

MALTA'S NATIONAL PLANT *PALAEOCYANUS CRASSIFOLIUS* (BERTOLONI) DOSTÁL (ASTERACEAE) AND SOME ARTHROPOD VISITORS

George Zammit Maempel¹

Abstract

The history, nomenclature and systematics of Malta's National Plant, *Palaeocyanus crassifolius* (Bertoloni) Dostál are reviewed and results are given of a survey of arthropod visitors to its flower-heads, carried out at three different sites during the period 1993 - 1997. Fifty-one species belonging to five insect orders (Diptera, Coleoptera, Heteroptera, Hymenoptera and Lepidoptera) and one arachnid order (Araneae) were recorded.

I. THE PLANT.

History and nomenclature

The history of Malta's National Plant is somewhat complicated and stormy. The plant, which is not known to grow in the wild anywhere in the world except on the southern and western cliffs of Malta and Gozo, is of great antiquity and is considered to be a remnant of our prehistoric flora (Gulia Gav., 1890:43). Notwithstanding that its discovery is generally attributed to the Maltese doctor-naturalist Stefano Zerafa (1791-1871), it was actually his medical colleague Agostino Naudi (1783-1830) [PLATE I, top], who, in 1825, had discovered this endemic plant at Wied Babu, on the outskirts of Zurrieq.

Dr Agostino Naudi, formerly an architect, was a Maltese medical doctor enjoying a very high reputation and esteem in the medical profession. He set up a private 'school' for medical students and lectured on anatomy, botany, physiology, pathology and therapeutics. Italy recognised his valuable contributions and invited him to occupy the Chair of Medicine at the University of Naples (Camilleri, C. 1831:18; Zammit, N. 1864: 4; Cassar, P. 1965: 450). Agostino Naudi was also an enthusiastic collector of the flora of the Maltese Islands and in 1811, his large collection of local plants was described and published by the Italian Carmelite Friar Carlo Giacinto then Professor of Botany at the University of Malta. Giacinto's list and description of over 800 local plants was prepared with the collaboration of both Naudi and Zerafa. In 1829, the latter succeeded Padre Giacinto in the Chair of Botany.

After some time, Naudi passed the plant on to Stefano Zerafa, who, not finding it listed in botanical books, referred it to Professor Todaro for an opinion. Todaro agreed with Zerafa that this peculiar Maltese endemic, perennial, cliff-hanging plant represented a species that was new to science. On account of its fleshy spathulate leaves, Stefano Zerafa (1827, Part 1, Fasc.I, p.11, No. 102) called it *Centaurea spathulata*, recording in the original description that its flowers are purple or white - "*Flores purpurei vel albi*".

Zerapha (Zerafa) may not have been aware that the name "*Centaurea spathulata*" was pre-occupied by a form of a variety of another plant of the genus *Centaurea* - *Centaurea jacea* Linn. var. *transalpina* Schleich, forma *spathulata* Tenore 1811. In fact Tenore (1811) described this as a species *C. spathulata* and it was later demoted by others to "form" status. So, in 1829, on the basis of a dry specimen sent to him by Giovanni Gussone (author of *Florae Siciliae*), the Bologna University botanist Antonio Bertoloni corrected this nomenclatorial confusion. This he did by substituting the specific name *spathulata* by *crassifolia* (a reference to the fleshy nature of its leaves). In his *Annali di Storia Naturale* (1829 : 359-360) and in his subsequent work *Flora Italica* (1833-54), Bertoloni referred to the plant as "*Centaurea crassifolia* Bertoloni", thereby disclaiming Zerafa's rights and claiming for himself its full authorship. Because of Zerapha's original error, however, Antonio Bertoloni was quite within the accepted practice to rename the plant and was not obliged to give credit to the original author in any way in the authorities (Dr.D.J.N. Hind, Kew, *personal communication*, 12/7/95).

Habitat and vernacular name.

