

**Ghar il-Friefet
or
The Bats' Cave
at Birzebbugia**

Geology, Natural History, and Antiquities



C. Savona-Ventura

2007

GHAR IL-FRIEFET

OR

THE BATS' CAVE

AT BIRZEBBUGIA

Geology, Natural History, and Antiquities

C. Savona-Ventura

2007

Published by the Birzebugia Local Council
Malta

© Birzebugia Local Council 2007
©C. Savona-Ventura 2007

No part of this publication may be reproduced,
stored in a retrieval system or transmitted
in any form by any means, electronic, mechanical,
photocopying, recording or otherwise,
without the previous written permission
of the authors

CONTENTS

FORWARD	4
GENERAL INFORMATION	6
GEOLOGICAL FEATURES	10
ECOLOGY	12
ANTIQUITIES	14
REFERENCES	16

FOREWORD

Very little material has been published about Ghar il-Friefet, even though this cave has been long known to local inhabitants. The cave was threatened during the late 1980s as a result of the building extension at the site, but was fortunately saved by the intervention of the local council and concerned environmental groups. Its entrance has been closed off to the public by a gate and admittance controlled by the Department of Environment. The cave now falls under the jurisdiction of the Birzebbugia Local Council.

This guidebook comprises relevant information about the cave and is being presented to provide visitors with a concise amount of information. It is hoped that this booklet will create a sense of awareness to the scientific importance of this site so that the cave becomes considered an important Maltese heritage site.

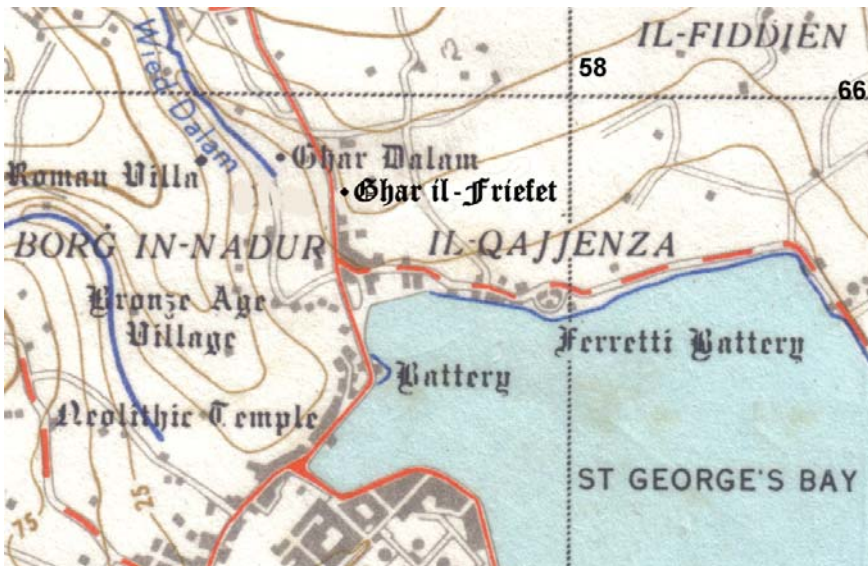
C. Savona-Ventura
2007

GENERAL INFORMATION

LOCATION

The cave is situated in the south of Malta (bearing 576659) on the outskirts of Birzebugia across the road from the palaeontologically important cave of Ghar Dalam. The Cave can be reached by using Bus Nos. 11, 12, 13 or 115 traveling from Valletta to Birzebugia.

The best place to stop is the Bus Stop opposite Ghar Dalam. A short walk down the hill along the right side of the road will bring one to the residential area. The entrance to Ghar il-Friefet is located under one of the buildings. The keys to the cave's entrance can be obtained by appointment from the Birzebugia Local Council offices (phone: 356-21650165; email: birzebugia.lc@gov.mt)



Map of the region (1970s)

ACCESS

The entrance to Ghar il-Friefet was originally a small opening in the Qajjenza Hill slope. This had been reinforced with concrete possibly during the Second World War to enable it to serve as an air-raid shelter.

