OSTRACODA FROM THE PLIOCENE? PEBAS FORMATION AT IQUITOS, PERU

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Abstract

Six species and subspecies of Late Neogene, Pliocene? Ostracoda are recorded from beds possibly representing the Pebas Formation at Iquitos, Peru. The fauna is believed to be of brackish water origin in a lagoon near the mouth of a slow-moving river system as suggested by Sheppard and Bate (1980).

Introduction

A small collection of Ostracoda was sent to the writer in the 1950's by A. G. Fischer labelled"Pebas Beds, Iquitos, Peru, E. P. F. Dock across from Hotel Iquitos". The washed residue sample consists of lignite fragments, small gastropods and bivalve shells, together with abundant ostracodes of the Genus *Cyprideis* Jones.

Purper (1977, 1979) has summarized the paleontologic work on the Pebas mollusks, including that of Gabb (1868), Conrad (1871, 1874a, 1874b), Woodward (1871), Dall (1872), Boettger (1878), Ethridge (1879), Roxo (1924, 1935, 1937), Marshall (1928), Marshall and Bowles (1932), Maury (1924, 1937), Greve (1938) and Santos and Castro (1967).

The Ostracoda of the Pebas beds have been described and illustrated by Purper (1977, 1979), Purper and Pinto (1982, 1983, 1985), Purper and Ornellas (1991) and Munoz-Tores, Whatley and van Harten (1998). Purper recognized 18 0stracode genera and 27 species in her 1979 paper and described six new genera and nine new species. She also noted the presence of reworked Mesozoic and earlier Cenozoic ostracodes in the Pebas collections. Most of the species were assigned to *Cyprideis* and *"Cytheridea"* and the identified forms ranged from Miocene to Recent. She noted that five of the species should be placed in synonymy with three other species.

Sheppard and Bate (1980) identified 15 species, nine of them new and two subspecies from Pebas beds of Peru and from an unnamed formation at La Tagua, Colombia. The also described three new genera. Fresh-water, brackish-water and marine types of Ostracoda are present in their assemblage.

Purper and Pinto (1982, 1983) found two new genera and four new species in the Pebas beds in Brazil. Purper and Pinto (1985) recorded several additional localities containing ostracodes in the Pebas Formation in wells in northwestern Brazil. In that paper they discussed several synonymies and ecologic aspects and described two additional species of *Cyprideis*. Purper and Ornellas (1991) described additional endemic species from the Pebas beds.

Munoz-Torres, Whatley and van Harten (1998) published an extensive review of the non-marine to brackish water Neogene ostracodes of the Upper Amazon Basin in Brazil, Colombia and Peru. They recognized 31 species including six new species in a fauna dominated by 17 species of *Cyprideis*. They assigned a Miocene age to the Pebas Formation and associated ostracode-bearing strata of the Basin based on palynomorph studies by Hoorn (1995). Of the species previously described, Munoz et al. did not record 19 of these species. They also placed many of the earlier described endemic species and genera in synonymy of *Cyprideis*. The present writer has not had the opportunity to evaluate these nomenclatorial changes

The largely indigenous Pebas ostracodes appear to represent fresh-water to brackish-water lacustrine, lagoonal or estuarine conditions. Rivers of the Upper Amazon Basin in northeastern Peru in the Miocene?, Pliocene and early Pleistocene? emptied into lakes, lagoons and estuaries resulting in a mixture of marine and non-marine species of ostracodes at some localities. The more westerly localities studied by Sheppard

and Bate (1980) yielded *Cytheridella, Pelocypris, Darwinula* and *Cypria* (mainly fresh-water forms). The intermediate localities contained *Perissocytheridea, Rhadinocytherura, Ambocythere* and *Cyprideis* (a mixture of brackish and marine forms). The eastern localities yielded *Paracypris* and *Pontocypris* of more normal marine aspect as well as other brackish-water forms.

