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Iberina praelusitanica n. sp. from the Upper Oxfordian of Israel

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With 2 figures in the text and 2 plates (I and II)

As a consultant to the combined research projects carried out by the Israel National Oil Company Ltd., Lapidoth Israel Oil Prospectors Corporation Ltd., Naphta Israel Petroleum Corporation Ltd., and the Ministry of Development-Geological Survey of Israel, the author was requested early in 1961 to embark upon a detailed micropaleontological and stratigraphic analysis of the Jurassic of Israel.

The first phase of this long-range research project has come to an end by now, and hence it is held to be of advantage to give an account of a new and stratigraphically important form before the publication of a more comprehensive report which will deal with the micropaleontology[2]) and biostratigraphy of the Jurassic of Israel and adjacent areas. The present note gives a description and illustrations of the new species *Iberina praelusitanica* n.sp. (published with the kind permission of the above-mentioned Oil Companies).

Some stratigraphic remarks

According to published sources, there exists no depositional break between the Upper Jurassic and the Lower Cretaceous in the Coastal Plain area (GRADER & REISS, 1958; GRADER, REISS & KLUG, 1960; GRADER, 1960). Here, the Jurassic limestone complex held to be of Kimmeridgian age is succeeded by a sequence of black calcareous shales with rare sandy interbeds. This shale section, designated as Unit L Cr I (see GRADER & REISS, 1958) and attaining a thickness of 280 m in the Heletz area, was assigned to the Tithonian-Berriasian, mainly on account of some deficiently preserved ammonites held to represent Upper Jurassic-Lower Cretaceous forms (PARNES, 1958, see GRADER & REISS, 1958; RAAB, 1962). Moreover, the microfaunas of said unit carry many banal Foraminifera of a great vertical distribution as well as others of which the stratigraphic range was not known previously, and the Ostracoda, which proved to be of great importance, had not been studied.

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[1]) Geological Consulting Service, 19 Laupenstrasse, Bern, Switzerland.

[2]) All the research work on the Ostracodes was carried out by Dr. H. J. OERTLI, S.N.P.A., PAU (B.-P.), France.

