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Some representatives of the family Thecideidae (Brachiopoda) from the Upper Jurassic of Poland

ABSTRACT: The brachiopods of the family Thecideidae Gray from the Middle Oxfordian of Bałtów (NE Mesozoic margin of the Holy Cross Mts), including two species, *Praelacazella ulmensis* (Quenstedt) and *Praelacazella baltoviensis* sp. n., of the subfamily Lacazellinae, one species, *Agerinella lyrata* Pajaud & Patručius, of the subfamily Davidsonellinae and one species, *Moorellina septata* (Moore), of the subfamily Moorellininae are described. These species indicate very shallow-sea conditions that predominated in the basin in this area of the margin of the Holy Cross Mts.

INTRODUCTION

Very few species of Jurassic brachiopods of the family Thecideidae Gray, 1840, are known so far. In the regions situated near the territory of Poland, *Thecidella gerassimovi* Makridin is known from the Callovian of the environs of Moscow (Makridin 1964) and *Glazewska* sp. from the „Bononian” of Podolia (Glazewski & Pajaud 1964). Two Rumanian species, *Davidsonella? tithonica* Pajaud & Patručius from the Tithonian of the environs of Sinaia and *Agerinella lyrata* Pajaud & Patručius from the Oxfordian of Visterna Valley in Central Dobruja were also described by Pajaud & Patručius (1964).

In Poland, the species *Thecidea pedunculata* Münster has so far been known from Bathonian oolites at Balin near Cracow (cf. Suess 1853, p. 1,002). Describing the brachiopod fauna from the Balin Oolite, Szajnocha (1879) mentions, however, *Thecidium* sp. indet. only.

The thecidean brachiopods, which are the subject of the present paper, were found in the coraliferous limestones at Bałtów (NE Mesozoic margin of the Holy Cross Mts). Part of the material has been collected by Dr E. Roniewicz to whom the present writer extends his thanks for

making it available for elaboration. All the specimens under study are housed at the Museum of the Faculty of Geology, Warsaw University, where they have been given catalogue numbers of T 1/1 to T 42/4.

DESCRIPTION OF THE MATERIAL

Family *Thecideidae* Gray, 1840
Subfamily *Lacazellinae* Pajaud, 1966
Genus *Praelacazella* Smirnova, 1969

Type species: *Thecidium valangense* Loriol, 1868.

Occurrence: Upper Jurassic — Cretaceous.

The genus *Praelacazella* Smirnova has so far included the species occurring in the entire Cretaceous. The following species were assigned to this genus by Smirnova: *Praelacazella valangensis* (Loriol), known from the Valanginian and Hauteriviian of Switzerland, Germany and Crimea; *Praelacazella laczelliformis* (Elliott) from the Cenomanian and Santonian of England and Germany, and *Praelacazella longirostris* (Morris) from the Maastrichtian of Western Europe. The analogous external structure, the shape of shell and manner of the attachment to substratum induced the present writer to assign to this genus some Upper Jurassic species which previously, having no unequivocally documented generic assignment, were placed (Rollier 1915) either within the genus *Thecidella* Oehlert or *Lacazella* Munier-Chalmas. These are *Praelacazella ulmensis* (Quenstedt) and *Praelacazella baltoviensis* sp. n.

Praelacazella ulmensis (Quenstedt, 1858)

(Fig. 1; Pl. II, Figs 1—9)

1858. *Thecidea Ulmensis*; F. A. Quenstedt. pp. 749, 754; Pl. 91, Figs 17—18.

