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**Radiolarian evidence for Middle Bathonian radiolarites in the Episkopi Formation
(Ayios Photios Group, Mamonia Complex, SW Cyprus).**

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Abstract

The Ayios Photios Group in SW Cyprus represents a deep-water slope or base of slope sequence that was accumulated on a Mesozoic margin of the Mediterranean Tethys. The Episkopi Formation is an essentially radiolaritic sequence, the age of which was previously considered to range between the Callovian and the Valanginian. A moderately well preserved (PI 4-5) radiolarian assemblage was extracted after laboratory leaching with diluted hydrofluoric acid of a radiolarian chert bed south of the village of Episkopi. Based on the co-occurrence of *Bernoullius rectispinus leporinus* Conti & Marcucci, *Hexasaturnalis tetraspinus* (Yao) and *Theocapsommella cucurbitiformis* (Baumgartner), the assemblage is correlated with the Middle Bathonian (Unitary Association Zone 6). Our results extend downwards the known age range of radiolarites of the Episkopi formation and reduce the previously known range of depositional hiatus with the underlying Upper Triassic formations of the Ayios Photios Group.

Key-words

Radiolaria, Bathonian, Mamonia Complex, Episkopi Formation, Cyprus.

1. Introduction

The Mamonia Complex in SW Cyprus (Fig. 1) is an important tectono-sedimentary unit for the understanding of the paleogeographic and geodynamic evolution of the Tethyan oceanic realm (Dercourt et al. 1993; Barrier and Vrielynck, 2008; Lapierre et al. 2006; Robertson, 1998; Robertson et al., 1996; Robertson and Woodcock, 1979; Torley and Robertson, 2018). It is a highly complicated allochthonous unit (Lapierre, 1968), emplaced over the Troodos ophiolite; it consists of a series of tectonic slices, the upper part of which is composed of rocks of the Ayios Photios Group *sensu* Robertson and Woodcock (1979) or the Mamonia Formation *sensu* Lapierre et al. (2007). The Ayios Photios Group is further subdivided into three lithostratigraphic units: the Vlampouros, Marona and Episkopi Formations (Robertson and Woodcock, 1979; Swarbrick and Robertson, 1980). The Vlampouros Fm is an essentially terrigenous sedimentary sequence, containing some intercalations of *Halobia*-bearing micritic limestones and calcarenites that contain shallow-water clasts; it is ca. 30 m-thick and Late Triassic (Carnian-Norian) in age, as established by radiolarians (Bragin and Krylov, 1996). The Marona Fm is a ca. 25-m-thick pelagic carbonate sequence (mainly calcilutites) that include abundant elements of the Upper Triassic pelagic bivalve *Halobia*. It is only locally distributed in the Dhiarizos River valley; thus, in most cases, the overlying Episkopi Fm lies directly over the Vlampouros Fm, without the presence of the Marona Fm, considered by Bragin and Krylov (1996) as a member of the Vlampouros Fm.

The Episkopi Fm is a ca. 100m-thick sequence of radiolarites (couplets of cm-thick radiolarian cherts and mm-thick shales), which contain some intercalations of redeposited limestones and terrigenous sediments, the latter becoming more abundant towards the top. The few paleontological data available point essentially to late Middle Jurassic – Early Cretaceous ages. More particularly, Bragin and Krylov (1999) have found radiolarian assemblages suggestive of three distinct time intervals: Callovian-Oxfordian, Oxfordian and Kimmeridgian-Valanginian. Radiolarian chert blocks of early Turonian age were dated recently in the Mamonia and Moni mélanges (Bragina and Bragin, 2016; Bragin et al., 2021), which may be suggestive of a larger stratigraphic interval for the Episkopi Fm.

