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CONTENTS

In 1998, three N.G.O.s which shared the common aim of promoting the awareness, conservation and study of Malta's natural heritage decided to join forces so as to form a single, more effective association. The organisations were the Society for the Study and Conservation of Nature, which had been founded in 1962, and the more recently formed groups Arbor and Verde.

This merger resulted in the formation of Nature Trust (Malta) which was officially launched by His Excellency the President of the Republic on Friday 8th January 1999. In June 2001 another organisation, the marine Life Care Group also joined Nature Trust (Malta).

Mission Statement

"Committed to the conservation of Maltese nature by promoting environmental awareness, managing areas of natural and scientific interest, and lobbying for effective environmental legislation."

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SYNTECTONIC DEPOSITION OF AN OLIGO-MIOCENE PHOSPHORITE CONGLOMERATE BED IN MALTA

Peter A. Gatt[1]

ABSTRACT

A succession of Oligo-Miocene sediments at Sliema, Qawra and Migra Ferha includes a 10-20cm phosphorite conglomerate bed capping the terminal hardground of the Lower Coralline Limestone Formation (Oligocene) which consists of carbonate platform sediments. The conglomerate bed always occurs in areas of significant thinning of the overlying Lower Globigerina Limestone. These palaeohighs have been linked to NNE-SSW trending lineaments.

At Sliema, allochthonous phosphatised conglomerate infill NW-SE trending Neptunian dykes that dissect the platform sediments. These Oligo-Miocene syntectonic deposits were later cemented and vertically displaced by minor faulting trending NW-SE. Tectonic features at Sliema are linked to the regional N-S extensional regime and tentatively interpreted to have developed from stresses caused by displacement along the western margin of a NNE-SSW trending strike-slip fault. East of this fault, synclinal subsidence created the Valletta Basin and set conditions for current upwelling. Phosphatogenesis occurred along the basin margin swept by the prevailing westward currents. Phosphatised pebbles and ahermatypic corals were transported westward of palaeohigh margins in central and western Malta and deposited on the terminal hardground of the drowned Oligocene carbonate platform.

INTRODUCTION

The Maltese Islands are located about 100km south of Sicily (figure 1a) and consist of an Oligocene to Miocene succession (Trechmann, 1938) forming one of the emergent eastern parts of the Pelagian block which extends from eastern Tunisia to the Ionian Basin (Burollet *et. al.,* 1978). Murray (1890) named the five Maltese Formations shown in figure 1b. The oldest consists of the Late Oligocene sediments of the Lower Coralline Limestone Formation (Felix, 1973). These shallow marine carbonate sediments are terminated by an Oligo-Miocene hardground in the Maltese Islands that marks a change to the overlying Miocene pelagic sediments of the Globigerina Limestone Formation.

This paper is first to record a 10-20cm phosphorite conglomerate bed at west Sliema, Qawra and Migra Ferha (figure 1c) overlying the terminal hardground of the Lower Coralline Limestone Formation. Phosphorite conglomerates terminating the Lower Coralline Limestone Formation have been generally overlooked by most authors, although Cooke (1896) describes a "seam of phosphatic nodules" without disclosing its location. Felix (1973) locates a brown hardground or "pebble bed" at il-Qaws [Grid Reference 418 697]. Dispersed phosphorite pebbles outcrop northwest of il-Qaws in western Malta (figure 1c).

Several Early Miocene phosphorite conglomerate beds extending from Sicily to Malta have been described by Carbone *et. al.* (1987). In Malta, the formation and occurrence of this earliest phosphorite conglomerate bed is linked to active tectonism as well as pre-existing tectonic or biogenic features that resulted in local palaeohighs. At Sliema, the conglomerate bed infills a series of Neptunian dykes that cut across the terminal

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hardground and the Late Oligocene platform sediments. The NE-SW extension also created minor faulting that vertically displaced the phosphorite conglomerate bed. These Oligo-Miocene syntectonic deposits precede any recorded for the Maltese Islands by Illies (1981), Reuther (1984), Grasso *et.al.* (1986) and Dart *et.al.* (1993) and are here associated with the formation of the poorly-known Valletta basin.

Although accessible outcrops of phosphorite conglomerate beds are limited to only narrow coastal zones, the available evidence has been used to construct a depositional model to explain the deposition of this Oligo-Miocene phosphorite conglomerate over the terminal hardground. The extensional discontinuities at Sliema are also related to the tectonic framework of the Pelagian Block and its three principal trends of faulting shown in figure 1a.

LATE OLIGOCENE LITHOSTRATIGRAPHY

The 140m thick Lower Coralline Limestone Formation is interpreted by several authors as being deposited along a shallow marine carbonate platform (Felix, 1973, Pedley *et.al.* 1976, Bennett, 1980). Sedimentation was controlled by three factors: (1) a depositional surface that deepened eastward (Bosence, 1991) along a slope $<1°$, which is characteristic of a ramp system (Burchette & Wright, 1992); (2) westward flowing sea currents (Pedley, 1987, Gatt, 1992) and; (3) a series of patch reefs in central Malta. These are interpreted by Pedley (1987) as having developed along a N-S palaeohigh (Rabat axis) related to pre-Oligocene tectonism (Pedley, 1990), although Saint Martin *et.al.* (1998) discards the notion of a palaeohigh basement and interprets these sediments as biogenic buildups consisting of corals and rhodoliths that accreted over time.

Four successive Facies Associations are identified in Malta and are here related to sequence-stratigraphic concepts:

Facies Association I: Lowstand sediments are exposed in the lower part of the Formation and consist mainly of fine-grained foraminiferal mudstones, algal debris wackestones (Bennett, 1980) and coral framestone deposited in an inner ramp lagoon-type of environment.

Facies Association II: A transgressive sequence consisting of horizontal thick red algal debris and rhodolithic beds, reaching a thickness of >20m (Gatt, 1992). These truncate the framestone coral heads of Facies Association I at Wied Znuber [557 630], Mosta [488 758] and Migra Ferha gorge [405 705]. These inner ramp sediments were deposited in an environment under constant wave agitation and are terminated by a sharp erosional surface.

Facies Association III: Foraminiferal and algal debris packstones and grainstones showing westward prograding cross-bedding. These sediments extend from Wied iz-Zurrieq [506 643] in the south to Bahar ic-Caghaq [510 776] and west Sliema (figure 1c) in the north (Gatt, 1992). Pedley (1987) interprets these coarse-grained sediments as a N to S trending facies deposited by powerful traction currents.

This sandbody is considered by Pedley (1987) to be laterally penecontemporaneous to expanded sequences of packstone and wackestone beds with abundant *Lepidocyclina* and *Amphistegina* in east Malta. At Xghajra [593 718], 1m thick well-sorted beds of these giant foraminifera show oblique and edgewise imbrication formed by bi-directional storm sea currents (Gatt, 1994) in a mid-ramp environment.

The topmost sediments are locally dominated by the echinoid *Scutella subrotunda.* Sections in east Malta consist of wackestones capped by a pectenid bivalve pavement and bryozoans (Gatt, 1994). These sediments become increasingly coarse-grained and dominated by large foraminifera towards central Malta. At Qammieh [400 811] in west Malta, Pratt (1990) describes beds of packstones of bryozoans, echinoids and the giant benthic foraminifer, *Lepidocyclina.* These sediments are terminated by a ubiquitous hardground surface formed during the drowning of the carbonate platform.

Facies Association IV: The western part of central Malta is dominated by a number of patch reefs that show highstand shedding of algal sediments followed by incipient drowning. At Naxxar [498 741], a biogenic buildup of corals succeeded by algal sediments and rhodoliths reaches a thickness <70m (Saint Martin *et.al.*, 1998) and forms large prograding clinoforms of well-sorted algal debris and rounded rhodolith beds dipping 20° to the SE (Gatt, 1992). The clinoforms are onlapped by pelagic sediments of the Globigerina Limestone Formation (Gatt, 1992), deposited along this persistent biogenic build-up during the final drowning of the platform.

