

UDK 56:594.1(560)=20

Three new species of the genus *Gorjanovicia* Polsak from Kocaeli region (Northwestern Anatolia)

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Abstract

Three new species (*G. polsaki* n. sp., *G. kayae* n. sp. and *G. akyoli* n. sp.) of the genus *Gorjanovicia* Polsak have been determined from the Campanian beds at Köseler village in Northwestern Anatolia.

Introduction

In the Kocaeli region, the Upper Cretaceous rocks are represented mainly by rudistid limestones. K. Erguvanlı (1949) has discovered rudistid limestone with Campanian age in the Hereke-Gebze area. I. E. Altınlı (1968) studied the geology of the Kocaeli-Hereke area and also found the rudists in the Campanian limestone. O. Kaya (personal communication, 1981) has recently made a detailed geologic investigation and collected many specimens of rudistid fauna in the Upper Cretaceous of Kocaeli region.

The studied samples has been collected by Kaya from a location, approximately 2 km south of Köseler village (map reference G 23-a 4). The rock unit that includes the material is of small-size reefy buildup of rudistids, at the base of the well known Latest Cretaceous limestone-limy mudrock sequence of Northwestern Anatolia. In the area of collection this basal unit unconformably overlies the older Triassic beds.

The examination of this collection, of the genus *Gorjanovicia* Polsak revealed the presence of the three new species. On the otherhand, new species of *Gorjanovicia* are associated with *Vaccinites inaequicostatus* Münster, *Gorjanovicia* cf. *costata* Polsak, *Gorjanovicia* sp., *Miseia* sp. and Radiolitids.

Associated rudistid fauna and previous studies show that three new species are of Campanian age.

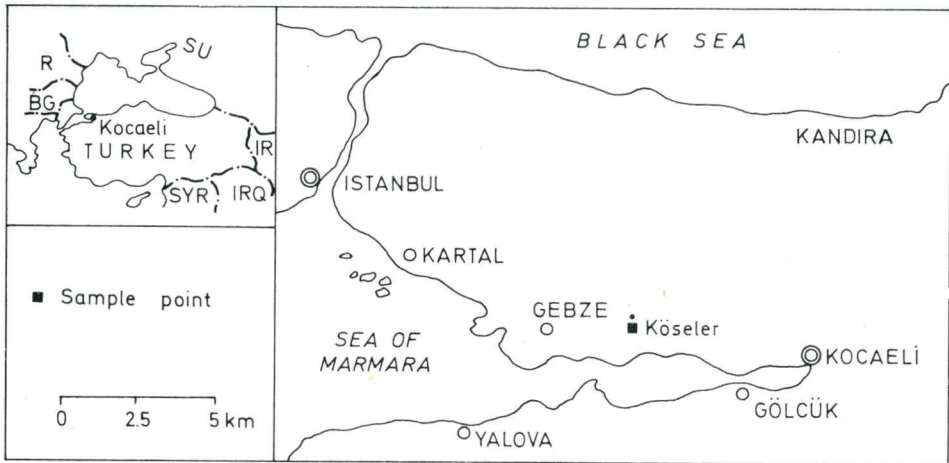


Fig. 1. Location map

Systematic Study

- Classis **LAMELLIBRANCHIATA**
 Ordo **Rudistida** Lamarck, 1819
 Familia **Radiolitidae** Gray, 1848
 Genus **Gorjanovicia** Polsak, 1967

Gorjanovicia polsaki n. sp.

Pl. 1, Figs. 1, 2

Derivatio nominis: This new species is dedicated to Dr. Ante Polšak who has made many valuable works on rudists.

Material: Holotype and paratype with lower valves.

Holotypus: Pl. 1, Figs. 1, 2, with lower valve is deposited at the Ege Üniversitesi Yerbilimleri Fakültesi, Jeoloji Bölümü, with No. 2568.

Diagnosis: Siphonal bands concave, interband bulge. Ligamental pillar inclined toward the anterior, head of ligament with two lobes.

Descriptio: Lower valve is conical. The diameter is 3,2 cm, the height is 7.5 cm at posterior. The shell surface is covered with longitudinal costae of 1 mm width. Anterior siphonal band is 4 mm wide and concave. The wide of posterior siphonal band is 6 mm and it has 3 costules. Interband is bulge and 4 mm wide. Probably, there are 2 costules on the interband. The ligamental groove is 3 mm wide and decreases toward the end of cone. Thickness of the outer layer is 4—5 mm. Ligamental pillar inclined towards anterior and it has 3 mm length. The head of ligament has two lobes and elongated towards anterior. The posterior tooth *B* is more nearer to the ligament than the anterior tooth *B'*. The anterior accessory cavity can be preserved.

Discussio: *G. polsaki* n. sp. differs from the other species of the *Gorjanovicia* by the position of ligamental pillar and the shape of head of the ligamental pillar.

Locus typicus: Holotype, Köseler village, Gebze, Kocaeli. Coordinate on 1 : 25 000 scaled map is 25.20 : 17.15.

