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Pannonian-Pontian Ostracoda fauna of Gelibolu Neogene Basin (NW Turkey)

Gelibolu Neojen Havzası'nın Pannoniyen-Ponsiyen ostrakod faunası (KB Türkiye)

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ABSTRACT

In this study, Pannonian-Pontian Ostracoda fauna is researched from the material obtained from Gelibolu Neogene Basin. Ostracoda fauna are mainly derived from the white marl, mudstone and siltstone. Fourteen species and eight taxa belonging to open nomenclature mainly have brackish and freshwater origin are investigated in the study. Two new species and one subspecies are described as new. These are *Cyprideis pannonica, C. sublitorallis, C. tuberculata, C. torosa tuberculata* n.ssp.*, C.* cf. *seminulum, C. trituberculata, C. quadrituberculata, C. hexatuberculata* n.sp.*, C.* sp. 1*, Candona neglecta, C. candida, C. parallela pannonica, C.* sp.*, Ilyocypris bradyi, I. pontica* n.sp.*, I.* sp.*, Limnocythere* sp. 1, *Limnocythere* sp. 2*, Paralimnocythere* sp. 1*, Paralimnocythere* sp. 2, *Loxoconcha* sp. 1 and *Cyprinotus salinus.* Chronostratigraphical subdivision of the Neogene sequence was mainly consisted of Ostracoda associations and correlated with the other fauna and flora groups. These Ostracoda fauna clearly indicates the Pannonian and Pontian age. Ostracoda fauna from Gelibolu Basin reveals that the depositional environment of the basin was coastal (littoral). Furthermore in some cases, freshwater input effects also can be encountered in the fauna *Ilyocypris, Paralimnocythere, Limnocythere* and *Cyprinotus*. The characteristics of faunal and floral associations suggested that the environmental conditions in the study area were similar to Paratethys bioprovince in the Pannonian and Pontian Ostracoda fauna from Gelibolu Basin, no effects and interferences from Tethys bioprovince was detected.

Key words: Ostracoda, Pannonian-Pontian, Paratethys, Turkey.

ÖZ

Bu çalışmada, Gelibolu Neojen Havzası'ndan elde edilen örneklere ait Pannoniyen-Ponsiyen ostrakod faunası araştırılmıştır. Ostrakod topluluğu daha çok beyaz marn, çamurtaşı ve sittaşlarından elde edilmiştir. Bu çalışmada, acısu ve tatlısu kökenli ondört tür ve isimlendirmeye açık sekiz taxa saptanmış ve incelenmiştir. Bu arada iki yeni tür, bir yeni alttür tanımlanmıştır. Bunlar; Cyprideis pannonica, C. sublitorallis, C. tuberculata, C. torosa tuberculata n.ssp.*, C.* cf. *seminulum, C. trituberculata, C. quadrituberculata, C. hexatuberculata* n.sp*, C.* sp. 1*, Candona neglecta, C. candida, C. parallela pannonica, C.* sp.*, Ilyocypris bradyi, I. pontica* n.sp.*, I.* sp.*, Limnocythere* sp. 1*, Limnocythere* sp. 2*, Paralimnocythere* sp.1*, Paralimnocythere* sp. 2*, Loxoconcha* sp. 1 *ve Cyprinotus salinus türleridir. Neojen istifinin kronostratigrafik bölümlemesi başlıca ostrakod topluluğundan yararlanılarak gerçekleştirilmiş, ancak gözlemlenen diğer fauna ve flora grupları ile de deneştirme yapılarak, Pannoniyen ve Ponsiyen katları ayırtlanmıştır. Ostrakod faunasının ortam belirleyici özelliklerine bağlı olarak, çökelme bölgesinde, sığ denizel (litoral) koşulların egemen olduğu, ancak bazı seviyelerde dönem dönem tatlısu girişiminin de etkin olduğu Ilyocypris, Paralimnocythere, Limnocythere ve Cyprinotus cinslerine bağlı olarak söylenebilir. Tüm saptanan fauna ve flora, incelenen bölgedeki sucul koşulların Paratetis biyoprovens özelliklerini taşıdığını ve Tetis'in etkisinin ve girişiminin bu dönem boyunca gerçekleşmediğini göstermektedir.*

Anahtar kelimeler: *Ostrakoda, Pannoniyen-Ponsiyen, Paratetis, Türkiye*

INTRODUCTION

In the Neogene period, there were many isolated or connected distinct basins from west to east along the Black Sea and the Sea of Marmara coasts of Turkey. These basins have a connection to Tethys or Paratethys bioprovince or to both of them from Middle Miocene to Recent. One of them is called as “Gelibolu Basin” which is located at Gelibolu Peninsula, Çanakkale, and oriented in NE-SW direction (Figure 1). This basin is numbered as 50a-f by Steininger et al. (1985).

Many researches have been carried out in the investigated area as İlhan (1964), Saltık and Saka (1971, 1972), Önem (1974), Önal (1984), Erol (1985), Sümengen et al. (1987), Şentürk and Karaköse (1987), Siyako et al. (1989), Okay et al. (1990), Erol (1992). Paleontological investigations have been performed in the region by Ternek (1949), Ülkümen (1960), Erol and Nuttal (1973), Ozansoy (1973), Önem (1974), Taner (1977, 1981, 1983), Sümengen et al., (1987), Şentürk and Karaköse (1987), Taner (1994), Tunoğlu and Ünal (2001).

The aim of this paper is to introduce the taxonomy and classification of Pannonian-Pontian Ostracoda assemblage of Gelibolu Neogene Basin. Furthermore, paleogeographic and chronostratigraphic comparisons of this basin with the other similar Neogene basins of Turkey and Paratethys are realized.

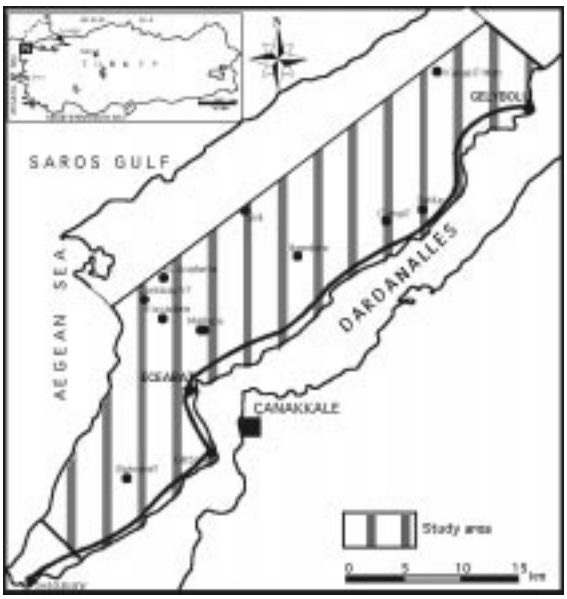


Figure 1. Location map of the study area.
Şekil 1. İnceleme alanının yer bulduru haritası.

GEOLOGIC SETTING

In the study area, the Neogene units unconformably overlie the Oligocene aged basement rocks (Figure 2). The Middle-Late Miocene units are composed of two different formations, as Çanakkale (Pannonian) and Conkbayırı (Pontian). The Çanakkale formation consists of four different members from bottom to top as Gazhanedere, Anafarta, Çamrakdere and Bayraktepe. These members and formations names assigned by Sümengen et al. (1987) and Şentürk and Karaköse (1987) are also- accepted and utilized in this investigation.

The Gazhanedere member of the Çanakkale formation deposited at the Early Pannonian substage is comprised of claystone, sandstone, mudstone, marl, clayey limestone and limestone. In this mamber, abundant Ostracoda (Table 1) and microvertebrate fauna were obtained.

The Anafarta member of the Çanakkale formation conformably overlies the Gazhanedere member, which consists of marl, sandstone, claystone, conglomerate and tabular sandstone (see Figure 2). This member is in Middle Pannonian age and contains abundant and well preserved Ostracoda (see Table 1) and microvertebrate fauna.

The Çamrakdere member is conformably overlain by Anafarta member of Middle-Late Pannonian age. It is composed of claystone, marl, conglomerate, thick clayey limestone and mudstone (see Figure 2). This member also contains Ostracoda (see Table 1) and microvertebrate fossils.

The last member of the Çanakkale formation, is called as Bayraktepe which is consists of fossiliferous limestone, sandstone, conglomerate, claystone and sandy limestone and was deposited at the Late Pannonian time interval (see Figure 2). This unit is rich in ostracod (see Table 1), gastropod and spore-pollen (Tunoğlu and Ünal, 2001).

The Conkbayırı formation of Pontian age is the youngest unit of the Neogene sequence. It con-

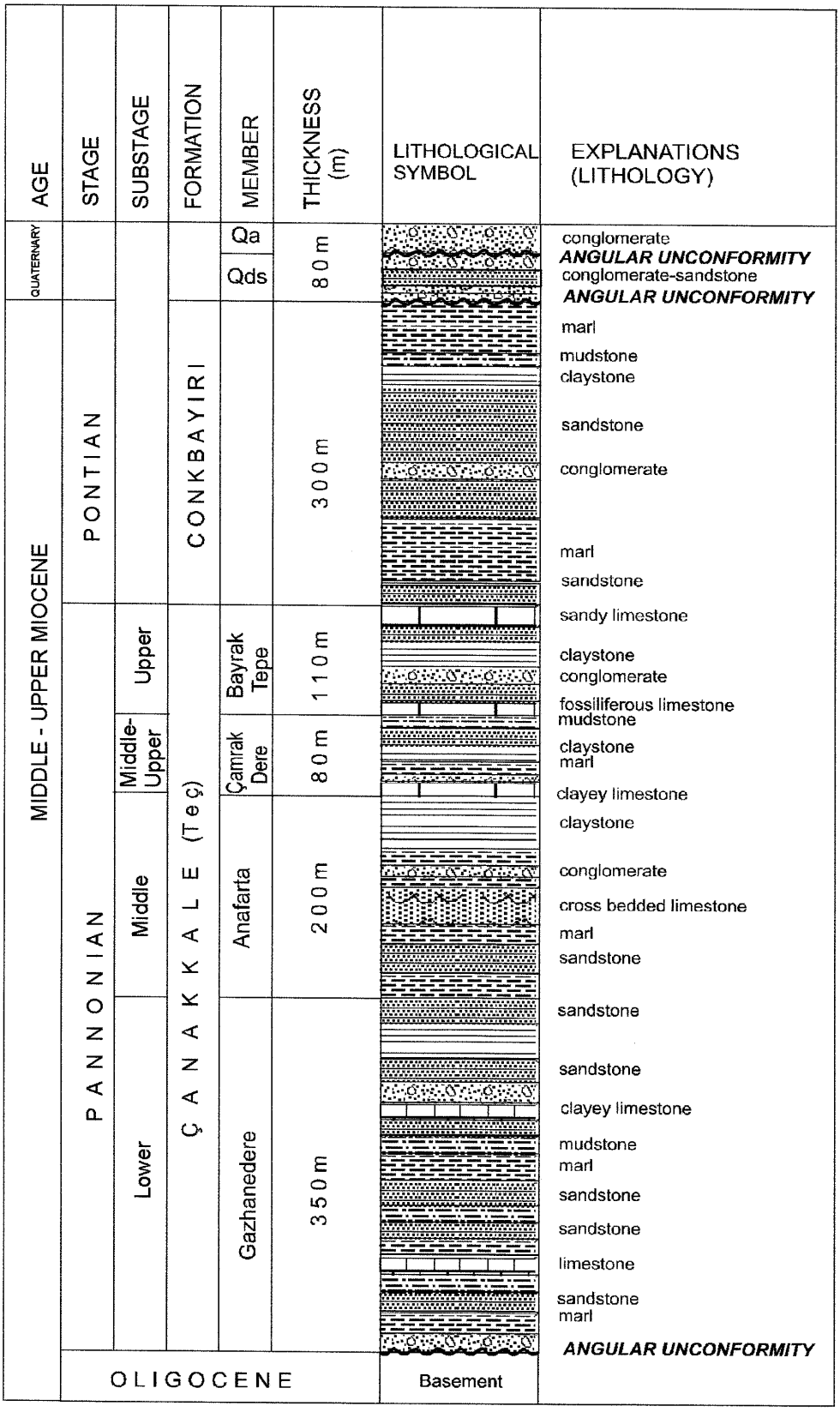
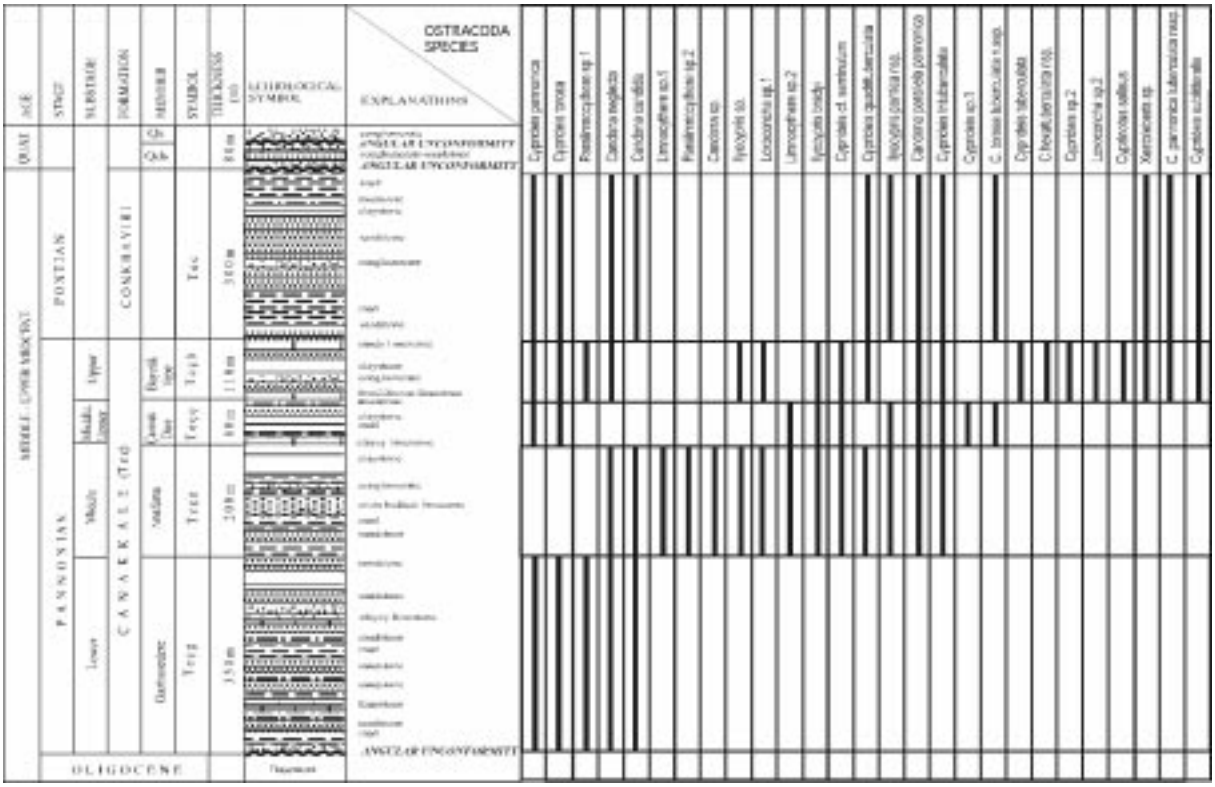


Figure 2. Generalized stratigraphic columnar section of the study area.
Şekil 2. Çalışma alanının genelleştirilmiş stratigrafik dikme kesiti.

Table 1. Ostracoda distribution of the Neogene units of the Gelibolu Peninsula.
Çizelge 1. Gelibolu Yarımadası Neojen birimlerinde ostrakodların stratigrafik dağılımı.



formably overlies the Bayraktepe member of the Çanakkale formation. It contains thick marl, sandstone, mudstone, claystone and conglomerate (see Figure 2) with abundant ostracoda (see Table 1) and microvertebrate fauna.

SYSTEMATIC PALEONTOLOGY

Twentytwo Pannonian-Pontian ostracoda species, subspecies and taxa belonging to open nomenclature were identified in the Gelibolu Neogene Basin. Two species and one subspecies are new. Especially, *Cprideis* species were confirmed with Ostracoda Zones 16 and 18 in the studies of Jiricek (1983), Jiricek and Riha (1990) and Tunoğlu and Ünal (2001). In this study, Hartmann and Puri (1974)'s Classification was utilized for systematical description of the taxa. Moore (1961), Morkhoven (1962, 1963) and "Catalogue of Ostracoda" (Ellis and Messina, 1953-1981) were also utilized and considered during descriptions. The species are deposited at the Geological Engineering Department of Hacettepe University.

Phylum : **ARTHROPODA**
Class : **CRUSTACEA**
Subclass : **OSTRACODA** Latreille, 1806
Order : **PODOCOPIDA** G. W. MULLER, 1894
Suborder : **PODOCOPA** Sars, 1866
Family : **LIMNOCYTHERIDAE** Klie, 1938
Subfamily : **LİMNOCYTHERINAE** Klie, 1938

Genus: *Limnocythere* Brady, 1868
Type-species : *Cythere inopinata* Baird, 1843
Stratigraphic level: Oligocene-Recent
Environment : Fresh water, some brackish water (Morkhoven, 1963).

***Limnocythere* sp. 1**
Plate 1 Figures 1, 2

***Definition*:** Carapace is rectangular in shape in lateral view. Dorsal and ventral margins are concave in the center of margin. Maximum height and width are at the anterior of the carapace. Posterior area is tapering at the dorsal view and rounded at the lateral view. Normal pore canals are very small, interior features and sexual dimorphism could not be observed.

