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Preliminary notes on Early and Middle Jurassic corals of the Bakony Mountains (Hungary)

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(with 9 figures and Plate 5)

Abstract

Hettangian, Pliensbachian and Bajocian corals were examined from 6 localities of the Bakony Mountains. All of the suborders existed in Early and Middle Jurassic are present in the 80 specimens. The determined 6 genera belong to 4 suborders. 88% of the fauna is derived from the Domerian formations, but the number of taxa are nearly equal in Carixian, Domerian and Bajocian. Four genera appeared earlier in the Bakony Mountains, than in other areas.

Seventy-seven specimens belong to solitary corals, and only 3 specimens are colonial. Two-third of the fauna is hermatypic at the Pliensbachian localities, but at the same time 80% of the specimens are ahermatypic in Bajocian. Fissures of seamounts and the edge of a seamount are represented at these localities. This means, that the top of the seamounts were not sinking below the depth of 100 m during the Pliensbachian, but it may have been below 100 m in Bajocian. The elongated morphotypes of corals stabilized themselves by root-like fixation, or the specimens had to be sunk in the loose sediments. Because the loose sediments were rare at the top of seamounts, the corals are sometimes overturned (scolecoid specimens).

Key words: Early Jurassic, Middle Jurassic, coral, Scleractinia, Bakony, Hungary, paleoecology

Introduction

The Jurassic fossils of the Transdanubian Central Range are examined in most detail perhaps in the Mediterranean region. Ammonites, brachiopods, gastropods and bivalves are studied for a long time up to the present. At the same time some fossil groups are in very neglected position. Corals belong to these groups, therefore data of Jurassic corals from Hungary are almost completely missing though they (mostly solitary but sometimes colonial) sporadically but regularly can be found in the Jurassic sediments of the Transdanubian Central Range, both in the Bakony and the Gerecse Mountains.

In spite of this fact only some data can be seen about Hungarian Jurassic corals in the literature. KOCH (1909) mentioned *Trochocyathus truncatus* ZITTEL from the Tithonian beds of Tata, Kálvária Hill. FÜLÖP et al. (1960) figured a section of a solitary coral from the Tithonian formations of Vértes Mountains (Mór, Csókahegy). The only one publication, which dealt with corals in detail is by KOLOSVÁRY (1954), who described 23 taxa (including a new genus, 4 new species and 2 new subspecies) from 7 localities.

Jurassic corals are similarly poorly known in the other areas of the Mediterranean region. There is a profuse literature on European reef-forming corals (mainly in the Upper Jurassic) but at the same time we have only sparse data about deeper-water ahermatypic solitary corals. Some solitary corals can be found in monographs of the last century, which essentially were written about other fossil groups. Some attempts were made on the examination of Jurassic (Bajocian, Kimmeridgian, Tithonian) corals in Italy in the last few decades (NICOSIA & PALLINI, 1977; MARIOTTI et al., 1979a–b).

The author was commissioned to examine the Jurassic corals within the framework of a scientific research program on Jurassic benthic fossils of the Transdanubian Central Range (OTKA No. T.4431, leader: János SZABÓ). The studied material consists of about 200 specimens (of this 80 specimens are from Early and Middle Jurassic), which are derived from the collections of the Hungarian Geological Survey, the Hungarian Natural History Museum and from the collections of some colleagues, who work on Jurassic fossils (I. FŐZY, J. SZABÓ, A. VÖRÖS, I. SZENTE, A. GALÁCZ). Unfortunately the type specimens of the new taxa described by KOLOSVÁRY (1954) and some other described specimens are missing from the collection of Hungarian Geological Survey.

The preliminary results of the examination of Early and Middle Jurassic corals of the Bakony Mountains are given in this article. For lack of adequate literature and previous experience on corals, the determinations are given at generic level, mainly on the basis of external morphological characters of the specimens. The correspondence with genera known from WELLS (1956) is sometimes uncertain. This fact permits the supposition that the examined material contains not only new species but probably new genera, too. Further examination is required to the exact and detailed description. Therefore this paper can be regarded as a preliminary report and it will be followed by other publications.

The importance of the fauna is increased by the fact that in most cases the corals were collected with ammonites, so the exact ages of the specimens are known.

Localities

The corals were collected from 6 localities of the Bakony Mountains (Fig. 1). The localities from north to south are the following.

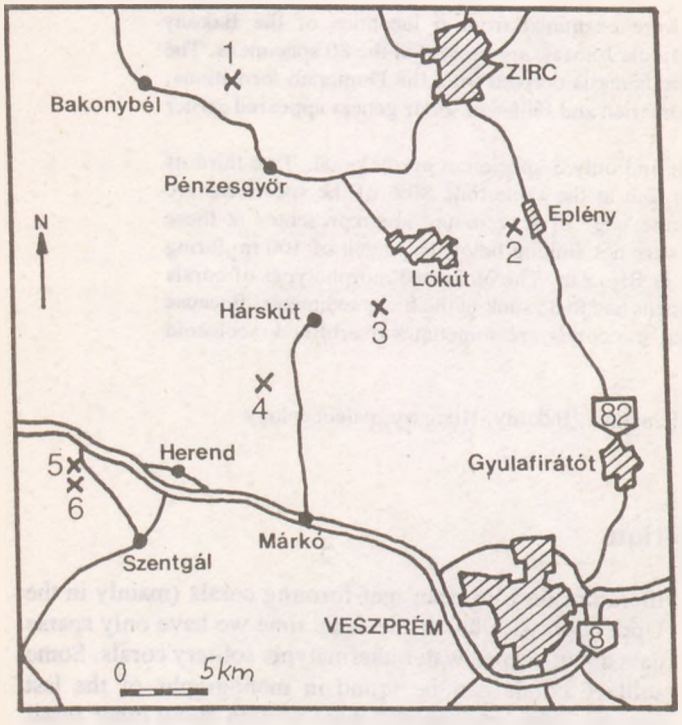

Fig. 1. Sketch-map of the localities of the studied corals in the Bakony Mountains.

Bakonybél, Somhegy

Somhegy Hill is situated east of the village Bakonybél, on the northern side of the Bakonybél–Pénzesgyőr road. The locality was described in detail by GALÁCZ (1976). The highly condensed sequence was deposited in a seamount area. Within the Hettangian Dachsteinkalk-type Kardosrét Limestone there is a 60 cm thick fissure, filled with reddish manganiferous limestone and yielding Bajocian fossils. The Liassic Limestone is overlain by red, nodular Bajocian limestone and Kimmeridgian limestone.

The studied 5 solitary corals were collected from the Bajocian fissure of the locality by J. SZABÓ. (Two solitary specimens are known from the Kimmeridgian limestone, but these are disregarded in the present paper).

Layer 1
Middle Bajocian, Humphriesianum Zone

Epistreptophyllum ? sp.

One poorly preserved specimen, with the following characteristic dimensions:

Height of the corallum (mm)	8
Minimum diameter (mm)	3
Maximum diameter (mm)	5
Basal angle	23°
Number of septa	(26)

Septa cannot be seen well because of the poor preservation, but the estimated number of septa is about 26. The surface of the specimen is nearly completely smooth, only some very weak growth lines are visible. Epitheca is developed, the calice is slightly sunk in. The form of the corallum is cylindrical (slightly trochoid). Some roof-like growth are at the bottom of the specimen.

Trochocyathus sp.
Fig. 2.2

Two specimens can be seen only in transverse sections. One of the sections is fragmentary. The diameter of the corallum is 5 mm, and there are 16 septa arranged in a semicircular arch with 5–6 pali in the central part of the section. Septa are slightly undulating. The other section is 4 mm in diameter and the number of septa is about 22. The form of the corallum is unknown.

Layer 3
Upper Bajocian, Subfurcatum–Garantiana Zones

Trochocyathus sp.
Text-fig. 2.3. and Plate 5, fig. 15.

Only one specimen with the following dimensions:

Height of the corallum (mm)	7.5
Minimum diameter (mm)	2.5
Maximum diameter (mm)	4.5
Basal angle	20°
Number of septa	22

There are about 8–10 pali at the central part of the section of the specimen. Weak growth lines and weak longitudinal costae can be seen on the surface of the theca. The form of the corallum is turbinate.

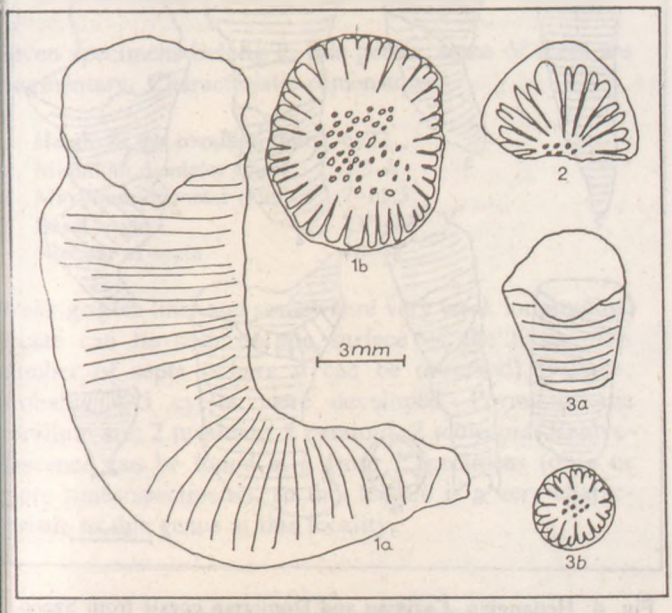

Fig. 2. Bajocian solitary corals from Bakonybél, Somhegy.
1.a: *Trochocyathus* sp.; Bed 6; scolecoid specimen; 1.b: transverse section
2: *Trochocyathus* sp.; Bed 1; transverse section
3.a: *Trochocyathus* sp.; Bed 3; turbinate specimen; 3.b: transverse section

Layer 6
Upper Bajocian, Subfurcatum–Garantiana Zones

Trochocyathus sp.
Text-fig. 2.1a–b and Plate 5, fig. 16

Dimensions of the single specimen:

Height of the corallum (mm)	19
Minimum diameter (mm)	5
Maximum diameter (mm)	7
Basal angle	22°
Number of septa	41

Large number (36–40) of pali are in the central part of the specimen. Strong growth lines and weak longitudinal costae are on the surface of the theca. The form of the corallum is scolecoid.

