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YAVUZ OKAN

İZZET HOŞGÖR

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YAVUZ OKAN & İZZET HOŞGÖR

Ankara University, Faculty of Engineering, Department of Geological Engineering,
Tandoğan, TR–06100 Ankara, Turkey (E-mail: okan@eng.ankara.edu.tr)

Abstract: Marine bivalves *Septimyalina sublamellosa* (Etheridge 1878), *Septimyalina lamellosa* (de Koninck 1842), *Septimyalina minor* (Brown 1841) and *Posidonia becheri* Bronn, 1828 are described from the Visean–Namurian transition of Zonguldak coal basin, Northwestern Turkey. Macroinvertebrate fossils are rare in the Lower Carboniferous of the Zonguldak coal basin and only a few shallow marine forms of Myalinidae and Posidoniidae families are present. Their palaeobiogeographic distribution delineates a seaway from Britain to the Black Sea coast during the Carboniferous.

Key Words: bivalvia, Septimyalina, Posidonia, Early Carboniferous, Zonguldak, Turkey

Zonguldak Kömür Havzasının Geç Vizeyen–Erken Namuriyen Bivalvleri, Kuzeybatı Türkiye

Özet: Zonguldak kömür havzasında, Kuzeybatı Türkiye, Vizeyen–Namuriyen yaş sınırında, *Septimyalina sublamellosa* (Etheridge 1878), *Septimyalina lamellosa* (de Koninck 1842), *Septimyalina minor* (Brown 1841) ve *Posidonia becheri* Bronn, 1828 denizel bivalv örnekleri tanımlanarak, yaşam şekilleri ve paleobiyocoğrafik yayılımları incelenmiştir. Çalışma bölgesinde Erken Karbonifer'de omurgasız fosil azdır ve ancak sığ denizel Myalinidae ve Posidoniidae familyalarına ait fosiller bulunmaktadır. Bu fosillerin varlığı Karbonifer'de, Britanya'dan Karadeniz kıyılarına uzanan bir deniz yolunu işaretlemektedir.

Anahtar Sözcükler: bivalvia, Septimyalina, Posidonia, Erken Karbonifer, Zonguldak, Türkiye

Introduction

In Northwest Turkey, the most complete sequence of Carboniferous rocks of the Pontides is exposed in the Zonguldak area (Figure 1), where the pioneering regional studies were made by Lucius (1931). Arni (1938), Jongmans (1939), Artüz (1959), Ağralı & Konyalı (1969), Dil (1975, 1976, 1980), Nakoman (1975), and Dil *et al*. (1976) subsequently investigated the stratigraphy and structure of the Carboniferous rocks in the Zonguldak and contiguous areas. Carboniferous rocks exposed in the Zonguldak coal area in Northwestern Turkey contain a poor macroinvertebrate fauna dominated by brachiopods, corals, goniatites, bivalves and plants (Figure 2). The bivalves represented by *Septimyalina* and *Posidonia* in Visean beds as the conspicuous elements of the fauna with their large size and distinct shapes. Until now, bivalves from the Zonguldak coal area were only mentioned by a few authors (Dil & Konyalı 1978; Dil 1980). In the present study, the authors describe three representatives from the Myalinidae Frech, 1891, and one from the Posidoniidae Frech, 1909 families introduced from the Lower Carboniferous of Zonguldak coal field and discuss their modes of life and palaeobiogeographical distribution.

General Geologic Setting

The rock units of Carboniferous age cropping out in northwest Anatolia along the Black Sea coast are overlain by folded and faulted Mesozoic and Tertiary formations. Where the younger formations are stripped away, Carboniferous outcrops can be seen as inliers along a strip parallel to the Black Sea from Ereğli in the west to İnebolu in the east. The longest and most important outcrops of Carboniferous strata can be seen at Zonguldak where the productive coal measures of the Upper Carbonifeous are exploited. The formations which underlie the base of the coal-bearing rocks, are the

