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Effects of Seed Stratification Treatments on Germination of *Grewia tenax* (Forssk.) Fiori., a Wild Fruit Species

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Abstract

Grewia tenax (Forssk.) Fiori is a fruit shrub and grows wild in arid and semi-arid tropics of Asia and Africa. The species is highly valuable for the rural populations because of its multipurpose use. Despite its great ability to withstand drought and high temperature, wild stands of the species are sparse. Seed dormancy is a typical feature of dryland tropical woody species for seed survival under unfavourable climatic conditions. The aim of this study was to define seed dormancy breaking methods for *G. tenax*. Seeds were collected from the wild stand in the surrounding of Dera Ismail Khan (31°48'N, 70°37'E) in Pakistan. The investigation was composed of two successive experiments under controlled environmental condition in the growth chambers of the Institute of Crop Science in Witzenhausen. In the first experiment, treatments were control, constant heat exposure at 40°C, constant cold exposure at 4°C and alternate heat and cold exposure at 4 and 40°C. Seeds were treated for one week before sowing. In the second experiment, seeds were subjected to constant heat exposure (40°C) for 0, 1, 2, 3, 4, 5 and 6 weeks before sowing. The results of the first experiment showed that exposure of seeds to dry heat at 40°C for one week significantly improved total germination up to 42% as compare to control (20%). Results of the second experiment displayed a linear increase in total seed germination with increase in time of seed incubation at constant heat. However, maximum total germination (70%) was achieved, when seeds were incubated for 4 weeks. Seeds exposed to constant heat for 4 weeks also took only 4 and 5 days to reach first and 50% emergence, respectively as compared to untreated seeds, which took 10 and 14 days to reach first and 50% emergence, respectively. Emergence spread (duration between emergence of first and last seedling) lasted only 4 days as compare to untreated seeds with 21 days.

Our results indicate that seeds of *G. tenax* possess non-deep physiological dormancy which can be overcome by heat stratification.

Keywords: Germination, *Grewia tenax*, seed stratification, wild fruit species