The national plant grows naturally in the southern and south western valleys and cliffs of Malta and Gozo and visitors to Wied iz-Zurrieq and the Blue Grotto (Ghar Qattus) may get a good glimpse of it growing naturally in numbers on the high rocky cliff facing the natural arch of the Cave. It is this habit of growing close to the sea that earned for the plant its Maltese name of *Widnet il-Bahar* (Ear of the sea). This refers to the similarity between the shape of its leaves and those of the common fodder plant "Widna". This appellation is generally thought to have been first adopted by Professor Ganni Borg in 1927 (see Lanfranco E, 1989 : 142 footnote 1). Records show, however, that this vernacular name existed well before 1927. In fact, Dr Gavino Gulia (1890: 43) notes that "*Dai Maltesi la centaurea si conosce sotto il nome di Uidnet il bahar*" (the Maltese call the Centaury *Widnet il-Bahar*).

Zerafa's plant - or rather, Naudi's plant - was initially

¹ 148, Triq San Frangisk, Hal-Balzan, BZN 07, Malta.

thought to be limited to the Wied Babu region, but in 1874, the botanist J.F. Duthie records it growing naturally also on the cliffs at Ta' Cenc and Xlendi in Gozo - where the plant's leaves are said to have been serrated. This serrated variety was subsequently (1907) described by Fiori and Paolletti as "form *serratifolia* Nobili" (Vol. IV, Appendice p.188 No.3743. See also Vol. III, p.344 and Vol. IV, p.65).

Serrations of the leaves are not listed in Zerafa's initial description of the cliff hanger and no such features were noted by the present author in a 1994 survey of the 'Maltese Centaury' growing naturally at Ta' Cenc and Xlendi. Borg (1927), however, did record the development of some serrations in the leaves of some of his "normal" potted plants. In view of this, Lanfranco (1989 : 142) does not consider the serrated variety to be a stable one.

Systematics.

Taxonomically, Malta's National Plant belongs to the Family Asteraceae (= Compositae) and is the only member of its genus (*Palaeocyanus*). In the early 1970s, the Czech botanist Dostál revised the subtribe Centaureinae and discovered in the process that the Maltese plant (*Centaurea spathulata* Zerapha, 1827), though very much resembling members of the genus *Centaurea*, was not one of them. Such features as the fleshy leaves, the involucre calyx lacking spines or marginal bristles and the absence of trichomes were typically its own and necessitated the erection of a new genus. Even the shrubby nature of the plant is a rare feature in this genus. Dostál consequently transferred the taxon from *Centaurea* to the new genus *Palaeocyanus* (Gk. *Palaeo*, old, and *cyanus*, heavenly blue, cf. the cornflower *Centaurea cyanus*), which he himself erected to accommodate this very peculiar Maltese endemic plant. - Zerafa's plant - thus came to be known as "*Palaeocyanus crassifolius* Dostál 1975" - thereby obliterating completely any reference to the original author Zerapha (Dostál 1973, 1975).

Not all authors recognize the genus *Palaeocyanus*, so that the plant from Malta is still known as "*Centaurea crassifolia* Bertoloni" in some texts - with "*Centaurea spathulata* Zerapha *Fl.Melit.*(1827) non Tenore 1811" and "*Palaeocyanus crassifolius* (Bertoloni) Dostál" as its synonyms. It is important to state, however, that *Flora Europaea* does recognize the genus *Palaeocyanus* and refers to the plant as "*Palaeocyanus crassifolius* (Bertoloni) Dostál" - with "*Centaurea spathulata* Zerapha *Fl.Melit.* (1827) non Tenore 1811" and "*Centaurea crassifolia* Bertoloni" as its synonyms.

National Status

As the Maltese Centaury is endemic to the Maltese Islands and is not known growing in the wild in any other country, the Natural History Society of Malta in 1962 chose "*Centaurea spathulata* Zerapha 1827" as its emblem [*Notes & News*, December 1971, p. 5]. That same year (1962), the Zurrieq Civic Council and the above-mentioned Society - which afterwards came to be known as the SSCN (Society