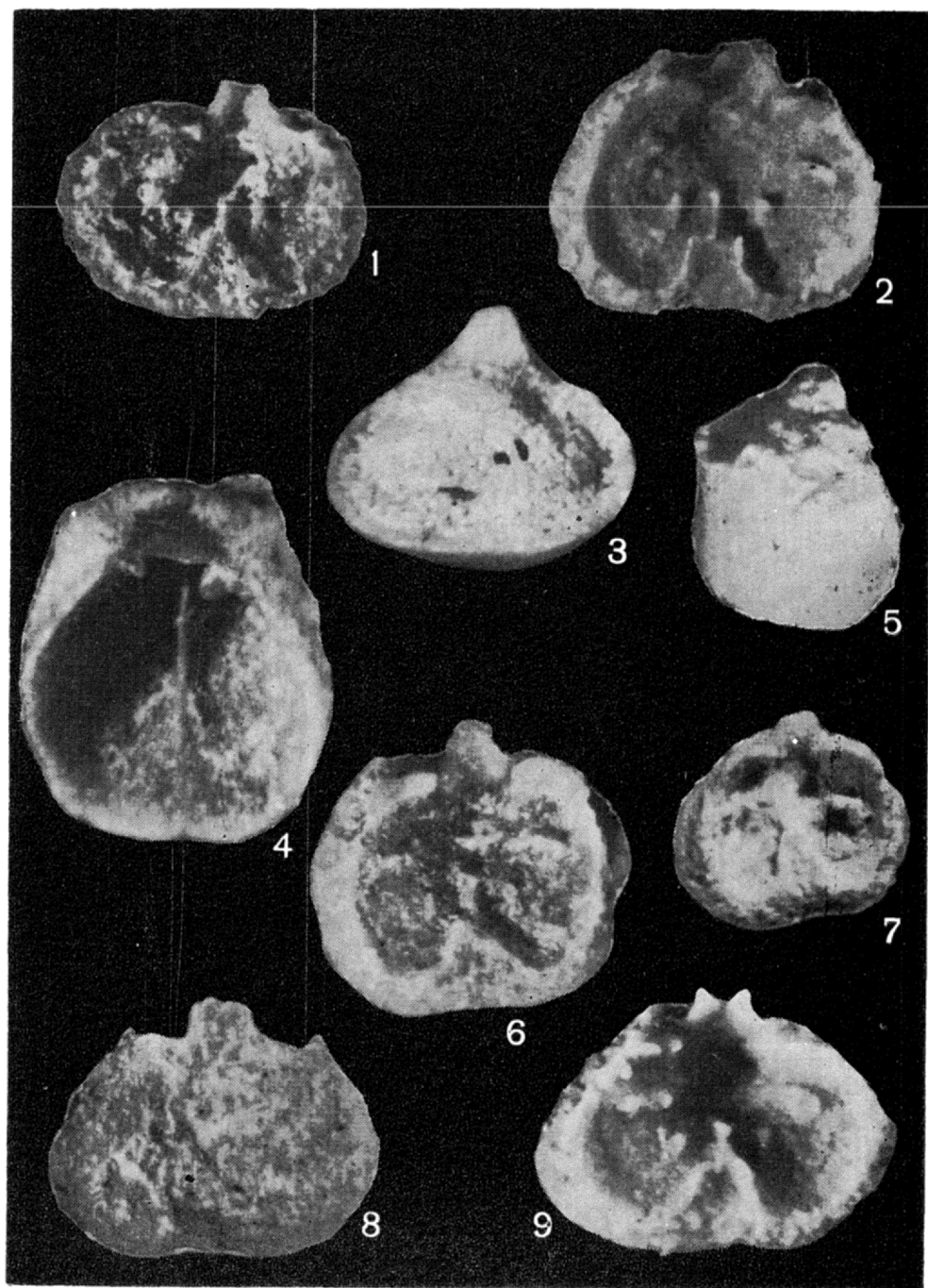
1915. *Thecidea Ulmensis* Quenst.; L. Rollier, p. 56.

Material. — Seventy specimens, including six complete shells, 21 pedicle and 43 brachial valves.

Dimensions (in mm):

