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## Seed size, storage and germination requirements can shape plant community structure in arid Arabian deserts

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**Background & Aim:** Seed size (mass) and growth forms can affect dispersal distance, position of diaspora storage and consequently affect seedling establishment, growth, and survival and can shape community structure. Fewer studies assessed the relationship between seed size and germination level among different growth forms. Here, we assessed the impact of plant growth form, seed storage, and seed size and masses on seed dormancy, and light and temperature requirements during germination of 23 desert plants with aerial seed bank.

**Location:** Northern Emirates of the United Arab Emirates (UAE) was the setting taken for this study.

**Methods:** Seeds of 23 species with aerial seed bank, representing different growth forms (6 herbaceous, 11 small shrubs and 6 trees) were collected from natural habitats of the arid deserts of the UAE. Average seed mass and size were determined for each species. Fresh seeds, and those stored both in room temperatures for 9 months were germinated at daily night/day temperature regimes of 15/25°C, 20/30°C and 25/35°C in both continuous darkness and alternating light/darkness. Pearson correlation coefficients were used to assess the significance of the relationship between seed mass and seed size with final germination, relative light germination (RLG) and germination rate index (GRI) for each growth form at each temperature and light condition.

**Results:** Trees and shrubs have significantly larger, heavier seeds that are characterized with higher dormancy, compared to herbaceous plants. Germination at all storage conditions was positively photoblastic in herbaceous plant, but was neutrally photoblastic in both shrubs and trees. Field storage enhanced light germination in trees, but not in shrubs and herbs. The relationships between both seed size and mass and final germination at all light and temperature conditions was positive in herbaceous, but negative in shrubby species. The relationship between seed size and LGI was significantly positive in shrubs; but was significantly negative in herbs and trees. GRI was greater for bigger seeds of herbs, but the reverse was true for seeds of trees.

**Conclusion:** Seed size and storage, and light requirement during germination of species belonging to different growth forms could explain their distribution in the community and consequently could help explain community structure and composition.

### Biography

Hatem Ahmed Shabana is a PhD student at Malaga University, currently working as a botanist and ecologist researcher in seed bank and herbarium in Sharjah Research academy, UAE and worked in Egypt at Egyptian environmental ministry. His current and previous work gave him experience in many environmental fields and programs like seed collection and germination, preparing herbarium specimens, plant species surveys, endemic species monitoring and conserving, restoration, public awareness and conservation biology and sustainable use of natural resources.

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### Notes: