

**Effect of salinity on seed germination of *Vigna marina* a wild relative of crop *Vigna* species using hydrotime modelling**

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**Abstract**

*Vigna marina* (Fabaceae) is a wild relative of cultivated *Vigna* species. Crop wild relatives are important genetic source, which can be utilized in developing desired crop varieties. *V. marina* is a vine, growing naturally in sandy seashore with high saline soil conditions and have the different threshold water potential effects on germination pattern rather non-salt tolerant *Vigna* species. Thus, salinity tolerant traits of *V. marina* can be utilized to develop salinity tolerant crop *Vigna* varieties.

The objective of the study was to study the salinity stress tolerance of *V. marina* seeds during germination using a hydrotime model. Healthy seeds of *V. marina* were extracted from randomly selected plants from coastal area of Southern Province of Sri Lanka. Germination and imbibitions of untreated and chemically scarified seeds were studied. Several acid scarification treatments were conducted to determine the best dormancy breaking treatment. Acid scarified seeds of *V. marina* and *V. radiata* were separately germinated in series of salt concentrations to develop a hydrotime model.

Chemically scarified seeds of *V. marina* increased mass > 62% while, untreated seeds increased mass <21%. Chemically scarified seeds germinated 100% whereas, untreated seeds germinated 67% both at light and dark conditions. Results revealed that 5% of *V. marina* seeds have physical dormancy. Chemically scarified seeds for 5 minutes showed the highest germination which was > 85% and confirmed that chemical scarification for 5 minutes was the best dormancy breaking treatment. In Na<sub>2</sub>SO<sub>4</sub> base water potential is [ $\psi_{b(60\%)}$ ] -5.47 MPa and - 5.43 MPa for *V. marina* and *V. radiata* respectively. In KNO<sub>3</sub> base water potentials are - 5.65 MPa and - 5.59 MPa for *V. marina* and *V. radiata* respectively. Lower base water potentials of *V. marina* seeds compared to base water potential of *V. radiata* indicate the salt tolerance ability of *V. marina* than the *V. radiata*. Therefore *V. marina* can be utilized to develop salt tolerant crop *Vigna* species.

**Key Words:** *V. marina*, *V. radiata*, crop wild relatives, salt tolerance, hydrotime modelling