New Aspects on Tethyan Cretaceous Fossil Assemblages.
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3.2. Tethyan Cretaceous corals in Yugoslavia

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Abstract

The distribution of corals within the paleo-geotectonic units of Yugoslavia is varying during the Cretaceous period. Lower Cretaceous corals are restricted to the Dinarid Platform and to the Carpathian-Balcanid unit. Cenomanian-Turonian-Coniacian corals occur exclusively in the Drina-Ivanjica unit. The Santonian-Campanian and Maastrichtian corals are restricted to the northern part of the Inner Dinarids. The prosperity and obliteration of corals on the paleo-geotectonic units of Yugoslavia was caused by environmental changes due to tectonic activities.

1. Short review of Cretaceous corals in the Tethyan region

Corals played an important role in the formation of the Cretaceous sediments throughout the shallow Tethys (Fig. 1). Fossil remains of these organisms may be found in almost all Cretaceous intervals. From some stages recordings are rare; in others, however, corals are extraordinarily abundant. The total number of known coral genera from the Cretaceous is 362 (WELLS, 1986). The number of species exceeds 1200.

While corals are hardly known from Berriasian to Valanginian sediments the number of species recorded from the Hauterivian (and "Neocomian") is almost 300. In Barremian and Aptian times this group developed equally successfully in all shallow marine regions of the Tethys. A major crisis occurred at the end of the Aptian, when the number of species decreased to some tens. The largest number of species is known from the Cenomanian although coral faunas are only known from a small number of localities. In the Turonian, the number of species decreases again and reaches a minimum of 12 in the Coniacian. In the

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Santonian, the corals flourished again. They are spread all over the world, the number of species is more than 300. Due to an unsufficient stratigraphic resolution many of the Santonian-Campanian corals are ascribed the Senonian in general. In the Maastrichtian, the number of genera and species decreases and only a few of them persists into the Paleocene.

A number of researchers have attempted to delineate the world-wide development of corals during the Cretaceous. The most accomplished presentation of species is given in the catalogue "Anthozoa Cretacea" by FELIX (1914). It reviews all species known up to this time. More recently, important revisions of corals were published by VAUGHAN & WELLS (1943), ALLOITEAU (1952), and WELLS (1956). The distribution of Upper Cretaceous corals in the entire Tethys was studied by M. and L. BEAUVAIS (1974), who presented all the localities and quoted some of the species important for individual horizons. TCHECHMEDJIEVA (1986) provided a review of the Upper Cretaceous corals of Bulgaria, KUZMICHEVA (1986) for the Upper Cretaceous of the Soviet Union, SIHARULIDZE (1979) for the Urgonian corals of Georgia, and TURNŠEK (1989) for the Mesozoic corals of NW Yugoslavia. Among others, monographic works on corals from the following localities are important: Upper Cretaceous localities of the Gosau Group, Austria (M. BEAUVAIS, 1982), Lower Cretaceous of the Polish and Romanian Carpathians (MORYCOWA 1964, 1971), Eastern Serbia (TURNŠEK & MIHAJLOVIČ 1981), Catalonia in Spain (BATTALER 1937), Texas, Mexico and other regions in North America (WELLS 1932, 1933), Madagascar (ALLOITEAU 1958).

The present paper deals with the stratigraphic distribution of corals in the territory of Yugoslavia and its relationship to paleogeography. A complete data base of Cretaceous coral species will be presented in the near future under the auspicies of IGCP Project 262.

2. Geographic and stratigraphic distribution of Cretaceous corals in Yugoslavia

No corals have yet been found in the Berriasian.

Three species of Valanginian corals have been found in Banjska planota in western Slovenia; all three are known from Jurassic strata. They are accompanied by large tintinnids and the stromatopore *Milleporidium variocellatum* (TURNŠEK & BUSER, 1974).

In Hauterivan deposits of Ozren and Devica in eastern Serbia four coral species have been found together with various fossils such als *Cidaris, Rhynchonella, Terebratula,* and others (SUČIĆ, 1953). A locality with *Cladocoropsis cretacica* in Montenegro is also ascribed to this stage (TURNŠEK, 1968).

In the Barremian-Aptian an extraordinary increase of coral species has been registered. 97 species have been found. Their localities are on Banjška planota in western Slovenia, where the stromatopore *Dehornella* occurs besides corals. They are accompanied by other fossils as *Chaetetopsis,* nerineacean gastropods as *Phanerophtyxis,* the foraminiferan genera *Orbitolina, Chofatella, Cosci-*

nolina, the algae *Macroporella, Triploporella,* and *Salpingoporella dinarica* (TURNŠEK & BUSER, 1974). Some corals of the same stratigraphic interval are mentioned from Montenegro (RADOIČIĆ, 1960). Corals are very numerous in eastern Serbia in the territory between the South Morava river and Stara Planina (KOCHANSKY, 1951; MARKOVIĆ, 1951; TURNŠEK & MIHAJLOVIĆ, 1981). A review of the Urgonian facies of this territory was provided by JANKIČEVIĆ (1978), who cited in addition to corals 15 species of algae, 15 species of foraminifera, 29 brachiopod species, 83 bivalve species, 45 sea-urchin species, and 6 cephalopod species.

No corals have yet been found in the Albian of Yugoslavia.

Three coral species from the locality Duboki potok in western Serbia were ascribed to the Cenomanian (MAKSIMOVIĆ & MARKOVIĆ, 1953). Besides of corals this locality contains gastropods, sea-urchins, brachiopods, bivalves and other fossils.

Only two coral species have been found in Turonian strata. They have been discovered in Kosjerić in western Serbia, where the section continues into the Coniacian with 6 species of corals (PAŠIĆ, 1957). They are accompanied by the rudists *Requienia, Chondrophora, Sauvagesia,* by gastropods and by other fossils. The stromatoporoid genera *Actinostromaria* and *Burgundostromaria* are also known from this stage and environment.