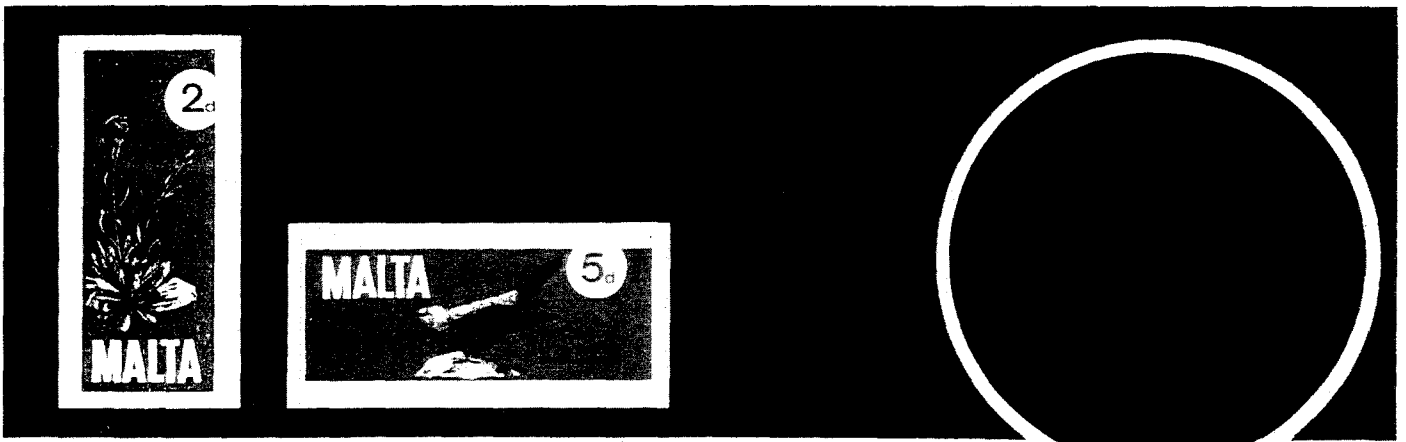
for the Study and Conservation of Nature) and in 1999 as Nature Trust (Malta) - made strong recommendations and requests for the Government to adopt "Widnet il-Bahar" (the *Centaurea spathulata* of Zerafa, 1827) as the National Plant of Malta and "Il-Merill" (the Blue Rock Thrush, *Monticola solitaria* L., a common resident of the Maltese Archipelago) as the National Bird of Malta. The recommendation also had the full support of the Head Gardener of the Argotti Botanic Gardens, Mr Carmelo Penza. On the 100th anniversary of Zerafa's death (1971), the Zejtun Civic Council and the Natural History Society made an official request to the Minister of Trade, Industry and Agriculture to issue a stamp commemorating Zerafa (*The Times of Malta*, Sat.16 January 1971, p.4).

In spite of the general belief in the official status of the above-mentioned plant and bird, however, the present author could find no Government Notice in *The Malta Government Gazette* (the official organ of the Government of Malta) declaring "Widnet il-Bahar" (*Centaurea spathulata* Zerapha, 1827) and "Il-Merill" (*Monticola solitaria* L.), respectively the National Plant and the National Bird of Malta. Their "National" status is, apparently, based on the Government's acceptance to issue a set of postage stamps figuring respectively the plant and the bird. It is unfortunate, however, that none of these stamps carries the words "National Plant" or "National Bird" printed on them. The commemorative issue was released on 18th September 1971, and consisted of four postage stamps each measuring 48.26 mm x 20.32 mm. Those with vertical format (face value of 2d and 1/6d respectively) represent the plant and those with horizontal format (face value 5d and 10d respectively) depict the bird. [Plate I, bottom].

Botanical observations.

This evergreen plant flowers from late May to early August, producing a great number of unscented, large, thistle-like, purple/lilac flower-heads on long (c. 355 mm) uniformly rounded stalks that branch and widen close to the bud. At the site of the branching there develop two leaflets (av. 15mm x 3mm). Before producing the flower, the branched stalks bear 2 whorls of small longilinear leaflets (3-4 per whorl) that diminish in size distally, becoming hardly perceptible in the most distal region.

The large flower head or capitulum (diameter 30 - 40 mm, rising to a height of c.25mm abovebracts) is made up of numerous narrow tubular purplish florets each with a white base and a very long thin purple stigma. The edge of the corolla of each floret is prolonged as four fimbriae - each almost the length of the tubular part of the floret. The involucre calyx consists of about 60 hard, smooth pentagonal bracts that characteristically lack spines, marginal bristles or trichomes. The bracts increase in length (3mm - 23mm) and width, reaching a maximum of about 18 mm towards the central row. The innermost row, however, is long (max.23 mm) and narrow (min.3 mm). When all the purple florets have fallen off, these innermost and tallest hard bracts will ultimately form the hard "crown"



**National Plant and
National Bird of Malta**

MALTA

PLATE I Top: Portrait of Dr. Agostino Naudi P.A.A., M.D. (1783 - 1830) (Reproduced from "L'Arte" 2 (33): 3).
Bottom: The four postage stamps that gave official status to the National Plant and the National Bird.

bordering the wide, soft, smooth centre - looking very much like a daisy with hard petals. In spite of Zerapha's statement "*Flores purpurei vel albi*", no white flowers have ever been seen by this author anywhere on the Island. The deepest parts of the inflorescence, however, are white and the tips of some of the florets may be white.