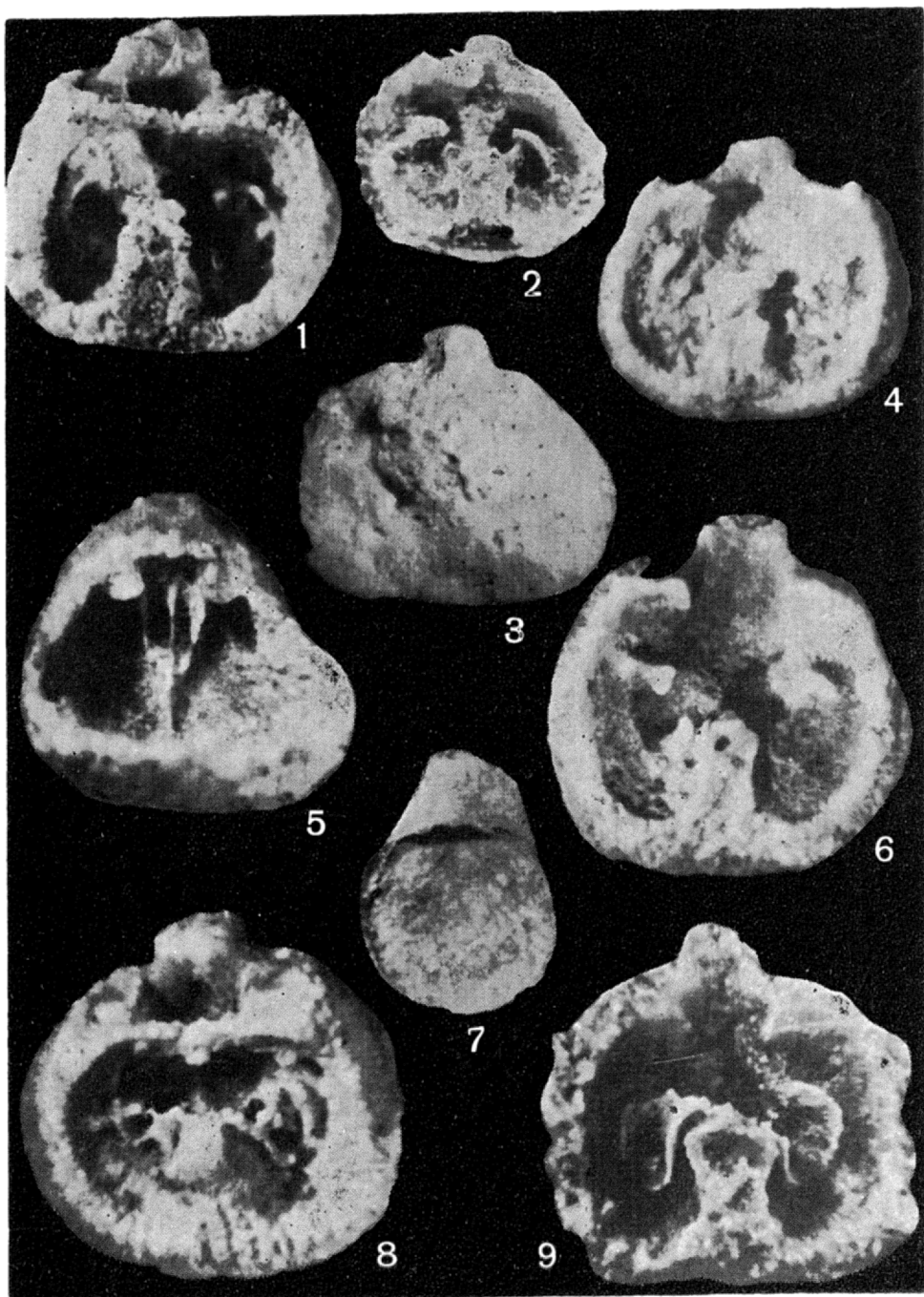
No	15/1	24/1	29/2	29/1	15/4
length	2.10	2.04	2.04	1.92	1.80
width	1.80	2.80	2.76	2.52	1.80

Description. — Shells small, transversely oval, the largest width halfway the length or somewhat nearer the anterior margin. Beak of pedicle valve large, very strongly deflected towards brachial valve. Attachment scar large, flat, occupying the entire beak and part of pedicle valve, thus causing its considerable deformation



Praelacazella ulmensis (Quenstedt), Middle Oxfordian, Baltów, $\times 20$

1, 2, 6, 7, 9 interior of the brachial valve; 3 outer view of the shell, brachial-valve side; 4 interior of the pedicle valve; 5 outer view of the pedicle valve; 8 outer view of the brachial valve



Praelacazella baltoviensis sp.n., Middle Oxfordian, Bałtów, $\times 20$

1, 2, 4, 6, 8, 9 interior of the brachial valve (9 presents the holotype); 3 outer view of the brachial valve; 5 interior of the pedicle valve; 7 outer view of the shell, brachial-valve side

(Pl. I, Fig. 5). Surface of brachial valve smooth, with concentric growth lines slightly marked. Surface of pedicle valve covered with a distinct radial ornament, marked over the space between a thickened attachment scar and a place halfway the length of the shell. Anterior part of pedicle valve smooth.

Pedicle valve roundish-triangular, strongly thickened and deformed by a large attachment scar. Beak massive, strongly deflected towards the brachial valve. Pedicle valve very deep, at least twice as much as brachial valve. Area triangular flat; pseudodeltidium narrow, high, poorly visible. Cardinal margin short. Hinge teeth massive, spatulate. Hemispondylium fused with septum at one third of the length of valve (Pl. I, Fig. 4). A slightly marked granulation is observable on the margin of valve.

