

Root characteristics of tea [*Camellia sinensis* (L.) O. Kuntze] and silver oak [*Grevillea robusta* (A. Cunn)] in a mixed tea plantation at Munnar, Kerala

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Abstract

Rooting characteristics of tea (*Camellia sinensis*) and silver oak (*Grevillea robusta*) were evaluated in a mixed plantation of these species in the Western Ghats in Munnar, Kerala employing three techniques viz., root excavation, measurement of starch concentration, and root cation exchange capacity (CEC) determination. Root systems of three representative trees of *G. robusta* and three tea bushes were exposed by systematically removing the soil both in the vertical and horizontal planes. While a majority of tea feeder roots (47%) were found in the surface (0 to 22.5 cm) and sub-surface (22.5 to 45.0 cm) layers of the soil, *G. robusta* had only a relatively smaller proportion (33%) of their fine roots in these layers. The feeder roots of *G. robusta* (67%) were mostly found in the soil layers below 45 cm implying complementarity in resource use by tea and *G. robusta*. *G. robusta* roots also penetrated deeper into the soil profile (2.4 m) compared to that of tea bushes, which were confined within a limit of 1.5 m. Starch concentrations of coarse roots (> 2 mm diameter) of *G. robusta* and tea, analyzed at monthly intervals as a measure of nutrient demand, suggest that *G. robusta* had lower starch levels than tea roots and an inverse relationship existed between the two species. *G. robusta* trees, however, had higher root CEC than tea plants, which again signifies that interspecific competition for plant nutrients like N and K in such systems, may not be substantial.

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