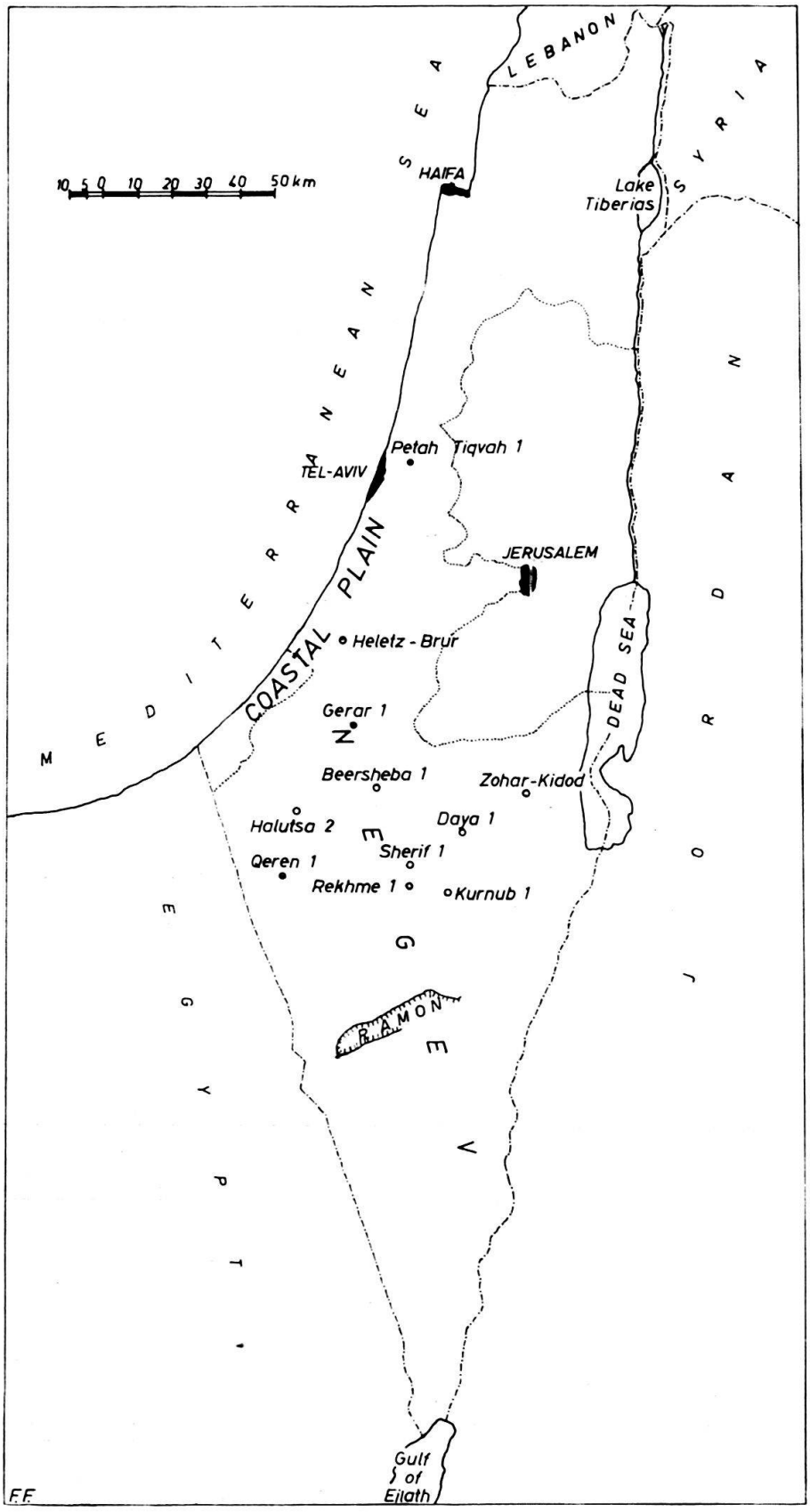


Fig. 1. Israel – Reference map.

This L Cr I unit is succeeded by an alternation of black calcareous shales and shaly detrital limestones (Unit L Cr II a) of Valanginian-Lower Hauterivian age (Ammonites, Ostracoda, Foraminifera).

Coastal Plain area (GRADER & REISS, 1958)

Hauterivian	L Cr II b
Valanginian	L Cr II a
Berriasian to Tithonian	L Cr I
Kimmeridgian (partly Bathonian)	Limestone complex

The microfaunal analysis of all the important wells drilled into or through the Jurassic and of the outcrop section exposed in the Kurnub structure has shown that the Unit L Cr 1 is Oxfordian to Callovian in age and that late Jurassic (post-Oxfordian) beds are absent in Israel, unless future research in northern Israel (Galilee) should still disclose their local presence there[3]).

The top part of the limestone complex underlying the L Cr I shale section, hitherto largely referred to as Kimmeridgian, could be reliably dated as Upper Bathonian, an age assignment which had already been proved locally in the Coastal Plain area by the brilliant work carried out previously by Dr. REISS (presence of *Meyendorffina* and *Kilianina*) (GRADER, REISS & KLUG, 1960).