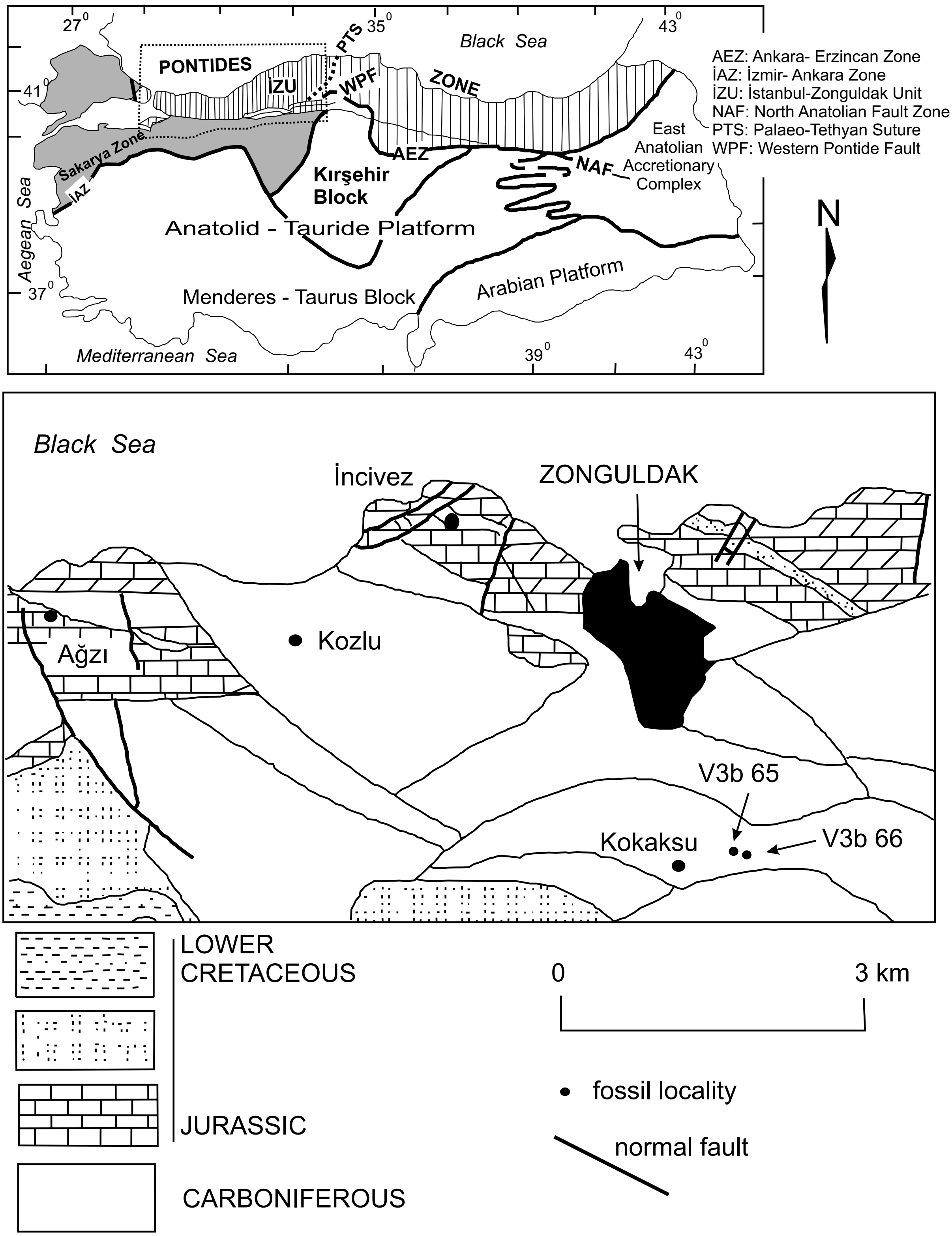

Figure 1. Zonguldak Carboniferous basin of northwest Anatolia and geological map of the study area in the Kokaksu Valley (Tüysüz 1999; Elmas & Yiğitbaş 2001).

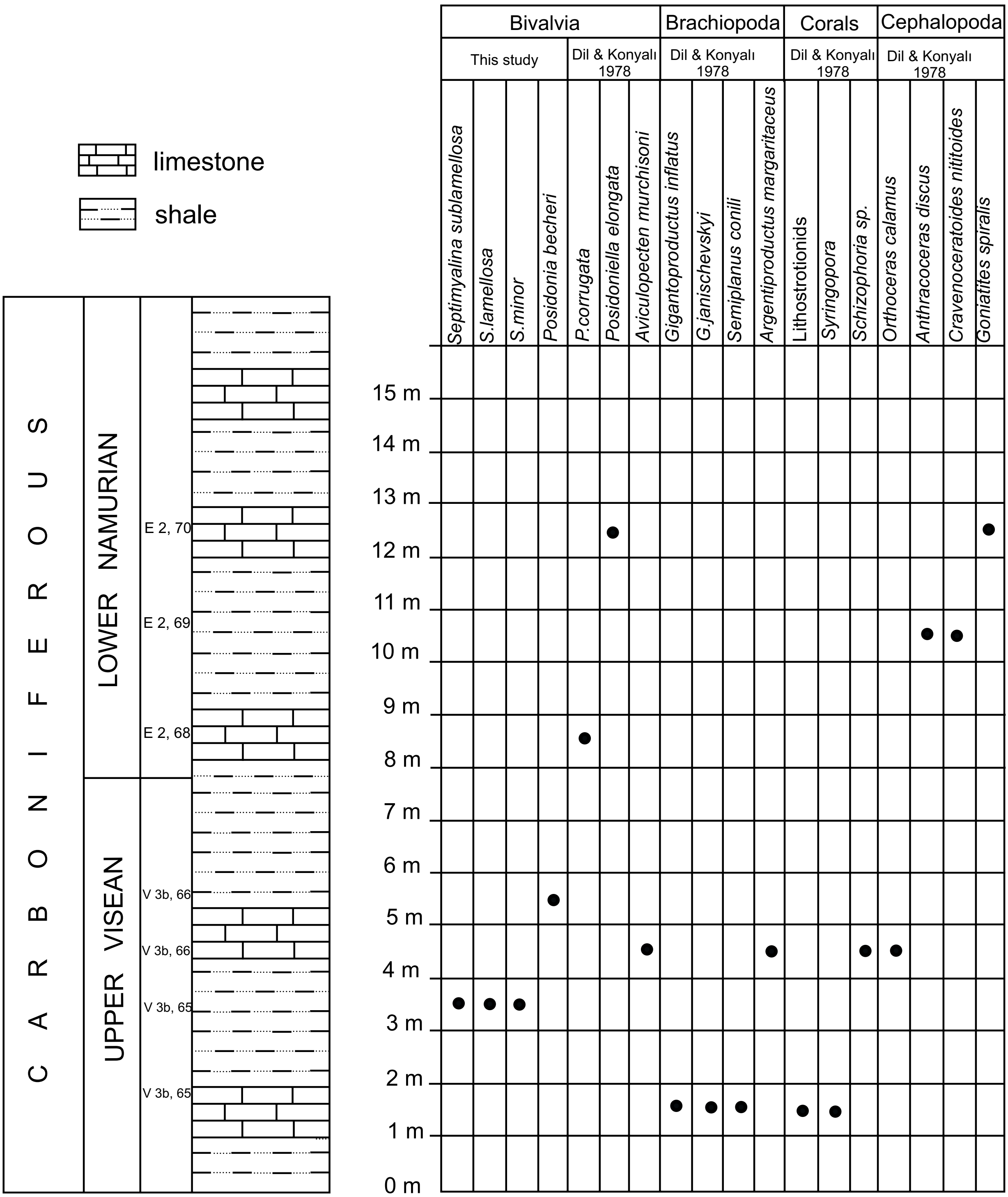

Figure 2. Measured section of the Kokaksu Valley, wtih stratigraphic ranges of all identified macroinvertebrate fossil species (Dil 1975; Dil & Konyalı 1978).

Precambrian metamorphics and Palaezoic sediments (Silurian, Devonian, and Lower Carboniferous).

The Lower Carboniferous of the Zonguldak area is represented by well bedded, grey to cream coloured limestones and dolomites in the lower levels of the sequence, and alternation of dark coloured, fossil-rich shale and limestones 30–40 m thick (Dil 1975; Dil & Konyalı 1978) which contains large brachiopods (Figure 2) (*Gigantoporoductus* sp., *Semiplanus* sp.), corals (*Syringopora* sp.) and plants (*Siphonodendron* sp.). The shale contains plant remains and a thin coal seam from which myaliniids and posidoniids have not previously been identified. Both groups are excellent palaeobiostratigraphic tools for interpretation of Carboniferous strata and in this study, the authors identify *Septimyalina sublamellosa* (Etheridge 1878), *Septimyalina lamellosa* (de Koninck 1842), *Septimyalina minor* (Brown 1841) and *Posidonia becheri* Bronn, 1828 from thick shale units. The shale section is located 1.5 km south of Zonguldak, in the Kokaksu Valley. Further south the oldest part of the section is unconformably overlain by the Velibey sandstone of Lower Cretaceous age.

