

DORMANCY BREAKING METHODS: *IN-SITU* AND *EX-SITU* CONSERVATION OF SRI LANKAN ENDEMIC WILD RICE *ORYZA RHIZOMATIS*

**N. Thasajini^{1, 2*}, S. Orsenigo¹, T.W.M.M. Wijayasinghe³, K.M.M.G. Jayasuriya⁴,
M.N.G.M.V. Kumarage⁵ and A. Mondoni¹**

¹Department of Earth and environmental Sciences, University of Pavia, Italy

²Department of Biological Sciences, South Eastern University of Sri Lanka, Sammanthurai, Sri Lanka

³Department of Biological Sciences, Rajarata University of Sri Lanka, Mihintale, Sri Lanka

⁴Department of Botany, University of Peradeniya, Peradeniya, Sri Lanka

⁵Department of Geology, Kansas State University, United States

*thasathasa91@gmail.com

Sri Lanka consists of five wild rice species. Among them, *Oryza rhizomatis* is endemic and distributed only in the low-country dry zone of Sri Lanka. According to the previous literature, some of the recorded populations of this species are declining due to natural and anthropogenic processes. Thus, this study was conducted to determine the conservation status and the seed biology of *O. rhizomatis*. *Ex-situ* conservation data were gathered from seed banks (43), the national herbarium (2) and literature (46) and were confirmed using field surveys. Seed germination and the effect of dormancy-breaking treatments were studied using freshly collected seeds. A field survey revealed that 13 out of 46 previously recorded populations have disappeared in the wild. Only 28% of the existing populations were inside protected areas, while only 26% of the population was conserved *ex-situ*. Thus, high priority should be given to the *in-situ* and *ex-situ* conservation of *O. rhizomatis*. Seeds were identified as dormant since no germination was observed for intact fresh seeds. Percentage mass increments, after 48 h of imbibition of scarified and non-scarified seeds, were not significantly different, revealing that seeds have no physical dormancy. The embryo had not developed prior to germination; thus, physiological dormancy could be the possible dormancy class. Chemical treatments with HNO₃, KNO₃ and H₂O₂ did not significantly improve seed germination. Only 12% and 9% of seeds germinated after exposure to wet heat at 45 and 50 °C, respectively. Only 5% of seeds germinated after dry storage at -20 °C. Nevertheless, 80% of seeds germinated when they were physically scarified just above the embryo, revealing their physiological dormancy. However, a more feasible dormancy-breaking treatment must be identified to assist the propagation of this species. Since this is an endemic and high-priority species for *in-situ* and *ex-situ* conservation, further studies must be conducted on seed germination and dormancy-breaking treatments.

Keywords: Conservation, Dormancy, Germination, Seed, Wild rice