Most Upper Cretaceous corals are known from strata of Santonian-Campanian age. Corals from this interval have been found in Slovenia (TURNŠEK, 1978; TURNŠEK & BUSER, 1976), in northern Croatia (TURNŠEK & POLŠAK, 1978; PAŠIĆ, 1951a), and in eastern Serbia (MILOVANOVIĆ, 1939; PAŠIĆ, 1953). In some of these localities many other fossils occur together with corals: *Inoceramus, Acteonella, Hippurites, Gorjanovicia, Bournonia, Radiolites, Kuehnia,* but also *Globotruncana, Praeglobotruncana, Watznaueria, Coccolithus* and others (TURNŠEK, 1978).

Only three coral species have been mentioned so far in the Maastrichtian on the Fruška gora mountains where they are accompanied by *Inoceramus balticus, Loftusia morgani, Gryphaea vesicularis* (PAŠIĆ, 1951b).

A list of the corals with their stratigraphic and paleogeographic position is presented on Fig. 2.

3. Vertical distribution of coral genera in the Yugoslavian Cretaceous

The systematic analysis shows that the Valanginian coral species are equal to the terminal Jurassic ones, while the Hauterivian species are more similar to those of Barremian-Aptian age.

Among the 97 species of Barremian-Aptian age only 4 are the same as in the Upper Jurassic; not a single one ranges into the Upper Cretaceous.

Of the Upper Cretaceous species three are restricted to the Cenomanian and two to the Turonian. Seven species known from the Coniacian continue into the Santonian. The greatest number of species (58) is known from the Santonian-Campanian. Eight species are restricted to the Campanian, 10 have been ascribed to the Campanian-Maastrichtian, and three to the Maastrichtian.

Changes on the species level took place at the beginning of the Hauterivian, at the end of the Aptian, and at the end of the Campanian.

An analysis shows changes at the generic level at different intervals. Of the 62 genera of Barremian-Aptian age, 24 are the same as in the Upper Jurassic, 10 of them continue into the Upper Cretaceous. In the Santonian-Campanian 36 genera occur first, only three of them continue into the Maastrichtian and two into the Tertiary. Major generic changes occurred at the end of the Aptian and again at the end of the Campanian.

4. Distribution of Cretaceous corals on the paleo-geotectonic units of Yugoslavia

The success of corals in the individual regions of the Tethys depends on the interaction of paleogeography, tectonics, water temperature and favorable water currents. Investigations on the present-day distribution of Cretaceous corals have to take into account that numerous reefs at platform margins have been eroded and deposited on secondary sites. It is also possible that soft corals prevailed in some intervals of the Cretaceous period which were not fossilized.

Cretaceous coral localities in Yugoslavia are restricted at different time intervals to certain geotectonic units (combined and re-arranged after Herak, 1986; Karamata, 1988 and Buser, 1989): Lower Cretaceous corals appear on the Dinaric carbonate platform and in the Carpathian-Balcanid unit. Cenomanian, Turonian and Coniacian corals are mainly resticted to the Drina-Ivanjica unit. Santonian-Campanian and Maastrichtian corals are known only from the northern part of the Inner Dinarids (Fig. 3).

The Dinaric carbonate platform sedimentation was continuous during the Mesozoic. Corals have been found in various Lower Cretaceous levels in patch reefs. On the margin of the platform, reefs must have been abundant. These have been eroded later, which is shown by the Lower Cretaceous corals found in breccias north of the platform. Nearly half of the Lower Cretaceous coral genera are the same as in the Upper Jurassic. It is therefore concluded that the sedimentary environment did not change essentially during this time interval.

The Carpathian-Balcanid unit represents a somewhat different sedimentary environment. The Lower Cretaceous corals are of the same age as those on the Dinaric platform. Species and fossils assemblages are similar. In eastern Serbia, however, numerous rich accumulations of corals have been found. The sediments are as well carbonates as terrigenous. Jankičević (1978) considers this location to have been an unstable continental threshold, where local facies changed rapidly. Corals accumulated on platforms are frequently filled with terrigenous sediments. The facies of these sediments is comparable to the Urgonian facies of southern France and elsewhere.

Within the Inner Dinarids, the Drina-Ivanjica unit represents a shoal between the west Diabase-chert formation and the Vardar zone. It is interpreted by HERAK (1986) as "not persisting land bodies in the course of Alpine orogeny ... but parts of the basement, subsequently uplifted through the ophiolitic nappe system ...". In the Cenomanian, Turonian and Coniacian small patch coral and stromatoporoid reefs were floorishing temporarily on these shoals. The shape of the coral colonies is similar to those of the Dinaric platform, but the reefs are smaller. It can't be excluded that the reefs had been originally larger and were partly eroded after denudation.

In the Inner Dinarids Santonian-Campanian and Maastrichtian corals occur in rocks which are considered to have been deposited at somewhat deeper marine conditions than coral reefs usually occur. This environment was also spreading over the Slovenian trough (BUSER, 1988), the Supradinaricum and partly over the Paradinaricum (HERAK, 1986) where different types of corals have been found. Finally, it occurred in the Fruška gora mountains and in eastern Serbia (MILOVANOVIĆ, 1939; PAŠIĆ, 1951a, b).

The paleoenvironment of northern Slovenian and Croatian occurrences has been interpreted by TURNŠEK (1989). The isolated, biolithitic and brecciated types of coral occurrences are similar to those of the Gosau group in Austria. According to HÖFLING (1985) they were located in the shallow water environments of the back reef and also of the fore reef, where an influence of the open sea was possible. Some of these corals have probably been resedimented and accumulated in secondary sites (Fig. 4).