Brachial valve transversely oval in outline (Fig. 1). Maximum width is recorded halfway the length of valve. Valve strongly flattened, a small elevation may be observed only in the region of cardinal margin. Cardinal margin straight. Dental sockets large, deep. Cardinal process large, rectangular, with strongly incurved

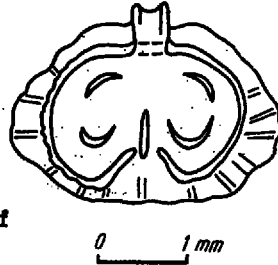


Fig. 1

Praelacazella ulmensis (Quenstedt), interior of the brachial valve

margins and forming a distinct trough perpendicular to cardinal margin. A pustulate, slightly raised subperipheral rim surrounds the valve. In the posterior part of valve, the rim passes over a very small visceral cavity, forming a slitlike transversarium, which has not been preserved complete in most specimens under study. In the anterior part, the rim forms a median ramus, similar in shape to an inverted and widely open letter V and forming a slitlike process in the distal part (Fig. 1; Pl. I, Figs 2 and 8). Only fragments of bases of a descendent brachial apparatus, in the form of falcate brachial ridges (Pl. I, Figs 1-6), fused with brachial valves, are preserved on both sides of median ramus.

Praelacazella baltoviensis sp. n.

(Fig. 2; Pl. II, Figs 1-9)

Holotype: No. 10/1 (Pl. III, Fig. 9).

Type stratum: Middle Oxfordian.

Type locality: Bałtów, NE Mesozoic margin of the Holy Cross Mts.

Derivation of the name: After Bałtów, the place of occurrence.

Material. — Sixty specimens, including four complete shells, 21 pedicle and 35 brachial valves.

Diagnosis. — Shells small, pearlike-oval. Surface of shell smooth, with slightly marked growth lines. A large attachment scar occurs at the apex of a deflected beak. Median ramus shaped like an inverted V, extended in the distal part and forming

an indistinct triangle. Descendent brachial apparatus in the form of two reniform, strongly concave and porous plates.

Dimensions (in mm):

No	2/1	10/1	2/3	2/2
length	2.52	2.52	2.40	2.16
width	2.76	2.40	2.40	2.52

Description. — Shells small, pearlike-oval. The largest width in the vicinity of the anterior margin. Surface of shell smooth, with slightly marked concentric growth lines. Beak of pedicle valve large, somewhat bent towards the brachial valve. A large attachment scar of shell occurs at the apex of beak.

Pedicle valve roundish-triangular (Pl. III, Fig. 5), extended lengthwise. Beak large, massive, in the apical part slightly deflected towards the brachial valve. Pedicle valve strongly thickened and deeper than the brachial one. Area triangular, flat. Pseudodeltidium high, flat or sometimes slightly concave. Hinge teeth massive, spatulate. Hemispondylium large, deep, oval. Septum low, rounded. Anterior margin clearly pustulate. Pustulae arranged in radial lines.

Brachial valve oval-quadrangular, always extended widthwise (Fig. 2), and strongly flattened with a small convexity near cardinal margin. Cardinal margin straight and short. Dental sockets deep. Cardinal process large, slightly concave and quadrangular, conspicuously projecting above the cardinal margin. A pustulate, slightly raised subperipheral rim occurs inside the brachial valve near the outer

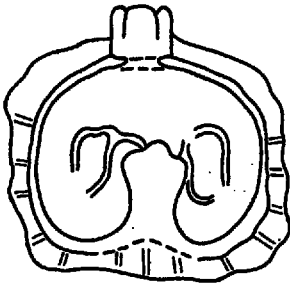


Fig. 2

0 1mm

Praelacazella baltoviensis sp.n., interior of the brachial valve

margin. In the posterior part of the valve, a transversarium is formed over visceral cavity (Pl. III, Fig. 1). A small notch is visible in the median part of transversarium (Pl. III, Fig. 8). In the anterior part, the subperipheral rim forms a median ramus similar in shape to an inverted V and extending in the terminal part to form an indistinct triangle with strongly incurved sides. Two reniform, strongly concave plates of descendent brachial apparatus detach themselves from the upper part of median ramus. They are porous, very strongly notched (Pl. II, Fig. 9) and best preserved and visible in the apical part of median ramus, as well as in a place in which they are attached to valve floor.

Remarks. — *Praelacazella baltoviensis* sp. n. conspicuously differs from *Praelacazella ulmensis* (Quenstedt) in the development of median ramus, which in *P. baltoviensis* sp. n. distinctly branches in the terminal part into three parts in

contradistinction to *P. ulmensis* (Quensted) in which it terminates in a flat slot. In addition, *P. ulmensis* (Quenstedt) has a radial ornamentation of pedicle valve which is lacking in *P. baltoviensis* sp. n.

Subfamily **Davidsonellinae** Pajaud, 1966
Genus ***Agerinella*** Pajaud & Patruilius, 1964

Type species: Agerinella lyrata Pajaud & Patruilius, 1964.
Occurrence: Upper Jurassic.

