Germinative metabolism of Caatinga savannah forest species in biosaline agriculture

Barbara França Dantas[1], Renata Conduru Ribeiro-Reis[1], Janete Rodrigues Matias[1], Débora Luanne Dias Ramos[1] and Gherman Garcia Leal Araújo[1]

[1] Brazilian Agricultural Research Corporation, Embrapa Tropical Semiarid, BR 428, Km 152, Zona Rural - Caixa Postal 23, Petrolina, PE - Brasil - CEP 56302-970
email: barbara.dantas@embrapa.br

The Caatinga savannah is the only exclusively Brazilian biome, which means that much of its biological heritage cannot be found anywhere else on the planet. Often the soils of the ecosystem are salinized. On the other hand, a great proportion of goundwater of this region is salty. Due to degradation of this biome, some native species are on the list of endangered species. The production of seeds and seedlings of forest species from Caatinga is of importance to prevent the loss of biodiversity. To germinate and establish itself in this ecosystem seeds require strategies related to environmental stress tolerance. Biosaline agriculture is a broad term used to describe agriculture under a range of salinity levels in groundwater, soils, or a combination of both. This work aimed to evaluate the possibility of production of Caatinga tree seedlings with biosaline agriculture, through the study of metabolism of seeds subjected to salted and/or biosaline water. Caatinga seeds, such as Anadenanthera macrocarpa (Benth.) Brenan, Myracrodruon urundeuva (Fr. All.), Aspidosperma pyrifolium (Mart.), Poincianella pyramidalis (Tul.) L.P. Queiroz and Erythrina velutina (Willd.) were germinated in solutions with EC ranging from 0-18dS.m-1 at 25°C, with a 12h photoperiod. The germination kinetic variables were assessed, after that the seeds and seedlings cotyledons, aerial parts, and roots were assayed for seed reserve biomolecules and proline content and antioxidant enzymes activity. The Caatinga seeds are highly tolerant to salinity, with germination limiting EC above 12dS.m-1. Although, high EC promotes an alteration in seeds metabolism enabling them to tolerate this condition. Thus, Caatinga seedling production is viable through biosaline agriculture, whereas the groundwater of this region presents itself within this level.