22. JURASSIC OSTRACODES OF DSDP LEG 11 (SITES 100 and 105) – PRELIMINARY ACCOUNT

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ABSTRACT

Ostracod associations from the Jurassic deposits (Sites 100 and 105) are comparable to those of the deep deposits of the Tethys (Dogger-Malm in S.E. France, Malm of the Apennin, "Argovien" = Upper Oxfordian of the Jura). A great many forms are unknown on a specific–and even generic–level. The associations are quantitatively dominated by Bairdiidae. There is a predominance of dwarfed and larval forms.

INTRODUCTION

When H. P. Luterbacher asked me if I would undertake a study of Jurassic Ostracoda from the western Atlantic, I was delighted to accept.

On first examination of these ostracodes, I was rather disappointed; throughout the greater part of the material, forms were minute, fragile, and often corroded and deformed. There were no representatives of genera which are characteristic and abundant in the neritic deposits of Europe, such as *Galliaecytheridea, Schuleridea, Macrodentina, Lophocythere, Protocythere*. There was thus no element which would enable precise identification.

At the beginning, then, the study of these materials seemed to be somewhat handicapped . . . However, taken as a whole, the isolated observations made during further study produced some rather interesting results, and these are outlined below. This report must be regarded as being purely preliminary (especially the rather 'shaky' taxonomic section). A more detailed study is planned in conjunction with R. H. Benson (Smithsonian Institution).

The materials studied here are from: Site 100, Cores 1, 7, 8, 9 and 10; and Site 105, Cores 33, 34, 35, 36, 37, 38 and 39.

MAIN RESULTS

Faunal Associations

Cores 33 and 39 from Site 105 are all characterized by a predominance of *Bairdia* s.l. As well as this genus, some *Cytherella, Pontocyprella, Monoceratina, Polycope, Saipanetta* and others are also found. Normal-sized individuals were found mainly among the *Bairdia*

Core 1 and Cores 7 through 10 from Site 100 contain almost exclusively small-sized individuals, among which there are quite a few *Pontocyprella*, as well as a few *Polycope* s.l., and some "*Acrocythere*", *Monoceratina, Bairdia,* and *Cytherella*.

The associations are quite uniform throughout, that is, no significant change is observed (not even in the cores immediately above the basalt). The taxonomic position of a large number of species–and even some genera–remains to be studied. Conservation of species is highly variable–so variable in fact that at times it is difficult to distinguish between relief ornamentation and a corroded surface. In addition, internal features are, more often than not, almost indistinguishable.

At certain levels (particularly Site 100, Core 1), the surface of the ostracodes looks like a nannofossils cemetery, and at times, the coccoliths and nannoconids seem–from outward appearances at any rate–to replace the calcite elements of which the test is composed (Plate 2, Figure 29a).

Comparisons – Ecological and Chronostratigraphical Criteria

Viewed as a whole, the fauna, with its alternate predominance of *Bairdia* and *Pontocyprella*, is very closely linked with the deep deposits of the "Terres Noires" of the Dogger-Malm in Southeastern France; although I was unable to find identical species, the numerous similarities with regard to general form and the very similar composition of assemblages are striking. There are also very strong resemblances to the Upper Oxfordian (deep facies = "Argovian") of the Jura and to the bathyal Malm of the Apennin (Italy).

Two forms could be specifically determined. These are:

Bairdia (Akidobairdia farinacciae Oertli, 1967 (Plate 2, Figures 18, 19, and 20)

Bairdia italica Oertli, 1967 (Plate 1, Figures 12 through 16).

The first is found in Cores 33 and 34 of Site 105, and in Core 8 of Site 100; while the second is found in Cores 38 and 39 of Site 105. These two species were described for the first time in the bathyal Upper Jurassic of the Apennin (Italy).

All these faunal similarities indicate: Very strong links between the western part of the present Atlantic and the Tethys; age most likely Upper Jurassic; and a constantly deep deposit environment (outer neritic to bathyal).

The fact that the associations contain numerous larval stages and very delicate forms would suggest that the environment was calm, probably without currents.

Another interesting aspect of these faunas is their partly "archaic" character, which would seem to indicate the survival of ancient forms in an environment where "evolutionary stress" was non-existent. This is particularly true of *Acratia* (Plate 2, Figures 24 and 25) and also of a form very similar to the *Graphiadactyllis* group (Plate 2, Figure 26). As far as I know, *Acratia* has so far never been found above the Triassic. This "survival" in comparatively deep environments can also be observed in the case of *Bairdia* ? sp. (Plate 2, Figures 21, 22 and 23)—this time in younger sediments; a form closely resembling this species occurs also in the Barremian of deep sediments in the east central Atlantic (direct observation of a sample from Leg 13, Site 120).