Agerinella lyrata Pajaud & Patruilius, 1964
(Fig. 3; Pl. III, Figs 1—9)

1964. *Agerinella lyrata* nov. sp.; D. Pajaud & D. Patruilius, p. 583; Pl. 19b, Figs 1—3.

Material. — Fifty-two specimens, including seven complete shells, 17 pedicle and 28 brachial valves.

Dimensions (in mm):

No	13/2	19/3	13/1	19/2	19/1
length	3.00	2.64	2.64	2.52	1.62
width	2.16	2.52	2.04	2.16	1.92

Description. — Shells small, oviform in outline, longitudinally oval, with maximum width near anterior margin. Fine but clearly marked, concentric growth lines are visible on the surface of shells. Beak of pedicle valve large, massive. A distinct thickening of shell, forming a flat attachment scar, occurs in the apical part of beak.

Pedicle valve oviform-elongate in outline, strongly thickened and more convex than the brachial one (Pl. III, Fig. 9). Beak long, massive, straight. Area triangular, pseudodeltidium slightly marked, covered with horizontal growth lines.

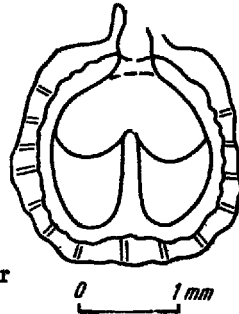


Fig. 3

Agerinella lyrata Pajaud & Patruilius, interior of the brachial valve

Two massive hinge teeth are situated on a short cardinal margin. Hemispondylium tiny but distinct. Septum low, reaching halfway the length of valve.

Brachial valve round or transversely oval, flatter than the pedicle one (Fig. 3). The largest convexity occurs in the vicinity of cardinal margin. Cardinal

process long, straight, projecting outside the outline of valve and forming a flat trough provided on its sides with slatlike thickenings. Dental sockets deep. Pustulate border narrow and limited inside the valve by a distinct subperipheral rim, which in the posterior part of valve forms transversarium over a deep visceral cavity. In most specimens examined, transversarium is destroyed. In the anterior part of valve, the subperipheral rim slightly extends and forms a conspicuously raised median ramus reaching more or less halfway the length of valve. Descendent brachial apparatus composed of two more or less preserved thin calcareous plates, supported by sharp crescentiform appendices (Pl. III, Figs 2 and 6).

Remarks. — The specimens are in conformity with those described by Pajaud & Patručius (1964) from the Oxfordian of Visterna but display certain differences in shape of shells. The specimens from Bałtów are more elongate and have smaller attachment scars than the specimens from Visterna, but this is probably the result of different ecological conditions. The specimens from Bałtów lived among corals to which they attached, and consequently were compelled to limit the attachment area of shells.

Subfamily Moorellininae Pajaud, 1966

Genus *Moorellina* Elliott, 1953

Type species: Thecidea duplicata Moore, 1885.

Occurrence: Jurassic.

Moorellina septata (Moore, 1854)

(Fig. 4; Pl. IV, Figs 1—9)

1886. *Thecidium septatum* Moore; T. Davidson, p. 109; Pl. 12, Figs 22—24.

1915. *Th. (D.) septata* C. Moore; L. Rollier, p. 53.

1953. *Moorellina septata* (Moore); G. Elliott, p. 694.

1966. „*Thecidea*” *septata* Moore; D. Pajaud, p. 635, Fig. 6a.

1966. *Moorellina septata* aff. *dundrensis*; D. Pajaud, p. 636.

