

# Cave Explorations on the Islands of Kárpáthos and Kásos (South Aegean, Greece)

**Thomas Rathgeber**

Staatliches Museum für Naturkunde Stuttgart, Rosenstein Gewann 1, D-70191 Stuttgart, Germany

**Herbert Jantschke**

Höhlenforschungsgruppe Ostalb-Kirchheim, Römerstraße 7, D-72127 Kusterdingen, Germany

## Abstract

During two visits in the years 1983 and 1987 to the islands of Kárpáthos and Kásos 13 smaller caves were documented. The explorations included surveys of the caves and the examination of Recent, subfossil and fossil bones found in these caves and also at other places of the area. The results are seen as a contribution for the questions on the formation of the Greek islands. A better knowledge of the faunal and floral development on the islands allows the identification of old land-bridges. A summary of the work is given, including the illustrated and detailed descriptions of two of the more interesting caves.

## Introduction

In the south of the Aegean Sea the Greek island of Kárpáthos is situated at a point of interfering influences from Europe and Asia (and Africa as well). The island is 49 km long and 15 km wide. It lies halfway between Crete and Rhodes. Together with Kásos (12 km long, 4 km wide) in the southwest, the nearby Sáría (6 km long, 4 km wide) in the north and a number of smaller to tiny costal islands Kárpáthos forms the Kárpáthos-Archipelago. The three larger islands contain widespread mountaineous areas with some higher peaks, culminating on Kárpáthos in the Kalilímni (1213 m), on Kásos in the Megálo Príonas (601 m), and on Sáría in the Megálos (660 m).

The islands are built up of Cretaceous limestone on Kásos and in the north of Kárpáthos and of a series of neritic limestones (Lias-Eocene) and phyllite in the main part of Kárpáthos. While the limestones of Kásos are completely autochthonous, the structures of Kárpáthos belong to an autochthonous and to four allochthonous series, being displaced from their submarine development area. Due to considerable tectonic movements in the Miocene (20 million years ago), these masses were uplifted, forming a landmass from this time on. According to current knowledge, there were no land bridges to other larger islands or to the neighbouring continents during the Pleistocene

ice ages. This point is significant for a discussion about the younger history of the faunal and floral development on the islands.

Politically Kárpáthos belongs to the Greek district Dodecanes. The harbour of the capital town Pigádhia connects the island to the ferry lines from Crete and Rhodes. A small airport on the island also allows daily flight transfers from Rhodes. The historical development of the islands is quite complex. It is thought that the first settlements took place in the Neolithic period about 4600 years b.p. from the northeast. During Bronze Age (about 3500 b.p.) the Minoan culture had greater influences. Around 2500 b.p. four antique prospering villages are known from Kárpáthos: Poseidon (Pigádhia), Arkeseia (Arkása), Vrykous (Vrukúnta, see cave description below) and Nissyros (Tá Palátia on the now uninhabited island Sáría). After belonging to the Roman Empire in the years before Christ, Kárpáthos was governed by Genoa, Venice, Rhodes, Turkey, Italy, Germany and Britain, and it was not until 1948, when it was united with Greece after 654 years of foreign occupation.

In the year 1991 a population of only 5323 inhabitants was living on Kárpáthos. Signs of a denser settlement in former times are for example man-made terraces almost everywhere and the occurrence of artificial cave structures even in very remote places. 9 older villages are situated on Kárpáthos with Ólimpos in the north and Pigádhia together with Apéri in the south being the greatest. On Kásos, a number of 5 villages exists, but today only the harbour town Frí is of greater significance. A network of good roads was built between all the villages on the main islands and it was only in 1981, when a road reached Ólimpos, up to then being the remotest town in Greece, accessible only by trails. Comfortable annual temperatures of 20°C (Pigádhia) and low annual precipitations of 464 mm give the islands touristic attractiveness.

Karst forms are abundant on the islands, but in contrast to Crete and Rhodes they are of minor extension and only of regional significance. Typical for this fact is a region near the summit of the Kalilímni, where corrosive surface features like karren and dolines are formed and the open potholes reach down only to a depth of about 10 m. Bigger caves are found only in costal regions, related to old sea-levels, mainly around 70 m above the present level.



Fig. 1: Entrances of the Bat Cave (Fledermaushöhle – right) and Cricket Cleft (Grillenspalte – left) near Apéri on Kárpáthos (photograph: TH. RATHGEBER, 1<sup>st</sup> of October 1987).