Material: 3 carapaces, 2 valves
Dimensions: Length : 0.85 - 0.90 mm
Height : 0.35 - 0.40 mm
Width : 0.15 - 0.20 mm
Remarks*: Limnocythere* sp. 1 is closely similar to *L. santipatricii* Brady and Robertson. But differs from it by having well rounded anterior margin and convex dorsal margin
Locality and stratigraphic level: Gelibolu Peninsula, Neogene Basin, Middle Pannonian.

***Limnocythere* sp. 2**
Plate 1 Figures 3, 4

Definition: Carapace is ovate in the lateral view. Dorsal margin is straight, ventral margin is concave. Anterior and posterior margins are well rounded. Postero-dorsal margin of right valve is oblique. Anterior end is tapering, but posterior end is well rounded in the dorsal view. Left valve is larger than the right valve. Interior features could not be obsreved.
Material: 13 carapaces.
Dimensions: Length: 0.85 - 0.90 mm
Height: 0.45 - 0.50 mm
Width: 0.20 - 0.25 mm
Remarks: *Limnocythere* sp. 2 is similar to general valve shape of the *L. africana minor* Lindroth, but it differs from it by having a good reticulations on the surface of the valve.
Locality and stratigraphic level: Gelibolu Peninsula, Neogene Basin, Middle-Late Pannonian.

Subfamily: LİMNOCYTHERINAE Klie, 1938
Genus: Paralimnocythere Carbonnel, 1969
Type-species: *Cythere inopinata* Baird, 1843
Stratigraphic level: Oligocene-Recent
Environment: Fresh water, some of them brackish water (Morkhoven, 1963).

***Paralimnocythere* sp.1**
Plate 1 Figure 5

Definition: Carapace is in rectangular shape in lateral view. Dorsal margin is straight where as ventral margin is broadly concave, anterior margin is depressed towards ventral margin and well rounded. Posterior margin is also well rounded and postero-dorsal corner is very strong at the lateral view of the left valve. Anterior end is more tapering than the posterior at the dorsal view. Left and right valves are aproximatelly equal.
Material: 31 carapaces.
Dimensions: Length: 0.65 - 0.70 mm
Height: 0.25 - 0.30 mm
Width : 0.30 - 0.35 mm
Remarks: *Paralimnocythere* sp. 1 is different to general valve shape of the *P.* sp. Carbonel, 1985. *P.* sp. Carbonel has good reticulation on the surface of the valve.
Locality and stratigraphic level*:* Gelibolu Peninsula, Early-Late Pannonian.

***Paralimnocythere* sp. 2**
Plate 1 Figures 6, 7

Definition: Valve is in rectangular shape in lateral view. Dorsal margin is nearly straight, ventral margin is slightly concave, anterior margin is well rounded, posterior margin slightly tapering at the center of the dorsal margin. Anterior end is most tapering than the posterior end. Maximum length, height and width are at the center of the carapace. There are pitted and small reticulates on the surface of the valve. Normal pore canals are very abundant and thick. Hinge is lofhodont. Sexual dimorphism could not be observed.
Material: 12 valves, 2 carapaces.
Dimensions: Length: 0.75 - 0.80 mm
Height: 0.35 - 0.40 mm
Width: 0.25 - 0.30 mm
Remarks*: Paralimnocythere* sp. 2 is different to general valve shape of the *P.* sp Krstic. *P. sp* Krstic has longer carapace than the *P.* sp. 2.
Locality and stratigraphic level*:* Gelibolu Peninsula, Neogene Basin, Turkey, Middle Pannonian.

Family: CYTHERIDEIDAE Sars, 1928
Genus: *Cyprideis* Jones, 1857
Type species: *Candona torosa* Jones, 1850
Stratigraphic level: Sarmatian-Recent
Environment: Most of them are brackish (meso-polihaline), rarely in saline (‰ 80) lakes (Morkhoven, 1963).

Cyprideis pannonica (Mehes, 1908)
Plate 1 Figure 8

1908 *Cytheridea pannonica* Mehes, p. 553, pl. 11, figs. 6-14.
1958 *Cyprideis pannonica* (Mehes), Kollmann, p. 163, pl. 13, figs. 1-4.

1962 *Cyprideis pannonica pannonica* (Mehes), Decima; pl. 16, figs. 5a-10b.
1968a *Cyprideis (Cyprideis)* cf. *pannonica* (Mehes), Krstic; p.111, pl. I, figs. 2, 3.
1971 *Cyprideis pannonica* (Mehes), Krstic, p. 393, pl. 2.
1978 *Cyprideis pannonica* (Mehes), Carbonnel; p. 81, pl. 1, figs. 11-13.
1979 *Cyprideis (Cyprideis) pannonica* (Mehes), Bassiouni; p. 84, pl. 1, figs. 1-6.
1990 *Cyprideis pannonica* (Mehes), Jiricek and Riha; p. 438, pl. 4, fig. 8.
1996 *Cyprideis pannonica* (Mehes), Ünal, p. 92, 93; pl. 1, figs. 9-11; pl. 8, figs. 7, 8, pl. 14, figs. 1, 2.

Material: 694 carapaces, 338 valves.
Dimensions: Length: 1.00 - 1.10 mm
Height: 0.55 - 0.60 mm
Width: 0.45 - 0.50 mm

Remarks*: C. pannonica* has resemblance to *C. pontica* Krstic. Former differs from latter in having angular antero-dorsal corner. Dorsal and ventral margins are approximately parallel to each other. *C. pontica* Krstic does not have antero-dorsal sulcus. According to Krstic (1971), *C. ventroundulata* Krstic is junior synonym of *C. pannonica* (Mehes).

Locality and stratigraphic level: Gelibolu Peninsula, Neogene Basin, Early-Late Pannonian-Pontian.

Stratigraphic and geographic distribution: Budhapest, Hungary: Early Pannonian (Mehes, 1908); Vienna, Austria: Early Pannonian (Kollmann, 1958); Vienna Basin, Austria: Early Pannonian, Chersonian (Jiricek and Riha, 1990); Italy: Late Miocene (Decima, 1962); Belgrade, Yugoslavia: Late Pannonian (Krstic, 1968a); Pannonic Basin: Pannonian (Krstic, 1971); Lyon, France: Messinian (Carbonnel, 1978); Sea of Marmara, Aegean Region, Southwest and Central Anatolia of Turkey: Late Miocene (Bassiouni, 1979); Gelibolu Peninsula, Turkey: Early-Late Pannonian- Pontian (Ünal, 1996).

Cyprideis sublittoralis Pokorny, 1952
Plate 1 Figure 9

1962 *Cyprideis heterostigma sublittoralis* (Pokorny), Decima; pl. 24, figs. 1-5.
1971 *Cyprideis sublittoralis* (Pokorny), Krstic; p. 393, pl. 2.
1983 *Cyprideis sublittoralis* (Pokorny), Jiricek; p. 217, pl. VII, fig. 39.
1990 *Cyprideis sublittoralis* (Pokorny), Jiricek and Riha; p. 440, pl. 5, fig. 5.
1990 *Cyprideis sublittoralis* (Pokorny), Rundic; p. 296.
1996 *Cyprideis sublittoralis* (Pokorny), Ünal; p. 94, 95, pl. 2, figs. 3, 4; pl. 9, figs. 1-3.

Material: 129 carapaces, 100 valves.
Dimensions: Length: 1.00 - 1.05 mm
Height: 0.50 - 0.55 mm
Width: 0.55 - 0.60 mm

Stratigraphic and geographic distribution: Italy: Early Pannonian (Decima, 1962); Yugoslavia: Pannonian (Krstic, 1971); Belgrade, Yugoslavia: Pontian (Rundic, 1990); Austria: Late Pannonian (Jiricek, 1983; Jiricek and Riha, 1990); Gelibolu Peninsula-Neogene Basin, Turkey, Late Pannonian-Pontian (Ünal, 1996).

Cyprideis torosa tuberculata n. ssp.
Plate 1 Figure 10

Derivation of name: Tuberculates on the valve surface.
Holotype: Left valve, collection number: A9609
Paratype: 47 valves.
Type locality: Gelibolu Peninsula.
Type level: Middle-Late Pannonian, Pontian.
Diagnosis: Carapace in rectangular shape in lateral view. Anterior margin well rounded, dorsal and ventral margins nearly parallel to each other. Ventral margin straight, posterior margin diagonal from postero-dorsal corner to ventral corner. Marginal zone well developed, muscle scars as genus character.

Description*:* Valve is in rectangular shape in the lateral view. Anterior margin is well rounded. Posterior margin is most tapering than the anterior. Ventral margin is straight. Dorsal margin is slightly convex, both of them are nearly parallel to each other. Maximum length, height and width are encountered at the center of the carapace. Surface of the valves are covered with pits and reticulates. There are three different tuberculates on the center of the surface. Two of them are located nearly ventral margin, and the other is at dorso-central part. Anterior end is most tapering than the posterior at the dorsal view. Marginal zone and marginal pore canals are well developed. Marginal pore canals are thin, abundant and straight. Hinge and muscle scars same as genus. Sexual dimorphism is present, male forms are more longer than the female, posterior area of the female forms are more swollen than the male forms.