Stratum typicum: Campanian.

Gorjanovicia kayae n. sp.

Pl. 1, Fig. 3

Derivatio nominis: The new species is given the name after late Dr. Orhan Kaya who has made a detailed geologic studies in the Northwestern Anatolia.

Material: One sample with lower valve.

Holotypus: Pl. 1, Fig. 3, with lower valve is deposited at the Ege Üniversitesi Yerbilimleri Fakültesi, Jeoloji Bölümü, with No. 2566.

Diagnosis: The anterior siphonal band as a groove, the posterior siphonal band and interband flat. The ligamental pillar strong with a rounded head.

Descriptio: Lower valve is conical. The height of the lower valve is 9 cm. In the cross-section, the diameter is $2,8 \times 3,7$ cm in size. The surface is ornamented with 2—5 mm thick costae and grooves of 1—2 mm wide. The anterior siphonal band as a groove, is 10 mm wide. The posterior band is 7 mm wide and flat. It has 2 costae. Interband is flat and 8 mm wide. Probably, it has 3 costae. The ligamental groove is 5 mm wide and it has 3 costules. Outer layer is 3—5 mm and it is recrystallized. The ligamental pillar is widened in a very short distance and its head rounded off. The ligamental pillar is 2 mm long, head of ligament is 1.3 mm wide.

Discussio: *G. kayae* n. sp., shows similarities with the shape of ligamental pillar to *G. planinica* Plenicar and *G. n. sp. Plenicar*. *G. planinica* has concave siphonal bands and ridge-shaped interband. *G. n. sp. Plenicar* has narrower siphonal bands (M. Pleničar, 1973). But, *G. kayae* n. sp. has groove anterior siphonal band and flat posterior siphonal band and interband. *G. kayae* n. sp. is similar with the ligamental pillar to *G. planinica* and *G. n. sp. Plenicar*, but it completely differs with the structure of the siphonal region.

Locus typicus: Holotype, Köseler village, Gebze, Kocaeli.

Stratum typicum: Campanian.

Gorjanovicia akyoli n. sp.

Pl. 2, Figs. 1—3, Pl. 3, Figs. 1, 2

Derivatio nominis: This new species is dedicated to Dr. Erol Akyol who has made many valuable studies on palynology.

Material: Holotype, with well preserved upper and partly broken lower valves, and one paratype represented only with lower valve.

Holotypus: Pl. 2, Figs. 1—3 and Pl. 3, Fig. 1 is deposited at the Ege Üniversitesi Yerbilimleri Fakültesi, Jeoloji Bölümü, with No. 2570.

Diagnosis: Lower valve with sharp longitudinal costae. Shell structure partly lamellar, partly prismatic. Ligamental pillar well developed with a triangular in shape at anterior. Upper valve well developed also, and the commissure makes an upward folding at siphonal region.

Descriptio: Lower valve is conical and the end of the lower valve is curved towards the siphonal region. The height of the lower valve in siphonal region is 6 cm, and at ligamental region 7,6 cm. The diameter at commissure is $3,8 \times 3,5$ cm in size. The surface is ornamented with longitudinal costae. The anterior siphonal band is 9 mm wide and flat. The posterior siphonal band is 5 mm and also flat. But, siphonal band *E* is narrower than the posterior siphonal band *S*. Interband has 6 mm width, and as a groove. The shell structure is partly lamellar, partly prismatic. In the cross-section, passing through 2 cm below the commissure, ligamental pillar is 4 mm long, head of ligament is 1 mm wide. The head of ligament is widened towards the anterior side as triangular in shape. Anterior and posterior cardinal teeth are very well developed and anterior tooth is bigger than the posterior tooth. The posterior accessory cavity is very smaller than the anterior accessory cavity.

Upper valve is well developed and it is 10 mm in height. The commissure makes an upward folding of 2 mm height at the siphonal region. Shell wall is composed of very thin lamellae.

Discussio: *G. akyoli* n. sp. resembles with the structure of the siphonal region to *G. costata* Polsak (A. Polšak, 1967; M. Pleničar, 1974). It differs with the head of ligament from *G. costata*.

Locus typicus: Holotype, Köselir village, Gebze, Kocaeli.

Stratum typicum: Campanian.