In appearance, its involucred buds much resemble a miniature artichoke, but the external surface of each of the hard bracts forming the calyx bears, on its distal end, a deep purple spot with a lighter purple smudge just proximal to it. This gives the closed bud a very characteristic appearance - deep purple at its distal pointed end, with a number of large deep purple spots scattered regularly on its entire surface.

In cultivation the National Plant's short main stem, its irregular, low-lying and wide-spreading branches with a dense growth of leaves and its long weight-tipped flower-stalks give the plant a characteristic, but somewhat shabby and bushy appearance. In the wild, however, the plant seems to be less bushy and its flower stalks shorter than those growing under cultivation. Observation on the short-petioled, spatulate, entire, fleshy, hairless leaves of a large number of cultivated Maltese Centaury plants has shown also that the dorsal surface midrib may, at times, become coloured deep purple - without any evidence of any such pigmentation on the very prominent ventral surface midrib. The pigmentation invariably starts proximally and may proceed distally, with or without involvement of the lateral venations.

II. THE SURVEY.

The only studies known to have been carried out on "*Widnet il-Bahar*", Malta's National Plant, relate to its taxonomy, so that the present survey of insect pollinators and some other visitors to its flower-heads/buds, covering the period 1993-1997 is the first of its kind. In spite of the long duration of the survey, however, the number of arthropod species recorded visiting the national plant in flower is relatively small - 51 species. This is undoubtedly due to the short time devoted by the author to each inspection, carried out mostly during office hours or on the way home from work. The survey is, consequently, by no means comprehensive.

During this period, *cultivated* plants of *Palaeocyanus* in flower at Ghar Dalam Museum unwallled gardens (Birzebbuga, SE Malta), at a private orange grove in Hal Lija (Central Malta) and in a roundabout and in a central strip at San Gwann (Eastern Malta) were inspected regularly for their arthropod visitors. Those at Ghar Dalam Museum gardens were inspected every other day - repeatedly between 0830 and 1400 hours throughout 1993-94 and occasionally in 1995-97; those in the high walled private orange-grove and flower gardens at Hal-Lija received only occasional visits in 1993 (between 1830-1945 hours), whilst those in the central strip in the region of San Gwann were investigated (1993), every other day between 1400 and 1500 hours. The record of three caterpillars of the moth *Plusia gamma* L. on the leaf of a potted plant in the back yard of the author's residence at Birkirkara (31st May 1988) is also being listed on account of its related interest.

Unless otherwise stated, the records are of arthropod visitors to the open flower-heads of the National Plant. It was observed, however, that wasps and most flies (especially the larger ones) preferred to settle on ripe, partially open buds (i.e. buds that had opened enough to show colour of flower). Some of these insects were noted "feeding" on the buds, notwithstanding that naked eye inspection revealed no aphids and/or mildew. Such visitors are marked [B].

LIST OF ARTHROPOD VISITORS

INSECTA

DIPTERA

Bombyliidae

Geron sp.

Calliphoridae

Calliphora vicina Robineau-Desvoidy [B]

Chrysomya albiceps (Wiedemann)

Pollenia rudis (Fabricius) [B]

Stomorphina lunata (Fabricius) [B]

Muscidae

Musca domestica Linnaeus [B]

Rhinophoridae

Stevenia deceptoria (Loew) [B]

2 undetermined species [B]

Sarcophagidae

2 ♀♀ [not possible to identify] [B]

Helicophagella novercoides (Böttcher)

Sepsidae

Sepsis punctum Fabricius

Tachinidae

Leucostoma sp.

Tephritidae

Acanthiophilus helianthi (Rossi)

Ulidiidae

Physiphora demandata Fabricius

COLEOPTERA

Anobiidae sp.

Bruchidae sp.

