

## A CONTRIBUTION TO THE FRESHWATER MACROALGAL FLORA OF THE MALTESE ISLANDS

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### ABSTRACT

A number of freshwater macroalgae are recorded for the first time from the Maltese Islands. These are: *Tetrasporidium lundii*, *Palmella miniata*, *Stigeoclonium tenue*, *Monostroma bullosum*, *Spirogyra parvula*, *Spirogyra* cf. *occidentalis*, *Klebsormidium* cf. *flaccidum*, *Tolypella glomerata*, *Vaucheria geminata*, *Vaucheria mulleola* and *Vaucheria verticillata*. Of these the most biogeographically important are *Tetrasporidium lundii* which constitutes the first record for Europe and the Mediterranean area and *Vaucheria mulleola*, which was previously known only from Swedish Lapland.

### INTRODUCTION

Knowledge of Malta's freshwater algal flora is still rather fragmentary. The basic text outlining the Maltese species is the list of algae given by Sommier & Caruana Gatto (1915) in which reference is also made to the few previous records. Subsequent records of macroscopic freshwater algae are given by the author (Lanfranco, 1967, 1969, 1979). For the purpose of this contribution I have regarded as macroscopic those algae which have a definite structure, e.g. filaments or consistent gelatinous colonies, visible to the unaided eye, even when determination required optical aid. Several more remain unreported, especially in the genera *Oedogonium*, *Bulbochaete*, *Spirogyra*, *Zygnema* and *Mougeotia* which, while frequent in Malta, require the presence of fertile material for identification down to species level. Materials of all the taxa recorded here are deposited in the author's herbarium at the Department of Biology of the University of Malta.

### SPECIES LIST

#### DIVISION: CHLOROPHYTA

Sub-Division: Chlorophytina

Class: Chlorophyceae

Family: Palmellopsidaceae

*Tetrasporidium lundii* R.S. Pandey, Tiwari & D.C. Pandey (Plate 1)

**Material examined:** Wied il-Qlejgha: 5.01.1967 (leg. Edwin Lanfranco); Fiddien: 13.11.1976 (leg. Edwin Lanfranco), 30.12.1988 (leg. Edwin Lanfranco & Jennifer

Mallia); Wied is-Seqer (Gozo): 10.01.1993 (leg. Edwin Lanfranco & Shirley Micallef (mixed with *Monostroma bullosum*).

First recorded by the present author under the erroneous determination *Prasiola* sp. (Lanfranco, 1967) from Wied il-Qlejgha (Chadwick Lakes) and simply as "palmelloid green alga" in a pictured key to freshwater plants (Lanfranco, 1979) produced for the use of biology teachers. More recently met with at Wied is-Seqer in Gozo, where it was accompanied by *Monostroma bullosum*. The specimens were determined by Dr. Pierre Bourrelly. This species was first described in 1980 from Allahabad district (India) (Pandey *et al.*, 1980 as quoted in Ettl & Gärtner, 1988). It seems that there are no records from Europe and the Mediterranean area. Occurs in early winter in water courses where it seems to thrive best in slow to moderately fast moving water, anchoring itself to the rocky or other substrates. The young plants start off being tubular, but the tubes generally split to form an *Ulva*-like body. Material is deposited in the author's herbarium at the Biology Department, University of Malta, at the British Museum (NH) and the Paris Natural History Museum.

Family: Palmellaceae

*Palmella miniata* Liebl. (Plate 1)

**Material examined:** Wied Harq Hamiem: 16.01.1977 (leg. Edwin Lanfranco); Ghajn Rihana: 24.01.1980 (leg. Edwin Lanfranco).

Forms amorphous gelatinous masses, usually reddish, amidst moist vegetation; particularly in small depressions on rocky ground. Not uncommon.

