

Tomao Antonio^a, Juan Martínez de Aragón^b, Jose Antonio Bonet^{b,c}

^a Department for Innovation in Biological, Agro-food and Forest systems (DIBAF), University of Tuscia, Viterbo, Italy; ^b Centre Tecnològic Forestal de Catalunya (CTFC-CEMFOR), Ctra. de St. Llorenç de Morunys km 2, E-25280 Solsona, Spain; ^c Departament de Producció Vegetal i Ciència Forestal, Universitat de Lleida-Agrotecnio Center (UdL-Agrotecnio), Avda. Rovira Roure, 191, E-25198 Lleida, Spain.

1. Introduction

Mushrooms recently become a very important socioeconomic resource, especially in woodlands where timber value is low, such as in most Mediterranean pine forests. Silvicultural practices such as thinning, modify canopy cover, resulting in a modification of mushroom species composition and sporocarp production.

This study aims at understanding if and to what extent forest management (thinning) can influence:

- (i) diversity of fungal communities
- (ii) abundance and production of saprotrophic and ectomycorrhizal functional groups



2. Project area

Natural Park of National Interest in Poblet (Tarragona -Catalonia-)



3. Materials and methods

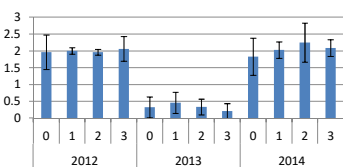
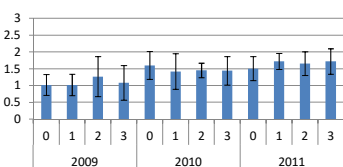
- Mushroom data have been collected in 30 permanent plots (10m x 10m) with a basal area reduction ranging from 0% to 77% in the period 2009-2014. Fifteen non-thinned plots were also surveyed in 2008

- Shannon Wiener ($H' = 0 \rightarrow \infty$) and Pielou's ($E = 0 \rightarrow 1$) indices were calculated

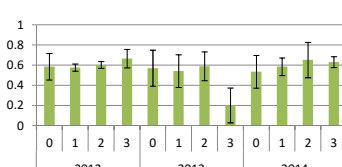
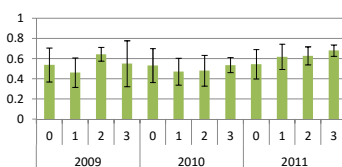
- Significant differences have been evaluated by analysis of variance (ANOVA)



4. Results: effect of thinning on mushroom diversity



Shannon index



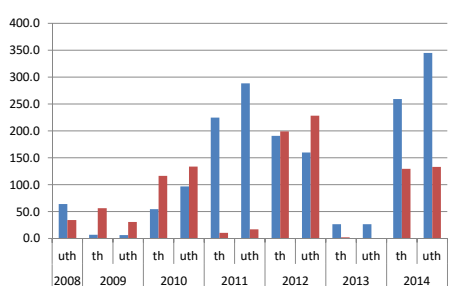
Pielou's index

- Four thinning intensities were considered: 0) control; 1) 0-29% of removed basal area; 2) 30-49% of removed basal area; 3) more than 50% of removed basal area

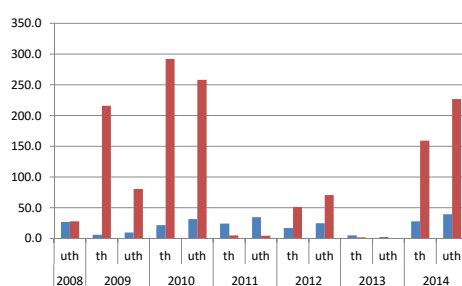
- No significant differences were found between thinned and unthinned plots in the same year ($p > 0,05$), except for relative index in 2011 ($p < 0,05$)

- No significant differences were found among thinning intensities in the same year ($p > 0,05$), except for Pielou's index of highest thinning intensity plots in the year 2013

5. Results: effect of thinning on mushroom yield



Number of sporocarps for saprophytic (blue) and ectomycorrhizal (red) species



Dry weight for saprophytic (blue) and ectomycorrhizal (red) species

- In 2011, 2013 and 2014 number of sporocarps of saprotrophic species is higher compared to ectomycorrhizal ones. Ectomycorrhizal abundance is higher in 2009 and 2010

- Ectomycorrhizal dry weight is significantly higher in 2009, 2010 and 2014.

- Dry weight of ectomycorrhizal fungi significantly differ between control and managed plots in 2009, particularly in low intensity thinned plots