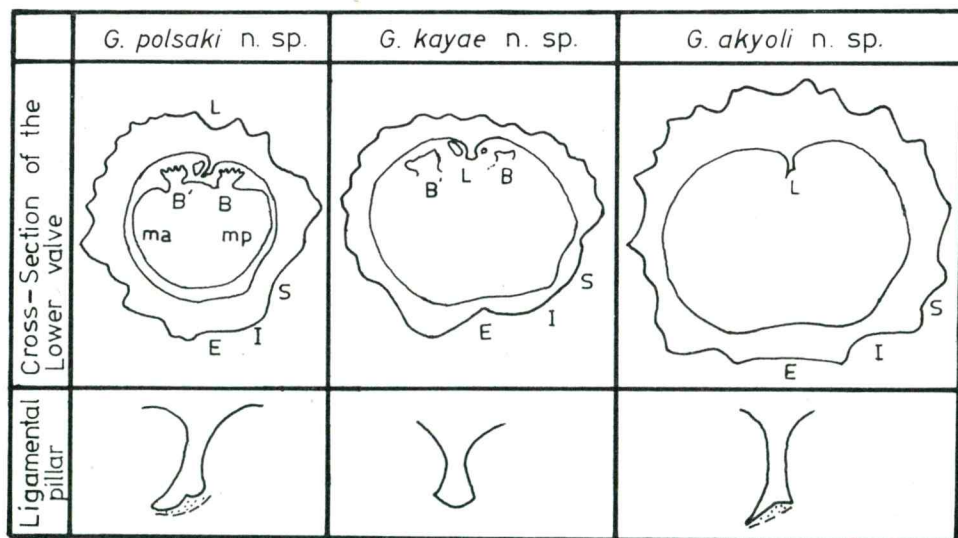
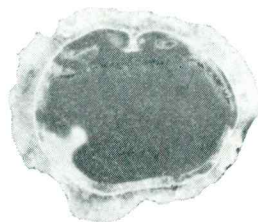
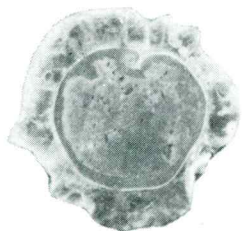


Fig. 2. Comparison of the new species of *Gorjanovicia* Polsak

Plate 1



1 *Gorjanovicia polsaki* n. sp.

lower valve, cross-section, holotype, 1 ×

3 *Gorjanovicia kayae* n. sp.

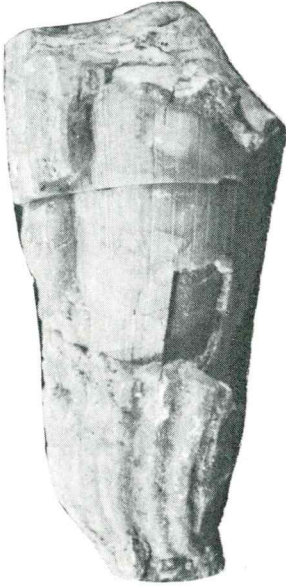
lower valve, cross-section, holotype, 1 ×



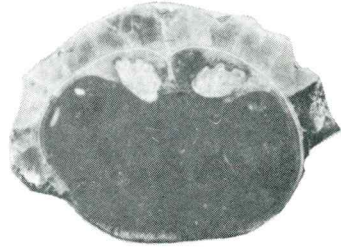
2 *Gorjanovicia polsaki* n. sp.

lower valve, cross-section, holotype, 3,5 ×

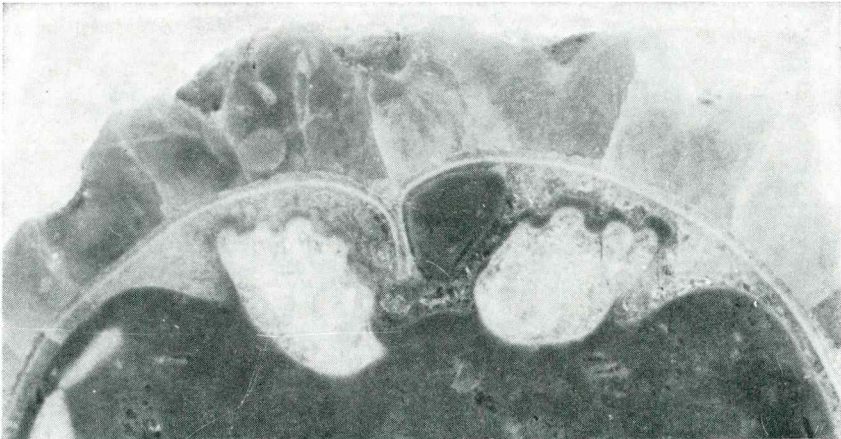
Plate 2



1 *Gorjanovicia akyoli* n. sp.
lower and upper valves, anterior side, holotype, 1 ×



2 *Gorjanovicia akyoli* n. sp.
lower valve, cross-section, holotype, 1 ×

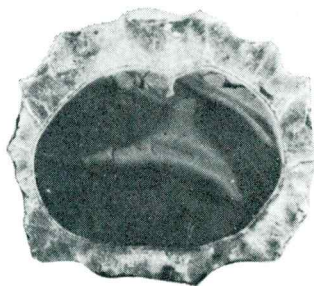


3 *Gorjanovicia akyoli* n. sp.
lower valve, cross-section, holotype, 3,5 ×

Plate 3



1 *Gorjanovicia akyoli* n. sp.
upper valve, external view, holotype, 1 ×



2 *Gorjanovicia akyoli* n. sp.
lower valve, cross-section, paratype, 1 ×



3 *Miseia* sp.
lower and upper valves, anterior side, 1 ×

Acknowledgment

I thank to Dr. E. Akyol for his critical reading the manuscript and to dr. O. Kaya who provided the material.

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