Dimensions: Length: 1.00 - 1.10 mm
Height: 0.45 - 0.50 mm
Width: 0.35 - 0.40 mm

Remarks: *C. torosa tuberculata* n. ssp. has close resemblance to *C. torosa* Jones, but it differs from *C. torosa torosa* Jones by having not tuberculate on the surface of the valve.It is also similar to *C. trituberculata* Krstic, but, *C. torosa tuberculata* n. ssp. differs in having a short carapace at the dorsal and lateral view.

Cyprideis tuberculata (Mehes, 1908)
Plate 1 Figures 11, 12

1908 *Cytheridea banatica* Mehes, p. 552, pl. 10, fig. 13-16.
1908 *Cytheridea pannonica* (Mehes) var. *tuberculata* n. var. Mehes; p. 554, pl. 13, figs. 17-21.
1958 *Cyprideis tuberculata* (Mehes), Kollmann; p. 161, pl. 13, figs. 7-14.
1962 *Cyprideis tuberculata tuberculata* (Mehes), Decima; p. 125-127, pl. 2, figs. 5a-6b, pl. 3, figs. 1a-4, pl. 4, figs. 3a-6e, pl. 14, figs. 6-9.
1968b *Cyprideis (Cyprideis)* cf. *tuberculata* (Mehes), Krstic; p. 116, pl. 3, figs. 7- 9, pl. 12, fig. 5.
1969 *Cyprideis tuberculata* (Mehes), Carbonnel; p. 78, pl. 12, figs. 16,17.
1971 *Cyprideis tuberculata* (Mehes), Krstic, p. 393, pl. 2.
1972 *Cyprideis mehesi* (Mehes), Sissingh; p. 86, pl. 43.
1978 *Cyprideis tuberculata* (Mehes), Carbonnel; p.79-95, pl. 1, figs.14,15.
1979 *Cyprideis tuberculata* (Mehes), Doruk; p. 165-172, p. 1-2.
1983 *Cyprideis tuberculata* (Mehes), Jiricek; p. 206, pl. 6, fig. 33.
1984 *Cyprideis tuberculata* (Mehes), Tunoğlu; p. 60-61, pl. 2, figs. 13-16.
1988 *Cyprideis tuberculata* (Mehes), Nazik; p. 71-72, pl. 2, figs. 5-9.
1990 *Cyprideis tuberculata* (Mehes), Jiricek and Riha; p. 440, pl. 5, fig. 2.
1996 *Cyprideis tuberculata* (Mehes), Ünal; p. 98,99, pl. 3, figs.3,4; pl.9, figs. 5,6.

Material: 32 carapaces.
Dimensions: Length: 1.00 - 1.25 mm
Height: 0.55 - 0.60 mm
Width : 0.45 - 0.50 mm

Locality and stratigraphic level: Gelibolu Peninsula, Neogene Basin, Late Pannonian. ***Stratigraphic and geographic distribution:*** Austria, Hungary: Pannonian (Kollmann,1958); Vienna Basin: Early Pannonian (Jiricek, 1983; Jiricek and Riha, 1990); Italy: Early Pannonian-Messinian, (Decima,1962); Belgrade, Yugoslavia; Middle-Late Pannonian (Krstic, 1968b); Pannonic Basin: Pannonian (Krstic, 1971); Rhone Basin, France: Late Miocene-Tortonian- Pliocene (Carbonnel, 1969); Crete and Rhodos, Aegean Sea: Late Miocene (Sissingh, 1972); Svaborice, Slovakia: Late Miocene (Carbonnel, 1978); Adana Basin, Turkey: Messinian (Doruk, 1979); Sinop Peninsula, Turkey: Pontian (Tunoğlu, 1984); Ulukışla: Pontian (Nazik, 1988); Gelibolu Peninsula: Late Pannonian (Ünal , 1996).

Cyprideis trituberculata Krstic, 1968a
Plate 2 Figure 1

1968a *Cyprideis (Cyprideis) trituberculata* Krstic, p. 115, pl. 3, figs. 1-3, pl. 12, fig. 2.
1971 *Cyprideis trituberculata* Krstic, p. 394.
1979 *Cyprideis (Cyprideis)* cf. *trituberculata* (Krstic), Bassiouni; p. 86, pl. 10, figs. 11-14.
1996 *Cyprideis trituberculata* (Krstic), Ünal, p. 100,101, pl: 3, figs. 5-7, pl.10, fig.1.

Material: 106 valves.
Dimensions: Length: 0.90 - 1.05 mm
Height: 0.55 - 0.60 mm
Width: 0.45 - 0.50 mm

Stratigraphic and geographic distribution: Belgrade, Yugoslavia: Middle Pannonian (Krstic, 1968a); Pannonic Basin: Late Miocene (Krstic, 1971); Southwest Anatolia, Turkey: Middle-Late Pannonian (Bassiouni,1979); Gelibolu Peninsula, Turkey: Middle-Late Pannonian-Pontian (Ünal, 1996).

Cyprideis quadrituberculata Krstic, 1960
Plate 2 Figures 2, 3

1960 *Cyprideis heterostigma tribulata* (Reuss), Krstic; p. 277, pl. 2, figs. 14-17, pl. 4, figs. 3, 4.
1968 a *Cyprideis (Cyprideis) quadrituberculata* Krstic, p. 116, pl. 3, figs. 4-6, pl. 12, figs. 3-4.
1971 *Cyprideis quadrituberculata* Krstic, p. 394.
1996 *Cyprideis quadrituberculata* Krstic , Ünal; p. 101,102, pl. 4, figs. 1-3, pl.10, figs. 2-4.

Material: 47 valves.
Dimensions: Length: 0.85 - 0.90 mm
Height: 0.50 - 0.60 mm
Width: 0.45 - 0.50 mm
***Stratigraphic and geographic distribution*:** Belgrade, Yugoslavia: Pannonian (Krstic, 1960, 1968a); Pannonian Basin: Pannonian (Krstic, 1971); Gelibolu Peninsula, Turkey: Middle-Late Pannonian, Pontian (Ünal, 1996).

Cyprideis hexatuberculata n. sp.
Plate 2 Figures 4, 5

Derivation of name: It is named as hexatuberculata due to six tuberculates on the surface of valves.
***Holotype*:** Right valve (plate 2, figure 4), Collection number: A9613.
***Paratype*:** 5 valves (Plate 2, Figure 5).
***Type locality*:** Gelibolu Peninsula, Neogene Basin.
Type level: Late Pannonian.
***Diagnosis*:** Valve in kidney shape in lateral view. Dorsal margin strongly convex, ventral margin concave. Anterior margin well rounded and depressed towards to ventral margin, while posterior margin oblique towards the postero-ventral corner.
Description: Carapace is kidney shaped in lateral view. Dorsal margin is strongly convex at the left valve, ventral margin is slightly concave, anterior margin is depressed towards ventral margin and well rounded. Posterior margin is diagonal towards postero-ventral corner. Maximum length, height and width are encountered at the center of carapace. There are six different tuberculates on the surface of the valves. Two of them are equal size and located antero-dorsal and postero-ventral area of carapace, one of them is located postero-dorsal part, three of the others are located at the centre of the carapace and have larger dimensions than the other three tuberculates. Three of them are observed at the dorsal view. Marginal pore canals are well developed, and muscle scar area and sexual dimorphism could not be observed.
Dimentions: Length: 0.75 - 0.80 mm
Height: 0.40 - 0.45 mm
Width: 0.30 - 0.35 mm
Remarks: *C. hexatuberculata* n.sp is differentiaed from *C. trituberculata* and *C. quadrituberculata* by having six tubercules instead of three or four.

Cyprideis cf. ***seminulum*** Reuss, 1850
Plate 2 Figures 6, 7

cf. 1850 *Cytherina seminulum* Reuss, p. 59, pl. 9, fig. 5.
cf. 1958 *Cyprideis seminulum* (Reuss), Kollmann, p. 172 -174, pl. 16, figs. 6-13, figs. 2a - d, 3a -b.
cf. 1979 *Cyprideis (Cyprideis) seminulum* (Reuss, 1850), Bassiouni; p. 91 - 92.
cf. 1996 *Cyprideis* cf. *seminulum* (Reuss), Ünal, p.103, 104, pl. 4, figs. 6, 7; pl. 10, figs.6,7.
Material: 229 carapaces, 60 valves.
Dimensions: Length: 1.00 - 1.05 mm
Height: 0.55 - 0.60 mm
Width: 0.50 - 0.55 mm
Locality and stratigraphic level: Gelibolu Peninsula, Neogene basin, Middle-Late Pannonian.
Remarks: This form has close resemblance to *C. seminulum* Reuss but differs from it by having long carapace in the lateral and dorsal view.