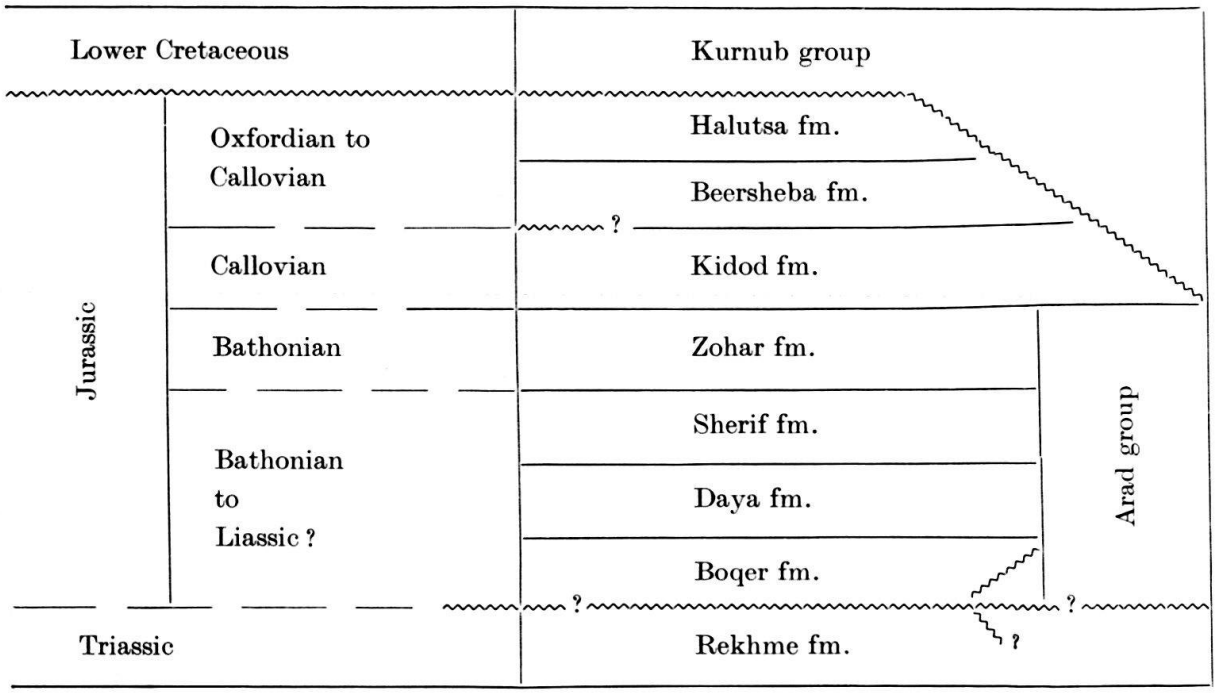
To sum up, the concept of a continuous sedimentation from the Upper Jurassic into the Lower Cretaceous cannot be maintained as the microfaunas give clear evidence of a considerable gap comprising the Kimmeridgian-Tithonian (pre-Lower Cretaceous folding and truncation); the Neocomian-Aptian beds disconformably overlap strata of Upper Oxfordian to Callovian age, respectively. This disconformity was also pointed out by I. Z. ELIEZRI (Geological Department of the Israel National Oil Co. Ltd.) on lithologic and electric log evidence.

The stratigraphic terminology of the subsurface Jurassic of the Interior (Negev, Western Dead Sea Region) as adopted by the Oil Companies in Israel during the progress of our studies is summarized below (COATES *et al.*, 1963). A subdivision into zones (in the sense of OPPEL) was subsequently suggested on the basis of the final microfaunal data at hand (see table on p. 563).

The youngest strata of the truncated Jurassic which are preserved in the Negev beneath the Lower Cretaceous transgression plane are designated as Halutsa formation. Instead of the local formation names applied to certain lithological units, such as Halutsa formation, Beersheba formation, etc., we have introduced micro-biostratigraphic zones which do not depend on lithofacies and may hence be used

[3]) True enough, the exact age of the top part of the L Cr I unit in the Coastal Plain area, characterized i.a. by *Trocholina alpina* (LEUPOLD), *Trocholina elongata* (LEUPOLD), is not definitely established yet. It may be pointed out that the stratigraphic sequence below the Lower Cretaceous is more complete in the adjacent southern Lebanon where the Oxfordian is succeeded by beds bearing a Kimmeridgian microfauna with *Iberina lusitanica* (EGGER), *Torinosuella*, *Ostracoda*, etc. (private collection of the author).

Negev-Western Dead Sea Region (COATES *et al.*, 1963)



in both the Coastal Plain area and the Interior. The uppermost unit of the Jurassic below the Lower Cretaceous overlap is the *Pseudocyclammina jaccardi* zone of Upper Oxfordian age (with *Cytherella index* OERTLI, etc.) which in the Negev comprises the Halutsa formation and the upper portion of the Beersheba formation. The upper half of the *Pseudocyclammina jaccardi* zone has been referred to as *Iberina praelusitanica* subzone, on account of this explicit marker of which a description is given on the following pages (see table on p. 563).

Systematic description

Family Lituolidae

Subfamily *Spirocyclininae*

Genus *Iberina*[4]) MUNIER-CHALMAS, 1902 emend. MAYNC, 1959

Iberina praelusitanica n.sp.

(Pl. I, fig. 1–21; Pl. II, fig. 1–13)

Derivatio nominis: The specific name of the new species was chosen on account of the fact that it occurs at a stratigraphically lower level than the only hitherto described species *Iberina lusitanica* (EGGER) which ranges from the Lower Kimmeridgian into the basal Valanginian (MAYNC, 1959).