So far, little is known of the fossil Ostracoda from the deep sediments; their study will provide us with some very interesting information—and a few surprises. A study of ostracodes of the Tethys, from the Mesozoic to Recent, is to be undertaken shortly by a group of specialists led by R. H. Benson (Smithsonian Institution, Washington) and P. C. Sylvester-Bradley (University of Leicester).

Acknowledgments

I should like to thank my friend H. P. Luterbacher for having entrusted me with this study, and for having supplied me not only with the Ostracod samples ready for study, but also with all the additional information required concerning Leg 11. Anne Kearns, Branford University, England, translated the manuscript into English. I should also like to thank the Management of the Société Nationale des Pétroles d'Aquitaine for the interest shown by them in this study, and for having allowed me to use the scanning electron microscope (Stereoscan)—without which the illustration of the "micro-ostracodes" would have posed a few problems.

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Oertli, H. J., 1963. Mesozoic Ostracod Faunas of France. Leiden (Brill), Leiden. 57 p., 91 pl. (see p. 30 and pl. 31/2 + 37/1).

Oertli, H. J., 1967. Ostracodes de sédiments bathyaux de Jurassique supérieur de l'Apennin (Italie). *Bull, Centre Rech. Pau-SNPA*. **1** (1), 7, 3 pl.

PLATE 1

Figures 1-3 *Bairdia* sp. A
1. Carapace; 105-34-2, 18-25 cm; réf. specimen: 8/2/1; X55.
2. Right valve; 105-35-4, 44-60 cm; ref. 8/2/2; X55.
3. Left valve; 105-35-4, 44-60 cm; ref. 8/2/5, X55.

Figure 4 *Bairdia* sp. B
Right valve; 105-33-2, top; ref. 8/1/2; X55.

Figures 5-7 *Pontocyprella* sp.
5. Right valve; 100-9-CC; ref. 8/7/9; X55.
6. Carapace; 100-8-3, 30-32 cm; ref. 8/7/4; X55.
7. Carapace; 100-7-CC; ref. 8/6/2; X110

Figure 8 Indet. gen. et sp.
Right valve; 105-35-4, 44-60 cm; ref. 8/2/6-1; X110.

Figure 9 *Bairdia* sp.-larval stage
Carapace; 100-8-1, 92-94 cm; ref. 8/6/6; X110.

Figure 10 Indet. gen. et sp.
Right valve; 100-1-3, 50-52 cm; ref. 8/5/3; X110.

Figure 11 *Paracypris* sp.
Carapace; 105-35-4, 44-60 cm; ref. 8/2/6-2, X110.

Figure 12-16 *Bairdia italica* Oertli, 1967
12. Carapace; 105-38-CC; Ref. 8/3/5; X55.
13. Carapace; Upper Jurassic near Spoleto, Italy (coll. OERTLI); X55.
14. Left valve from interior; 105-38-CC; ref. 8/3/6; X55.
15. Left valve; 105-38-CC; ref. 8/3/2; X55.
16. Left valve; Upper Jurassic near Spoleto, Italy (coll. OERTLI); X55.

Figure 17 *Fabalicypris* sp.
Carapace; 105-33-2, 20-33 cm; ref. 8/1/5; X110.