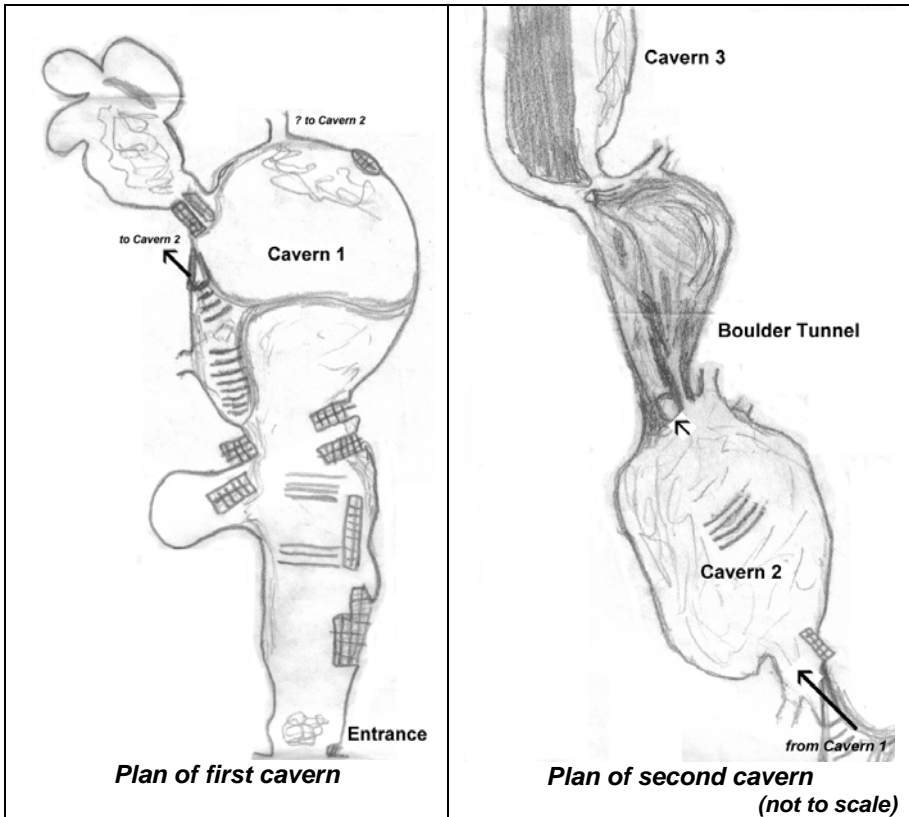


Original entrance to cave (1970s)

This entrance has now been completely modified to allow residential buildings to be completed over the cave.

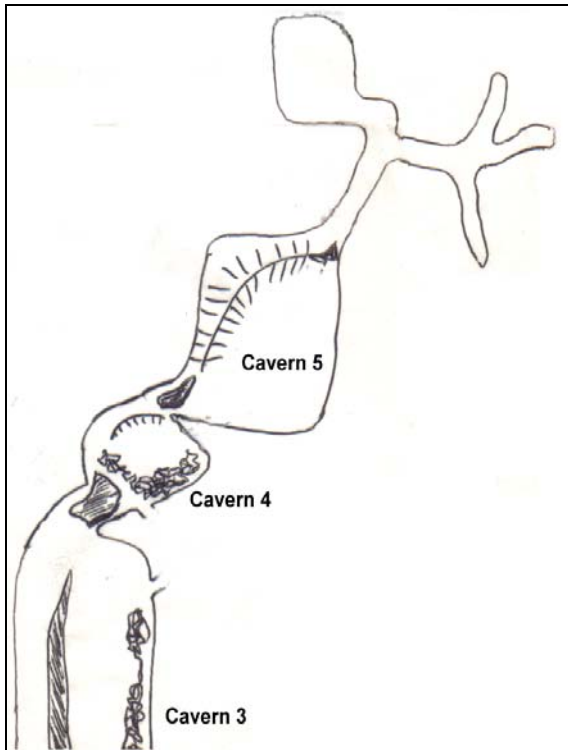
DESCRIPTION

The cave can be described as a series of chambers connected by tunnels set at three levels. On entering the cave, one progresses through a high-roofed arched re-enforced passage down a number of steps to enter a large cavern (Cavern 1). To the left of the cavern are a further series of steps that lead to a rather narrow tunnel, which eventually leads to the deeper parts of the cave. The first cavern has a number of other connections leading to blind alleys. The main passage lies to the left at the far end of the cavern. This leads to a small recess with three short blind alleys. At the far end of the cavern, a passage runs downwards at a ~45° dip downwards. This probably links to a tunnel in the second cavern of the cave complex.