Reliable ages for radiolarites are important to reconstruct the highly complex geodynamic, paleogeographic and paleoenvironmental evolution of the Tethyan oceanic realm (i.e. Asatryan et al. 2010, 2011; Chiari et al., 2012; Danelian et al., 2010, 2012, 2014; Ferrière et

al., 2015; Goričan et al., 2012; Halamic et al., 1999; O'Dogherty et al., 2006, 2017; Segvić et al., 2014), especially in the Eastern Mediterranean region (Al-Riyami et al., 2000, 2002; Bragin, 2010; Bragina and Bragin, 1995, 1996, 2006; Vrielynck et al., 2003).

In this paper, we present a new radiolarian age evidence that establishes for the first time a clear and short-range Middle Jurassic (Middle Bathonian) age for part of the radiolarites of the Episkopi Fm. Consequently, our result allows to reduce the age range of the previously known hiatus between the Upper Triassic and the Jurassic sequences of the Aghios Photios Group.

2. Material & methods

Our studied section is situated 2 km southwest of the village of Episkopi (Fig. 1; coordinates: 34° 46' 57.78'' N, 32° 31' 08.86'' E) and may be accessible by taking a small road coming out of the village. It was studied previously by Robertson and Woodcock (1979) and Bragin and Krylov (1999). In this paper we present results from a relatively well-preserved assemblage, yielded from the sample Ep.19-9, collected from the lower part of the section made of typical radiolarites, reddish in colour, presenting couplets of cm-thick ribbon cherts and shales (Fig. 2).

Radiolarians were extracted in the laboratory by repetitive leaching of samples with low-concentration hydrofluoric acid (HF 4%). The residues were dry picked and mounted on SEM stubs. Taxonomic concepts applied during this study follow essentially those presented in Baumgartner et al. (1995a), but we also took into account more recent taxonomic opinions for some species, such as those of O'Dogherty et al. (2006, 2017) and Dumitrica and Dumitrica-Jud (2005).

3. Results

The preservation of the extracted radiolarians is moderate to good; according to the Preservation Index established by Kiessling (1996), the PI is situated between 4 and 5. The radiolarians identified are listed in Table 1 and most of them are illustrated in Plate 1.

The co-occurrence of species *Bernoullius rectispinus leporinus* Conti & Marcucci, *Hexasaturnalis tetraspinus* (Yao) and *Theocapsommella cucurbiformis* (Baumgartner) characterizes the Unitary Association Zone 6 (U.A.Z. 6) of the biozonation of Baumgartner et al. (1995b), which is correlated with the Middle Bathonian. In addition, according to Dumitrica & Dumitrica-Jud *Hexasaturnalis nakasekoi* originated close to the Bajocian/Bathonian boundary; therefore the co-occurrence of this species with *H. tetraspinus* is restricted in the early-middle Bathonian interval. It is noteworthy that the species *Paronaella pygmaea* Baumgartner was also found in our assemblage although its presence is not compatible according to the biozonation of Baumgartner et al. (1995b), in which it is only known to occur since the U.A.Z. 7. However, as it was mentioned previously by O'Dogherty et al. (2006) and Danelian et al. (2008), this kind of incompatibilities are now a rather common phenomenon; they should be considered as a new evidence and they can only be solved by reprocessing the new data together with those taken into account for establishment of the biozonation.

4. Discussion

The Upper Triassic to Lower Cretaceous sedimentary sequence of the Ayios Photios Group in SW Cyprus represents the record of a distal Mesozoic continental margin that accumulated in the proximity of a carbonate platform (Robertson and Woodcock, 1979; Swarbrick and Robertson, 1980). More specifically, according to the depositional model of Torley and Robertson (2018), the Ayios Photios Group was accumulated in a deep-water slope or base of slope environment on an unknown basement that had subsided already tectonically to ca. several 100s m-deep, following the rifting processes under way in the Mediterranean Tethys. Consequently, the terrigenous rocks of the Vlampouros Fm, including its lowermost sandstones, were regarded by these authors as accumulations in a relatively deep-water slope or base of slope setting.