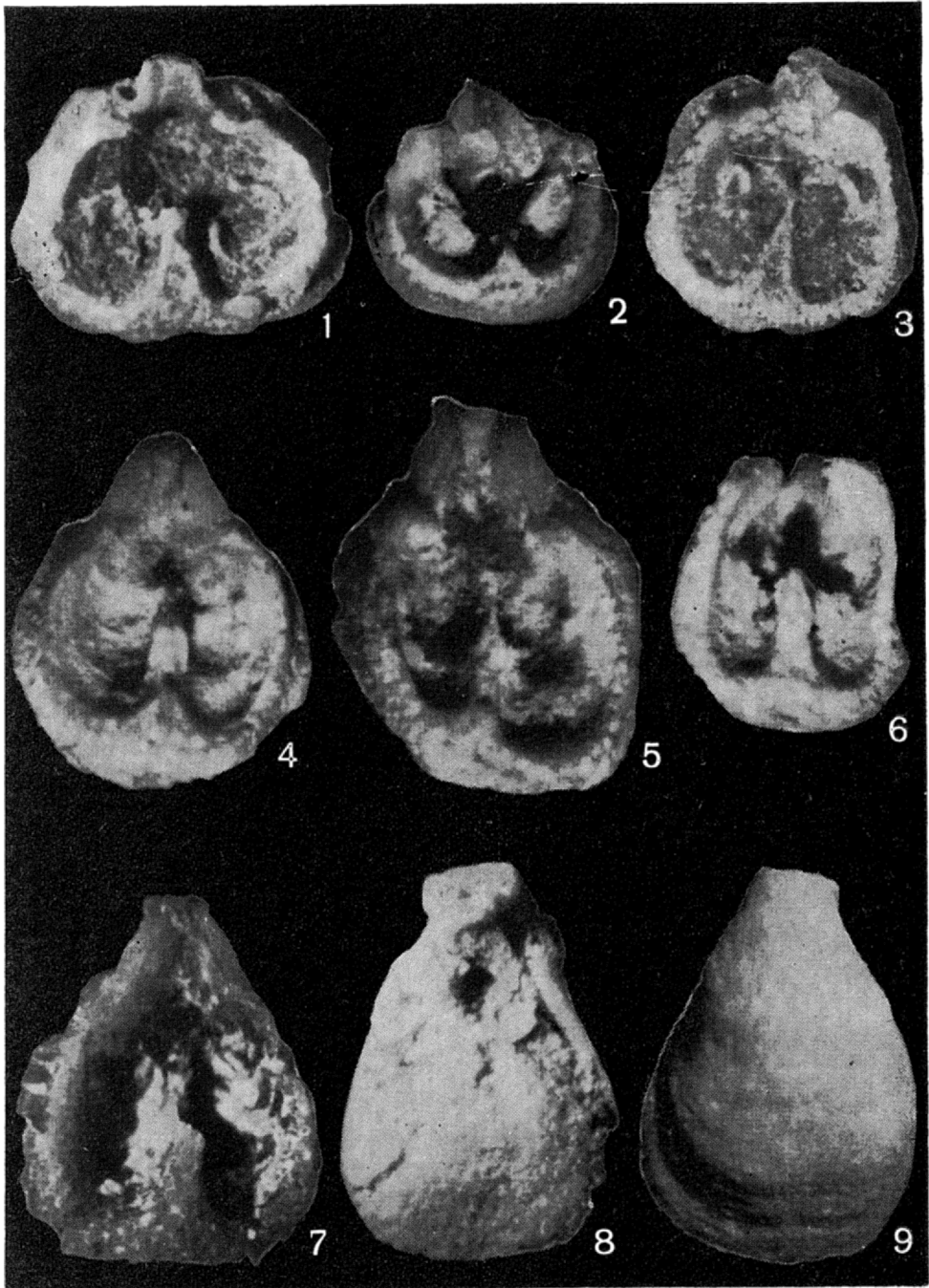
Material. — Thirty-nine specimens, including two complete shells. 12 pedicle and 25 brachial valves.

Dimensions (in mm):