Summarising it is clear, that on the islands only an “initial karst” is developed. The reason for this might be the small catchment areas for precipitation and the geological disturbance with a lack of a long time constant karst water table inside the limestone. This result of our work supports the theory of a relatively independent development with no land bridges in the younger history of the earth, especially none during the Pleistocene.

### Remarks on the fauna of Kárpáthos

From Neogene sediments near the airport DAAMS & VAN DE WEERD (1980) investigated a fauna of small mammals and placed them in the early Pliocene. The sample contained teeth of 5 different species. In a quantity of only 20 teeth this comparatively high number is a sign for a diverse continental influence. Hence, the authors came to the conclusion of a high evidence for massive land bridges from Kárpáthos over Rhodes to the Asian continent in the early Pliocene.

The Pleistocene mammal fauna is completely reigned by remarkably small endemic cervids. First found 1963 in a cave 700 m to the southeast of Pigádhia, these cervids were placed by KUSS (1975) in a new genus and in the two new species *Candiacervus cerigensis* and *C. pigadiensis*. Type locality is a cave named Kandilia or, used by the German ornithologists KINZELBACH & MARTENS (1965), Seglergrotte (see Tab. 1). Living in the Middle and Upper Pleistocene, probably even in the early Holocene, these deer species held the ecological niche which now is occupied by the domestic goats. Nearly all discoveries of fossil deer bones have taken place in caves or in karst sediments, giving a spotlight on the living

circumstances of the animals, seeking for shade and a damp climate. Beside the deer only remnants of snails, birds, a mouse and a turtle have been found up to date (KUSS 1967, 1973, 1975; WEESIE 1984). Predators are lacking in the Pleistocene fauna. Today, only one wild living Mammalian species of predators exists on the island, the Stone Marten (*Martes foina*).

### Cave descriptions

As examples, two of the more interesting caves of Kárpáthos are presented, one being an old Christian church and the other one the longest cave of the island known to us.

The cave church Ágios Ioánnis near Avlóna at the north-western part of Kárpáthos is probably the most visited underground structure of the whole archipelago. A considerable portion of the underground volume seems to be carved out of the rock in former times and it is difficult to determine natural and artificial parts. The cave lies at the tip of Cape Vrukúnta near the antique town Vrykous, from which relics of walls and tombs are preserved. It is very likely that the artificial parts of the cave were

Fig. 2 (opposite): The Kárpáthos-Archipelago with the caves surveyed in 1983 und 1987. The numbers are the same as in Tab. 1 (Altitudes of the mountains as given in the Road Map 1:75000 Karpáthos/Kasos by Freytag-Berndt u. Artaria, Wien – Edition 01/99).

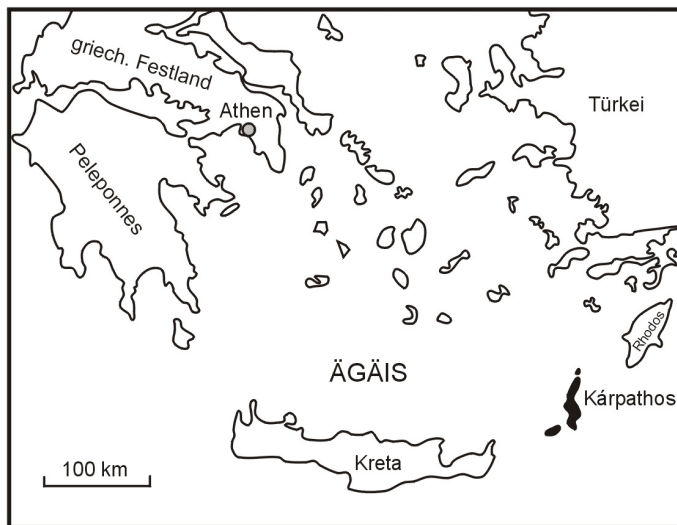
Table 1: Caves on the islands of Kákos und Kárpáthos.

