

# Weed species composition under different coffee (*Coffea arabica* L.) production systems, altitude and soil conditions in Ethiopia

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## Abstract

A weed population survey was carried out to assess the influence of the coffee production system, altitude gradients and physicochemical characteristics of the soil on weed species composition and distribution in the major coffee-growing belt of Ethiopia. A total of 168 coffee fields were assessed using a quadrat count (0.5 m x 0.5 m) in a systematic sampling technique. The result revealed that a total of 98 weed taxa belonging to 35 families were recorded. Asteraceae and Poaceae were the most abundant families. The most frequent weed species, regardless of the production systems, altitude and soil types, were *Oplismenus hirtellus*, *Galinsoga parviflora*, *Achyranthes bidentata*, *Impatiens balfourii*, *Bidens pilosa* and *Commelina benghalensis*, with a frequency of > 40%. The density of weed species was varied (ranged from 0.04 to 95.29 plants 0.25m<sup>-2</sup>) and the highest abundance value (95.25 plants per 0.25m<sup>2</sup>) was recorded by *O. hirtellus*. Similarity indices of the 16 districts were ranging from 8.33% to 72.73% and that of the 4 coffee production systems and 3 altitudinal gradients were also ranged from 7.14% to 49.49% and 41.76% to 68.75%, respectively. According to canonical correspondence analysis (CCA) and the Kruskal-Wallis test, coffee production systems, altitude and physicochemical properties of soil were the main explanatory variables influencing weed species distribution and composition. Therefore, it is concluded that the measured variables significant account for variation in the composition and distribution of weed species in coffee fields of Ethiopia and coffee producers should take into account those variables to manage weeds of coffee.

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