DESCRIPTION OF NEW *BORELIS* SPECIES FROM THE HATAY (S OF TURKEY) AND ELAZIĞ REGION (E OF TURKEY)

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ABSTRACT. — Two new species of Foraminiferida; *Borelis arpati* n. sp. and *Borelis merifi* n. sp. are described; the former occurring in the Middle-Upper Miocene of the Babatorun region (SE of Hatay) and the latter occurring in the Lower-Middle Oligocene of the Sanbuğday village (E of Elazığ).

INTRODUCTION

A project on the Tertiary biostratigraphy of the southern and southeastern Anatolia has been carrying out by the present authors since 1977 in the region of Muş (E of Turkey), Elazığ (E of Turkey), Kahramanmaraş (SE of Turkey) and Hatay (S of Turkey). The description of two new *Borelis* species and biostratigraphy of the Hatay and Elazığ regions (Fig. 1) was investigated as a part of this 'project. The biostratigraphy of these regions can only be demonstrated on a generalized stratigraphic column representing the whole regions (Fig. 2 A,B).

The holotypes and paratypes are deposited in the personal collection of the authors.

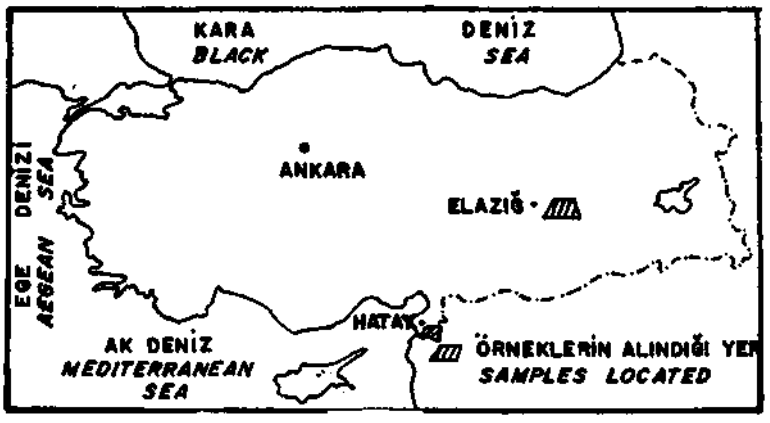

Fig. 1 - Location map.