The westerly-located Iquitos, Peru assemblage recorded here contained only *Cyprideis*. Munoz et al., however found a *Heterocypris* (non-marine) and a *Macrocypris* (marine) in their collections from Iquitos. The age of the Pebas beds has been estimated on the basis of molluscan faunas to be any time from Eocene to Pliocene. Emphasis has been placed on a Pliocene age for the mollusks (Purper, 1979), and a Miocene age for the palynomorphs (Munoz, et al.(1998) ; Hoorn (1995). The formation also contains reworked Mesozoic and perhaps early Tertiary ostracodes. Sheppard and Bate (1980) noted the presence of a Pleistocene fresh-water ostracode species *Pelocypris zilchi* Triebel, but believed that the bulk of the fauna was late Tertiary and suggest a Pliocene-Pleistocene age for the Pebas. In the present paper the described Pebas ostracodes are assigned to the Pliocene?

Systematic Paleontology
Class Crustacea
Subclass Ostracoda Latreille, 1806
Order Podocopida Muller, 1884
Suborder Podocopina Sars, 1866
Superfamily Cytheracea Baird, 1850
Family Cytherideidae Sars, 1925
Subfamily Cytherideinae Sars, 1925
Cenus Cyprideis Jones, 1857

Chlamydocytheridea Purper, 1979
Paulacoutoia Purper, 1979
Otarocyprideis Sheppard and Bate, 1980
Sohnicythere Purper and Pinto, 1983
Pseudoparakrithella Purper, 1979
Amazonocytheridea Purper, 1979
Botulocyprideis Sheppard and Bate, 1980

Cyprideis purperi colombiaensis Sheppard and Bate

Plate 1, figures 1-6; Plate 2, figures 1-6, 8, 9; Plate 3, figures 3-6

Cyprideis purperi colombiaensis Sheppard and Bate, 1980, p. 101, pl. 8, figs. 3-9

The densely pitted specimens conform to characters prescribed by Sheppard and Bate, although the "fulcral point" between the V-shaped frontal muscle scar spot and the most dorsal adductor muscle scar spot is transverse in the present specimens (Pl. 1, fig. 2; Pl. 2, fig. 6) rather than vertical as in the original descxription of the species. The surface pits become smaller toward the terminal margins.

*Occurrence.*Pebas Formation, Iquitos, Peru; also at La Tagua, southern Colombia (Sheppard and Bate, 1980)

Cyprideis purperi purperi Sheppard and Bate

Plate 4, figures 6, 7; Plate 5, figures 1-6

Cyprideis purperi purperi Sheppard and Bate, 1980, p. 99, pl. 7, figs. 1-13; pl. 8, figs. 1, 2; TF 2

This subspecies differs from *C. purperi colombiaensis* in that the anterior border is broader and does not have a pitted surface, whereas in *colombiaensis* the surface of the border is concentrically pitted.

Occurrence. Pebas Formation, Iquitos, Peru; also at Pichua, Maranon River, Peru. Other occurrences of the subspecies from the Upper Amazon Basin assigned by Sheppard and Bate, in addition to those cited by Purper (1977) to *C.* spp. C, D and E are stated by Purper and Pinto (1985) to be distinct species.

Cyprideis amazonica Purper

Plate 2, figure 7

Cyprideis sp. B., Purper, 1977a, p. 362
Cyprideis amazonica Purper, 1979, p. 231, pl. 4, figs. 1-11

The present form from Iquitos resembles the female of the species in outline, but the shell surface is more weakly and sparsely punctate than described by Purper

Occurrence. Pebas Formation, Iquitos and Pebas, Peru (Munoz et al., 1998); also in wells at Sao Paulo de Olivenca and at Tamandua and in outcrop at Atalaia do Norte, Brazil (Purper, 1979)

Cyprideis sp. aff. C. amazonica Purper

Plate 3, figures 1, 2; Plate 4, figure 5

The illustrated forms are more ovate than *C. amazonica* in lateral outline and have only widely spaced punctae

Occurrence. Pebas Formation, Iquitos, Peru.

