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Seed germination report for *Limonium merxmuelleri* subsp. *merxmuelleri* (*Plumbaginaceae*)

Abstract

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The present report illustrates the first germination data of *Limonium merxmuelleri* subsp. *merxmuelleri*, a pioneer species of mine waste materials of Iglesiente region (South-West Sardinia). After harvesting, seeds were subjected to germination tests at the Sardinian Germplasm Bank (BG-SAR). The results show a high germination capability and germination rate at each tested temperature, with a slight germination reduction at the highest temperature (25°C) that simulates the aridity of the summer period.

Key words: endemics, metallophyte, mine environments, Sardinia, Mediterranean vascular flora.

Introduction

Limonium merxmuelleri Erben subsp. *merxmuelleri* is a metallophyte and a pioneer species of mine wastes in Sardinian abandoned mine sites. It grows in a few square kilometres in the Iglesiente biogeographic subsector (Sardinia, Italy) and it is considered of medium/high conservation priority at the regional scale (Bacchetta & al. 2012). Taking into account its metallophyte character and its natural distribution on mine waste surfaces, the knowledge of the germination behaviour of this species can help in the design of effective phytoremediation action.

This work reports the first germination data concerning this taxon. The germination tests were carried out at the Sardinian Germplasm Bank (BG-SAR; Porceddu & al. 2017). The results of these experiments showed a high germination capability together with a high germination rate.

87. *Limonium merxmuelleri* Erben subsp. ***merxmuelleri*** (*Plumbaginaceae*)

Accession data

Sa: Iglesias (South-West Sardinia), Monte Agruxiau (WGS84: 39.302329°N, 8.488891°E), garrigue, 117 m a.s.l., 23 Sept 2021, *M. E. Boi, L. Podda & L. Murgia* (BG-SAR 108/21, Sardinian Germplasm Bank).

Germination data

Pre-treatments: no treatment.

Germination medium: 1% agar.

Sample size: 100 seeds (25 × 4 replicates).

Germination	Thermoperiod	Photoperiod [light/dark]	T_1 [d]	T_{50} [d]	T_{max} [d]	MTG [d]
100.0%	constant 15°C	12/12h	3.0	3.5	7.0	4.1
100.0%	constant 20°C	12/12h	2.0	2.8	7.0	3.8
96.0%	constant 25°C	12/12h	2.0	3.0	7.0	4.3

Observations

Limonium merxmuelleri subsp. *merxmuelleri* is an endemic dwarf frutex of Sardinia (Fois & al. 2022), that occurs exclusively in the Iglesiente subsector and, in particular, in a limited area in the southernmost portion of the Metalliferous ring, between the municipalities of Iglesias and Gonnesa. It is a chamaephyte with spatulate-lanceolate leaves and violet flowers that blooms from the end of July to October (Fig. 1), giving mature fruits from September to December. It occurs together with other endemic vascular species, for instance, *Iberis integerrima* Moris, *Lysimachia monelli* (L.) U.Manns & Anderb. subsp. *monelli*, and *Reseda luteola* L. subsp. *dimerocarpa* (Müll.Arg.) Abdallah & de Wit, leading several plant assemblages exclusive of these environments, for instance, *Resedo luteolae-Limonietum merxmuelleri* and its subass. *Iberidetosum integerrimae* (Angiolini & al. 2005).

L. merxmuelleri subsp. *merxmuelleri* germinated with a high percentage at all tested temperatures (15°C, 20°C and 25°C; 100% or close; Fig. 2) with faster germination that finished approximately in a week. This behaviour is common in other *Limonium* species and has already been observed in *Limonium avei* (De Not.) Brullo & Erben (Santo & al. 2017). Only a slight reduction in terms of germination (96%) occurs at the highest temperature (25°C) which corresponds to the mean values of summertime as well as to the high drought conditions of this period.

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Fig.1. Blooming specimen of *Limonium merxmuelleri* subsp. *merxmuelleri* and an example of mine environments.

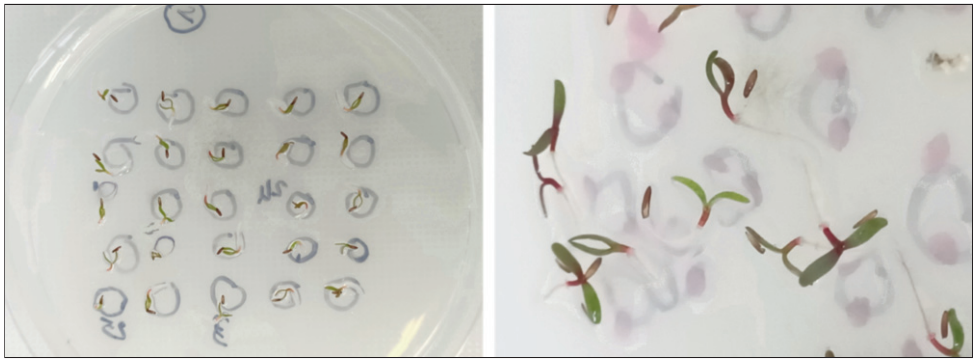

Fig. 2. Details of germination tests of *Limonium merxmuelleri* subsp. *merxmuelleri*

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