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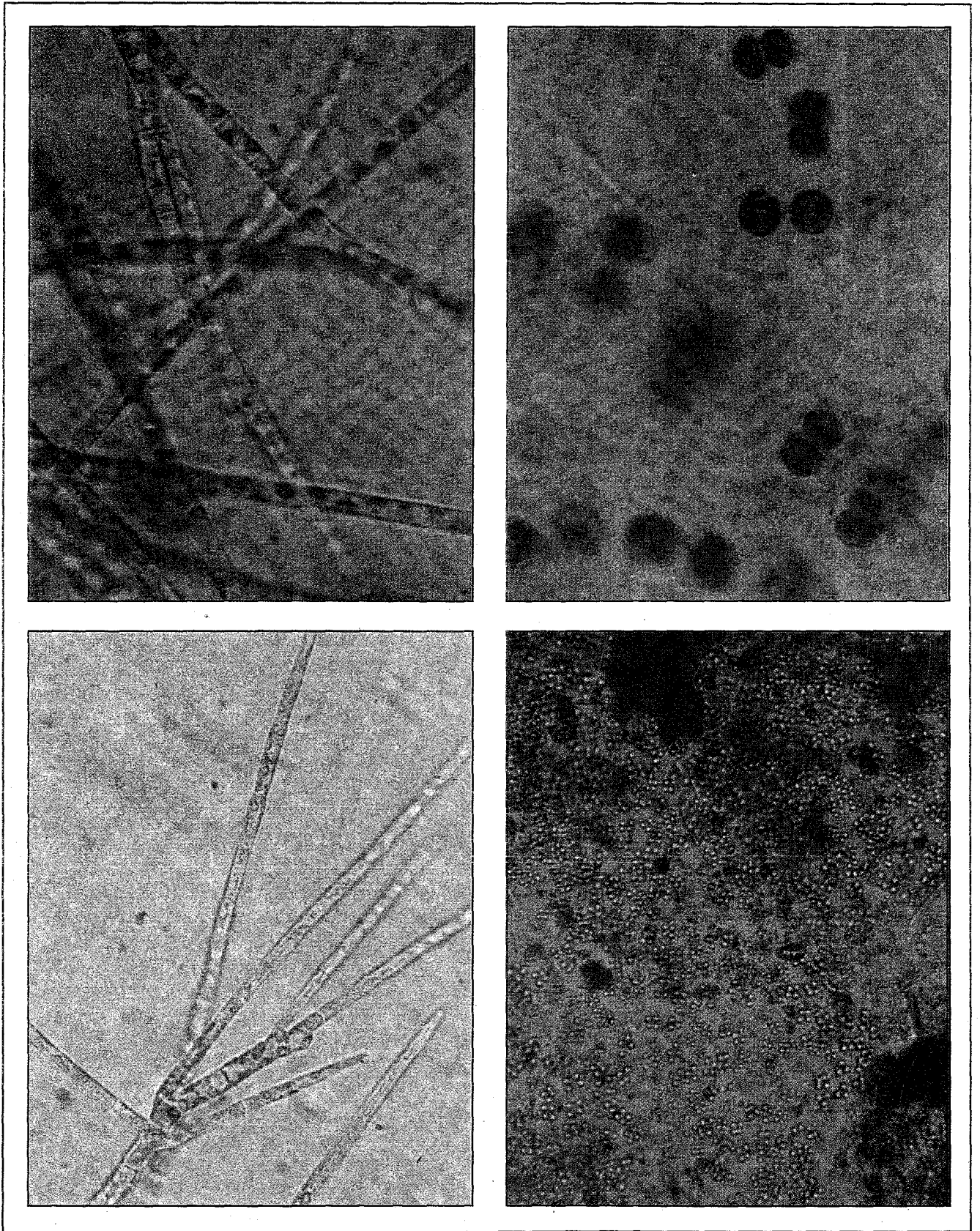


Plate 1. Top left: *klebsormidium* cf. *flaccidum* (cell diam. 7-8 micrometres); Top right: *Palmella miniata* (cell diam. 10-14 micrometres); Bottom left: *Stigeoclonium tenue* [cell diam. (main axis): 7 micrometres]; Bottom right: *Tetrasporidium lundii* (cell diam: c. 10 micrometres).

Family: Chaetophoraceae

*Stigeoclonium tenue* (C.A. Agardh) Kützing (Plate 1)

**Material examined:** Sliema: 29.06.1978 (leg. Edwin Lanfranco) in water-filled bowl.

So far only known from one record, but is easy to overlook and may actually be fairly frequent. Identification is based on Nurul Islam (1963).

Sub-Division: Ulvophytina

Class: Ulvophyceae

Family: Monostromataceae

*Monostroma bullosum* (Roth) Wittrock

Probably rare. So far only found once at Wied is-Seqer (Gozo) where it was growing in a well aerated pool fed by the water course. Most of the plants were more or less globose and several were floating in the pool. It was accompanied by *Tetrasporidium lundii* which it superficially resembles. Material is deposited at the Paris Natural History Museum.

**Specimens examined:** Wied is-Seqer (Gozo): 10.01.1993 (leg. Edwin Lanfranco & Shirley Micallef) mixed with *Tetrasporidium lundii*.

Class: Gamophyceae (= Zygothryxaceae, Conjugatophyceae)

Family: Zygnemaceae

*Spirogyra parvula* (Transeau) Czurda [= *S. catenaeformis* (Hassall) Kützing v. *parvula* Transeau]

**Material examined:** Ghajn Rihana: 08.04.1978 (leg. Edwin Lanfranco).

Fertile material was encountered forming pure stands in slowly moving water at Ghajn Rihana. The vegetative filaments had a diameter of 25µ while the dimensions of the smooth zygospores were 42µm x 30µm. Identification is based on Czurda (1932).

Family: Zygnemaceae

*Spirogyra cf. occidentalis* (Transeau) Czurda (= *S. velata* Nordsted v. *occidentalis* Transeau)

**Material examined:** Hemsija: late 06.1978 (leg. Edwin Lanfranco).

Record from still water of the Hemsija valley where it was mixed with a *Cladophora* sp. Specimens seen had two chloroplasts per cell. Filaments in material examined had a diameter of 49µm. Identification, which is tentative since material was sterile, is based on Czurda (1932).

