GEOL. CROAT.	46/1	1 - 7	2 Figs.	2 Tabs.	2 Pls.	ZAGREB 1993

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Scientific Paper - Note

Kastamonina abanica, n.gen., n.sp., a Complex Lituolid (Foraminiferida) from the Upper Jurassic Limestone of the Kastamonu Area (North Turkey)

Ercüment SIREL

Key words: Systematics, Foraminifera, *Hauraniidae*, Carbonate Platform Facies, Kimmeridgian-Portlandian, Kastamonu, Turkey

Abstract

Kastamonina abanica n.gen., n.sp., is a new complex conical lituolid foraminifer occurring in Upper Jurassic (Kimmeridgian-Portlandian) shallow marine deposits in the Kastamonu region of Northern Turkey. The new genus is characterized by the structural elements of its endoskeleton and exoskeleton which resemble those of *Hauraniidae*.

1. INTRODUCTION

Limestone samples with *Kastamonina abanica* n.gen.n.sp. were collected by the geologist E.Develciler from the lower part of the Akkaya Limestone in the type locality of the new genus East of Abana town, North of Kastamonu, Northern Turkey (Fig. 1). The Akkaya Limestone was named by GEDIK & KORKMAZ (1984). The limestone takes its name from the Akkaya hill. The importance of this limestone sequence lies not only in its widespread occurrence in Northern Turkey but in the fact that it provides a good faunal succession (mainly larger foraminifer) extending from the Upper Jurassic to the Barremian in what is virtually a single facies (shallow marine carbonate environment).

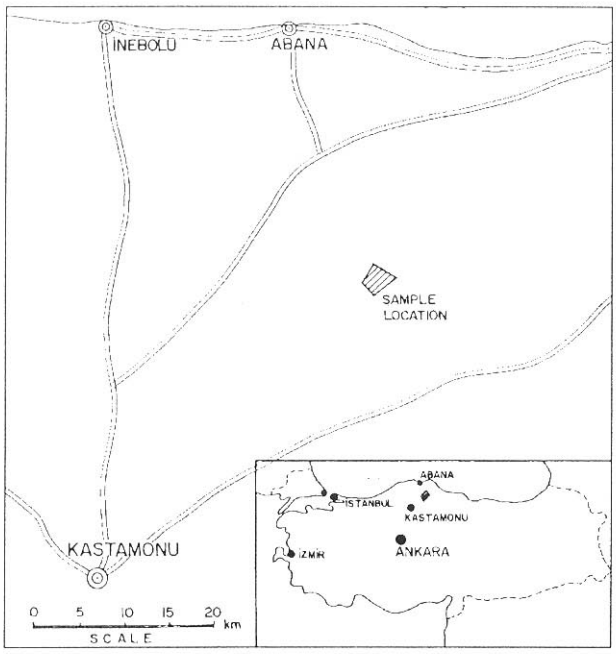

Fig. 1 - Location map.

The first paleontological studies on the Akkaya Limestone were carried out by CHARLES (1932, 1933) and MAYNC (1959) from the Upper Jurassic to the Basal Cretaceous in the Zonguldak area of Northern Turkey. The former author established a new subspecies under the name of *Spirocyclina choffati* MUNIER-CHALMAS *euxina* CHARLES in the Akkaya Limestone. In 1959, several specimens collected from various localities of Mediterranean were classified by MAYNC under the name of *Iberina lusitanica* (EGGER). Some samples obtained from the Zonguldak area contain a few specimens of *Iberina lusitanica*, which is shortly discussed by MAYNC (1959).

The examined limestone samples with the new genus yielded the following foraminiferal assemblage, indicating Kimmeridgian-Portlandian age: *Anchispirocyclina neumannae* BERNIER, FLEURY & RAMALHO, *Anchispirocyclina* sp., *Rectocyclammina chouberti* HOTTINGER, *Trocholina alpina* (LEUPOLD), *Conicospirillina basiliensis* MOHLER, *Conicospirillina* sp. (high conical form), *Pseudocyclammina* cf. *lituus* (YOKOYAMA), *Protopeneroplis* sp., *Mesoendothyra* ?.

Due to the hardness of the limestone samples, it was not possible to obtain isolated individuals for the preparation of perfectly oriented thin sections. Therefore, the following description of the new genus is based on randomly selected thin sections.

All the thin sections bearing this foraminiferal new genus discussed in this paper are deposited at the Museum d'Histoire Naturelle, Geneva, Switzerland.