Eplény, Manganese Ore Mine

The former Manganese Ore Mine is situated about 300 m west from the village of Eplény, near to the Zirc–Veszprém road. The examined material is derived from the collection of the Hungarian Geological Survey. It was collected by M. SZABÓ-DRUBINA, I. SZABÓ and J. NOSZKY, Jr. from a submarine dyke in the northern part of the mine. The fissure can be found in the Rhaetian Dachstein Limestone or Hettangian Kardosrét Limestone. The formation is light red in colour, fine-grained but sometimes slightly crinoidal in texture. At some places manganese-oxide covers are in the limestone.

Benthic fossils are dominant in the megafauna. The age of the limestone is Domerian (Margaritatus Zone) (GÉCZY, pers.comm. *in:* SZABÓ, 1990). About 50 coral specimens belong to three genera, so this locality is fairly rich in specimen number but not too diverse in taxon number.

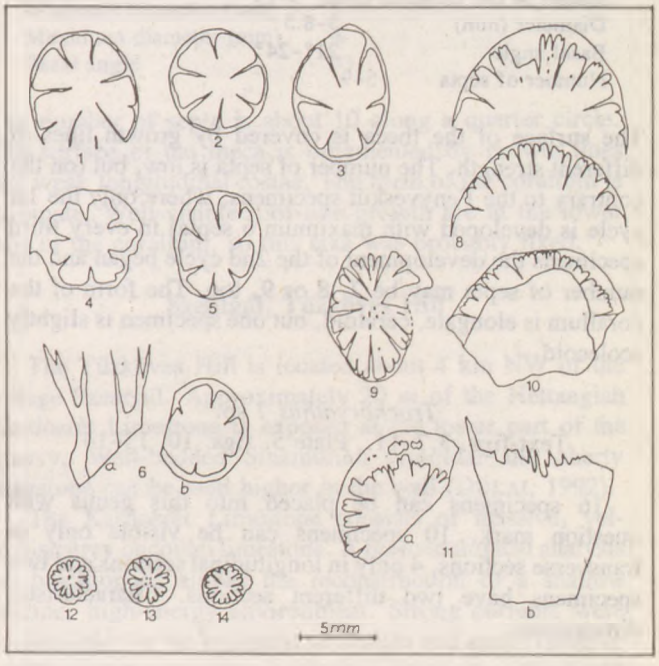

Fig. 3: Domerian corals from Eplény, Manganese Ore Mine.
1–5.: *Ceratocoenia* sp.; transverse sections
6.: *Ceratocoenia* sp.; a: longitudinal section; b: transverse section
7–9.: *Trochocyathus* sp.; transverse sections
10.: *Trochocyathus* sp.; transverse section with rejuvenescencion
11.: *Trochocyathus* sp.; a: transverse section; b: longitudinal section
12–14.: *Stylosmilia* sp.; transverse sections

Stylosmilia sp.
Text-figs. 3.12–14 and Plate 5, Fig. 12

Three specimens are placed into this genus. All of them can be seen only in transverse sections. Characteristic dimensions are the following:

Diameter (mm)	2.8–3
Number of septa	15–16

Strong styliform columella can be seen in sections. These specimens are fragments of a phaceloid colony. At some places the septa are well-visibly step out beyond the theca, so the surface of the corallum is probably costate.

Ceratocoenia sp.
Text-figs. 3.1–6, 4.2–3, Plate 5, figs. 5–9, 11

30 specimens (about two-third of the material) belong to this genus. From these, 22 can be seen only in transverse sections, one specimen has two different sections (a transverse and a longitudinal) and 7 specimens are fragmentary but three dimensional in preservation. Dimensions:

Height of the corallum (mm)	5–15
Diameter (mm)	3–8.5
Basal angle	21°–24°
Number of septa	5–9

The surface of the theca is covered by growth lines of different strength. The number of septa is low, but (on the contrary to the Fenyveskút specimens, where only the 1st cycle is developed with maximum 6 septa) in every third specimens the development of the 2nd cycle began and the number of septa may be 7, 8 or 9, too. The form of the corallum is elongate, ceratoid, but one specimen is slightly scolecoid.

Trochocyathus ? sp.
Text-figs. 3.7–11., Plate 5, figs. 10, 13–14

16 specimens can be placed into this genus with question mark. 10 specimens can be visible only in transverse sections, 4 only in longitudinal sections and two specimens have two different sections. Characteristic dimensions:

Height of the corallum (mm)	13–14
Diameter (mm)	5–12
Number of septa	(30–60)

Septa generally can be seen along a quarter- or semicircle arch, so these values are only estimated data. At one of the sections rejuvenescence is well-visible, when the corallum becomes thin, and after that increase to the original dimension. The form of the corallum is turbinate in the longitudinal sections.

