

Conservation status of *Crepis pusilla* (Sommier) Merxmüller (Asteraceae: Cichorieae, Crepidinae) in Malta

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INTRODUCTION

The Maltese Dwarf Hawksbeard, *Crepis pusilla* (Sommier) Merxmüller, is an annual plant first described from four stations in the Maltese Islands in 1907. Up to 1967, it was only known from Malta but has since been found in other Mediterranean stations. For the past 50 years, the species has only been recorded from one site in Malta, where the plant is restricted to a single country path despite detailed searches.

Current available data suggest that the local IUCN conservation status of *C. pusilla* is "Critically Endangered". The aim of this study was to enhance its conservation status through LIFE SEEDFORCE.

MATERIALS & METHOD

Detailed Site Survey: A detailed survey of the known population in Dingli (SW Malta) was carried out between 1st March and 23rd May 2023 via weekly visits (x10 in total). The number of individuals or close clusters was recorded during each visit. Throughout the flowering season (i.e. when specimen could be identified precisely), variables such as size and reproductive state were noted for each individual/cluster.

Distribution: The position of individual plants or clusters was measured with a precision of c. 1 cm, using an internal frame of reference. The distribution of *C. pusilla* was also recorded by UAV-assisted imagery.

Morphological & Phenological Analysis: Detailed morphological and phenological analysis was carried out *in situ* and *ex situ* using microscopic and photographic analysis. Five specimens were collected and dried to eliminate moisture and mould. Seeds were then extracted from the glomeruli, counted, and SEM imaging was carried out for a detailed achene study.

Germination Data: Seeds collected from Malta were germinated under four temperature conditions with diurnal light/dark cycles, on 1% agar and Terra Rossa soil.

