

World Conference on Ecology

March 19-20, 2018 | Berlin, Germany

Germination of seeds from thornscrub species with respect to light and phylogeny

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Germination is crucial in the life of plants; they go from a quiescent stage to growing in a sometimes rapidly changing environment. In arid and semiarid lands, moisture availability is a limiting factor that affects germination. Seeds in northern Mexico semiarid zones tend to germinate quickly after rainfall or to do it under the canopy of other species arguably for protection from immediate desiccation. We explore influence of light quality and neighboring seeds on germination. The expectations are that red light will mimic the light filtered by a tree canopy under natural conditions and that to avoid competition; seeds will germinate more next to phylogenetically distant species than with their own species or close relatives. This study was developed using shrub species from northeastern Mexico: *Vachellia farnesiana*, *Cordia boissieri*, *Ehretia anacua*, *Havardia pallens*, *Celtis pallida* and *Caesalpinia mexicana*. In a separate experiment, we placed seeds from *Acacia berlandieri*, (*Acacia*) *Vachellia farnesiana*, *Acacia rigidula*, *Acacia Schaffneri*, *Acacia wrightii*, *Caesalpinia mexicana*, *Ebenopsis ebano*, *Havardia pallens* and *Prosopis laevigata* to germinate on their own, or with each of the rest of the species. Seeds were inside petri dishes in germinating chambers with 12/12 light, in a random design, with ten seeds in each replicate per species. We used direct light, 80% shade, darkness and red plastic as light treatments. Germination was recorded daily. *Ehretia anacua* and *Havardia pallens* germinated in the three light conditions. *Caesalpinia mexicana* germinated more in shade and darkness. *Celtis pallida* germinated more under light and shade. For *Vachellia farnesiana* the number of germinated seeds was higher in direct light and in darkness. *Cordia boissieri* did not germinate in any treatment. Germination was not affected by red light. Seeds of most species germinated equally placed on their own or with other species thus germination was not influenced by phylogeny.

Recent Publications

1. Aragon Gastelum J L, Flores J, Yanez Espinosa L, Reyes Olivas A, Rodas Ortiz J P, Robles Diaz E and Gonzalez F J (2017) Advantages of vivipary in *Echinocactus platyacanthus*, an endemic and protected Mexican cactus species. *Journal of Arid Environments* 141:56-59.
2. Aragon Gastelum J L, Badano E, Yanez Espinosa L, Ramirez Tobias H M, Rodas Ortiz J P, Gonzalez Salvatierra C and Flores J (2017) Seedling survival of three endemic and threatened Mexican cacti under induced climate change. *Plant Species Biology* 32:92-99.
3. Arroyo Perez E, Flores J, Gonzalez Salvatierra C, Matías Palafox M L and Jimenez Sierra C L (2017) High tolerance to high-light conditions for the protected species *Ariocarpus kotschoubeyanus* (Cactaceae). *Conservation Physiology* 5(1):cox042.
4. Bauk K, Flores J, Ferrero C, Perez Sanchez R, Las Penas M L and Gurvich D E (2017) Germination characteristics of *Gymnocalycium monvillei* (Cactaceae) along its entire altitudinal range. *Botany* 95:419-428.
5. Cuellar Rodriguez G, Jurado E and Flores J (2017) Seeds and seedlings from isolated mesquite trees. *Journal of the Torrey Botanical Society* 144:58-62.

Biography

Joel Flores is a Mexican National Research Scientist with recognition of level 3. He has a PhD since 2001 and has published over 80 papers on Ecology and Ecophysiology of plants. His research has been cited over 800 times. He has supervised many undergraduate and graduate students at the IPICYT (the research institution where he works) and also as an Invited Professor elsewhere.

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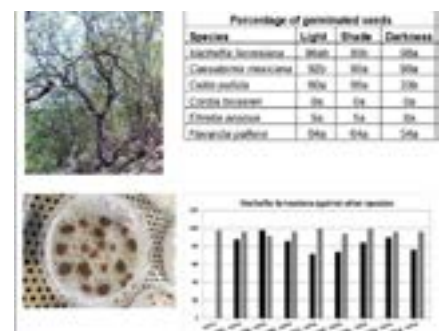


Figure 1: a) Tamaulipan thornscrub. b) Five of the six species germinated equally under the three treatments. c) Seeds of two species placed in petri dishes for germination trial. d) *Vachellia farnesiana* (ACFA) showed the highest germination when competing against others, kinship did not influence germination between competing species.