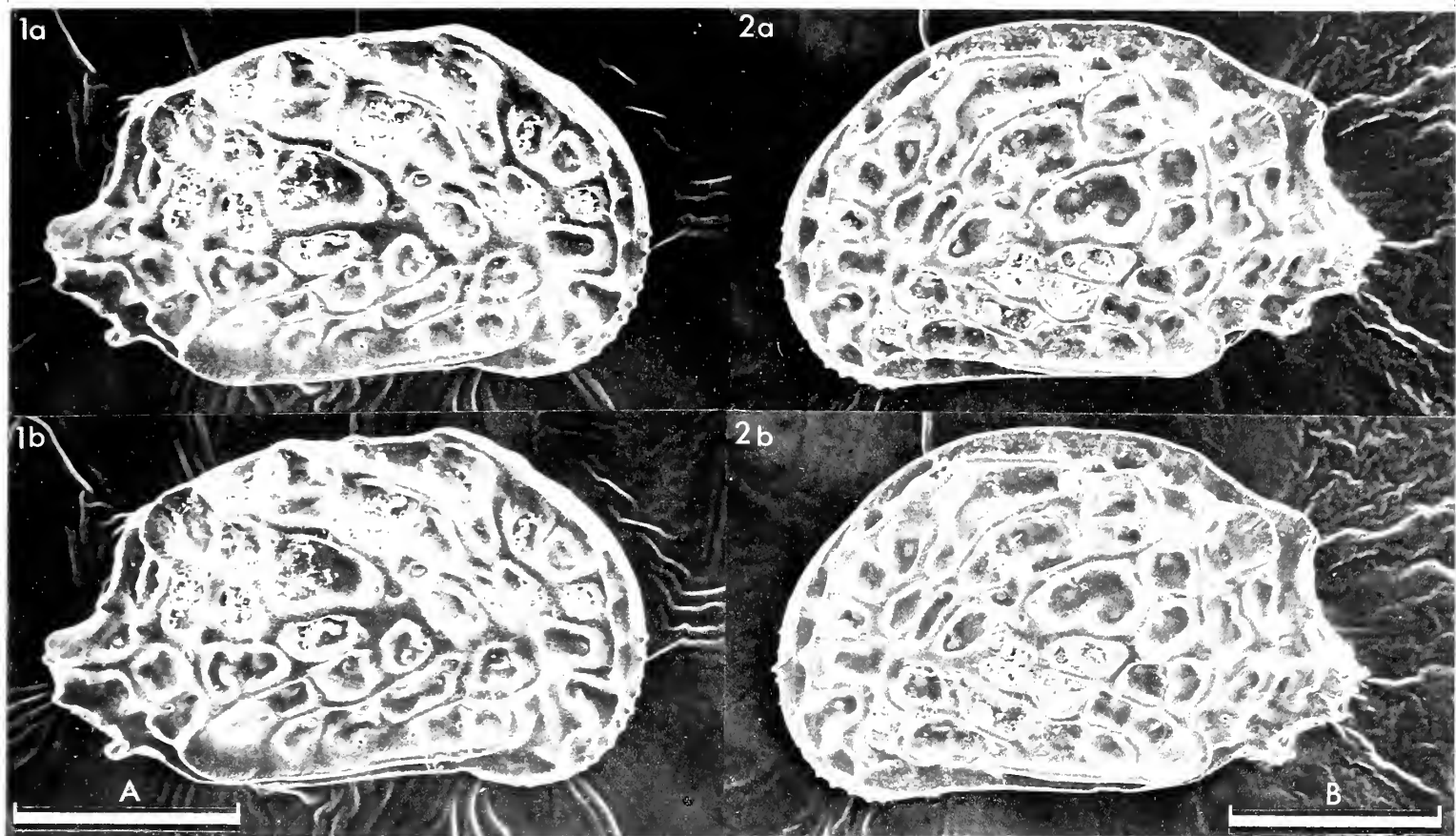
Text-fig. 1 Muscle scars



Explanation of Plate 1:21:120

Fig. 1, ♀ LV, int.; fig. 2, ♀ RV, int.; fig. 3, LV, int. musc. sc.

Scale A (250 µm ; ×101), figs. 1, 2; scale B (100 µm ; ×306), fig. 3.



ON *MUTILUS CIMBAEFORMIS* (SEGUENZA)
by Neriman Doruk
(University of Leicester, England)

Mutilus cimbaeformis (Seguenza, 1882)

Cythere cimbaeformis G. Seguenza, *Naturalista sicil.*, II-V, p. 22, pl. 1, figs. 6a-d (1882).
Hemicythere cimbaeformis (Seguenza); G. Ruggieri, *G. Geol.*, ser. 2, vol. 21, p. 1, fig. 2,
text-fig. 22 (1950).

Mutilus cimbaeformis (Seguenza); F. Uliczny, *Hemicytheridae und Trachyleberididae aus dem
Pliozän der Insel Kephallinia*, Dissertation, Univ. Munich, p. 52, pl. 14, fig. 7 (1969).

Holotype: Depository not known. Probably lost during Messina earthquake of 1908
(Ruggieri 1963, *Boll. Soc. paleont. ital.*, 1 (2), p. 3).

Type locality: Rizzola, Sicily. Quaternary.

Explanation of Plate 1:22:122

Fig. 1, ♀ RV, ext.; fig. 2, ♂ LV, ext.

Scale A (250 µm ; ×98), fig. 1; scale B (250 µm ; ×107), fig. 2.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 4940 (RV: Pl. 1:22:122, fig. 1), IO 4941 (LV:
Pl. 1:22:122, fig. 2), IO 4942 (LV: Pl. 1:22:124, fig. 1), IO 4943 (RV:
Pl. 1:22:124, figs. 2, 3). IO 4940, IO 4942 and IO 4943 from drillings
at Kato-Lakatamia, Cyprus, 4-5 km SW of Nicosia; Pliocene; presumed
shallow marine; approx. lat. 35°08'N, long. 33°18'E. IO 4941 from Imola,
Italy; Quaternary; fine-grained sandstone; approx. long. 11°43'E, lat.
44°22'N (coll. G. Ruggieri).

Diagnosis: Characteristic ornament.

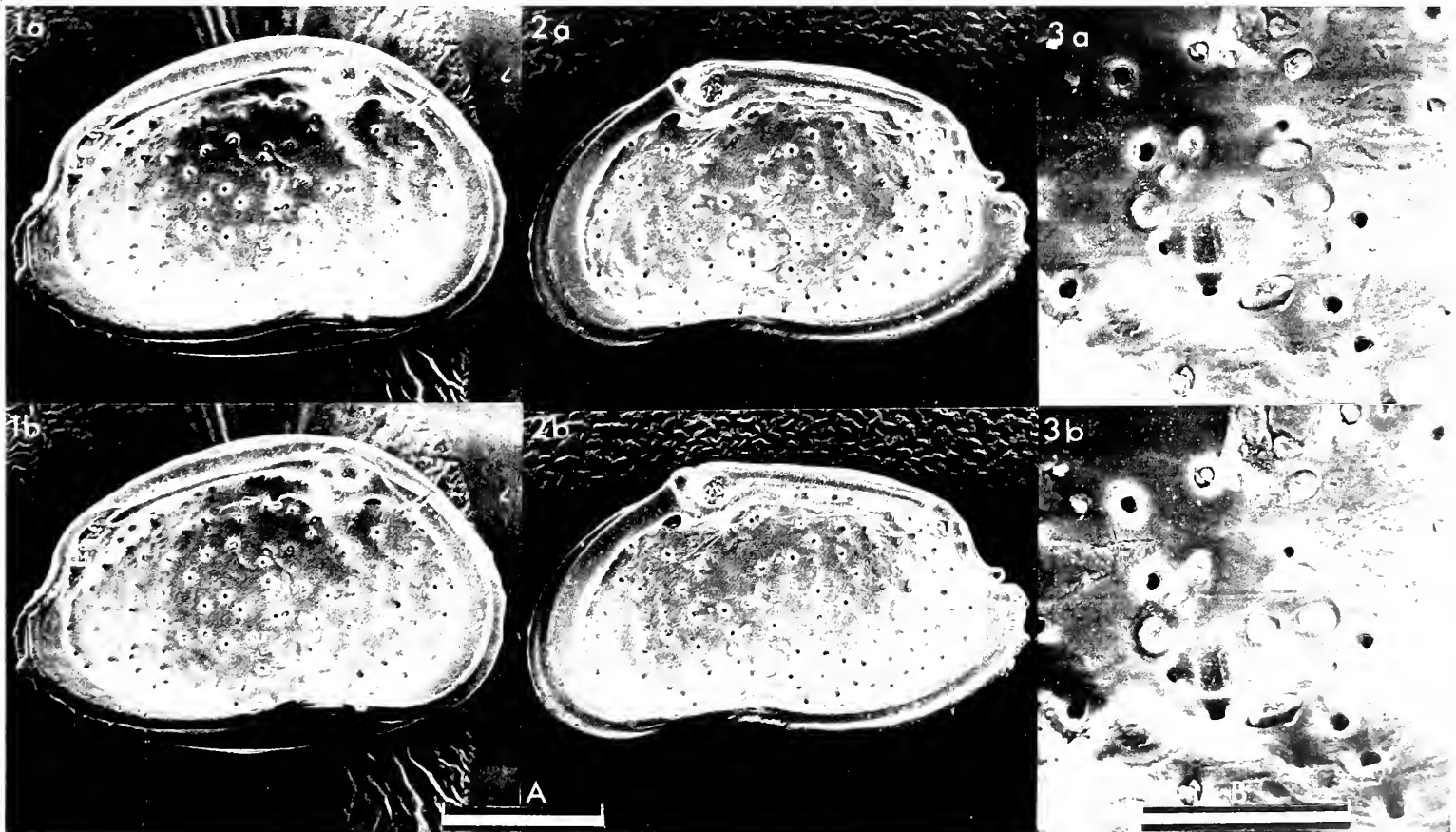
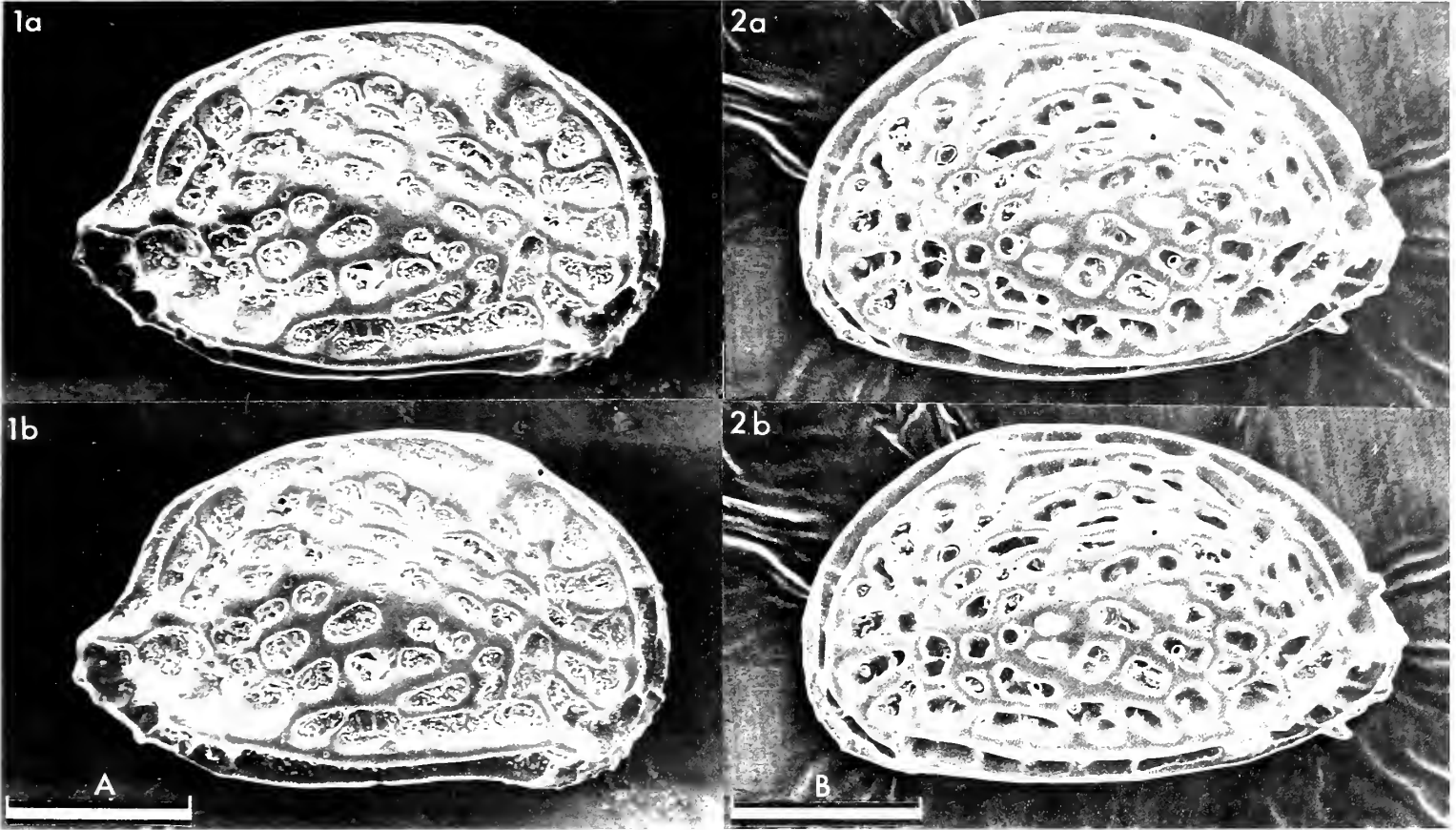
Remarks: Always 3 frontal scars; 5 adductor scars (see Pl. 1:22:124, fig. 3).
Posterior with variable number of marginal spines (1-6). Sexual
dimorphism: males more elongate. Anterior marginal carina continuous
with ventrolateral carina in males, interrupted by 1 or 2 fossae in
females (see Pl. 1:22:122, figs. 1, 2).