***Cyprideis* sp.1**
Plate 2 Figure 9

***Definition*:** Valve is in triangular shape in lateral view. Anterior margin is well rounded, dorsal margin is convex, ventral margin is slightly straight. Posterior margin is diagonal between postero-dorsal and postero-ventral corners. Maximum dimensions are encountered at the centre of the carapace. There are four tuberculates on the surface of the valves. Two of them are located at the antreo-dorsal and antero-ventral areas. Another two tubercules are at the postero-dorsal area. A greater tubercule of two is located in the centero-ventral. Normal pore and marginal pore canals are well developed. Marginal pore canals are thin, straight and short. Hinge is in genus character (amphidont). Muscle scars could not be observed.
Material: 10 valves.
***Dimensions*:** Length: 0.65 - 0.70 mm
Height: 0.35 - 0.40 mm
Width: 0.10 - 0.15 mm
***Remarks*:** *Cyprideis* sp. 1 is similar to *C. quadrituberculata* Krstic. But, *Cyprideis* sp.1 has very strong and larger tuberculates than *C. quadrituberculata* Krstic. *Cyprideis* sp. 1 is also similar to *Cyprideis undosa* (Harten), but it differs from it by having stronger and larger tuberculates.

***Locality and stratigraphic level*:** Gelibolu Peninsula, Neogene Basin, Late Pannonian.
Family: LOXOCONCHIDAE Sars, 1928
Genus: *Loxoconcha* Sars, 1866
Type species: *Cythere rhomboidea* Fischer, 1855
Stratigraphic distribution:Paleocene-Recent
Environment: Littoral, mesohaline salinity conditions.

***Loxoconcha* sp.1**
Plate 2 Figures 10, 11

Definition: Lateral view is ovate, dorsal and ventral margins are convex and nearly parallel to each other. Anterior and posterior margins are well rounded and depressed towards postero-dorsal area. Maximum length, height and width are observed at the centre of the carapace. Surface of the valve is covered with small pits. Interior features and sexual dimorphism could not be observed.
Material: 22 carapaces.
Dimensions: Length: 0.55 - 0.60 mm
Height: 0.35 - 0.40 mm
Width: 0.25 - 0.30 mm
Remarks: *Loxoconcha* sp. 1 is similar to *L. elliptica* Krstic, but differs former from latter not having a caudal proces at the posterior. Furthermore, *Loxoconcha* sp. 1 has more depressed carapace than *L. elliptica* Krstic at the dorsal view.
Locality and stratigraphic level: Gelibolu Peninsula, Neogene Basin, Middle-Late Pannonian.
Superfamily: CYPRIDACEA Baird, 1845
Family: ILYOCYPRIDIDAE Kaufmann, 1900
Genus: *Ilyocypris* Brady and Norman, 1889
Stratigraphic distribution: ? Triassic-Recent
Environments: Freshwater and oligohaline salinity condition and mudy substrate (Morkhoven, 1963)

***Ilyocypris pontica* n. sp.**
Plate 2 Figures 12-14

Derivation of name: Due to its occurrence in Pontian stage.
Holotype: Right valve (plate 2, figure 12), Collection number: A9620.
***Paratype*:** 39 valves.
***Type locality*:** Gelibolu Peninsula-Neogene Basin.
Type level: Middle Pannonian-Pontian.
Diagnosis: Carapace rectangular in lateral view. Dorsal margin straight, ventral margin slightly concave, anterior margin broadly rounded, posterior margin well rounded. Anterior end more tapering than the posterior end at the dorsal view. Surface ornamentation characterized by large tubercules between postero-dorsal and central-dorsal areas.
Description: General valve is rectangular shape laterally. Dorsal margin is straight and has angular antero and postero-dorsal corners. Ventral margin is slightly concave. Anterior margin is broadly rounded. Posterior margin is well rounded. Anterior and posterior margins have spines. Surface of the valve is covered by reticulates and three strong tuberculates. One of them is larger and located between central-dorsal and postero-dorsal parts. Another one is located at antero-dorsal area with moderate dimensions. The last one is located at the central-ventral area. Maximum height is encountered at the anterior, maximum length and width are observed at the center of carapace. Muscle scars and sexual dimorphism could not be observed.
Dimensions: Length: 0.75 - 0.80 mm
Height: 0.35 - 0.40 mm
Width: 0.25 - 0.30 mm
Remarks: *Ilyocypris pontica* n.sp is similar to *I. gibba* Guernet et al., but it differs from *I. Gibba* Guernet et al. by having large tuberculates on the valve surface.

***Ilyocypris bradyi* Sars, 1890**
Plate 2 Figures 15, 16

1888 *Ilyocypris bradyi* Sars; p. 59 (nomen nudum).
1928 *Ilyocypris bradyi* Sars; p. 109, pl. 4, fig. 2.
1956 *Ilyocypris bradyi* Sars , Agalarova; p. 158, pl. 6, figs. 5a - 5b.
1962 *Ilyocypris bradyi* Sars , Jordan et. al.; p. 87, pl 44, figs. 26 - 40.
1966 *Ilyocypris bradyi* Sars , Stancheva; p. 212, pl. 3, fig. 2.
1970 *Ilyocypris bradyi* Sars , Gagic and Sokac; p. 138.
1977 *Ilyocypris bradyi* Sars , Guernet et. al.; p. 308, pl. 1, fig. 15.
1979 *Ilyocypris bradyi* Sars , Harten; p. 77, pl. 1, figs. 1b, 2c, 2d, pl. 2, figs. 1b, 2b.
1980 *Ilyocypris bradyi* Sars , Krstic and Obradovic, p. 94.

1988 *Ilyocypris bradyi* Sars , Nazik; p. 78, pl. 4, figs. 1 - 3.
1992 *Ilyocypris bradyi* Sars, Şafak; p. 25, pl. 5, fig. 5.
1992 *Ilyocypris bradyi* Sars, Şafak et. al., p. 176, pl. 1, fig. 1.
1996 *Ilyocypris bradyi* Sars, Ünal, p. 108-110, pl. 6, figs. 1,2; pl. 11, figs. 8-10.

***Material*:** 50 carapaces, 5 valves.

***Dimensions*:** Length: 0.85 - 0.95 mm
Height: 0.45 - 0.50 mm
Width: 0.35 - 0.40 mm

Stratigraphic and geographic distribution: Azerbaijan-Turkmenistan: Pliocene(Agalarova, 1956); Yugoslavia: Pleistocene (Gagic and Sokac, 1970); Recent (Harten,1979); Pleistocene (Krstic and Obradovic, 1980); Bulgaria: Pliocene (Stancheva, 1966); Germany: Pleistocene (Jordan et.al.,1962); Greece: Late Pliocene (Guernet et. al., 1977); Ulukışla, Turkey: Pontian (Nazik, 1988); Antakya, Turkey: Pliocene (Şafak, 1992); Sarız, Turkey: Pliocene (Şafak et al., 1992); Gelibolu Peninsula, Turkey: Middle-Late Pannonian (Ünal, 1996).

***Ilyocypris* sp.**
Plate 2 Figure 17

Definitions: Carapace is in subrectangular shape in the lateral view. Dorsal margin is straight. Ventral margin is slightly straight. Anterior end is broadly rounded. Posterior margin is well rounded. Postero-dorsal and antreo-dorsal corners are angular. Maximum height is at the anterior. Maximum length and width are at the center of the carapace. Marginal zone is narrow, Marginal pore canals are straight and simple. Hinge is adont.

Material: 6 valves.

Dimensions: Length: 0.95 - 1.00 mm
Height: 0.35 - 0.40 mm
Width: 0.40 - 0.45 mm

Remarks: Due to less and not well preserved material, species identification could not be realized.

Locality and stratigraphic level: Gelibolu Peninsula, Neogene Basin, Middle-Late Pannonian.

Family: CANDONIDAE Kaufmann, 1900
Subfamily: CANDONINAE Kaufmann, 1900
Genus: ***Candona,*** Baird, 1854
Type specimen: ***Cypris candida*** Müller, 1776
Stratigraphic distribution: Oligocene (Eocene ?)-Recent

Environment: Freshwater, rarely brackish water.

Candona neglecta Sars, 1888
Plate 3 Figure 1

1888 *Candona neglecta* Sars; p.107 (nomen nudum)
1957 *Candona neglecta* Sars, Wagner; p. 21, pl. 3.
1959 *Candona neglecta* Sars, Luttig; p. 190,191, pl. 23, fig.1, 2.
1965 *Candona neglecta* Sars, Devato; p. 340, fig. 41.
1966 *Candona neglecta* Sars, Stancheva; p. 214, pl. 2, fig. 1.
1968 *Candona neglecta* Sars, Bhatia; p. 474, pl. 3, figs. 1a-f, pl. 5, figs. 5-7.
1969 *Candona neglecta* Sars, Carbonnel; p. 39-41, pl. 1, fig. 19, pl. 3, figs. 20-21.
1969 *Candona neglecta* Sars, n. subsp. Sars, Grammann; p. 518, pl. 32, fig. 6.
1975 *Candona neglecta* Sars, Sokac; p. 112-114, pl. 1-3.
1979 *Candona neglecta* Sars, Gökçen; p. 116, pl. 6, figs.14,15.
1979 *Candona neglecta* Sars, Guernet; p. 34, pl. 3, figs. 3, 4.
1980 *Candona neglecta* Sars, Freels; p. 94, pl. 16, figs. 8-11.
1983 *Candona neglecta* Sars, Jiricek; p. 220.
1988 *Candona (Candona) neglecta* Sars, Nazik; p. 80, 81, pl. 4, figs. 4-6.
1991 *Candona neglecta* Sars, Pietrzeniuk; p.106, pl. 2, figs. 1-4.
1992 *Candona (Candona) neglecta* Sars, Şafak et. al., p. 178, pl. 3, figs. 3, 4.
1994 *Candona neglecta* Sars, Nasser; p. 314, pl. 5, fig. 2.
1995 *Candona (Candona) neglecta* Sars, Tunoğlu et al; p. 273, pl.1, figs.19-23.
1996 *Candona neglecta* Sars , Ünal p. 112, 113, pl. 6, figs. 6,7; pl. 12, fig. 5.