5. Coral shape and environment

Corals are classified into solitary, phaceloid and massive forms. Among the Lower and "Middle" Cretaceous corals of the Dinaric platform, of the Carpathian-Balcanids and of the Drina-Ivanjica unit, massive forms predominate. Here, solitary corals scarcely exceed 15% of the total assemblage. Among the Upper Cretaceous corals of the Inner Dinarids solitary corals prevail and represent more than 50% of the total assemblage (Fig. 5). The percentage of solitary corals in the Inner Dinarids would even be greater if the massive colonies found in breccias had been separated.

6. Conclusions

During the Cretaceous the geotectonic units described by HERAK (1986), KARAMATA (1988) and for Slovenia by BUSER (1989) have yielded various paleogeographic and sedimentary environments suitable for the growth of corals. The 195 coral species found so far belong to 98 genera and represent one fourth of all known Cretaceous Tethyan scleractinian genera. The highest rates of occurrences are in the Barremian-Aptian and Santonian-Campanian. In all other Cretaceous stages corals are rare, in the Berriasian and Albian no coral has yet been found.

All Lower Cretaceous corals are restricted to the Dinaric carbonate platform and to the Carpathian-Balcanid tectonic unit. Cenomanian, Turonian and Coniacian corals have been found in the Drina-Ivanjica unit. Santonian-Campanian and Maastrichtian corals are only known from the northern part of the Inner Dinarids, and as a whole they represent a Gosau assemblage. Some of them were resedimented.

The success and extinction of the corals can be explained by general environmental changes as well as by local paleogeographic tectonic changes.

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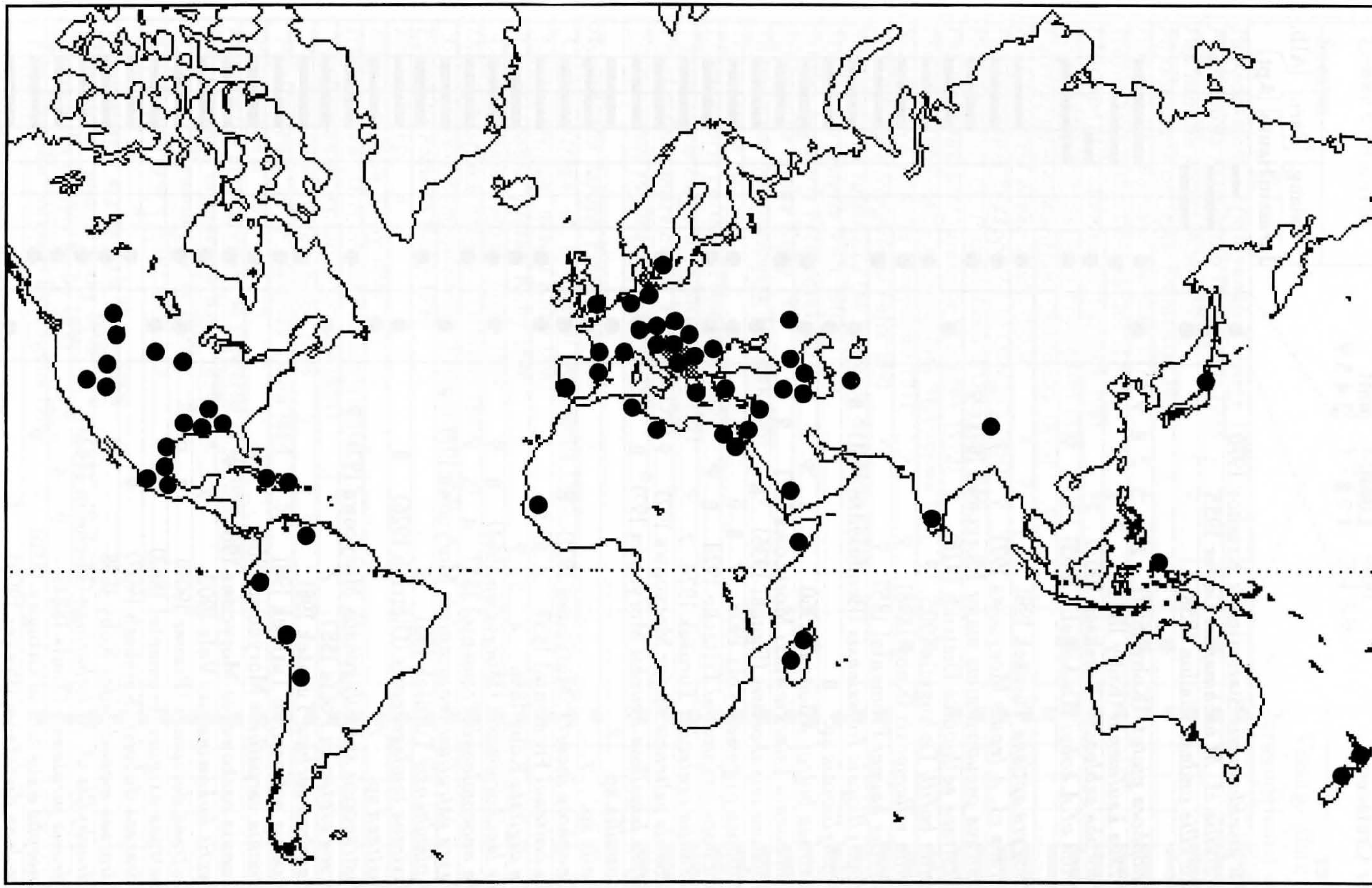

Fig. 1: Cretaceous coral localities in the Tethyan region (partly from BEAUVAIS & BEAUVAIS, 1974).