Torley and Robertson (2018) reviewed all the main sedimentological and tectonostratigraphic data available for the wider region and discussed the various paleogeographic alternatives for the origin of the Ayios Photios Group. They concluded that the locus of its sedimentation should have been situated a few 10s of kms away from one of the several microcontinents that were located at the time along the northern margin of Neotethys (to the north of Cyprus) and

on which carbonate platforms were developed. It is noteworthy that the above authors interpreted the hemi-pelagic limestones of the Marona Fm as periplatform carbonate ooze accumulation in a deep water seafloor that was protected from the arrival of terrigenous or carbonate detrital input, but it was affected by low-density turbidites that transported fragmented debris of *Halobia* bivalve shells.

The existing stratigraphic data are suggestive of a Lower and Middle Jurassic (pre-Callovian) depositional hiatus between the radiolarites of the Episkopi Fm and the upper Triassic Vlambouros/Maronia Fm. It is noteworthy that Torley and Robertson (2018) stressed the absence of evidence for an angular unconformity, “which would be indicative of major tectonic disturbance (e.g. rifting)”; they have interpreted this 35 million years long gap, either as the result of sediment bypassing of the margin “during early-stage rapid thermal subsidence” or alternatively as the result of sediment winnowing due to the action of submarine currents.

We here establish for the first time that radiolarian ooze accumulation started at least since the Middle Bathonian on the distal margin represented by the Ayios Photios Group (Fig; 3). Radiolarites are perceived today as biogenic deposits of moderately high productivity that accumulated slowly in pelagic environments starved of any significant siliclastic and/or carbonate detrital input. Modern syntheses establish the widespread accumulation of radiolarites in Tethyan oceanic basins and margins since the Bajocian (Baumgartner, 2013), possibly under strong influence of a monsoonal type climate (De Wever et al., 2014).

5. Conclusions

The Middle Bathonian (U.A.Z. 6) radiolarian assemblage extracted from a radiolarian chert of the Episkopi Fm establishes for the first time that radiolarian ooze accumulation was taking place on the Mamonia distal margin in an environment protected of any major siliclastic or carbonate detrital input, at a time of widespread development of radiolarite facies in Tethys. Our results extend down to the Bathonian the known age range of radiolarites of the Episkopi formation; they thus reduce the previously known range of depositional hiatus with the underlying Upper Triassic formations of the Ayios Photios Group.

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References

- Al-Riyami, K., Robertson, A.F.R., Xenophontos, C., Danelian, T., Dixon, J.E., 2000. Tectonic evolution of the Mesozoic Arabian passive continental margin and related ophiolite in Baer-Bassit region (NW Syria). In : Panayides, I., Xenophontos, C. & Malpas, J. (Eds.), Proc. 3rd Intern. Conf. Geology Eastern Mediterranean, pp. 61-81.
- Al-Riyami, K., Danelian, T., Robertson, A.H.F., 2002. Radiolarian biochronology of Mesozoic deep-water successions in NW Syria and Cyprus: implications for south-Tethyan evolution. *Terra Nova* 14, 271-280.
- Asatryan, G., Danelian, T., Sosson, M., Sahakyan, L., Person, A., Avagyan, A., Galoyan, G. 2010. Radiolarian ages for the sedimentary cover of Sevan Ophiolite (Armenia, Lesser Caucasus). *Ofioliti* 35, 91-101.
- Asatryan, G., Danelian, T., Sosson, M., Sahakyan, L., Galoyan, G. 2011. Radiolarian evidence for Early Cretaceous (late Barremian – early Aptian) submarine volcanic activity in the Tethyan oceanic realm preserved in Karabagh (Lesser Caucasus). *Ofioliti* 36, 117-123.
- Barrier, E., Vrielynck, B. (eds) 2008. Palaeotectonic Maps of the Middle East. Commission for the Geological Map of the World (CGMW/CCGM), Paris.
- Baumgartner, P. O. 2013. Mesozoic radiolarites – accumulation as a function of sea surface fertility on Tethyan margins and in ocean basins. *Sedimentology* 60, 292-318.
- Baumgartner, P. O., O'Dogherty, L., Gorican, S., Dumitrica-Jud, R., Dumitrica, P., Pillecuit, A., Urquhart E., Matsuoka, A., Danelian, T., Bartolini, A., Carter, E. S., De Wever, P., Kito, N., Marcucci, M., Steiger, T., 1995a. Radiolarian catalogue and systematics of Middle Jurassic to Early Cretaceous Tethyan genera and species. In: Baumgartner et al. (Eds.), *Middle Jurassic to Lower Cretaceous Radiolaria of Tethys: Occurrences, Systematics, Biochronology*. *Mém. Géol. (Lausanne)* 23, 37-685.