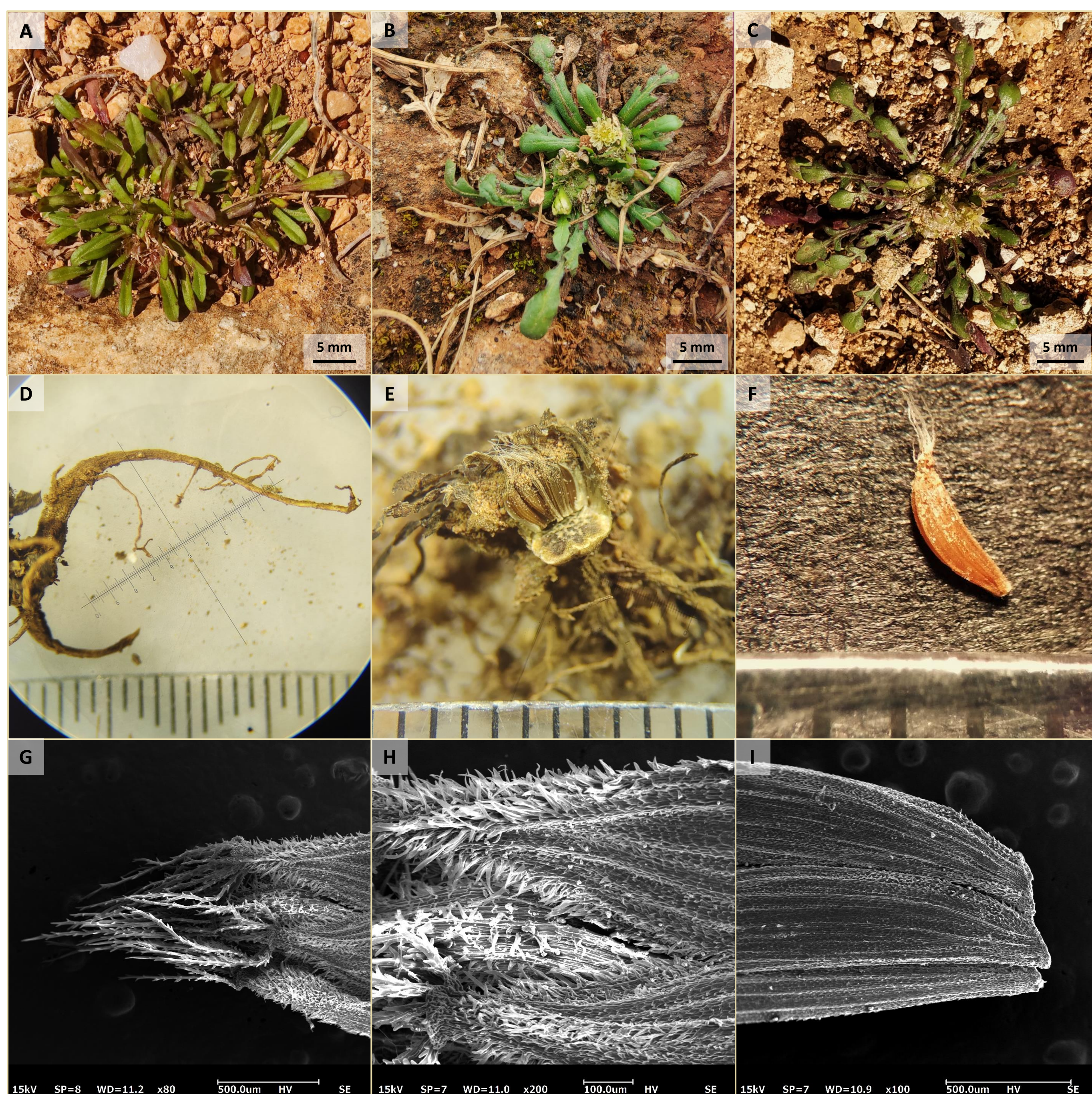


Fig. 1: Characteristics of Maltese specimen of *Crepis pusilla*; (A-C) *In situ* basal rosettes, varying leaves and flowering stages; (D) Root structure; (E) Cross-section of glomerulus; (F) Seed; & (G-I) SEM close-up images of seeds.

RESULTS & DISCUSSION

This survey provides key insights into the morphological characteristics (Fig. 1) and population dynamics of *Crepis pusilla* in Malta (2023).

Detailed Site Survey: A total of 27 individual plants or close clusters (Fig. 1A-C) were identified *in situ* during the flowering phase situated in a linear extent of approximately 60 m along the country path (Fig. 2). A mean rosette diameter of 2.5 (\pm 0.9) cm was recorded. First flowering was recorded on 4th April and peak flowering was noted between 11th to 17th April for approximately 75% of the plants. Most foliage had withered completely by 23rd May.

Distribution: *C. pusilla* was mostly associated with the central verge of the path, which is characterised by compact soil, less competition with more robust plants, and greater sunlight exposure. Attendant flora included *Erodium moschatum*, *Plantago spp.*, *Romulea spp.* and *Trifolium nigrescens*.

Reproductive Effort: Reproductive effort of *C. pusilla* was estimated by calculating the number of seeds produced by each plant. Preliminary data suggested that each individual plant produces c. 150 achenes although the sample (x5) was too small to assess variability across the whole population.

Germination Data: Preliminary *in vitro* seed germination tests gave a germination rate between 50 – 100% (Fig. 4A) and further trials are programmed as part of a broader study on the rarity of this species.

CONCLUSIONS & FURTHER WORK

This study represents the first precise quantification of the population size and dispersion of *Crepis pusilla* in Malta. Improvement of the conservation status to 'favourable' would necessitate extensive population reinforcement, a process that is only plausible if characteristics of the life cycle are known in detail. Such surveys and experiments will be repeated over several years, allowing the authors to propose a data driven conservation action plan for *C. pusilla* in Malta.