The fossiliferous shaly sequence is mainly composed of shales with intercalations of limestone bands of late Visean age. The very rich fauna includes: *Girvanella ducii, G. wetheredi, Tetrataxis* sp., *Valvulinella* sp., numerous Archaediscidae, *Endothyra* sp., *Endothyranopsis compressa*, numerous *Endostaffella* sp., and *Euxinella* sp., *Exvatarisella* sp., *Moravammina kamaena*, *Stacheoides* cf. *papillata*. Consequently, the rich microfauna of bivalves presented in this paper supports the age assignment (Dil 1976; Dil & Konyalı 1978).

Material and Collections

This study is based on 25 specimens collected from a single locality in the Kokaksu valley, to the south of the Zonguldak area. More complete geographic and stratigraphic details of the listed localities can be found in Dil (1975, 1976). The material consists of poorly to moderately well-preserved internal and external moulds. The bivalves are preserved as silica pseudomorphs which contain fine details of the outer calcite layers of the shell and the external surface ornamentation. Unfortunately, the inner shell layers of the bivalves, presumably composed of aragonite which would exhibit muscle scars, are most often not silicified and preserved.

Specimens are housed in the collections of the Palaeontology Laboratory of the University of Ankara, Turkey.

Systematic Palaeontology

Class Bivalvia Linné, 1758

Subclass Pteriomorphia Beurlen, 1944

Order Pterioda Newell, 1965

Suborder Pteriina Newell, 1965

Superfamily Ambonychioidea Miller, 1877

Family Myalinidae Frech, 1891

Revised Diagnosis and Shell Morphology. Mostly inequivalved Ambonychioidea with the right valve slightly less convex than the left; inequilateral; toothless or with cardinal tooth or boss beneath beak of right valve and corresponding furrow in left valve; pallial line entire, generally pitted; anisomyarian; ligament duplivincular continuous, not extending to calcitic shell layer; inner shell layer in both valves nacreous aragonite; outer shell layers either prismatic calcite or homogeneous calcite in right valve and homogeneous calcite in a mosaic structure in left valve. There has been much discussion concerning the taxonomic content and systematic place of the Myalinidae within higher categories of the Bivalvia. In the pioneer works they were aligned with the Pterioidea, although Newell (1942) evaluated them with the Mytiloidea. However, it was later shown that similarities in the ligament point to the Superfamily Ambonychioidea (Newell 1965; Pojeta 1966; Amler 1999; McRoberts & Newell 2005).

The shell morphology of myalinid bivalves has been the subject of much discussion. Although many morphological features, including shell outline, are diagnostic in discriminating myalinid genera and species, that shape is often controlled by environmental factors such as grain size, stability of substrate, water chemistry, and water temperature (Hicky 1987; McRoberts & Newell 2005). A summary of internal features used in determinations is provided in Figure 3.

The Myalinidae are a diverse group of marine and nonmarine (paralic or limnic, for example *Anthraconaia* sp.) bivalves represented in a variety of habitats from Carboniferous to Middle Triassic. However, following the

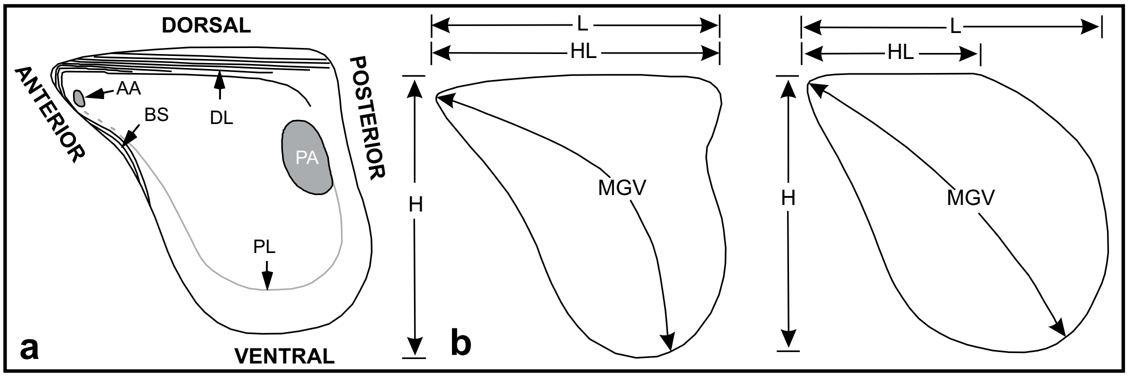

Figure 3. (a) General internal morphologic features. DL, duplivincular ligament grooves; BS, byssal sinus; PL, pallial line; PA, posterior adductor insertion scar; AA, anterior adductor insertion scar. (b) Measurement axis conventions and orientations for shell forms, H, height; L, length; HL, hinge length; MGV, maximum growth vector (umbonal ridge) (McRoberts & Newell 2005).

end-Permian mass extinction, the marine Myalinidae diminished greatly in taxonomic and ecological diversity but persisted until possibly the Middle Triassic, when the group finally became extinct (Newell 1942; Schubert & Bottjer 1995). Marine myalinids are noteworthy in that they display distinctive shell shapes and ornamentation, but despite their significant morphological diversity, Late Palaeozoic genera are conservative in their development of hinge structures, which facilitates interpretation of their taxonomic relationships and evolutionary history (McRoberts & Newell 2001).

Currently, the following genera are considered to be marine Myalinidae: *Myalina* (Devonian, Carboniferous–Early Triassic, Middle Triassic), *Septimyalina* (Carboniferous–Late Permian), *Orthomyalina* (Late Carboniferous–Early Permian), *Myalinella* (Late Carboniferous–Early Triassic), *Arctomyalina* (Late Carboniferous), *Elversella* (Middle Permian), *Pseudomyalina* (Early Permian), *Selenimyalina* (Late Carboniferous), *Novaculopermia* (Early Permian), *Promyalina* (Early Triassic) and, less certainly, *Liebea* (Late Permian) and *Aviculomyalina* (Middle Triassic) (McRoberts & Newell 2005).