Baumgartner, P. O., Bartolini, A., Carter, E. S., Conti, M., Cortese, G., Danelian, T., De Wever, P., Dumitrica, P., Dumitrica-Jud, R., Gorican, S., Guex, J., Hull, D. M., Kito, N., Marcucci, M., Matsuoka, A., Murchey, B., O'Dogherty, L., Savary, J., Vishnevskaya, V., Widz, D., Yao, A., 1995b. Middle Jurassic to Early Cretaceous Radiolarian Biochronology of Tethys based on Unitary Associations. In: Baumgartner et al. (Eds.), Middle Jurassic to Lower Cretaceous Radiolaria of Tethys: Occurrences, Systematics, Biochronology. *Mém. Géol. (Lausanne)* 23, 1013-1048.

Bragin, N.Yu., Krylov, K.A., 1996. Stratigraphy and Lithology of the Upper Triassic Beds of Southwestern Cyprus (Vlambouros Formation). *Stratigr. Geol. Correlation* 4, 28–37.

Bragin, N.Yu., Krylov, K.A., 1999. Stratigraphy and Conditions of the Formation of Siliceous Terrigenous Deposits of the Jurassic of Southwest Cyprus. *Stratigr. Geol. Correlation* 7, 29–39.

Bragin, N., Yu. 2010. Stratigraphy of Mesozoic (Upper Triassic- Lower Cretaceous) volcanogenic-sedimentary deposits of the Dhiarizos Group, the allochthonous Mamonia Complex of Cyprus. *Stratigraphy and Geological Correlation* 18, 118-132.

Bragin, N.Y., Bragina, L., Tsiolakis, E., Symeou, V., 2021. The Upper Cretaceous Mamonian Mélange (Petra tou Romiou, southwestern Cyprus): composition and age. *Cretaceous Research* 125, 104850.

Bragina, L.G., Bragin, N.Yu., 1995. Radiolarians and stratigraphy of the Campanian–Maastrichtian deposits in southwestern Cyprus. *Stratigraphy and Geological Correlation* 3, 147–155.

Bragina, L.G., Bragin, N.Yu., 1996. Stratigraphy and radiolarians from the type section of Pelapedhi Formation (Upper Cretaceous of Cyprus). *Stratigraphy and Geological Correlation* 4, 246–253.

Bragina, L.G., Bragin, N.Yu., 2006. Stratigraphy and Radiolarians of the Upper Cretaceous Sedimentary Cover of the Arakapas Ophiolite Massif (Cyprus). *Stratigraphy and Geological Correlation* 14, 507–523.

[Bragina, L.G., Bragin, N.Yu., 2016. Cretaceous \(Albian to Turonian\) radiolarians from chert blocks of Moni M_élange \(Southern Cyprus\). *Rev. Micropal.* 59, 311-338.](#)

Chiari, M., Bortolotti, V., Marcucci, M., Photiades, A., Principi, G., Saccani, E. 2012. Radiolarian biostratigraphy and geochemistry of the Koziakas massif ophiolites (Greece). In Danelian T. & Gorican S. Eds. Radiolarian biochronology as a key to tectonostratigraphic reconstruction. *Bull. Soc. Géol. France* 183: 287-306.