Cyprideis sp. aff. C. retrobispinosa Purper and Pinto

Plate 4, figures 3, 4; Plate 6, figures 1-8

The present specimens resemble *C. retrobispinosa* Purper and Pinto (1985) in general outline, in having an oblique anteromedian sulcus and in hingement and musculature, but are less densely pitted, lack the two postventral spines and in attaining the adult subelliptical outline, rather than a subtriangular outline of the instars of *C. retrobispinosa*.

Occurrence. Pebas Formation, Iquitos, Peru

Cyprideis ? sp. aff. C. machadoi Purper

Plate 4, figures 1, 2

A synonymy of *C. machadoi* is given because of numerous changes recommended by Munoz et al. (1998)

Ostracoda B, Purper, 1977, p. 358
Chlamadocytheridea machadoi Purper, 1979, p. 237, pl. 6, figs. 1-6
Cyprideis truncata Purper 1979, p. 232, pl. 4, figs. 12-22
Paulacoutoia krommelbeini Purper, 1979, pl. 5, figs. 18-24
Otarocyprideis elegans Sheppard and Bate, 1980, p. 101, pl. 8, figs. 10-12
Chlamydocytheridea kotzianae Purper and Ornellas, 1991, p. 427
Cyprideis machadoi Munoz, Whatley, Van Harten, 1998, p. 98, pl. 3, figs. 15-17

The illustrated specimen resembles *C. machadoi (*Purper) in general outline, nearly smooth surface and slightly concave venter, but is not so strongly flanged anteriorly as in that species.

Occurrence. Pebas Formation, Iquitos, Peru.

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Plate Descriptions

Plate 1

Figures 1-6. *Cyprideis* sp. aff. *C. colombiaensis* Sheppard and Bate. 1, Exterior of immature LV, X 216. 2, 3, Interior of immature RV, X 135; enlargement of posteroventral margin, X 675. 4, Stereo pair of immature RV, X 225. 5, Stereo pair of LV, X 90. 6, LV, X 79.

Plate 2

Figures 1-6, 8, 9. *Cyprideis* sp. aff. *C. purperi colomniaensis* Sheppard and Bate. 1, RV, X 102. 2, 3. RV interior, X 103; adductor muscle scar area, X 414. 4-6, RV interior, X 90; RV dorsal view, X 99; adductor muscle scar area, X 342. 8, 9. LV interior, X 95; adductor muscle scar area X 360.

Figure 7. *Cyprideis* cf. *amazonica Purper*, RV, X 99.

Plate 3

Figures 1, 2, 5, 6. *Cyprideis* sp. aff. *C. amazonica* Purper. 1, 2 Stereo pair of LV, X 117; a sieve plate, X 4950. 5, 6. LV interior, X 90; adductor muscle scar area, X 360.

Figures 3, 4. *Cyprideis* sp. aff. *C purperi colombiaensis* Sheppard and Bate. Stereo pair of LV interior, X 94; adductor muscle scar area, X 342 (retake of pl. 2, figs. 8, 9.).

Plate 4

Figures 1-4. *Cyprideis* sp. aff. *C. machadoi* (Purper). 1, 2. LV stereo pair, X 94; a poorly preserved sieve plate, X 5220. 3, 4. LV interior, X 99; adductor muscle scar area, X 297.

Figure 5. *Cyprideis* sp. aff. *C. amazonica* Purper. RV, X 162, of immature specimen.