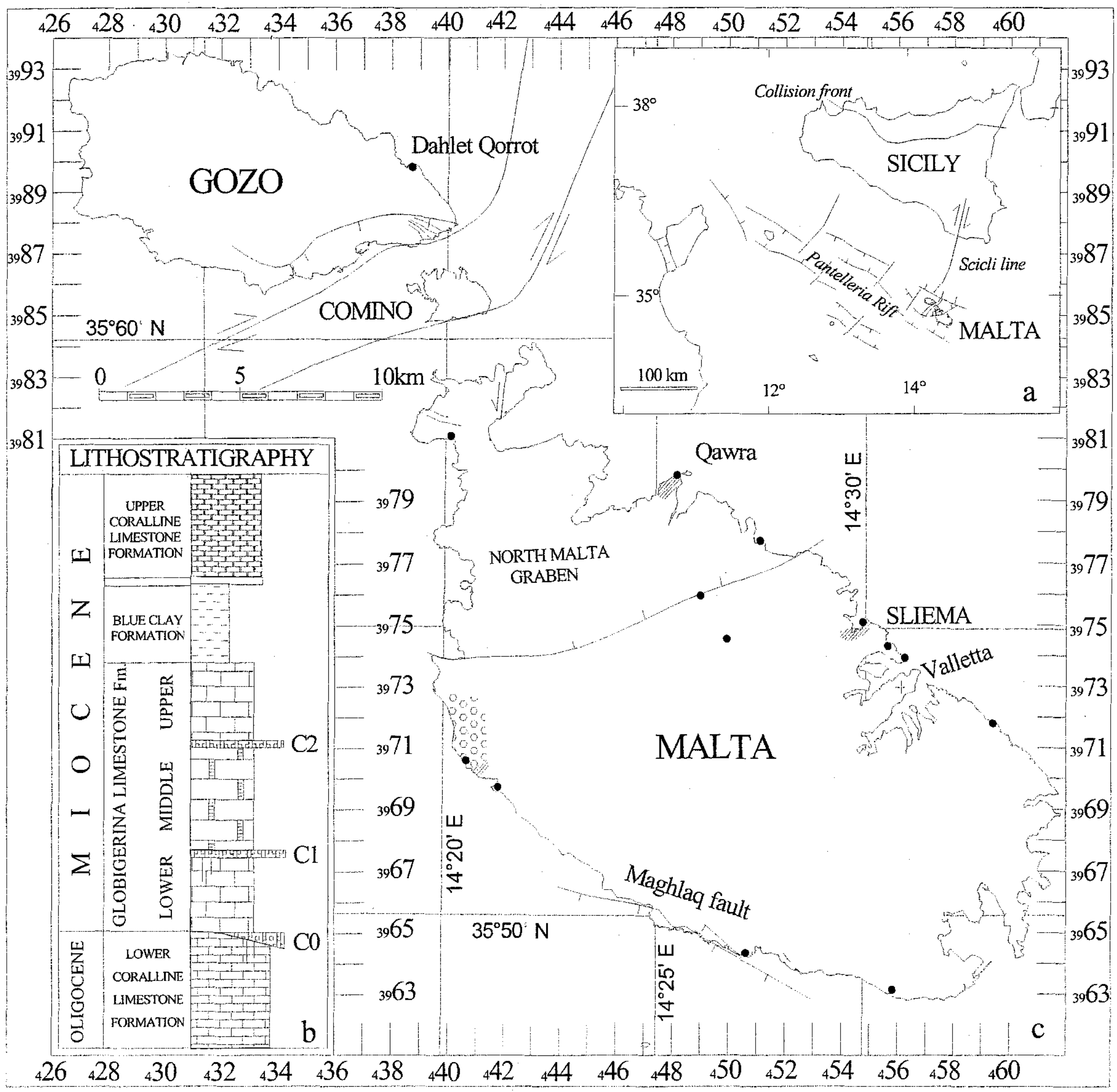

Fig. 1 (a) Main tectonic structural trends in the Central Mediterranean (partly based on Reuther, 1984 and Grasso *et. al.*, 1993) ; (b) Lithostratigraphy of the Maltese Islands; (c) Sections and main faults (partly based on Reuther, 1984 and Illies, 1981) in the Maltese Islands. Oligo-Miocene C0 phosphorite conglomerate bed shaded in stripes where C0 bed >10cm thick; in circles where only phosphorite pebbles (<5cm) are present

REGIONAL SETTING OF OLIGO-MIOCENE HARDGROUNDS AND CONGLOMERATES

Three main regional hardgrounds mark the stratigraphic boundaries of the Oligo-Miocene succession comprising the Lower Coralline Limestone and Globigerina Limestone Formations. The terminal Lower Coralline Limestone hardground is the oldest and marks the end of shallow marine platform sedimentation which is considered by several authors to coincide with the end of the Oligocene (Felix 1973, Pedley *et. al.*, 1976, Challis, 1979, Pedley, 1987). Some authors consider Oligocene sedimentation to have extended to the Lower Member of the Globigerina Limestone Formation (Giannelli & Salvatorini, 1972, Mazzei, 1985, Rose *et.al.* 1992), although all authors confirm that the Lower Coralline Limestone Formation is of Late Oligocene age.

The succeeding two main hardgrounds subdivide the Globigerina Limestone Formation into the three

Members, named by Rizzo (1932) as the Lower, Middle and Upper Globigerina Limestone. The hardgrounds are overlain by the ubiquitous C1 and C2 phosphorite conglomerate beds respectively (figure 1b) described by Felix (1973), Pedley *et.al.* (1976), Bennett (1980) and Pratt (1990). The phosphorite conglomerate bed described in this paper has been designated as the C0 bed accordance to this nomenclature.

These three principal hardgrounds have been correlated with the global eustatic sea-level curves of Haq *et. al.* (1987). The terminal hardground is associated with the beginning of the Aquitanian global eustatic rise in the TB1 supercycle. The two main hardgrounds in the Globigerina Limestone Formation are interpreted by Rose *et.al.*, (1992) to have formed during Miocene episodes of global marine transgression and were capped by condensed sections, the C1 and C2 conglomerates.
The occurrence of the C0 bed is limited to three areas in Malta seen in figure 1c. At Sliema and Qawra, the C0 bed exceeds 10cm in thickness and consists of 5-10cm subrounded pebbles, coral fragments and disarticulated pectenid bivalves. The C0 bed at Qawra is very limited in outcrop and its surroundings modified by Recent subaerial process. Only the Oligo-Miocene sediments at southwestern Malta and Sliema are described in detail.

THE C0 PHOSPHORITE CONGLOMERATE BED AT SOUTHWESTERN MALTA

The Lower Coralline Formation in western Malta forms vertical coastal cliffs which, according to Pedley *et. al.* (1976) are capped by a ubiquitous thin bed of the Lower Globigerina Member. Rose *et.al.* (1992) name these pectenid-bryozoan packstone sediments as the Gnejna bed, which extends around a synsedimentary high centred at il-Qaws where the Lower Globigerina Member is absent. In this paper, the Gnejna bed is reinterpreted as the topmost Lower Coralline Limestone Formation which correlates to other bryozoan beds within the Formation in east Malta and Qammieh (Pratt, 1990), although in southwestern Malta it is locally capped by the C0 bed.

The size of phosphorite pebbles in the C0 bed varies along a gradient from large (>5cm) sub-rounded conglomerate associated with ahermatypic corals and intraclasts of phosphatised burrows at Grid Reference 408 702 near Migra Ferha, to smaller (<5cm) well-rounded, discrete phosphorite pebbles further northwest (figure 1c).

THE C0 PHOSPHORITE CONGLOMERATE BED AT SLIEMA

Coastal outcrops of facies associations II and III in west Sliema are overlain by the Globigerina Limestone Formation along most of the coast (figure 2), which comprises four facies grouped into units A and C, separated by a C1 phosphorite conglomerate bed (unit B);

A. The Middle Member outcrops close to sea level and estimated to be 18m thick;

1. About 10cm of fine-grained low-angle cross-bedded laminae at Qui-si-Sana [556 744] passing upward to a thicker bioturbated sequence which is mostly inaccessible in outcrop. This facies is an unrecorded outlier of the Middle Member of this Formation.

B. The C1 conglomerate phosphorite bed (figure 3) is of regional extent and outcrops from Qui-si-Sana to Dragut
point [562 739], overlying a hardground;

2. This bed consists of brown-coloured phosphorite pebbles with serpulid encrustations, echinoids (some intact) and ahermatypic corals in a white sandy matrix overlying a phosphatised hardground. The pteropod *Gamopleura melitensis* in this bed is commonly associated with the C1 phosphate bed (Janssen, 2003).

C. The thickness of the Lower Globigerina Limestone Member is < 20m at west Sliema and consists of two main ichnofacies;

3. A set of poorly-defined mudstone/wackestone beds which are intensely bioturbated with alternating beds showing burrows of *chondrites* and *thalassinoides* exposed along most of the northeast facing coast.

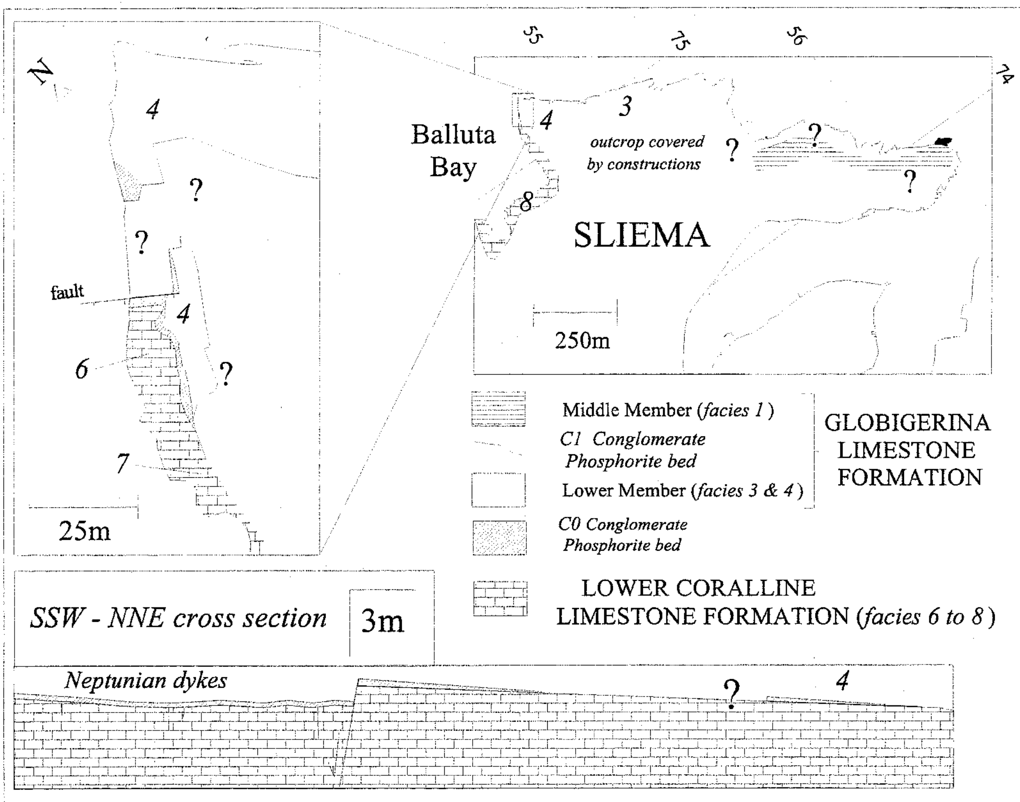

Fig. 2. Sliema: facies distribution and cross section at west Sliema

4. About 4m of globigerinid wackestone and mudstone that abruptly overlie the CO bed in west Sliema (fig. 2) with no evidence of reworked phosphorite intraclasts. The basal sediments show poorly preserved small straight burrows which further up pass to large bow-form burrows *circa* 0.5 to 1m long with a *Cylindrichnus*-mode of infill (Goldring *et.al.*, 2002).

D. The C0 conglomerate bed, overlying the terminal hardground;

5. A 10 to 20cm bed consisting of irregular-shaped dark brown phosphatised pebbles and ahermatypic corals within a white sandy matrix. The bed has a wavy surface and infills the underlying Neptunian dykes with corals and *pecten*. A minor normal fault along a NW-SE strike (130°) with an offset of 1m cuts the C0 bed and underlying sediments (shown in cross section in figure 2).

E. The top part of the Lower Coralline Limestone Formation shows a regional low dip (<5°) towards the northeast and outcrops along the coast around Balluta bay (figure 2) where it consists of three facies;

6. The topmost facies of about 1.5m of coarse-grained foraminiferal packstones with preserved echinoid tests of *Scutella subrotunda*, oysters and *pecten*, ending in the terminal hardground. At Grid Reference 547 751, the hardground is dissected by 40 to 200cm deep Neptunian dykes trending between 120° and 140°, which are infilled with sediments from the C0 phosphorite conglomerate bed. The dykes cut across the stratification at steep angles.
7. Two metres of cross-bedded coarse-grained sediments consisting of echinoid bioclasts and the large foraminifera *Lepidocyclina* and *Amphistegina*. The cross-beds show westward prograding foresets. This facies corresponds to Pedley's (1978) Xlendi Member
8. An intensely bioturbated medium-to-coarse–grained red algal debris packstone abruptly terminated by an erosion surface about 0.5m above sea level at Balluta Bay [543 749].