Danelian, T., De Wever, P., Durand-Delga, M. 2008. Revised radiolarian ages for the sedimentary cover of the Balagne ophiolite (Corsica, France). Implication for the palaeoenvironmental evolution of the Balano-Ligurian margin. *Bull. Soc. Geol. France* 179, 289 – 296.

Danelian, T., Asatryan, G., Sahakyan, L., Galoyan, Gh., Sosson, M., Avagyan, A. 2010. New and revised radiolarian biochronology for the sedimentary cover of ophiolites in the Lesser Caucasus (Armenia). In Sosson M., Kaymakci N., Stephenson R.A., Bergerat F. & Starostenko V. Eds. Sedimentary Basin Tectonics from the Black Sea and Caucasus to the Arabian Platform. Geol. Soc., London, Spec. Publ. 340: 383-391.

Danelian, T., Asatryan, G., Galoyan, Gh., Sosson, M., Sahakyan, L., Caridroit, M., Avagyan, A. 2012. Geological history of Armenian ophiolites and correlation with the Izmir-Ankara-Erzincan suture zone: insights from Radiolarian biochronology. In Danelian T. & Gorican S. Eds. Radiolarian biochronology as a key to tectonostratigraphic reconstruction. Bull. Soc. Géol. France 183: 331-342.

Danelian, T., Zambetakis-Lekkas, A., Galoyan, G., Sosson, M., Asatryan, G., Hubert, B., Grigoryan, A. 2014. Reconstructing Upper Cretaceous (Cenomanian) paleoenvironments in Armenia based on Radiolaria and benthic Foraminifera; implications for the geodynamic evolution of the Tethyan realm in the Lesser Caucasus. Pal., Pal., Pal. 413: 123-132.

Dercourt, J., Ricou, L.E., Vrielynck, B. (eds) 1993. Atlas Tethys Palaeoenvironmental Maps. Gauthier-Villars, Paris, 307p., 14 maps, 1 pl.

De Wever, P., O'Dogherty, L., Goričan, S. 2014. Monsoon as a cause of radiolarite in the Tethyan realm. Comptes Rendus Geosciences 346, 287-297.

Dumitrica, P., Dumitrica-Jud, R., 2005. *Hexasaturnalis nakasekoi* nov. sp., a Jurassic saturnalid radiolarian species frequently confounded with *Hexasaturnalis suboblongus* (Yao). Rev. Micropal. 48, 159-168.

Ferrière, J., Chanier, F., Baumgartner, P.O., Dumitrica, P., Caridroit, M., Bout-Roumazielles V., Graveleau, F., Danelian, T., Ventalon, S. 2015. The evolution of the Triassic-Jurassic Maliac oceanic lithosphere: insights from the supra-ophiolitic series of Othris (continental Greece). Bull. Soc. Geol. France 186, 399-411.

Goričan, Š., Pavšič, J., Rožič, B., 2012. Bajocian to Tithonian age of radiolarian cherts in the Tolmin Basin (NW Slovenia). In: Danelian, T., Goričan, S. (Eds.), Radiolarian biochronology as a key to tectono-stratigraphic reconstructions. Bull. Soc. Géol. France 183, 369-382.

Halamic, J., Goričan, S., Slovenec D., Kolar-Jurkovec, T. 1999. A Middle Jurassic Radiolarite-Clastic Succession from the Medvednica Mt. (NW Croatia). Geol. Croat. 52, 29-57.

Kiessling, W. 1996. Facies Characterization of Mid-Mesozoic Deep-Water Sediments by Quantitative Analysis of Siliceous Microfaunas. Facies 35, 237-274.

Lapierre, H. 1968. Nouvelles observations sur la série sédimentaire Mamonia (Chypre). C. R. Acad. Sci., Paris 267, 32-33.

Lapierre, H., Bosch, D., Narros, A., Mascle, G.H., Tardy, M., Demant, A. 2007. The Mamonia Complex (SW Cyprus) revisited: remnant of Late Triassic intra-oceanic volcanism along the Tethyan southwestern passive margin. *Geol. Mag.* 144, 1-19.