Lower Cretaceous Species	Dinarid platform (Local. 1 7 8)	Carpathianr. Balcanid unit (2 4 5 9)	Jurassic	Valang.	Haute.	Barr.	Apt.	Alb.
Ironella giseldonensis Starostina & Krasnov 1970 1	●			—				
Microphyllia cf. *M.bachmayeri* Geyer 1955 1	●		—	—				
Microphyllia undans Etallon 1858 1	●		—	—				
Eohydnophora picteti (Koby 1897) 2 4 5 7 8 9	●	●			—	—	—	
Latiastraea kaufmanni (Koby 1898) 2 9		●			—	—		
Mesomorpha sablensis (Karakash 1907) 2		●			—			
Axosmilia cf.A.kobyi (DeAngelis 1905) 2 5 9		●			—	—	—	
Acanthogyra aptiana Turnšek 1981 9		●				—	—	
Actinaraea cf. *A.tenuis* Morycowa 1971 9		●				—	—	
Actinastraea pseudominima major Morycowa 1971 9		●				—	—	
Amphiastraea aethiopica Dietrich 1926 8	●					—	—	
Axosmilia bofilli DeAngelis 1905 9		●				—	—	
Axosmilia villersensis (Koby 1898) 9		●				—	—	
Baryphyllia haimei Fromentel 1857 9		●				—	—	
Calamophylliopsis fotisalensis (Bendukidze 1961) 8	●					—	—	
Calamophylliopsis sp. 8	●					—	—	
Clausastraea bolzei Alloiteau 1960 7 8 9	●	●				—	—	
Columnocoenia ksiazkiewiczi Morycowa 1971 9		●				—	—	
Cyathophora miyakoensis (Eguchi 1936) 8	●					—	—	
Cyathophora pygmaea Volz 1903 7 8 9	●	●				—	—	
Cyathophora steinmanni Fritzche 1924 8 9	●	●				—	—	
Dermosmilia cretacica Turnšek 1974 7	●					—	—	
Diplocoenia saltensis major Morycowa 1971 9		●				—	—	
Diplogyra lamellosa eguchii Morycowa 1971 8	●					—	—	
Donacosmilia sp. 7	●					—	—	
Enallhelia sp. 7	●					—	—	
Eohydnophora incerta (Morycowa 1971) 8	●					—	—	
Eugyra cotteaui Fromentel 1857 7 8 9	●	●				—	—	
Eugyra digitata Koby 1896 4 5 9		●				—	—	
Eugyra lanckoronensis (Morycowa 1964) 8 9	●	●				—	—	
Eugyra neocomiensis Fromentel 1857 4 5 9		●				—	—	
Felixigyra patruliusi tenuiseptata Morycowa 1971 7	●					—	—	
Floria planinensis Turnšek 1981 9		●				—	—	
Fungiastraea tendagurensis (Dietrich 1926) 8	●					—	—	
Fungiastraea sp. 7	●					—	—	
Fungiastraeopsis subpolygonalis Morycowa 1971 9		●				—	—	
Glenaraea cretacica Počta 1887 7	●					—	—	
Gyrodendron serbica Turnšek 1981 9		●				—	—	
Heliocoenia actinastrae Turnšek 1981 9		●				—	—	
Heliocoenia carpathica Morycowa 1964 9		●				—	—	
Heliocoenia rozkowskae Morycowa 1964 9		●				—	—	
Holocystis bukowinensis Volz 1903 9		●				—	—	
Latusastraea decipiens (Prever 1909) -7 9	●	●				—	—	
Latusastraea exiguis (Fromentel 1862) 7	●					—	—	
Meandraraea duboisi (Karakash 1907) 9		●				—	—	
Meandraraea meandroides Koby 1898		●				—	—	
Meandrophyllia cf. *M.lotharinga* (Michelin 1843) 9		●				—	—	
Meandroria pirotensis (Toula 1884) 9 5		●				—	—	
Mesomorpha excavata (d'Orbigny 1850) 9		●				—	—	
Microsolena distefanoi (Prever 1909) 7	●					—	—	
Microsolena guttata Koby 1898 7 9	●	●				—	—	
Microsolenastraea balcanica Turnšek 1981 9		●				—	—	
Ovalastraea polygonalis Alloiteau 1958 9		●				—	—	

Fig. 2: Stratigraphic distribution and paleogeographic origin of Cretaceous coral species recorded from Yugoslavia. Part 1.