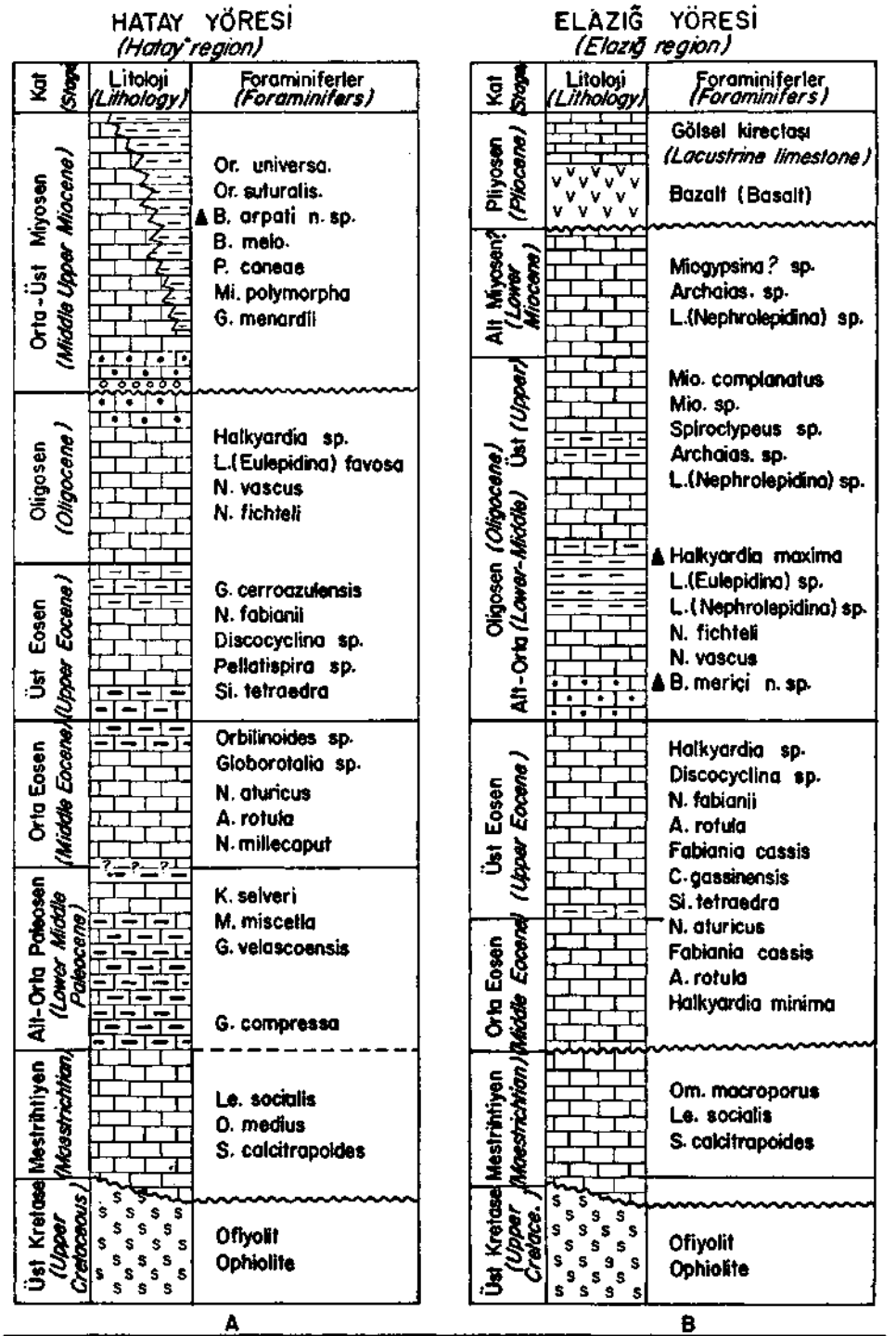

Fig. 2 - Generalized columnar section of Hatay and Elâzığ regions.

SYSTEMATIC STUDY

Family: ALVEOLINIDAE EHRENBERG, 1839

Genus: Borelis de MONTFORT, 1808

Borelis arpati n. sp.
(PL I, fig. 1-8)

Derivation of name: This name is dedicated to geologist Esen Arpat who has made valuable works on the geology of Turkey.

Holotype: It is an axial section from the free specimen, collection no (Hat-1); illustrated by (PL I, fig. 1).

Material: Examined material consist 5 free specimens in the sandy marl from the type locality, about 15 measurable specimens in random thin section of sandy limestone from the Ayışığı village (S of Hatay).

Type locality: Büyüktepe, in Babatorun town (SE of Hatay).

Type level: Middle-Upper Miocene (Langhian-Tortonian).

Diagnosis: Small, elongated nautiloid in shape, index of elongation 0.52-0.67, the width of the proloculus 50-62 m; spherical proloculus followed by 2-3 streptospirally coiled whorls with 8-11 undivided nepionic chambers and adult chambers in regular whorls; Y-shaped septula very rare.

Description: Test is small and elongated nautiloid in shape. The axial diameter varies between 0.35 and 0.55 mm, the equatorial diameter reaches 1.15 mm. The index of elongation 0.52-0.67, but the mean values are around 0.6. There are 30 chambers within the 6 whorls in an equatorial diameter of 0.91 mm (PL I, fig. 2).

Undifferentiated nepionts have a very small spherical proloculus followed by streptospirally coiled 2-3 whorls with 8-11 undivided chambers. The diameter of proloculus ranges from 50 to 62 m.

