

Insect Diversity Potential in Olive Trees in Two Orchards Differently Managed Under an Arid Climate in the Western Steppe Land, Algeria

Authors : Samir Ali-arous, Mohamed Beddane, Khaled Djelouah

Abstract : This study investigated the insect diversity of olive (*Olea europaea* Linnaeus (Oleaceae)) groves grown in an arid climate in Algeria. In this context, several sampling methods were used within two orchards differently managed. Fifty arthropod species belonging to diverse orders and families were recorded. Hymenopteran species were quantitatively the most abundant, followed by species associated with Heteroptera, Aranea, Coleoptera and Homoptera orders. Regarding functional feeding groups, phytophagous species were dominant in the weeded and the unweeded orchard; however, higher abundance was recorded in the weeded site. Predators were ranked second, and pollinators were more frequent in the unweeded olive orchard. Two-factor Anova with repeated measures had revealed high significant effect of the weed management system, measures repetition and interaction with measurement repetition on arthropod's abundances ($P < 0.05$). Likewise, generalized linear models showed that N/S ratio varied significantly between the two weed management approaches, in contrast, the remaining diversity indices including the Shannon index H' had no significant correlation. Moreover, diversity parameters of arthropod's communities in each agro-system highlighted multiples significant correlations ($P < 0.05$). Rarefaction and extrapolation (R/E) sampling curves, evidenced that the survey and monitoring carried out in both sites had a optimum coverage of entomofauna present including scarce and transient species. Overall, calculated diversity and similarity indices were greater in the unweeded orchard than in the weeded orchard, demonstrating spontaneous flora's key role in entomofaunal diversity. Principal Component Analysis (PCA) has defined correlations between arthropod's abundances and naturally occurring plants in olive orchards, including beneficials.

Keywords : Algeria, olive, insects, diversity, wild plants

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