Lower Cretaceous Species	Localities	Paleogeographical units: Dinarid platform (Local. 1 7 8)	Paleogeographical units: Carpathianr. Balcanid unit (2 4 5 9)	Jurassic	Valang.	Haute.	Barr.	Apt.	Alb.
Palaeopsammia zljebinensis Turnšek 1981	9		●				■	■	
Peplosmilia fromenteli DeAngelis 1905	5 7 9	●	●				■	■	
Peplosmilia stutzi (Koby 1896)	5 9		●				■	■	
Phyllocoenia cotteaui Fromentel 1857	5 7	●	●				■	■	
Placophyllia curvata Turnšek 1974	7 9	●	●				■	■	
Plesiofavia dubia (Fromentel 1857)	9		●				■	■	
Pleurophyllia skuviensis Turnšek 1981	9		●				■	■	
Polyphylloseris convexa Fromentel 1857	7 8 9	●	●				■	■	
Polytremacis edwardsana (Stoliczka 1873)	9		●				■	■	
Pseudocoenia annae (Volz 1903)	4 9		●				■	■	
Pseudocoenia hexaphyllia (d'Orbigny 1850)	9		●				■	■	
Pseudocoenia cf. *P.suboctonis* d'Orbigny 1850	9		●				■	■	
Pseudocoeniopsis jurassica (Turnšek 1972)	9		●				■	■	
Pseudopolytremacis spinoseptata Morycowa 1971	7	●					■	■	
Siderastraea senecta Morycowa 1971	9	●					■	■	
Siderofungia irregularis Felix 1891	7		●				■	■	
Smilotrochus tuberosus (M.Edwards & Haime 1850)	9		●				■	■	
Stylina parvistella Volz 1903	9		●				■	■	
Stylina regularis Fromentel 1867	7 9	●	●				■	■	
Stylosmilia alpina Koby 1897	9		●				■	■	
Thamnaraea mammelonata Turnšek 1981	9		●				■	■	
Thamnaraea sp.	9		●				■	■	
Thamnasteria cotteaui Fromentel 1857	9		●				■	■	
Thamnoseris carpathica Morycowa 1971	9		●				■	■	
Trochoidomeandra ovalis Turnšek 1981	9		●				■	■	
Truncoconus inclinatus Turnšek 1981	9		●				■	■	
Baryphyllia barotei Fromentel 1864	5		●					■	
"Convexastraea" cf. *C.almerai* DeAngelis 1905	4		●					■	
"Convexastraea" desori Koby 1890	4		●					■	
"Cryptocoenia" picteti Koby 1898	4		●					■	
"Cryptocoenia" ramosa Toula 1884	5		●					■	
Dimorphastraea bellula d'Orbigny 1849	4		●					■	
"Elipsocoenia hemisphaerica (Fromentel 1857)	4 5		●					■	
Epismilia robusta Koby 1898	5		●					■	
Epismilia sp.	4		●					■	
Eugyra pussila Koby 1898	4 5		●					■	
Hydnophora aff.*H.crassa* Fromentel 1862	5		●					■	
"Phyllocoenia" exculpta (Reuss 1854)	5		●					■	
"Phyllocoenia" picteti Koby 1898	5		●					■	
"Phyllocoenia" cf. *P.zlatarski* Toula 1884	5		●					■	
"Phyllocoenia" sp.	4 5		●					■	
Placosmilia cf. *P.arcuata* M.Edwards & Haime 1849	5		●					■	
Polytremacis urgonensis Koby 1898	4		●					■	
Stylina cf. *S.esmuni* Felix 1909	5		●					■	
Stylina micropora Koby 1898	4		●					■	
Stylohelia sp.	4		●					■	
Thamnasteria urgonensis Koby 1898	4		●					■	
"Thecoseris" pumila Koby 1898	4		●					■	
Thecosmilia tobleri Koby 1898	4		●					■	
"Trochosmilia" neviani DeAngelis 1905	5		●					■	

Fig. 2: Stratigraphic distribution and paleogeographic origin of Cretaceous coral species recorded from Yugoslavia. Part 2.

Upper Cretaceous Species	Paleogeographical units: Drina Ivanjica belt 10 11 12	Paleogeographical units: Inner Dinar. North. Jugosl. 8 14 15 16 17 18 19	Stratigraphical distribution: Cenom.	Turon.	Conia.	Sant.	Camp.	Maast.
Amphiastraea cf. *A.paronai* Prever 1909. 10	●		■					
Thamnoseris hoernesi (Reuss 1854) 10 15	●	●	■			■	■	
"Trochosmilia" sp. 10	●		■					
Thecosmilia minor Prever 1909 11	●			■				
"Trochosmilia" polymorpha Prever 1909 11	●			■				
Actinastrastraea orbignyana (M-Edwards & Haime 1849)	●				■	■		
"Heliastraea" lilli Reuss 1854 11	●				■	■		
Nefophyllia multicincta (Reuss 1854) 11	●				■	■		
Placocoenia dumortieri Fromentel 1879 11 14 17 19	●	●			■	■	■	■
Procladocora tenuis (Reuss 1854) 11 15	●	●			■	■	■	
Corbariastraea junctiseptata (Oppenheim 1930) 11	●				■	■		
Microsolena aff. *M.distefanoi* (Prever 1909) 12	●				■	■	■	
Acrosmilia conica (d'Orbigny 1850) 16		●				■	■	
Actinacis martiniana d'Orbigny 1849 12 15	●	●				■	■	■
Actinacis remesi Felix 1903 8 17		●				■	■	
Actinastraea ramosa (Michelin 1847) 14 15 17		●				■	■	
Actinastraea octolamellosa (Michelin 1846) 15		●				■	■	
Astraraea media (Sowerby 1832) 15 17		●				■	■	
Aulosmilia aspera (Sowerby 1831) 16		●				■	■	
Aulosmilia cuneiformis (M.Edwards & Haime 1849) 16		●				■	■	
Aulosmilia salisbergensis (M.Edwards & Haime 1849) 14		●				■	■	
Columactinastraea pygmaea (Felix 1903) 15		●				■	■	
Columastraea formosa (Goldfuss 1826) 15		●				■	■	
Columastraea striata (Goldfuss 1826) 15		●				■	■	
Columellogyra lomensis Turnšek 1976 8		●				■	■	
Conicosmilotrochus dentatus Turnšek 1978 16		●				■	■	
Conicosmilotrochus stranicensis Turnšek 1978 16		●				■	■	
Conicosmilotrochus strictus Turnšek 1978 16		●				■	■	
Cunnolites (Cunnolites) faecata (Stoliczka 1873) 16 18		●				■	■	
C.(Cunnolites) longifossata Tchechmedjieva 1973 16		●				■	■	
C.(Cunnolites) profunda (Oppenheim 1930) 16 18		●				■	■	
C.(Cunnolites) reussi (Fromentel 1862) 16 18		●				■	■	
C.(Cunnolites) sellata (Quenstedt 1880) 16		●				■	■	
C.(Cunnolites) undulata (Goldfuss 1826) 14 16		●				■	■	
C.(Paracunnolites) scutellum (Reuss 1854) 16 18		●				■	■	
C.(Plesiocunnolites) cycloides (Felix 1903) 16		●				■	■	
C.(Plesiocunnolites) dispar (Quenstedt 1880) 16		●				■	■	
C.(Plesiocunnolites) cf. *P.depressa* (Reuss 1854) 16		●				■	■	
C.(Plesiocunnolites) gosavicus (Oppenheim 1930) 16		●				■	■	
C.(Plesiocunnolites) nummulus (Reuss 1854) 16 18		●				■	■	
C.(Plesiocunnolites) orbignyi (Fromentel 1864) 16		●				■	■	
C.(Plesiocunnolitopsis) robusta (Quenstedt 1880) 16		●				■	■	
Dasmiopsis lamellicostatus (Reuss 1854) 16		●				■	■	
Dermosmiliopsis orbignyi Alloiteau 1957 15		●				■	■	
Dermosmiliopsis tenuicosta (Reuss 1854) 15		●				■	■	
Diploctenium ferrumequinum (Reuss 1854) 16		●				■	■	
Diploctenium cf. *D.pavoninum* Reuss 1854 16		●				■	■	
Elasmophyllia deformis (Reuss 1854) 15		●				■	■	
Ellipsosmilia sp. 15		●				■	■	
Heterocoenia grandis Reuss 1854 8		●				■	■	
Hydnophora styriaca (Michelin 1847) 8 17		●				■	■	
Meandrastraea antiqua (Reuss 1854) 15		●				■	■	
Meandroria konincki (M.Edwards & Haime 1849) 8 17		●				■	■	
Neocoeniopsis lepida (Reuss 1854) 15 17		●				■	■	