Distribution: Post-Pliocene, Quaternary; Italy (Ruggieri 1950). Middle Pliocene-
Pleistocene; Greece (Uliczny 1969), Cyprus and Turkey.

Explanation of Plate 1:22:124

Fig. 1, ♀ LV, int.; fig. 2, ♀ RV, int.; fig. 3, RV, int. musc. sc.

Scale A (250 µm ; ×85), figs. 1, 2; scale B (100 µm ; ×280), fig. 3.



ON *MUTILUS FREUDENTHALI* (SISSINGH)
by Neriman Doruk
(University of Leicester, England)

Mutilus freudenthali (Sissingh, 1972)

Aurila freudenthali W. Sissingh, *Bull. Micropaleontol. Utrecht*, vol. 6, p. 116, pl. 9, fig. 3 (1972).

Holotype: Deposited in the Utrecht Micropalaeontological collection, ♂ LV.

Type locality: Province of Kania, Crete, S Aegean Islands (see Sissingh 1972, p. 19). Approx. long. 24°20'E, lat. 35°25'N. Upper Miocene (Tortonian). White and beige fossiliferous marls with abundant concretions.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 4994 (RV: Pl. 1:23:126, fig. 1; Pl. 1:23:128, fig. 2), IO 4995 (LV: Pl. 1:23:126, fig. 2), IO 4996 (RV: Pl. 1:23:128, fig. 3). The specimen figured in Pl. 1:23:128, fig. 1 has been broken after photography. All the figured specimens are from a stream cutting about 200-300 m S of Sarılı village, Antakya region of Turkey. Tortonian (Upper Miocene). Bioclastic limestone with molluscan shells, presumed shallow marine (sublittoral). Approx. long. 36°13'E, lat. 36°07'N.

Explanation of Plate 1:23:126

Fig. 1, ♂ RV, ext.; fig. 2, ♀ LV, ext.

Scale A (250 µm ; ×93), fig. 1; scale B (250 µm ; ×88), fig. 2.

Diagnosis: Semicircular outline with horizontal venter giving triangular cross section. Deeply punctate, the fossae variably shaped, with excavate muri; surface minutely foveolate.

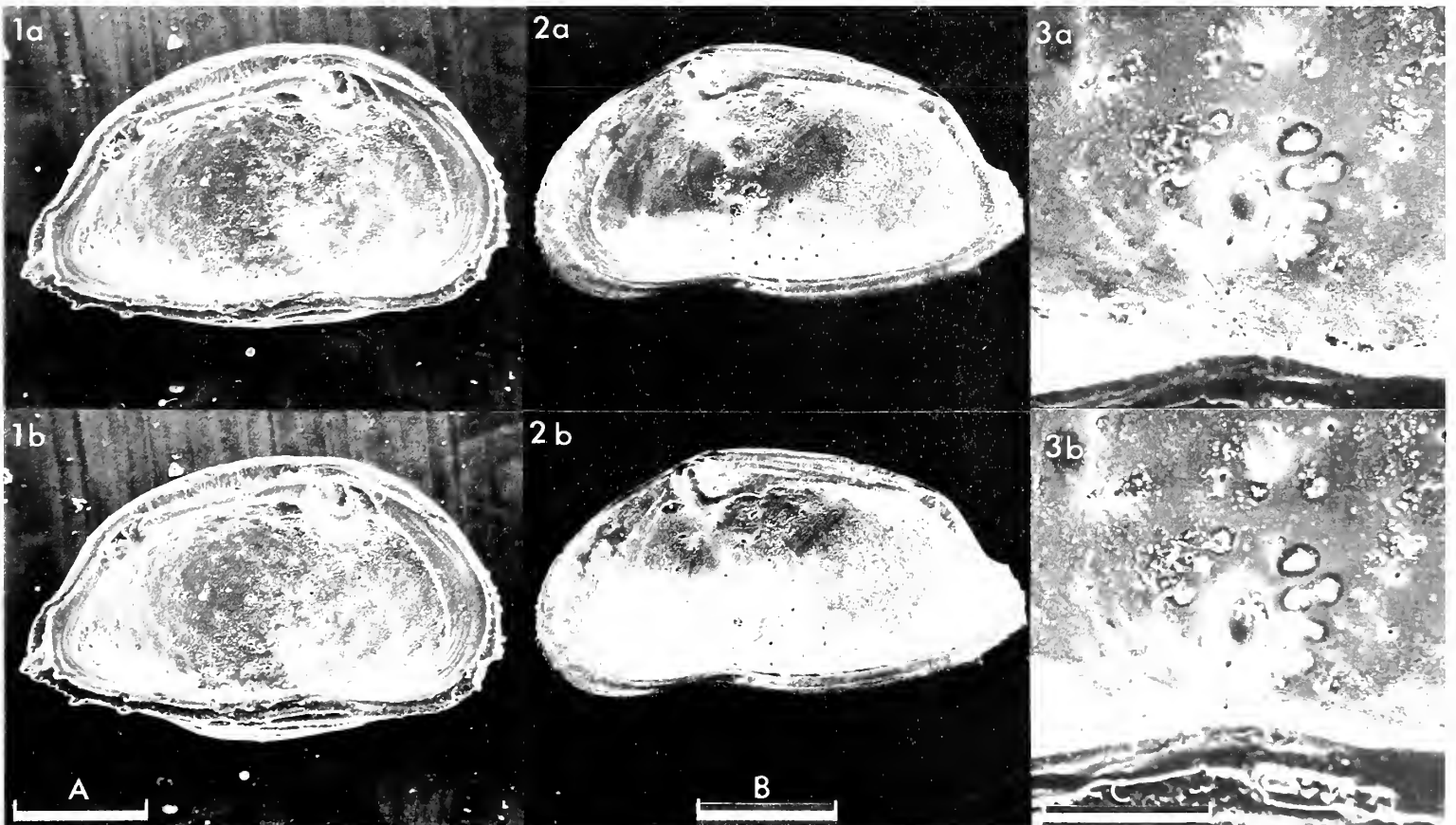
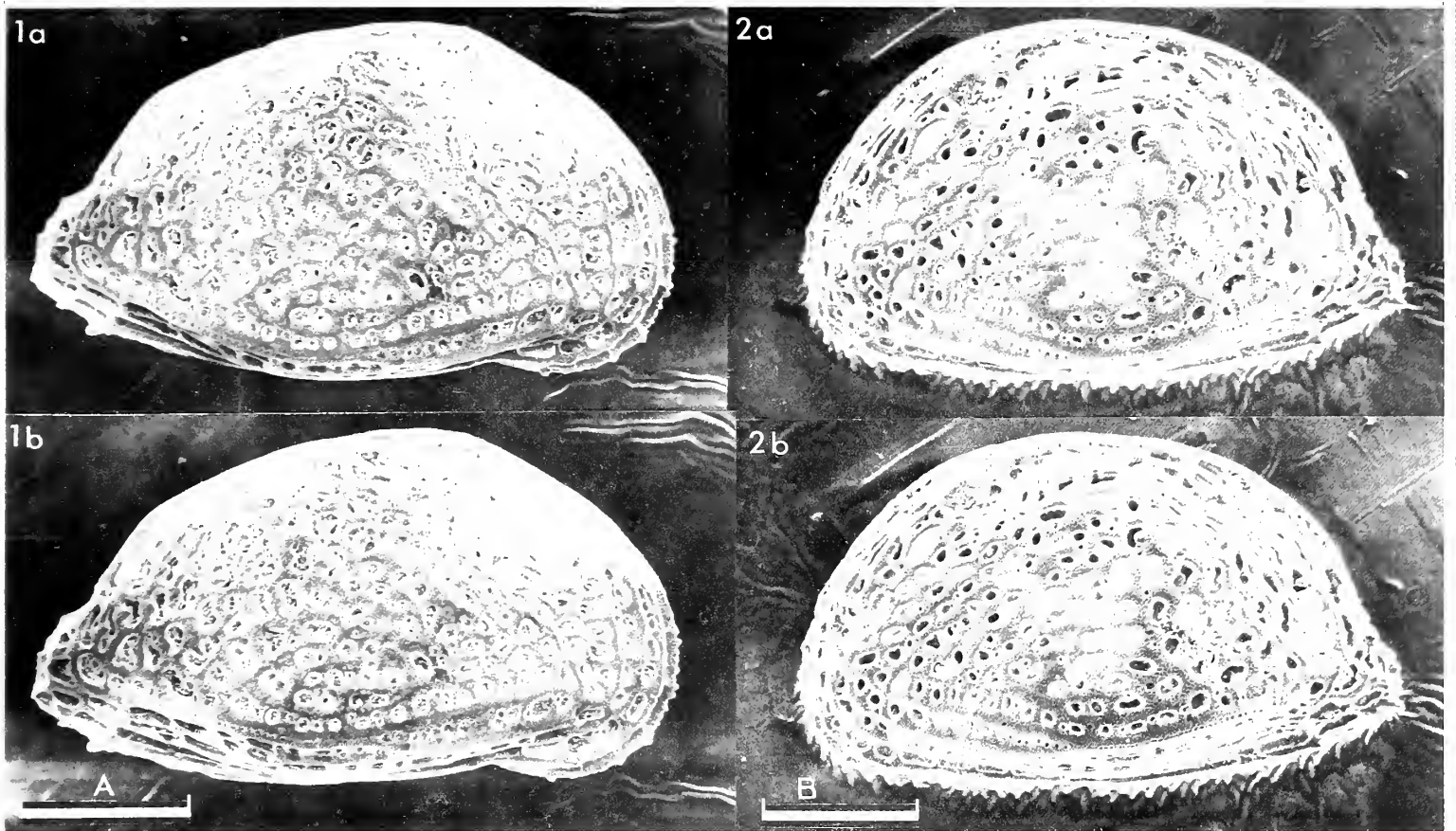
Remarks: Always 3 frontal scars; 4-6 adductor scars with undivided or divided median scars. Sexual dimorphism: females more convex dorsally.

Distribution: Upper Miocene (Tortonian) of Crete, Aegean Islands (Sissingh 1972); Upper and uppermost Miocene of Antakya region, Turkey.

Explanation of Plate 1:23:128

Fig. 1, ♂ LV, int.; fig. 2, ♂ RV, int.; fig. 3, RV, int. musc. sc.

Scale A (250 µm ; ×72), fig. 1; scale B (250 µm ; ×75), fig. 2; scale C (100 µm ; ×232), fig. 3.



ON *MUTILUS CONVEXUS* (BAIRD)
by Neriman Doruk
(University of Leicester, England)

Mutilus convexus (Baird, 1850)

Cythere convexa W. Baird, *Ray. Soc. Publs.*, p. 134, pl. 21, fig. 3 (1850).

Cythereis convexa (Baird); G. W. Müller, *Zool. Jber. Neapel.*, Berlin, no. 21, p. 366, pl. 28, figs. 14, 19; pl. 30, figs. 49-51; pl. 35, figs. 6, 13, 19-21 (1894)

[non *Hemicythere convexa* (Baird); G. Ruggieri, *G. Geol.*, ser. 2, vol. 23, p. 88, pl. 6, fig. 56 (1953).]

Aurila convexa (Baird); V. Pokorný, *Acta Univ. Carol. Geol.*, 3, p. 17, figs. 8-14 (1955).

Aurila convexa (Baird); C. W. Wagner, *Sur les Ostracodes du Quaternaire Récent des Pays-Bas et leur utilisation dans l'étude géologique des dépôts Holocènes*, Dissertation, Univ. de Paris, p. 59, pl. 25, figs. 1-6 (1957).

Aurila livathoensis F. Uliczny, *Hemicytheridae und Trachyleberididae aus dem Pliozän der Insel Kephallinia*, Dissertation, Univ. Munich, p. 32, pl. 12, figs. 7-9; [non *A. c. convexa* (Baird) p. 21, pl. 11, figs. 1, 2; non *A. c. emathiae* p. 22, pl. 1, figs. 7, 8, pl. 11, figs. 3, 4] (1969).

[non *Aurila convexa* (Baird); H. Uffenorde, *Göttinger Arb. Geol. Paläont.*, no. 13, p. 77, pl. 8, fig. 4 (1972).]

Explanation of Plate 1:24:130

Fig. 1, ♀ RV, ext.; fig. 2, ♀ LV, ext.

Scale A (250 µm ; ×107), fig. 1; scale B (250 µm ; ×115), fig. 2.

Syntypes: Types from Tenby kept in the Zoological section of British Museum.

Type localities: Torquay, SE Devonshire; Tenby, S Wales.