O'Dogherty L., Bill M., Gorican S., Dumitrica P. & Masson H. (2006) Bathonian radiolarians from an ophiolite mélange of the Alpine Tethys (Gets Nappe, Swis-French Alps). *Micropaleontology* 51: 425-485.

O'Dogherty L., Gorican S. & Gawlick H.-J. (2017) Middle and Late Jurassic radiolarians from the Neotethys suture in the Eastern Alps. *J. Paleont.* 91, 25-72.

Robertson, A.H.F. 1998. Mesozoic – Tertiary tectonic evolution of the easternmost Mediterranean area: integration of marine and land evidence. In Robertson et al. (eds.) *Proc. ODP, Sci. Results.* 160, College Station, TX Ocean Drilling Program), 723-782.

Robertson, A.H.F., Dixon, J.E., Brown, S., Collins, A., Morris, A., Pickett, E., Sharp, I., Ustaömer, T. 1996. In Morris, A. & Tarling, D.H. (eds) *Palaeomagnetism and Tectonics of the Mediterranean Region*, *Geol. Soc. Spec. publ.* 105, 239-263.

Robertson, A.H.F., Woodcock, N.H. 1979. Mamonia Complex, southeast Cyprus: Evolution and emplacement of a Mesozoic continental margin. *Geol. Soc. America Bull.* 90, 651-665.

Šegvić, B., Kukoč, D., Drajičević, I., Vranjković, A., Brčić, V., Goričan, Š., Babajić, E., Hrvatović, H., 2014. New record of Middle Jurassic radiolarians and evidence of Neotethyan dynamics documented in a mélange from the central Dinaridic ophiolite belt (CDOB, NE Bosnia and Herzegovina). *Ofioliti* 39, 33-43.

Swarbrick, R. E., and A. H. F. Robertson (1980). Revised stratigraphy of the Mesozoic rocks of southern Cyprus. *Geological Magazine* 117.6, 547-563.

Torley, J.M. & Robertson, A.H.F. (2018) New evidence and interpretation of facies, provenance and geochemistry of late Triassic-early Cretaceous Tethyan deep-water passive margin-related sedimentary rocks (Ayios Photios Group), SW Cyprus in the context of eastern Mediterranean geodynamics. *Sedimentary Geology* 377, 82-110.

Vrielynck, B., Bonneau, M., Danelian, T., Cadet, J.P., Poisson, A. 2003. New insights on the Antalya Nappes in the apex of the Isparta angle: The Isparta Cay unit revisited. *Geological Journal* 38, 283-293.

CAPTIONS

Fig. 1 Simplified geological map of Cyprus, including the location of the studied area (star) south of the Episkopi village.

Fig. 2. Field photographs of the studied outcrop of radiolarian cherts. The studied sample Ep19-9 comes from the radiolarites viewed on the right photo.

Fig. 3. Synthetic column of the lithostratigraphic formations recognized within the Ayios Photios Group and available paleontologically determined ages.

Table 1. Radiolarians identified in sample Ep19-9 and the U.A.Z. age range for those included in the biozonation of Baumgartner et al. (1995b).

Plate 1: Scanning Electron micrographs of radiolarians extracted from sample Ep19-9. Scale bar = 100 μm for all photos; a) for specimens 1-3, 6, 8-10, 14-16, 20-21; b) for specimens 4-5, 7, 11, 12-13, 17-19.