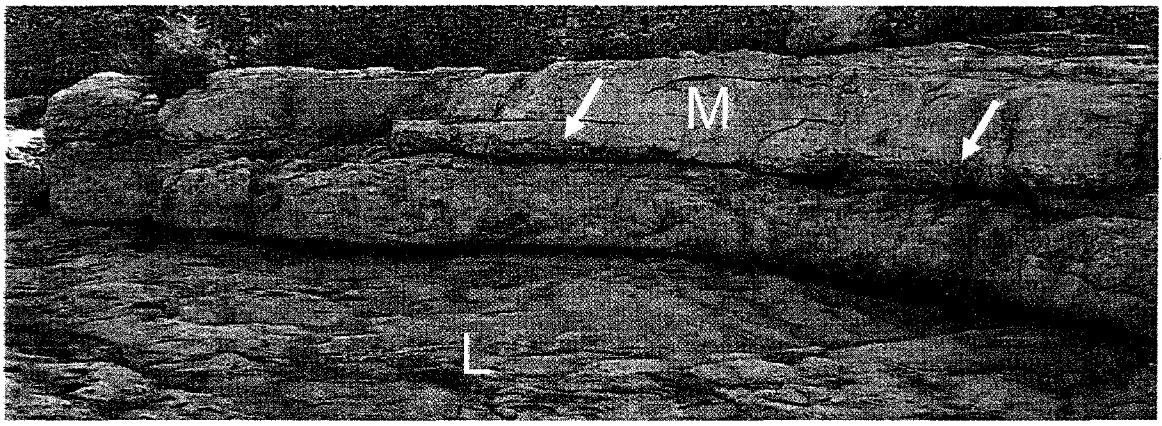

Fig. 3. Sliema (Qui-Si-Sana): C1 Conglomerate Phosphorite bed (arrows) overlying the Lower Globigerina Limestone (L). The Middle Globigerina Limestone (M) shows cross-bedding.

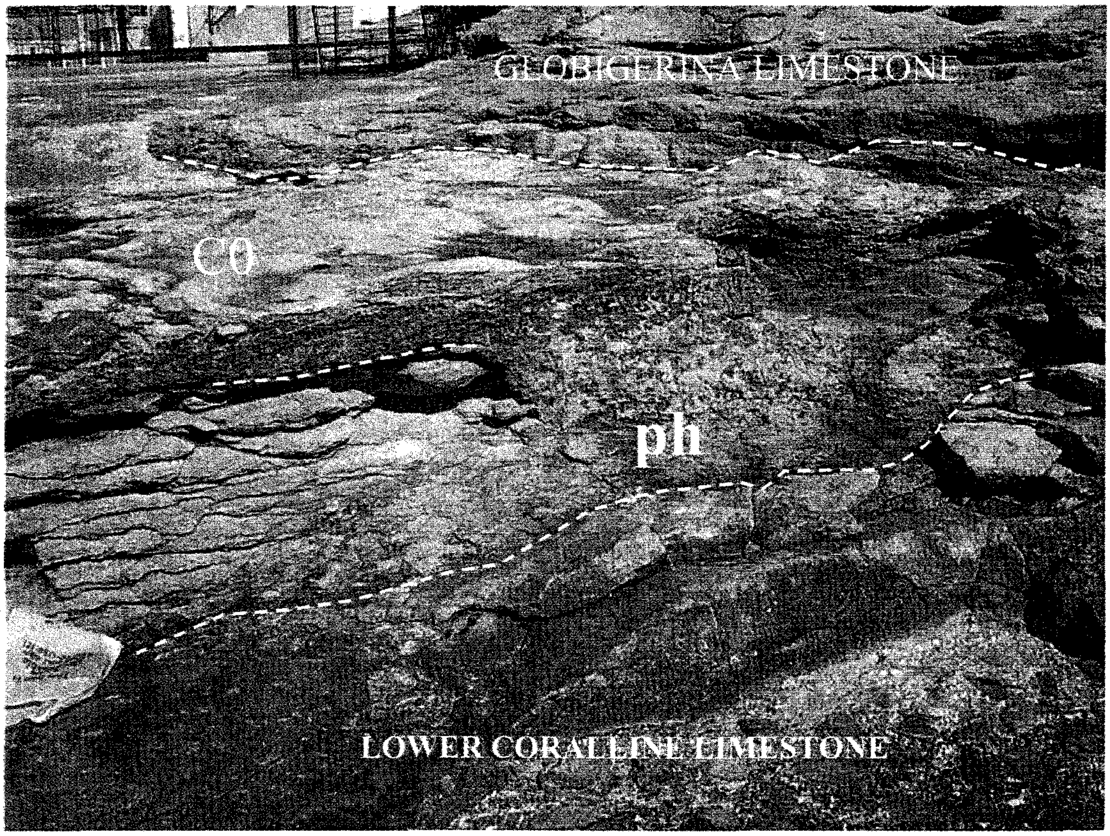

Fig.4. Partly eroded phosphorite sediments (ph) infilling a Neptunian dyke at Sliema [547 598]. The eroded foreground has exposed the dyke in vertical section. Phosphorite conglomerate bed (C0) in background.

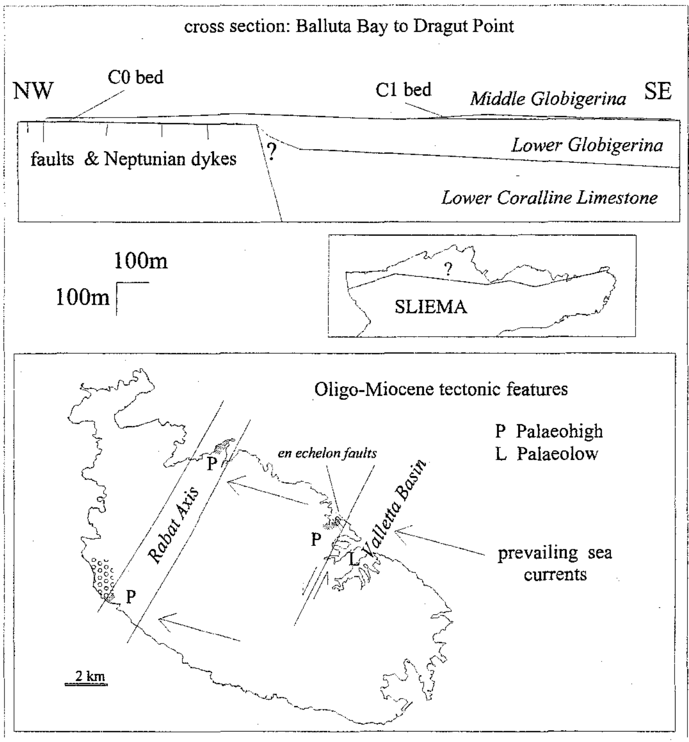

Fig. 5 top: Cross-section along Sliema showing stratigraphic thickening of Lower Globigerina capped by Middle Globigerina; bottom; tectonic setting of Rabat Axis (partly based on Pedley, 1987) and Valletta basin along a strike-slip fault showing NW-SE *en echelon* faults and Neptunian dykes at west Sliema. The C0 bed is located in areas of palaeohighs.

DEPOSITIONAL SETTING AND TECTONISM

The sediments at Sliema reflect successive relative sea level variations resulting from a combination of adjustments in carbonate sediment production, eustatic sea level changes and tectonic controls. The coarse-grained sediments forming the top part of the Lower Coralline Limestone Formation (facies 7) were deposited in a high hydrodynamic energy environment associated with a sea depth of <5m (Davies, 1976). The topmost condensed section (facies 6) reflects a drop in sedimentation rate at the onset of a marine transgression that created conditions for early cementation of the seabed leading to the formation of the terminal hardground. Rapid relative sea level rise terminated platform sedimentation and drowned the carbonate platform.

During this hiatal phase in sedimentation, the platform is interpreted to have underwent extension that created the Neptunian dykes which dissect the terminal hardground at west Sliema. The C0 phosphorite conglomerate bed infilling the dykes is interpreted as being allochthonous since the terminal hardground surface does not show *in situ* phosphatisation. Further extensional stresses along the platform generated NW-SE trending faults and created the small vertical displacements at west Sliema cutting into the cemented C0 bed.

The heightening of the marine transgression by eustatic and possibly tectonic controls, produced open marine conditions on the platform area at Sliema and the deposition of the Lower Member of the Globigerina Limestone Formation. The lime mud sediments were bioturbated by a succession of burrowers that reflect cyclic changes in the availability of oxygen at the seabed. Ichnofacies with larger burrows (facies 4) formed during episodes of shallower sea level or increased current activity that oxygenated the seabed. The *Chondrites* burrows in facies 3 are an indicator of minimal oxygenation at the seabed (Goldring, 1991).

At Qui-si-Sana, the Lower Member is terminated by the C1 phosphorite conglomerate bed overlying a phosphatised hardground. These autochthonous sediments are indicative of a hiatus in sedimentation and early cementation of the sea bed. The current-swept C1 bed was succeeded by cross-bedded carbonate sediments (facies 1) deposited during an increase in the sedimentation rate under moderate current energy conditions. These conditions later subsided and sediments become increasingly bioturbated further up.

DISCUSSION

The C0 phosphorite conglomerate bed is limited to particular western and central sections where the Lower Globigerina Member shows local thinning to <20m. In western Malta, these palaeohighs are related to highstand deposits of Facies Association IV overlying a NNE-SSW trending tectonic lineament. In central Malta, Neptunian dykes and faults at west Sliema provide tectonic evidence related to the formation of another palaeohigh adjacent to a subsiding seabed. The succeeding C1 and C2 beds in the Globigerina Limestone Formation are condensed sections formed during peak global marine transgressive episodes and consequently differ from the C0 bed in being ubiquitous in Malta and of regional extent.

Depositional model

The proposed depositional model in this paper is of a drowned homoclinal carbonate ramp that becomes distally steepened east of Sliema. This model is supported by west-to-east stratigraphical data for the Globigerina Limestone Formation in central Malta that points to the formation of the Valletta basin east of Sliema. Different interpretations on the extent of the Valletta basin have been described by Pedley *et.al.* (1976), Pratt (1990), Pedley (1990) and Rose *et.al.* (1992). The Lower Member (facies 3 and 4) at the basin margin in west Sliema reaches a thickness of <20m. Further east, hydrological borehole data indicates an unusual thickening of the Lower Member, where it reaches a maximum of >100m at Valletta. These sediments are capped by an outlier of the Middle Member in eastern Sliema (figure 5).