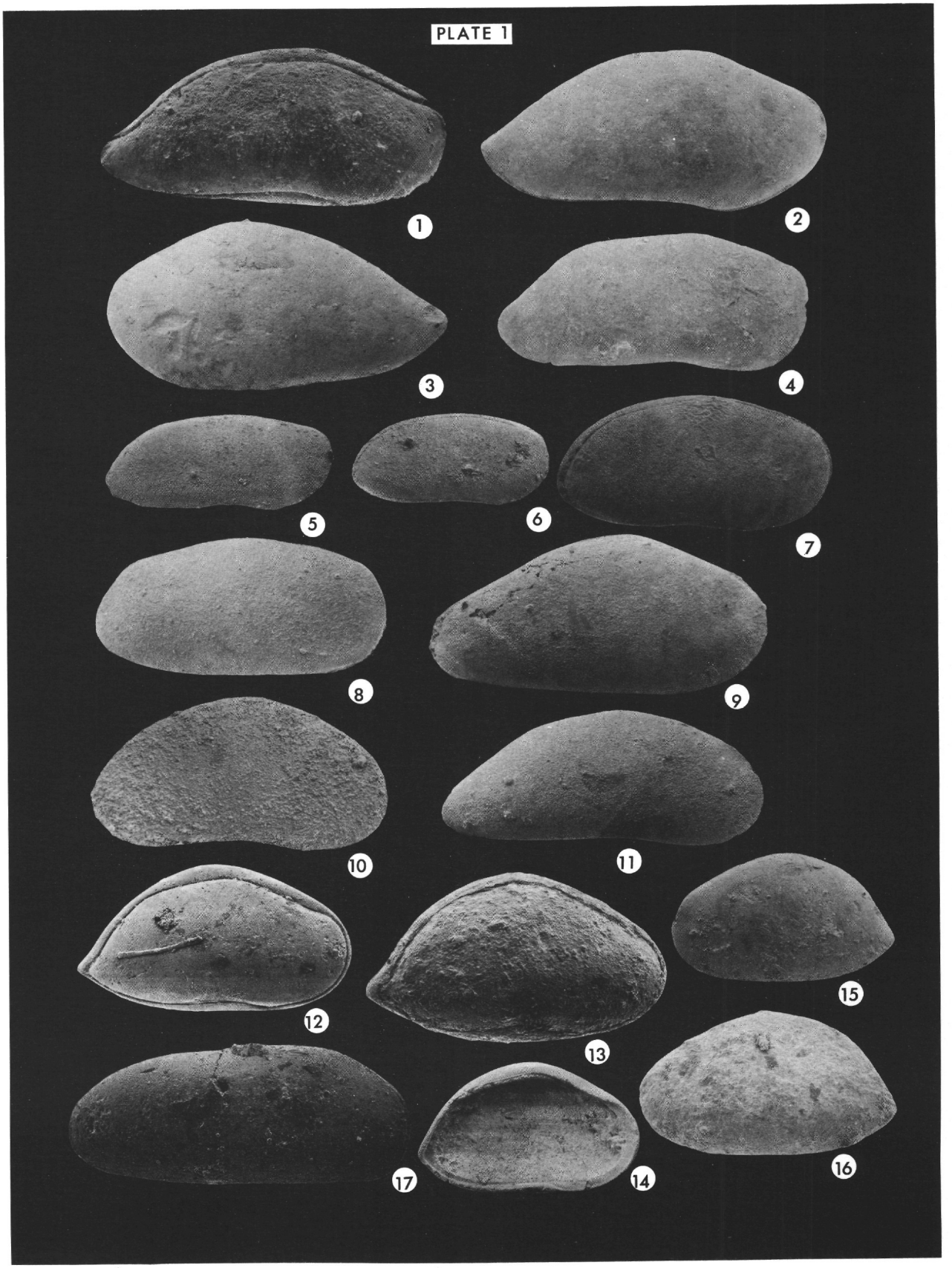
PLATE 1
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PLATE 2

18-23: approx. X55
24-31: approx. X110
29a: approx. X1650
C = Carpace RV = right valve LV = Left valve

Figures 18-20 *Bairdia (Akidobairdia) farinacciae* Oertli, 1967
18. Carapace; 105-33-2, 20-33 cm; ref. 8/1/1; X55.
19. Carapace; 100-8-3, 30-32 cm; ref. 8/7/6; X55.
20. Carapace; Upper Jurassic near Spoleto, Italy (coll. OERTLI); X 55.

Figures 21-23 *Bairdia ?* sp.
21. Left valve; 105-38-CC; ref. 8/3/3; X 55.
22. Left valve; 105-38-CC; ref. 8/3/4; X 55.
23. Left valve; 105-33-4, 10-30 cm; ref. 8/1/7; X55.

Figures 24-25 *Acratia* sp.
24. Carapace; 100-8-1, 92-94 cm; ref. 8/6/9-2; X110.
25. Carapace; 100-8-1, 92-94 cm; ref. 8/6/9-1; X110.

Figure 26 Indet. (near Graphiadactyllis ?)
Carapace; 100-7-CC; ref. 8/6/4; X110.

Figure 27 Indet. gen. et sp.
Carapace; 105-35-4, 44-60 cm; ref. 8/2/6-3; X110.