Lókút, Fenyveskút

The locality is SW of the village Lókút at the northern foot of the Papod Hill, on the southern side of a ravine directed NW–SE. The ravine follows a paleotectonic zone, which rejuvenated several times. Limestone blocks of different size, lithology, colour and texture emerge from the soil. Rhaetian, Hettangian, Sinemurian, Domerian, Toarcian and Middle Bajocian limestones can be found in this melange (VÖRÖS, 1992). This association was interpreted as a megabreccia formed along the Papodalja line by repeated tectonic movements (GALÁCZ, 1988). About two dozens Domerian solitary corals were collected from this locality by A. GALÁCZ and A. VÖRÖS. The specimens belong to two genera.

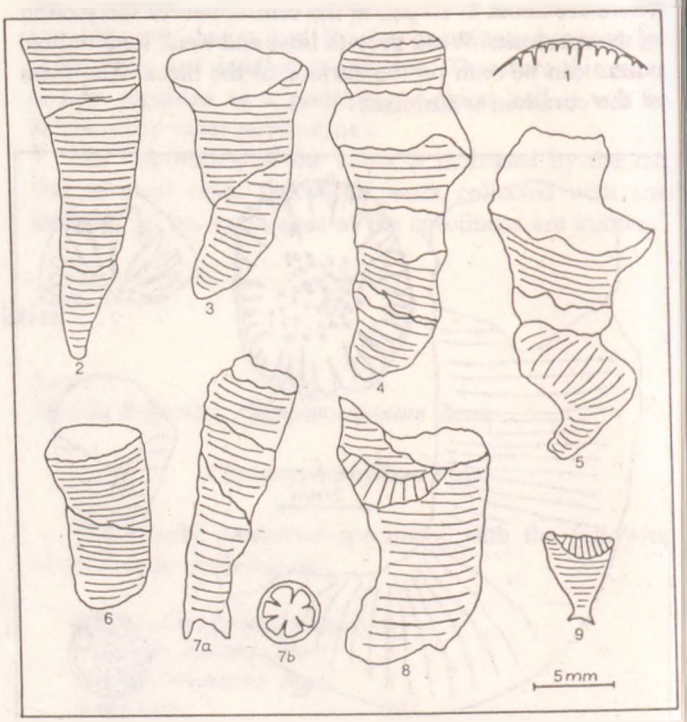

Fig. 4: Hettangian, Carixian and Domerian corals from Szentgál, Eplény, Lókút and Hárskút.
1.: Scleractinia gen. et sp. indet.; Szentgál, Tűzköves-hegy; Hettangian
2–3.: *Ceratocoenia* sp.; Eplény, Manganese Ore Mine; Domerian
4.: *Trochocyathus* sp.; Lókút, Fenyveskút; Domerian; rejuvenescenced specimen
5.: *Trochocyathus* sp.; Lókút, Fenyveskút; Domerian; scolecoid specimen
6.: *Ceratocoenia* sp.; Lókút, Fenyveskút; Domerian
7.: *Ceratocoenia* sp.; Lókút, Fenyveskút; Domerian; b: transverse section
8.: *Trochocyathus* sp.; Lókút, Fenyveskút; Domerian; rejuvenescenced specimen
9.: *Caryophyllia* ? sp.; Hárskút, Közöskút-ravine; Carixian

Ceratocoenia sp.
Text-figs. 4.6–7, Plate 5, fig. 4

15 specimens can be ranked to this genus, most of them are fragmentary. The characteristic dimensions are the following:

Height of the corallum (mm)	4–18
Minimum diameter (mm)	2–4(7)
Maximum diameter (mm)	3.5–6.5(9.5)
Basal angle	15°–22°
Number of septa	5–6

The surface of the theca is covered by growth lines different in strength. There are only a few (5–6) septa, only a single cycle was developed. The growth is uneven, slightly keeps bending. The form of this genus is elongate, ceratoid. One specimen is larger (7 and 9.5 mm in

iameter) but it was placed here on the basis of the umber of the septa (6).

Trochocyathus sp.
Text-figs. 4.4–5, 8, Plate 5, figs. 1–3

even specimens belong to this genus, some of them are ragmentary. Characteristic dimensions:

Height of the corallum (mm)	6–22
Minimum diameter (mm)	2.5–8
Maximum diameter (mm)	7–11.5
Basal angle	23°–32°
Number of septa	40–48

Weak growth lines and somewhere very weak longitudinal costae can be seen on the surface of the theca. The umber of septa (where it can be observed) is large, robably 4–5 cycles were developed. Forms of the orallum are: 2 turbinate, 3 ceratoid, 2 scolecoid. Rejuvesescence can be found in 6 from 7 specimens (once or ore times/specimens), so this feature is a very characristic to this genus at this locality.

Hárskút, Közöskút Ravine

The Közöskút-ravine is about 2.5 km SW from the illage of Hárskút, directly next to the Borostyánhajag-ill. The profile was described by GALÁCZ (1976, 1990). Massive, light red (sometimes grey owing to manganese-xide) limestone rests on the rough surface and in the issures of Hettangian Kardosrét Limestone. This for-ation is overlain by Toarcian and Middle Jurassic imestones.