Class: Klebsormidiophyceae

Family: Klebsormidiaceae

*Klebsormidium cf. flaccidum* (Kützing) S. Mattox & Blackwell (Plate 1)

[= *Hormidium flaccidum* (Kützing) Braun, *Chlorhormidium flaccidum* (Kützing) Fott]

**Material examined:** Sliema: 29.05.1978 (leg. Edwin Lanfranco), in jar filled with rain water.

Frequent in ephemeral water bodies and in subaerial conditions. Identification to species level is tentative, and more than one species may be involved. First recorded as *Hormidium* sp. by the author (Lanfranco, 1969, 1979).

Class: Charophyceae

Family: Characeae

*Tolypella glomerata* (Desvaux) von Leonhardi

**Material examined:** Bajda Ridge: 18.02.1969 (leg. Edwin Lanfranco) in karst pool; Ta' Ċenċ (Gozo): 25.02.2001 (leg. Edwin Lanfranco & Darrin T. Stevens) in karst pool; San Pawl tat-Targa: 24.03.2002 (leg. Edwin Lanfranco & Sandro Lanfranco) in karst pool. The only *Tolypella* recorded from the Maltese Islands is *T. nidifica* (O. Müller) von Leonhardi f. *condensata* A. Braun, the specimens being determined by L. Formiggini (Sommier & Caruana Gatto, 1915). This taxon has a predominantly Northern European distribution, particularly in the Baltic region (Stewart & Church, 1992) but also extends to reach the Mediterranean coast of France (Corillon, 1957). However all material examined has keyed out as *T. glomerata* which is much more widespread and is well known in the Mediterranean area. (Corillon, *op.cit.*). Since the two taxa are fairly similar, the original record for *T. nidifica* may be a misidentification, although its actual presence cannot be dismissed. *T. glomerata* occurs fairly frequently in rainwater pools (kamenitzas) which form on coralline limestones.

**DIVISION: HETEROKONTOPHYTA**

Class: Tribophyceae (= Xanthophyceae)

Family: Vaucheriaceae

*Vaucheria geminata* (Vaucher) DC.

**Material examined:** Wied Guno (Gozo): 07.04.1999 (leg. Edwin Lanfranco & Shirley Micallef) in pool along valley.

Fertile material of this hitherto unrecorded species was encountered at Wied Guno (Gozo). Material was also collected from a pond at Bugibba on 17.01.2000 by Dr. Roy Merritt (personal communication 21.02.2000).

***Vaucheria mulleola* Skuja**

Collected from a pond at Bugibba on the 17.01.2000 by Dr. Roy Merritt (personal communication 21.02.2000). This species was originally described from Swedish Lapland (Skuja, 1964) and it seems that it has not been recorded from anywhere else (Dr. Roy Merritt, personal communication 19.11.2002).

***Vaucheria verticillata* Kützing**

Collected from a pond at Bugibba on the 17.01.2000 by Dr. Roy Merritt (personal communication 21.02.2000).

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**REFERENCES**

- Corillon, R. (1957). *Les Charophycées de France et d' Europe Occidentale*. Travaux de Laboratoire de Botanique de la Faculté des Sciences d' Angers. 500pp.
- Czurda, V. (1932). Zygneales – 2<sup>nd</sup> edition. *Süßwasserflora Mitteleuropas* 9: vi+232pp.
- Ettl, H. & Gärtner, G. (1988). Chlorophyta II – Tetrasporales, Chlorococcales, Gloeodendrales. *Süßwasserflora von Mitteleuropa* 10: xii + 436pp.
- Lanfranco, E. (1967). Some cryptogams met with during recent excursions. *Natural History Society of Malta / Malta Ornithological Society Report 1967*: 7-12.
- Lanfranco, E. (1969). *A revised check-list of Maltese algae*. National Press. 24pp.
- Lanfranco, E. (1979). *Key to freshwater plants*. 6pp. (Available from the author).
- Nurul Islam, A.K.M. (1963). A revision of the genus *Stigeoclonium*. *Beihefte zur Nova Hedwigia* 10: viii + 164 + 47 plates.
- Pandey, R.S., Tiwari, G.L. & Pandey, D.C. (1980). Observations on two species of *Tetrasporidium* Möbius (Chlorophyta, Tetrasporales). *Nova Hedwigia* 32: 779 – 787.
- Skuja, H. (1964) – Grundzüge der Algenflora und Algenvegetation der Fjeldgegenden um Abisko in Schwedisch-Lappland. *Nova Acta Reg. Soc. Sci. Upsal. Ser. IV*, 18(3): 465 S (n.v.)
- Sommier, S. & Caruana Gatto, A. (1915). *Flora Melitensis Nova*. Firenze, Stab. Pellas. Xiii + 502pp.
- Stewart, N.F. & Church, J.M. (1992). *Red Data Books of Britain & Ireland: Stoneworts*. Joint Nature Conservation Committee, Peterborough. 144pp.