Progressing down the small stair tunnel from Cavern 1, one enters another smaller cavern, hewn with stones and boulders. The far end of this cavern (Cavern 2) presents evidence of a past cave-in which has resulted in the tunnel being partially blocked by large boulders. The way through this Boulder Tunnel is either dangerously over the boulders, or through an easier passage between the boulders entered from a tunnel on the left side. The Boulder Tunnel opens into a moderately sized cavern (Cavern 3).

Cavern 3 is marked by a huge builder to the right and a rock rubble to the left. This cavern continues through an upward $\sim 60^\circ$ incline very narrow tunnel which opens into another cavern (Cavern 4) strewn with boulders. The inner most wall of this cavern consists of a clayey soil face with two openings to a narrow $\sim 60^\circ$ slope tunnel which leads to a larger cavern (Cavern 5).



Plan of innermost parts of cave

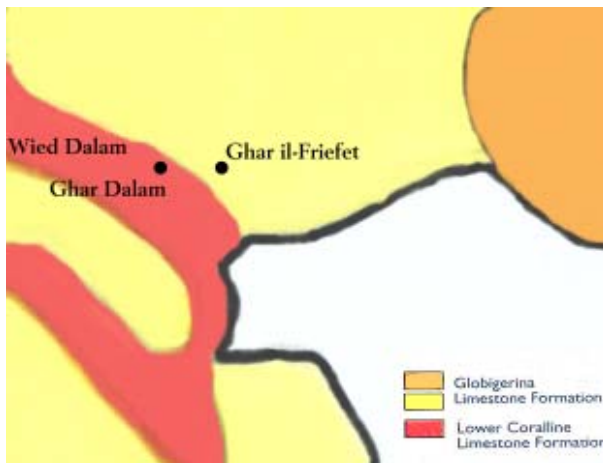
(not to scale)

Cavern 5 is characterised by steep sloping clayey walls. At the top of the slope is a narrow soil covered ledge which leads to a narrow opening. This opening continues down a narrow tunnel which forks out into two – the one on the right leading to a small cavern; the one on the left branching out into three forks all leading to a blind end.

GEOLOGICAL FEATURES

STRATIGRAPHY

The geological map of Malta shows the area to consist of Globigerina Limestone laid down during the Tertiary period. The underlying Lower Coralline Limestone has been exposed in the valley walls of Wied Dalam – a relatively deep ravine formed by running surface waters coming from a North-westerly direction.



Geological Map of region

The cave entrance was originally cut out in Globigerina Limestone, but once inside throughout most of the cave's length, Lower Coralline Limestone predominated. The roof throughout most of the cave showed fossils of the Echinoderm *Scutella sub-rotunda* Leske confirming that the cave complex had been originally formed in the Lower Coralline bed. Other fossil remains noted in the *Scutella* transition bed were remains of *Lepidocycline mantelli*. In localities where cave-ins had occurred, the roof was composed of Globigerina Limestone.

The cave floor is uniformly covered throughout by a dark brownish-red clayey soil. This deposit is composed of the insoluble residue of the limestone formed through the action of acidic percolating water within the tunnels themselves. The soil pH varied between 6.7-7.6. Examination of a

floor-soil core suggests that other factors may contribute to floor soil deposition. A superficial core shows the floor to be made up of different coloured layers – reddish brown, yellowish brown, and greyish brown. This suggests that floor-soil production has been variously dependant on an interplay of factors such as in situ erosion and water transport of soil from other localities. Bat guano in the inner rooms and wind-borne deposits in the other cavern also contribute to the floor deposits. The cave walls and roof are also covered by detrital soils formed in situ in the process of erosion and tunnel formation.

FORMATION OF THE CAVE

The various galleries of Ghar il-Friefet appears to have been formed by the effect of sub-terranean waters which dissolve the porous rock above and widen joint cracks in the lower strata. All the passages of the cave appear to be oriented along the major fault fissures of the area. The subterranean tunnels were formed by the chemical and mechanical action of water percolating from the surface through minor faults and cracks. The percolating water widened the cracks and parallel bedding planes or joints of the limestone. This markedly weakened the unsupported beds which as a result gradually collapsed often in large blocks ultimately forming the tunnels. A number of large blocks which have detached from the surface are evident in various sites in the present-day cave.

