Abstract ID: 058

SEED GERMINATION RESPONSES OF SRI LANKAN WILD RICE SPECIES (*Oryza nivara* AND *Oryza rhizomatis*) UNDER DRYING AND FLOOD CONDITIONS

S. Thasajini[a,b*], Andrea Mondoni[a], Malaka M. Wijayasinghe[c], and K. M. G. Gehan Jayasuriya[d]

[a]*Department of Earth and Environmental Sciences, University of Pavia, Italy*
[b]*Department of Biological Sciences, Faculty of Applied Sciences,South Eastern University of Sri Lanka, Sammanthurai, Sri Lanka*
[C] *Department of Biological Sciences, Rajarata University of Sri Lanka, Mihinthala, Sri Lanka*
[d]*Department of Botany, University of Peradeniya, Kandy, Sri Lanka*

[*]*thasajini@seu.ac.lk*

Abstract

Sri Lankan wild rice, *Oryza nivara* and *O. rhizomatis*, are two threatened species occurring in habitats characterised by different patterns of dry and wet periods. Both species have dormant seeds at dispersal, and little is known about their germination phenology. The aim of this study was to determine the germination strategies of these species, to contribute to their conservation. We hypothesized that seed germination behaviour is related to their habitat conditions. Germination phenology was studied by evaluating the prevailing environmental conditions that seeds experience after dispersal, i.e., a dry condition followed by a wet condition. Immediately after harvest, seeds were exposed to nine types of dry-storage conditions (0, 2, 4, 6, 8, 10, 12, 18 or 20 months) at 25°C and ~ 60 % RH. Four replicates each of twenty seeds were incubated on moist filter paper at 25°C for 12 hrs/12hrs under light/darkness for germination testing. Twenty seeds with Four replicates were used in the germination test. Seeds retrieved after 6, 8, 18 and 20 months of dry storage, were subjected to 1, 2- and 4-weeks of flood treatment. Seed germination of both species increased with increasing dry-storage periods until 12 months. Under prolonged dry storage, seed germination declined for *O. rhizomatis* (6 weeks – 44 %) and none of the seeds germinated in *O. nivara*. In *O. rhizomatis*, short flooding treatment (1 week) elicited higher germination (64%) compared to just dry-stored seeds, while prolonged flooding (2-4 weeks) had the opposite effect. Conversely, there was not a significant effect of flooding on seed germination for *O. nivara*. Overall, our results show that prolonged drying breaks dormancy in both species, a strategy to prevent seed germination right after dispersal, when high risk of drought may result in low seedling survival. The species also show distinctive dormancy cycling caused by either prolonged flooding (*O. rhizomatis*) or drying (*O. nivara*), which may contribute to their different geographical and ecological distribution. The increase in precipitation expected with climate change may constrain recruitment success due to lack of sufficient dry after-ripening and/or an excess of flooding. This risk might be especially high for the endemic *O. rhizomatis*. These results can guide conservation and restoration by identifying optimal drying and flooding conditions for seed germination and storage.

Keywords: *Crop Wild Relatives, Dormancy Cycling, Dry After-Ripening, In Situ Conservation, Oryza, Rice, Seed Dormancy*