The light red limestone contains some fossils. Three olitary corals are known from Bed 19 of this limestone, liensbachian (Ibex Zone) in age. Two specimens are rom the collection of Hungarian Geological Survey, the ird was got from the Paleontological Department of ötvös University.

Ceratocoenia? sp.
Plate 5, Fig. 17

The 16 mm high fragmentary specimen is 3 mm in iameter. Septa are unknown, because the corallum is nfilled with calcite spar. The surface of the theca is rnamented by concentric growth lines in different trength. At some places rejuvenescence are visible. The orm of the corallum is elongate, cylindrical, slightly eratoid.

Montlivaltia ? sp.
Plate 5, Fig. 18

One fragmentary specimen, of which the diameter is 1.5 mm and the number of septa is about 80. Only the pper part of the corallum can be observed on the surface of the limestone. The calice is convex (cupolate), the form of the corallum can not be seen, but probably trochoid or cylindrical.

Caryophyllia ? sp.
Text-fig. 4.9. and Plate 5, Fig. 19

One small-sized solitary specimen. The characteristic dimensions are the following:

Height of the corallum (mm)	5
Minimum diameter (mm)	1
Maximum diameter (mm)	4
Basal angle	43

The number of septa is about 10 along a quarter circle. The surface of the theca is ornamented by growth lines and weak longitudinal costae. The form of the corallum is turbinate. Well-visible roof-like growth are at the lower part of the corallum, so this taxa was probably fixed.

Szentgál, Tűzköves Hill

The Tűzköves Hill is located about 4 km NW of the village Szentgál. Approximately 20 m of the Hettangian Kardosrét Limestone is exposed at the lower part of the quarry. Well-bedded Sinemurian crinoidal and cherty limestone can be seen higher in the wall (DULAI, 1992).

The Kardosrét Limestone consists of massive, yellowish grey oncoidal limestone. A paleoecological analysis on brachiopods allows the reconstruction of a shallow marine, high-energy environment. Strong currents were responsible for the transport of ooliths and shells (DULAI, 1993). Ammonites are missing from the Kardosrét Limestone, the Hettangian age is based on brachiopods and lithological features.

Scleractinia gen. et sp. indet.
Text-fig. 4.1

Only one very fragmentary, unidentifiable section was collected by the author. Diameter is larger than 11 mm and 12 septa can be seen along a quarter circle. At least 3–4 cycles are developed.

Szentgál, Gombáspuszta

The sequence marked as Fg–II is situated at the northern foot of the Tűzköves-hegy, south of Gombáspuszta. Lower Pliensbachian thick-bedded, reddish crinoidal limestone can be found in the quarry. This formation is overlain by thinner-bedded brownish red limestone. This Carixian limestone contains lots of nodules of manganese-oxide, and some fossils. Middle and Upper Toarcian marl and limestone are in the upper part of the sequence and in some dykes (SZABÓ, 1990).

Montlivaltia ? sp.

One poorly preserved solitary coral was collected from the Carixian limestone by J. SZABÓ. The height of the specimen is 2 mm and the diameter is 6 mm. The number of septa is about 60. Columella cannot be seen on the fractured section. The surface of the corallum is black because of the manganese cover. The form of the corallum is probably tympanoid.

Systematic position of the determined genera

Order Scleractinia BOURNE,1900
Suborder Astrocoeniina VAUGHAN & WELLS, 1943
Family Stylinidae D'ORBIGNY, 1851
Subfamily Stylininae D'ORBIGNY, 1851
Genus *Stylosmilia* MILNE-EDWARDS, 1848

Suborder Fungiina VERRILL, 1856
Superfamily Agariciicae GRAY, 1847
Family Calamophylliidae VAUGHAN & WELLS, 1943
Genus *Epistreptophyllum* MILASCHEWITSCH, 1875

Suborder Faviina VAUGHAN & WELLS, 1943
Superfamily Stylophyllicae VOLZ, 1896
Family Amphiastreidae OGILVIE, 1896
Genus *Ceratocoenia* TOMES, 1884

Superfamily Faviicae GREGORY, 1900
Family Montlivaltiidae DIETRICH, 1926
Subfamily Montlivaltiinae DIETRICH, 1926
Genus *Montlivaltia* LAMOUROUX, 1821

Suborder Caryophylliina VAUGHAN & WELLS, 1943
Superfamily Caryophylliicae GRAY, 1847
Family Caryophylliidae GRAY, 1847
Subfamily Caryophylliinae GRAY, 1847
Genus *Caryophyllia* LAMARCK, 1801
Genus *Trochocyathus* MILNE-EDWARDS, 1848

The determined 6 genera belong to 4 suborders. From 5 suborders of order Scleractinia order the Dendrophylliina suborder appeared only in the Upper Cretaceous. This fact shows, that all of the existed suborders in Early and Middle Jurassic are present in the 80 specimens of the Bakony Mountains, but not equally. Suborder Faviina is represented by *Ceratocoenia* (46 specimens) and *Montlivaltia* (2) is forming 60% of the fauna, while *Caryophyllia* (1) and *Trochocyathus* (27) belonging to suborder Caryophylliina are present in 35%. In accordance with it the other two suborders are present in moderate number. *Stylosmilia* (3) belonging to Astrocoenia is 3.75% and *Epistreptophyllum* (1) belonging to Fungiina is 1.25% from the examined fauna (Fig. 5).