Figure 28 *Cytherella* sp.
Right valve; 100-9-CC; ref. 8/7/8; X110.

Figures 29-30 *Cytherelloidea* sp. A
29. Right valve; 100-1-2, 94-96 cm; ref. 8/4/6; X110.
30. Left valve; 100-7-1, 108-110 cm; ref. 8/5/7; X110.

Figure 31 *Cytherelloidea* sp. B
Right valve; 100-1-1, 110-120 cm; ref. 8/4/1; X110.

Figure 32 *Saipanetta ?* sp.
Left valve; 105-35-2, 20-40 cm; ref. 9/1/2.

Figure 29a Surface of *Cytherelloidea* sp. A (dorso-central part of Figure 29) with accumulation–incrustation of nannofossils; X1650.

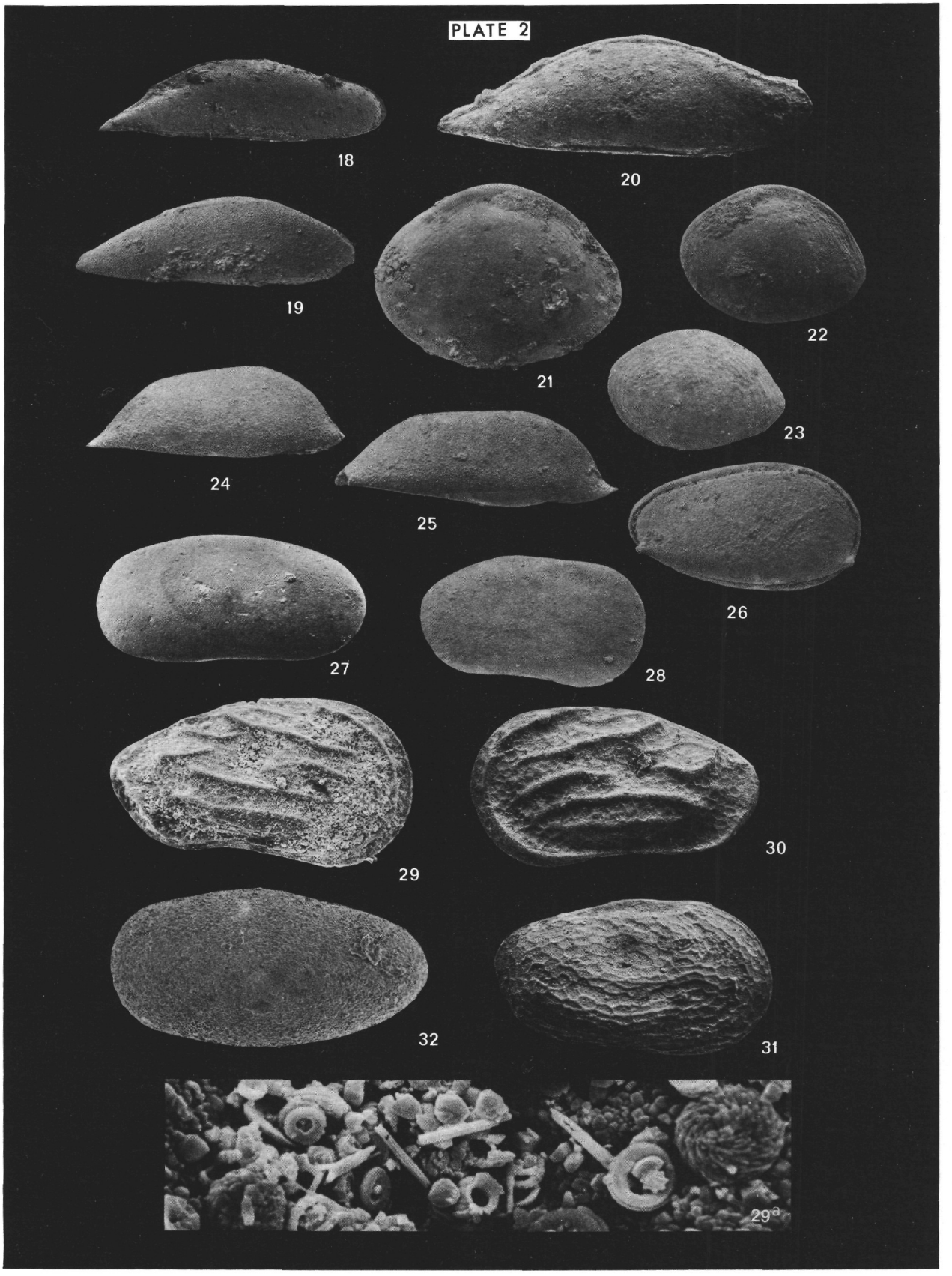
PLATE 2
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PLATE 3

Figure 33 — *Polycope* sp. A
Right valve; 100-8-1, 92-94 cm; ref. 8/6/7; X110.