[4]) It was recently pointed out that *Iberina* MUNIER-CHALMAS, 1902, is a junior homonym of *Iberina* SIMON, 1881, on which account it should be replaced by *Anchispirocyclina* JORDAN & APPLIN, 1952 (LOEBLICH *et al.*, 1964).

Supposed stage equivalents	Lithogenetic units	Microbiostratigraphic units		
		Zones	Subzones	Zonules
Lower Cretaceous				
Upper Oxfordian	Halutsa	Pseudocyclammina jaccardi zone	Iberina praelusitanica subz.	
	Beersheba			
Lower Oxford ia n Callovian	Kidod	«Agathammina ?» zone (Epibole Brotzenia gr parastelligera)	Oligocythereis ? decemsexta subzone	
Upper Bathonian			Meyendorffina bathonica subzone	Acanthocythere n.sp. zonule
Middle to Lower Bathonian	Zohar	Procytheridea ? sp. 4 zone	Cytherella certissima subzone	Praeschuleridea aff. sp. 1, form 0 subzone
	Sherif			Virgulacytheridea sherifensis zonule
				Praeschuleridea aff. sp. 1, form q zonule
Bajocian	Daya	Procytheridea ? sp. YZ zone	Procytheridea ? aff. crassa subzone	
Aalenian	Boqer	Procytheridea ? aff. magnycourtensis zone		
Liassic — Domerian	?	Orbitopsella praecursor zone		
Triassic	Rekhme			

Holotype: Pl. 1, fig. 1–3.
Paratypoids: Pl. 1, fig. 4–21.
Locus typicus: Well Halutsa 2 (Naphta Israel Petroleum Corp. Ltd.).
Stratum typicum: Pseudocyclammina jaccardi zone (Upper Oxfordian); *Iberina praelusitanica* subzone (1626–1635 m well depth).
Diagnosis: A closely coiled, nautiloid-lenticular or externally *Pseudocyclammina*-like representative of the genus *Iberina* which shows considerably less chambers in the last whorl than *Iberina lusitanica* (EGGER).
Depository: The specimens of *Iberina praelusitanica* n.sp. figured in the present note are deposited in the collection of the Geological Survey of Israel, Paleontology Division, Jerusalem (Israel).

Description

A) External morphology

Test free, involute, nautiloid coiled; planispiral, evenly contoured, occasionally somewhat deformed; microgranular with some arenaceous matter, externally smoothly finished; the larger forms usually a flattened spire with an umbilical depression, the smaller tests lenticular-biconvex with a raised umbilical region (relatively large axial diameter) and a sudden thinning toward the peripheral margin (subacute periphery); the last few chambers as a rule more strongly curved and overlapping the early ones of the same whorl; 11 to 18 arcuate chambers in the last coil with strongly recurved septal sutures distinctly visible; apertural face covered with numerous openings (cribrate aperture).

In the larger-sized microspheric tests, the maximum spiral diameter (b) ranges between 0.9 and 2.4 mm, with an axial diameter varying between 0.22 and 0.67 mm; the lenticular tests disclose an equatorial diameter (b) ranging from 0.45 to 1.8 mm, whereas the thickness (c) amounts from 0.3 to 0.82 mm. In the larger tests, the ratio ⌀ (b:c) varies between 3:1 and 5:1, which means that the spiral diameter (b) is 3 to 5 times as large as the axial diameter (c); in the smaller megalo-