Genus *Septimyalina* Newell, 1942

Type Species. Septimyalina perattenuata (Meek & Hayden 1858), from the Upper Carboniferous of Western Germany, by subsequent designation of Newell (1942).

Septimyalina sublamellosa (Etheridge 1878)

Plate 1 (a)–(b)

1878 *Myalina sublamellosa* Etheridge, p. 15, pl. 1, fig. 15; pl. 2, figs 16–17.

1879 *Myalina mytiloides* Koenen, p. 335, pl. 6, figs 6a–c.

1897 *Myalina sublamellosa* Etheridge, Hınd, p. 121, pl. 5, figs 6–8.

1934 *Myalina sublamellosa* Etheridge, Schmidt, p. 452, fig. 65.

1939 *Myalina sublamellosa* Etheridge, Paul, p. 169, pl. 12, fig. 17.

1941 *Myalina (Myalina) sublamellosa* Etheridge, Paul, p. 135.

1941 *Myalina sublamellosa* Etheridge, Demanet, p. 72, pl. 1, fig.14.

1944 *Myalina sublamellosa* Etheridge, Schwarzbach, p. 59, fig. 54.

1956 *Myalina sublamellosa* Etheridge, Schulga, p. 160, pl. 6, fig. 93.

1958 *Myalina sublamellosa* Etheridge, Zakowa, p. 113, pl. 8, figs 8a-b.

1962 *Myalina sublamellosa* Etheridge, Wilson, p. 61, pl. 4, figs 15–16.

1963 *Myalina sublamellosa* Etheridge, Nicolaus, p. 202, pl. 15, fig. 4.

1966 *Myalina sublamellosa* Etheridge, Bojkowski, pl. 2, fig. 2.

1969 *Myalina sublamellosa* Etheridge, Korejwo, pl. 9, figs 1–3.

1971 *Selenimyalina sublamellosa* Etheridge, Zakowa, p. 33, pl. 2, figs 10b–c; pl. 3, figs 1a–d; pl. 5, fig. 3.

1972 *Septimyalina sublamellosa* Etheridge, Rehor & Rehorava, p. 65, pl. 32, figs 2–6.

1972 *Myalina sublamellosa* Etheridge, Korejwo & Teller, pl. 9, fig. 8.

1976 *Myalina sublamellosa* Etheridge, Semertzidis, p. 122, pl. 1, figs 8–9.

1992 *Septimyalina sublamellosa* Etheridge, Amler, pl. 2, figs 13–15.

Figured Specimens. ZDK. 78.CM01; ZDK. 78.CM02

Horizons and Localities. Kokaksu Valley, Zonguldak area, Turkey, shale units, Bed 65, level 3.

Dimensions. (Measurements in mm)

Specimen	Valve	H	L	HL	MGV
ZDK. 78.CM01	LV	7	6	4	10
ZDK. 78.CM02	LV	12	8	6	14

Description and Discussion. Thin-shelled and triangular-shaped *Myalina* possessing distinct irregular commarginal overlapping growth lamellae; anteroventral fold in left valve. Shell; small, narrow; inequivalve, prosocline; triangular in outline; small posterior auricle; anterior margin slightly concave, indicating small byssal sinus; posterior margin broadly convex, almost parallel to anterior margin; beak small, rising slightly above hinge line; umbonal ridge nearly straight; surface marked by numerous closely spaced growth lamellae. Hinge structure and interior characteristics not observed.

Most of the European Carboniferous myalinids have been assigned to *Septimyalina sublamellosa* (Etheridge1878) or *Septimyalima lamellosa* (de Koninck 1842). The main distinguishing character between these species is the more elongate shape of *Septimyalina lamellosa* and its less distinctly umbonal ridges on the ventral part of the shell. However, their morphological differences are minor and have never been clearly defined.

Septimyalina orthonota (Mather 1915) (Newell 1942, p. 67, pl. 13, fig. 2) from the Carboniferous of North America is distinguished by its broader posterior end, more concave anterior margin and rounded pallial margin.

Septimyalina lamellosa (de Koninck 1842)

Plate 1 (c)–(f)

1842 *Myalina lamellosa* de Koninck, p. 126, pl. 3, fig. 6.

1885 *Myalina lamellosa* de Koninck, p. 169, pl. 29, fig. 11.

1897 *Myalina lamellosa* de Koninck, Hind, p. 124, pl. 4, figs 13–14.

1905 *Myalina lamellosa* de Koninck, Stuckenberg, p. 208, pl. 2, fig. 2.

1976 *Septimyalina lamellosa* de Koninck, Semertzidis, p. 124, pl. 1, figs 10–13.

2005 *Myalina lamellosa* de Koninck, McRoberts & Newell, p. 5, figs 4a–d.

Figured Specimens. ZDK. 78.CM03; ZDK. 78.CM05; ZDK. 78.CM07; ZDK. 78.CM12

Horizons and Localities. Kokaksu Valley, Zonguldak area, Turkey, shale units, Bed 65, level 3.

Dimensions. (Measurements in milimeters)

Specimen	Valve	H	L	HL	MGV
ZDK. 78.CM03	RV	15	7	5	14
ZDK. 78.CM04	LV	12	8	4	11
ZDK. 78.CM05	RV	10	5	3	10
ZDK. 78.CM06	RV	10	5	2	11
ZDK. 78.CM07	RV	9	5	3	9
ZDK. 78.CM08	RV	11	8	3	10
ZDK. 78.CM09	RV	11	4	3	11
ZDK. 78.CM10	LV	10	7	3	10
ZDK. 78.CM11	LV	18	9	5	20

ZDK. 78.CM12	LV	15	8	4	16
ZDK. 78.CM13	LV	15	7	4	14

Description and Discussion. Shell small, moderately narrow; elongate; triangular; inequilateral, strongly prosocline; posteroventral margin rounded, posterodorsal margin obtuse; beak small; umbonal ridge nearly straight; in some specimens by concentric growth lines; each valve regular growth lamellae; body cavity extending far into the umbones; anterior margin slightly concave indicating small byssal sinus.

Myalina virgula (de Koninck 1844), is a very similiar species described from the Viséan of Belgium (de Koninck 1842, pl. 6, fig. 3). It differs from *Septimyalina lamellosa* in having fewer concentric lines and in its lack of a straight umbonal margin.