The basin environment created conditions for upwelling of sea currents that brought an influx of nutrients along the basin margin. Upwelling of water has been linked to phosphatogenesis (Kazakov, 1937, McKelvey, 1967) which can occur in current-swept environments (Jarvis, 1992). These westward-flowing sea currents transported the subrounded phosphatised pebbles and corals at Sliema over a relatively short distance.

In western Malta, the C0 bed at Migra Ferha and Qawra are also indicative of a nearby current-swept zone of phosphatogenesis which may be related to highstand sediments of Facies association IV. At Migra Ferha, phosphorite pebbles become smaller and more rounded towards the northwest, indicating longer transportation and re-working by westerly currents.

Tectonic setting and the evolution of the Maltese Islands

The linking of the dykes and faulting at west Sliema to the tectonic evolution of the Maltese Islands is problematic because they precede syntectonism in the Maltese Islands described by Pedley *et.al.* (1976), Illies (1981), Reuther (1984), Grasso *et.al.* (1986) and Dart *et.al.* (1993). Three principal tectonic trends found in the region of the Maltese Islands are described and their possible relation to the formation of the C0 bed discussed:

1. The earliest phase of rifting in Malta is described by Illies (1981) to have produced a set of faults striking 50° to
70° in the Miocene that created the NE-SW trending horst-ridge morphology in the North Malta Graben (figure1c). Syntectonic sedimentation of a phosphorite bed has been recorded in these Miocene sediments by Pratt (1990) at Dahlet Qorrot in Gozo (figure 1c). Extensional faulting produced Neptunian dykes at the crest of the uplifted footwall which dissected the Lower Globigerina Member. This tectonic activity coincided with the deposition of the C1 phosphorite conglomerate bed that infills the dykes.
2. A second set of faults, the Maghlaq fault system strikes 120° (figure 1c) and crosscuts the NE-SW trending set of older faults (Grasso *et.al.*, 1986). Faulting extends to Miocene sediments in Sliema and the

Valletta area (Illies, 1980). The Maghlaq fault is considered by Illies (1969) to be the outermost master fault of the Pantelleria Rift (figure 1a) which developed from the Messinian onwards when the Pelagian Block was governed by NE-SW extension. Significantly, the strike of the Neptunian dykes at west Sliema parallels that of the Maghlaq fault system, although they precede its formation.

3. Dart *et. al.* (1993) reinterpret Maltese tectonics and consider the different rifting phases as coeval, produced by a N-S extensional regime proposed by Argnani (1990) for the Central Mediterranean. Rifting is considered to have commenced after the deposition of the Lower Coralline Limestone Formation. North-south extension affecting the Pelagian Block also generated strike-slip faulting in the Hyblean plateau in SE Sicily forming the Scicli Line (Grasso *et.al.* 1986) which is regarded by Pedley (1987) to extend to near Comino in the Maltese Islands (figure 1a,c). In Malta, N-S trending lineaments described by Pedley (1987, 1990) consist of an Oligo-Miocene palaeohigh in western Malta (Rabat axis) and a palaeolow in eastern Malta (Valletta basin). The geometry and occurrence of the C0 bed transported under the prevailing westerly flowing sea currents support this interpretation (figure 5).

The Valletta basin

The tectonic features at west Sliema and the formation of the Valletta basin are here considered within the framework of the regional N-S extensional regime proposed by Dart *et.al.* (1993). Pedley (1990) considers the Valletta basin to have a N-S alignment subparallel to underlying Mesozoic lineaments and the Miocene Scicli Line, although the actual tectonic mechanism leading to the formation of the Valletta basin have not been described.

The Valletta basin is tentatively interpreted to have developed along a NNE-SSW trending sinistral strike-slip fault terminating in Malta (figure 5). The NW-SE trending fault at west Sliema forms the tail end of a set of en-echelon faults with associated Neptunian dykes which released stresses along the strike-slip principal displacement zone. This faulting on the western margin oblique to the transform fault also produced a step-like topography shown in cross-section in figure 2.

An asymmetric syncline developed east of the strike-slip fault that was infilled by the Lower Globigerina Limestone and capped by the Middle Globigerina Member, which is preserved as an outlier in Sliema (figure 5a). The strike-slip motion that created the Valletta basin may form the southeastern flank of the block bounded on the west by the Scicli Line dextral shear. Further studies covering a wider area are required to reinforce this tentative interpretation of the Valletta basin.

CONCLUSIONS

1. The Oligo-Miocene carbonate sediments of Malta show three regional hardgrounds, each overlain by a phosphorite conglomerate bed.
2. The carbonate ramp sediments of the Late Oligocene Lower Coralline Limestone Formation are terminated by the first regional hardground that marks the drowning of the platform.
3. Regional N-S extension and the development of a NNE-SSW trending principal strike-slip fault may explain the development of minor faults and several Neptunian dykes at Sliema oblique to the principal fault.
4. The development of the Valletta basin east of Sliema created conditions for phosphatogenesis at the current-swept basin margin. These phosphatised sediments were transported westward by the prevailing sea currents and deposited at Sliema as a bed of phosphorite conglomerate consisting of subrounded pebbles with ahermatypic coral bioclasts that infill Neptunian dykes.
5. This bed also locally caps the terminal hardground of areas in western Malta where the overlying Lower Globigerina Member shows significant thinning. Here, pebble size decreases westwards.

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THE CURRENT KNOWLEDGE OF THE SPIDER FAUNA OF THE MALTESE ISLANDS WITH THE ADDITION OF SOME NEW RECORDS (ARACHNIDA: ARANEAE).

David Dandria[1], Victor Falzon[2] & Jonathan Henwood[3]

ABSTRACT

The current knowledge of the spider fauna of the Maltese Islands is reviewed. Four species are recorded for the first time, and information is given about the banded argiope, *Argiope trifasciata*, which is thought to be a recently introduced species. An updated checklist of the spider fauna of the Maltese Islands is also provided.

INTRODUCTION

The recorded spider fauna of the Maltese Islands hitherto comprises 137 species in 31 Families, including seven endemic species. Only one species belongs to the suborder Orthognatha - the endemic trapdoor spider *Nemesia arboricola*, first recorded by R.I. Pocock in 1903, and recently re-described by Kritscher (Kritscher, 1994). Another nemesiid (*N. macrocephala*) was recorded by Baldacchino *et al.* (1993), but after re-examination of the specimens in the light of Kritscher's 1994 redescription, this was found to be based on misidentification and the material was assigned to *N. arboricola* (Dandria 2001). The other 136 species belong to the sub-order Labidognatha, and their occurrence was documented by Cantarella (1982), Baldacchino *et al.* (1993), Bosmans & Dandria (1993) and Kritscher (1996).

The largest family is that of the ground spiders, Gnaphosidae, numbering 21 species including the endemic *Poecilochroa loricata* Kritscher 1996. The jumping spiders, Salticidae, which were the first Maltese spider family to receive serious attention in Cantarella's 1982 study, are represented by 19 species, among which is the sub-endemic *Aelurillus schembrii* Cantarella 1983, which has so far only been recorded from Malta and Sicily. Other prominent families include: the Theridiidae with 14 species including the endemic *Dipoenata cana* Kritscher 1996; the Araneidae with 12 species including *Argiope lobata* Pallas 1772, the largest Maltese spider and *A. trifasciata*, which is tought to be a recent introduction; and the Linyphiidae, also with 12 species among which are two endemics: *Palliduphantes melitensis*, Bosmans 1993 and *Syedra parvula* Kritscher 1996. The wolf-spiders, Lycosidae, and the crab-spiders, Thomisidae, are represented by 7 and 6 species respectively while the remaining families number less than 5 species. Eleven of these are represented by a single species including the 2 endemics *Nemesia arboricola* Pocock 1903 (Family Nemesiidae) and *Palpimanus punctatus* Kritscher 1996 (Family Palpimanidae). Table 1 summarises the distribution of the hitherto recorded species among the 31 Families.

The present work records 4 species for the first time from the Maltese Islands: 3 linyphiids [*Hybocoptus corrugis* (O. P-Cambridge 1875), *Erigone longipalpis* (Sundevall 1830) and *Ostearius melanopygius* (O. P-Cambridge 1879)] and 1 araneid (*Larinioides cornutus* Clerck 1757) bringing the total number of recorded species to 141. Information about the recently introduced araneid, *Argiope trifasciata* (Forskål 1775), whose presence in the Maltese Islands has already been recorded by Victor Falzon (Falzon, 2005a & 2005b) and by Bonnet & Attard (2005) is also given, together with a complete checklist of Maltese spiders.

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Table 1. The Families of Maltese spiders.

FAMILY	NUMBER OF SPECIES	NOTES
Sub-order Orthognatha		
Nemesiidae	1	endemic
Sub-order Labidognatha		
Filistatidae	1	
Sicariidae	1	
Scytodidae	3	
Pholcidae	4	
Segestriidae	2	
Dysderidae	2	
Oonopidae	1	
Palpimanidae	1	endemic
Oecobiidae	2	
Uloboridae	2	
Theridiidae	14	1 endemic sp.
Linyphiidae	12	2 endemic spp.
Araneidae	12	
Lycosidae	7	
Pisauridae	2	
Zoropsidae	1	
Agelenidae	4	
Dictynidae	4	
Amaurobiidae	1	
Titanoecidae	1	
Miturgidae	2	
Liocranidae	2	1 endemic sp.
Clubionidae	1	
Zodariidae	2	
Prodidomidae	1	
Gnaphosidae	21	1 endemic sp.
Sparassidae	1	
Philodromidae	4	
Thomisidae	6	
Salticidae	19	
Total	137	7 endemic spp.

NEW RECORDS

Family Linyphiidae

Hybocoptus corrugis (O. P-Cambridge 1875)
Synonym: *H. decollatus* (Simon, 1881) (see Platnick, 2005)

Material examined: Ghadira Nature Reserve, Malta 28/10/04 1 male; N. Barbara leg.
Determination: after Roberts (1985)
Distribution: Europe (Platnick, 2005)
Notes: Specimen was taken in a pitfall trap set on the banks of the saline pool during a survey of the macrofauna of the Ghadira Nature Reserve. (Barbara, 2005)

Erigone longipalpis (Sundevall 1830)

Material examined: Dwejra Inland Sea, Gozo 6/03 1 male M. Gauci leg.
Determination: after Roberts (1985)
Distribution: Palaearctic (Platnick, 2005)
Notes: Specimen was taken in a pitfall trap in a coastal area (supralittoral) (Marika Gauci pers. comm.)