Coccinellidae sp. [Retained by Ebejer for further study]

Curculionidae sp. [Retained by Ebejer for further study]

Dermestidae sp.

Mordellidae

Mordellistena sp.

Oedemeridae
Oedemera brevicollis Schmitt
Oedemera barbara Scop.

Scarabaeidae
Aethiessa floralis Fabricius
Oxythyrea funesta Poda

HETEROPTERA

Pentatomidae
Codophila raria (Fabricius)

HYMENOPTERA

Anthophoridae
Thyreus sp.

Apidae
Apis mellifera Linnaeus

Braconidae sp.

Formicidae
Plagiolepis pygmaea (Latr.)

Halictidae
Halictus fulvipes (Klug.)
Lasioglossum malachrum (Kirby)

Megachilidae
Chalicodoma sicula balearica Tkalcu
Megachile schmicdekrechti Costa

Scoliidae
Megascolia bidens (Linnaeus) ♀

Vespidae
Polistes omissus (Weyrauch)

Xylocopidae
Ceratina cyanea (Kirby)
Ceratina sp.
Xylocopa violacea (Linnaeus).

LEPIDOPTERA

Lycaenidae
Polyommatus icarus Rottenburg

Nymphalidae
Vanessa cardui Linnaeus

Papilionidae
Papilio machaon Linnaeus

Pieridae
Artogeia rapae (Linnaeus)
Gonepteryx cleopatra (Linnaeus)

Satyridae
Lasiommata megera Linnaeus.

Noctuidae
Dicestra trifolii Hufnagel
Plusia gamma Linné

ARACHNIDA

ARANEAE

Thomisidae

Thomisus onustus Walckenaer [8 imm. ♀ ♀]
Xysticus sp. [imm. ♀]

Salticidae

?*Euophrys* sp. [imm. ♂]

III. DISCUSSION AND REMARKS.

General observations

In the exposed unwalled gardens of Ghar Dalam Museum, insect visitors to the *Palaeocyanus* plant were most abundant and most active on warm calm mornings. In the high-walled sheltered orange garden at Lija, however, activity persisted very late into the afternoon, well after sunset.

The most common, most diligent and longest-staying visitors to the National Plant at Ghar Dalam gardens were the Common Halictid bees *Halictus fulvipes* (Klug.). Their activity does not seem to have been affected by wind, cloud and other climatic conditions but was influenced by time. Very little bee activity could be seen in the afternoon, whilst in the morning it was common to see 2-4 of these bees assiduously and almost continuously feeding on the same flower-head in the bentdouble position, with a yellowish (occasionally orange) pollen basket protruding horizontally from either side at their middle. Another very common visitor to the flower-heads was the honey bee, *Apis mellifera*, which seemed to linger for shorter periods than the former species.

Throughout the last week of May 1994 and 1995, the most common visitors (2-8 per flower) and the ones staying longest on the same flower-head were the beetles *Oedemera brevicollis*. They stayed on the same inflorescence most of the morning undisturbed by the continuous passage of tourists (0.5 metre away).

In June 1997, the plants at Ghar Dalam were noticeably patronized by Large Carpenter Bees (*Xylocopa violacea*), with one to six bees working assiduously and for protracted periods on the same plant.

Diptera

Most of the fly species included in the above list of visitors to the *Palaeocyanus* plant have been recorded previously from the Maltese Islands. The two bee-flies (*Geron* sp.) and the fruit fly *Acanthophilus helianthi* (Rossi), however, are of very particular interest.

Locally, there is only one record of the genus *Geron* - *Geron* sp. aff. *gibbosus* Olivier 1789. This was taken at 0830 hours from the garigue area of St. Paul's Island, Malta in 1975, where it was found by Ebejer hovering low over the soil. In addition to the field notes, Ebejer gives also illustrations of the male hypopygium. (Ebejer, 1988: 233, figs. 1-3). The two identical specimens recorded herein were feeding on the flower-heads of the National Plant in the Ghar Dalam Museum grounds on a warm calm day (25.6.93) at about 0930 hours. They differ from the already recorded *Geron* species and represent, not only a new record for the Island, but probably also a species new to science (*personal communication*, M. Ebejer, who has been donated the specimens for further study).