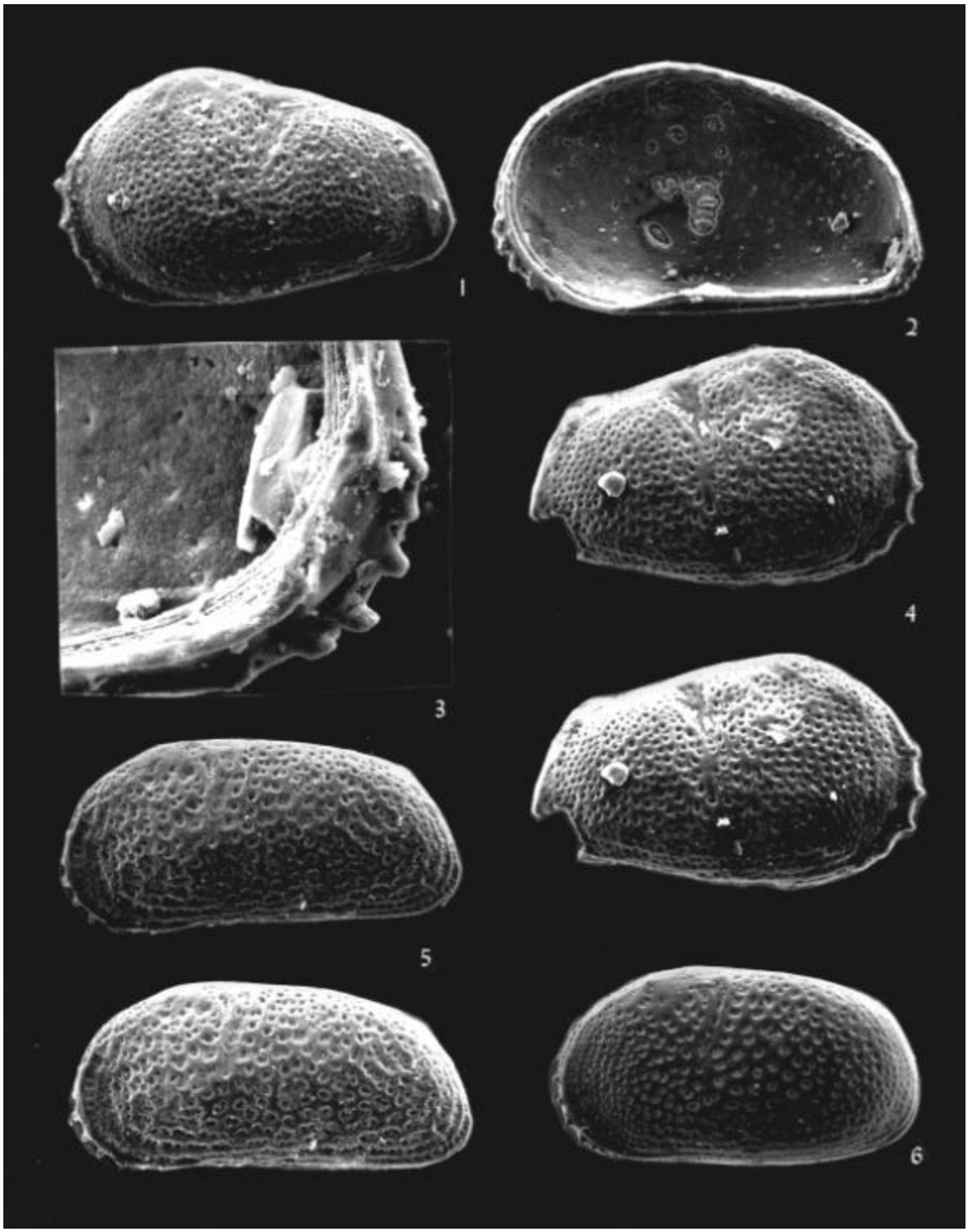
Figures 6, 7. *Cyprideis purperi purperi* Sheppard and Bate. RV
, X 75; sieve plate X 4320.

Plate 5

Figures 1-6. *Cyprideis purperi purperi* Sheppard and Bate. 1, LV, X 81; 2, adductor muscle scar area, X 360; 3, ventral part of anterior margin, X 945; 4, ventral part of posterior margin, X 945; 5, oblique view of anterior margin showing very narrow vestibule and marginal spines, X 270; 6, oblique view of postventral margin, X 567.