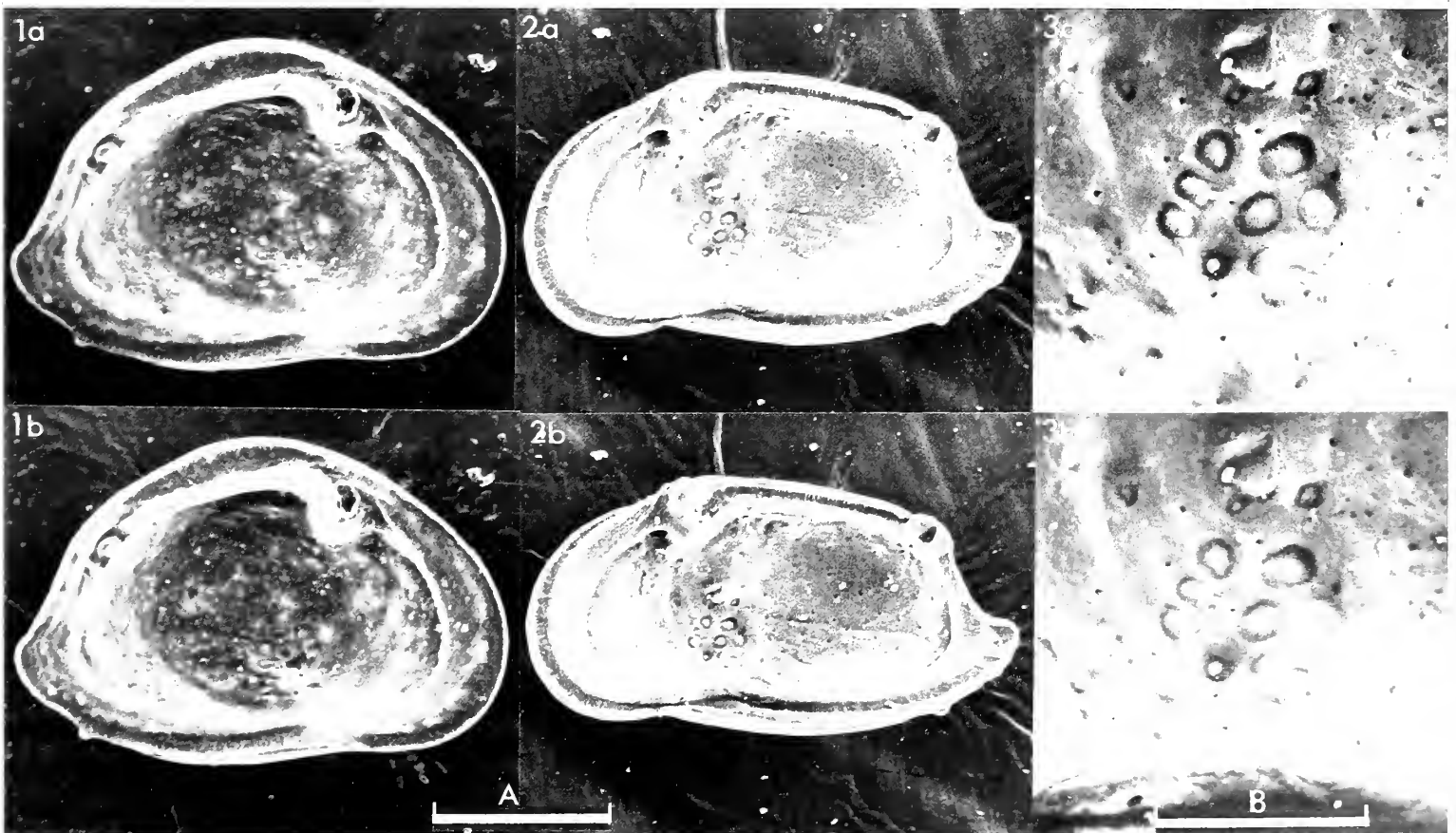
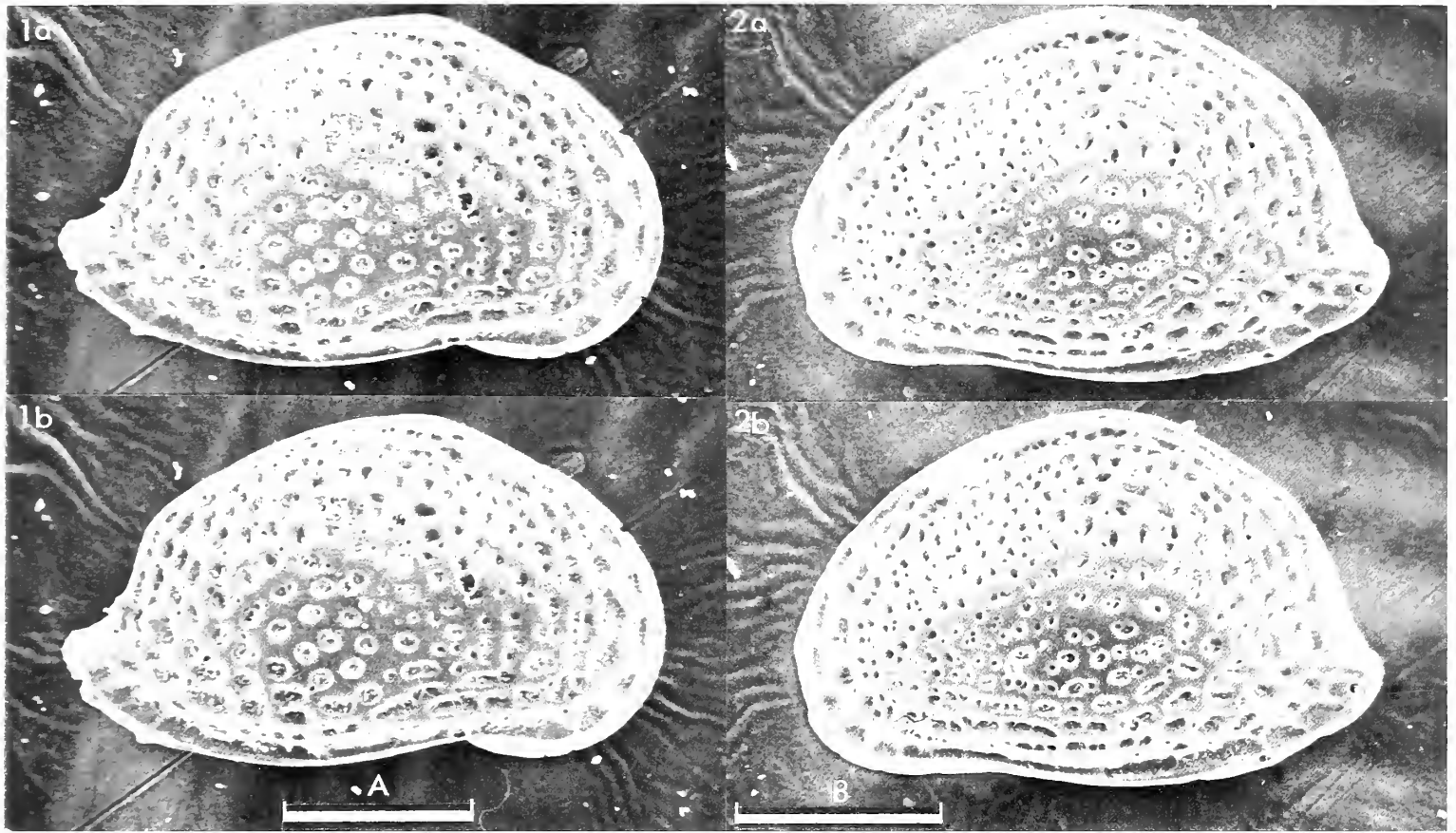
Figured specimens: Brit. Mus. (Nat. Hist.) IO 5659 (RV: Pl. 1:24:130, fig. 1), IO 5660 (LV: Pl. 1:24:130, fig. 2; Pl. 1:24:132, fig. 1), IO 5661 (RV: Pl. 1:24:132, figs. 2, 3), IO 5662 (RV: Pl. 1:24:134, fig. 1), IO 5663 (LV: Pl. 1:24:134, fig. 2; Pl. 1:24:136, fig. 3), IO 5664 (LV: Pl. 1:24:136, fig. 1), IO 5716 (LV: Pl. 1:24:136, fig. 2). IO 5659 dredged from Urla Bay, W coast of Turkey, 20 m below surface; subrecent; littoral; approx. long. 26°47'E, lat. 38°19'N. IO 5660, IO 5661 and IO 5716 from drillings near Nicosia, Cyprus; Pliocene; presumed littoral; approx. lat. 35°08'N, long. 33°18'E. IO 5662, IO 5663 and IO 5664 from Westdale Bay, Wales; Recent; approx. lat. 51°43'N, long. 5°11'W (coll. by P. C. Sylvester-Bradley).

Diagnosis: Shape distinctive, opaque area of consistent pattern.

Explanation of Plate 1:24:132

Fig. 1, ♀ LV, int.; fig. 2, ♂ RV, int.; fig. 3, RV, int. musc. sc.

Scale A (250 µm ; ×97), figs. 1, 2; scale B (100 µm ; ×300), fig. 3.



— **Remarks:** Generic assignment: *Cythere convexa* Baird is the type species of the genus *Aurila* Pokorný (1955, p. 17). Sissingh (*Bull. Micropaleontol. Utrecht*, 1972, p. 24) claims to be able to distinguish *Mutilus* from *Aurila* on the basis of "tubular pore canals." I have been unable to find any consistent difference between the pore canals of species assigned to the two genera. Indeed all characters appear to be gradational and I am forced to regard the two genera as synonymous. Differs from *M. speyeri* (Brady) and *M. versiculatus* in shape. Frontal scars 2 or 3; adductor scars 5 or 6 with undivided or divided ventromedian adductor scars.



Opaque area
LV ×53

Sexual dimorphism: males less high (see Pl. 1:24:136, fig. 2).

Distribution: Recent in Atlantic and Mediterranean. Miocene-Quaternary as fossil in Europe. Miocene, Pliocene and Recent in Turkey and Cyprus.

Explanation of Plate 1:24:134

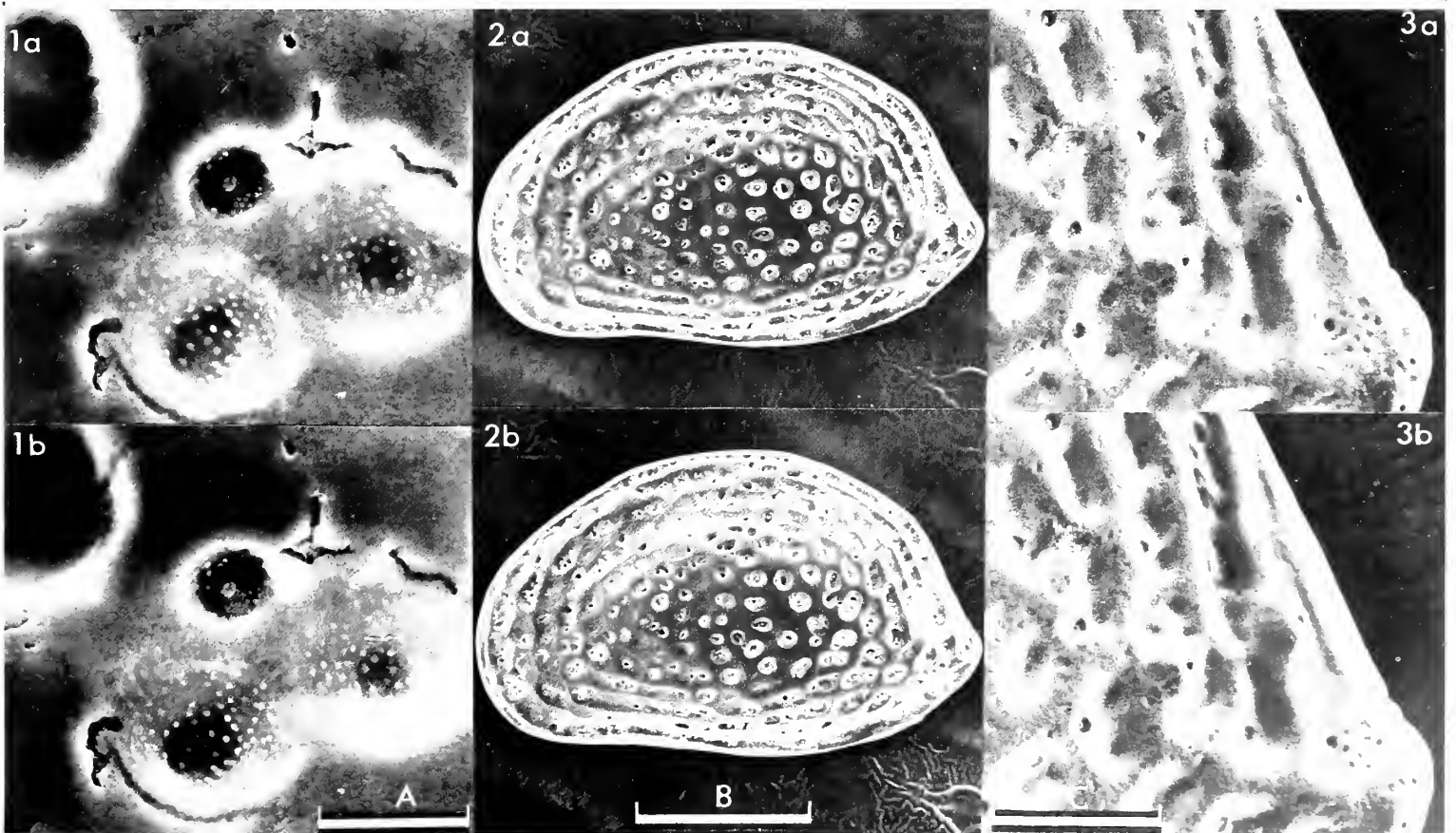
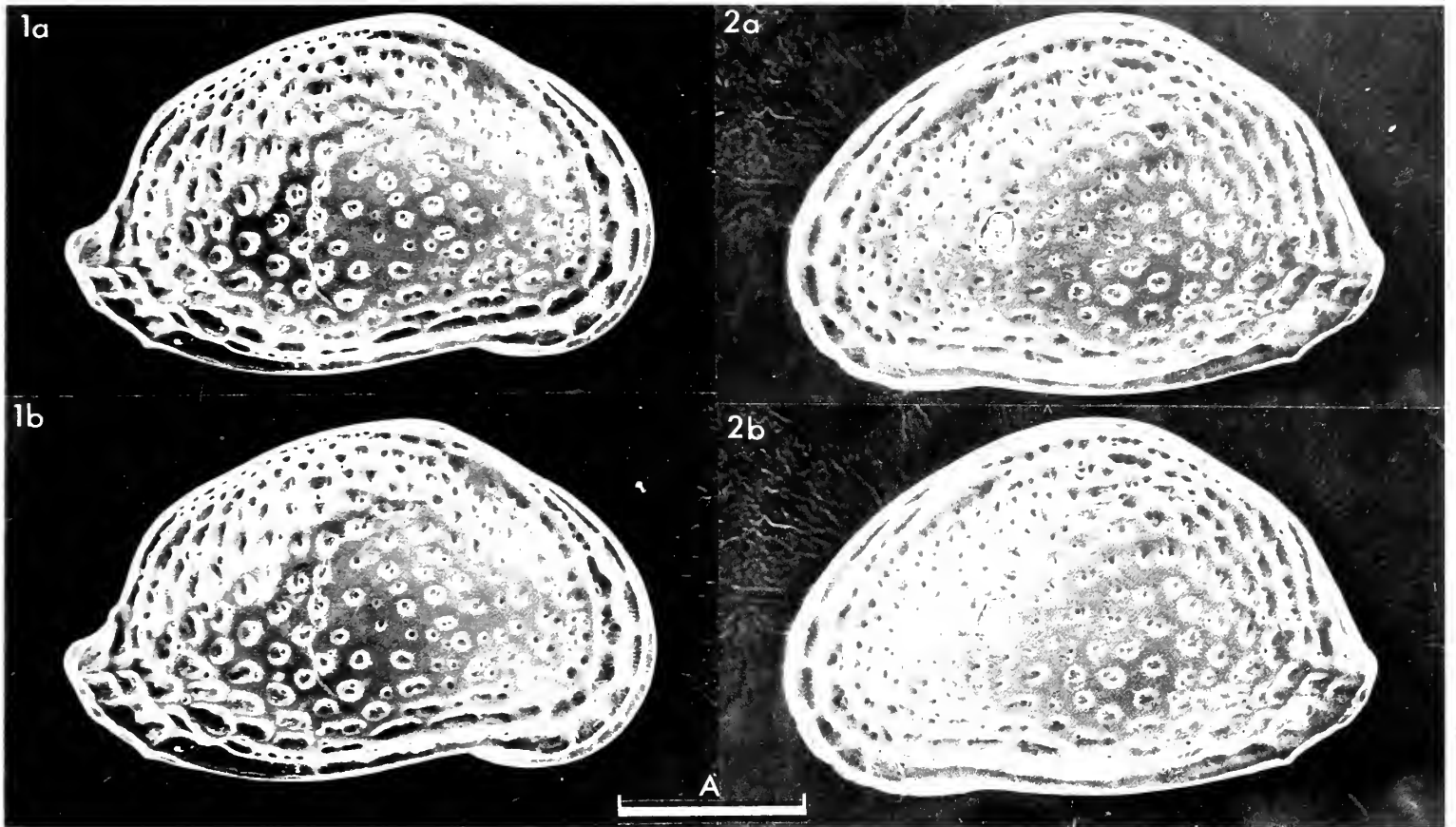
Fig. 1, ♀ RV, ext.; fig. 2, ♀ LV, ext.