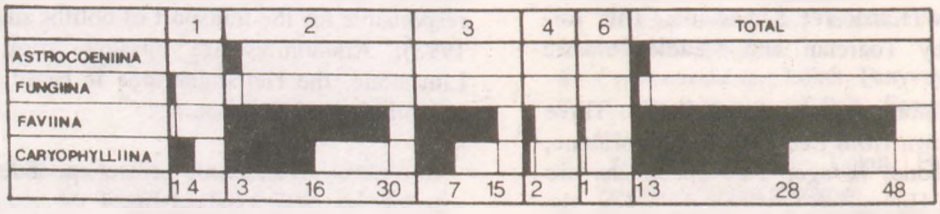

Fig. 5: Systematic composition of the coral fauna at the Early and Middle Jurassic localities of the Bakony Mountains.
1 – Bakonybél, Somhegy
2 – Eplény, Manganese Mine
3 – Lókút, Fenyveskút
4 – Hárskút, Közöskút-ravine
6 – Szentgál, Gombáspuszta

Stratigraphic distribution

Eighty-eight percent (71 specimens) of the studied fauna is derived from the Domerian beds. On the contrary we have only 1 specimen from Hettangian, 4 specimens from Carixian and 5 specimens from Bajocian formations. At this moment corals are unknown from Sinemurian, Toarcian, Aalenian, Bathonian and Callovian rocks of the Bakony Mountains (Fig. 6a).

At the same time these sharp differences cannot be seen during the investigation of the number of taxa. In spite of the large specimen number in the Domerian, the number of taxa is just as many as in the Carixian (3 taxa). In the same way 2 taxa are present by 5 specimens in the Bajocian (Fig. 6b). These facts show that larvae of the representatives of all the existed suborders arrived to the area of the Bakony Mountains, but the conditions were generally not favourable here for corals. The two Domerian localities (Eplény and Fenyveskút) are exceptional, where practically the same genera can be found in relatively greater number.

Making comparisons on the first appearence of determined genera between the Bakony Mountains and in global (based on WELLS, 1956), it can be seen, that except 2 genera (*Montlivaltia*, *Epistreptophyllum*) all the others appeared earlier in the Bakony Mountains, than in other areas (Fig. 7). This phenomena is also characteristic to other fossil groups (ammonites, brachiopods, gastropods etc.), i.e. some taxa appeared earlier in the Mediterranean region than in Northern Europe. At the same time at present it is possible, that during a detailed study, some of these taxa must be described as a new genus.

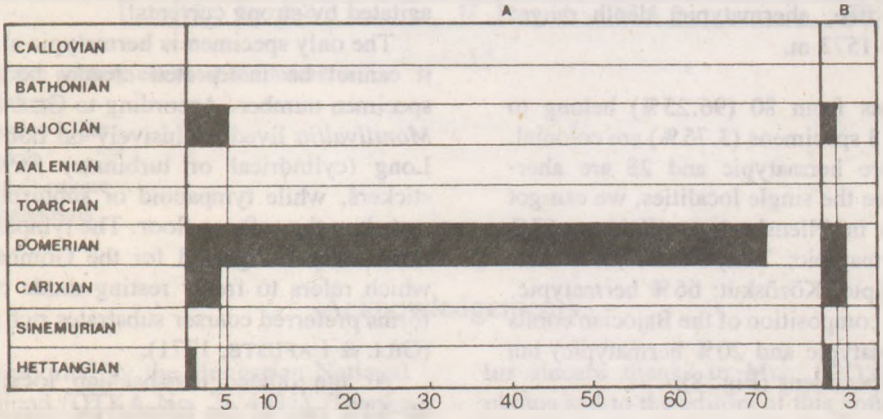

Fig. 6: Stratigraphic distribution of the studied corals.
A: number of specimens, **B:** number of taxa

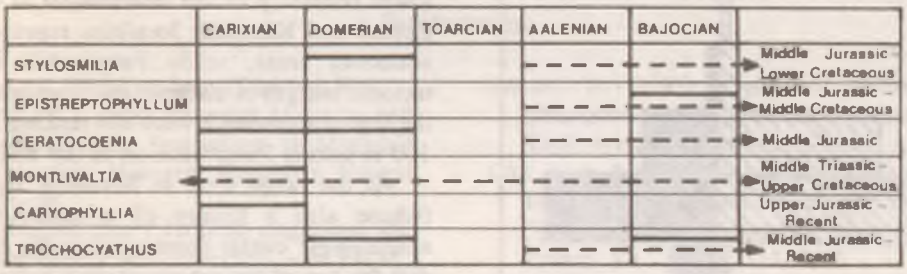

Fig. 7: Stratigraphic distribution of the determined Early and Middle Jurassic coral genera.
Continuous line: distribution in the Bakony Mts. (this paper). Broken line: global distribution (WELLS, 1956)

