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Chemical properties of wild coffee forest soils in Ethiopia and management implications

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ABSTRACT

The study aims at determining the status of soil chemical fertility in four wild coffee forests of southeastern and southwestern Ethiopia. Accordingly, soil samples were collected from surface and subsurface depths at three sites within each forest and analyzed for soil chemical properties. The results depicted that the soils at the four coffee forests did not reveal significant variations for most parameters, except Mg, CEC and C:N ratio. Significant variations were determined between the surface and subsurface soils of the four studied forests, partly indicating the impacts of anthropogenic factors on vegetation cover and soil fertility status along profile depth. At Hareenna, surface soil had significantly higher total nitrogen and organic matter than sub-surface soil. The decline in available phosphorus with soil depth was also significant at the Hareenna and Yaju forests. Most soil results were comparable and showed inter- and intra-forest variations, demonstrating the contributions of vegetation cover and climate gradients. The study revealed the declined soil quality parameters with increased depth, demonstrating the vulnerability of forest soils to human-induced disturbances of natural habitats and land degradation, coupled with climate changes. Overall, the results underline the need for a multi-site forest conservation and promote productivity of high quality coffee standards. This demands urgent supports for implementing community-oriented management and incentive options towards maintaining environmental sustainability and coffee genetic resources for global benefits.

KEYWORDS

Carbon Sequestration; Coffee Forest Environments; Profile Depth; Soil Fertility; Wild Coffee Genetic Resources

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