The dissolved carbonate trickles down the cave walls and drips from the cave roof. Redeposition has resulted in a number of small stalactites and stalagmites, beside calcitic sheets on the cave walls. The decomposition of the cave roof and walls is a continuous process which leaves an insoluble residue containing a high proportion of iron oxide. This residue contributes towards the cave floor soil. The period of cave formation is contemporaneous with the formation of Ghar Dalam, estimated as occurring in the Late Pliocene or Early Pleistocene (Zammit Maempel, 1989).

ECOLOGY

The climate in the cave is generally damp and humid in all its various sections. The dampness varied according to the amount of rainfall which falls in the previous days. Thus after a relatively heavy spell of rain, freshwater pools can be noted particularly in the Boulder Tunnel. The humidity is very high, and increases as one penetrates deeper within the cave. No air movement can be detected within the cave, though there seems to be adequate ventilation throughout.

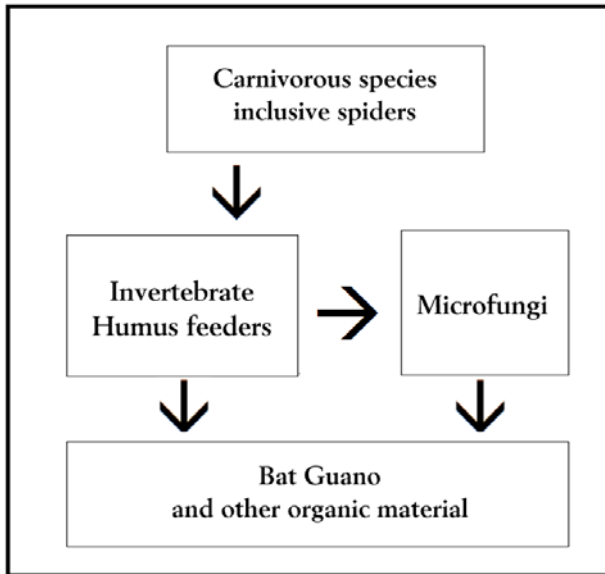
The lack of light within the cave leads one to assume a complete lack of plants. However in some localities there is evidence of hanging roots presumably belonging to surface plants or trees. Some angiosperm seeds could be found in the outer caverns probably transported by wind action or animals such as rodents. Over the bat guano, there seems to be the presence of microfungi living of the organic material.

Ghar il-Friefet is primarily important because of the resident fauna described therein. The cave complex has been described to have a large colony of bats belonging to the species *Myotis blythi* (Savona-Ventura, 1984a/1984b). In the mid-1970s, this bat colony was estimated to number about 100-150 individuals. The high pile of bat guano in Cavern 5 suggests that the colony had a particular preference to this roosting site. Another localised pile of guano was found in Cavern 1, suggesting a secondary roosting site. Analysis of the bat guano showed remains of several beetle species generally living outside the cave system. The bat guano serves as the basis of food for the cave invertebrate fauna (see scheme overleaf).

This species of bat has since been assigned by a number of mammalogists to the subspecies *punicus* distributed in Malta, Sardinia, Corsica and the Maghred. Others have assigned this species to the subspecies *omari* distributed in Malta, Crete, Sardinia, possibly Corsica and the Near and Middle East. Others consider the island races of this species to be only superficially similar due to convergent evolution under similar insular environments (Schembri, 1996). Examined bat specimens were noted to be parasitized by mites moving on the underwing surface.



Myotis blythi



Food pyramid

Other mammals inhabiting the cave were identified on the basis of skeletal remains found at various sites in the cave. These included remains of *Rattus sp.* In addition to the mammalian species, the cave system hosts a number of invertebrate species belonging to different invertebrate classes including mollusca, diplopoda, chilopoda, insecta, and arachnida. The range of invertebrate species includes two rare species which have been described as being restricted to this cave. These include the carvernicolous pseudoscorpion *Roncus melitensis* described by Giardini & Rizzerio in 1987; and the cave-dwelling woodlouse *Trichoniscus matulicii* Verheoff described by Caruso and Lombardi in 1982 (Schembri, 1989).

ANTIQUITIES

Ghar il-Friefet has not received any particular attention by archaeologists. Reference has been made to the fact that remains pertaining to the Bronze Age period were found within the cave, these probably being material redeposited from above (Evans, 1971, p.229). The lack of serious archaeological study of this cave is surprising in the light of the multiple archaeological sites that are to be found in the area (see table below). These sites date from the Palaeolithic up to the Classical Age.