Ostearius melanopygius (O. P-Cambridge 1879)

Material examined: Zebbug, Malta 3/8/99 1 male, 3 females, 4 juveniles D. Dandria leg.
Determination: after Roberts (1985)
Distribution: Cosmopolitan (Platnick, 2005)
Notes: Specimens taken from larger population in an apparently communal web in low shrubs.

Family Araneidae

Larinioides cornutus (Clerck 1757) (Fig. 1)

Material examined: Naxxar, Malta 9/04 1 female Juan Ellul Pirotta leg. (specimen was examined alive under stereomicroscope then returned to web)
Determination: after Roberts (1985)
Distribution: Holarctic (Platnick, 2005)
Notes: The specimen had built its orbweb among tree branches in a private garden at Naxxar, hiding in a tubular retreat on one of the branches. The species is very similar to *L. suspicax* (O. P-Cambridge, 1876) (= *L. folium*) a species which is commonly encountered in the Maltese Islands on vegetation near freshwater pools and reservoirs.

Fig. 1 *Larinioides cornutus* at web.

THE BANDED ARGIOPE

Argiope trifasciata (Forskål 1775) Fig. 2

Material examined: Is-Simar Nature Reserve 1/3/04 1 adult female DD leg.
Determination: after Levy (1997) by comparison of epigyne structure. Identification confirmed by Gershom Levy based on photograph of epigyne.
Distribution: Platnick (2005) gives the distribution as "Cosmopolitan (Except Europe)", while Levy (1997), quoting Levi (1983), gives "Cosmopolitan and partly temperate, not in Europe and Japan" and also mentions its presence in Egypt, Eritrea, Ghana and Israel. Despite the above indications of absence from Europe, however, the Fauna Europaea website indicates the species as present in the Canary Islands, Madeira, mainland Spain and mainland Portugal.
Notes: The presence of this species at the Ghadira Nature Reserve was brought to the attention of one of the authors (VF) in mid-October 2003, when a gravid female was observed on an orb-web suspended in a stand of rush growing near a small, shallow freshwater pool. A week later an egg sac was observed near the web. The specimen was last seen on 21/11/03, but the egg sac was still present at year's end (Falzon 2003a). At

first the spider was thought to be *Argiope bruennichi* (Scopoli 1772), a similar species which had been previously recorded from Malta, but which had not been seen since 1976 and is now regarded as being extinct from the islands (Baldacchino *et al.* 1993). Differences in the dorsal abdominal pattern soon became apparent and the spider was eventually identified as *Argiope trifasciata*. Later that year (11/11/03), *A. trifasciata* was also found at Is-Simar Nature Reserve, where a population consisting of at least 12 females and juveniles had become established in a grassy area of less than 100 sq. m., some of the webs being as near as 30 cm apart. At least 25 egg sacs were also noted. The population dwindled to four individuals by 8th December 2003 (Falzon 2003b). However in late February 2004, when the specimen on which the identification is based was taken, 6 adults and 2 juveniles were noted.

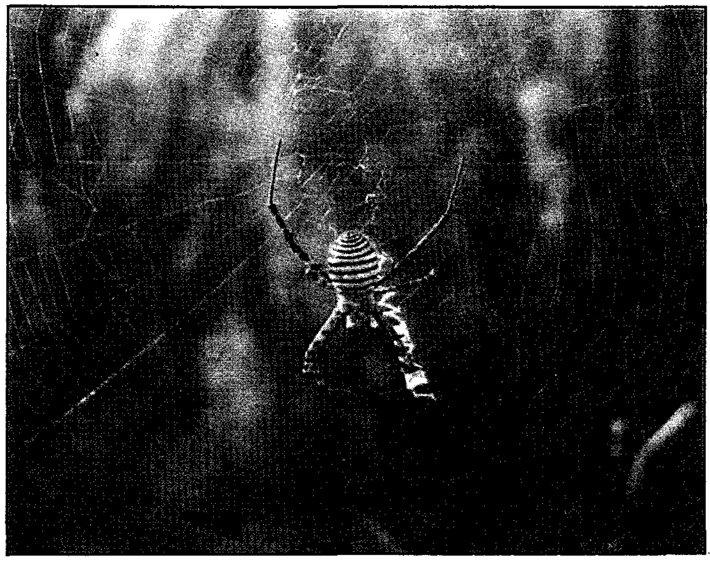

Fig. 2 Argiope trifasciata at web.

It later transpired that the species had been observed and photographed in Summer 2003 (May-June) at Wied il-Hanaq in Gozo (Joe Sultana pers. comm.) and this therefore can be taken as the first recorded sighting of the species. Subsequently the species was observed and photographed in a number of other locations including Birzebbuga (David Mifsud pers. comm.) and Naxxar (G. Bonnet pers.comm). A population of several individuals was found at Il-Ballut saltmarsh, Marsaxlokk, where one of the authors (JH) made several observations on this population. The first sighting was on 10/9/04, when an adult female (bodylength 2 cm) was observed on an orbweb spanning 100 cm, constructed between two tamarisk trees at a height of 110 cm above ground level. A second female of comparable size was sighted on 16/10/04 on a smaller web (diam. 30 cm), this time constructed in a *Suaeda maritima* shrub about 50 cm above ground. On 25/11/04, seven individuals of varying sizes (range 0.7 – 2.3 cm bodylength) were detected in a patch of *Inula crithmoides* bushes. A number of unoccupied webs were also observed from time to time.

The large size and conspicuous colouration of this spider lead us to surmise that it is very unlikely that its presence in Malta had hitherto escaped detection, and it is therefore assumed that it has been recently introduced to the Maltese Islands. Such introduction could have taken place through the presence of egg cocoons in consignments of plant material imported from North Africa, where the spider is known to occur.

CHECKLIST

In the following checklist only taxa which have been identified to species level are included. The taxonomic order of Families follows that of Platnick (2005) while the order of species within families is alphabetical. An asterisk next to a species indicates that it is endemic to the Maltese Islands.

ORDER ARANEAE

SUBORDER ORTHOGNATHA

Nemesiidae

**Nemesia arboricola* Pocock 1903

SUBORDER LABIDOGNATHA

Filistatidae

Filistata insidiatrix (Forskål, 1775)

Sicariidae

Loxosceles rufescens (Dufour, 1820)

Scytodidae

Scytodes bertheloti Lucas 1838
Scytodes thoracica (Latreille, 1804)
Scytodes velutina Lowe 1836

Pholcidae

Holocnemus pluchii (Scopoli, 1763)
Pholcus opilionoides (Schrank, 1781)
Pholcus phalangioides (Fuesslin, 1775)
Spermophora senoculata (Dugès, 1836)

Segestriidae

Ariadna insidiatrix Audouin, 1827
Segestria senoculata (Linnaeus, 1758)

Dysderidae

Dysdera crocata C.L. Koch 1839
Harpactea corticalis (Simon, 1882)

Oonopidae

Silhouettella loricatula (Roewer, 1942)

Palpimanidae

**Palpimanus punctatus* Kritscher, 1996

Oecobiidae

Oecobius maculatus Simon 1870
Oecobius navus Blackwall 1859

Uloboridae

Uloborus plumipes Lucas, 1846
Uloborus walckenaerius Latreille, 1806

Theridiidae

Achaearanea tepidariorum (C.L. Koch, 1841)
Anelosimus aulicus (C.L. Koch, 1838)
Argyrodes argyrodes (Walckenaer, 1841)
**Dipoenata cana* Kritscher, 1996
Enoplognatha macrochelis (Levy & Amitai, 1981)
Enoplognatha mandibularis (Lucas, 1846)

Euryopis acuminata (Lucas, 1846)
Neottiura uncinata Lucas 1846
Nesticodes rufipes Lucas 1846
Steatoda grossa (C.L. Koch, 1838)
Steatoda paykulliana (Walckenaer, 1806)
Steatoda triangulosa (Walckenaer, 1802)
Theridion mystaceum L. Koch, 1870
Theridion pinastri L. Koch, 1872

Linyphiidae

Araeoncus humilis (Blackwall, 1841)
Erigone longipalpis (Sundevall 1830)
Hybocoptus corrugis (O. P-Cambridge 1875)
Meioneta rurestris (C.L. Koch, 1836)
Microlinyphia pusilla (Sundevall, 1830)
Microctenonyx subitaneus (O.P-Cambridge 1875)
Ostearius melanopygius (O. P-Cambridge 1879)
**Palliduphantes melitensis* (Bosmans, 1994)
Pelecopsis inedita (O.P-Cambridge, 1875)
Silometopus curtus (Simon, 1881)
**Syedra parvula* Kritscher, 1996
Tenuiphantes tenuis (Blackwall, 1852)

Araneidae

Agelenatea redii (Scopoli, 1763)
Araneus quadratus Clerck, 1757
Argiope lobata (Pallas, 1772)
Argiope trifasciata (Forskål 1775)
Cyclosa insulana (Costa, 1834)
Cyrtophora citricola (Forskoel, 1775)
Larinioides cornutus (Clerck 1757)
Larinioides suspicax (O. P-Cambridge 1876)
Mangora acalypha (Walckenaer, 1802)
Neoscona subfusca (C.L. Koch, 1837)
Zygiella atrica (C.L. Koch, 1845)
Zygiella x-notata (Clerck, 1757)

Lycosidae

Alopecosa albofasciata (Brullé 1832)
Alopecosa canaricola Schmidt, 1982
Arctosa lacustris (Simon 1876)
Hogna ferox (Lucas, 1838)
Hogna narbonensis Walckenaer, 1806
Pardosa hortensis (Thorell, 1872)
Pardosa proxima (C.L. Koch, 1847)

Pisauridae

Pisaura mirabilis (Clerck, 1775)
Pisaura quadrilineata (Lucas 1838)

Zoropsidae

Zoropsis spinimana (Dufour, 1820)

Agelenidae

Lycosoides coarctata (Dufour, 1831)
Lycosoides flavomaculata (Lucas, 1846)
Tegenaria parietina (Fourcroy, 1785)
Tegenaria dalmatica Kulczynski1906

Dictynidae

Dictyna civica (Lucas, 1850)
Dictyna latens (Fabricius, 1775)
Dictyna pusilla Thorell, 1856
Marilynia bicolor (Simon, 1870)