2. SYSTEMATIC DESCRIPTION

Order: Foraminiferida
Superfamily: *Lituolacea* De BLAINVILLE 1827
Family: *Hauraniidae* SEPTFONTAINE 1988
Subfamily: *Amijiellinae* SEPTFONTAINE 1988
Genus: *Kastamonina* n.gen.
Type species: *Kastamonina abanica* n.sp.

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Genus *Kastamonina*, n.gen.

Derivation of name: Kastamonu, a city in the western Black Sea region of Northern Turkey.

Diagnosis: The shell with imperforate, agglutinated wall is elongated to high conical in its microspheric form and high conical with a tapered base in its megalospheric form (Pl. I/1-5, 7-12; Pl. II/8, 11). The large megalosphere is sometimes followed by a few chambers arranged in an arcuate series (Pl. I/1, 12). Later, during the late ontogeny, broad, low-domed and strongly overlapping adult chambers are uniserially arranged (Pl. I/1-5, 7-12; Pl. II/8). The marginal zone of each chamber is intricately subdivided by a so-called subepidermal network (or hypodermic network, SEPTFONTAINE, 1988) consisting of two generations of vertical partitions (beams) and horizontal partitions (rafters) (HOTTINGER, 1967). These two groups of subepidermal partitions (lames et lamelles, BASSOULLET et al., 1976) form numerous, irregular alveolar compartments in each chamber (Fig. 2; Pl. I/5, 7, 9; Pl. II/8, 9, 11). Irregularly distributed multiple openings (cribrate aperture) are present (Pl. I/1, 3, 11, 12: Pl. II/2, 4),but the pillars are absent at the central zone of the test. The microspheric embryos were not observed. The size and shape of the test suggest the existence of a microspheric generation (Pl. I/7, 9; Pl. II/8, 11).

Differential diagnosis: Because of the characteristics of the mode of coiling (chambers curved in the early growth stage become uniserial in the adult stage), the presence of the exoskeletal partitions (beams, rafters and alveolar compartments or hypodermic network according to SEPTFONTAINE, 1988) and cribrate aperture, this new genus has been considered to belong to the family *Hauraniidae* SEPTFONTAINE (1988). As it is without pillars in the central part of the chambers, it has been placed into the subfamily *Amijiellinae* SEPTFONTAINE (1988).

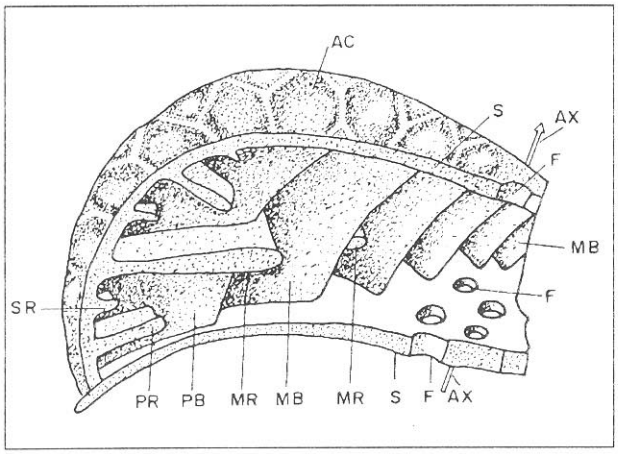

Fig. 2 - Structural model of the test of *Kastamonina abanica* n.gen. n.sp. without pillars in the central part of chamber: Main beam (MB), Primary beam (PB), Main rafter (MR), Primary rafter (PR), Secondary rafter (SR), Septum (S), Foramina (F), Alveolar compartments (AC) and Axis of test (Ax).