No.	Name of the cave	Longitude	Latitude	Altitude	Total length
<b>Kákos</b>					
1	Stilokamára	E 26°54'27"	N 35°23'26"	255	19 m
2	Ellinokamára	E 26°54'40"	N 35°23'45"	150	20 m
<b>Kárpáthos</b>					
3	Höhlenkirche Ágios Ioánnis bei Avlóna	E 27°10'22"	N 35°47'51"	15	32 m
4	Höhlenkirche Ágios Ioánnis bei Spóa	E 27°09'45"	N 35°37'03"	90	72 m
5	Kuss-Höhle	E 27°05'32"	N 35°34'53"	70	22 m
6	Ziegenhorst	E 27°06'45"	N 35°34'39"	190	23 m
7	Hirschhöhle	E 27°06'56"	N 35°33'18"	70	14 m
8	Achátahöhle	E 27°12'39"	N 35°33'12"	70	56 m
9	Marderhöhle	E 27°12'38"	N 35°33'11"	70	50 m
10	Fledermaushöhle	E 27°11'15"	N 35°31'44"	70	102 m
11	Grillenspalte	E 27°11'14"	N 35°31'44"	70	35 m
12	Pfeilergrotte	E 27°14'28"	N 35°30'02"	5	26 m
13	Seglergrotte	E 27°14'48"	N 35°29'43"	0	98 m

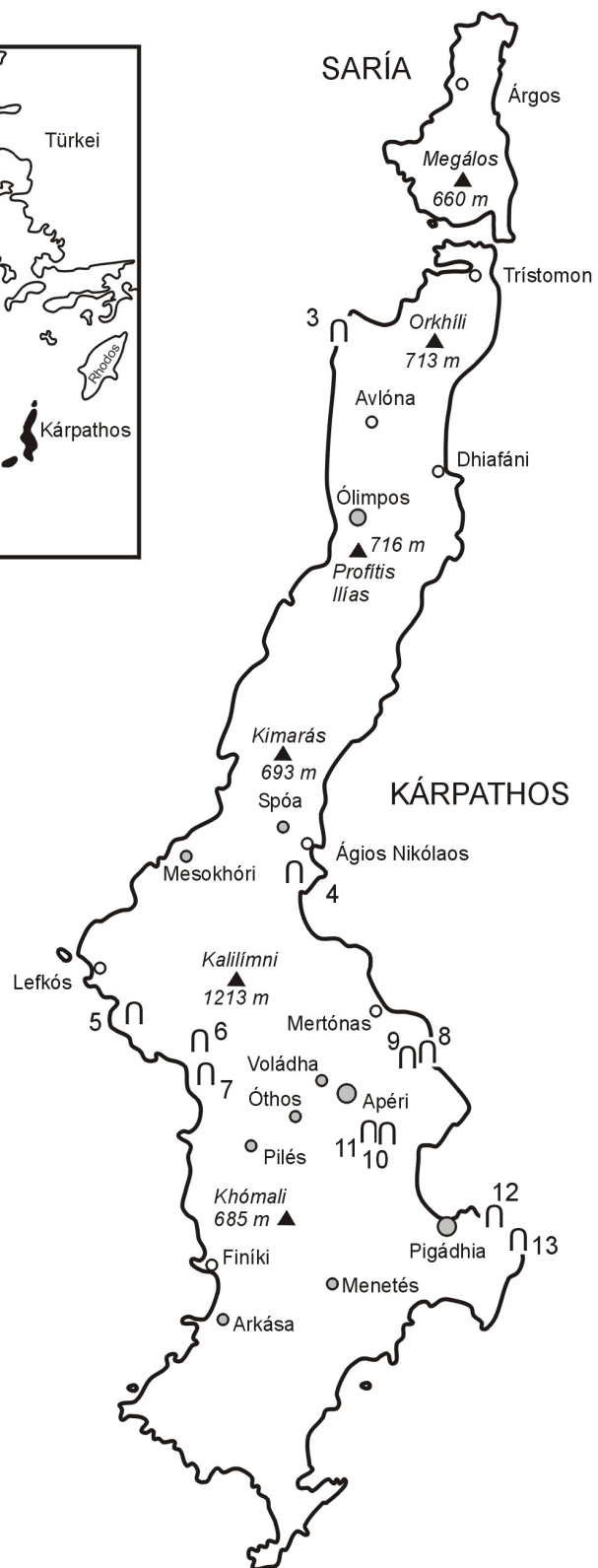
#### Explanations:

No.	Same number as in fig. 2
Name of the cave	For detailed information see JANTSCHKE & RATHGEBER (2005)
Longitude	According to the Italian topographical maps 1:25000 (1932-1934)