1. *Tetraditryma pseudoplana* Baumgartner
2. *Triactoma jonesi* (Pessagno)
3. *Hexasaturnalis tetraspinus* (Yao)
4. *Praewilliriedellum convexum* (Yao)
5. *Paronaella pygmaea* Baumgartner
6. *Hexasaturnalis nakasekoi* Dumitrica & Dumitrica-Jud
7. *Dictyomitrella* (?) sp. 1 in O'Dogherty et al. (2006)
8. *Leugeo hexacubicus* (Baumgartner)
9. *Bernoullius rectispinus delnortensis* Pessago, Blome & Hull
10. *Angulobracchia purisimaensis* (Pessagno)
11. *Theocapsommella cucurbiformis* (Baumgartner)
12. *Transhsuum* sp.cf. *T. lucidum* (Yeh)
13. *Archaeohagiastrum munitum* Baumgartner
14. *Archaeospongoprunum* sp. cf. *A. elegans* Wu
15. *Bernoullius rectispinus leporinus* Conti & Marcucci
16. *Stichomitra* (?) *takanoensis* gr. Aita
17. *Canoptum* sp. A in Halamic et al. (1999)
18. *Crococapsa tansinhoki* (Hull)
19. *Takemuraella* sp.cf. *T. schardti* O'Dogherty, Goričan & Dumitrica
20. *Emiluvia* sp. cf. *E. hopsoni* Pessagno
21. *Xiphostylus* spp. in Baumgartner et al. (1995a)



Cape
Apostolos
Andreas

Akamas
Peninsula

Kyrenia

KYRENIA RANGE

Nicosia

• Ammochostos

TROODOS

• Larnaca

Paphos

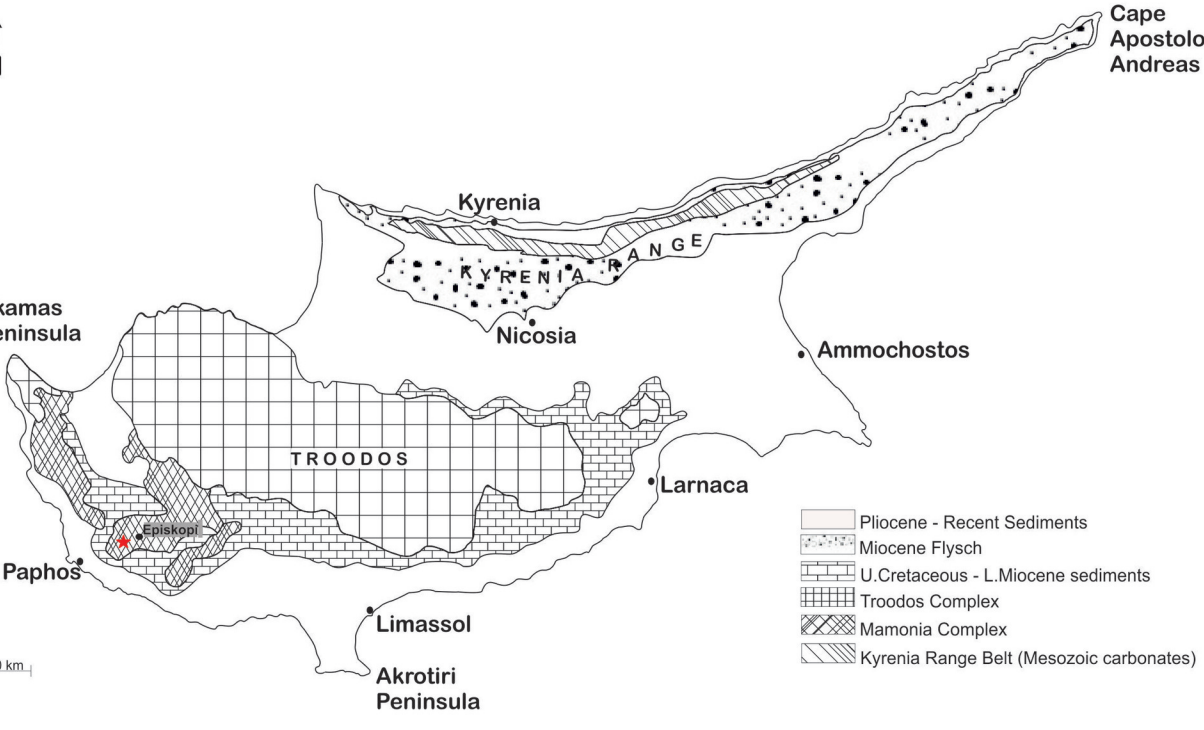
• Episkopi

• Limassol

Akrotiri
Peninsula

-  Pliocene - Recent Sediments
-  Miocene Flysch
-  U.Cretaceous - L.Miocene sediments
-  Troodos Complex
-  Mamonía Complex
-  Kyrenia Range Belt (Mesozoic carbonates)