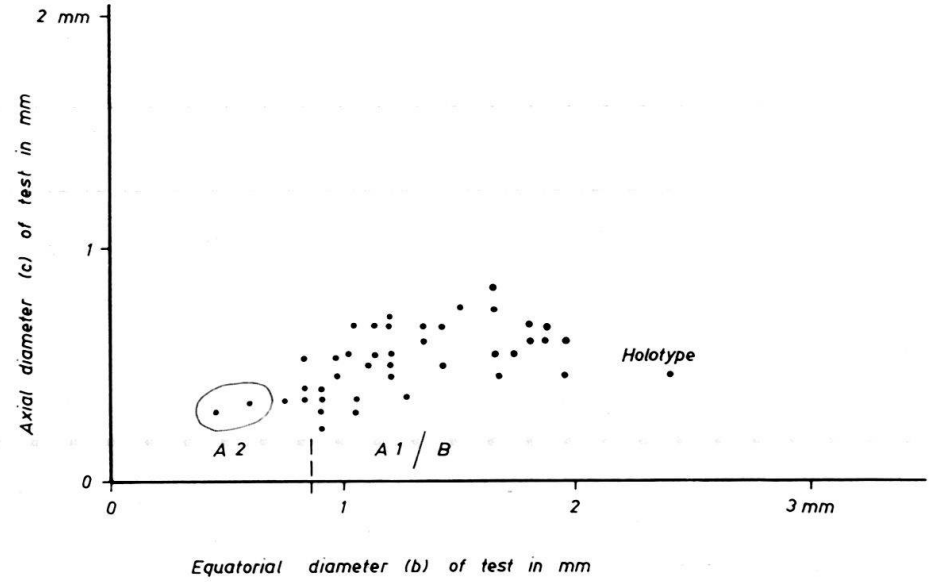


Fig. 2. Diagram of variability of *Iberina praelusitanica* n.sp.

spheric tests, the ratio ⌀ (b:c) ranges between 1.5:1 to 2.6:1. In other words, these tests are much thicker than the larger microspheric ones, which is particularly striking in the inflated tests representing the megalospheric (A2) generation.

No discoid-cyclical or reniform microspheric tests were observed in *Iberina praelusitanica* n.sp. such as are characteristic of the species *I. lusitanica*, but also the B generation of the new form maintains a spiral stage. Besides, the microspheric tests of *Iberina praelusitanica* are much smaller in size (1.8 to 2.4 mm) than those of *I. lusitanica*, the spiral diameter of which varies between 4 and 15 mm and may even attain 20 mm (MAYNC, 1959).

With regard to their external features, *Iberina lusitanica* (EGGER) and *Iberina praelusitanica* n.sp. may, therefore, readily be distinguished.

Iberina lusitanica	*Iberina praelusitanica*
Form B: Cyclical-reniform, strongly compressed large test	Form B: *Pseudocyclammina*-like test, spirally coiled
Form A1: More or less compressed, spirally coiled	Form A1: lenticular, spirally coiled
Form A2: Lenticular, more or less globular	Form A2: Lenticular, more or less globular
20 or more chambers in the last-formed whorl	Less than 18 chambers in the last-formed whorl

B) Interior structure

An account of the complex interior structure of the genus *Iberina* was given in a previous paper (MAYNC, 1959) which the reader may refer to.

The thin-sections figured in the present note (Pl. 2) display the characteristic structure of *Iberina*, viz.

(1) the alveolar subepidermal layer formed by parallel and transverse partitions;
(2) the narrow zone with open chambers; and
(3) the subcentral and central zones where the chambers are intergrown by interseptal lamelliform buttresses.

It may be remembered that it is this internal zone (3) which allows a distinction between the externally similar genera *Iberina* and *Pseudocyclammina*.

Trimorphism

The morphologically different tests of *Iberina praelusitanica* n.sp. give evidence of trimorphism, which we had also observed in *Iberina lusitanica* (MAYNC, 1959).

The large tests with a minute proloculus which, however, in none of the sectioned forms is visible and hence measurable, represent the B generation (Pl. 2, fig. 4–7), and the smaller tests with a larger proloculus (Pl. 2, fig. 11) the A 1 generation. The small, almost globular tests which disclose a still more voluminous proloculus belong to the A 2 form (Pl. 2, fig. 3).

Occurrence

As far as is hitherto known, the new species *Iberina praelusitanica* n.sp. occurs only in the *Pseudocyclammina jaccardi* zone (Upper Oxfordian) of Israel and the Lebanon. From the Kimmeridgian upwards, the species is replaced by *Iberina lusitanica* (EGGER). The new form is represented in Israel in the wells Beersheba 1, Gerar 1, Halutsa 2, Petah Tiqvah 1, and Qeren 1.

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Plate 1

Iberina praelusitanica n.sp.

Morphology

Fig. 1–3. Holotype (B generation). 20×. Fig. 1–2 Side views. Fig. 3. Apertural view.

Fig. 4–21. Paratypoids. 20×. Variation of external morphology. Fig. 6–8, 12–13 and 19: A 1 generation.