Latitude	According to the Italian topographical maps 1:25000 (1932-1934)
Altitude	Floor at the entrance (in metres above sea-level)
Total length	For detailed information see JANTSCHKE & RATHGEBER (2005)



0 2 4 6 8 10 km



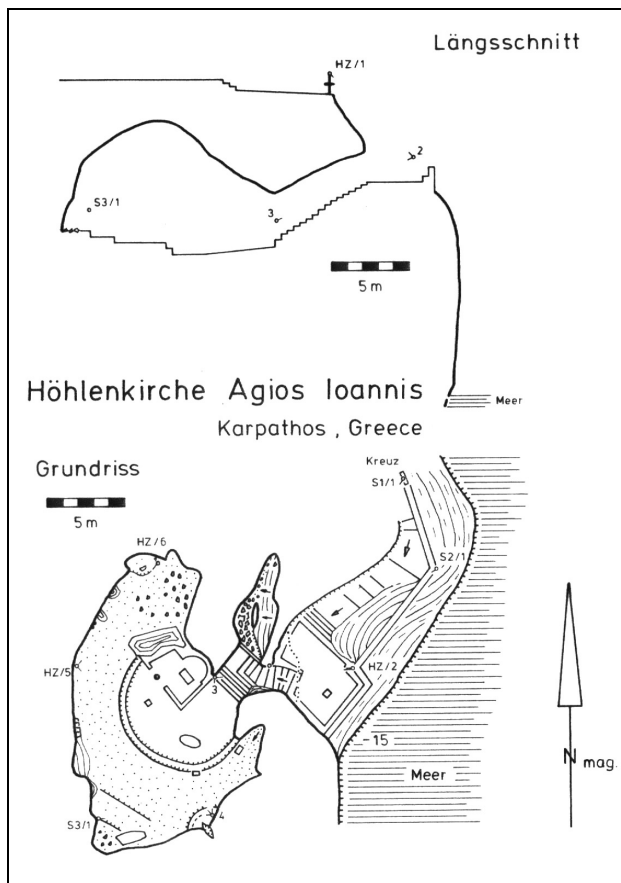


Fig. 3: Cave Church Ágios Ioánnis near Avlóna on Kápathos – plan of the cave surveyed and mapped 11<sup>th</sup> of October 1987 by H. JANTSCHKE, A. LEHMKUHL and TH. RATHGEBER (drawn by H. JANTSCHKE).

formed in these times and that the church has only been occupied and rearranged in Christian times. Even parts of the trail from Avlóna down to the festival ground above the cave are likely to be very old. As a replacement to a usual chapel tower, a rock cross was erected directly above the cave and the bells hang in a wooden frame nearby. Stairs are leading down to the entrance in the upper third of the steep cliff. A tiny harbour in the neighbourhood functions as a transfer point in festival times.



Fig. 4: Cave Church Ágios Ioánnis near Avlóna on Kápathos – view over the baptistry to the stairs which lead down into the cave (photograph: TH. RATHGEBER, 11<sup>th</sup> of October 1987).

At the entrance, some seating possibilities invite the guests to take a rest.

From the small and white painted entrance some more stairs lead down into an impressive dome with hot, sticky air and the ever lasting smell of incense. The room hosts a shrine, a part of an antique column and a baptistry in the form of a cross. This basin is fed, like two similar, but simpler ones, with dripping water from the roof. Candle holders and metal votive panels are installed at the walls. In the southeast corner of the room a tiny shaft drops into the dark, protected by stonewalls and “sealed” with many crosses and candles.

Concerning the foundation of the church a legend exists, saying that in the times of Byzantine emperors the inhabitants of Vrykous decided to build a church, but they did not know where. Three times it happened that an icon of Saint John, bound for the new church, vanished from the town and was found inside the cave. Therefore people followed the will of Saint John and the church was build inside the cave.

The 28<sup>th</sup> of August every year, several hundred people from Ólimpos and Diafáni are celebrating a festival in the honour of Saint John the Baptist, singing, dancing and staying there for two nights.