10 km



SW

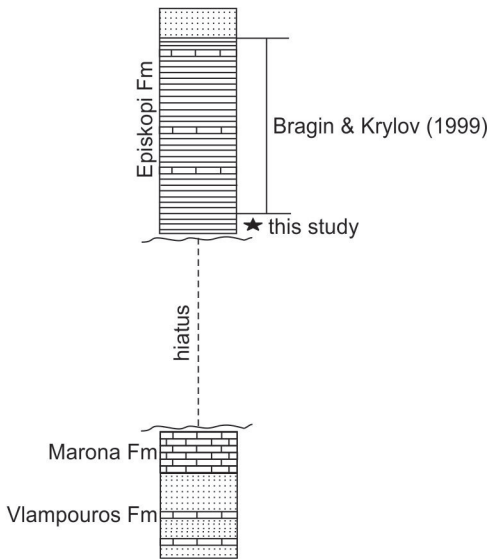


NE



Mesozoic

Cretaceous	Lower	Albian
		Aptian
Barremian		
Hauterivian		
Valanginian		
Berriasian		
Jurassic	Upper	Tithonian
		Kimmeridgian
	Middle	Oxfordian
		Callovian
		Bathonian
		Bajocian
	Aalenian	
	Lower	Toarcian
		Pliensbachian
		Sinemurian
Hettangian		
Triassic	Upper	Rhaetian
		Norian
		Carnian
	Middle	Ladinian
		Anisian
	Lower	Olenekian
		Induan



	U.A.Z.
<i>Angulobracchia purisimaensis</i> (Pessagno)	3-10
<i>Archaeohagiastrum munitum</i> Baumgartner	2-8
<i>Archaeospongoprunum</i> sp. cf. <i>A. elegans</i> Wu	
<i>Bernoullius rectispinus delnortensis</i> Pessago, Blome & Hull	2-7
<i>Bernoullius rectispinus leporinus</i> Conti & Marcucci	2-6
<i>Canoptum</i> sp. A in Halamic et al. (1999)	
<i>Crococapsa tansinhoki</i> (Hull)	
<i>Dictyomitrella</i> (?) sp. 1 in O'Dogherty et al. (2006)	
<i>Hexasaturnalis nakasekoi</i> Dumitrica & Dumitrica-Jud	
<i>Emiluvia</i> sp. cf. <i>E. hopsoni</i> Pessagno	(6-15)
<i>Hexasaturnalis tetraspinus</i> (Yao)	1-6
<i>Leugeo hexacubicus</i> (Baumgartner)	4-8
<i>Paronaella pygmaea</i> Baumgartner	7-9
<i>Podobursa helvetica</i> (Rüst)	3-10
<i>Praewilliriedellum convexum</i> (Yao)	1-11
<i>Stichomitra</i> (?) <i>takanoensis</i> gr. Aita	3-7
<i>Tetraditryma pseudoplana</i> Baumgartner	4-11
<i>Theocapsommella cucurbiformis</i> (Baumgartner)	6-7
<i>Transhsuum</i> sp.cf. <i>T. lucidum</i> (Yeh)	
<i>Triactoma jonesi</i> (Pessagno)	2-13
<i>Takemuraella</i> sp. cf. <i>T. schardti</i> (O'Dogherty, Goričan & Dumitrica)	
<i>Xiphostylus</i> spp. in Baumgartner et al. (1995a)	1-6
Age	6

Table 1