

AN OVERVIEW OF TISSUE CULTURE OF OUTSTANDING SPECIES FROM ARID AND SEMIARID LANDS IN MEXICO

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In Mexico, an area of approximately 1 020 055 Km² is classified as arid and semi arid lands with less than 500 mm/year rainfall. Within this area several botanical species grow in a well integrated habitat, some of them are used as raw material sources for different applications ranging from building materials to medicinal products, good examples are aloe vera that yields pharmaceutical substances and euphorbia antispyhillitica which produces a natural wax.

Most of the arid land species grow wild, are scarce, and require several years to reach the commercial exploitation stage, mainly due to lack of water. Tissue culture programs can help to increase the plant population, reduce the time for exploitation, and genetically improve the species to achieve higher yielding or better environmental adaptability. The present work focuses on reviewing the literature and personal results dealing with the tissue culture of semiarid land species growing in Mexico. Seven species are covered in this paper: *Aloe vera*, *cucurbita foetidissima*, *euphorbia antispyhillitica*, *opuntia spp*, *parthenium argentatum*, *simondsia chinensis* and *yucca filifera*. Each of this species is discussed separately and the tissue culture details will be discussed in the full paper.

Aloe vera (Zábila). The *in vitro* tissue culture (1) has allowed to produce plants, for intensive propagation, with higher metabolite concentrations. This metabolites are used in pharmacology and cosmetic products.

Cucurbita foetidissima (Calabacilla loca). The tissue culture results (2) prove useful for fast propagation and clone selection for later plant breeding programs.

Euphorbia antispyhillitica (Candelilla). Massive propagation, alleviating the low reproduction efficiency problems of traditional methods, can be carried out by tissue culture (3), the part of the plant with better response to roots production has also been determined by tissue culture.

Opuntia spp (Nopal). Tissue culture can be used for biomass or unicellular protein production (4, 5). From the biomass a mucilage can be isolated yielding fiber as a byproduct, this may be used as feeding stock for ruminating cattle, combustion material, or to produce composite materials. Actually in the state of Zacatecas there is a germplasm bank with 68 species.

Parthenium argentatum (Guayule). Tissue culture (6, 7) have helped in the asexual reproduction of this shrub useful for clone preservation, *in vitro* rubber production avoiding the woody material formation and study of the effect of several factors on biosynthesis.

Simondsia chinensis (Jojoba). Tissue culture (8) has been used to obtain the liquid wax from somatic and zygotic embryos and for plant propagation.

Yucca filifera (Yuca). Tissue culture (9) has been used to obtain high sarsapogenine and other steroidal bases content.

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