

Título: BIODIVERSITY OF COLLEMBOLA IN PINE FOREST ECOTONES OF NAVARRA

Nombre: MARTINEZ ALDAYA, MAITE

Universidad: NAVARRA

Departamento: ZOOLOGIA Y ECOLOGIA

Fecha de lectura: 27/06/2006

Dirección:

> **Director:** ENRIQUE BAQUERO MARTIN

> **Codirector:** Arturo Hugo Ariño Plana

Tribunal:

> **presidente:** RAFAEL JORDANA BUTTICAZ

> **secretario:** JESUS MIGUEL SANTAMARIA ULECIA

> **vocal:** JEAN MARC THIBAUD

> **vocal:** JEAN FERANCOIS PONGE

> **vocal:** Rafael Escribano Bombín

Descriptores:

> ECOLOGIA DE LOS INSECTOS

> BIOLOGIA DE SUELOS

> CONTROL DE LA EROSION

> CONSERVACION DE SUELOS

El fichero de tesis no ha sido incorporado al sistema.

Resumen: Traditional reforestation practices in southern Europe apparently have not yet taken the ecotone effect into account. Attaining tree crown closing as soon as possible has been the main goal, leaving out of focus the fact that it is the soil what needs to be regenerated. Carried out along transects in six pine forests of different age, development degree and location within Navarra, northern Spain, our research examines the collembola biodiversity in the ecotone of Aleppo pine (*Pinus halepensis* Miller) reforestations in arid Mediterranean areas. The soil organic matter was analyzed, and the infauna was determined from soil cores after extraction by heptane flotation. 6,214 individuals of Collembola were identified to species level and measured. Among the resulting 85 species, six were first records for Navarra. Apparently, the plantation of Aleppo pine stands benefited the Collembola communities. The shading of the crown, tree height, plantation frame and humification factor (RF) were found to influence soil fauna of the groves. Diversity on both abundance and on biomass, when used jointly, functionally complemented themselves and were good indicators of ecosystem status, even though the actual faunal compositions of the pine groves were, within a geographical similarity pattern, different among locations. From the Collembola diversity pattern and other results, the optimal distance between trees in grown plantations for an ecotone effect to appear was found to be 2.8 to 5 meters. In order to improve soil formation

and reduce the risk of erosión, we therefore suggest a redesign of pine reforestation management protocols seeking to maximize the biodiversity by expanding the distance between trees. we have al so compared the community of collembola along transects in an Aleppo pine grove located in a potentially desertification-prone Mediterranean área before and after 1/3 thinning, which opened clearings and al so left a larger distance between trees. Apparently the succession advanced after thinning, likely associated to the improved soil conditions. The interior of the pine stand after thinning seemed to have approached the characteristics of the ecotone itself, with increased richness and biodiversity, and exhibiting faunal characteristics closer to the ecotone than to the pre-successional stage. The ecotone proper was more stable than the other biotopes.