Material: 16 carapaces, 10 valves.

Dimensions: Length: 1.25 - 1.45 mm
Height: 0.75 - 0.95 mm
Width: 0.60 - 0.70 mm

***Locality and stratigraphic level*:** Gelibolu Peninsula, Neogene Basin, Pannonian, Pontian.

Stratigraphic and geographic distribution: Netherlands: Holocene (Wagner, 1957); Germany: Holocene (Luttig, 1959); Liri Valley, Italy: Quaternary (Devato, 1965); Bulgaria: Levantini-

an (Stancheva, 1966); Kasmin, India: Pleistocene (Bhatia, 1968); Rhone Basin, France: Late Miocene-Pliocene (Carbonnel, 1969), Dinaric Karst, Yugoslavia: Plio-Quaternary (Sokac, 1975); Greece: Late Senozoic (Guernet, 1979); Late Pliocene (Nasser, 1994); Denizli, Muğla, Turkey: Sarmatian-Pannonian (Gökçen, 1979); Burdur : Pleistocene (Freels, 1980); Ulukışla : Pontian (Nazik, 1988); Sarız, Kayseri: Pliocene (Şafak et al., 1992); Eskişehir: Pliocene (Tunoğlu et al., 1995); Gelibolu Peninsula, NW Turkey: Early-Late Pannonian-Pontian (Ünal, 1996).

Candona parallela pannonica Zalanyi, 1959
Plate 3 Figures 2-4

1959 *Candona parallela pannonica* Zalanyi; p. 200-202, pl. 3, figs. a-c.
1963 *Candona pokornyi* Kheil; p. 23-25, pl. 2, figs. 1-4.
1979 *Candona (Candona) parallela pannonica* Zalanyi, Gökçen; p. 119, pl. 7, figs. 1, 2.
1988 *Candona parallela pannonica* Zalanyi, Nazik; p. 80, pl. 4, figs. 8-11, pl. 7, fig. 11.
1989 *Candona parallela pannonica* Zalanyi, Tanar, p. 143, 144, pl. 11, figs. 1-3.
1992 *Candona (Candona) parallela pannonica* Zalanyi, Nazik et. al., p. 301, pl. 2, fig. 1.
1992 *Candona (Candona) parallela pannonica* (Zalanyi), Şafak et. al., p. 178, pl. 3, fig. 2.
1995 *Candona (Candona) parallela pannonica* Zalanyi, Tunoğlu et. al; p. 273, pl., 1, figs. 24-28.
1996 *Candona (Candona) parallela pannonica* Zalanyi, Ünal, p. 113-115, pl. 7, fig. 1,2; pl. 12, figs. 6-8.

Material: 173 valves.
***Dimensions*:** Length: 0.70 - 0.75 mm
Height: 0.35 - 0.40 mm
Width: 0.30 - 0.35 mm
***Stratigraphic and geographic distribution*:** Pannonic Basin, Hungary: Late Pannonian (Zalanyi, 1959); Trebon Basin, Czechoslovakia: Tortonian (Kheil, 1963); Denizli, Muğla, Turkey: Pontian(Gökçen, 1979); Ulukışla, Adana, Turkey: Pontian (Nazik, 1988); Mut Basin, Turkey: Burdigalian (Tanar, 1989); Adana: Pliocene (Nazik et al., 1992); Sarız, Kayseri: Pliocene (Şafak et al.,1992); Eskişehir, Turkey: Pliocene (Tunoğlu et al., 1995); Gelibolu Peninsula, NW Turkey: Middle-Late Pannonian-Pontian (Ünal, 1996).

Candona candida Müller, 1776
Plate 3 Figure 7

1776 *Candona candida* Müller (nomen nudum)
1965 *Candona candida* Müller, Devoto; p. 337, fig. 36.
1973 *Candona (Candona) candida pliocenica* Müller, Krstic; p. 151-173, figs. 1, 2.
1978 *Candona candida* Müller, Sokac; p. 24-25, pl. 9, figs. 1-4.
1980 *Candona (Candona)* aff. *candida* Müller, Freels; p. 80-82, pl. 13, figs. 6-8.
1984 *Candona (Candona)* cf. *candida* Müller, Tunoğlu; p. 118-119, pl. 9, figs. 1-3.
1991 *Candona candida* Müller, Pietrzeniuk; p. 106, Pl. 2, figs. 5-7.
1996 *Candona candida* Müller, Ünal, p. 116,117, pl. 7, figs. 3, 4; pl. 13, fig. 1.

***Material*:** 31 valves, 4 carapaces.
***Dimensions*:** Length: 1.00 - 1.25 mm
Height: 0.55 - 0.60 mm
Width: 0.50 - 0.55 mm
***Stratigraphic and geographic distribution*:** Liri Valley, Italy: Pleistocene (Devato, 1965); Yugoslavia, Pontian (Krstic, 1973); Pannonic Basin: Pontian (Sokac, 1978); Germany: Miocene (Pietrzeniuk, 1991); Aydın, Turkey: Late Miocene (Freels, 1980); Sinop Peninsula, Turkey: Pontian (Tunoğlu, 1984); Gelibolu Peninsula: Early Pannonian-Pontian (Ünal, 1996).

***Candona* sp.**
Plate 3 Figures 5, 6

Definitions: Valve is bean shape in outline. Dorsal margin is diagonally straight, ventral margin is strongly concave, anterior margin is depressed towards ventral margin and well rounded. Posterior margin is diagonal between postero-dorsal and postero-ventral and well rounded at the postero-ventral. Left valve is larger than the right valve. Maximum height is encountered at the posterior area, maximum length and width are at the center of carapace, postero-ventral corner is extended towards backward. Interior features could not be observed.

***Material*:** 3 valves, 7 carapaces.
***Dimensions*:** Lenght: 1.00 - 1.05 mm
Height: 0.60 - 0.65 mm
Width: 0.45 - 0.50 mm
***Remarks*:** This species is similar to *Candona devexa* (Kaufmann) in general valve shape and diagonal dorsal margin. But it differs shape from

C. devexa by having a very narrow, tapering postero-dorsal margin and straight dorsal margin.

***Locality and stratigraphic* level:** Gelibolu Peninsula, Neogene Basin, Middle Pannonian.

Family: CYPRIDIDAE Baird, 1845

Subfamily: CYPRINOTINAE Bronstein, 1947

Genus: *Cyprinotus* Brady, 1886

Type species: *Cyprinotus cingalansis* Brady, 1886

Stratigraphic level: Oligocene-Recent

Environment: Generally freshwater, insomecases in oligo-mesohaline (Morkhoven, 1963).

Cyprinotus salinus (Brady, 1886)
Plate 3 Figure 8

1886 *Cypris salinus* Brady; p. 368, pl. 28, figs. 8-13.
1957 *Cyprinotus salinus* (Brady), Wagner; p. 30, pl. IX.
1959 *Cyprinotus salinus* (Brady), Luttig; p. 191, pl. 23, fig. 4, pl. 24, figs. 1-3.
1962 *Cyprinotus salinus* (Brady), Jordan et al.; p. 76, pl.1, fig. 6-8, pl. 3, fig. 8.
1966 *Cyprinotus salinus* (Brady), Stancheva; p. 213, pl. III, fig. 1.
1969 *Cyprinotus salinus bressanus* n. subsp., Carbonnel; p. 53-55, pl. 2, figs. 14, 15, pl. 3, fig. 17.
1996 *Cyprinotus salinus* (Brady), Ünal, p. 117,118, pl. 7, figs. 5, 6; pl. 13, fig. 4.

Material: 11 valves.

Dimensions*:* Length: 1.05 - 1.10 mm
Height:: 0.65 - 0.70 mm
Width: 0.65 - 0.70 mm

Stratigraphic and geographic distribution: Germany: Pleistocene (Luttig, 1959, Jordan et al., 1962); The Netherland: Holocene (Wagner, 1957); Bulgaria: Levantian (Stancheva, 1966); Lyon, France: Tortonian (Carbonnel, 1969); Bou Ismail, Algeria: Recent (Yassini, 1979); Gelibolu Peninsula, Turkey: Late Pannonian (Ünal, 1996).

