

A NOTE ON THE BRYOPHYTES OF THE MALTESE ISLANDS

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A small set of bryophytes collected on the islands of Malta and Gozo in April-May, 1968, and April, 1969, by K. U. Kramer and L. Y. Th. Westra (Utrecht) was handed to the author for identification. The results are presented here as a supplement to a paper on the vascular plants of the Maltese islands (KRAMER *et al.* 1972). The collections are deposited in the herbarium of the State University of Utrecht.

In the past few years many new data have been published on the bryophytes of the Mediterranean islands, cf. SUNDING (1967, 1971), KOPPE (1965), LÜBENAU & LÜBENAU (1970), DÜLL (1967), GRADSTEIN (1971), and TOWNSEND (1965). The liverwort flora of the Mediterranean coasts is being studied thoroughly by JOVET-AST & BISCHLER (cf. 1968). Yet the bryophyte flora of the Maltese islands received very little attention in the literature. A brief survey of the main data follows here.

Collections of bryophytes were made by Sickenberger in 1876 on Malta (BAUR 1891)^{x)}, Caruana Gatto in 1904–1907 on Malta, and by Sommier in 1906–1907 on Malta, Gozo, and Comino. REIMERS (1934) recorded a species of the tropical moss genus *Vesicularia* new to Europe, presumably collected by Schweinfurth on Malta in 1872^{x)}. The Maltese origin of this collection was questioned by BIZOT & POTIER DE LA VARDE (1952). The only comprehensive account of the bryophytes of the islands is now over 50 years old (SOMMIER & CARUANA GATTO 1915). The liverworts in this checklist were treated by Massalongo; the data on the mosses are based on BOTTINI (1907). 74 species of mosses and 17 species of liverworts are now known from Malta, 19 species of mosses and 4 species of liverworts from Gozo, and one moss from Comino. Two endemic taxa have been described from Malta: *Thamnium cossyrense* var. *melitense* Bott. and *Riccia melitensis* Mass. Their systematic value has to be investigated. Most of the species in this checklist belong to the Mediterranean element, viz. many species of Pottiaceae among the mosses and several Riccias among the liverworts. The growth-period of these species is restricted to winter and early spring. In general, the arid conditions on the Maltese islands in connection with the absence of mountains and volcanic activity inhibit an all-year development of a well-differentiated bryophyte flora. Bryophytes are mostly found in sheltered localities under rocks and in ravines near springs and rivulets. In Gozo, areas with well-irrigated loamy soils covered by grassy vegetations

^{x)} Collections destroyed at the Berlin herbarium in 1945.

offer a suitable habitat for such common temperate species as *Brachythecium rutabulum* and *Calliergonella cuspidata*. *Scorpiurium circinatum* and *Orthotrichum diaphanum* have been recorded once as epiphytes on Malta.

The collections of Kramer and Westra yielded one species new to the Maltese islands, one species new to Malta, and five species new to Gozo.

SPECIES LIST

(M = Malta, G = Gozo, c.sp. = with sporophytes; the numbers are the collection numbers of Kramer and Westra).

Hepaticae

Fossombronina pusilla (L.) Dum.

M: Kalkara Ravine near St. Paul's Bay, in sheltered crevice of limestone rock, with *Tortella inflexa*, 4469a; c.sp. New to the Maltese islands.

Lunularia cruciata (L.) Dum.

G: Ġgantija Neolithic Temple near Xaghra, thin soil layer on sheltered floor of enclosure, with *Didymodon trifarius*, *Scorpiurium circinatum*, and *Timmiella barbuloides*, 4384. New to Gozo.

Phaeoceros laevis (L.) Prosk. (= *Anthoceros dichotomus* Raddi).

M: Buskett Gardens near Rabat, plentiful in shaded place among herbaceous plants, 4482; c.sp. Fig. 1.



Fig. 1. *Phaeoceros laevis*. Buskett Gardens, Malta (photogr. by L. Y. Th. Westra).

Musci

Brachythecium rutabulum (Hedw.) B.S.G.

G: Ta' Lunzjata, under grass in small valley, 4408. Not known from Malta.

Bryum donianum Grev.

G: Mgarr, on limestone rocks in ravine of small rivulet, with *Gymnostomum calcareum*, *Rhynchostegiella tenella*, *Tortella nitida*, and *Tortula marginata*, 4250a. New to Gozo.

Didymodon trifarius (Hedw.) Brid.

G: As *Lunularia cruciata*, 4383. New to Gozo.

Eucladium verticillatum (Brid.) B.S.G.

M: entrance of the cave of Ghar Hasan near Birżebbuġa, on moist limestone, 4308; Ghajn Astas near Wardija, on moist perpendicular wall below irrigation gully bordered by *Samolus valerandi*, in whitish, lime-encrusted tufts, 4495. The species evidently was growing here in a fragmentarily developed vegetation belonging to the *Eucladio-Adiantetum* Gradstein & Smittenberg 1968. This vegetation, of which *Eucladium verticillatum* and *Samolus valerandi* form a characteristic species combination, is found in the Mediterranean area on perpetually moist limestone rocks near springs or rivulets.

Fissidens viridulus (Sw.) Wahlenb.

M: Il-Maqluba near Qrendi, on steep shaded limestone rocks with *Funaria curviseta*, *Rhynchostegiella tenella*, *Scorpiurium circinatum*, *Tortella inflexa*, and *T. flavovirens*, 4517b. – det. M. A. Bruggeman-Nannenga.

Funaria curviseta (Schwaegr.) Mild.

M: As *Fissidens viridulus*, 4517a; c.sp.

Gymnostomum calcareum Nees et Hornsch.

G: As *Bryum donianum*, 4250b.

Rhynchostegiella tenella (Dicks.) Limpr.

G: As *Bryum donianum*, (4250a); c.sp. M: As *Fissidens viridulus*, 4516; c.sp.

Scorpiurium circinatum (Brid.) Fleisch. et Loesk.

G: As *Lunularia cruciata*, 4385; Wied il-Ghasri, forming thick cushions in crevices of wall in small tributary wied, 4397. M: As *Fissidens viridulus*, 4515a.

Timmiella barbuloidea (Brid.) Moenk.

G: As *Lunularia cruciata*, 4386. New to Gozo.

Tortella flavovirens (Bruch) Broth.

M: As *Fissidens viridulus*, 4517d. New to Malta.

Tortella inflexa (Bruch) Broth.

G: Wied Hanzira, upper part of valley near Xewkija, locally frequent on limestone rocks, 4429; c.sp. M: As *Fossombronina pusilla*, 4469b; as *Fissidens viridulus*, 4515b; c.sp.

This rare Mediterranean species seems to be common in the Maltese islands.

Tortella nitida (Lindb.) Broth.

G: As *Bryum donianum*, 4250c: c.sp. M: Il-Prajjet, on the W.coast, in shade under limestone rocks, 15–20 m above the sea, 4319.

Tortula marginata (B.S.G.) Spruce.

G: As *Bryum donianum*, 4250d; c.sp.

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