Septimyalina lamellosa de Koninck, shows similarities to forms regarded by Semertzidis (1976) as *Myalina pernoides* (Portlock 1843) but differs from that species in the absence of rounded posteroventral margin and in the thickness of the shell.

Septimyalina minor (Brown 1841)

Plate 1 (g)–(h)

1841 *Gervilla minor* Brown, p. 227, pl. 7, fig. 70.

1897 *Posidoinella minor* Brown, Hind, p. 98, pl. 6, figs 15–23.

1922 *Posidoinella minor* Brown, Weigelt, p. 125, fig. 50.

1924 *Posidoinella minor* Brown, Schmidt, p. 364.

1927 *Posidoinella minor* Brown, Jackson, p. 116, pl. 3, figs 4–7.

1935 *Posidoinella minor* Brown, Wirth, p. 226.

1941 *Posidoinella minor* Brown, Demanet, p.247, pl. 15, figs 1–3.

1956 *Posidoinella minor* Brown, Schulga, p. 154, pl. 6, figs 78–79.

1958 *Posidoinella minor* Brown, Zakowa, p. 106, pl. 8, figs 10a–c.

1966 *Posidoinella minor* Brown, Bojkowski, p. 77, pl. 5.

1966 *Posidoinella minor* Brown, Zakowa, p.106, pl. 18, figs 9a–b.

1969 *Posidoinella cf. minor* Brown, Korejwo, pl. 9, figs 6–8.

1972 *Selenimyalina minor* Brown, Rehor & Rehorova, p. 66, pl. 33, figs1–5.

1976 *Septimyalina minor* Brown, Semertzidis, p. 126, pl. 1, figs 14–16.

Figured Specimens. ZDK. 78.CM14; ZDK. 78.CM15

Horizons and Localities. Kokaksu Valley, Zonguldak area, Turkey, shale units, Bed 65, level 3.

Dimensions. (Measurements in mm)

Specimen	Valve	H	L	HL	MGV
ZDK. 78.CM14	RV	5	4	2	6
ZDK. 78.CM15	RV	9	6	3	10

Description. Shell small, inequivalve; prosocline; cardinal margin straight; forming obtuse angle with slightly curved posterior margin; ventral margin rounded; umbo extended to anterior part of the shell; right valves marked with regularly spaced fine concentric lamellae. The specimens contain a poorly preserved but simple, continuous pallial line roughly parallel to the posteroventral margin.

Superfamily Pectinacea Rafinesque, 1815

Family Posidoniidae Frech, 1909

Genus *Posidonia* Bronn, 1828

Type Species. Inoceramus carbonarius (Roemer 1854), from the Upper Carboniferous of Western Germany, by subsequent designation of Roemer (1876).

Posidonia becheri Bronn, 1828

Plate 1 (ı)

1854 *Posidonia becheri* Bronn, Roemer, p. 91, pl. 13, fig. 21.

1876 *Posidonomya becheri* Bronn, Roemer, p. 38, fig. 2.

1879 *Posidonomya becheri* Bronn, Koenen, p. 334, pl. 6, fig. 8.

1922 *Posidonomya becheri* Bronn, Weigelt, p. 118, pl. 22–31, fig. 43.

1924 *Posidonia becheri* Bronn, Schmidt, p. 43, pl. 11, figs 1–2.

1930 *Posidonomya becheri* Bronn, Patteisky, p. 216, pl. 17, figs 1–2.

1938 *Posidonomya becheri* Bronn, Demanet, p. 111, pl. 10, figs 1–4.

1941 *Posidonia becheri* Bronn, Paul, p. 175.

1958 *Posidonia becheri* Bronn, Zakowa, pl. 6, fig. 9.

1963 *Posidonia becheri* Bronn, Nicolaus, p. 190, pl. 13, fig. 4.

2004 *Posidonia becheri* Bronn, Amler, p. 199, text-figs 3–4.

Figured Specimens. ZDK. 78.CP01

Horizons and Localities. Kokaksu Valley, Zonguldak area, Turkey, shale units, Bed 66, level 4.

Dimensions. (Measurements in mm)

Specimen	Valve	H	L
ZDK. 78.CP01	RV	30	-

Description and Discussion. In general, *Posidonia becheri* Bronn is equilateral and equivalve; at a slightly larger size the umbones become somewhat anterior, the right valve becomes flatter than the left, and a byssal sulcus develops in its antero-ventral margin. The species has a large, equivalved shell; anterior margin generally lacking, posterior margin rounded, beak small, surface marked by numerous (18–20) strong concentric ridges and growth lines; hinge unknown, pallial line half.

Mode of Life and Palaeobiogeography

Bivalves have an excellent fossil record extending back to the Ordovician and most of the higher taxa have extant representatives. Thus, one can make analogies between modern and fossil taxa with more certainty than the analogies of many other fossil groups with their modern relatives. The most important sources of evidence concerning the mode of life of fossil animals in general are facies, analogy with living relatives, and functional morphology. In the present case facies is the most important of these. While direct analogy with living relatives is unreliable, functional morphology is more useful, particularly since many structures are analogous to those of living relatives.

Groups of the Ambonychioidea were certainly epifaunal. The myalinids, which possess a duplivincular ligament, were thought to have evolved from ambonychiids and were grouped with them in the Ambonychioidea. The correlation in myalinid evolution of several trends, each of which can be explained in terms of epifaunal stabilization, offers compelling evidence in support of postulated life habit change. In general the eight bivalve life habit groups are distincted, among epifaunal suspension feeders groups, comprises the benthonic auriculated bivalves, represented in the Zonguldak Visean beds by the pterioids *Septimyalina* species (Jefferies & Minton 1965; Stanley 1972; Kranz 1974). The Myalinid forms have probably evolved many strategies of life habit from the Devonian to the Triassic. In general, Palaeozoic myalinids have shown a life habit adapted model provided with edgewise recliners. In this model, shell geometry and weighting clearly correspond to a mytiliform edgewise recliner resting on the broad and byssus-bearing anterior surface. On the other hand, a significant inequivalved form with respect to external sculpture and to the inclination of the ligamental area suggests that they were pleurothethic recliners with the more coarsely sculptured left valve facing to the sediment (Figure 4a) (Newell 1942; Seilacher 1984).