Fig. 2: Stratigraphic distribution and paleogeographic origin of Cretaceous coral species recorded from Yugoslavia. Part 3.

Upper Cretaceous Species	Paleogeographical units: Drina Ivanjica belt 10 11 12	Paleogeographical units: Inner Dinar. North. Jugosl. 8 14 15 16 17 18 19	Stratigraphical distribution: Cenom.	Turon.	Conia.	Sant.	Camp.	Maast.
Phyllocoeniopsis pediculata (Deshayes 1831) 15		●				▬	▬	
Phyllocoeniopsis sp. 15		●				▬	▬	
Phyllosmilia sp. 16		●				▬	▬	
Phragmosmilia sp. 16		●				▬	▬	
Pleurocora (?Rhabdophyllia) crassa (Reuss 1854) 15		●				▬	▬	
Pleurocora haueri (M.Edwards & Haime 1848) 15		●				▬	▬	
Procladocora simonyi (Reuss 1854) 8 15		●				▬	▬	
Pseudofavia grandiflora (Reuss 1854) 8		●				▬	▬	
Rennensismilia complanata (Goldfuss 1826) 16		●				▬	▬	
Rennensismilia chondrophora (Felix 1903) 14 19		●				▬	▬	▬
Rennensismilia subinduta (Reuss 1854) 16		●				▬	▬	
Stephanosmilia polydectes Kolosvary 1954 8		●				▬	▬	
Synastraea procera (Reuss 1854) 15		●				▬	▬	
Thamnoseris morchella (Reuss 1854) 8		●				▬	▬	
Astrogyra voraccissima (Oppenheim 1930) 17		●					▬	
Heterocoenia exigua (Michelin 1847) 17		●					▬	
Hydnophora parviconus (Oppenheim 1930) 17		●					▬	
Meandroria konincki typica (Reuss 1854) 17		●					▬	
Placocoenia microcalix Oppenheim 193o 17		●					▬	
Polytremacis partschi Reuss 1854 17		●					▬	
Psilogyra telleri Felix 1903 17		●					▬	
Reussicoenia edwardsi (Reuss 1854) 17		●					▬	
Cunnolites barrerei 18		●					▬	▬
Cunnolites conoidea(Stoliczka 1873) 18		●					▬	▬
Cunnolites filamentosa (Forbes 1846) 18		●					▬	▬
Cunnolites gigantea (d'Orbigny 1850) 18		●					▬	▬
Cunnolites ligeriensis (M-Edwards & Haime 1851) 18		●					▬	▬
Cunnolites macrostomata (Reuss 1854) 18		●					▬	▬
Cunnolites numismalis (Lamarck 1816) 18		●					▬	▬
Cunnolites polymorphus (Goldfuss 1826) 18		●					▬	▬
Cunnolites quenstedti (Oppenheim 1930) 18		●					▬	▬
Cunnolites sororius (Quenstedt 1880) 18		●					▬	▬
Cunnolites ellipticus (Guettard 1770) 19		●						▬
Phragmosmilia psecadiophora (Felix 1903) 19		●						▬
Rennensismilia didyma (Goldfuss 1826) 19		●						▬

Fig. 2: Stratigraphic distribution and paleogeographic origin of Cretaceous coral species recorded from Yugoslavia. Part 4.
Numbers together with species names refer to localities on Fig. 3.