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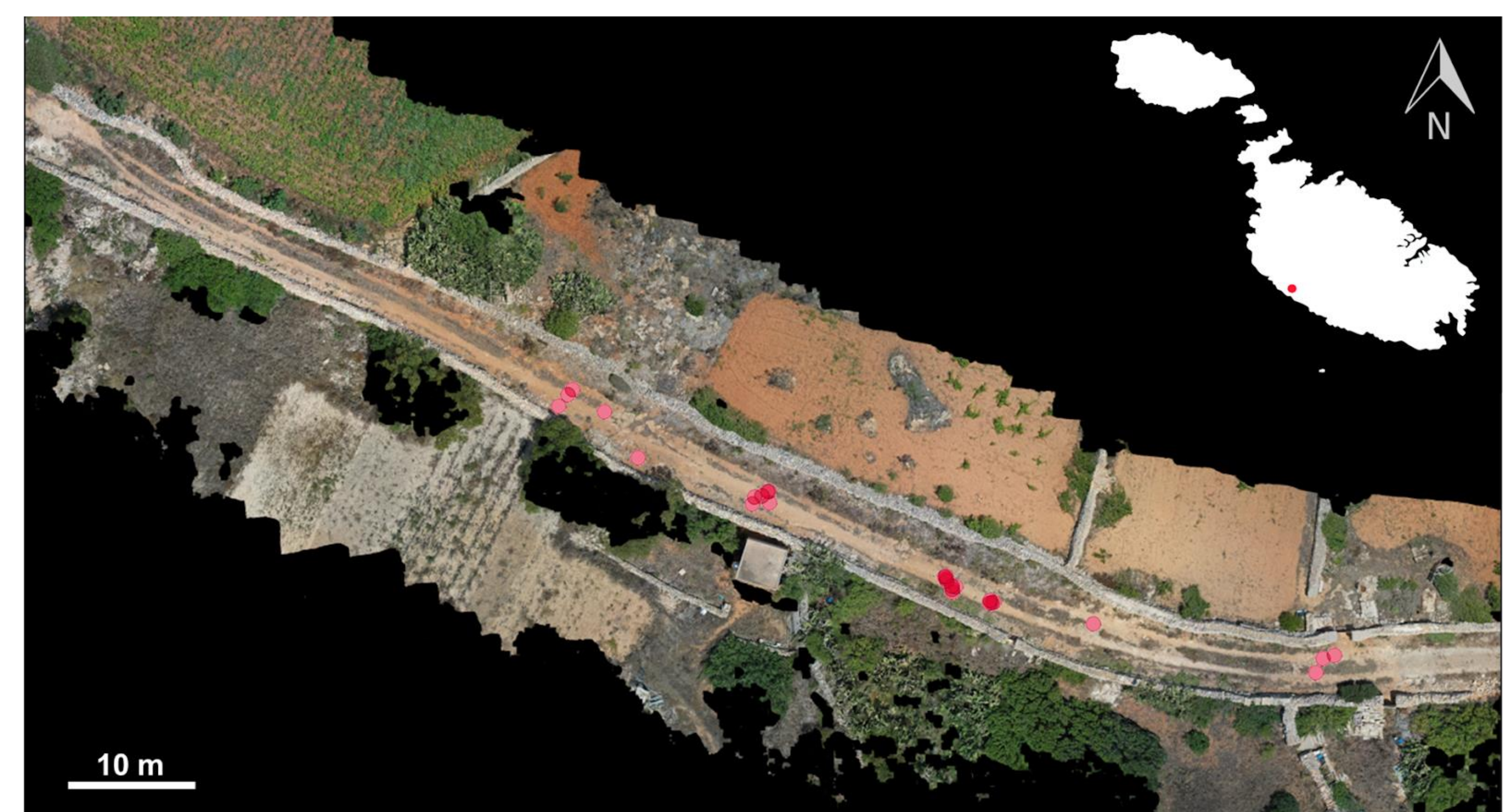


Fig. 2: Site area of *Crepis pusilla* population with the approximate location of recorded individuals/ clusters marked in red (Dingli, SW Malta, April 2023).