Very thin growth spiral of the test is subdivided by thin septa into more broad chambers. There are 6 chambers within the last whorls of paratype (PL I, fig. 2). The preseptal passage are occupying 1/5 of the chamber. The mtercanieral foramina are well developed.

The adult chambers are subdivided by the parallel thin septula into parallel chamberlets; the septula are arranged in an alignment pattern from one chamber to the next (PL I, fig. 8) and showing rarely Y-shaped structure. The cross-section of the chamberlets are generally teeth-like and rarely subrectangular in shape; but around the polar region they become circular; their width increase from the polar region to the equatorial part. The basal layer is very thin and its thickness is always smaller than the height of the chamberlets.

Comparisons and remarks: *Borelis arpati* n. sp. differs from *Borelis curdica* (Reichel, 1936-1937) by the absence of well developed Y-shaped septula, elongated nautiloid instead of spherical and slightly nautiloid in shape and by having fewer chambers in the whorls.

New species differs from *Borelis melo* (FichteFand Moll, 1803) in being more nautiloid (index of elongation: 0.52-0.67, instead of 0.9-1.1) and by having 4-6 chambers per whorl instead of 7 in the *B. melo*.

Associated Foraminifers: *Orbulina universa* d'Orbigny, *0. bilobata* (d'Orb.), *0. suturalis* Bronnimann, *Globoquadrina altispira* (Cushman and Jarvis), *Borelis melo, Planorbitlinel'a caneae* Frudenthal.

Borelis meriçi n. sp.
(PI. I, fig. 9-13)

Derivation of name: This name is dedicated to Assoc. Prof. Dr. Engin Meriç.

Holotype: It is an axial section from the free specimen, collection no: (El. 1); illustrated by (PI. I, fig. 10).

Material: Examined material consist 53 free specimens in the silty and sandy argilleous limestone from the type locality.

Type locality: Bağtepe, NE of Sarıbuğday village, NE Palu (E of Elazığ).

Type level: Lower-Middle Oligocene, *Nummiitites fichteli* range zone.

Diagnosis: Small, oval *Borelis* with thickened basal layer in the columellar region, axial length varies between 1.4 and 1.8 mm; equatorial diameter ranges from 0.7 to 0.84 mm; index of elongation varies 1.5-1.8, the diameter of proloculus 39-62 m, spherical proloculus followed by 1-2 streptospirally? coiled whorls with 10 small nepionic chambers and regular 8-9 whorls with divided adult chambers; Y-shaped septula absent.

Description: Test is small and oval in shape. The axial diameter ranging from 1.4 to 1.8 mm; the equatorial length varies between 0.7 and 0.84 mm. Index of elongation is 1.5-1.8, but the mean values are around 1.6. There are 10 nepionic chambers and 61 divided adult chambers within the 10 whorls in an equatorial diameter of 0.82 mm (PI. I, fig. 11).

The spherical juvenile stage has a small spherical proloculus followed by streptospirally? coiled whorls with 10 small spheric undivided chambers (in paratype; PI. I, fig. 11). The diameter of proloculus is 39-62 m.

Very thin growth spiral of the test is subdivided by thin septa into more chambers. There are 9-10 chambers within the last whorl of the paratype (PL I, fig. 11). The prescptal passage is almost occupying 1/4 of the chamber.

The adult chambers are subdivided by the parallel thin septula into parallel small chamberlets; the septula are arranged in an alignment pattern from one chamber to the next (PI. I, fig. 9) and not showing Y-shaped structure. The chamberlets are very small and arranged very closely; the cross-section of the chafnberlcts are generally subcircular and ovoid in shape. The basal layer of all whorls is very thin exceptionally in the columellar region; its thickness are smaller than the height of the chamberlets.