RESULTS

The general and important results derived from this investigation are as follows.

1. Fourteen species and eight taxa belonging to open nomenclature, two species and one subspecies are new from Neogene units of the Gelibolu Peninsula were systematically identified and described.
2. Genus *Cyprideis* and related species are dominant in the ostracoda.
3. These fauna clearly reveals brackish and lagoonal environments.
4. Based on this study, *Cprideis* species were determined and confirmed with Ostracoda Zones 16 and 18 in the studies of Jiricek (1983) and Jiricek and Riha (1990).
5. The chronostratigraphic subdivision of the Neogene sequence was mainly done by using ostracoda fauna and these data was correlated with the other fauna groups (microvertebrate, spore and pollen, microgastropoda, benthic foraminifera) As a result of this study, Pannonian (Early, Middle, Late) and Pontian stages were separated.
6. The Gelibolu Neogene Basin is associated with the Paratethys Basins, particularly Pannonic and Euxinic Basins, based on the ostracoda fauna assemblages. The basin was located at the southern margin of the Paratethys and had no connection to the Mediterranean Tethys during this time interval.

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PLATE 1

Figure 1, 2. ***Limnocythere* sp.1**
Karagöz Hill Section, KAR-2, Middle Pannonian.
1. Right valve, external.
2. Left valve, external.

Figure 3, 4. ***Limnocythere* sp.2**
Halaç Sırtı Section, H-8, Middle-Late Pannonian.
3. Right valve, external.
4. Left valve, external.

Figure 5. ***Paralimnocythere* sp.1**
Behramlı Section, BE-9, Early-Late Pannonian.
Left valve, external.

Figure 6, 7. ***Paralimnocythere* sp.2**
Çamtekke Point Sample, Ç-6, Middle Pannonian.
6. Right valve, external.
7. Carapace, dorsal.

Figure 8. ***Cyprideis pannonica*** (Mehes, 1908)
Behramlı Section, BE-18, Early-Late Pannonian-Pontian.
Right valve, external.

Figure 9. ***Cyprideis sublitorallis*** (Pokorny, 1952)
Ilgardere Section, I-16, Late Pannonian-Pontian.
Left valve, external.

Figure 10. ***Cyprideis torosa tuberculata* n. ssp**.
Ilgardere Section, I-24, Middle-Late Pannonian-Pontian.
Left valve, external (Holotype).

Figure 11, 12. ***Cyprideis tuberculata*** (Mehes, 1908)
Mata Dağı Section, MD-5, Late Pannonian.
11. Right valve, external.
12. Left valve, external.

LEVHA 1

Şekil 1, 2. ***Limnocythere* sp.1**
Karagöz Tepe Kesiti, KAR-2, Orta Pannoniyen.
1. Sağ kapak, dış görünüm.
2. Sol kapak, iç görünüm.

Şekil 3, 4. ***Limnocythere* sp.2**
Halaç Sırtı Kesiti, H-8, Orta-Geç Pannoniyen.
3. Sağ kapak, dış görünüm.
4. Sol kapak, dış görünüm.

Şekil 5. ***Paralimnocythere* sp.1**
Behramlı Kesiti, BE-9, Orta-Geç Pannoniyen.
Sol kapak, dış görünüm.

Şekil 6, 7. ***Paralimnocythere* sp.2**
Çamtekke, nokta örnek, Ç-6, Orta Pannoniyen.
6. Sağ kapak, dış görünüm.
7. Kabuk, sırt görünümü.

Şekil 8. ***Cyprideis pannonica*** (Mehes, 1908)
Behramlı Kesiti, BE-18, Erken-Geç Pannoniyen-Ponsiyen.
Sağ kapak, dış görünüm.

Şekil 9. ***Cyprideis sublitorallis*** (Pokorny, 1952)
Ilgardere Kesiti, I-16, Geç Pannoniyen-Ponsiyen.
Sol kapak, dış görünüm.

Şekil 10. ***Cyprideis torosa tuberculata* n. ssp**.
Ilgardere Kesiti, I-24, Orta-Geç Pannoniyen-Ponsiyen.
Sol kapak, dış görünüm, Holotip.

Şekil 11, 12. ***Cyprideis tuberculata*** (Mehes, 1908)
Mata Dağı Kesiti, MD-5, Geç Pannoniyen.
11. Sağ kapak, dış görünüm.
12. Sol kapak, dış görünüm.

PLATE / ***LEVHA 1***

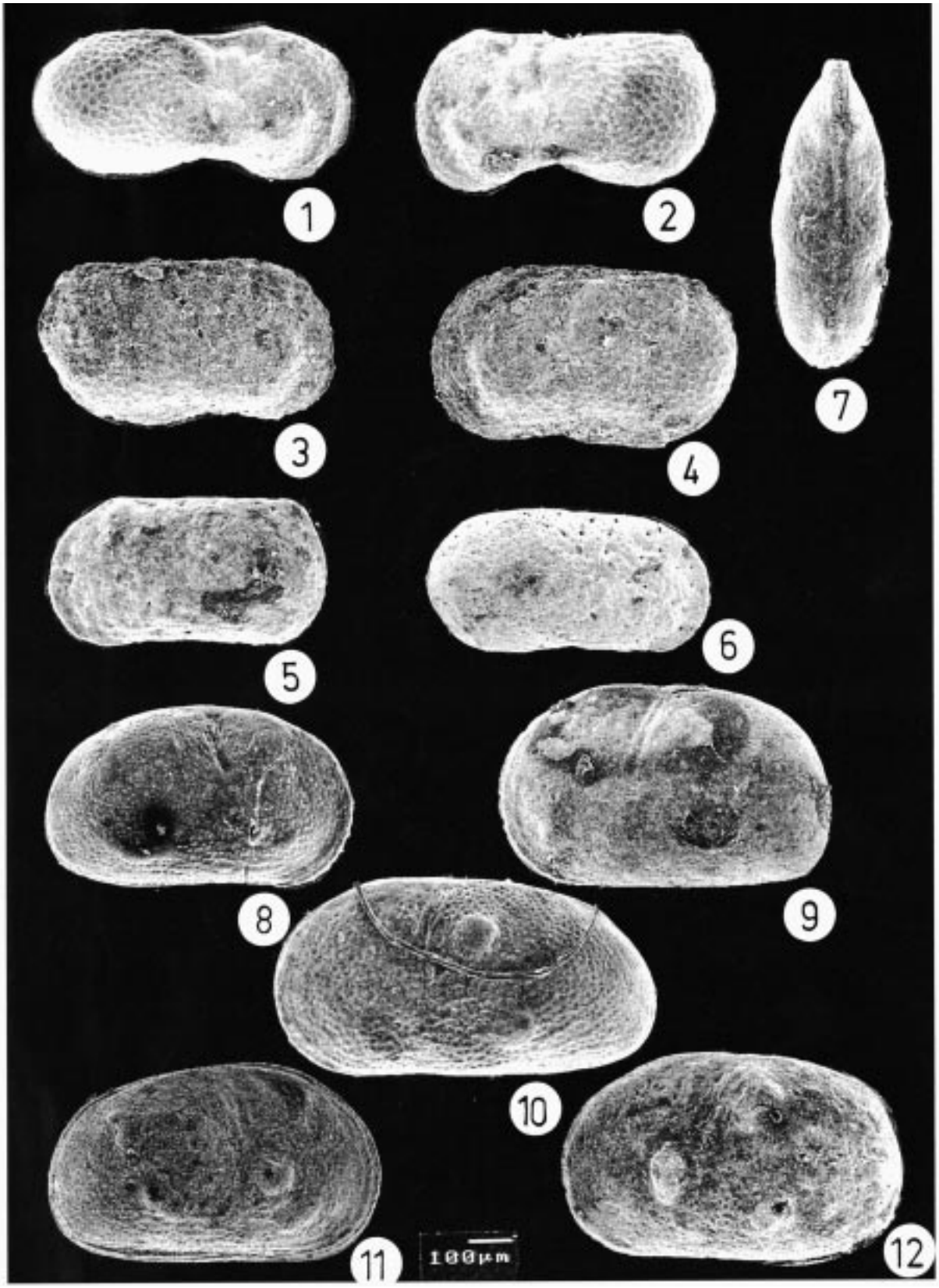

PLATE 2

Figure 1. ***Cyprideis tritubercula*** (Krstic, 1968a)
Behramlı Section, BE-18, Middle-Late Pannonian-Pontian.
Right valve, external.

Figure 2, 3. ***Cyprideis quadrituberculata*** Krstic, 1960
Cevizli Section, C-11, Middle-Late Pannonian-Pontian.
2. Left valve, external.
3. Carapace, dorsal.

Figure 4, 5. ***Cyprideis hexatuberculata*** n.sp.
Ilgardere Section, I-22, Late Pannonian.
4. Right valve, external, Holotype.
5. Rigth valve, dorsal, Paratype.

Figure 6, 7. ***Cyprideis*** cf. ***seminulum*** (Reuss, 1850)
Behramlı Section, BE-15, Middle-Late Pannonian.
Right valve, external.