The lituolid foraminiferal genus *Haurania* HENSON (1948) and its two representatives were named *H. deserta* and *H. amiji* by HENSON (1948) from the Triassic or Jurassic of Iraq, and *H. deserta* was chosen as the type species of *Haurania*. Detailed studies on the *Haurania* were carried out by many authors: HOTTINGER (1967), BALOGE (1981), LOEBLICH & TAPPAN (1985) and SEPTFONTAINE (1988). In 1985 the hauranid species *H. amiji* without pillars was transfered to the new genus *Amijiella* by LOEBLICH & TAPPAN (1985) and *Haurania amiji* was accepted as the type species of *Amijiella* by the latter authors. *Kastamonina* and *Amijiella* are structurally similar in the presence of the marginal partitions (beams) and the cribrate aperture. This suggests that the new genus arose from *Amijiella*. However, the new genus has a more complex structure than Amijiella: there are several generations of vertical and horizontal partitions forming numerous alveolar compartments with an irregular poligonal network below the epidermis (Pl. I/7, 9; Pl. II/9, 11). The new genus has marginal partitions (beams and rafters) and a cribrate aperture in common with *Haurania* HENSON (1948), but the latter has endoskeletal pillars in the central region of the test. In addition, *Haurania* has only main vertical and horizontal partitions (HENSON, 1948, Pl. 15/2, 4, 8, 10), (HOTTINGER, 1967, Pl. 8/5, 7, 22, 23-25) and (BALOGE, 1981, Pl. I/1, 6; Fig. 2, F, H, K). Also, the curved arrangement of early chambers of the new genus are much reduced compared to *Haurania* with planispiral early chambers. The new genus has low-domed adult chambers throughout the uniserial stage, while *Haurania* has saucer-shaped chambers in the uncoiled uniserial stage.

A similar lituolid genus, *Bramkampella*, was described by REDMOND (1964) from the Upper Jurassic to the Lower Cretaceous of Saudi Arabia. The type description of *Bramkampella* is based on four sections of it (REDMOND, 1964, Pl. I/26-29), and it was shortly discussed along with the other lituolid genera. The new genus resembles *Bramkampella* in that it has vertical and horizontal partitions, an alveolar subepidermal layer and a cribrate aperture. However, our new genus has a more complex structure than *Bramkampella*: there are several generations of vertical (main, primary and secondary beams) and horizontal partitions (main, primary and probably secondary rafters), forming numerous compartments (Pl. I/7, 9; Pl. II/1, 4, 7, 11), whereas *Bramkampella* only has main vertical and horizontal partitions (REDMOND, 1964, text Fig. 2).

The elongated conical agglutinated genus *Rectocyclammina* HOTTINGER (1967) from the Kimmeridgian of Morocco is easily distinguished from the *Kastamonina* in that it has a single central aperture (HOTTINGER, 1967, Fig. 27a, c, d; Pl. 9/19, 21) instead of a cribrate aperture. In addition, the new genus has a more complex exoskeletal structure than the former genus.

Species *Kastamonina abanica*, n.sp.

(Pl. I/1-12; Pl. II/1-11)

Derivation of name: Abana, a town in the western Black Sea region.

Holotype: Axial section of megalospheric form (89-29), illustrated by Pl. I/12.

Depository: Holotype and described specimens are deposited at the Museum d'Histoire Naturelle, Geneva, Switzerland.

Material: 12 specimens in random sections, exclusively from the type locality.

Type locality: 30 km southeast of Abana town, North of Kastamonu, Northern Turkey (map reference E32-a4, coordinate 26.40; 92.20).

Type level: Kimmeridgian-Portlandian.

Description:

Megalospheric form. Test is highly conical with a tapered base. The wall is imperforate, finely agglutinated and constructed of some calcite crystal and calcareous particules. Dimensions of eight typical specimens are shown on Table 1. The embryonic apparatus is positioned at the apex of the cone. It consists of a comparatively large proloculus followed by a short, slightly curved series of early chambers (Pl. I/8). Later broad adult chambers are arranged in a uniserial pattern; low-domed uniserial chambers which strongly overlap for as much as half the length of the test (Pl. I/1-4, 5, 8, 10-12). The diameter and the height of the uniserial chambers gradually increase from the early chambers to the last adult chamber.

Microspheric form. So far, the microspheric embryos have not been observed; the shape and size of the test suggest the existence of a microspheric generation. This generation is rather rare in the examined limestone samples compared with the megalospheric generations. Therefore, the internal description of this member of *Hauraniidae* is mainly based on megalospheric forms. The shape of the test varies from elongated to highly conical with a tapered base (Pl. I/7, 9; Pl. II/8, 11). Dimensions of four specimens are shown on Table 2.