Several modes of life have been proposed for bivalves of the genus *Posidonia*. The Late Visean–Early Namurian (Kulm Facies) bivalve *Posidonia* has been the subject of investigation due to its stratigraphical and systematic interests. Palaeoecological questions arose from the reconstruction of palaeoenvironments of typical *Posidonia*-bearing deposits like the Kulm Facies formations sequences of western and central Europe (Amler 2004). In general, these formations consist of organic-rich dolomites, marine limestones and black shales. The existence of large amount of kerogen in these sediments and fine undisturbed lamination led to the interpretation of a supposedly anoxic palaeoenvironment and hence hostile benthic conditions (Calder 1998; Schatz 2005). Therefore, posidoniforms (*Posidonia becheri*)

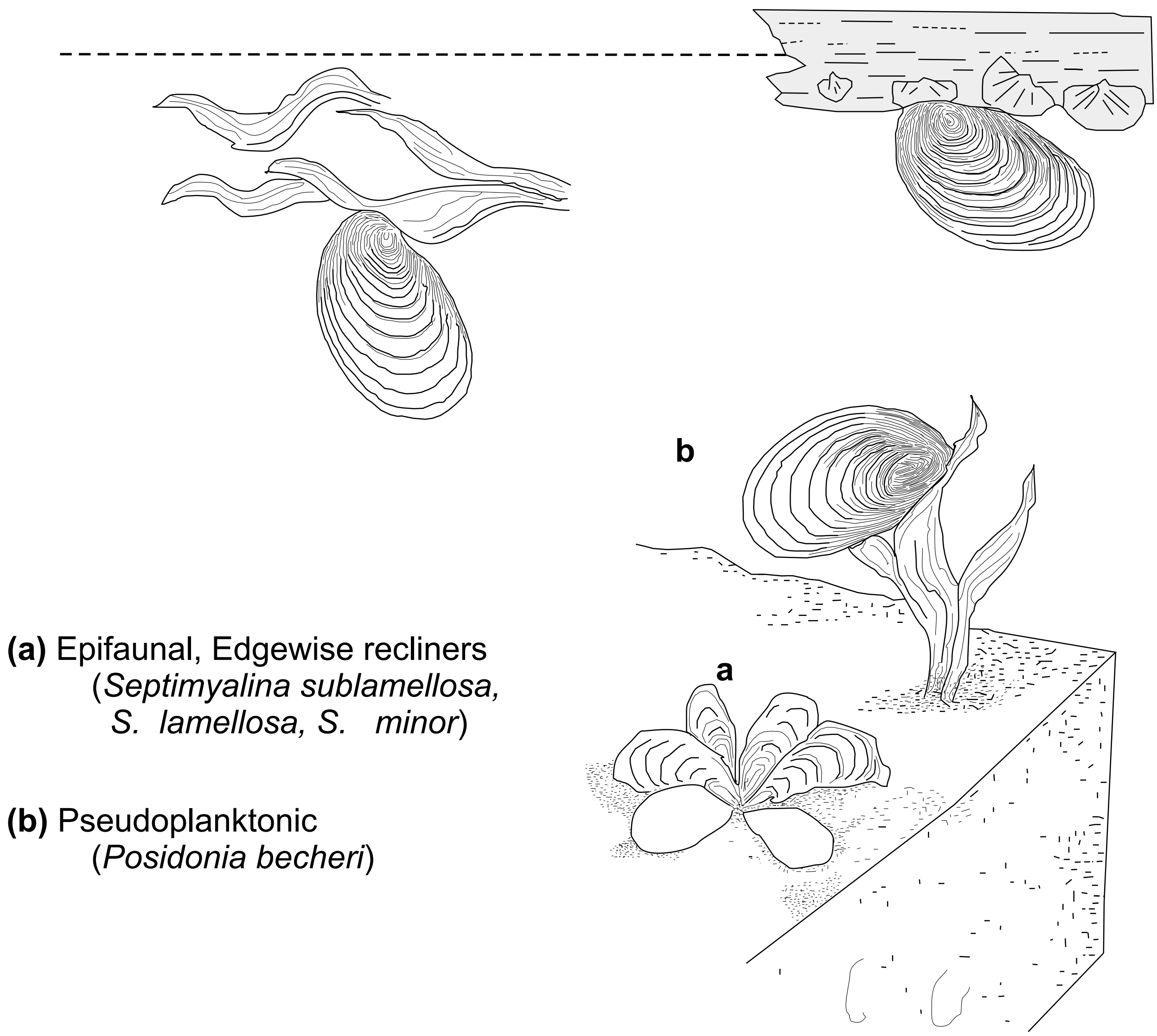

Figure 4. Life habit reconstruction of Late Visean–Early Namurian bivalves from the Zonguldak coal basin.

were assumed to be pseudoplanktonic (= epiplanktonic), attached to floating objects (Figure 4b) in the water column like driftwood, pumice, vesicular algae, plants or cephalopod shells with byssus threads analogous to other thin shelled bivalves from black shales.

A pseudoplanktonic mode of life of posidoniforms is the most widely encountered interpretation (Jefferies & Minton 1965; Wignal & Simms 1990). In the fossil record, pseudoplanktonic associations including bivalves are known. Often they are found attached to the floating objects, in particular to driftwood or plants (Figure 5) (Wignal & Simms 1990). Moreover, this condition corresponds to the Triassic daonellids bivalves (Jefferies & Minton 1965; Schatz 2005).