Figure 9. ***Cyprideis*** sp.2
Poyraz Hill Section, PT-5, Late Pannonian.
Right valve, external.

Figure 10, 11. ***Loxoconcha,*** sp.1
Behramlı section, BE-4, Middle-Late Pannonian.
10. Right valve, external.
11. Carapace, dorsal.

Figure 12, 13. ***Ilyocypris bradyi*** Sars, 1890
Behramlı Section, BE-19, Middle-Late Pannonian.
12. Right valve, external.
13. Carapace, dorsal.

Figure 14-16. ***Ilyocypris pontica*** n.sp.
Tersane Section, TER-4, Middle-Late Pannonian-Pontian.
14. Right valve, external, Holotype.
15. Left valve, external, Paratype.
16. Right valve, dorsal.

Figure 17. ***Ilyocypris*** sp.
Tersane Section, TER-5, Middle-Late Pannonian.
Left valve, external.

LEVHA 2

Şekil 1. ***Cyprideis tritubercula*** (Krstic, 1968a)
Behramlı Kesiti, BE-18, Orta-Geç Pannoniyen-Ponsiyen.
Sağ kapak, dış görünüm.

Şekil 2, 3. ***Cyprideis quadrituberculata*** Krstic, 1960
Cevizli Kesiti, C-11, Orta-Geç Pannoniyen-Ponsiyen.
2. Sol kapak, dış görünüm.
3. Kabuk, sırt görünümü.

Şekil 4, 5. ***Cyprideis hexatuberculata*** n.sp.
Ilgardere Kesiti, I-22, Geç Pannoniyen.
4. Sağ kapak, dış görünüm, Holotip.
5. Sağ kapak, sırt görünümü, Paratip.

Şekil 6, 7. ***Cyprideis*** cf***. seminulum*** (Reuss, 1850)
Behramlı Kesiti, BE-15, Orta-Geç Pannoniyen.
Sağ kapak, dış görünüm.

Şekil 9. ***Cyprideis*** sp.2
Poyraz Tepe Kesiti, PT-5, Geç Pannoniyen.
Sağ kapak, dış görünüm.

Şekil 10, 11. ***Loxoconcha*** sp.1
Behramlı Kesiti, BE-4, Orta-Geç Pannoniyen.
10. Sağ kapak, dış görünüm.
11. Kabuk, sırt görünümü.

Şekil 12, 13. ***Ilyocypris bradyi*** Sars, 1890
Behramlı Kesiti, BE-19, Orta-Geç Pannoniyen.
12. Sağ kapak, dış görünüm.
13. Kabuk, sırt görünümü.

Şekil 14-16. ***Ilyocypris pontica*** n.sp.
Tersane Kesiti, TER-4, Orta-Geç Pannoniyen-Ponsiyen.
14. Sağ kapak, dış görünüm, Holotip.
15. Sol kapak, dış görünüm, Paratip.
16. Sağ kapak, sırt görünümü.

Şekil 17. ***Ilyocypris*** sp.
Tersane Kesiti, TER-5, Orta-Geç Pannoniyen.
Sol kapak, dış görünüm.

PLATE / *LEVHA 2*

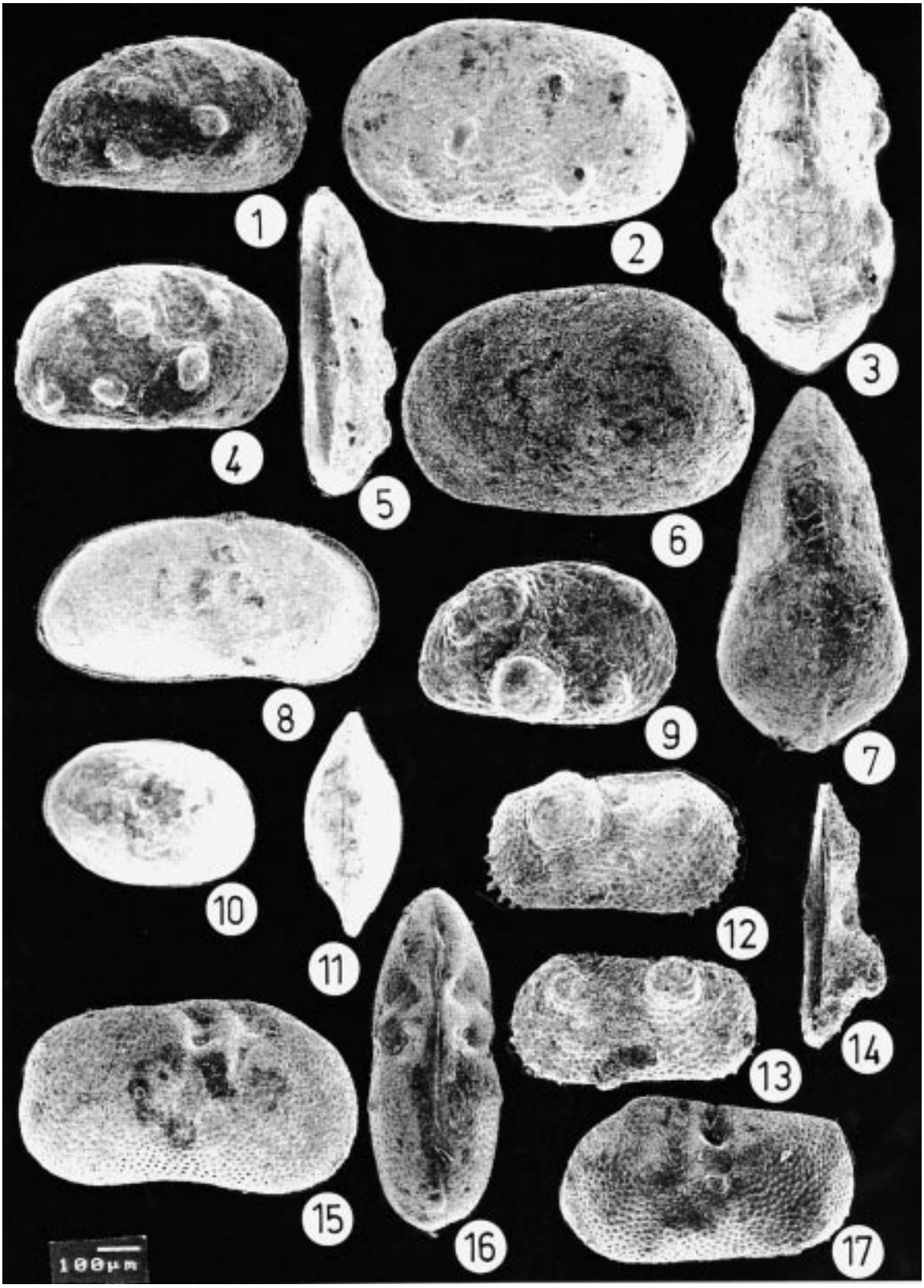

PLATE 3

Figure 1. ***Candona neglecta*** (Sars, 1888)
Poyraztepe Section, PT-5, Early-Late Pannonian-Pontian.
Left valve, external.

Figure 2-4. ***Candona parallela pannonica*** Zalanyi, 1959
Behramlı Section, BE-4, Middle-Late Pannonian-Pontian.
2. Left valve, external.
3. Right valve, external.
4. Right valve, dorsal.

Figure 5, 6. ***Candona*** sp.
Tersane Section, TER-2, Middle Pannonian.
5. Left valve, external.
6. Carapace, right valve.

Figure 7. ***Candona candida*** (Müller, 1776)
Mersinli Hill Section, M-6, Early-Late Pannonian-Pontian.
Left valve, external.

Figure 8. ***Cyprinotus salinus*** Brady, 1886.
Behramlı Section, BE-18, Late Pannonian.
Left valve, external.

LEVHA 3

Şekil 1. ***Candona neglecta*** (Sars, 1888)
Poyraztepe Kesiti, PT-5, Erken-Geç Pannoniyen-Ponsiyen.
Sol kapak, dış görünüm.

Şekil 2-4. ***Candona parallela pannonica*** Zalanyi, 1959
Behramlı Kesiti, BE-4, Orta-Geç Pannoniyen-Ponsiyen.
2. Sol kapak, dış görünüm.
3. Sağ kapak, dış görünüm.
4. Sağ kapak, sırt görünümü.

Şekil 5, 6. ***Candona*** sp.
Tersane Kesiti, TER-2, Orta Pannoniyen.
5. Sol kapak, dış görünüm.
6. Kabuk, sağ kapak görünümü.

Şekil 7. ***Candona candida*** (Müller, 1776)
Mersinli Tepe Kesiti, M-6, Erken-Geç Pannoniyen-Ponsiyen.
Sol kapak, dış görünüm.

Şekil 8. ***Cyprinotus salinus*** Brady, 1886.
Behramlı Kesiti, BE-18, Geç Pannoniyen.
Sol kapak, dış görünüm.

PLATE / ***LEVHA 3***