Figure 34 — *Polycope* sp. B
Left valve; 105-33-2, Top; ref. 8/1/3; X110.

Figure 35 — *Polycope* sp. C
Left valve; 100-1-2, 94-96 cm; ref. 8/4/12; X110.

Figures 36-38 — *Polycope* ? sp. D
36. Carapace; 100-8-1, 92-94 cm; ref. 8/6/8; X110.
37. Carapace; 100-8-3, 30-32 cm; ref. 8/7/2; X110.
38. Carapace; 100-9-CC; ref. 8/7/10

Figures 39-41 — *Polycope* ? sp., *Thaumatocypris ?* sp.
39. Carapace; 100-8-3, 30-32 cm; ref. 9/3/5; X110.
40. Left valve; 100-8-3, 30-32 cm; ref. 8/7/3; X110.
41. Right valve; 100-8-3, 30-32 cm; ref. 8/7/1; X110.

Figure 42 — *Monoceratina ?* sp.
Right valve; 105-33-2, 20-33 cm; ref. 9/1/1; X110.

Figure 43 — *Bythoceratina ?* sp.
Left valve; 105-36-2, 100-102 cm; ref. 8/3/1; X55.

Figure 44 — Indet. gen. et sp.
Left valve; 105-33-2, 100-102 cm; ref. 8/1/6; X110.

Figures 45-49 — *Hemicytherura ?* sp.
45. Right valve; 100-1-3, 50-52 cm; ref. 8/5/1; X110.
46. Right valve; 100-1-5, 67-69 cm; ref. 9/2/4; X110.
47. Right valve; 100-1-3, 50-52 cm; ref. 9/2/3; X110.
48. Right valve interior view; 100-1-5, 67-69 cm; ref. 9/2/5; X200.
49. Left valve; 100-1-1, 110-120 cm; ref. 9/1/6; X110.

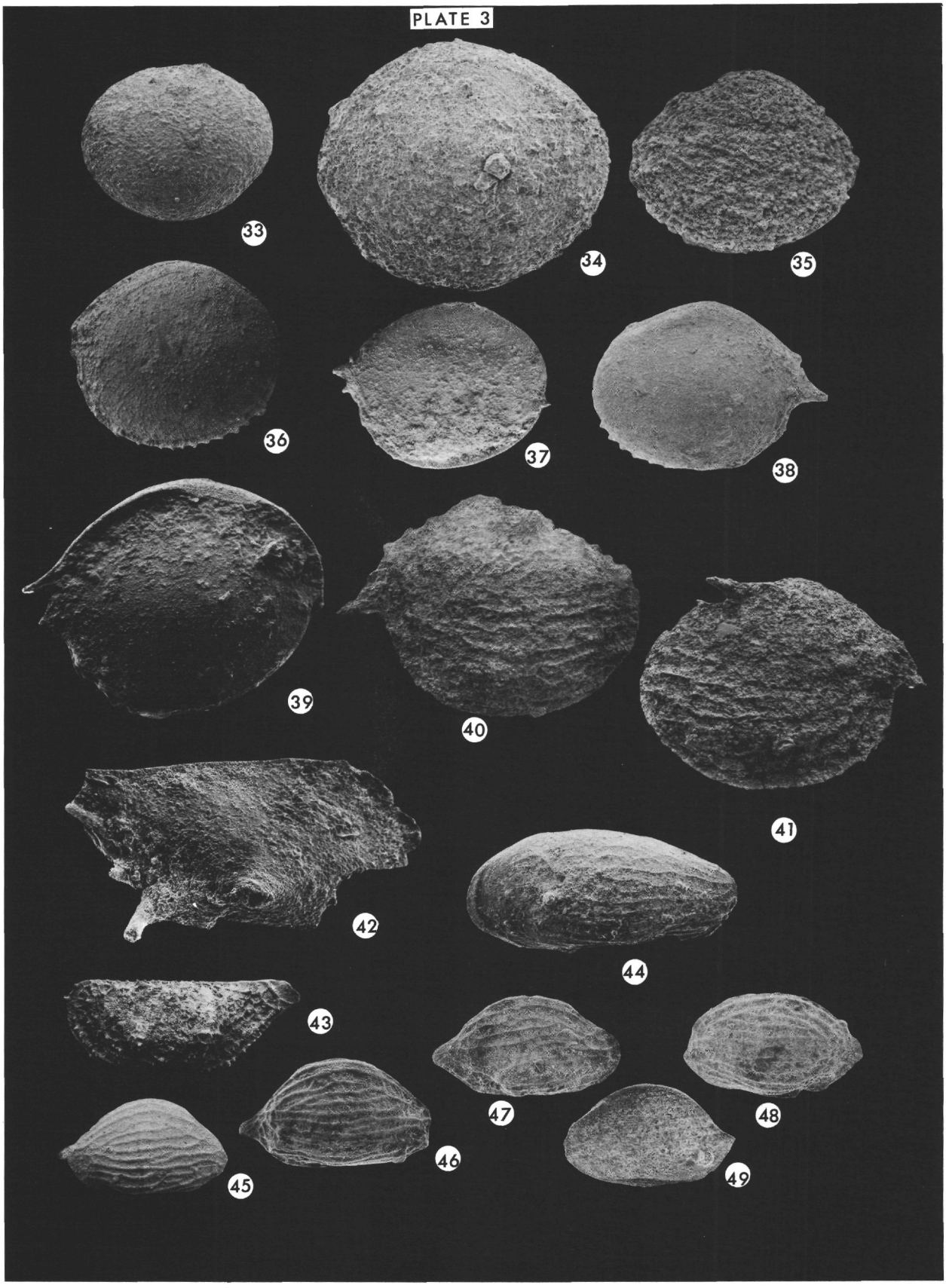
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PLATE 4