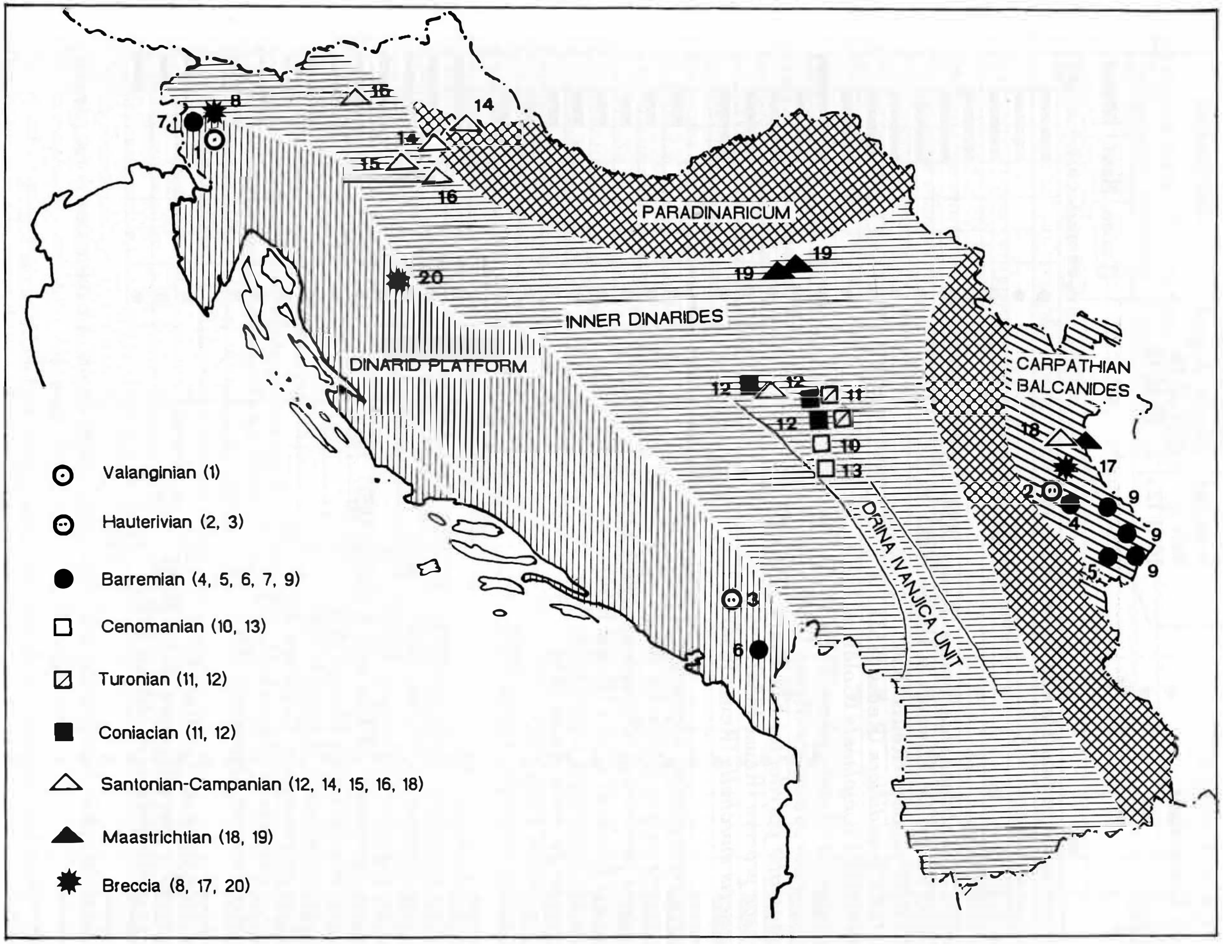

Fig. 3: The age and the distribution of the coral localities on the paleogeotectonic units of Yugoslavia. The numbers 1–19 refer to localities of Fig. 2. Paleogeotectonic units after HERAK (1986), KARAMATA (1988), BUSER (1989).