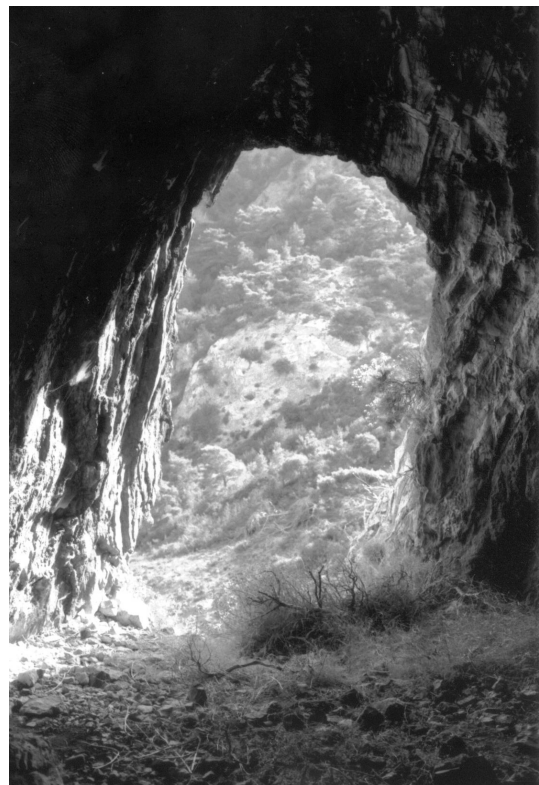


Fig. 5: View through the huge portal of the Bat Cave (Fledermaushöhle) down to the ground of the valley (photograph: TH. RATHGEBER, 1<sup>st</sup> of October 1987).

The great entrance of the Bat Cave (Fledermaushöhle, Höhle Tsourlaki, Tsoulaki's Cave, Tzoullaki Spilæon) is situated about 2 km southeast of Apéri and 4 km north-west of Pigádhia. It lies in a little valley about 70 m above sea-level. The cave is developed in Cretaceous Dolomites of the Olonos-Pindos-Series and shows a total length of 102 m. The dolomitic banks of the rock are

Directly behind the entrance the main room of the cave is 26 m long, 9 m wide und up to 8 m high. On the floor,

*coptila kinzelbachi* HARZ, 1971) were found. On the western wall of the main room a low gap gives way to a roomy fissure, orientated towards the hillside. Only few speleothems are found within the cave. In the development of the cave, the highest Pleistocene sea-level during the Tyrrhenic transgression (KINZELBACH & MARTENS 1965) might have played a role. MELAS (1985)

reports the discovery of ancient pottery, which he assigned partly to the Neolithic and mainly to the Middle and Late Bronze Age period. West of the entrance, the neighbouring cave Cricket Cleft (Grillenspalte) follows one of the faults mentioned above. The passage goes straight to the north without reaching a connection to the main cave. It forms a narrow fissure and its far end is difficult to access.

#### Further information

For a detailed description see JANTSCHKE & RATHGEBER (2005), where also a more complete list of literature is given.

#### Acknowledgements

The speleological investigations in the South Aegean were initiated by H. PIEPER, Kiel. From 14<sup>th</sup> of April to 4<sup>th</sup> of May 1983 he visited Káso and Kápathos together with the principal author. Also B. HELLWAGE-RATHGEBER, TH. RAUS, Berlin, O. RUNZE, Kiel, and H. SCHMALFUSS, Stuttgart, participated. During this journey, the islands Armáthia and Saria were also visited. From 30<sup>th</sup> of September to 14<sup>th</sup> of October 1987 a second journey led to Kápathos. This time both authors were accompanied by the speleologist A. LEHMKUHL, Stuttgart. We thank all the named persons for their friendship and for many helps.