Comparisons and remarks: *Borelis meriçi* n. sp. is distinguished from *Borelis inflata* (Adams, 1965) by having columellar thickening, higher index of elongation (1.5-1.8 instead of 1-1.3)and by having coarser internal texture. The holotype of *B. meriçi* has 9-10 whorls in an axial section of 1.56 mm; whereas the holotype of *B. inflata* has 10-11 whorls in an axial section of 1.29 mm.

Borelis pygmaea (Hanzawa, 1930) differs from new species in being fusiform (index of elongation; 2.2-3.2 may be more); also *B. pygmaca has* a very coarser internal texture comparing to *B. meriçi.*

Borelis philippinensis Hanzawa (1949), is an inadequately described *Borelis,* differs from *B. meriçi* by external shape (index of elongation; 1.35-1.56 instead of 1.5-1.8) and by having delicate internal structure; it has 10 whorls in an axial section of 0.95 mm (Hanzawa, 1949, PI. IX, fig. 4) whereas *B. meriçi* has 9-10 whorls in an axial section of 1.56 mm (in holotype).

Borelis parvulus Hanzawa (1957), is an inadequately described *Borelis,* differs from *B. meriçi* by its delicate internal structure; the holotype of *B. parvulus* has 8 whorls in oblique random section of 0.64 mm; whereas *B. meriçi* has 9-10 whorls in an axial section of 1.56 mm (in holotype).

Associated Foraminifers: *Nummulites fichteli* Michelotti, *N. vascus* Joly and Leymerie, *Halkyardia maxima* Cimerman, *Lepidocyclina (Nephrolepidina)* sp., *L. (Eukpidma)* sp., *Austrotrillina* sp., and *Spiroclypeus* sp..

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REFERENCES

Adams,C.G., 1965, The Foraminifera and stratigraphy of the Melinau limestone, Sarawak and its importance in Tertiary correlation: The Quart. Jour, of the Geol. Soc. of London; 121, 283-338.

Fichtel, L. and Moll, J.P.C., 1803, Testacea microscopies aliaque minuta ex generibus Argonauta et Nautilus ad naturam delineata et descripta, Wien.

Hanzawa, S., 1930, Note on Foraminifera found in the Lepidocyclina Limestone from Pabeasan, Java: Tohoku Univ. Sci. Rep. (2), 14/1, 94-95.

———, 1949, *Borelis philippinensis* n.sp. from Luzon. P.I: Japanese Jour. Geol Geogr., Tokyo, 21, 1/4, 155-157.

———, 1957, Cenozoic Foraminifera of Micronesia: The Geol. Soc. of Amer., mem. 66, 1-163.

Reichel,M., 1936-1937, Etude sur les alveolines: Soc. Paleont., Suisse. mem., 17, 59, 1-146.

P L A T E

PLATE - I

Borelis arpati n. sp.

Fig. 1 - Axial section, holotype (Hat-1), x 76

Fig. 2 - Equatorial section, paratype (Hat-2), x 63

Fig. 3 - Axial section, paratype (Hat-3),X 70

Fig. 4 - Axial section, young specimen (Hat-4), x 59

Fig. 5 - Tangential section (Hat-5), x 39

Fig. 6 - Axial section, more elongated nautiloid form, paratype (Hat-6), x 64

Fig. 7 - Axial section (Hat-7), x 68

Fig. 8 - Tangential section (Hat-8), x 79

Specimens from: fig 1-3 Middle-Upper Miocene (Langhian-Tortonian) type locality.

Specimens from: fig 4-8 Middle-Upper Miocene (Langhian-Tortonian) Ayışığı village (S Hatay).

Borelis meriçi n. sp.