Figure 50 — Indet. gen. et sp.
Right valve; 100-7-2, 140-142 cm; ref. 9/2/10; X110.

Figure 51 — Indet. gen. et sp.
Carapace 100-1-1, 110-120 cm; ref. 9/2/10; X110.

Figures 52-54 — Indet. gen. et sp.
52. Right valve; 100-8-1, 92-94 cm; ref. 8/6/11; X110.
53. Carapace; 100-10-2, 10-12 cm; ref. 8/8/2; X110.
54. Carapace; 100-8-2, 49-50 cm; ref. 9/3/3; X110.

Figure 55 — *Orthonotacythere ?* sp.
Left valve; 100-7-2, 140-142 cm; ref. 9/2/7; X110.

Figures 56-57 — *Orthonotacythere* sp.
56. Left valve; 100-9-CC; ref. 9/3/7; X110.
57. Carapace; 100-9-CC; ref. 9/3/6; X110.

Figure 58 — Indet. gen. et sp.
Right valve; 100-1-1, 110-120 cm; ref. 8/4/5; X110.

Figure 59 — Indet. gen. et sp.
Left valve; 100-1-3, 50-52 cm; ref. 8/5/4; X110.

Figure 60 — Indet. gen. et sp.
Left valve; 100-1-3, 50-52 cm; ref. 8/5/2; X110.

Figures 61-66 — *Acrocythere ?* sp.
61. Left valve; 100-7-CC; ref. 8/6/1; X110.
62. Left valve; 100-1-2, 94-96 cm; ref. 8/4/7; X110.
63. Left valve; 100-1-2, 94-96 cm; ref. 8/4/3; X110.
64. Right valve, interior view; 100-7-2, 140-142 cm; ref. 9/2/6; X200.
65. Right valve; 100-1-2, 94-96 cm; ref. 8/4/7; X110.
66. Right valve; 100-8-1, 92-94 cm; ref. 8/6/5, X110.

Figure 67 — Indet. gen. et sp.
Left valve; 100-1-1, 110-120 cm; ref. 9/1/4; X110.

Figure 68 — Indet. gen. et sp.
Left valve; 100-10-2, 10-12 cm; ref. 8/8/4; X110.

Figure 69 — Indet. gen. et sp.
Carapace; 100-8-1, 92-94 cm; ref. 8/6/10; X110.

Figures 70-71 — Indet. gen. et sp. (same genus as Figure 69?); X110.
70. Left valve; 100-9-CC; ref. 9/3/2; X110.
71. Carapace; 100-8-3, 148-150 cm; ref. 9/2/9; X110.