Paleoecology

All corals live in marine conditions and belong to the sessile epibenthos. Independently the taxonomically distinguished 5 suborders, ecologically the corals can be divided into two groups:

- hermatypic corals (zooxanthellae are present)
- ahermatypic corals (zooxanthellae are lacking)

In both groups solitary and colonial forms equally can be found. Zooxanthellae do photosynthesis, for this reason hermatypic corals can live in the upper, well-illuminated zone only (0–90 m). In this way hermatypic corals are excellent environment indicators. In addition to the depth, hermatypic corals give useful information about water-temperature, salinity, water-movement, sedimentation and substrate. Ahermatypic corals can live between quite wider limits down to 6000 metres, but mainly between 0 and 500 metres (WELLS, 1957).

According to WELLS (1956) the ecological characters and morphotypes of the determined genera are the following:

Stylosmilia	colonial, phaceloid, hermatypic
Epistreptophyllum	solitary, turbinate-cylindrical, hermatypic
Ceratocoenia	solitary, elongate, ceratoid or cylindrical, hermatypic
Montlivaltia	solitary, cupolate, trochoid to subcylindrical, hermatypic, usually free in ephebic stage. According to GALÁCZ & MONOSTORI(1992) *Montlivaltia* lives in shallow water, in

symbiose with zooxanthellae on the basis of recent analogies

Caryophyllia: solitary, turbinate to subcylindrical, fixed or free, ahermatypic, depth range: 0–2743 m

Trochocyathus: solitary, turbinate to ceratoid, fixed or free, ahermatypic, depth range: 32–1573 m.

Seventy-seven specimens from 80 (96.25%) belong to solitary corals and only 3 specimens (3.75%) are colonial. 52 specimens (65%) are hermatypic and 28 are ahermatypic (35%). If we see the single localities, we can got exactly the same rates in Pliensbachian (Eplény: 67% hermatypic, 33% ahermatypic; Fenyveskút: 68% hermatypic, 32% ahermatypic; Közöskút: 66% hermatypic, 34% ahermatypic). The composition of the Bajocian corals is different (80% ahermatypic and 20% hermatypic) but only on the basis of 5 specimens (Fig. 8).

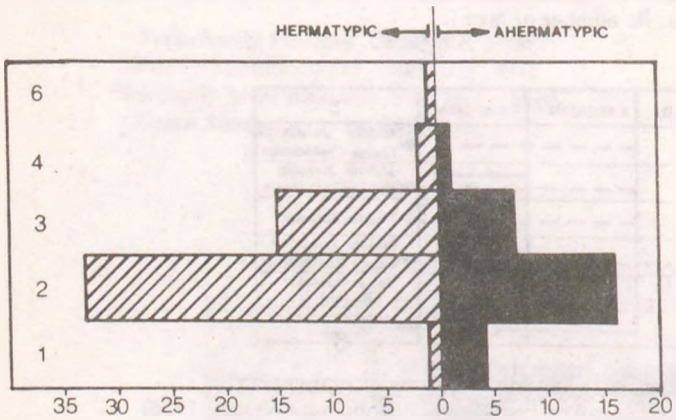

Fig. 8: Ratio of hermatypic and ahermatypic corals at the localities.
1 – Bakonybél, Somhegy
2 – Eplény, Manganese Ore Mine
3 – Lókút, Fenyveskút
4 – Hárskút, Közöskút-ravine
6 – Szentgál, Gombáspuszta

One part of the Scleractinia went down to the colder and deeper seas in the Jurassic and the recent deep-sea corals developed from these forms (GÉCZY, 1993). According to WELLS (1956) the first ahermatypic Scleractinian corals appeared in the Toarcian. On the other hand more than one-third of the coral fauna is ahermatypic in the Pliensbachian in the Bakony Mountains. (Moreover in the Jurassic corals of the Gerecse Mountains, which is not discussed in this work, the first ahermatypic coral came from Sinemurian formations.) The ahermatypic corals appearing in the Lower Jurassic presumably became more frequent in the Middle Jurassic and the coral fauna is mainly composed of ahermatypic forms at some Upper Jurassic localities.

The Hettangian Kardosrét Limestone was deposited in well-illuminated depths (it is proved by the large number of oncoids in this limestone) but the only indeterminable specimen suggests, that the depositional environment was unpleasant for settlement of corals. One of the preconditions of the settlement of the coral larvae is the immobile bottom in the sea. This requirement is not realized here, because the ooidal-oncoidal bottom was constantly agitated by strong currents.

The only specimen is hermatypic at Gombáspuszta but it cannot be interpreted clearly because of the small specimen number. According to GILL & LAFUSTE (1971) *Montlivaltia* lived exclusively on non-lithified substrate. Long (cylindrical or turbinate) forms were sediment stickers, while tympanoid or subturbinate forms simply rested on the soft sea floor. The tympanoid morphotype is uncertainly recognized for the Gombáspuszta specimen, which refers to freely resting mode of life. Tympanoid forms preferred coarser substrates rich in clasts and grains (GILL & LAFUSTE, 1971).

