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Introduction and domestication of woody plants for sustainable agriculture in desert areas

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High radiation in hot deserts results in high salinity, especially in irrigated fields. Whenever not treated properly, this salinization may harm crops and eventually bring to soil destruction, field abandonment, or literally desertification. Furthermore, the range of crops that can be grown commercially in hot deserts is limited (Nerd et al. 1990). With the globalization of the last century, Introduction of exotic species for commercial use became more accessible. However, these attempts may involve extreme land changes including establishment of potential invasive species. Therefore domestication of native species should be preferred rather than introduction of exotics. In the last six years we did first steps of domesticating several native species, searching for commercial potential (pharmaceutics, food, biomass for energy and desalination of constructed wetlands). We studied aspects of desert plant physiology in drought and saline conditions. We wish to share the knowledge we gained regarding the physiology and commercial potential of the following desert plant species:
1) Bassia indica is an annual halophyte. We proposed to use it for salt phytoremediation in constructed wetlands for wastewater treatment and as feed for livestock;
2) Commiphora gileadensis is considered as the balm tree of Judea, praised for its use as holy oil and in perfumes but also considered as a cure for many diseases. C. gileadensis today grows naturally in southwest Arabia and Somaliland. We found anti-proliferative and apoptotic effect of C. gileadensis extracts on several human cancer cells. Ben Gurion University of the Negev has patented these findings.
3) Artemisia sieberi and A. judaica are both known for various therapeutic traits. While studying effects of irrigation intensity on these traits, some allopathic characters were discovered.
4) Fichus palmate disappeared from Israel, but remind in neighbouring Jordan and Egypt. This tree may serve as a robust stand for fig plantation in arid conditions.
5) Balanites aegyptiaca is potentially a good biomass crop and good feed for grazers as goats. We illuminated differences related to drought tolerance between two distinct ecotypes.

Attempts to develope sustainable agriculture based on local species will save resources (water, fertilizers, insecticides and herbicides), keep endangered plant species and enhance vegetation reestablishment.