Scale A (250 μm ; ×105), figs. 1, 2.

Explanation of Plate 1:24:136

Fig. 1, sieve plates and papillate fossae; fig. 2, ♂ LV, ext.; fig. 3, detail of post.

Scale A (10 μm ; ×2160), fig. 1; scale B (250 μm ; ×94), fig. 2; scale C (250 μm ; ×450), fig. 3.



ON *MUTILUS SPEYERI* (BRADY)
by Neriman Doruk
(University of Leicester, England)

Mutilus speyeri (Brady, 1868)

Cythere speyeri G. S. Brady, *Ann. Mag. nat. Hist.*, vol. 4, ser. 2, p. 222, pl. 15, fig. 8, non figs. 9-11 (1868).

Cythereis speyeri (Brady); G. W. Müller, *Zool. Jber. Neapel.*, Berlin, no. 21, p. 367, pl. 32, figs. 24, 25, 28 (1894).

Aurila speyeri (Brady); P. Ascoli, *Archo Oceanogr. Limnol.*, vol. 14, fas. 1, p. 97, pl. 1, fig. 5 (1965).

Syntypes: Apparently at Hancock Museum, Newcastle-upon-Tyne, England (*Ostracodologist*, no. 19, pp. 7, 12, June 1972 & Sissingh 1972).

Type localities: Islands of Siros and Tenedos off the W coast of Turkey.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 4976 (RV: Pl. 1:25:138, fig. 1; Pl. 1:25:140, figs. 2, 3), IO 4977 (LV: Pl. 1:25:138, fig. 2; Pl. 1:25:140, fig. 1). Both from drillings off the S coast of Turkey; Pliocene-Pleistocene, 340 feet below the sea floor; presumed shallow marine. Approx. long. 35°04'E, lat. 36°26'N.

Explanation of Plate 1:25:138

Fig. 1, ♀ RV, ext.; fig. 2, ♀ LV, ext.

Scale A (250 µm ; ×84), fig. 1; scale B (250 µm ; ×81), fig. 2.

Diagnosis: Rectangular shape, evenly rounded dorsal arch. Diagnostic opaque area.

Remarks: Sexual dimorphism: females shorter and a little higher.



Opaque area

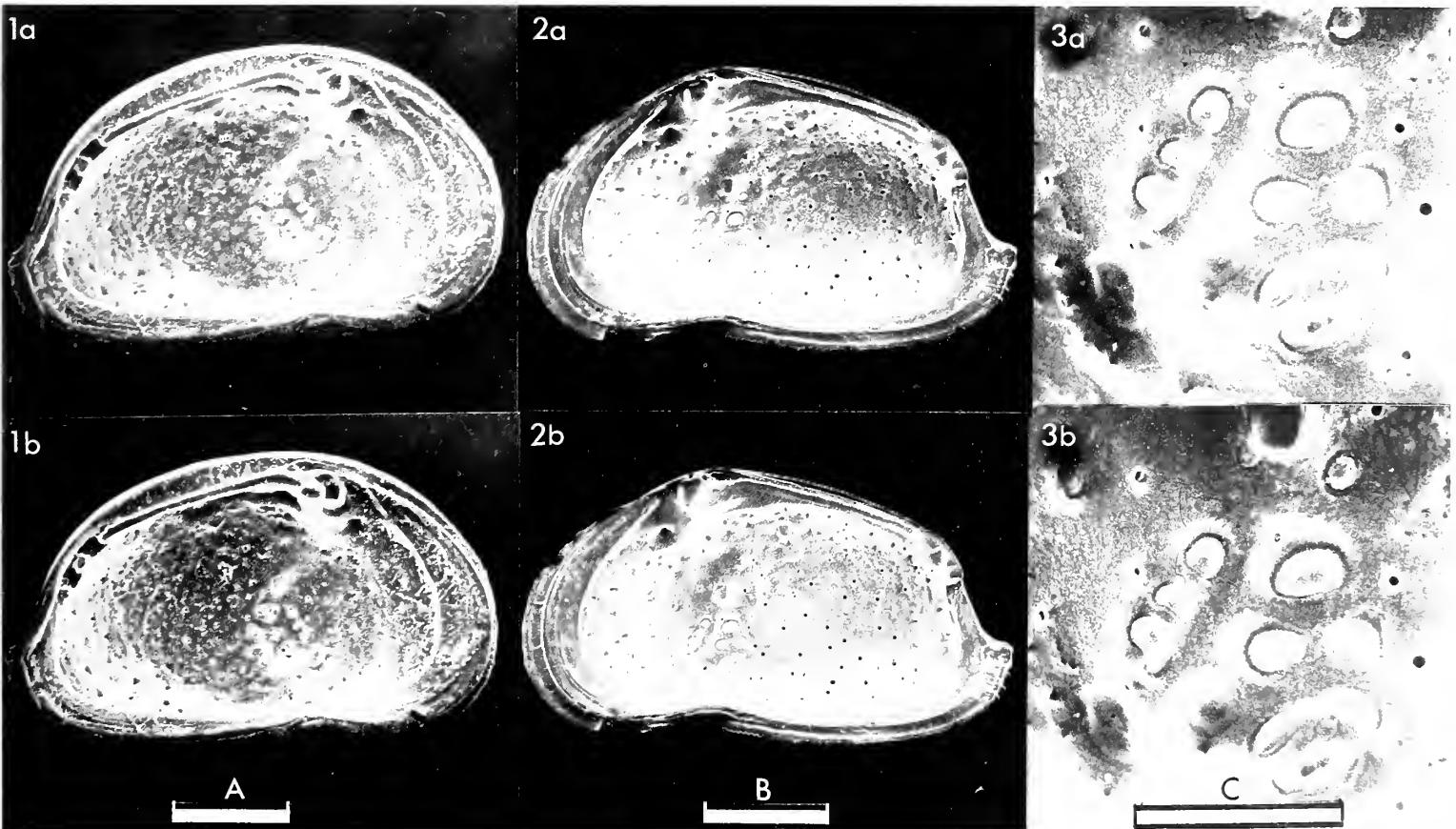
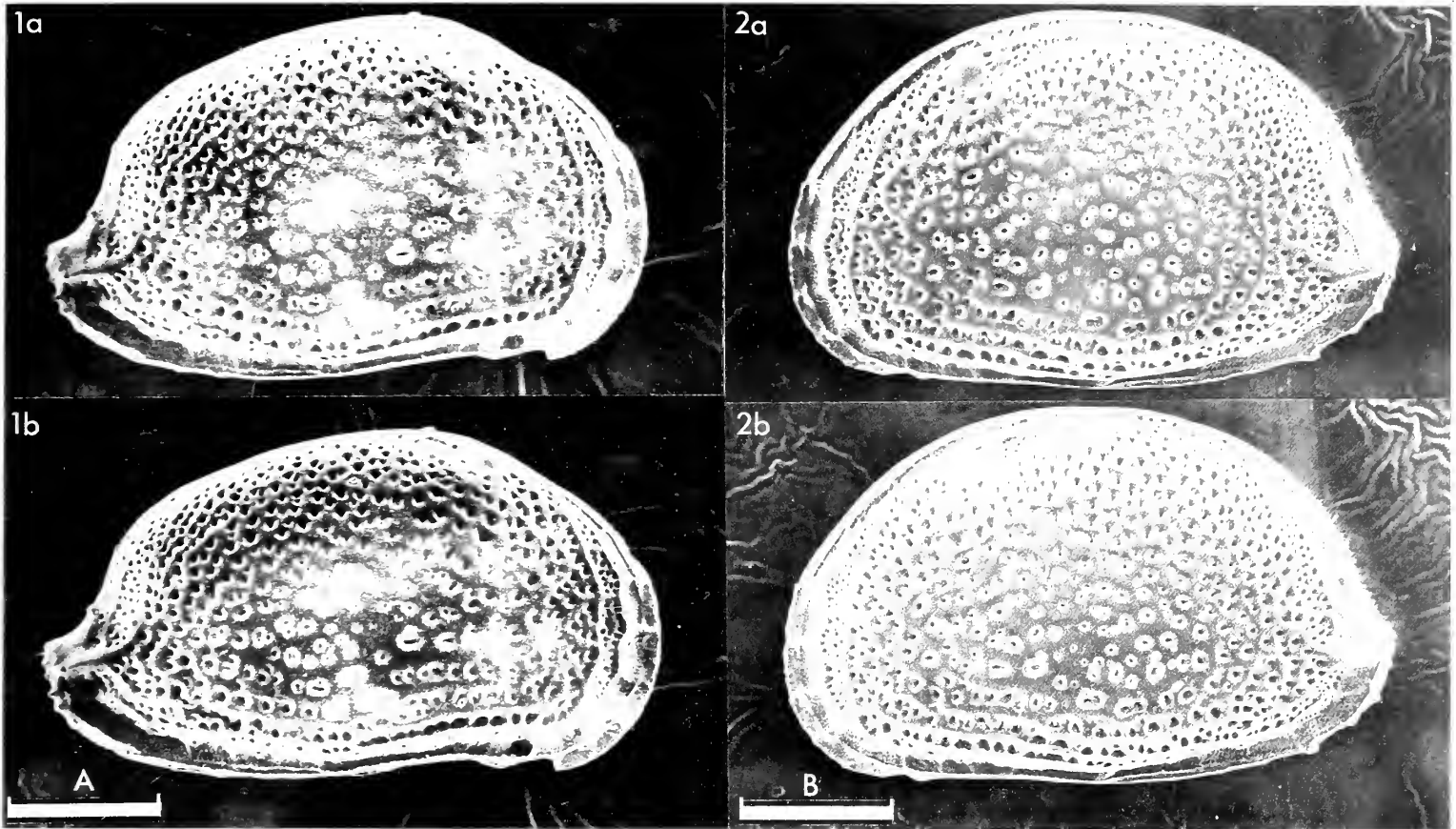
RV ×50

Distribution: Recent: W coast of Turkey (Brady 1868); Gulf of Naples (Müller 1894); Adriatic Sea (Ascoli 1965; Masoli 1968, *Mem. Mus. Tridentino Sci. Nat.*); Limskikanal, Istrian coast (Uffenorde 1972, *Göttinger Arb. Geol. Paläont.*). Pliocene-Pleistocene: Cephalonia, Greece (Uliczny 1969, *Hemicytheridae und Trachyleberididae aus dem Pliozän der Insel Kephallinia*. Dissertation, Univ. Munich); Rhodes, Greece (Sissingh 1972, *Bull. Micropaleontol. Utrecht*); Turkey.