All the Diptera species are probably coincidental visitors, having come to the flower-heads for an extra feed. The presence of the fruit fly *Acanthiophilus helianthi* (Rossi) on the thistle-like flower-head of the National Plant in citrus-gardens, however, may be of some significance. Given the common occurrence of the fly (especially in orange gardens), its wide distribution and its many recorded host-plants among the genera *Centaurea*, *Silybum*, *Carlina*, *Carthamus*, *Notobasis* and *Onopurdum*, it is most unlikely that *Palaeocyanus* is its major host plant. It could, however, be an additional one. *Acanthiophilus helianthi* (Rossi) is very alert and not easily caught. Several specimens were seen in the well-sheltered citrus garden with associated flowers at Lija and although they hovered and zig-zagged swiftly and repeatedly over the flower-heads, all seemed to prefer alighting and staying on buds rather than on open flower-heads. They were still active and hovering over and around the flower-heads late in the evening (1930 hours, 4.7.93), well after sunset.

The presence of *Chrysomya albiceps*, *Physiphora demandata* and *Sepsis punctum* in this list might seem incongruous. It should be noted, however, that though *Chrysomya albiceps* breeds on carrion and dead fish and *Physiphora demandata* breeds on dung, the adults of both insects are known to feed on flowers. *Sepsis punctum*, also lives on dung. It was noted, however, that the only *Chrysomya albiceps* seen during this survey was feeding persistently on the buds and never on the flower, and whenever it did land on the flower, it quickly worked its way down to the calyx (externally). *Physiphora demandata* was often seen alighting on discoloured and semi-shriveled flowerheads.

The record of the above-mentioned Diptera is also of ecological interest as some of them parasitize specific members of the local fauna. Thus, members of the genus *Geron* are parasitic on moths of the small families Psychidae and Tortricidae -- represented in the Maltese Islands by three and eight species respectively [Valletta, 1973: 57-58]. Likewise, *Stomorhina lunata* is parasitic on the egg pods of locusts, *Pollenia rudis* parasitises earthworms, *Stevenia deceptoria* parasitises terrestrial isopods, and *Leucostoma*, like the majority of flies in the tachinid sub-family Phasiinae, parasitize Hemiptera (true bugs). In addition, *Chrysomya albiceps* is known to cause secondary myiasis in animals.

Coleoptera

The commonest beetles observed were *Oedemera barbara* and *Oedemera brevicollis*. Their large numbers and their long visits to the flower-heads have already been stressed. The "Barbary bug", *Oxythrea funesta* Poda (locally known as "Busuf"), was also a common visitor, with more than one specimen foraging contemporaneously on the same flower. Saliba (1963: 13) remarks on the frequency of this species on peaches. The present author found them to be extremely common (1-4 per flower) on arum lilies where they tend to gather at the bottom of the conical inflorescence. Cases are known of this beetle entering the human ear canal, and elderly people are known to caution children about this danger when they see them shaking off the insects from the tall-stalked arum lily inflorescence, as the "bug" may fly erratically into their ear when disturbed.

Lepidoptera.

The swallow-tail butterfly, *Papilio machaon* (popularly known locally as *Farfett tal-Fejge* or *Farfett tar-Regina*), was noted to prefer the red flowers of *Pelargonium* to the lilac ones of the neighbouring *Palaeocyanus*, alighting on the first but never on the second. It was only on 17th July 1994, when at Ghar Dalam there was great activity by different butterflies, that the Swallow-tail was noted feeding assiduously and persistently on a flower-head of the National Plant. This apparently anomalous behaviour makes one speculate that, possibly, the Swallowtail's colour vision renders the red flower attractive and the lilac/purple flower visually unappealing and that an accidental landing on the flower and the tasting of its nectar proved otherwise! There is, however, no scientific data to support this speculation.

The moth *Dicestra trifolii* Hufnagel, known as "The Nutmeg" on account of its very characteristic colour, was taken on 25.6.93 at 1000 hours after it had been seen feeding continuously for some time on the flowerhead. In Malta, this moth is recorded as being quite common in March-May and August-October and its green larva (with a black line on its back and a red stripe on its side) feeds on Chenopodiaceae (Valletta, 1973: 24). A number of plants of this family are to be found in the Ghar Dalam gardens, with *Rumex lunaria* as the most abundant representative.