Stratigraphical Occurrence: *Kastamonina abanica* is found throughout the Lower Part of the Akkaya Limestone in the type locality of the new genus, where it is associated with rich foraminiferal assemblage (the fossil content of the Lower Part of the Akkaya Limestone was given in the introduction). The new foraminiferal species *Anchispirocyclina neumannae* BERNIER, FLEURY & RAMALHO and associated species *Freixialina planispiralis* RAMALHO, *Rectocyclammina chouberti* HOTTINGER, *Everticyclammina virguliana* (KOECHLIN) were reported from the Jurassic (Kimmeridgian-Portlandian) of Portugal and Greece by BERNIER et al. (1979). Likewise, other index species such as *Rectocyclammina chouberti*

Specimens	Shape and diameter of proloculus (mm)	Height (mm)	Greater diameter (mm)	Number of early chambers	Number of uniserial chambers	Apical angle (°)
Pl. I, Fig. 1	Not observed	1.1	0.6	Few	6	69
Pl. I, Fig. 2	Spherical, 0.110	0.85	0.55	Not observed	5	62
Pl. I, Fig. 3	Not observed	1.1	0.64	Not observed	7	Not measured
Pl. I, Fig. 4	Subspher., 0.085	1.05	0.63	Not observed	6	76
Pl. I, Fig. 8	Spherical, 0.085	1.2	0.65	Few	7	70
Pl. I, Fig. 10	Spherical, 0.085	0.8	0.59	Few	6	65
Pl. I, Fig. 11	Not observed	1.1	0.7	Few	6-7	80
Pl. I, Fig. 12 (Holotype)	Spherical, 0.080	0.9	0.61	Few	6	81

Table 1.Dimensions of eight typical specimens of the megalospheric form.

Specimens	Height (mm)	Greater diameter (mm)	Number of early chambers	Number of uniserial chambers
Pl. I, Fig. 7	1.45	0.65	Not observed	8-9?
Pl. I, Fig. 9	1.45	0.8	Not observed	7
Pl. II, Fig. 8	1.50	1	Not observed	7-8?
Pl. II, Fig. 11	2.1	0.75	Not obsreved	Not counted

Table 2. Dimensions of four specimens of the microspheric form

HOTTINGER occured in the Kimmeridgian of Morocco (HOTTINGER, 1967). Because of the presence of index-associated foraminiferal species "*Rectocyclammina chouberti* and *Anchispirocyclina neumannae*", a Kimmeridgian-Portlandian age has been assumed for the Lower Part of the Akkaya Limestone with the new genus.

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PLATE I

Kastamonina abanica, n.gen., n.sp.
Kimmeridgian - Portlandian
Southeast of Abana, Northern Turkey

1 - Axial section of megalospheric form showing proloculus and later uniserial chambers with cribrate aperture, (89-25), x 62.
2 - Axial section of a young specimen of megalospheric form, (89-27), x 56.
3 - Subaxial section, not centered, showing uniserial chambers with cribrate aperture, (89-20), x 59.
4 - Centered subaxial section of megalospheric form, (89-27), x 58.
5 - Centered tangential section, showing structural elements of the exoskeleton, (89-29), x 51.
6 - Horizontal section, showing vertical partitions, (89-27), x 80.
7 - Tangential section of microspheric form, showing structural elements of the exoskeleton (vertical and horizon tal partitions, as well as alveolar compartments), (89-28), x 47.
8 - Centered subaxial section, showing large proloculus following arcuate chambers of the early growth stage and uniserial chambers, (89-27), x 55.
9 - Tangential section of the microspheric form, showing vertical and horizontal partitions, and alveolar compart ments, (89-28), x 48.
10 - Centered oblique section, megalospheric form, (89-29), x 79.
11 - Subaxial section, megalospheric form, (89-20), x 20.
12 - Axial section, megalospheric form (holotype), showing large proloculus, structural elements of the marginal zone and cribrate aperture, (89-29), x 64.


