EFFECT OF ORGANIC SUPERABSORBENT ON THE GROWTH OF *BOSWELLIA ELONGATA* ON SOCOTRA ISLAND

Natálie Holešová, Hana Habrová

Mendel University in Brno / Faculty of Forestry and Wood Technology
Department of Forest Botany, Dendrology and Geobiocoenology

Introduction

This study evaluates the effectiveness of superabsorbent polymers (SAPs) on Socotra, Yemen, focusing on their potential to mitigate water scarcity. Socotra experiences highly erratic rainfall, resulting in dry conditions for most of the year. The island suffers further from strong winds and heavy rains during brief monsoon periods, which cause significant vegetation damage (Culek et al., 2006). Notably, cyclones in 2015 and 2018 devastated large areas of Socotra's unique woodlands, including frankincense (*Boswellia* sp.) and dragon's blood trees (*Dracaena cinnabari*) (Maděra et al., 2019).

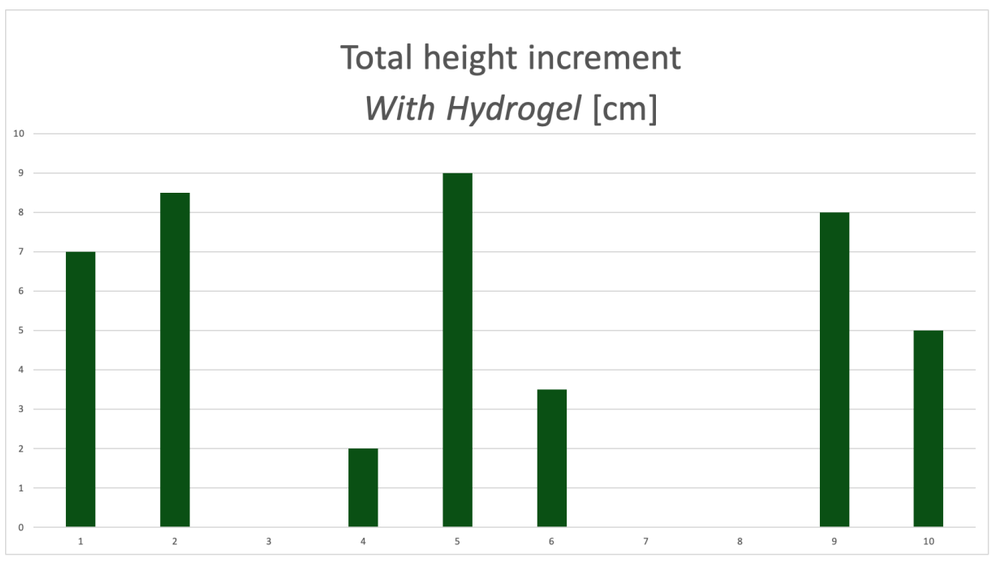
SAPs, recognized for exceptional water-holding properties, offer a promising method to enhance soil quality and promote optimal plant growth. Their controlled release mechanism regulates water availability, promotes aeration, and supports nutrient diffusion, providing robust conditions for healthy root development. Applying SAP may mitigate drought-induced stress, increase seedling establishment rates, and reduce mortality.

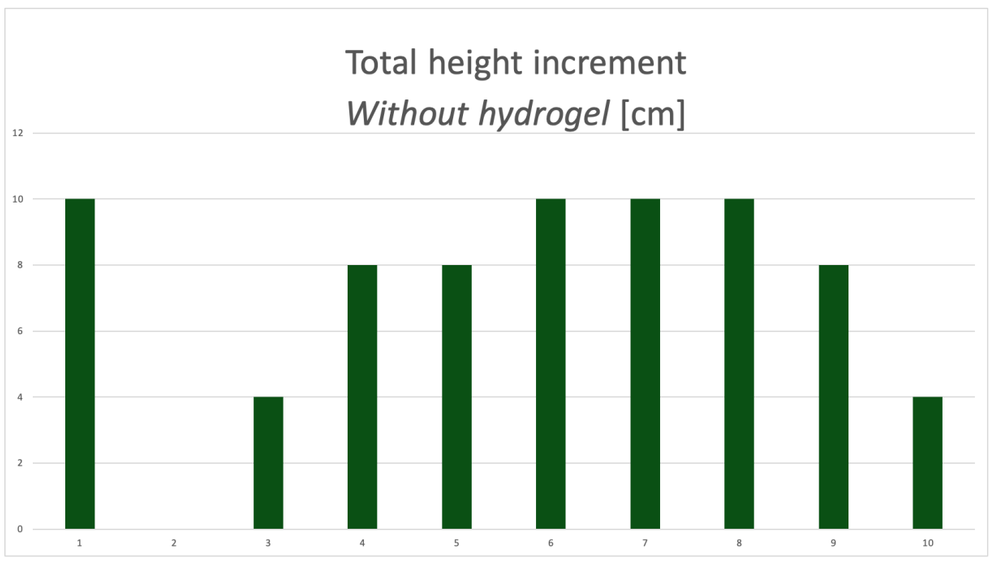
Materials and methods

The study took place in April 2025 in Socotra's Diburak region, using 20 *Boswellia elongata* seedlings. One gram of hydrogel retains 0,25 liters of water and remains effective for up to seven years (Hydrogel.cz, 2025). Ten seedlings were treated with 3 g of superabsorbent per liter of soil. All seedlings were watered with 1,5 l after planting in sandy-stony soil protected by fencing.

Results

Results indicate that hydrogel application did not positively affect the growth of *Boswellia* seedlings on Socotra. Seedling mortality was approximately 30 % higher among those treated with hydrogel. Additionally, the average height increment was greater for seedlings without hydrogel (8,0 cm vs. 6,1 cm with hydrogel). Measurements were taken immediately after planting and again in August. Although SAPs have shown positive results in annual plants, outcomes for woody species in arid tropical regions remain inconclusive and appear species dependent. For *Boswellia*, the present results suggest a negative impact from hydrogel use. Research in these environments must address challenges such as abiotic stressors, biological interactions (e.g., grazing, grasshoppers), and human-related factors. At present, hydrogels can be suggested mainly for use in forest nurseries, where growing conditions are more easily controlled.





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Faculty of Forestry and Wood Technology