Plate 6

Figurs 1-8. *Cyprideis* sp. aff. *C. retrobispinosa* Purper and Pinto. 1, RV, X 72; 2, LV, X 68; 3, LV interior, X 72; 4, adductor muscle scar area of 3, X 2160; 5, anterior hinge margin of 3, X 225; 6, RV, X 81; 7, portion of shell survace, X 720; 8, sieve plate, X 4320.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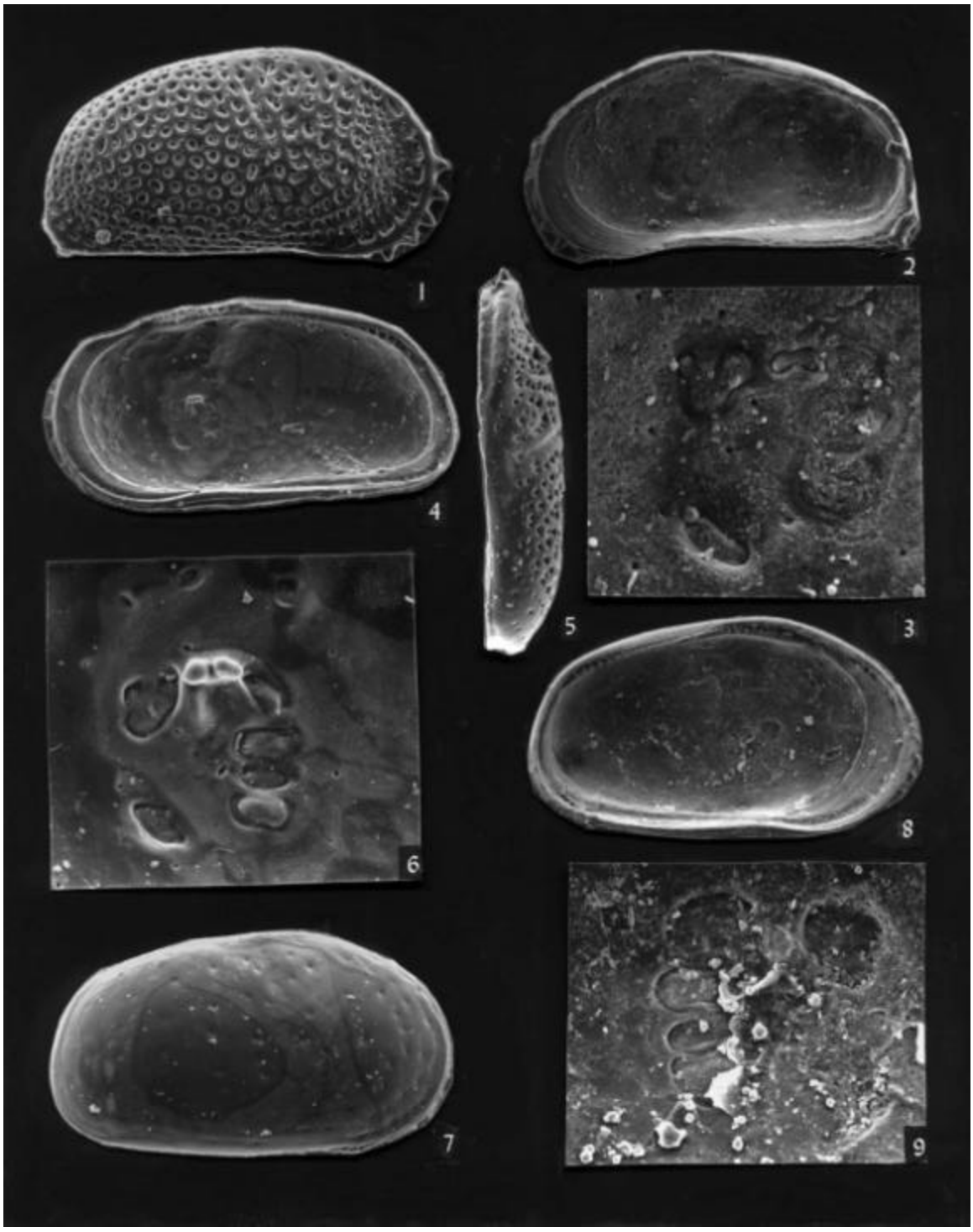