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Plate II

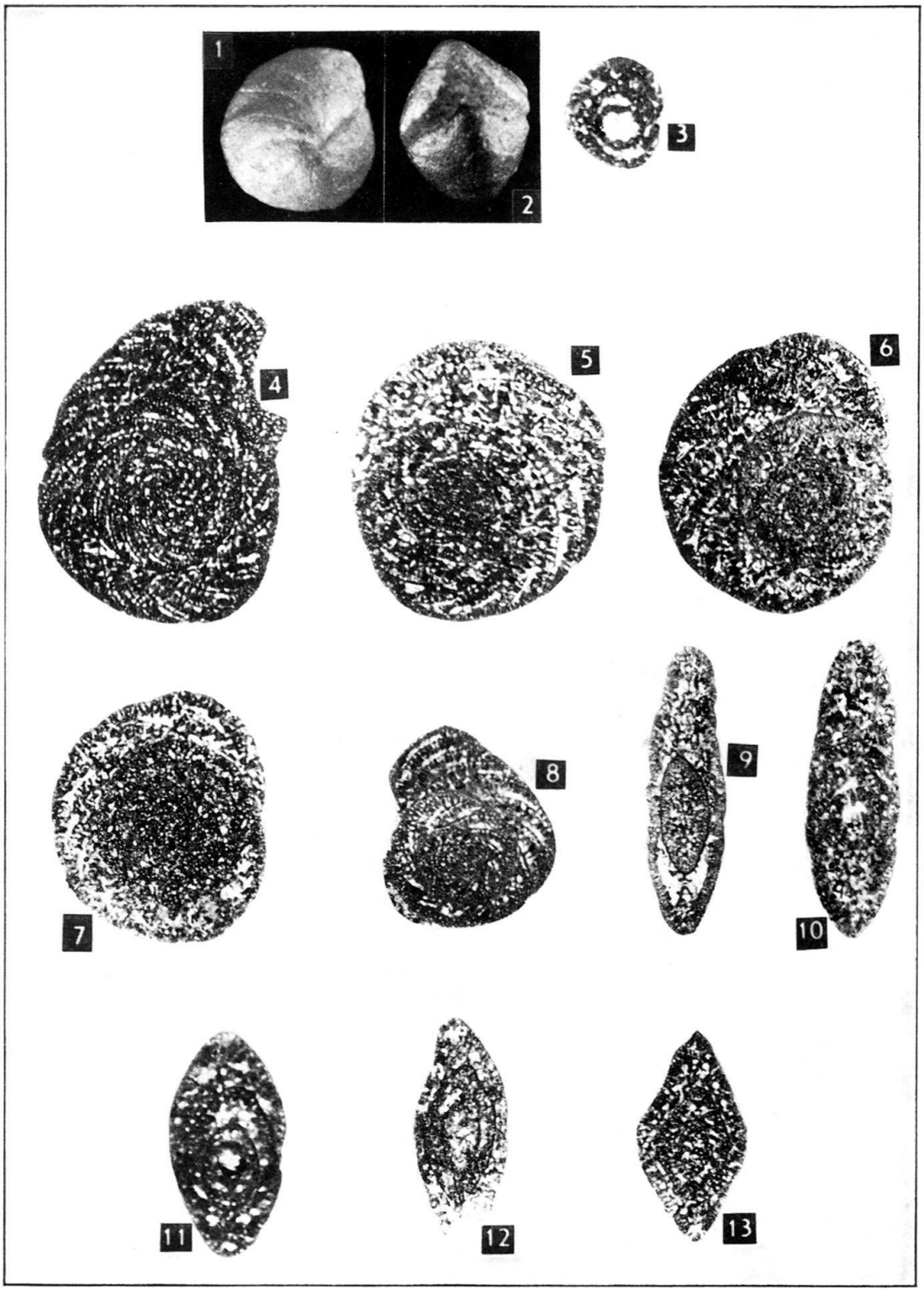
Iberina praelusitanica n.sp.

Morphology and interior structure

Fig. 1–2. A 2 generation. 29×.

Fig. 3. A 2 generation. 40×.

Fig. 4–13. Interior structure showing the different zones (1) to (3). Fig. 4–8: Median and subequatorial sections. Fig. 9–13: Axial and subaxial sections. Fig. 4–10 and 12–13 20×. Fig. 11 (A 1 generation): 40×.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