No	18/3	45/2
length	2.52	2.28
width	2.04	2.22

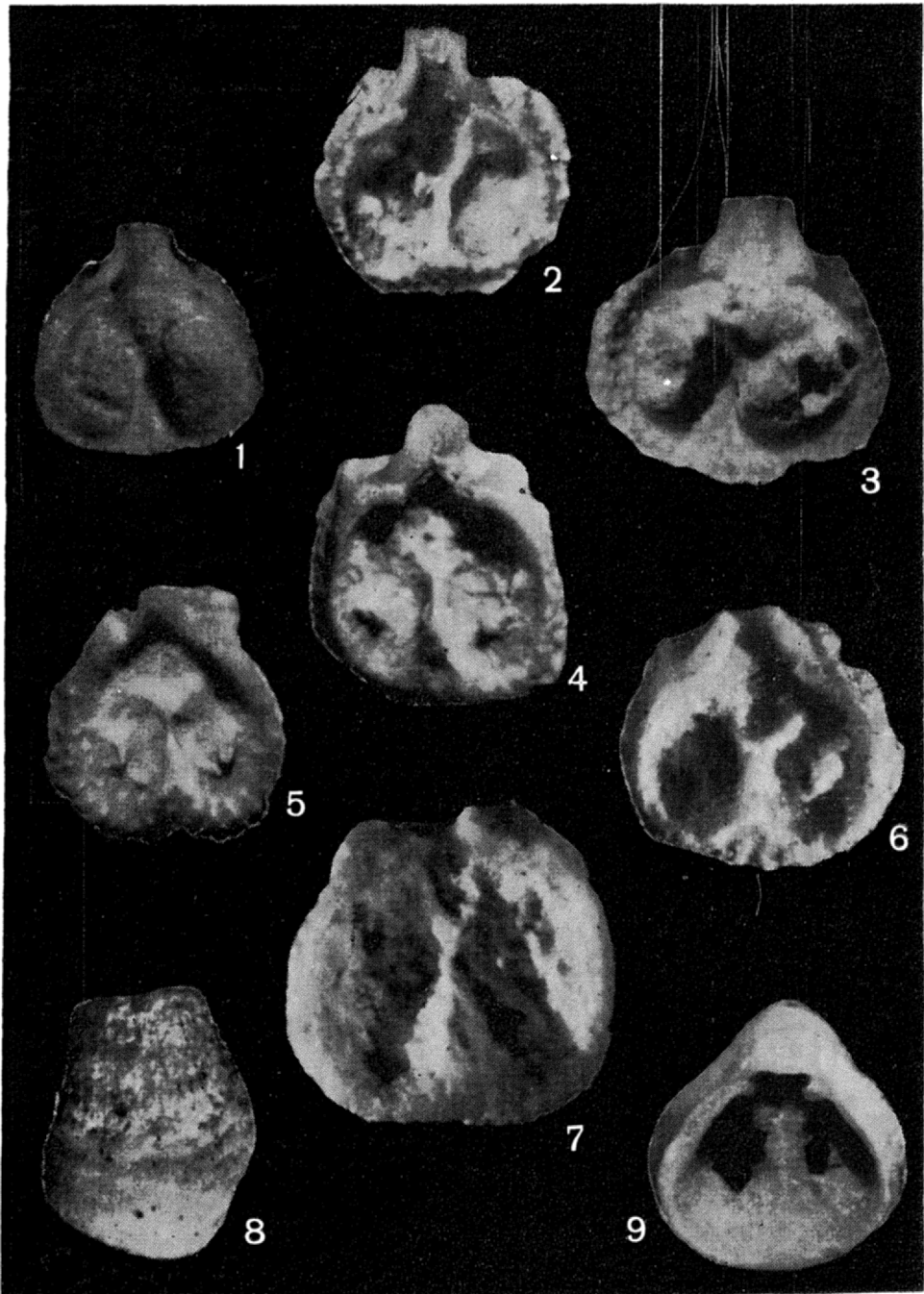
Description. — Shells small, oval in outline, slightly extended lengthwise. The largest width of shell near anterior margin. Beak of pedicle valve short, straight. Attachment scar very large, occupying the entire area of beak and part of pedicle valve. Surface of brachial valve smooth, while that of pedicle valve covered with a distinct radial ornament which disappears in the region of anterior margin.

Pedicle valve triangular-oval in outline (Pl. IV, Fig. 9). The largest width occurs in the vicinity of the anterior margin. Beak short, straight. Pedicle valve strongly thickened and deeper than brachial one. Area small, flat. Pseudodeltidium high, narrow, triangular. Hinge teeth massive, straight. Hemispondylium tiny. Septum low, very short, only in the posterior part of valve. distinct. A deep,



Agerinella lyrata Pajaud & Patruilius, Middle Oxfordian, Bałtów, $\times 20$

1-7 interior of the brachial valve; 8 outer view of the shell, brachial-valve side; 9 outer view of the shell, pedicle-valve side



Moorellina septata (Moore), Middle Oxfordian, Bałtów, $\times 20$

1-7 interior of the brachial valve; 8 interior of the pedicle valve; 9 outer view of the pedicle valve

rectangular notch, corresponding to cardinal process of brachial valve, occurs between hinge teeth. Anterior margin of valve slightly pustulate.

Brachial valve roundish-quadrangular (Fig. 4), almost completely flat with a small convexity in the vicinity of cardinal margin. Maximum width occurs halfway the length of valve. Cardinal process large, rectangular, projecting outside the margin of valve, forming a flat trough vertical to cardinal margin. On the margin of valve, a strongly pustulate (Pl. IV, Fig. 5), slightly raised subperipheral

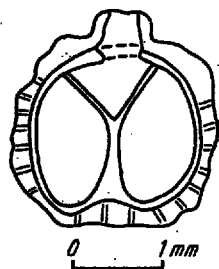


Fig. 4

Moorellina septata (Moore), interior of the brachial valve

rim is developed. In the posterior part of valve, the rim continues into a smooth slatlike transversarium, which in all the specimens under study is damaged. In the anterior part of valve, the subperipheral rim transforms into a sharp and thin median ramus, reaching halfway the length of valve. Two slatlike elevations detach themselves at the end of the ramus and resemble divergent septa which join the base of transversarium. Thus, three depressions are formed inside the valve. The first of them, small, deep, nonpaired, situated below transversarium in the posterior part of valve, forms a visceral cavity. The remaining two, situated on both sides of median ramus, make up lophophore grooves. In these grooves, small club elevations, forming brachial ridges (Pl. IV, Figs 1, 4 and 6), are visible on the valve floor.