Explanation of Plate 1:25:140

Fig. 1, ♀ LV, int.; fig. 2, ♀ RV, int.; fig. 3, RV, int. musc. sc.

Scale A (250 µm ; ×65), fig. 1; scale B (250 µm ; ×68), fig. 2; scale C (100 µm ; ×292), fig. 3.



ON *MUTILUS ALBICANS* RUGGIERI
by Neriman Doruk
(University of Leicester, England)

Mutilus albicans Ruggieri, 1958

Mutilus (Aurila) albicans G. Ruggieri, *Atti. Soc. ital. Sci. nat.*, vol. 97, ser. 2, p. 133, figs. 1, 2, 16-21, 26, 27 (1958).

Aurila albicans (Ruggieri); W. Sissingh, *Bull. Micropaleontol. Utrecht.*, vol. 5, p. 113, pl. 8, fig. 4 (1972).

Holotype: ♂ LV, OCR Sl. 1605/1. Deposited in the Istituto di Geologia e Paleontologia (University of Palermo).

Type locality: Republic of San Marino, near Casa i Gessi, Italy. Approx. long. 12°26'E, lat. 43°56'N. Upper Miocene (Sahelian).

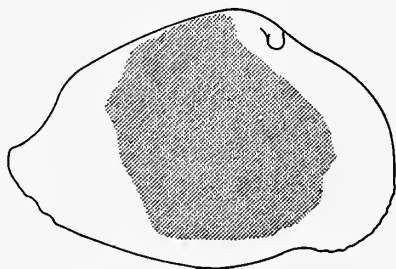
Figured specimens: Brit. Mus. (Nat. Hist.) IO 5654 (RV: Pl. 1:26:142, fig. 1), IO 5655 (LV: Pl. 1:26:142, fig. 2), IO 5656 (LV: Pl. 1:26:144, fig. 1), IO 5657 (RV: Pl. 1:26:144, fig. 3), IO 5658 (RV: Pl. 1:26:144, fig. 2). IO 5654 and IO 5655, from a stream cutting about 300 m S of Sarılı, Turkey; Upper Miocene bioclastic limestone; presumed shallow marine; approx. long. 36°13'E, lat. 36°07'N.

Explanation of Plate 1:26:142

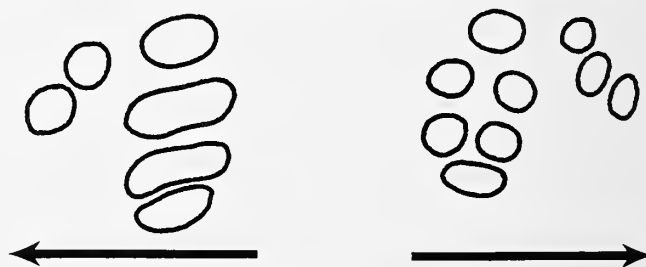
Fig. 1, ♂ RV, ext.; fig. 2, ♀ LV, ext.

Scale A (500 μm ; ×79), fig. 1; scale B (500 μm ; ×84), fig. 2.

Figured specimens: IO 5656 and IO 5657 from a road cutting 1 km SW of Babatorun, Turkey; (contd.) Uppermost Miocene; yellow sandstone; presumed littoral; approx. long. 36°15'E, lat. 36°04'N. IO 5658 from type locality (coll. G. Ruggieri).



Text-fig. 1 Opaque area RV ×48



Text-fig. 2 Muscle scars

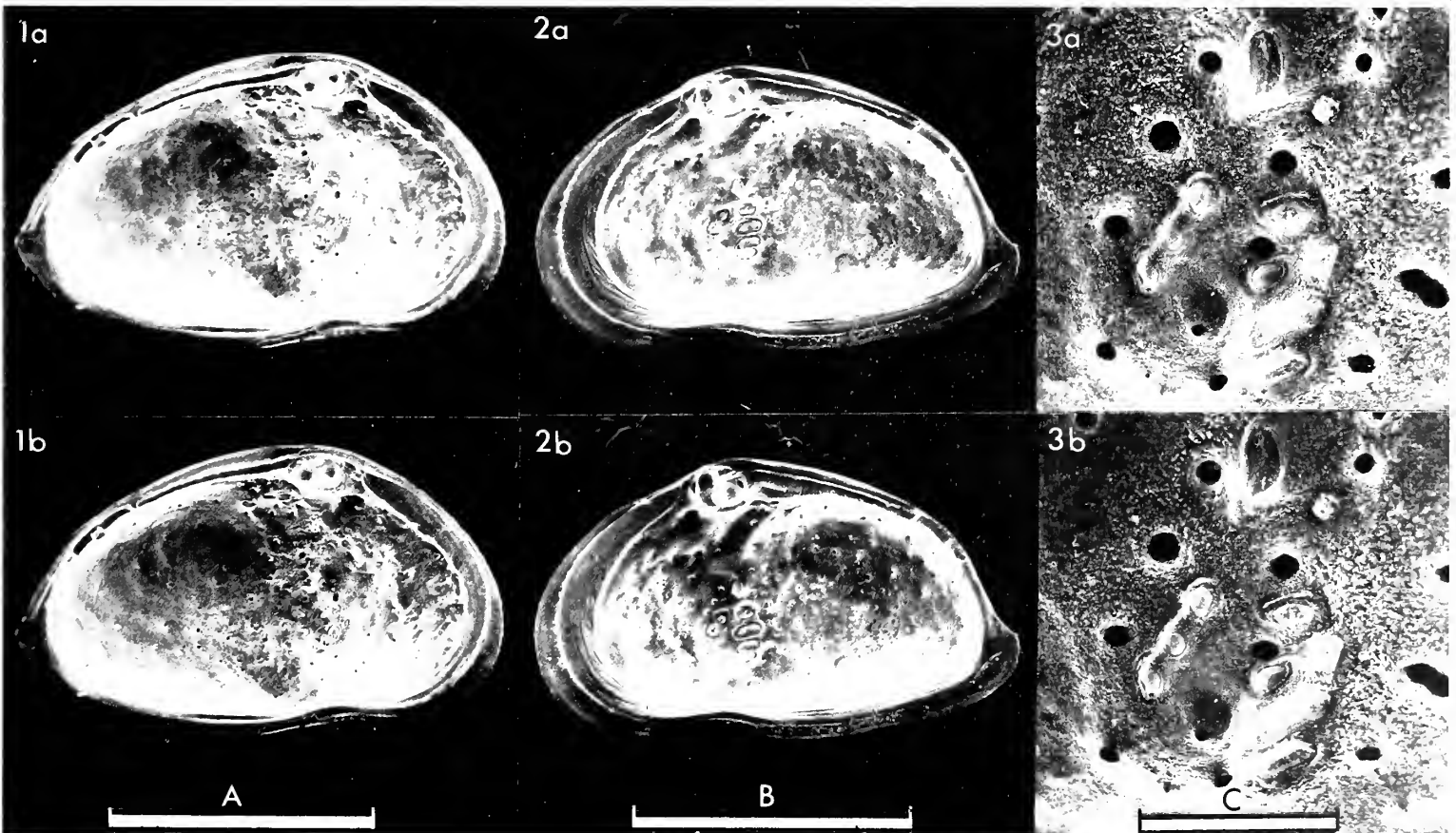
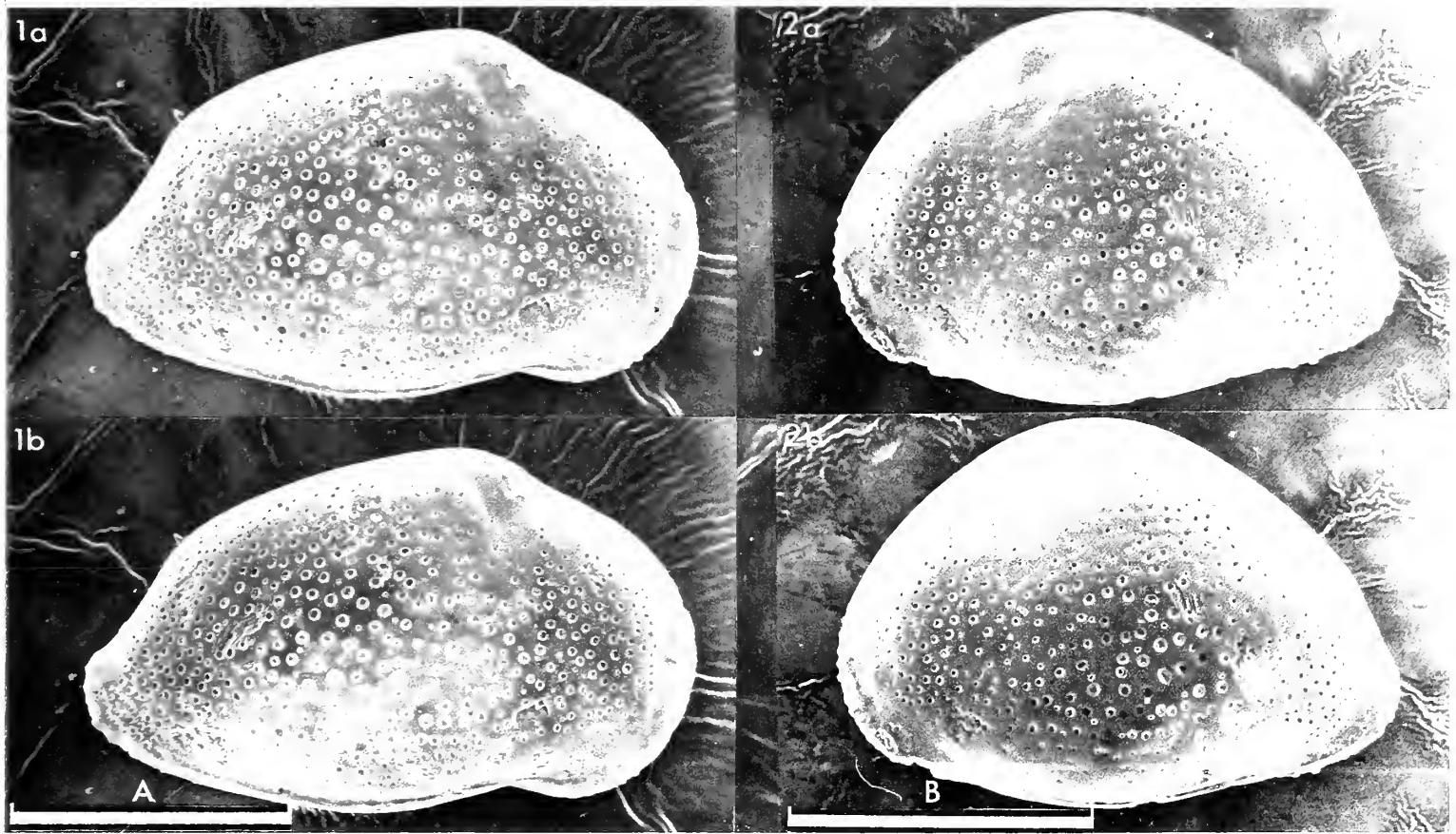
Diagnosis: The outline is diagnostic and the carapace rather tumid.

Remarks: Frontal scars 2 or 3; adductor scars 5 or 6 with undivided or divided ventromedian scars (see text-fig. 2). Eye tubercle slightly to strongly marked. Varies in size and in the number of puncta. Juveniles with more puncta. Sexual dimorphism very distinct; males more elongate and less tumid. Distribution: Middle-Upper Miocene, Gavdhos and Crete, S Aegean Islands (Sissingh 1972); Upper Miocene, San Marino, Italy (Ruggieri 1858), and Antakya region, Turkey.

Explanation of Plate 1:26:144

Fig. 1, ♂ LV, int.; fig. 2, ♂ RV, int.; fig. 3, int. musc. sc.

Scale A (500 μm ; ×76), fig. 1; scale B (500 μm ; ×69) fig. 2; scale C (100 μm ; ×280), fig. 3.



ON *SLEIA TROGLODYTOPHILA* MARTINSSON
by David J. Siveter
(University of Leicester, England)

Sleia troglodytophila Martinsson, 1962

Beyrichia Kloedeni, M'Coy var. *granulata*, Jones; T. R. Jones & H. B. Holl, *Ann. Mag. nat. Hist.*, ser. 5, vol. 17, p. 350, pl. XII, fig. 2 (1886).

[? *Beyrichia tuberculata*, (Kloden) var. *gibbosa*, Reuter; T. R. Jones & H. B. Holl, *Ann. Mag. nat. Hist.*, ser. 5, vol. 17, p. 349, pl. XII, fig. 1b, (non 1a), (1886).]

Beyrichia granulata (Jones & Holl); R. S. Bassler & B. Kellett, *Geol. Soc. America*, special papers, no. 1, p. 193 (part), (1934).