Amaurobiidae

Amaurobius erberi (Keyserling, 1863)

Titanoecidae

Nurscia albomaculata (Lucas, 1846)

Miturgidae

Cheiracanthium mildei L. Koch, 1864
Cheiracanthium pennyi O. P-Cambridge, 1873

Liocranidae

Mesiotelus tenuissimus (L. Koch, 1866)
**Scotina occulta* Kritscher., 1996

Clubionidae

Clubiona leucaspis Simon, 1932

Zodariidae

Zodarion emarginatum (Simon, 1873)
Zodarion nigriceps (Simon, 1873)

Prodidomidae

Anagraphis pallens Simon, 1893

Gnaphosidae

Aphantaulax cincta (L. Koch, 1866)
Drassodes lapidosus (Walckenaer, 1802)
Drassodes cupreus (Blackwall 1834)
Drassylus pusillus (C.L. Koch 1833)
Gnaphosa lugubris (C.L. Koch, 1839)
Haplodrassus severus (C.L. Koch, 1839)
Haplodrassus signifer (C.L. Koch, 1839)
Kishidaia conspicua (L. Koch, 1866)
Leptodrassus albidus Simon, 1914
Micaria coarctata (Lucas 1846)
Micaria formicaria (Sundevall, 1832)
Nomisia exornata (C.L. Koch, 1839)

Nomisia recepta (Pavesi 1880)
**Poecilochroa loricata* Kritscher, 1996
Pterotrichina elegans (Dalmas, 1921)
Scotophaeus blackwalli (Thorell, 1871)
Scotophaeus scutulatus (L. Koch, 1866)
Trachyzelotes barbatus (L. Koch, 1866)
Zelotes fuscotestaceus Simon, 1878
Zelotes nilicola (O. P-Cambridge, 1874)
Zelotes tenuis (O. P-Cambridge, 1874)

Sparassidae

Micrommata ligurinum (C.L. Koch, 1845)

Philodromidae

Philodromus glaucinus Simon, 1870
Philodromus pulchellus Lucas, 1846
Philodromus rufus Walckenaer, 1820
Thanatus vulgaris Simon, 1870

Thomisidae

Runcinia cerina (C.L. Koch, 1845)
Synaema globosum (Fabricius, 1775)
Thomisus onustus Walckenaer, 1806
Xysticus caperatus Simon 1875
Xysticus cribratus Simon, 1932
Xysticus nubilus Simon, 1875

Salticidae

Aelurillus monardi (Lucas, 1846)
Aelurillus schembrii Cantarella 1982
Chalcoscirtus infimus (Simon, 1868)
Cyrba algerina (Lucas, 1846)
Euophrys rufibarbis (Simon, 1868)
Evarcha jucunda (Lucas, 1846)
Hasarius adansoni (Sav. & Aud., 1825)
Heliophanus tribulosus Simon, 1868
Icius hamatus (C.L. Koch, 1846)
Icius nebulosus (Simon, 1868)
Menemerus semilimbatus (Hahn, 1827)
Menemerus taeniatus (L. Koch, 1867)
Neaetha membrosa (Simon, 1868)
Phlegra bresnieri (Lucas, 1846)
Phlegra fasciata (Hahn, 1826)
Plexippus paykulli (Sav. & Aud., 1825)
Salticus mutabilis Lucas, 1846
Salticus unciger (Simon, 1868)
Talavera petrensis (C.L. Koch, 1837)

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ON THE OCCURRENCE OF THE BUOY BARNACLE *DOSIMA FASCICULARIS* ELLIS & SOLANDER, 1786 (CIRRIPEDIA: LEPADIDAE) IN MALTESE WATERS WITH NEW RECORDS OF OTHER SPECIES OF THORACICA.

Constantine Mifsud[1]

ABSTRACT
The occurence of *Dosima fascicularis* Ellis & Solander 1786 in Maltese waters is recorded for the first time and additional records of other lepadid and scalpellid species are given.

INTRODUCTION

The various species of thoracican barnacles inhabiting the sea around our shores have been reviewed by Rizzo & Schembri (1997). The authors listed 19 species which were recorded with certainty from these Islands, three of which belong to the family Lepadidae Darwin, 1851. These include *Lepas anatifera* Linnaeus, 1767, *Lepas pectinata* Spengler, 1851, and *Paralepas minuta* (Philippi, 1836), a species found in deeper waters attached to the primary spines of cidariid sea urchins. *Lepas hillii* (Leach, 1818), (1988) and *Conchoderma virgatum* (Spengler, 1790), which had been recorded by Gramentz (1988) and *Scalpellum scalpellum* (Linnaeus, 1767), recorded by Rizzo & Schembri (1997) off Lampedusa, are recorded with certainty herein. *Dosima fascicularis* Ellis & Solander, 1786 is recorded for the first time for these Islands and probably also for the Mediterranean Sea.

Family Lepadidae

Lepas anatifera Linnaeus, 1767. (Fig. 1) This is the most abundant cirripede around our shores, found especially attached to our local fishermen's lampuki floats in great numbers, at times outweighing the float itself. This species is distinguished from its other congeneric species by possessing a tooth near the umbo of the right scutum.

Lepas pectinata Spengler, 1851. (Fig. 3) This is also extremely common around our shores. It is found attached to all types of floating objects such as pieces of wood, plastic containers and pumice stones. It was also found to be frequently attached to the shell of the pelagic snail *Janthina pallida* Thompson, 1840. The species is distinguished by the small size, the fleshy pinkish-brown colour and the heavily ribbed scuta and terga.

Lepas hillii (Leach, 1818). (Fig. 2) Rizzo & Schembri (1997) refer to a record of this species by Gramentz (1988) as an epibiont on the turtle Caretta caretta. A large number of specimens were found attached to an old, large motor vehicle tyre which was washed up at Mellieha Bay after an Easterly-Northeasterly storm. A few individuals were also found attached to fishing boat hulls at Gnejna Bay. The species differs from *L. anatifera* in having no teeth at the umbones of the scutum, and the carina is well separated from the scutum by a thick membrane.

Dosima fascicularis Ellis & Solander, 1786. (Fig. 6) During recent (May 2004) NW storms, a living specimen of *Dosima fascicularis* was washed ashore at Gnejna Bay. *Dosima fascicularis* can reach a length of 3.5cm. The capitulum consists of five valves, which are usually very brittle and translucent white. Unlike

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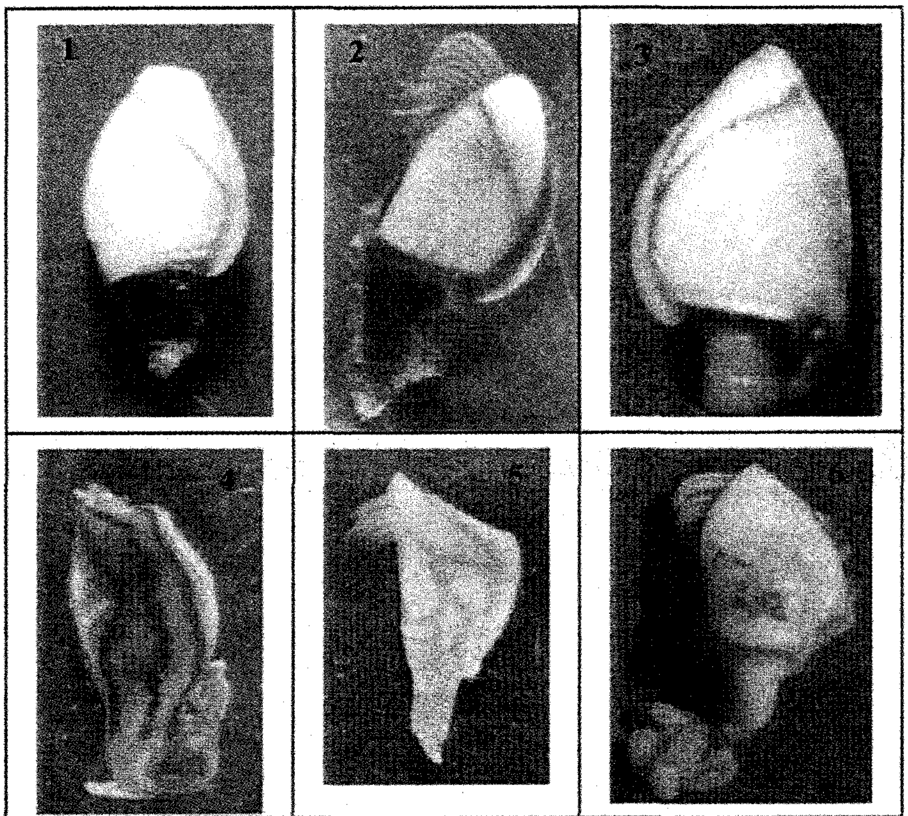

Fig. 1. ***Lepas anatifera*** **Linnaeus, 1767**
Fig. 2. ***Lepas hillii*** **(Leach, 1818)**
Fig. 3. ***Lepas pectinata*** **Spengler, 1851**
Fig. 4. ***Conchoderma virgatum*** **(Spengler, 1790)**
Fig. 5. ***Scalpellum scalpellum*** **(Linnaeus, 1767)**
Fig. 6. ***Dosimia fascicularis*** **Ellis & Solander, 1786**

other congeneric species, *D. fascicularis* does not usually attach itself to flotsam, but it secrets a white spongy float or buoy from the cement glands in its pedunculus (attachment stalk) and it is therefore completely pelagic. Although it may be found singly, in Atlantic waters it is usually found as a bunch, all attached to one common float. However, recently it has also been found attached to weathered globules of tar. Its distribution is cosmopolitan but it is mainly found in the Atlantic as far North as the English Channel.

The single live specimen found at Gnejna Bay has a capitulum length of 3cm. The valves of the tergum and the scutum were translucent, light bluish-purple in colour with their external surfaces delicately granular giving it a rather frosted appearance. The pedunculus is 1.5cm long and the white buoy perfectly spherical in shape and 15mm in diameter. Several juvenile specimens of *L. pectinata* were also attached to the capitulum of the specimen. The bluish-purple colour of the live specimen changed to orange yellow when it was later preserved in alcohol. Searches for similar specimens at the other adjacent beaches of Ghajn Tuffieha and Golden Sands and on the successive days of the storm, proved negative, although this could have been due to the large stinking masses of *Velella* and the acorn-shaped *Posidonia* fruits from the *Posidonia* meadow plants, which that year were beached in great quantities, in Malta as well throughout most of the Mediterranean.