Three green caterpillars feeding on the leaf of the National Plant (31.5.88) are also being recorded herein. They had the peculiar habit of eating solely the thick green pulp on the underside of the distal three fourths of its fleshy leaf. The uppermost epidermis is left completely intact as a flimsy transparent membrane. After three days in captivity (fed on leaf and stalk of *Palaeocyanus* and of *Pelargonium*), each of the 25mm green larvae formed a flimsy horizontal cocoon within the curled leaf of these plants and 10 days later (13/6/94, temperature 24°C), developed into the moth *Plusia gamma* Linnaeus, which is very common in Malta. Valletta (1973: 44) records this moth as being common and its larva as feeding "on all sorts of vegetables and on ornamental plants like *Coleus*, *Geranium*, *Impatiens* and *Datura*".

Araneae

All spider records listed herein are from the back garden of Ghar Dalam, where no spider was noticed on the flower-head / plant of *Palaeocyanus* before mid-June. In May 1994, however, a c.15 cm vertical sheet-like web was found between the leaves of two different branches of one of the plants. A careful search failed to reveal its owner.

During the five-year survey, spiders visiting the flower-heads comprised eight white immature female crab spiders *Thomisus onustus* (Walckenaer, 1805), one immature female *Xysticus* sp. (specific identification not possible) and one immature male Salticid (?*Euophrys* sp. - specific identification not possible)]. It is not usual to find members of the Salticidae on flowers. The only record of this genus from the Maltese Islands is of *Euophrys rufibarbis* (Simon, 1868) from Comino (Baldacchino, 1983; see also Baldacchino, *et al.* 1993: 45).

With its typically-shaped, elevated, laterally-angular large abdomen, the orange circular plate-like cephalothorax, the convex, dark brown lateral flaps on the thorax and the two dots on the ventral surface, *Thomisus onustus* has a characteristic appearance. The Thomisidae are crab-like spiders which tend to assume different colours according to their background. They are characterised by the lack of cheliceral teeth. The commonest form encountered locally is the yellow coloured one, found on the crown daisy (*Chrysanthemum coronarium*), where it blends perfectly

well with the background colour (*personal communication*, D. Dandria).

The *T. onustus* specimens recorded herein (all from different flowers) are white-coloured immature females and the only background they could possibly blend with are the deepest parts (white) of the purple flower. Only one specimen, however, was located deep in the inflorescence, the others being noticed as a motionless white blotch on the purple flower -- where they could very easily have been mistaken for a white tipped floret. *T. onustus* is said to be one of the most static of spiders, depending on complete stillness for the success of its ambush. This spider waits patiently for its prey to lower its head in search of nectar, then seizes it and inserts its toothless chelicerae into the head or thorax of the victim, sucking it dry and leaving it apparently undamaged. [Bristowe, 1958].

ACKNOWLEDGEMENTS

I would like to thank the following for identifying the arthropods: Dr Martin Ebejer (Diptera and Lepidoptera), David Dandria (Araneae) and Stephen Schembri (Coleoptera and Hymenoptera). I am also grateful to Dr. J.N. Hind, Head of Compositae sub-section at the Royal Botanic Gardens Kew, and to Guido and Edwin Lanfranco for helpful discussions and advice.

(Accepted 12th March, 1999)