Sleia troglodytophila n. sp. A. Martinsson, *Bull. geol. Inst. Univ. Uppsala*, vol. XLI, p. 220, figs. 98B, 104A-C (1962).

Holotype: A ♀ RV, no. EW11, Institute of Palaeontology, University of Uppsala, Sweden.

Type locality: The Wren's Nest, Dudley, Worcestershire, England; marl within the Wenlock Limestone. Approx. long. 2°05'W, lat. 52°30'N.

Explanation of Plate 1:27:146

Fig. 1, ♀ RV, int. showing subcruminal morphology & hinge line. Figs. 2, 3, ♀ RV: fig. 2, ext. lat.; fig. 3, post.

Scale A (400 µm ; ×54), fig. 1; scale B (400 µm ; ×52), figs. 2, 3.

Figured specimens: Brit. Mus. (Nat. Hist.) Nos. IO 5805 (♀ RV: Pl. 1:27:146, fig. 1), IO 5806 (♀ RV: Pl. 1:27:146, figs. 2, 3), IO 5807 (♀ LV: Pl. 1:27:148, fig. 1) IO 5808 (♂ LV: Pl. 1:27:148, figs. 2-4). All specimens are from the crest of the exposed ridge on the W side of the type locality; Wenlock Limestone. Nat. Grid Ref.: SO 93569195. Coll. author, 1970.

Diagnosis: *Sleia* species with a very large calcarine tubercle in the female. The velar edge on the crumina is divided into one shorter, straight, anterior portion and one larger, posterior portion, the anterior half of which is bent out from the posterior portion (after Martinsson 1962)

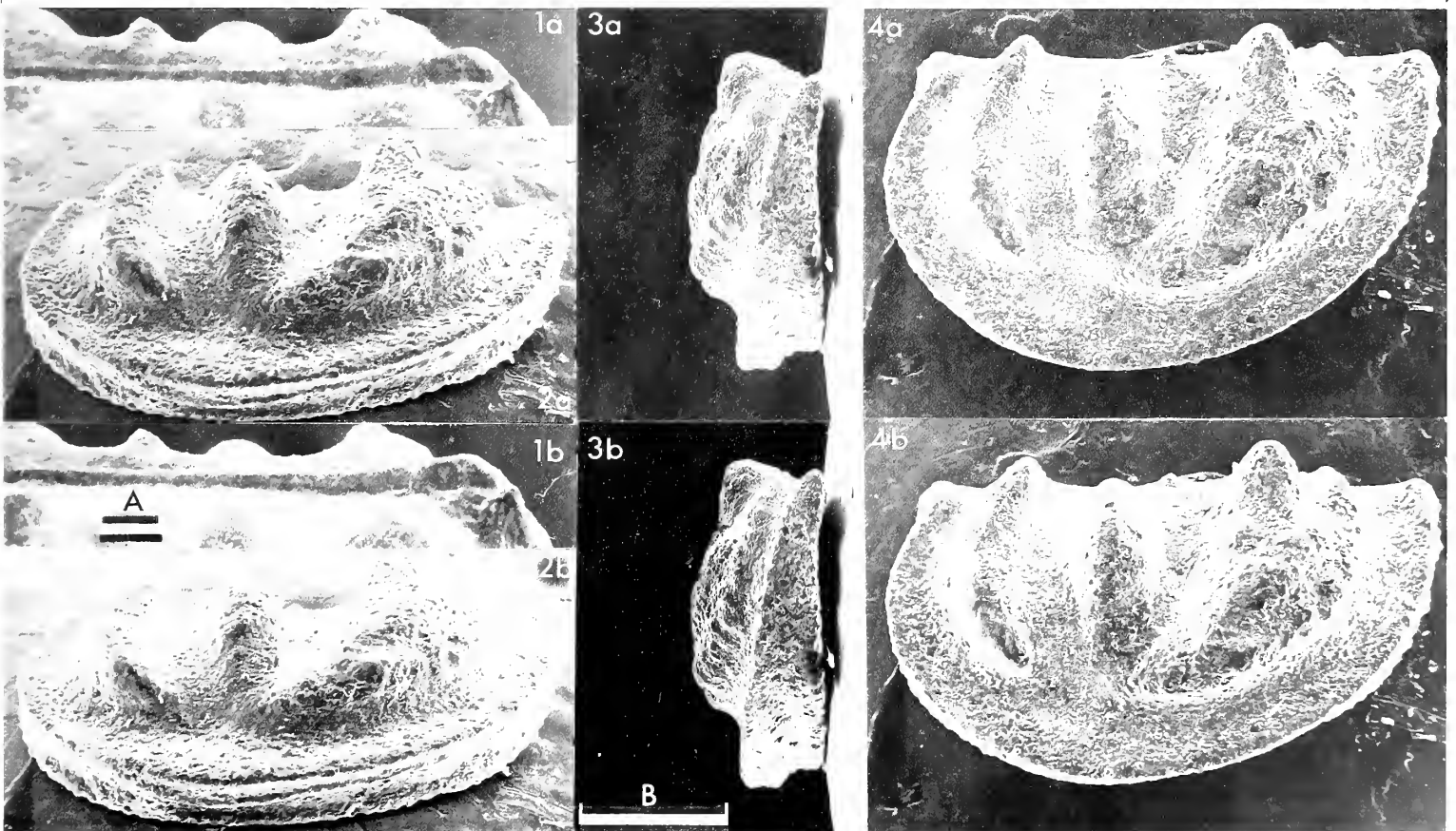
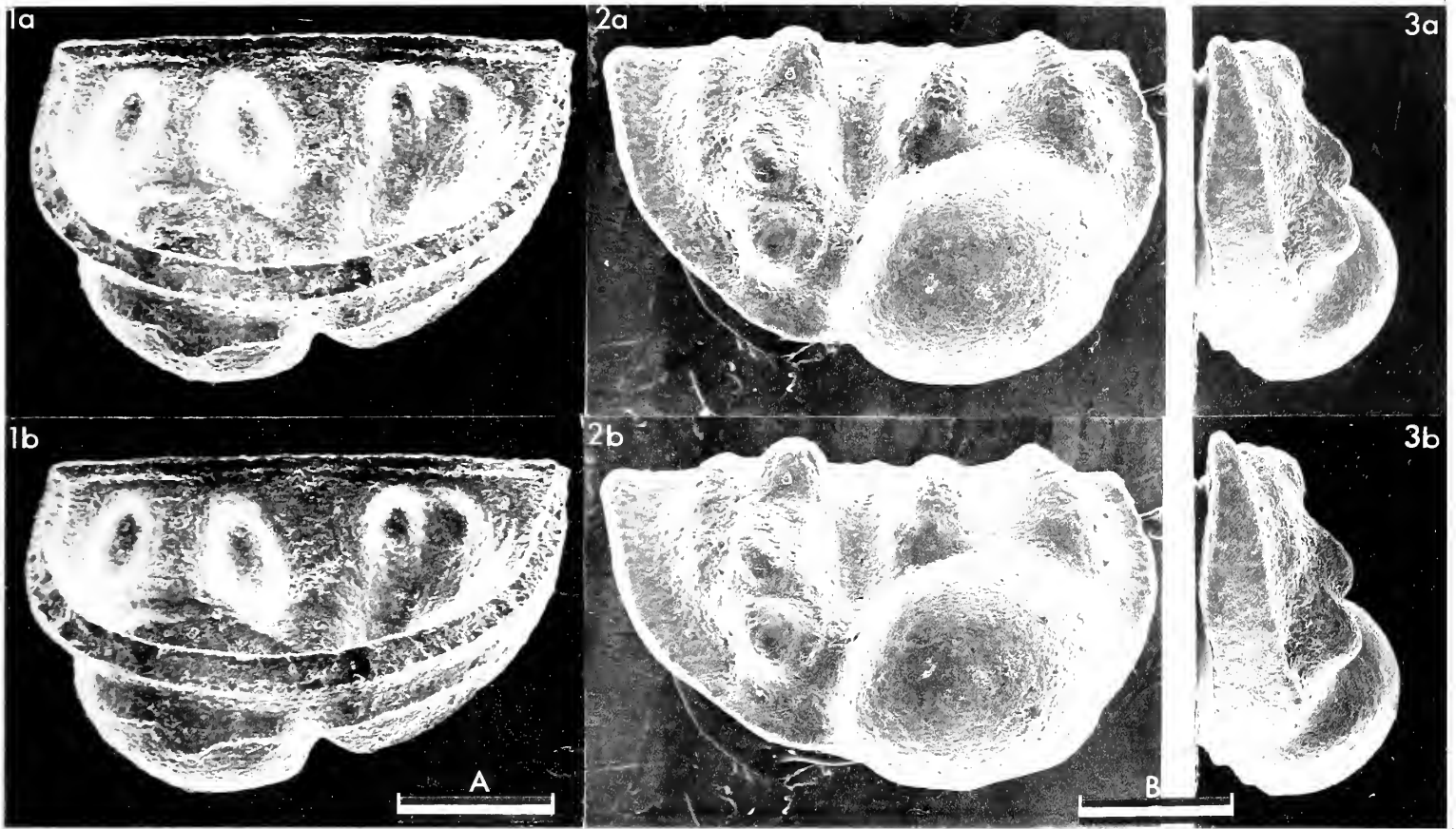
Remarks: The specimen figured by Jones & Holl 1886 (p. 350, pl. XII, fig. 2) as "*Beyrichia Kloedeni* var. *granulata*, Jones" (BM (NH) IN 52504) is here considered conspecific with *S. troglodytophila* Martinsson, 1962. However there is little point in choosing this specimen (or any of the other syntypes which would now be referred to many different species) as the lectotype of "*B. granulata* Jones (in Jones & Holl), 1886" as this name is a junior primary homonym of *Beyrichia granulata* Hall, 1859.

There are at least five other British *Sleia* species (to be described); *S. troglodytophila* is distinguishable, especially by its subcruminal morphology (see "Diagnosis" above). It is found in the Wenlock Limestone of the W Midlands of England (e.g. Wren's Nest, Hurst Hill) and the Welsh Borderlands (e.g. at Benthall Edge).

Explanation of Plate 1:27:148

Fig. 1, ♀ LV, hinge line. Figs. 2-4, ♂ LV: fig. 2, ext. vent. obl.; fig. 3, post.; fig. 4, ext. lat.

Scale A (100 µm ; ×80), fig. 1; scale B (400 µm ; ×52), figs. 2-4.



ON *ILYOCYPRIS MONSTRIFICA* (NORMAN)
by P. C. Sylvester-Bradley and E. K. Kempf
(University of Leicester, England, and University of Cologne, Germany)

Ilyocypris monstrifica (Norman, 1862)

- Cypris monstrifica* sp. nov. A. N. Norman, *Ann. Mag. nat. Hist.*, ser. 3, vol. 9, p. 45, pl. 3, figs. 4, 5 (1862).
Limnocythere monstrifica (Norman); G. S. Brady, *Intellectual Observer*, vol. 12, p. 121 (1867).
Ilyocypris gibba var. *tuberculata* Brady; K. Kertész, *Természetr. Füz.*, vol. 16, pp. 114-121, 169-176, pl. 6 (1894).
Ilyocyprois tuberculata Kertész non Brady; L. Masi, *Boll. Soc. zool. ital.*, ser. 2, vol. 7, p. 261 (1906).
Ilyocypris ambigua sp. nov. A. G. Lowndes, *Ann. Mag. nat. Hist.*, ser. 10, vol. 8, pp. 569-571 (1931).
Ilyocypris hartmanni sp. nov. R. Lerner-Seggev, *Israel J. Zool.*, vol. 17, pp. 123-128, pls. D, E, figs. 15-29; pl. J, figs. 1-2; pl. K, fig. 7 (1968).
Ilyocypris monstrifica (Norman); K. G. McKenzie, *Crustaceana*, vol. 18, pp. 109, 110 (1970).
Ilyocypris monstrifica (Norman); A. L. Kovalenko, *Akad. Nauk. Moldavia SSR*, no. 4, 1972e, pp. 65-67, fig. 1 (1972).

Explanation of Plate 1:28:150

Figs. 1-2, LV ext. lat.; fig. 2 to show spines & setae & setal collars in normal pore canals; fig. 3, RV ext. lat.
Scale A (500 μ m ; \times 88), fig. 1 (specimen 725 μ m long); scale B (50 μ m ; \times 700), fig. 2; scale C (500 μ m ; \times 87), fig. 3 (specimen 775 μ m long).

Lectotype: (here designated) Brit. Mus. (Nat. Hist.) 1911.11.8M3402.

Type locality: Canal, Fleckney, Leicestershire, England; Nat. Grid Ref.: SP 6593; long. 1°59'W, lat. 52°30'N. Shallow (maximum 3 m), almost static, freshwater (Sal. 0.2‰ in 1973), muddy bottom, weedy sides. Rec. Coll. August, 1856.