Fig. 9 - Tangential section, paratype (El-2), x 40

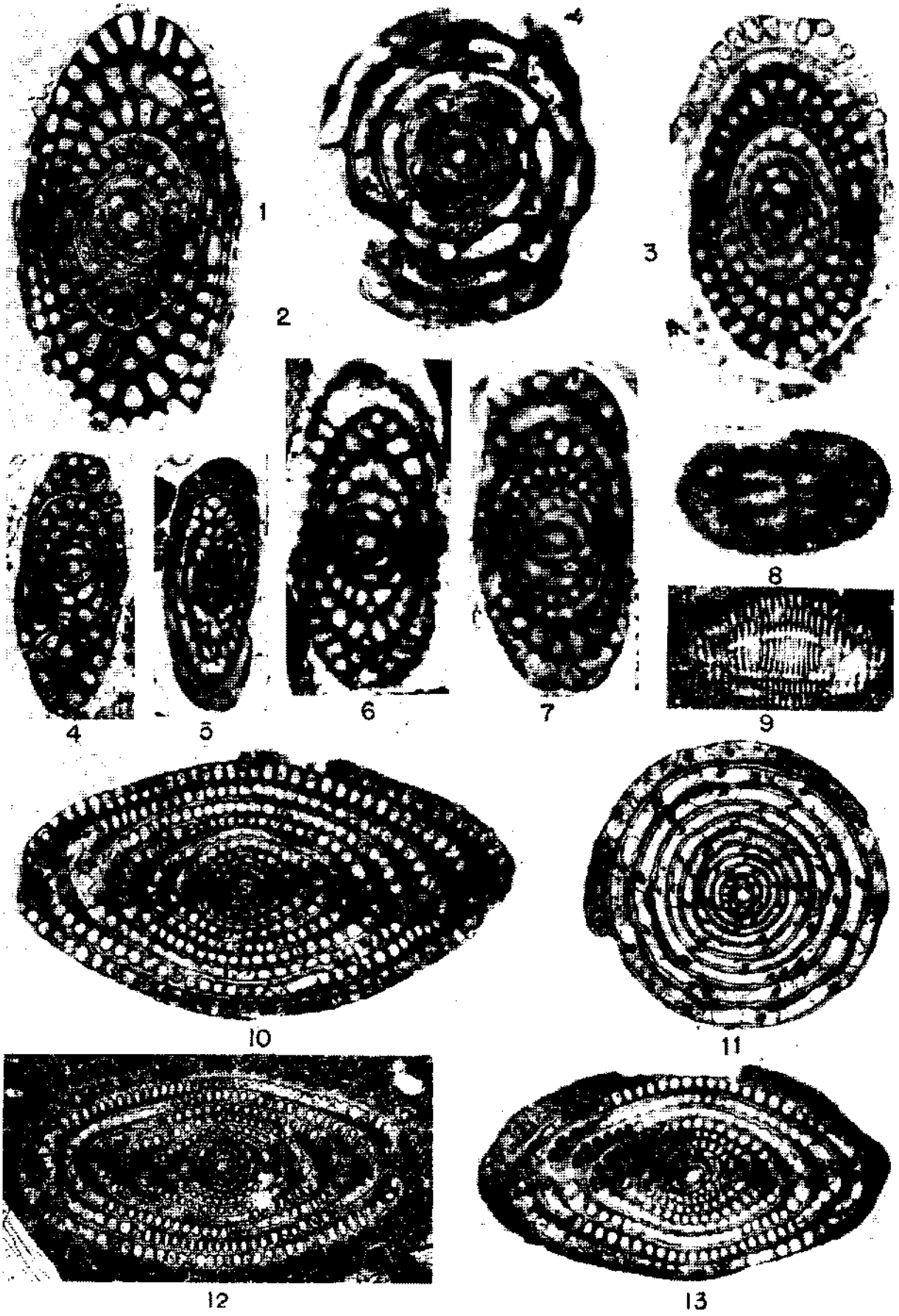
Fig. 10 - Axial section, holotype (El-1),x62

Fig. 11 - Equatorial section, paratype (El-3), X 66

Fig. 12 - Axial section, paratype (El-4), X 51

Fig. 13 - Axial section, paratype (El-5), x 56

All specimens from Lower-Middle Oligocene of the type locality.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