Figure 72 — Indet. gen. et sp.
Left valve; 100-1-2, 94-96 cm; ref. 8/4/11; X110.

Figures 73-74 — *Bythocythere ?* sp. A
73. Right valve; 100-1-3, 50-52 cm; ref. 9/2/1; X110.
74. Right valve, interior view; 100-1-3, 50-52 cm; ref. 9/2/2; X110.

Figure 75 — *Bythocythere ?* sp. B
Left valve; 100-1-3, 50-52 cm; ref. 8/5/5; X110.

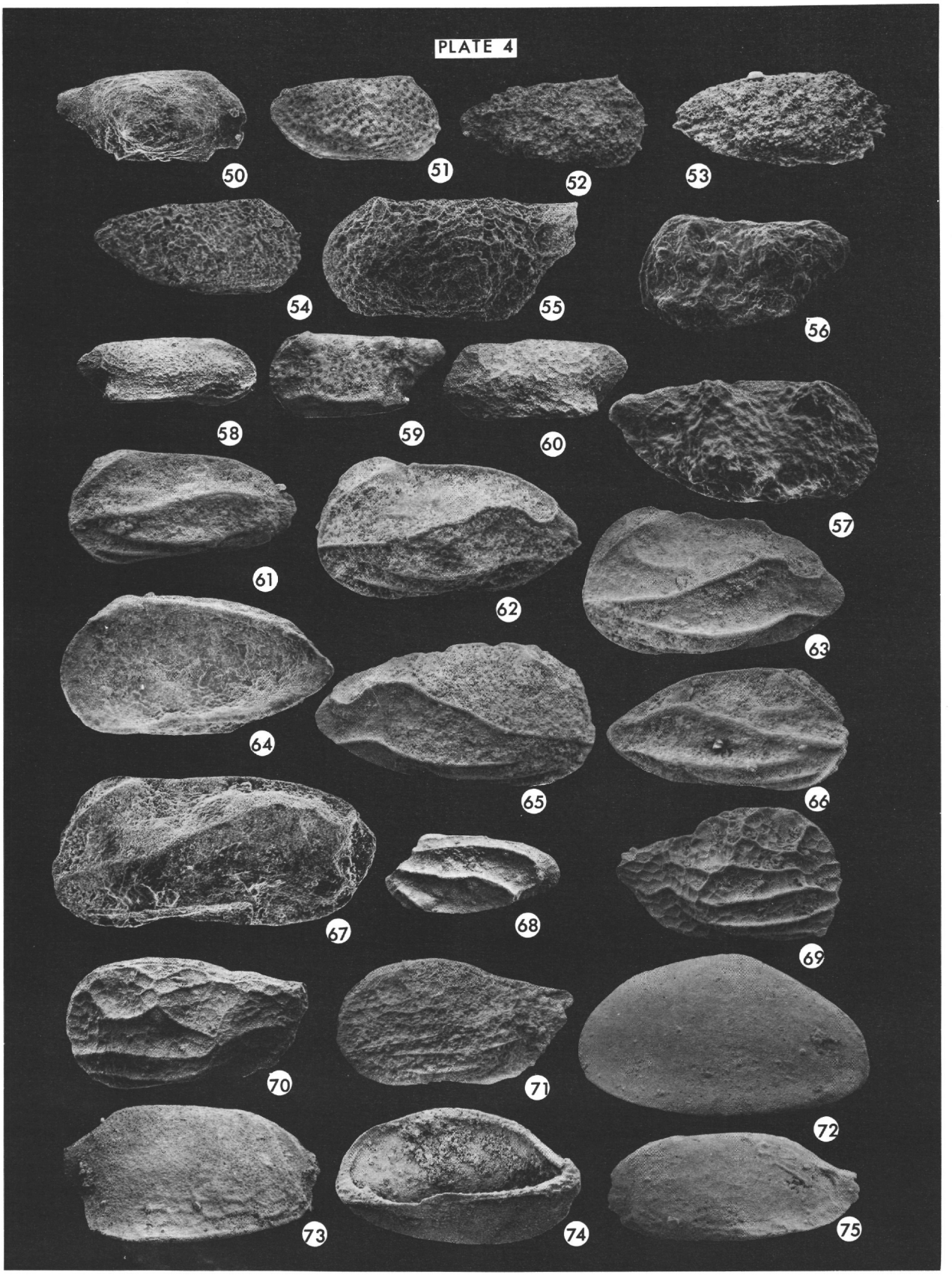