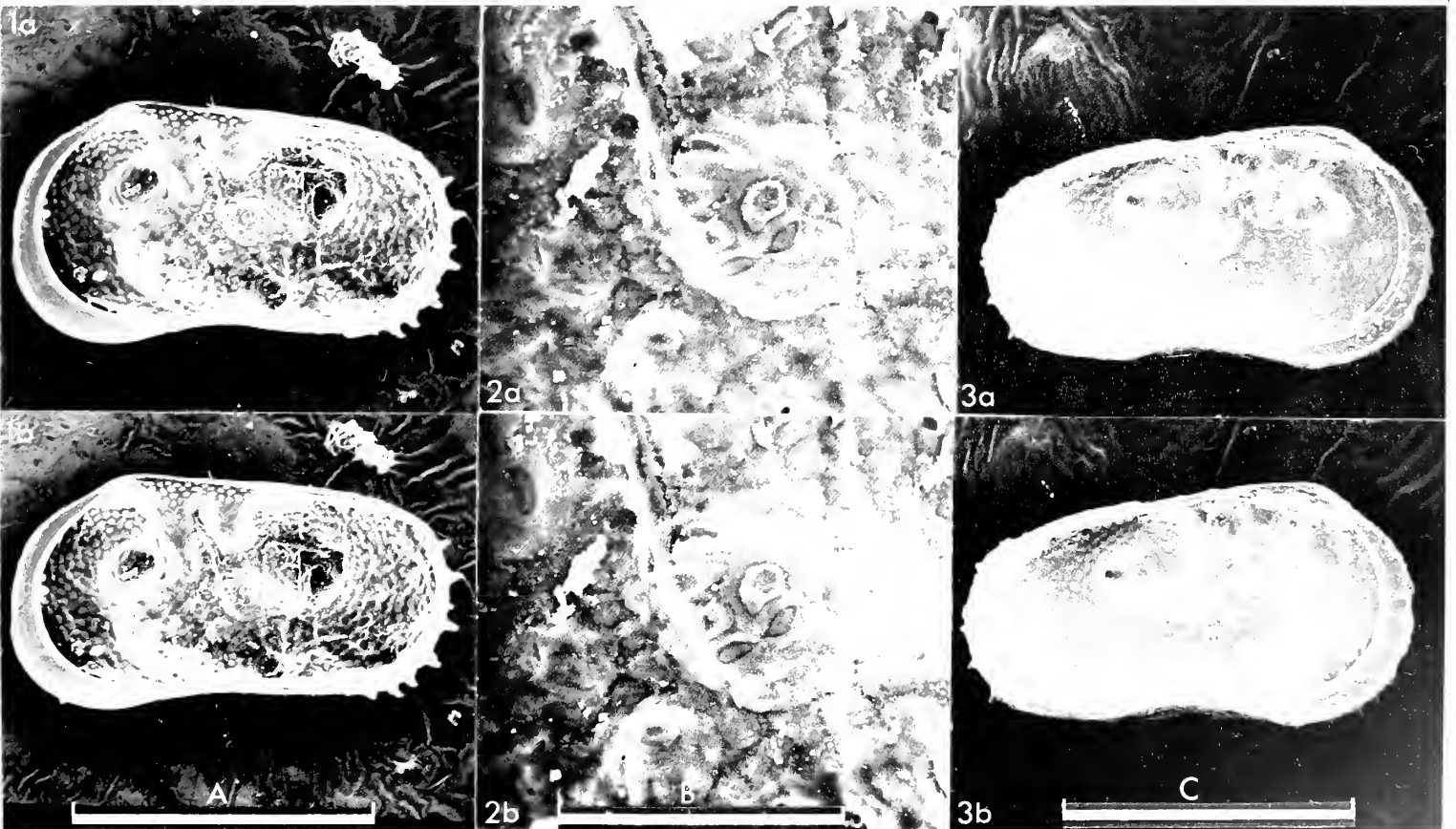
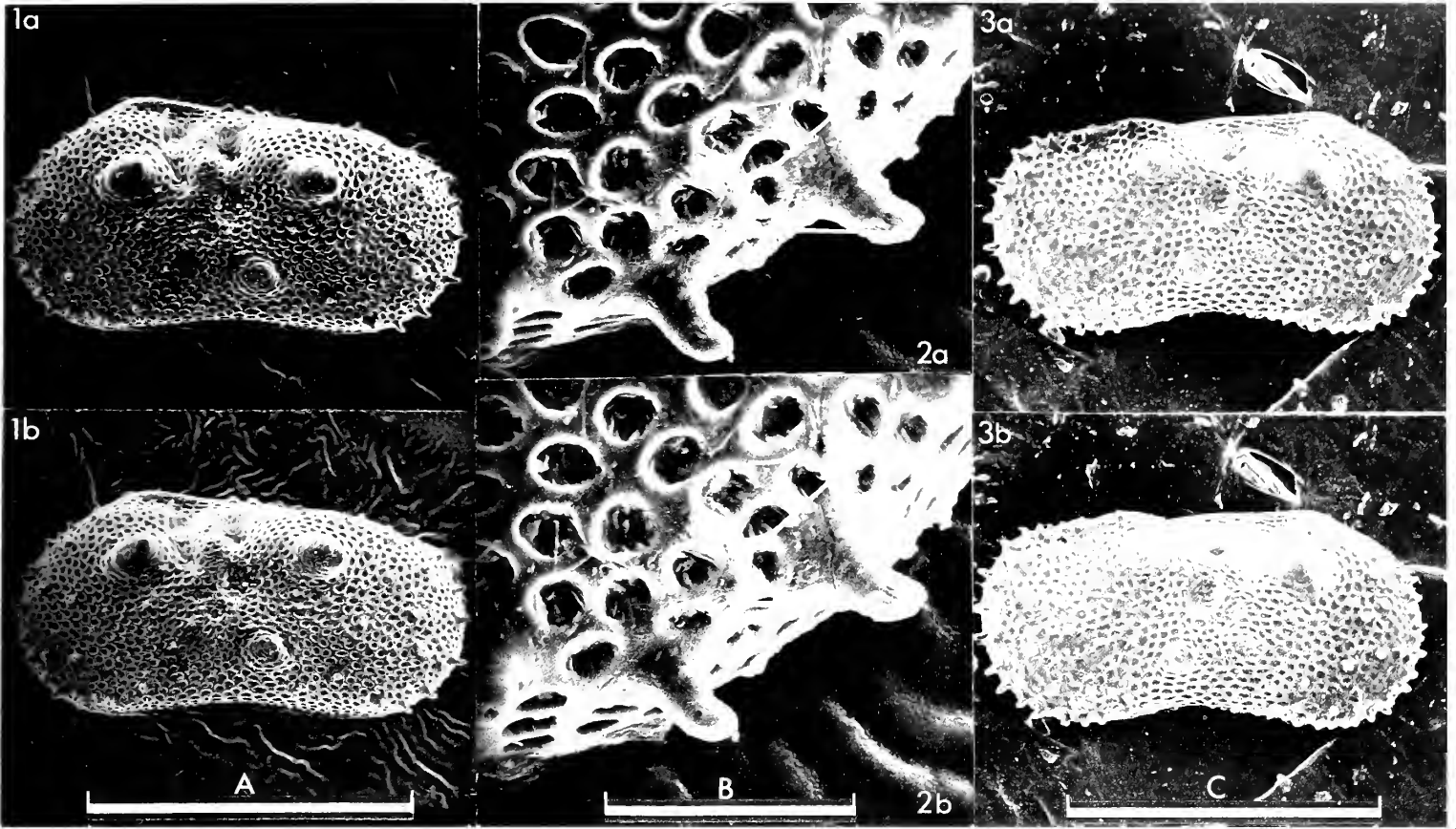
Figured specimens: BM(NH) 1973.306A (Pl. 1:28:150, figs. 1, 2); 1973.307 (Pl. 1:28:152, fig. 3), both coll. from type locality March, 1973 by P.C.S.B.; 1973.308 (Pl. 1:28:150, fig. 3) from Lake Tiberias, Israel, long. 35°E, lat. 32°N, coll. by Lerner-Seggev from type locality of *I. hartmanni*; 1972.2.1.10-11A (Pl. 1:28:152, figs. 1, 2) from R. Dnestr, near Kishinev, Moldavia, USSR, long. 28°50'E, lat. 47°0'N, coll. R. H. Bate (see Kovalenko 1972).

Diagnosis: Finely reticulate, with two prominent conical processes tending to curve towards post. on upper half of each valve, and two smaller conical eminences below and between them. A further, lesser protuberance may occur with varying strength between the more dorsal pair. Both ant. and post. thirds decorated with about 40 spines, more or less cylindrical in shape, very variable in length in different specimens, but always longer and more prominent towards margins (Pl. 1:28:150, fig. 2).

Remarks: Recent, widely distributed in freshwater lakes and rivers of Europe and Asia; fossil, from Upper Pleistocene of Syria (see Kempf *Z. Geomorph.*, Supp. Bd., 1973, in press). *I. monstrifica* is the senior subjective synonym of the type-species of the nominal genus *Ilyocyprois* Masi, but we believe this genus to be a synonym of *Ilyocypris*.

Explanation of Plate 1:28:152

Figs. 1-2, RV int. lat.; fig. 3, LV int. lat.
Scale A (500 μ m ; \times 83), fig. 1 (specimen 750 μ m long); scale B (100 μ m ; \times 390), fig. 2; scale C (500 μ m ; \times 79), fig. 3 (specimen 800 μ m long).



ON *SYLVESTR*A *POSTEROBURSA* DORUK gen. et sp. nov.
by Neriman Doruk
(University of Leicester, England)

Genus *SYLVESTR*A gen. nov.

Type-species: *Sylvestra posterobursa* sp. nov.

Derivation of name: In honour of Prof. P. C. Sylvester-Bradley.

Diagnosis: A genus of Leptocytherinae Hanai with a ventral "snap-knob" as in *Callistocythere*, but differing from that genus in hinge and shape. Hinge with median element of left valve reduced to two separated knobs, one median and one anterior in position, underlying extension of anterior element, which consists of a separate groove. Posterior element a quadriloculate socket. Shape trapezoidal with prominent posteroventral pouch.

Explanation of Plate 1:29:154

Fig. 1, ♀ RV, ext.; fig. 2, ♀ LV, ext.

Scale A (250 µm ; ×144), fig. 1; scale B (250 µm ; ×138), fig. 2.

Sylvestra posterobursa sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) IO 5159, LV.

Type locality: A road cutting about 2 km S of Com, Antakya (Turkey). Approx. long. 36°15'E, lat. 36°02'N. Upper Miocene. Yellow sandstone with abundant molluscan shell fragments and foraminifera. Presumed littoral.

Derivation of name: Latin, "posterior pouch."

Figured specimens: Brit. Mus. (Nat. Hist.) IO 5158 (RV: Pl. 1:29:154, fig. 1; Pl. 1:29:156, figs. 2, 3), IO 5159 (LV: Pl. 1:29:154, fig. 2; Pl. 1:29:160, fig. 1), IO 5160 (LV: Pl. 1:29:156, figs. 1, 4), IO 5166 (LV: Pl. 1:29:158, figs. 1-3; Pl. 1:29:160, figs. 2-4). All the figured specimens are from the type locality, 3 m from the base of the section.

Diagnosis: Fossae in groups, 2 to about 8 in each group.