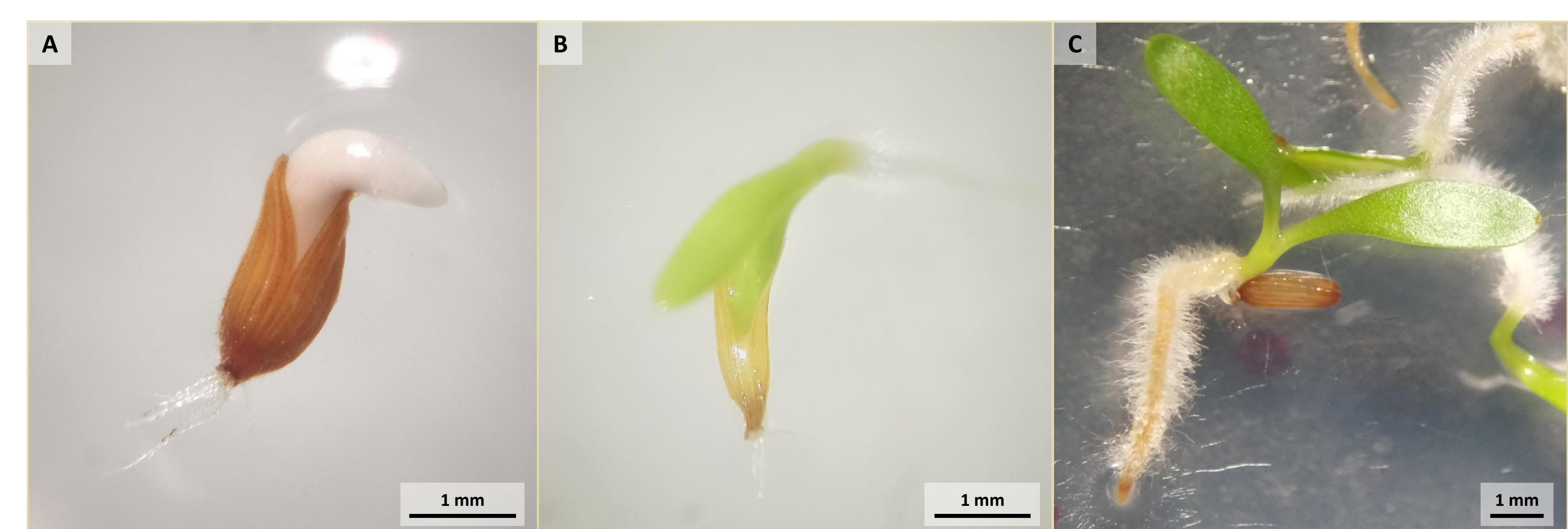


Fig. 3: *Crepis pusilla* germination stages; (A) Radicle emergence; (B) Shoot emergence; & (C) Seedling formation.

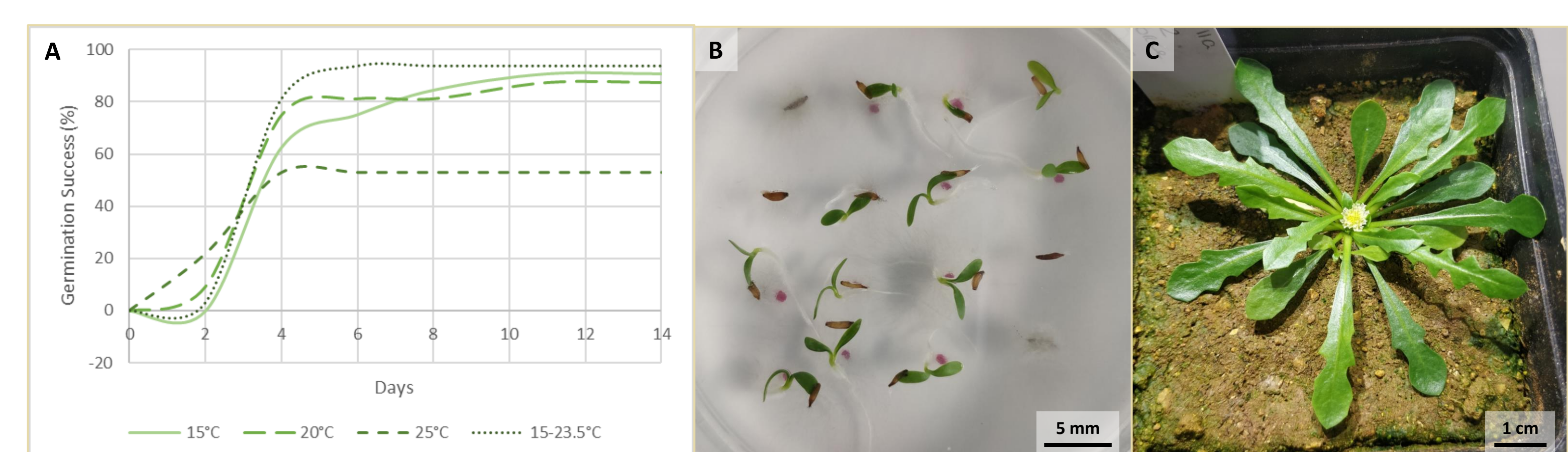


Fig. 4: *Crepis pusilla* germination. (A) Germination success (%) at different temperatures; (B) Germination in 1% agar after 6 days; & (C) Germination in Terra Rossa soil after 35 days showing strong plant growth.