

Does Land Use Change Affect the Abundance and Diversity of Soil and Litter Ants?

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Species: A group of individuals consisting of similar individuals capable to interbreeding

Genus: A group of species that share some of the characteristics general than those of species

Subfamily: A group of genus that share inclusive characteristics general than those of genus



With the increase of human population, natural lands have been continuously transformed into agricultural lands. Some crops are cultivated for food production, and some others are planted to generate an income. The shift from natural to agricultural lands is coupled with the environmental degradation. It also reduces human's benefits from natural environments such as woods, timber, and water resources. To solve this problem, restoration activities were encouraged through tree forest plantations. In this regard, trees comprising either native or introduced species were planted.

Natural lands also provide suitable habitats to living organisms including soil and litter ants. Even though they are small and insignificant as single individuals, ants are among the most dominant and diverse groups of insects. Ants contribute to soil aeration, soil water availability, and transport of nutrients at different soil-depths. This is done through the creation of galleries and pores in soil. Ants are also important to humans. They are used as the source of food in some countries, and help farmers to get good agricultural production through pest control.

Less is known whether the shift from natural land to the agricultural and forest plantation land use affects the diversity and abundance of ants. A research was conducted in planted native and exotic tree species at the Arboretum of Ruhande, and in varieties of coffee and banana plantations at the Rubona agricultural research station, in Southern Rwanda. The Arboretum was used as human settlement, while Rubona was dominated by natural vegetation until the 1960s. Ants were collected by different sampling techniques including hand collection and pitfall traps, and then identified to species level per each land use.

Results indicated a total of 1680 individuals comprising 30 species, 14 genera and 4 subfamilies. Higher abundance was found in plots of coffee plantations and native tree species. Higher diversity was found in plots of exotic tree species and banana plantations. The findings indicated a decreasing in diversity of soil and litter ant species from exotic tree species and coffee plantations to native tree species and varieties of banana plantations. There is an important role of exotic tree species and coffee plantations in conservation of soil and litter ant species

Future studies may be conducted in other regions of Rwanda. They shall also be done in other land uses of Rwanda in order to verify which land use offer better conditions for soil and litter ants.