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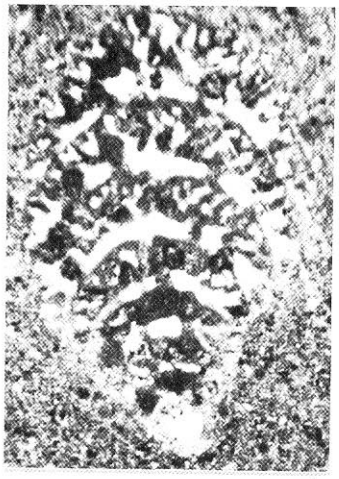
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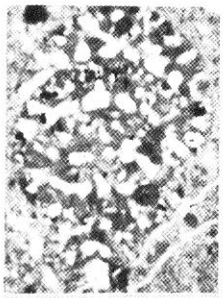
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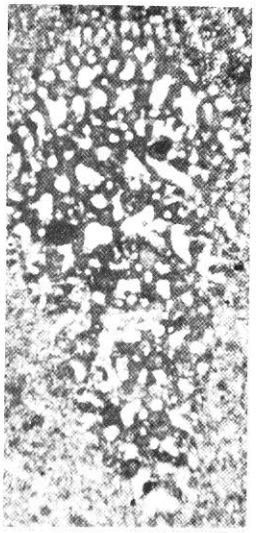
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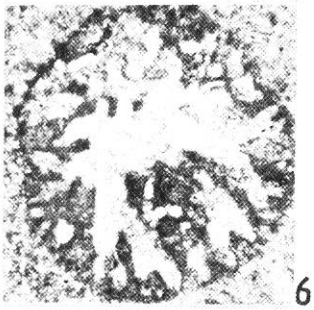
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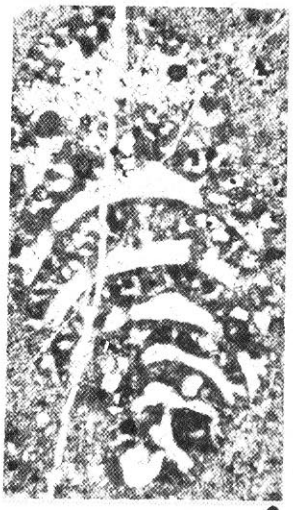
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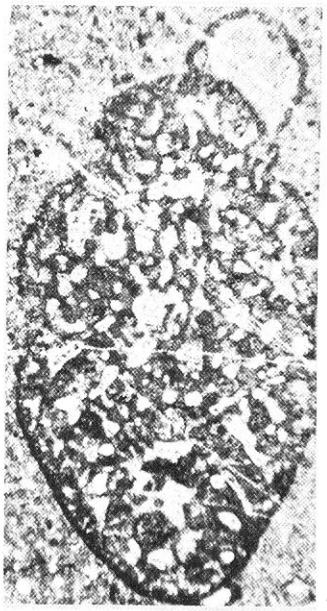
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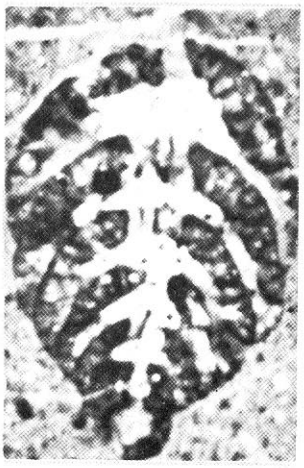
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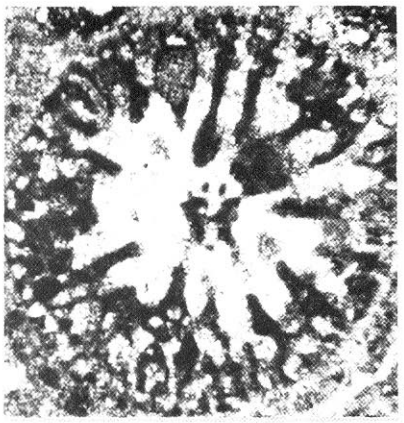
PLATE II

Kastamonina abanica, n.gen., n.sp.
Kimmeridgian - Portlandian
Southeast of Abana, Northern Turkey

