European chestnut tree (Castanea sativa Mill) have a great economic interest for wood and fruit production in the northeast of Portugal. In order to maintain the soil free of weeds, traditionally, farmers practice several superficial tillages along the year. Phytophobal antiplant disease mainly related with increasing Phytophthora cinnamomi contamination of soils are progressively changing these practices. In this context, the present work intend to evaluate the effect of two different soil management (tille vs. non-tillage) of chestnut orchard on the macrofungi diversity and abundance.

Objectives

European chestnut tree (Castanea sativa Mill.) have a great economic interest for wood and fruit production in the northeast of Portugal. The diversity of macrofungi associated with C. sativa Mill. trees (tilled and non-tilled) is represented in fig. 2. In all plots 50 species, belonging to 20 genera were identified. In the tilled orchard 17 species from 12 genera were observed, mainly from the genera Russula. Non-tilled soil showed higher number of species (47) and genera (17). Rusula was the most species-rich genera, with 11 species. Nine genera were common in the two soils management. Amanita sp., Mycena sp, and Xerula sp. were only found in tilled soils and Boletus sp., Calocybe sp., Cantharellus sp., Hydnum sp., Hylotoma sp., Leotia sp., Lycoperdon sp. and Xerocomus sp. in non-tilled.

Material and methods

During Autumn-Winter 2003, two neighbors C. sativa orchards were selected, one tilled and one non-tilled (Fig. 1), with more than 100 years old, located in Oleiros, near Bragança (Portugal). In each orchard, five plots of 100 m² were delimited and weekly all mushrooms were harvested. The sporocarps were identified, counted, dried at 30°C for 72 h, and weighed. Taxonomic identification followed Moser (1983), Courtecuisse & Duham (1995), Courtecuisse (1999), Bon (1988), Marchand (1971-86) and Bat et al. (1990-2001). Representative voucher specimens were dried and deposited at herbaria of Escola Superior Agrária of Instituto Politécnico de Bragança.

Results

The diversity of macrofungi associated with C. sativa Mill. trees (tilled and non-tilled) is represented in fig. 2. In all plots 50 species, belonging to 20 genera were identified. In the tilled orchard 17 species from 12 genera were observed, mainly from the genera Russula. Non-tilled soil showed higher number of species (47) and genera (17). Rusula was the most species-rich genera, with 11 species. Nine genera were common in the two soils management. Amanita sp., Mycena sp, and Xerula sp. were only found in tilled soils and Boletus sp., Calocybe sp., Cantharellus sp., Hydnum sp., Hylotoma sp., Leotia sp., Lycoperdon sp. and Xerocomus sp. in non-tilled.

The number of sporocarps significantly higher in non-tilled than in tilled (Table 1). In the first type of management a total number of 29820 sporocarps were collected whereas in a tilled only 3660 sporocarps were observed. With regard to occurrence, we observed that the greatest number of sporocarps occurred in a identical period as the number of species (Fig. 4).

Conclusions

- This study has demonstrated that C. sativa Mill. orchard provide a habitat for diverse macrofungus communities.
- The number of species, sporocarps and biomass production increased in non-tilled C. sativa Mill. orchard and decreased considerably in tilled soils. These changes were found to be statistically significant, especially for mycorrhizal species.

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