



EFFECT OF FUNGI ON SEED GERMINATION OF *Mammillaria bocasana*

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Introduction. One of the most representative plant families from Mexico are cacti, they are an exceptionally diverse group because of their morphological and taxonomic variety. Cacti are endemic in the America and have its principal place of diversification in arid and semiarid regions of Mexico. (1, 2).

Cacti seeds have physiological and physical dormancy; they need a period of after-ripening to break dormancy (3). Seeds in the soil interact with microorganisms that could help them break seed dormancy. Fungi attack eroding or cracking the testa and could help to reduce the mechanical the resistance to germination (4). In arid environments, the effects of fungi on breaking seed dormancy in cacti have received very little attention (5). Herein, we evaluated the effect of three fungi on the testa on germination of *Mammillaria bocasana*.

Methods. *Penicillium chrysogenum*, *Phoma medicaginis*, and *Trichoderma harzianum* were grown on PDA plates at 28°C for three days. The spores and mycelia were collected in sterile distilled water and counted in a Neubauer chamber for later inoculation of the *Mammillaria bocasana* seeds.

Sterilized seeds were grown on water-agar plates and inoculated with 2 µL of a solution of spores or mycelium ($6 \times 10^7 \text{ ml}^{-1}$) from each fungus. There were five replicates per treatment and 20 seeds per replicate.

Results. We found that seeds inoculated with *Penicillium chrysogenum*, *Phoma medicaginis*, and *Trichoderma harzianum* had a higher percentage of germination than control seeds (Figure 1).

The seeds without fungi had 0 germination percentage of 70%, while, seeds inoculated with *Phoma medicaginis*, *Penicillium chrysogenum* and *Trichoderma harzianum* showed a germination percentage of 100%, 81% and 77% of seeds after 20 days from the inoculation process (Figure 2).

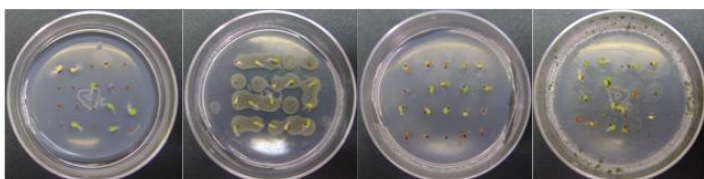


Fig.1 *Mammillaria bocasana* seeds inoculated with three different fungi to promote germination.

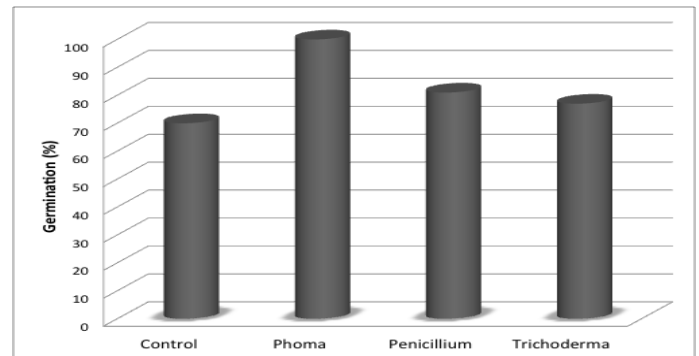


Fig.2 Percentages of *Mammillaria bocasana* seeds inoculated with three different fungi to promote germination.

Conclusions. Results strongly indicate that fungi are involved in breaking seed dormancy of *Mammillaria bocasana*, perhaps through the action of enzymes that degrade the hard testa. Fungi attack the testa potentially reducing the mechanical resistance to germination in seeds with physiological dormancy. Thus, fungi may play an important role in breaking seed dormancy of desert species. This study provides new insights regarding the effect of fungi in breaking seed dormancy of arid and semi-arid plants.

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