1 - Horizontal section, showing three (possibly more) generations of vertical partitions (beams), (89-27), x 85.
2 - Horizontal section of three succesive uniserial chambers, showing beams and foramen, (89-23), x 63.
3 - Oblique horizontal section, (89-29), x 52.
4 - Horizontal section of two succesive chambers of the uniserial stage, showing beams and cribrate aperture (pores), (89-25), x 63.
5 - Oblique horizontal section, (89-21), x 40.
6 - Oblique section inclined to horizontal plane, (89-21), x 40.
7 - Horizontal section showing two succesive chambers of the uniserial stage, (89-22), x 66.
8 - a) Horizontal section of the megalospheric form at the left side; b) subaxial section of the microspheric form at the middle part of the picture; c) subaxial section of the megalospheric form at the right side of the picture, (89-22), x 32.
9 - Oblique section showing alveolar compartments, (89-24), x 64.
10 - Oblique horizontal sections, inclined to the vertical plane, (89-29), x 50.
11 - Tangential section of the microspheric form showing structural elements of the exoskeleton (vertical and hori zontal partitions, as well as alveolar compartments), (89-26), x 43.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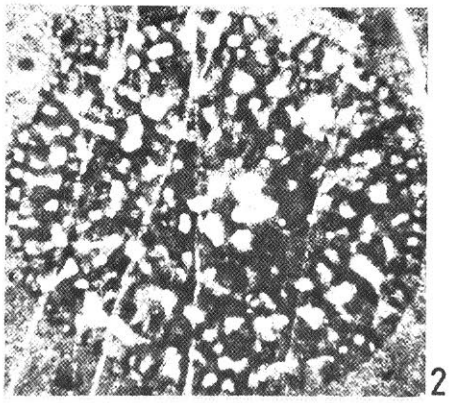
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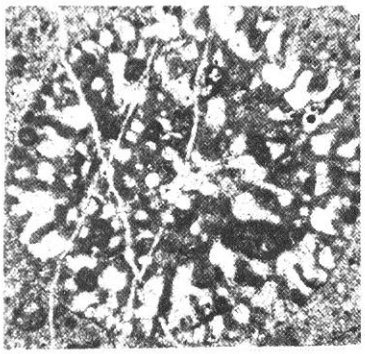
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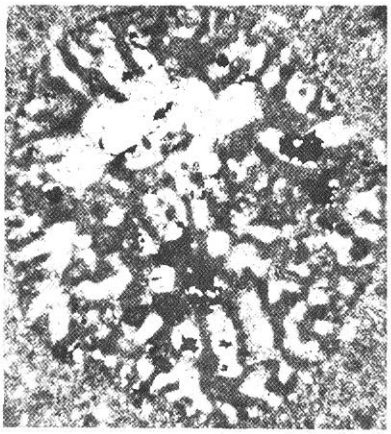
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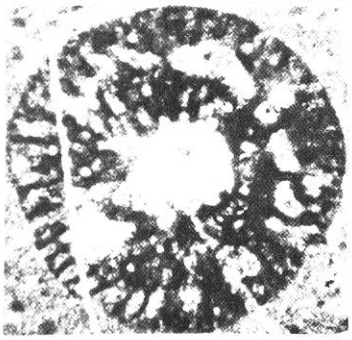
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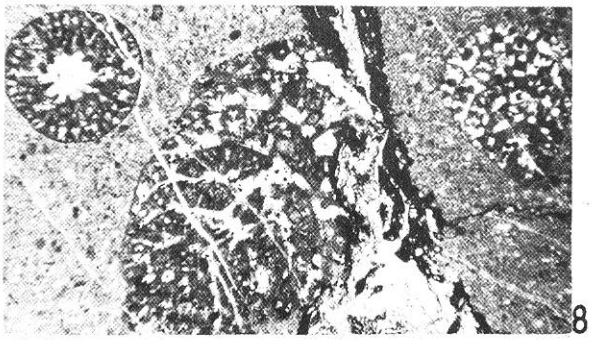
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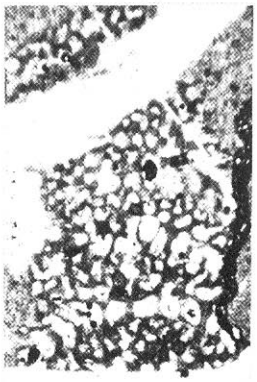

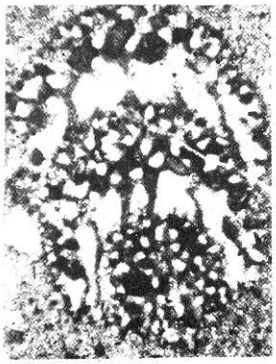
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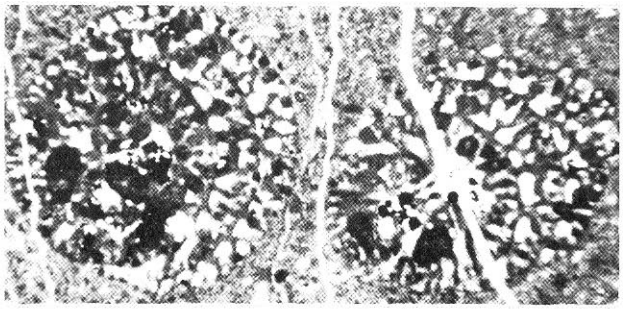
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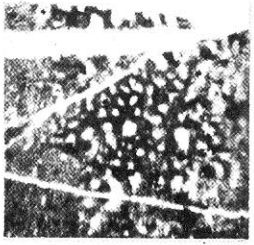
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