REFERENCES

- Anon. (1971). "A National Plant" from a Correspondent. *The Times of Malta*, Saturday, 16 January 1971, p. 4.
- Baldacchino, A. E. (1983). Spiders. *Civilization*, (11) : 294 - 296, Malta .
- Baldacchino A. E., Dandria D., Lanfranco E. & Schembri P.J. (1993). Records of spiders (Arachnida: Araneae) from the Maltese Islands (Central Mediterranean). *The Central Mediterranean Naturalist* (1993) 2 (2) : 37 - 59, 7 figs.
- Bertoloni, A. (1829). Flora Melitensis Thesaurus. Curante Stephano Zerapha Med. Doct. *Annali di Storia Naturale*, Fasc. 1^o. 2 : 359-360. Bologna.
- Bertoloni, A. (1833-54). *Flora Italica sistens planta in Italia et in insules circumstantibus sponte nascentes*. Bologna, 10 Volumes.
- Borg, J. (1911). Remains of the Prehistoric Flora of Malta. *Archivum Melitense* (1910-12). 1 (2-4) : 39.
- Borg, J. (1927). *Descriptive Flora of the Maltese Islands*. Government Printing Office, Malta. 864 pp.
- Bristowe, W.S. (1958). *The World of Spiders*. The New Naturalist No. 37, Collins, London. 204pp, 36 pls., 116 figs.
- Camilleri, C. (1831). *Elogio funebre del Dr Agostino Naudi, professore di Medicina e Chirurgia*. Malta, Stamperia del Governo, 1831. 18 pp.
- Cassar, P. (1965). *Medical History of Malta*. The Wellome Historical Medical Library, London. New Series, Vol. 6. 586 pp., 19 pls.
- Dostál, J. (1973). Preliminary notes on the subtribe Centaureinae. *Acta Bot. Acad. Sci. Hung.*, 19 (1-4) : 73-79.
- Dostál, J. (1975). "New nomenclatural combinations and taxa of the Compositae subtribe Centaureinae in Europe" In: Heywood, V.H. (ed.) *Flora Europea Notulae systematicae ad Floram Europeam spectantes*, Issue No. 18 *Bot. J. Linn. Soc.* 71 : 191-210.
- Dostál, J. (1976). "Palaeocyanus" In: Tutin, T.G. et al. *Flora Europaea*, Vol. 4, *Plantaginaceae to Compositae*.
- Duthie, J.F. (1874-75). On the Botany of the Maltese Islands in 1874. *Journal of Botany British and Foreign* (London), Part 1 (1874): 321 - 326; Part 2 (1875) : 36 - 42.
- Ebejer, M. (1988). Beeflies (Dipt., Bombyliidae) from Malta. *Entomologist's Monthly Magazine* 124 : 233 - 241, 9 figs.
- Ellul-Micallef, R. (1989). Tobba Maltin ma tul iz-zminijiet. In: Toni Cortis (ed.). *L-Identità kulturali ta' Malta*. Kungress Nazzjonali 13 - 15 April 1989. 235 - 262. Dipartiment ta' l-Infurmazzjoni, Malta.
- Fiori, A. & Paolletti, G. (1896-1909). *Flora analitica d'Italia*. 5 vols. Padova.
- Giacinto, C. (1811). *Saggio di Agricoltura per le isole di Malta e Gozo*. Messina, Giovanni del Nobolo, 275 pp..
- Gulia G. (1890). *Centaurea crassifolia*, Bert. *Il Naturalista Maltese*, 1 (5) : 42-43.
- Gussone, J. (1844). *Flora Siciliae Synopsis*. 2 Vols. Neapoli, ex Typis Tramater. Vol. 2: 451- 452.
- Lanfranco, E. (1989). "Il-Pjanti vaskolari endemici tal-Gzejjer Maltin", pp. 141 - 164 In: Cortis, T. (ed.). *L-Identità kulturali ta' Malta*, Kungress Nazzjonali, 13 - 15 ta' April 1989. Dipartiment ta' l-Infurmazzjoni. Malta 278 pp.

- Lanfranco, G.** (1972). "L-Istorja tal-Pjanta Nazzjonali ta' Malta". *Pronostiku Malti. Almanakk ta' Malta u Ghawdex*, Malta. 98 - 107, 1 fig.
- Saliba, L.** (1963). *Insect pests of crop plants in the Maltese Islands*. Department of Information, Valletta, Malta. 35 pp.
- Tenore, M.** (1811). *Prodromo della Flora Napolitana*. Napoli, 5 Vols. + Appendices. Vol. 1, p.61].
- Valletta, A.** (1972). *The Butterflies of the Maltese Islands*. Giov. Muscat & Co. Ltd., Malta. 64 pp., 16 pls.
- Valletta, A.** (1973). *The Moths of the Maltese Islands*. Progress Press, Malta. 118 pp., 16 pls.
- Zammit, N.** (1864). 'Biografie'. *L'Arte*, 2 (33) : 3-5. Malta, 1864.
- Zerapha, S.** (1827-31). *Florae Melitensis thesaurus, sive plantarum enumeratio quae in Melitae Gaudosque insulis aut indigene aut vulgatissimae recurrunt Melitae*. The Author, Valletta, MDCCCXXVII - MDCCCXXXI. 2 fasciculi. Fasc.I, 1827, pp. iv + 36; Fasciculus alter 1831, pp. 37-86 (including Index).
-