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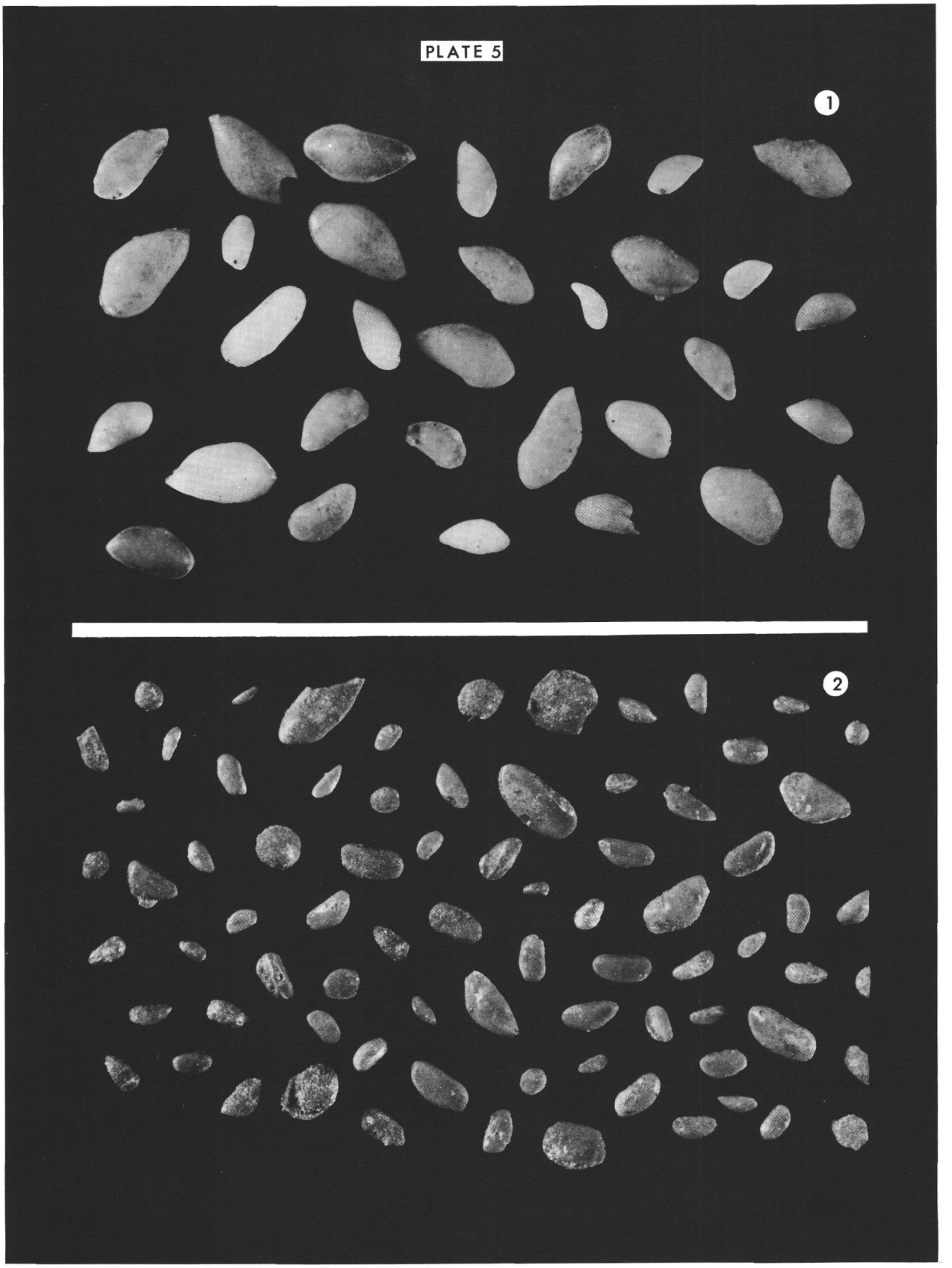
PLATE 5

Ostracod Associations

Ostracod Associations

Figure 1 — *Bairdia* association. Site 105, Core 35, Section 4, 44-60 cm; X24.75.

Figure 2 — Association with *Pontocyprella, Polycope, acrocythere; ?* et al. Site 100, Core 8, Section 3, 30-32 cm; X24.75.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