D. fascicularis is absent from the Italian Marine fauna list (www.faunitalia.it/checklist) and no records for the Mediterranean could be found (G. Relini pers. comm.). Although it is listed in the European Register of

Marine Species (www.vliz.be/vmdcdata/erms), this is probably the first known record of *Dosima fascicularis* for the Mediterranean Sea.

Conchoderma virgatum (Spengler, 1790). (Fig. 4) A frequent and unmistakable species due to its particular fleshy capitulum and its colour pattern of purple vertical streaks. Some specimens were found attached to old ropes and fishing boat hulls at Gnejna Bay. Mamo (in Caruana, 1867) recorded this species as *Cineras coriacea* Poli, 1795, which is a synonym of this species. This species was previously recorded by Gramentz in 1998 as an epibiont on the turtle *Caretta caretta.*

Family Scalpellidae

Scalpellum scalpellum (Linnaeus, 1767). (Fig. 5) A large number of specimens were brought up attached to an old fishing line from a depth of 80 metres. The rope still had plastic ball floats attached to it at about 60 metres depth and had other species of marine fauna attached, including the bivalves *Pteria hirundo* (Linnaeus, 1758)., *Pinctada radiata* (Leach, 1814) and *Neopycnodonte cochlear* (Poli, 1795) (Mifsud 2004).

ACKNOWLEDGEMENTS

I would like to thank Dr. G. Relini from the University of Genoa for help and important literature.

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(Accepted November 2005)

SHORT COMMUNICATIONS

Recent records of uncommon butterflies from the Maltese Islands

Anthony Seguna[1]

The lycaenid butterflies *Lycaena phlaeas phlaeas* (Linnaeus 1761), *Zezeeria knysna knysna* (Trimen 1861) and *Aricia agestis agestis* (Denis & Schiffermuller,1775) and the satyrid butterfly *Maniola jurtina hyperhispulla* (Thomson,1972) are recorded again after a long absence.

LYCAENIDAE

Lycaena phlaeas phlaeas (Linn. 1761) Eng. Small Copper; M. Farfett tas-Selq (Fig. 1).

MALTA: Wied Qirda l/0 Zebbug 2 ex., 10.x.2004. The butterflies were observed feeding on flowers on a sunny day (temperature 20°C). Dock (*Rumex* sp.), which is the larval food plant of this species (Valletta, 1973), was abundant in the vicinity. This species, which was rarely recorded in recent years, could be re-establishing itself in the Maltese Islands..

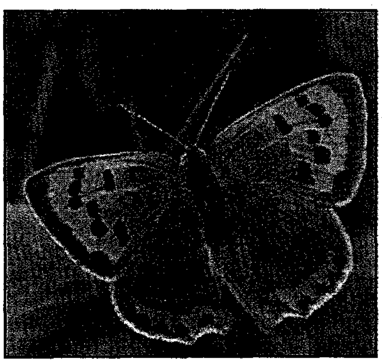

Fig. 1 Lycaena phlaeas phlaeas

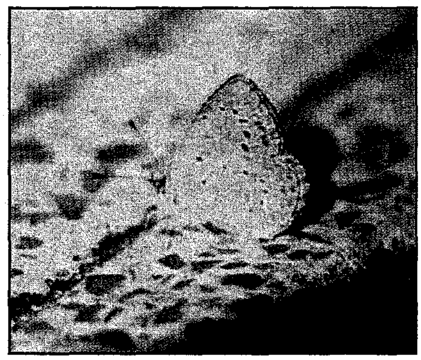

Fig. 2 Zizeeria knysna knysna

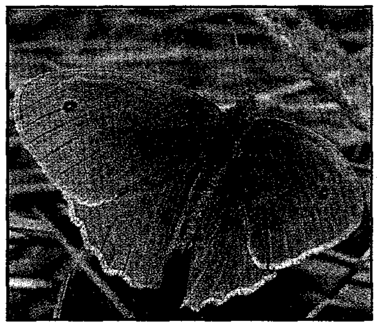

Fig. 3 Maniola jurtina

Zizeeria knysna knysna (Trimen, 1861) Eng. African Grass Blue; M. Ikhal ta' l-Afrika (Fig. 2).

MALTA: Wied Dalam l/o Birzebbuga, 1 m, 19.xi.2000, 3m, 1f, 3.x.2004; Wied Qirda l/o Zebbug, several ex., 4.xi.2000 and 10.x.2004. The 2000 Wied Dalam record is the first for this locality. At Wied Qirda in October, 2004, mating was observed. It appears that this species has now established itself quite well in the Maltese Islands.

Aricia agestis agestis (Denis & Schiffermuller,1775) Eng. Brown Argus; M. Kannelli ta' l-Anglu

MALTA: Wied Qirda l/o Zebbug, 1m, x.2005. The specimen was in perfect condition. Previously quite common, this species has now become very rare.

SATYRIDAE

Maniola jurtina hyperhispulla (Thomson, 1972) Eng. Meadow Brown; M. Kannella Kbir (Fig. 3) .

MALTA: Armier, 5m, 21.v.2003 GOZO: Wied Xlendi, 4m, 1 f; Dwejra l/o San Lawrenz 1m and 3 f; Hondoq ir-Rummien l/o Qala 1 f, 8.vi.2004. This species has declined drastically in recent years and is now quite rare.

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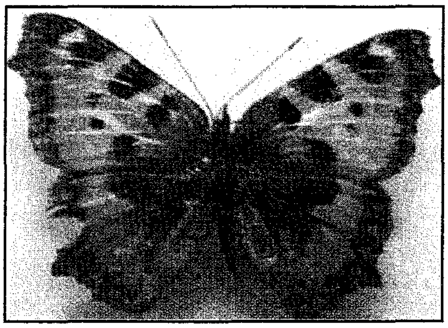
The presence of *Aglais urticae* (Lepidoptera: Nymphalidae) in the Maltese islands

Arnold Sciberras[1] and Esther Schembri[2]

The first mention of the presence of the Small Tortoiseshell, *Aglais urticae,* in the Maltese islands was by T.B Fletcher in 1904-05 who mentions that a specimen was "noticed" by Gervase F. Mathew on March 23rd 1892. It was also repeatedly mentioned by a number of other authors (as either *Aglais* or *Vanessa urticae*) (Bainbridge-Fletcher, 1904, 1905; Caruana-Gatto, 1925; P. Borg, 1932; J. Borg, 1939; De Lucca,1950 and Sammut 2000)) but considerable doubt was cast on the validity of *A. urticae* records, so much so that Sammut (2000) regards these as based on probable misidentifications.

On May 14th 1985 Mr. E. Cardona captured a specimen of *Aglais urticae* at Wied Hanzir, Qormi and in his collection it was misidentified as another species. In late 2002 the specimen was definitely identified by Paul Sammut as *Aglais urticae.* The information that the collector provided was that in those days he never collected outside the Maltese Islands so there could be no doubt that the specimen was captured in Malta. The specimen was taken during a *Vanessa cardui* migration. (E. Cardona, personal communication) On November 23rd 2003 one of the authors (AS) collected a number of *Vanessa cardui* specimens on a *Lantana camara* shrub at Marsa Racourse; while the specimens were on the setting boards Mr. J.Sciberras noted that one of the specimens was different, and it was definitely identified as *Aglais urticae.* This specimen was also caught during a *Vanessa cardui* migration. It is now in one of the authors (ES) private collection. In the period 13th November - 4th December, there were other possible but, unconfirmed, sightings of the species.



The Marsa specimen

The Wied Hanzir and Marsa Racecourse records can be regarded as the only reliable confirmed records of *Aglais urticae* in the Maltese Islands, and the species can therefore be added to the list of Maltese butterflies. We propose the Maltese name of this species as **Qoxra ta' Fekruna Zghira** since the Maltese name for *Nymphalis polychloros*, commonly known as the large tortoise shell, is **Qoxra ta' Fekruna.**

ACKNOWLEDGEMENTS

The authors are grateful to Mr. Paul Sammut for providing all his assistance and to Mr. Emmanuel Cardona for sharing information about his specimen. They also thank Mr. Jeffrey Sciberras for his keen eyesight and identification of the Marsa specimen.

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A report of nesting on a Maltese beach by the Loggerhead Turtle *Caretta caretta* (Linnaeus 1758) (Reptilia: Cheloniidae)

Alan Deidun[1] and Patrick J. Schembri[1]

Of the seven species of marine turtles in the world, five occur in the Mediterranean: the Loggerhead [*Caretta caretta* (Linnaeus, 1758)], Green [*Chelonia mydas* (Linnaeus, 1758)], Kemp's Ridley [*Lepidochelys kempi* (Garman 1880)], Hawksbill [(*Eretmochelys imbricata* (Linnaeus, 1766)] and Leatherback [*Dermochelys coriacea* (Vandelli 1761)] (UNEP/IUCN, 1990; Arnold & Ovenden, 2002). Of these, only the first two listed now breed in the Mediterranean. The Leatherback is mainly an Atlantic species that regularly enters the Mediterranean in small numbers and apparently used to occasionally breed there, although there are no recent records of it doing so; the Hawksbill is a tropical species that only very rarely enters into the Mediterranean, while Kemp's Ridley is an Atlantic species for which there is only a single record from the Mediterranean (UNEP/IUCN, 1990; Arnold & Ovenden, 2002).

All the five species recorded from the Mediterranean have also been recorded from Maltese waters (Gramentz, 1989; Baldacchino & Schembri, 2002) and indeed the only Mediterranean record of Kemp's Ridley is from Malta (Brongersma & Carr, 1983). However, all apart from the Loggerhead may be considered as either vagrants (Leatherback and Green turtles) or as accidental (Hawksbill and Kemp's Ridley). On the other hand, the Loggerhead forms part of the Maltese fauna since it is relatively common in Maltese waters and, until it was declared a protected species in 1992 (Legal Notice 76 of 1992), it was regularly landed and offered for sale at the Fish Market in Valletta (Gramentz, 1989; Baldacchino & Schembri, 2002). Both Gulia (1890) and Despott (1915) reported that the Loggerhead also used to breed in the Maltese Islands. The former author makes a general statement that Loggerheads came ashore on sandy beaches to breed (Gulia, 1890), but the latter states that " *it has been known during that season* [spring] *to lay its eggs on our unfrequented sandy beaches, especially at Gozo*" (Despott, 1915). There are no other records of turtles nesting in the Maltese Islands following Despott's and it has been assumed that the Maltese beaches have been abandoned as nesting grounds for at least 75 years (e.g. Savona Ventura, 1979; Gramentz, 1989; Lanfranco & Schembri, 1989; Baldacchino & Schembri, 2002).