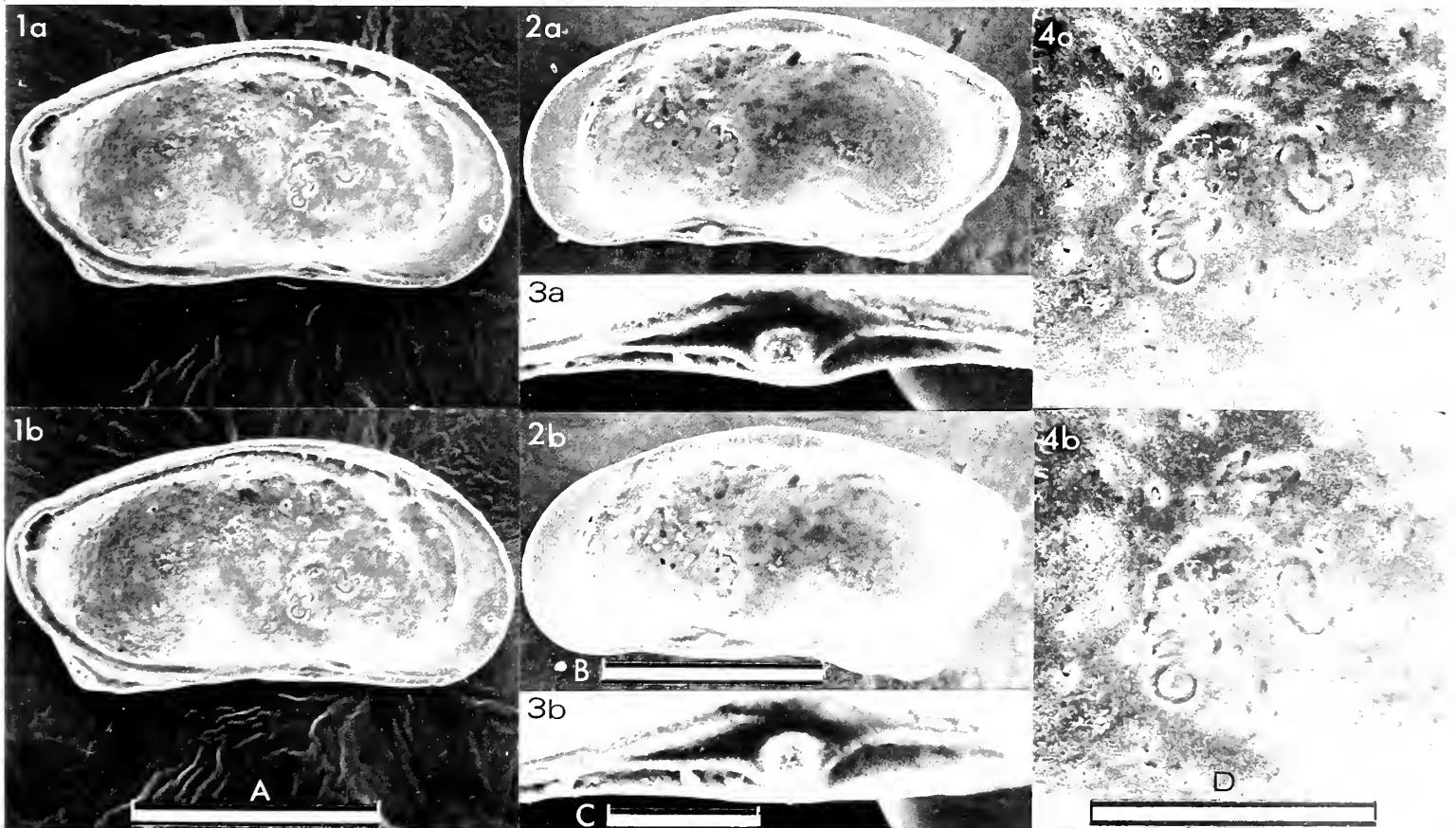
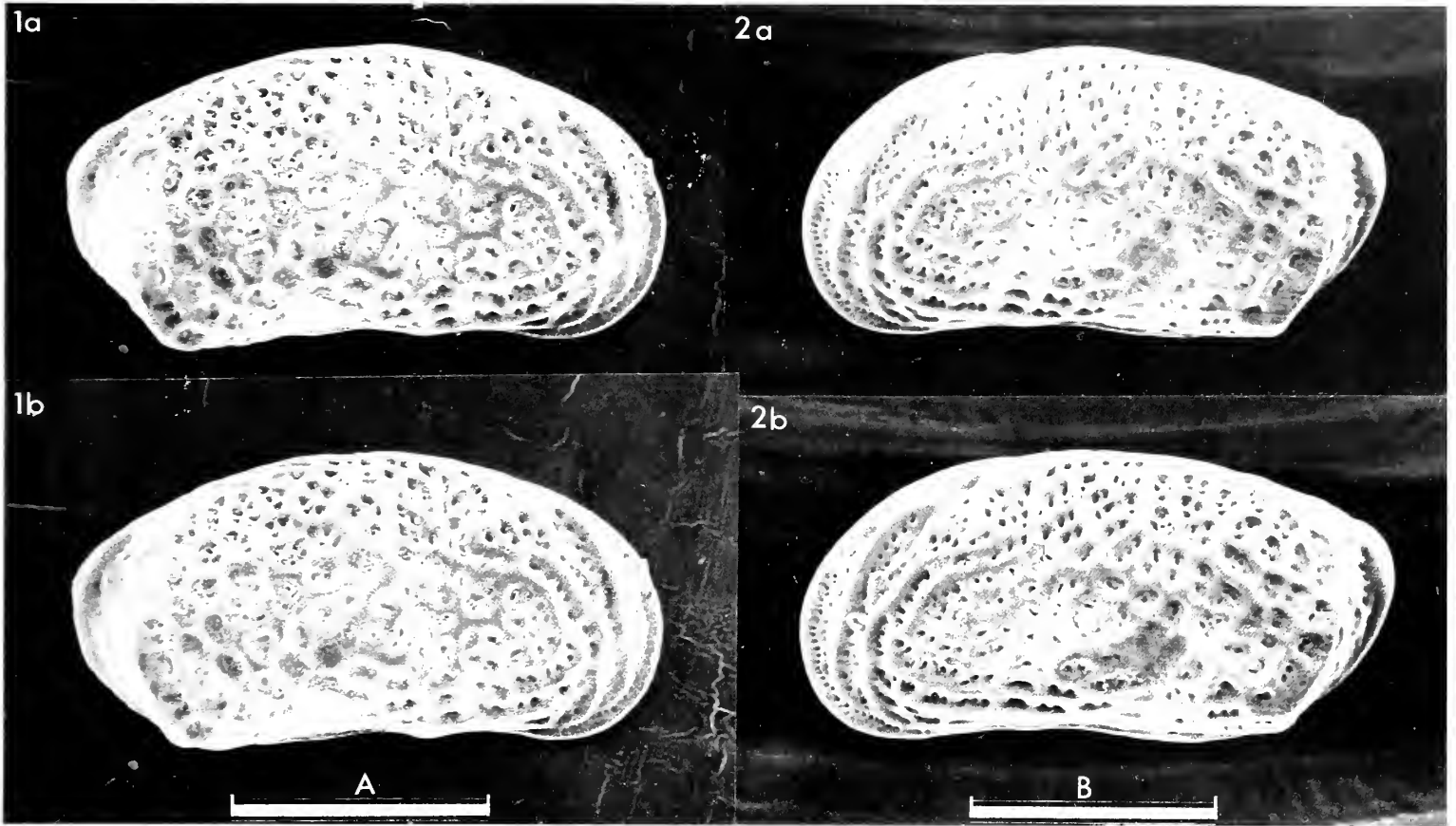
Remarks: Sexual dimorphism: slight, males a little less high in the posterior.

Distribution: Upper Miocene from several localities in Antakya region, Turkey.

Explanation of Plate 1:29:156

Fig. 1, ♀ LV, int.; fig. 2, ♀ RV, int.; fig. 3, snap-knob, RV; fig. 4, LV, int. musc. sc.

Scale A (250 µm ; ×131), fig. 1; scale B (250 µm ; ×122), fig. 2; scale C (50 µm ; ×427), fig. 3; scale D (100 µm ; ×393), fig. 4.



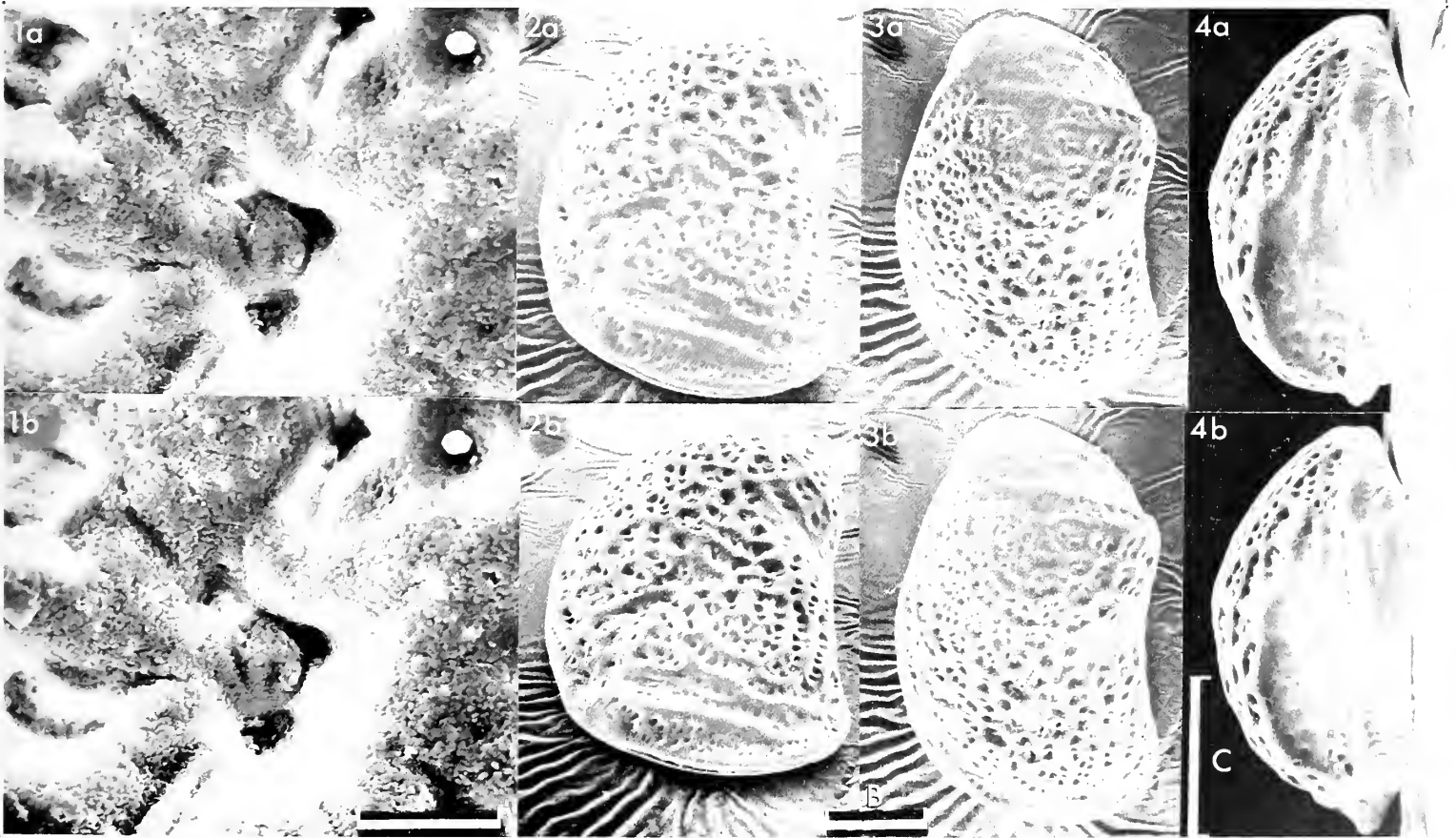
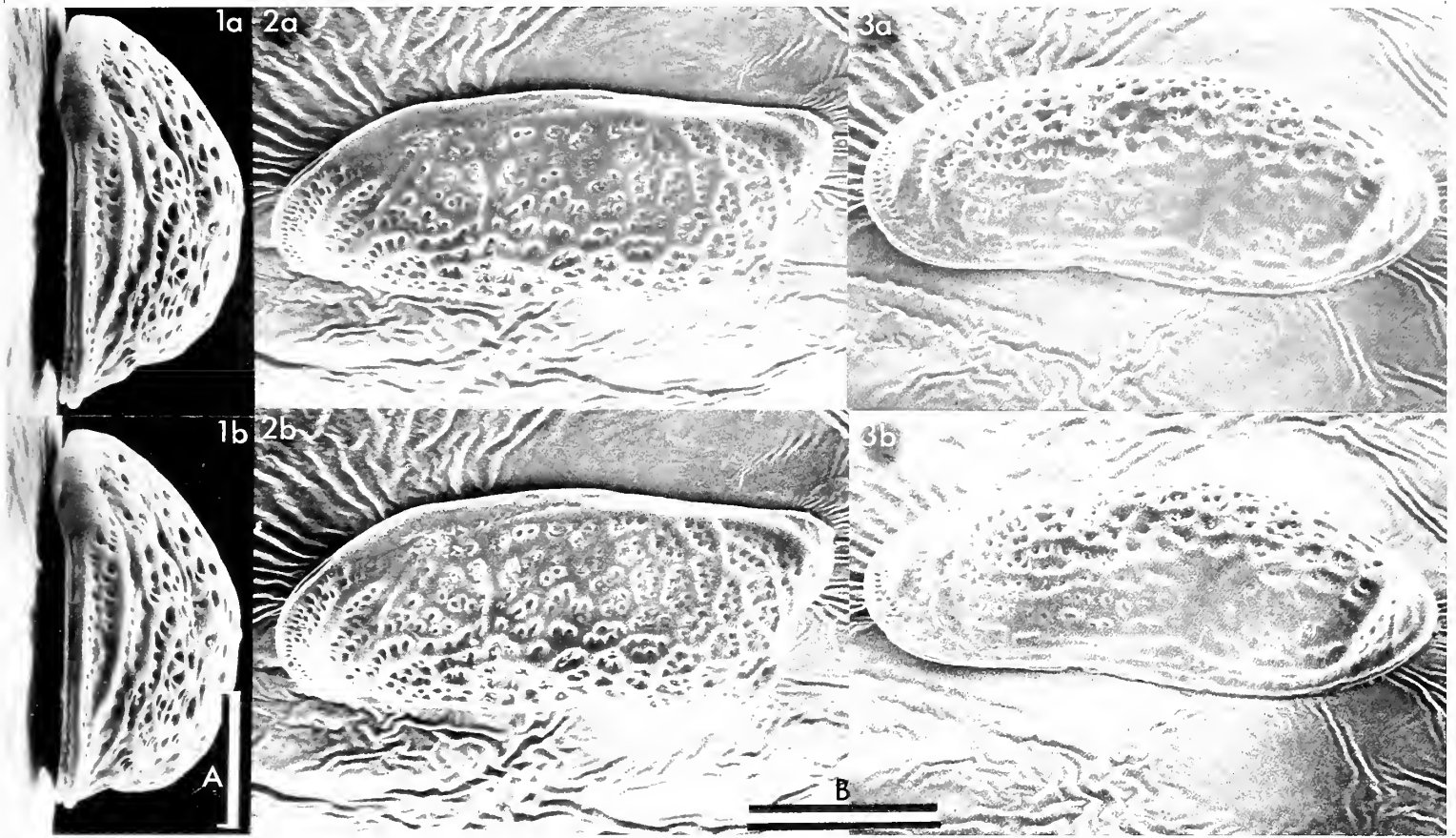
Explanation of Plate 1:29:158

Fig. 1, ant. view of LV, ext.; fig. 2, obl. dors. view of LV; fig. 3, obl. vent. view of LV.
Scale A (100 μm ; $\times 189$), fig. 1; scale B (250 μm ; $\times 105$), figs. 2, 3.

Explanation of Plate 1:29:160

Fig. 1, LV, ext. detail of surface; fig. 2, obl. ant. view of LV; fig. 3, obl. post. view of LV; fig. 4, post. view of LV.

Scale A (20 μm ; $\times 945$), fig. 1; scale B (100 μm ; $\times 136$), figs. 2, 3; scale C (100 μm ; $\times 210$), fig. 4.



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