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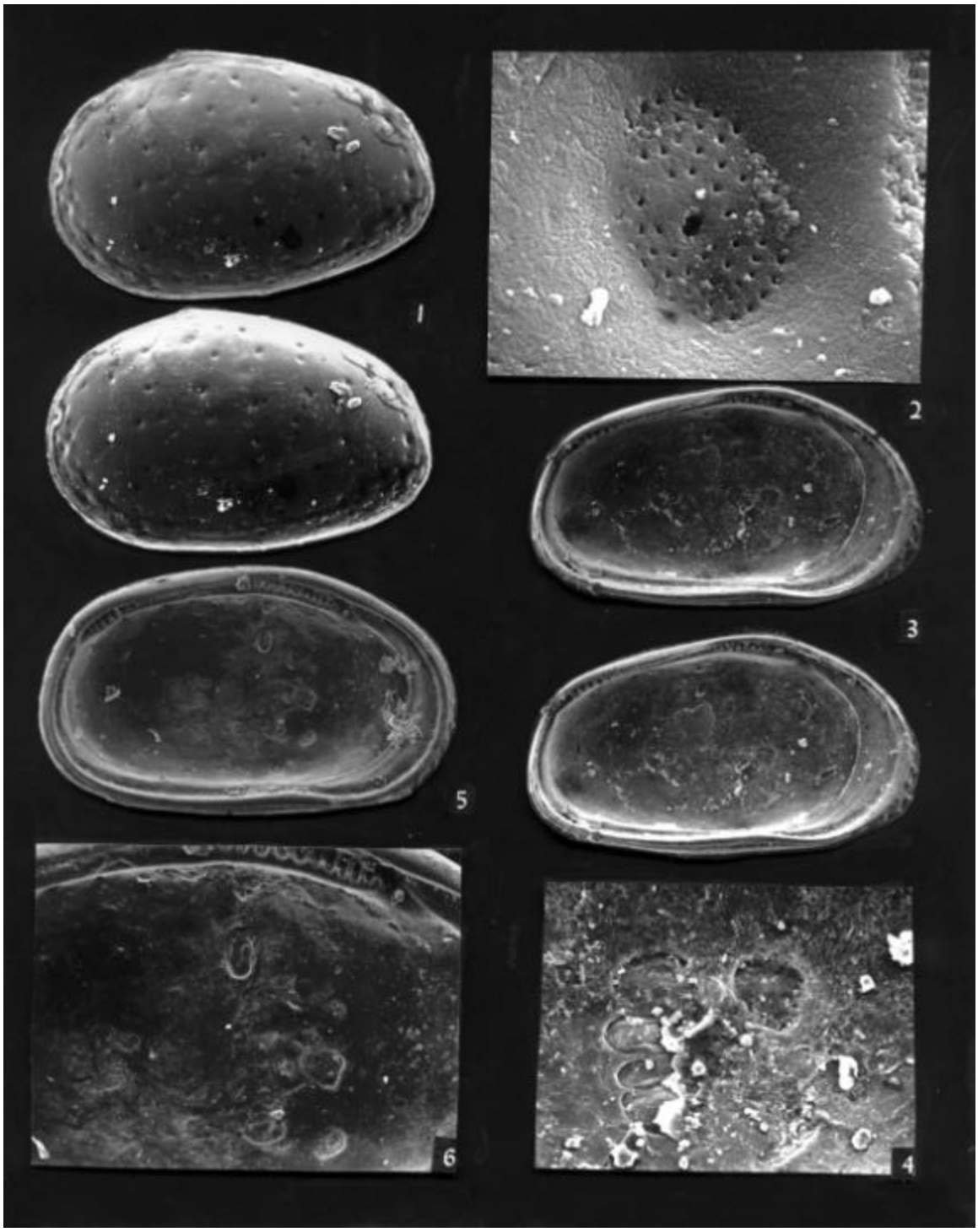
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