

Abstract Submitted
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The effects of psammophilous plants on sand dune dynamics

GOLAN BEL, YOSEF ASHKENAZY, Ben Gurion University — Sand dune dynamics involve physical processes in many temporal and spatial scales. Many physical and mathematical models have been developed to explain the interesting patterns of sand dunes. While many works have focused on the formation and patterns of sand dunes, the observed bi-stability of fixed and active sand dunes under the same climatic conditions has received little attention. Many of the models considered different types of sand dune cover (affecting dune activity); however, despite their important role in dune dynamics, to our knowledge, psammophilous plants (special plants that flourish in moving sand environments) have never been incorporated into mathematical models of sand dunes. Here, we propose a non-linear physical model for the role of psammophilous plants in the dynamics of sand dunes. The model exhibits complex bifurcation diagrams and dynamics, which explain observed phenomena, and predicts new dune stabilization scenarios.

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