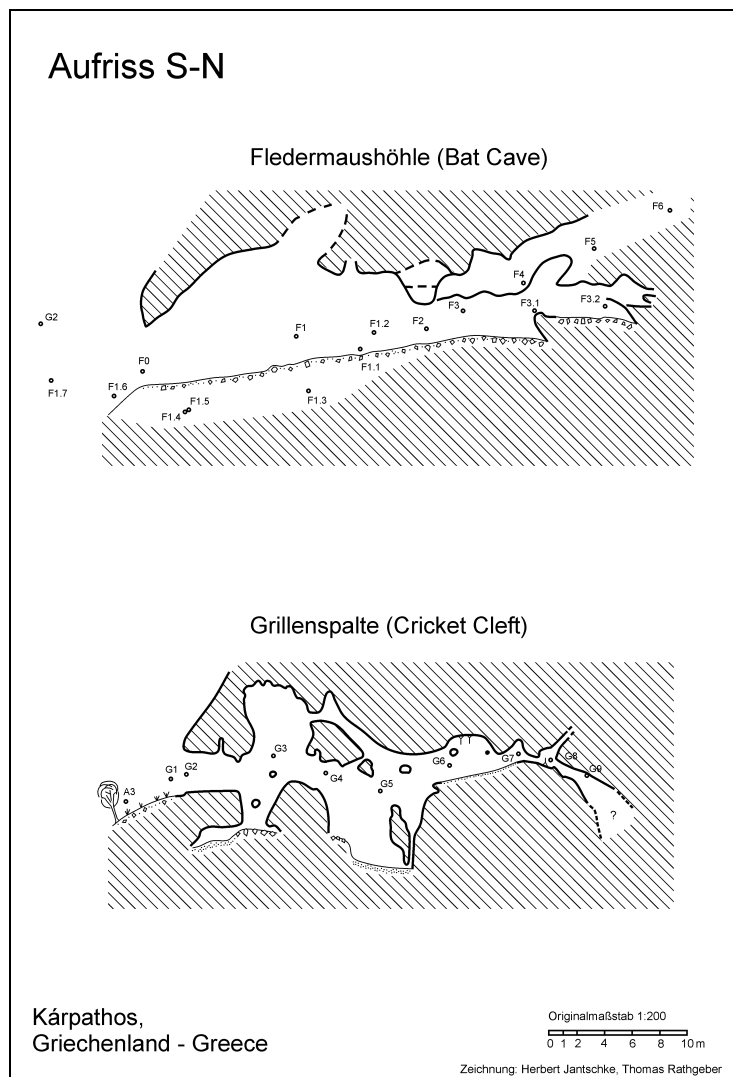


Fig. 7: Sections of the Bat Cave (Fledermaushöhle) and the Cricket Cleft (Grillenspalte) near Apéri on Kápathos (map see fig. 6).

#### References

- DAAMS, REMMERT & WEERD, ANNE VAN DE (1980): Early Pliocene small mammals from the Aegean island of Kápathos (Greece) and their palaeogeographic significance. – *Geologie en Mijnbouw*, 59, p. 327-331, 3 fig., 1 pl.; Den Haag.
- JANTSCHKE, HERBERT & RATHGEBER, THOMAS (2005 – in press): Höhlenkundliche Beobachtungen und Untersuchungen auf dem Kápathos-Archipel (Süd-Ägäis, Griechenland). – *Materialhefte zur Karst- und Höhlenkunde (MKH)*, 19; Heidenheim.
- KINZELBACH, RAGNAR & MARTENS, JOCHEN (1965): Zur Kenntnis der Vögel von Kápathos (Südliche Ägäis). – *Bonner zoologische Beiträge*, 16, p. 50-91, 1 fig.; Bonn.
- KUSS, SIEGFRIED E. (1967): Pleistozäne Säugetierfunde auf den ostmediterranen Inseln Kythera und Kápathos. – *Berichte der Naturforschenden Gesellschaft zu Freiburg im Breisgau*, 57, p. 207-215, pl. I and II; Freiburg im Breisgau.
- KUSS, SIEGFRIED E. (1973): Die pleistozänen Säugetierfaunen der ostmediterranen Inseln. Ihr Alter und ihre Herkunft. – *Berichte der Naturforschenden Gesellschaft zu Freiburg im Breisgau*, 63, p. 49-71; Freiburg im Breisgau.
- KUSS, SIEGFRIED E. (1975): Die pleistozänen Hirsche der ostmediterranen Inseln Kreta, Káso, Kápathos und Rhodos (Griechenland). – *Berichte der Naturforschenden Gesellschaft zu Freiburg im Breisgau*, 65, p. 25-79, 8 fig., 3 tab., 4 pl.; Freiburg im Breisgau.
- MELAS, EMMANUEL M. (1985): The Islands of Kápathos, Sáros and Káso in the Neolithic and Bronze Age. – 337 p., 140 fig., 1 tab.; Göteborg (Paul Åströms Förlag). (=Studies in Mediterranean Archaeology, 68).
- WEESIE, PETER D. M. (1984): On some Pleistocene bird fossils from the south Aegean island of Kápathos (Greece). – *Geobios*, 17, p. 845-849, 1 fig.; Lyon.