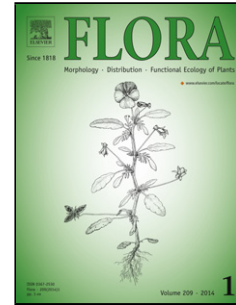


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Plant functional trait structure in two fog deserts of America

Bárbara Larraín Barrios¹, Luis Faúndez Yancas², Alberto Búrquez^{1, 3}

¹*Instituto de Ecología, Unidad Hermosillo, Universidad Nacional Autónoma de México, Blvd. Luis Donaldo Colosio s/n, Colonia Los Arcos, C.P. 83250, Hermosillo, Sonora, México.*

²*BIOTA Gestión y Consultorías Ambientales, Miguel Claro 1224, Santiago, Chile.*

³*Author for correspondence*

Highlights

- The American fog coastal deserts have similar climates, but different topographic features.
- Only a few genera and families are common in the most abundant set of species.
- Similarity in functional traits is widespread between the studied deserts.
- Traits segregate forming the same three functional groups in both deserts.

Abstract

Regions with similar environmental determinants are known to produce the independent evolution of similar features in unrelated species. This hypothesis is pervasive in ecology evolution and biogeography. To explore community convergence in trait structure, we compared perennial plant species assemblages in samples of a representative section of two distant and isolated coastal fog deserts of North and South America. These fog deserts are considered equivalent biomes, but there is a paucity of quantitative data to objectively support their similarities. General climate in both deserts showed the same trends, but Atacama exhibited almost no precipitation and had a stronger influence of fog. We found no shared species in our plots and limited phylogenetic relatedness. A two way cluster analysis separated groups of traits in fog deserts from neighboring dry deserts and Mediterranean systems. We found remarkable similarities in functional structure of fog deserts; 65% of the 26 studied functional trait categories showed less than 12% difference in relative cover among them. Three functional plant groups (deciduous, evergreen and succulent–CAM) were well defined when using hierarchical clustering. The deciduous group was dominant in both areas. There was a strong community convergence in vegetation structure, but some traits inevitably differed among deserts. Our results resolved in quantitative terms the similarities among functional traits, and indicated the need to expand the fine scale study of plant trait convergence in fog deserts.

Keywords: community convergence, Baja California; Atacama; vegetation, coastal desert, cluster analysis

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