Septimyalina sublamellosa (Etheridge), *S. lamellosa* (de Koninck), *S. minor* (Brown) and *Posidonia becheri* Bronn are a stratigraphically and geographically widely distributed species. In Turkey these occurs in the Late Visean–Early Namurian of the Zonguldak coal basin. They are also described from the Tournasian to Namurian of Europe (Figure 6). Their palaeobiogeographic distiribution delineates a seaway from Britain to the Black

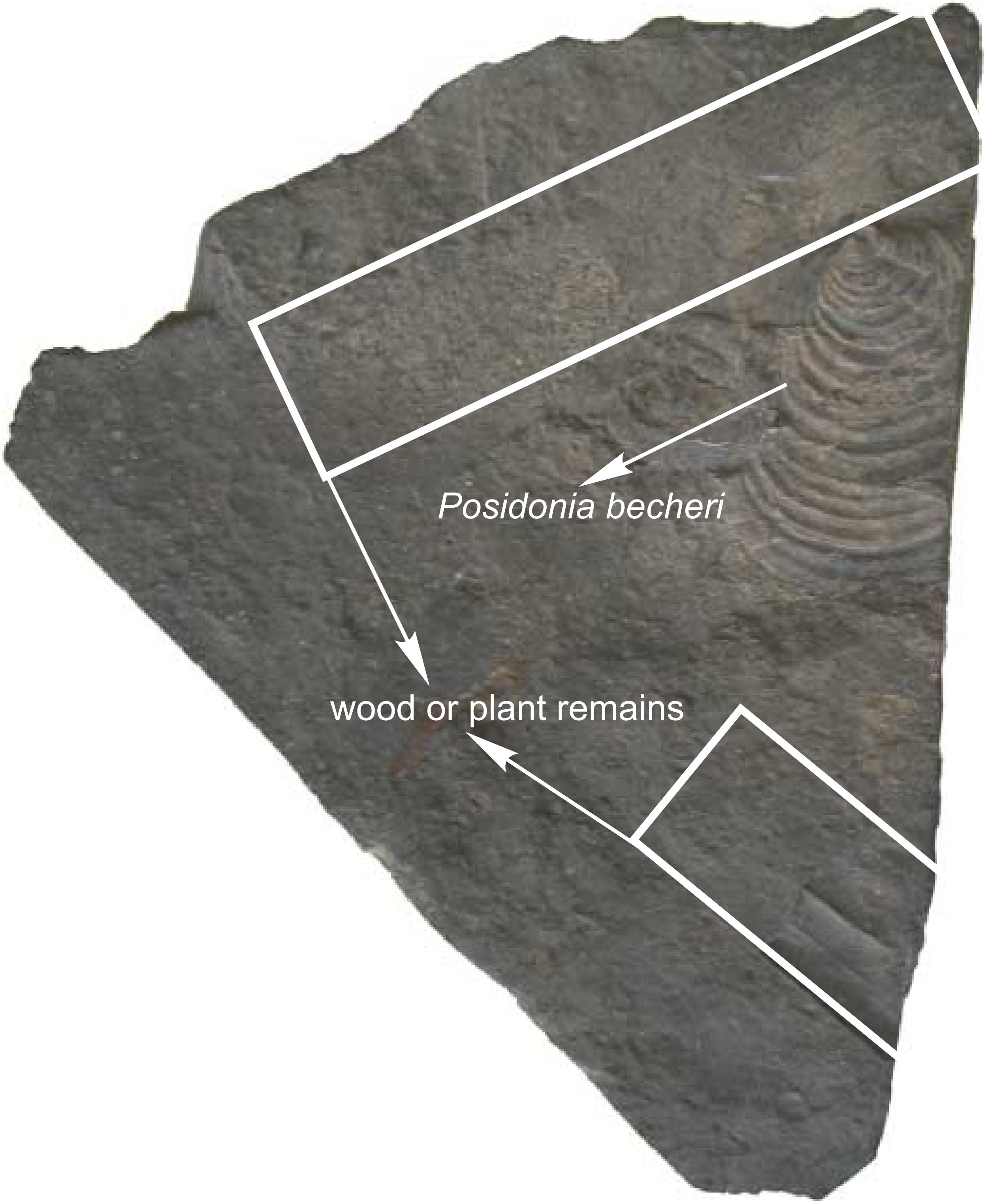

Figure 5. Preservation stages of *Posidonia becheri* Bronn, and its attachment to wood or plant remains (pseudoplanktonic associations).