In August of 2005, one of us (AD) had occasion to interview a person (who wishes to remain anonymous) who described in great detail a turtle emerging from the sea, crawling up the sandy beach at Ir-Ramla tal-Mixquqa (Golden Bay), to excavate a nest in the sand and deposit a clutch of eggs. This event happened some time between the 1st and 15th of July 1960 (our informant does not remember the exact date), while he formed part of the 11th Regiment of the Royal Malta Artillery (popularly known as the 'Territorials') and was stationed at the then army barracks at Ghajn Tuffieha. Our informant witnessed the event while he andfour others were relaxing on the beach at Ir-Ramla tal-Mixquqa in the evening. At around 21.30h a turtle, described to us as some 50-60cm long, some 40cm wide, and with a light brown carapace and a yellow plastron, swam to the water's edge and then crawled up the beach for some 150m until it reached the reed bed fringing the Ramla tal-Mixquqa dune, behind the position of the catering establishment that is now sited in front of this dune. The turtle then excavated a nest and deposited its eggs. When egg laying was over, the observers approached the nest and dug out the eggs, of which there were between 50 and 100 (our informant does not remember the exact number but is fairly sure that it was closer to 100 than to 50). The eggs and turtle were collected and eventually consumed. Our informant also remarked that the beach in question was completely dark in those days and was only lit when necessary by means of a generator.

This report of nesting by what is most likely to have been the Loggerhead Turtle *Caretta caretta* on a local beach in 1960 is important since it suggests that turtles may have still been nesting in the Maltese Islands up to about 45 years ago, immediately before the local tourism industry took off in the early 1960s and Maltese beaches became much more frequented, and their hinterland developed and well lit. At present the Loggerhead nests in the central and eastern part of the Mediterranean basin, mainly in, Libya, Greece, Cyprus, Turkey, Syria, Lebanon, Israel and Egypt, but small populations also nest in Tunisia, Sicily, and Lampedusa (Gramentz, 1989; UNEP/IUCN, 1990; see also papers and reports presented at the Second

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Mediterranean Conference on Marine Turtles, 4-7 May 2005, Kemer, Antalya, Turkey; Ministry of Environment and Forestry of Turkey, 2005). In the past this species also nested in southern Italy and Corsica (UNEP/IUCN, 1990), apart from Malta. Thus, there are several potential sources in the central Mediterranean from where a local breeding population may be founded. However, it is not likely that local beaches will once again start being used as nesting sites, given the high level of disturbance, human activity and bright illumination at all hours of the evening and night that now occurs on the beaches where nesting has been recorded, especially during the nesting period (in the Mediterranean, from the end of May until the end of August and sometimes early September).

ACKNOWLEDGEMENTS

We are very grateful to our informant for consenting to an intensive interview on the event subject of this note and we also thank Ferdinand Demicoli from Nature Trust (Malta) who first introduced us to this person.

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First record of *Aleurolobus olivinus* (Silvestri) (Hemiptera: Aleyrodidae) in Malta

David Mifsud[1] & Angelo Porta-Puglia[1]

In recent years there have been a number of faunistic studies on the whitefly fauna of the Mediterranean Basin. A total of 56 species accommodated within 25 genera were recorded from Europe and countries bordering the Mediterranean Basin (Martin *et al.*, 2000). The whitefly fauna of the Maltese Islands was thoroughly investigated with 13 species recorded (Mifsud, 1995; Mifsud & Palmieri, 1996). Mifsud (1995) suggested that other whitefly species could eventually be found in Malta mainly due to their typical Mediterranean distribution and availability of their host plant/s. One such species, *Aleurolobus olivinus* (Silvestri), was recently collected in Malta and it thus represents a new record for this country.

The identification of this species was based on examination of pupal cases under a compound microscope and the following dichotomous keys were used: Martin *et al.*, 2000; Mifsud, 1995 and Mifsud & Palmieri, 2000.

Aleurolobus olivinus (Silvestri, 1911)

Material examined: **MALTA**: Hamrun, 17.ii.2005, several pupal cases found on the upper surface of leaves of olive trees (*Olea europaea* L.) planted in the back yard (inside car park) of the Hexagon House of HSBC Bank, leg. D. Mifsud.

Aleurolobus olivinus (Silvestri) is a typical Mediterranean species being recorded from the following territories: Corsica, Crete, Cyprus, France, Greece, Israel, Italy, Jordan, Mallorca, Malta, Morocco, Portugal, Sardinia, Sicily, Spain, Syria, and Turkey. The species is mainly found on oleaceous hosts (*Olea europaea*, *Phillyrea angustifolia* and *Phillyrea latifolia*) but it has also been recorded from *Erica* (Bink-Moenen, 1989). Occasionally, *A. olivinus* (Silvestri) becomes a minor pest of olives, however, the species is well controlled by a number of natural enemies, namely parasitoids (Maniglia, 1985). Generally, *A. olivinus* (Silvestri) goes through one generation per year with adults appearing in June and July; in western Sicily, however, two generations per year were recorded with adults emerging in June-July and again in September-October (Maniglia, 1985).

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The jewel beetle (Coleoptera, Buprestidae) fauna of Malta – Remarks and Additions

David Mifsud[1] & Henry Borg Barthet[2]

The jewel beetle fauna of the Maltese Islands was recently studied by Mifsud & Bílý (2002) and a total of seventeen species were recorded. The present note is intended to provide data on a new record of a buprestid for Malta and includes other information on some previously recorded species.

Acmaeoderella adspersula adspersula (Illiger, 1803)

Material examined: MALTA: Mellieha, 1 ex., (reared) emerged on 12.viii.2005 from dead twigs of *Ceratonia siliqua* collected on 20.ix.2003, leg. H. Borg Barthet.

Acmaeoderella adspersula adspersula (Illiger) represents a new record for Malta. It is a typical Mediterranean species being recorded from the following territories: Albania, Bosnia, Bulgaria, Croatia, France, Greece, Hungary, Italy, Macedonia, Monaco, Portugal, Spain, Yugoslavia, Algeria, Morocco, Tunisia, Cyprus, Israel, Syria and Turkey. The other subspecies, *A. adspersula squamiplumis* (Peyerimhoff, 1921) is distributed in Algeria, Morocco, Israel and Sinai. The species is extremely polyphagous, developing in dead branches of *Acacia* spp., *Acer monspessulanum*, *Celtis australis*, *Cistus albidus*, *Cytisus laburnum*, *Ephedra fragilis*, *Euphorbia dendroides*, *Genista corsica*, *Malus domestica*, *Pistacia lentiscus*, *Quercus* spp., *Retama retama*, *Sorbus* sp., *Spartium junceum*, *Thymelaea hirsuta*, *Ulmus* sp., *Vitis vinifera* (Curletti, 1994), *Castanea*, *Ceratonia*, *Populus*, *Rhus*, *Zygophyllum* and *Ficus carica*.

Buprestis novemaculata novemaculata Linnaeus, 1767

Material examined: MALTA, Zejtun, 19.viii.2004, 1 ex., leg. D. Mifsud.

This species was previously recorded by Curletti (1994) from Buskett. The above record represents the second one for this species in Malta. It is mainly associated with dead wood of *Pinus* spp.

Melanophila cuspidate (Klug, 1829)

Material examined: MALTA, Rabat, 1/15.x.2005, 1 ex., captured in a UV light trap, leg. P. Sammut.

This species was originally recorded for Malta by Andres (1916). A second capture from Girgenti was reported by Mifsud & Bílý (2002).

Aphanisticus pygmaeus Lucas, 1849

Material examined: **MALTA**, Zejtun, 12.viii.2005, 1 ex., leg. D. Mifsud

This species was previously recorded on the basis of a single record by Mifsud & Bílý (2002) from Ghajn Rihana.

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On the occurrence of *Schedophilus ovalis* (Cuvier, 1833) and *S. medusophagus* Cocco, 1839 (Perciformes, Centrolophidae) in Maltese waters.

Constantine Mifsud[1]

The family Centrolophidae includes Atlantic and Mediterranean pelagic fish which seek shelter under floating debris and which do not reside for very long periods under moored floats such as those used by in Malta for catching dolphin fish (*Coryphaena hippurus* Linn.) There are three species from this family which are found occasionally in Maltese waters, two in the genus *Schedophilus, **S. ovalis*** (Cuvier, 1833) and ***S. medusophagus*** Cocco, 1839 and one in the genus *Centrolophus, **C. niger*** (Gmelin, 1789). *S. ovalis* (Cuvier, 1833) (fig.1) can reach a length of one metre while *S. medusophagus* is much smaller, not exceeding 30 cm in length. These species of fish are known to feed on jellyfish, but they also feed on other marine animals present in the plankton and scavenge dead fish (Debelius 1997).

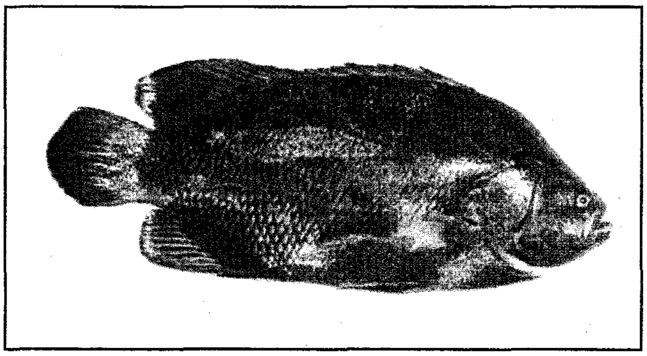

Fig. 1 *Schedophilus ovalis*

Lanfranco (1965) records *S. medusophagus* Cocco, while the same author later records *S. ovalis* (Val.) indicating that *S. medusophagus* should be referred to as *S. ovalis*, but giving no further explanation (Lanfranco, 1993). Farrugia Randon & Sammut (1999), probably following Lanfranco (1993), cite only *S. ovalis*, repeated by Farrugia Randon (2001) and Farrugia Randon & Micallef (2004) in their checklists.

When alive, *S. ovalis* shows some similarities to juveniles of *Polyprion americanus* (Bloch & Schneider, 1801) also known as wreckfish (Malt. *hanzir*); these are caught at the same time of the year (during the dolphin fish season). However, *S. ovalis* is much flatter, the mouth is smaller and the front of the head is much blunter. *S. ovalis* has always been known in the Maltese fishing community by the vernacular name of "*fallakka*".

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