SITE	NATURE OF REMAINS	PERIOD
Ghar Dalam	Natural Cave: habitation and burial deposits; best known for the range of Pleistocene fossils excavated from the lower layers.	<ul style="list-style-type: none"> ○ Palaeolithic ○ Neolithic ○ Temple period ○ Bronze Age
Borg in-Nadur	Megalithic remains and later settlement; Cyclopean wall and settlement; Dolmenic niche.	<ul style="list-style-type: none"> ○ Temple period ○ Bronze Age
Ta' Kacciatura	Roman farmhouse	○ Roman period

The cave floor Pleistocene deposits of the nearby cave of Ghar Dalam have been recently reviewed (Savona-Ventura and Mifsud, 1998). In conjunction with these fossil deposits, a number of implements were excavated in association with deer, hippopotami and elephant bones at Ghar Dalam by G. Despott (Despott, 1918/1923). Other excavated remains previously attributed by Sir Arthur Keith as belonging to Palaeolithic man included two taurodont teeth. These in later years were reported on the basis of chemical relative dating tests to be “*not older than the Neolithic*” and that they had probably fallen to the “deer deposit layer” datable to the Late Pleistocene c.18,000 years ago from the overlying “domestic layer” deposits datable to the Neolithic c.7000 years ago (Zammit Maempel, 1989). It has recently been shown that the chemical tests performed by the British Natural History Museum for the local Museum authorities did not in fact prove that the taurodont teeth were contemporary with Neolithic material, but rather to the Palaeolithic horizon (Mifsud and Mifsud, 1996).

While the presence of Palaeolithic man in Malta has been a bone of contention, it is generally accepted that man definitely settled the Islands during the Neolithic period c.5200 BC, when this society was already

farming-based. The presence of Neolithic Man has been definitely established at Ghar Dalam. This community set out on a path of a very independent cultural development with the building of Megalithic Temples dedicated to a Fertility deity. An example of such a temple, dated to c.3500 BC is to be found at Borg in-Nadur nearby. This Temple Culture community came to an abrupt end c.2500 BC, and the islands were repopulated by an entirely different people who used bronze tools and weapons. Borg in-Nadur also has yielded important remains of the Bronze Age community in Malta. The locality also boasts the remains of a large *villa rustica* dated to the 2nd-4th century AD at Xghara ta' Kaccatura to the west of Wied Dalam.

REFERENCES

- D. Caruso, B.M. Lombardo: Isopodi terrestre delle isole Maltesi. *Animalia*, 1982, 9(1/3):5-52
- G. Despott: Excavations conducted at Ghar Dalam (Malta) in the Summer of 1917. *J. Roy Anthropol. Soc.*, 1918, xlviii:214-221
- G. Despott: Excavations at Ghar Dalam (Dalam Cave), Malta. *J. Roy. Anthropol. Soc.*, 1923, lii:18-35
- J.D. Evans: *The Prehistoric Antiquities of the Maltese Islands. A Survey*. Athlone Press, London, 1971, +260p.
- G. Gardini, R. Rizzerio: I *Roncus* eucavernicoli del gruppo *siculus* (Pseudoscorpionida Neobisiidae). *Boll. Soc. Ent. Ital.*, 1987, 119(2):67-80
- A. Mifsud, S. Mifsud: *Dossier Malta: Evidence for the Magdalenian*. Proprint, Malta, 1997, +212p.
- C. Savona-Ventura: A study of the genus *Myotis* Kaup (1829) in Malta (Mammalia: Chiroptera: Vesperilionidae). *Central Med. Nat.*, 1984a, 1(3):51-54
- C. Savona-Ventura: Observations on the genus *Myotis* in Maltese caves. *Potamon*, 1984b, 13:77-78
- C. Savona-Ventura and A. Mifsud: Ghar Dalam Cave. A review of the sediments on the cave floor stratigraphy. *Ix-Xjenza. Journal of the Malta Chamber of Scientists*, 1998, 3(1):p.5-12
- P.J. Schembri: Invertebrates other than insects and molluscs. In: P.J. Schembri and J. Sultana (eds.): *Red Data Book for the Maltese Islands*. Dept. of Information, Malta, 1989, p.74
- P.J. Schembri: The way science works. *The Sunday Times (of Malta)*, 13 October 1996, p.18
- G. Zammit Maempel: *Ghar Dalam. Cave and Deposits*. PEG, Malta, 1989, +74p.