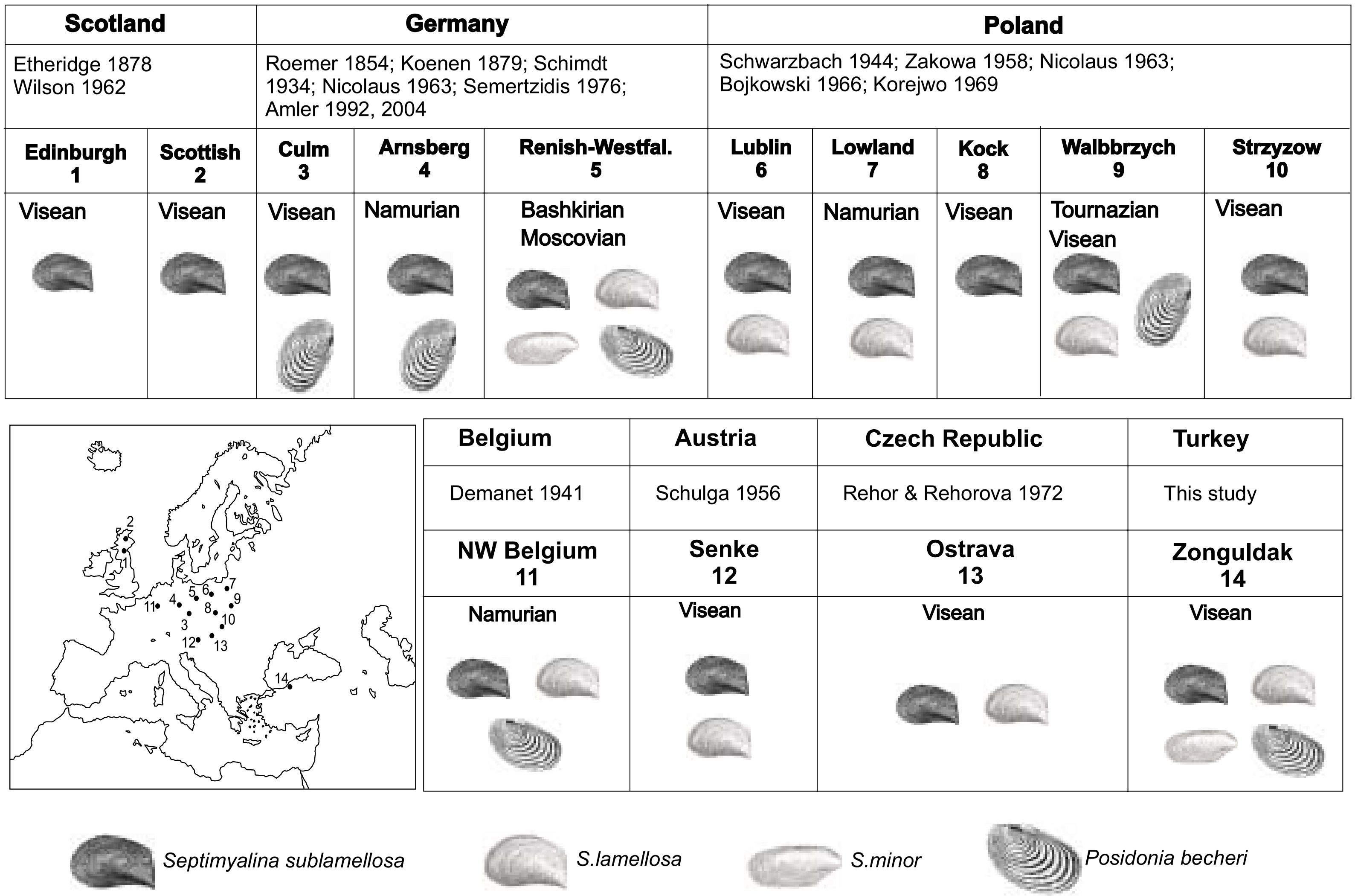

Figure 6. Palaeogeographical distribution of Zonguldak Carboniferous coal basin bivalves.

Sea coasts during Carboniferous. Besides, many myalinids species described from the Carboniferous (Mississipian–Pennsylvanian) to Permian of North America (Hoare *et al.* 1989; Quiroz-Barrosso & Perrilliat 1998; McRoberts & Newell 2005). A number of very similiar species and *Posidonia becheri* Bronn have also been described from the Early Carboniferous of South China (Renjie & Daoping 1993).

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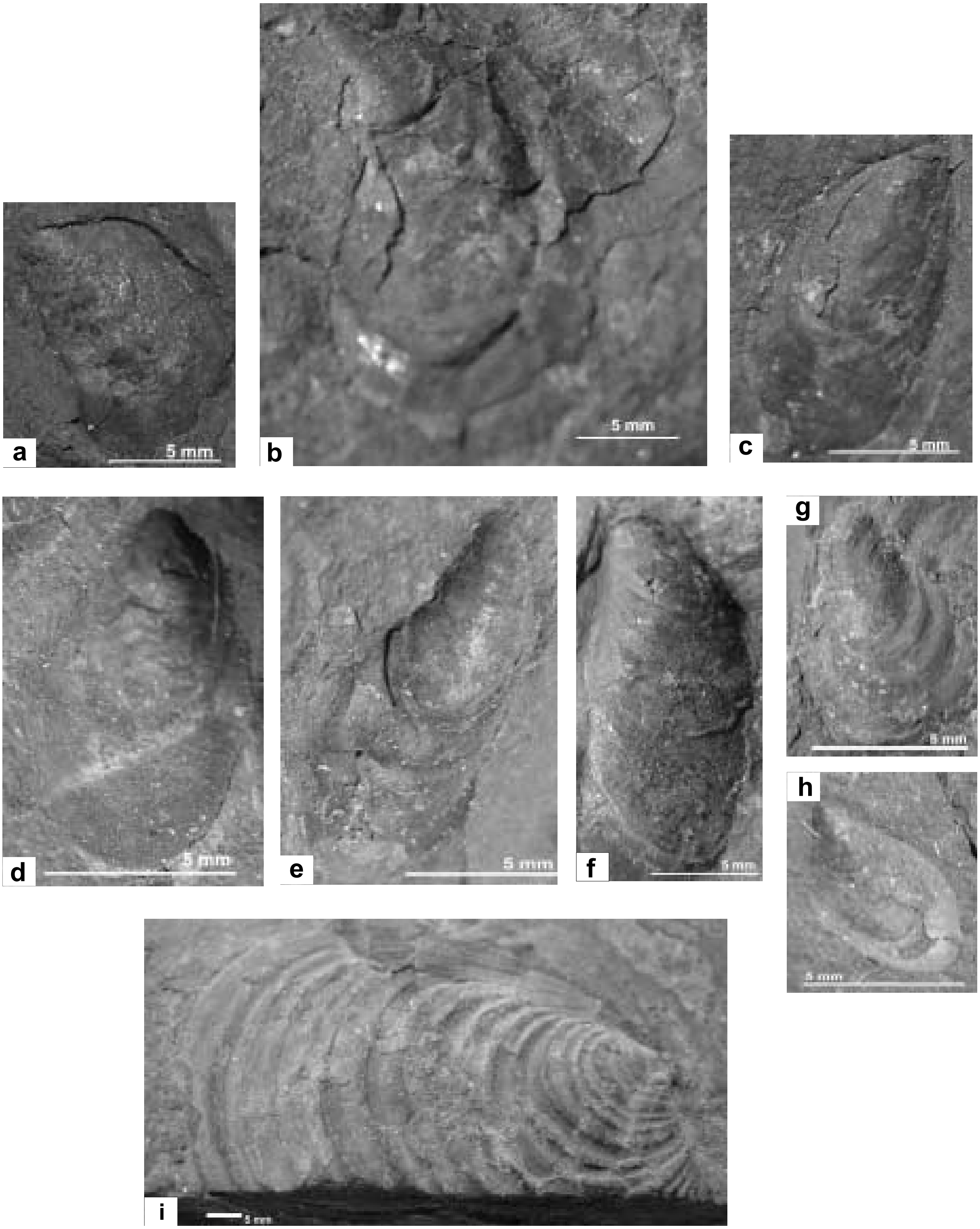
PLATE 1

All specimens are from the black shale member at the Zonguldak coal basin (Kokaksu Valley). (a, b) *Septimyalina sublamellosa* (Etheridge 1878), left valve, Locality V 3b 65 level 03, ZDK. 78. CM01, ZDK. 78 CM02; (c, f) *Septimyalina lamellosa* (de Koninck 1842), (c) right valve, (d–f) left valve, Locality V 3b 65 level 03, ZDK. 78. CM03, ZDK. 78. CM05, ZDK.78. CM07, ZDK.78. CM12; (g, h) *Septimyalina minor* (Brown, 1841), right valve Locality V 3b 65 level 03, ZDK. 78. CM14, ZDK. 78. CM15; (i) *Posidonia becheri* Bronn, 1828, right valve, Locality V 3b 66 level 04, ZDK. 78. CP01.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