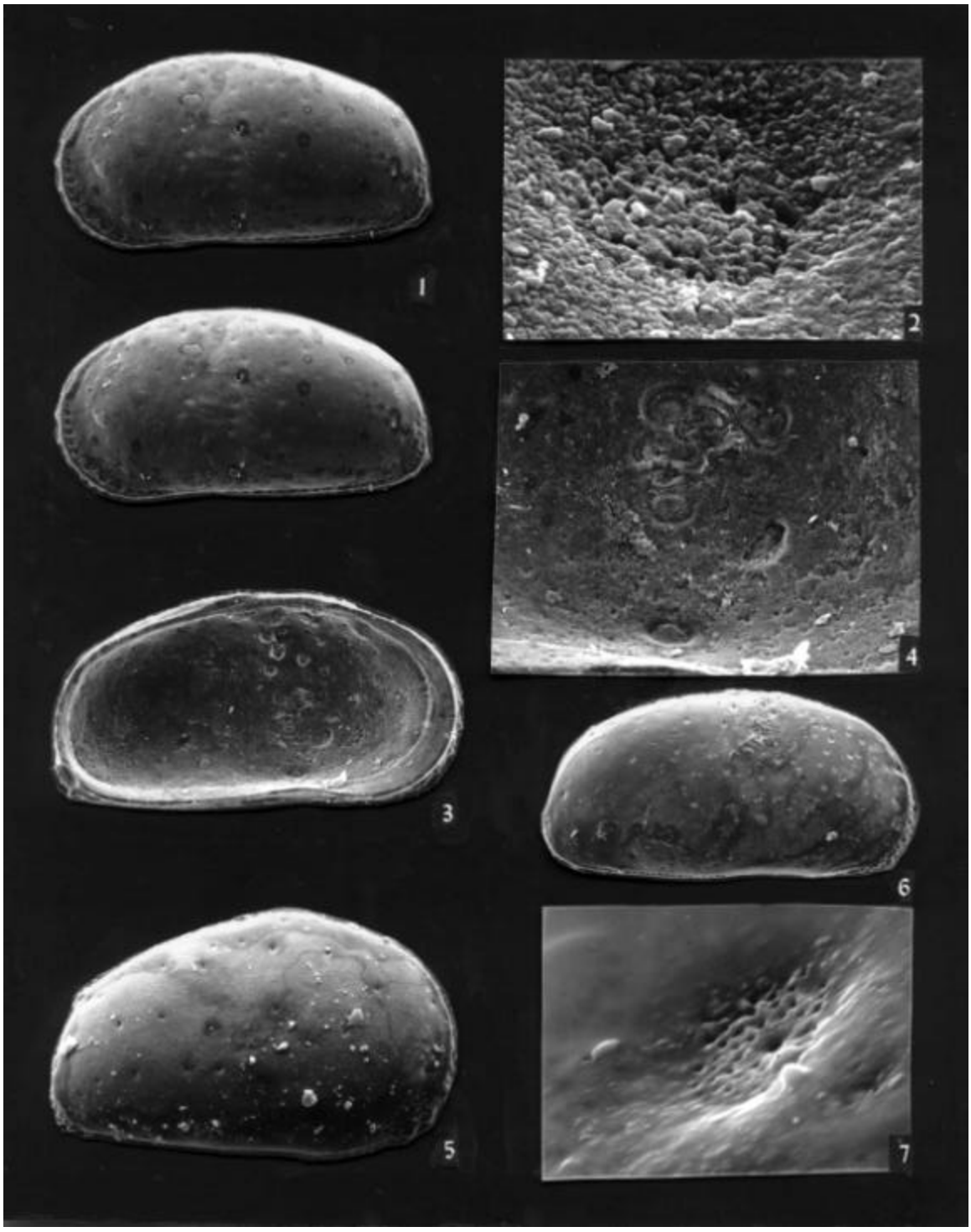
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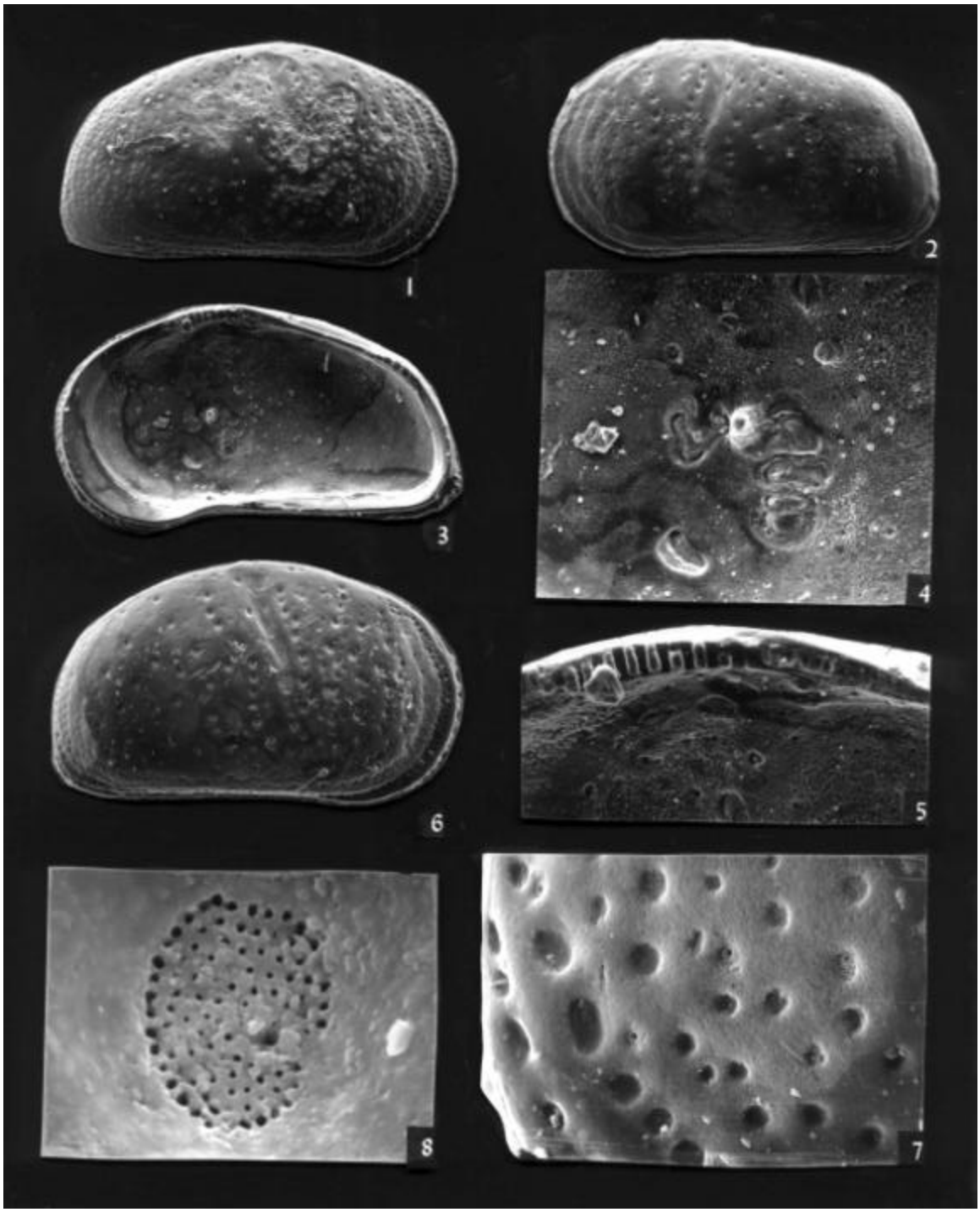
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