Remarks. — The specimens under study completely correspond to *Thecidea septata* Moore, described and figured by Davidson (1886). Recently, certain doubts have been expressed by Pajaud (1966b) concerning the purposefulness of maintaining the species *Thecidea septata* Moore and *Moorellina dundrensis* (Rollier), since the specimens of both species, displayed such a high degree of similarity that one could suppose that *Thecidea septata* Moore was a juvenile form of *Moorellina dundrensis* (Rollier). This was the reason why this author suggested a tentative introduction of either a combined name *Moorellina septata* aff. *dundrensis*, or „*Thecidea*” *septata* Moore. Not having at his disposal any new arguments in this discussion, the present writer abides by a taxonomy used by Elliott (1953).

ECOLOGY

The Recent thecideans live mostly in the near-shore zones of warm and rather calm seas which are marked by a flat shore and an extensive shallow-water zone. The depths at which they live range within limits of 5 and 500 m. The thecideans which inhabit the Mediterranean Sea and part of the Atlantic Ocean included in the warm Gulf Stream, e.g., *Lacazella mediterranea* Risso, occur as a rule at larger depths (50—500 m)

than those in the area of the Pacific Ocean (100—300 m) or near coral atolls, e.g., *Thecidea barretti* Davidson, which are met with at depths ranging between 10—15 and 75—150 m (Backhaus 1959).

The thecideans occurring in the Middle Oxfordian deposits of Bałtów, lived under shallow-sea conditions. On the basis of the associate brachiopod fauna (cf. Barczyk 1968, 1969), such as, *Craniscus antiquior* (Jelly), *C. bipartitus* (Münster), *C. corallinus* (Quenstedt), *Ismenia pectunculoides* (Schlotheim), *I. recta* (Quenstedt), *Cheirothyris fleuriauxa* (d'Orbigny), *Dictyothyropsis loricata* (Schlotheim), as well as corals (cf. Roniewicz 1966), bryozoans, ophiuroids, echinoids and sponges, one may presume that the environment of the Jurassic sea under study was 5 to 10 m deep and its bottom was overgrown with bushy colonies of corals to which the thecideans were attached. A variable and rich associate fauna lived between corals on a muddy bottom.

The brachiopod fauna has been found at Bałtów in very similar deposits as the Oxfordian fauna from Visterna, Central Dobruja (cf. Pajaud & Patruilus 1964). In the two regions, these are complexes of lumpy, oolite-coral limestones, which in fact contain analogous faunal assemblages.

Similar environmental conditions also predominated in the English Jurassic (Bajocian) where the thecideans, in particular those of the genus *Moorellina*, occur in oolite-coral calcareous deposits of the Inferior Oolite. Comparing these two complexes of different ages from the English Inferior Oolite and from Bałtów, we may find — as it has previously been mentioned (Barczyk 1969) — a conspicuous eastward migration, during the stratigraphic time, of the oolite-coral facies, along with an entire assemblage of associate fauna, from the areas of Western Europe.

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W. BARCZYK

O KILKU PRZEDSTAWICIELACH RODZINY THECIDEIDAE (BRACHIOPODA) Z GÓRNEJ JURY W POLSCE

(Streszczenie)

W oksfordzkich wapieniach koralowych w Bałtowie (północno-wschodnie obrzeżenie mezozoiczne Gór Świętokrzyskich) występują stosunkowo liczne okazy rzadkich brachiopodów należących do rodziny Thecideidae Gray. Względnie dobry stan zachowania pozwolił na przeprowadzenie badań morfologii zewnętrznej i wewnętrznej tych brachiopodów, które są reprezentowane przez cztery gatunki: *Praeiacazella ulmensis* (Quenstedt), *Praeiacazella baltoviensis* sp. n., *Agertnella lyrata* Pajaud & Patruilius oraz *Moorellina septata* (Moore). Opisane gatunki, podobnie jak cały zespół faunistyczny występujący w rozpatrywanych osadach, wskazują na panowanie w ówczesnym zbiorniku warunków bardzo płytkomorskich (por. Roniewicz 1966; Barczyk 1968, 1969).

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