At the other Pliensbachian localities the observed 66–68% rate of the hermatypic corals suggests that the depositional environment was shallower than 100 m. The sizes of corals are generally small, the conditions probably were not very favourable, so depth may be near to the lower boundary of the distribution of hermatypic corals. Eplény and Közöskút localities represent the fissures of seamount areas, while Fenyveskút is situated at the tectonic margin of a seamount. This practically means that the top of seamounts were not sinking below the depth of 100 m during Pliensbachian in the Bakony Mountains.

At the same time at Somhegy during the Bajocian (where also a fissure of a seamount is represented) ahermatypic corals dominated in the fauna which means that the top of the seamount sank below 100 metres.

Solitary corals may be collected into groups on the basis of the shape of the corallum and the size of the attachment and resting area (WELLS, 1956; FÜRSICH et al.,1994). Five morphotypes were distinguished in the fauna of the Bakony Mountains, at that specimens where not only a section can be seen (Fig. 9). The most frequent type is ceratoid (23), relatively frequent the turbinate (6) and the scolecoid (4) types whereas cylindrical (2) and tympanoid (1) are rare. Nearly all types are elongated in shape and the attachment area are small. The small attachment area indicates that the larvae settled only on one particle or small fragments. The stabilization of the elongated corals required the fixation of the corallum (roof-like growth can be seen at some specimens) or the specimens had to be sunk in the loose sediments by the pointed basis of the corallum. However loose sediments were probably rare on the top of the seamounts, therefore the fixation was uncertain. The scolecoid morphotype, with worm-like irregular shape demonstrates this problem. These specimens were overturned by currents and because they were not able to stand up, the coral started to build itself to a new direction.

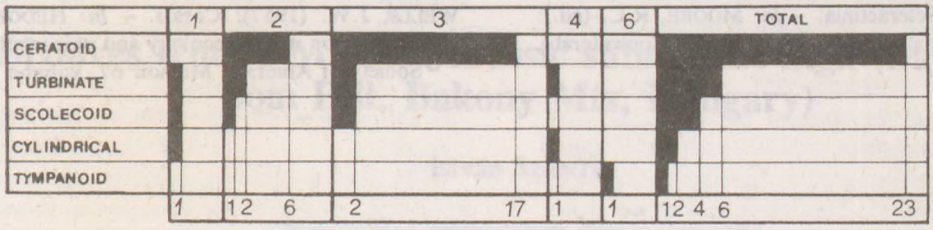

Fig. 9: Morphotypes of the solitary corals at the localities
1 – Bakonybél, Somhegy
2 – Eplény, Manganese Mine
3 – Lókút, Fenyveskút
4 – Hárskút, Közöskút-ravine
6 – Szentgál, Gombáspuszta

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Plate 5

Fig. 1. *Trochocyathus* sp.; Lókút, Fenyveskút; Domerian; rejuvenescenced specimen; 2×
Fig. 2. *Trochocyathus* sp.; Lókút, Fenyveskút; Domerian; rejuvenescenced specimen; 2×
Fig. 3. *Trochocyathus* sp.; Lókút, Fenyveskút; Domerian; rejuvenescenced specimen; 2×
Fig. 4. *Ceratocoenia* sp.; Lókút, Fenyveskút; Domerian; 2×
Fig. 5. *Ceratocoenia* sp.; Eplény; Domerian; 2×
Fig. 6. *Ceratocoenia* sp.; Eplény; Domerian; 2×
Fig. 7. *Ceratocoenia* sp.; Eplény; Domerian; longitudinal section; 2×
Fig. 8. *Ceratocoenia* sp.; Eplény; Domerian; transverse section; 2×
Fig. 9. *Ceratocoenia* sp.; Eplény; Domerian; transverse section; 2×
Fig. 10. *Trochocyathus* ? sp.; Eplény; Domerian; longitudinal section; 2×
Fig. 11. *Ceratocoenia* ? sp.; Eplény; Domerian; transverse section; 2×
Fig. 12. *Stylosmilia* sp.; Eplény; Domerian; transverse section; 2×
Fig. 13. *Trochocyathus* sp.; Eplény; Domerian; transverse section; 2×
Fig. 14. *Trochocyathus* sp.; Eplény; Domerian; transverse section with rejuvenescence; 2×
Fig. 15. *Trochocyathus* sp.; Bakonybél, Somhegy, Bed 3; Upper Bajocian; 2×
Fig. 16. *Trochocyathus* sp.; Bakonybél, Somhegy, Bed 6; scolecoid specimen; Upper Bajocian; 2×
Fig. 17. *Ceratocoenia* sp.; Hárskút, Közöskút-ravine; Carixian; 2×
Fig. 18. *Montlivaltia* ? sp.; Hárskút, Közöskút-ravine; Carixian; 2×
Fig. 19. *Caryophyllia* ? sp.; Hárskút, Közöskút-ravine; Carixian; 2×