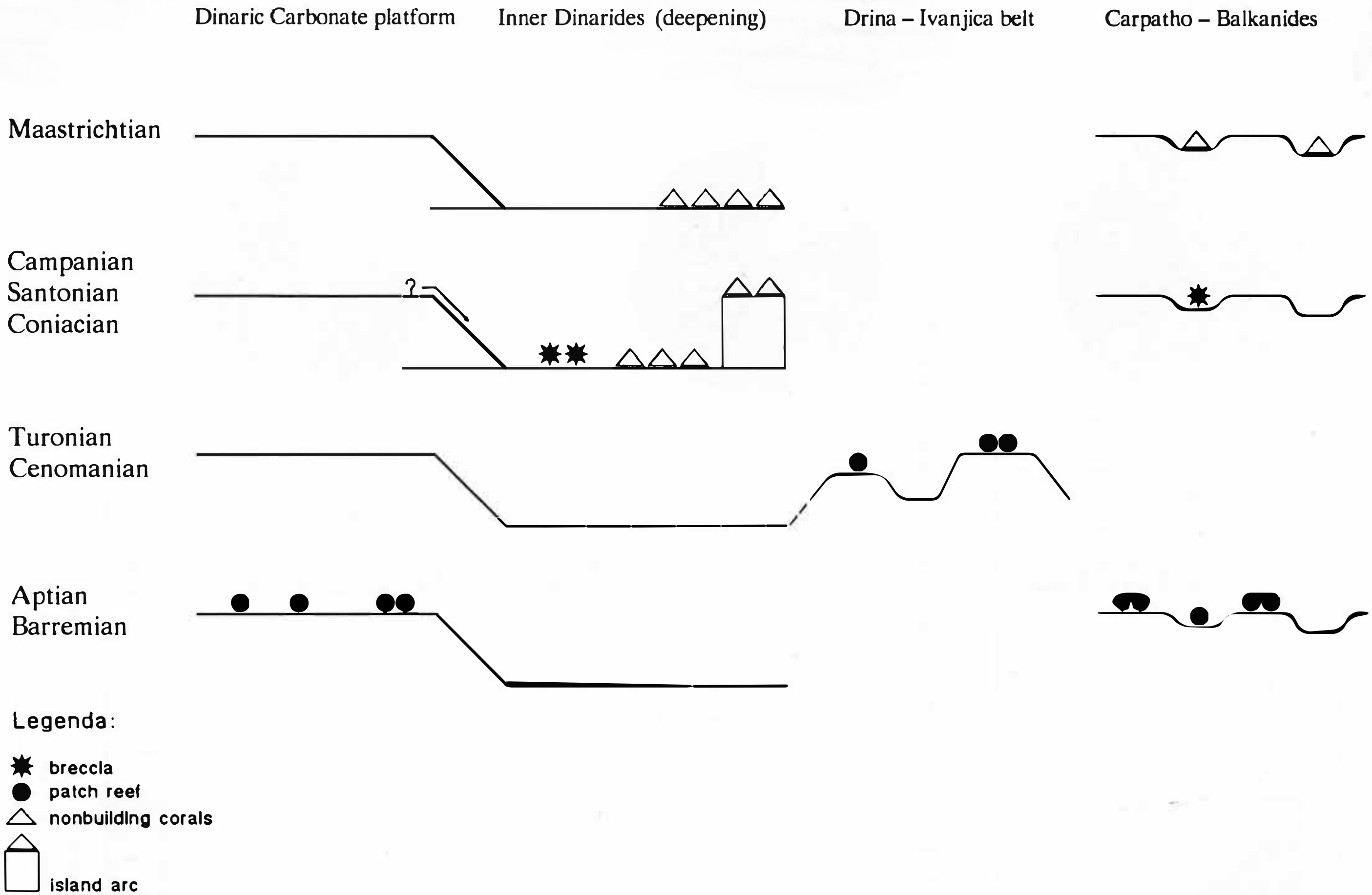

Fig. 4: Generalized palinspastic cross section of Yugoslavia showing the position of coral localities. Note the stable Dinaric Platform containing autochthonous localities, the Inner Dinarids with various forms of coral occurrences and the unstable Carpato-Balkanid Platform with autochthonous occurrences and coral accumulations.

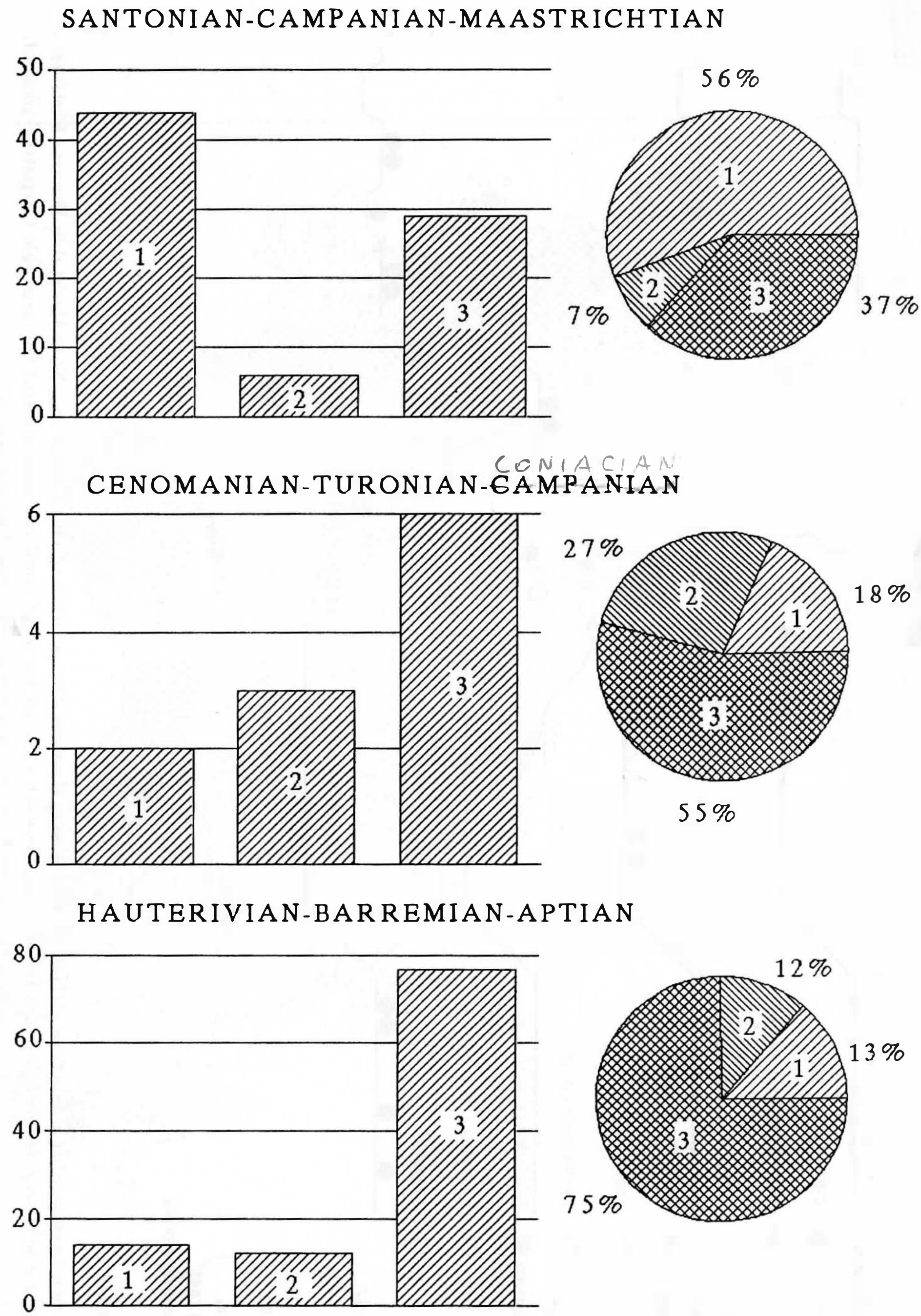

Fig. 5: Relationship between coral shape and environment. 1: solitary corals; 2: phaceloid corals; 3: massive corals. The diagrams on the left show the numbers of species, the diagrams on the right their percentage in the total assemblages. In the Lower and "middle" Cretaceous solitary corals represent ecarcely 15% of the coral assemblages. In the Santonian-Campanian they represent more than 50% of the assemblages and indicate deeper water environments.