

## HEAVY METAL CONCENTRATION IN SOILS AND TEA PLANTS IN BLACK SEA REGION

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### Summary

The study area covers two geologically different regions which have intensively been carpeted by tea plants in the Eastern Black Sea. The rocks exposed in the region contain considerable amount of trace metals due to Upper Cretaceous massive sulfide formations and Tertiary epithermal mineralizations. Tea plants grow over the soils derived from such mineralized rocks indicate different concentration in Cu, Pb, Zn, Fe, Cd, P, Al, Na, K, S. Most of the analyzed elements except Al shows higher content ratios in basaltic and sedimentary rocks.

The highest average Cu values occur in tea plants in Sürmene and Çayeli areas. Pb reaches the highest value in Çayeli and Peronit tea plants. The highest Cu, Pb, Zn concentrations were recorded in soils at Sürmene area whereas the highest Al (7.56 %) concentration was observed in Çayeli. The most enriched soils with respect to Mn are found in Peronit area. The soils in Sürmene area sampled during first sprout period of tea plants contain relatively high amount of Cu. During third period of sprout, Cd appear to accompany to Cu, Mn enrichments occur in soils of Hopa area sampled during first tea sprout campaign.

In order to better understand the element distribution processes in tea plants, some experimental studies were undertaken. Young tea plants were planted in small boxes and were applied with Cu, Zn, Cd and Mn element complexes and fertilizers. The effect of fertilizers in element mobility was found to be significant. Especially Ammonium sulfate fertilizer increased element uptake of tea plants by lowering pH. Bioavailability coefficients of the applied elements are as follows, Cu: 0.14, Zn: 0.18, Cd: 2.45 and Mn: 0.15. The differences in the amount of irrigation played an important role in bioavailability and uptake of elements both in soil and tea plants. Cu, Zn, and Mn are relatively easily uptaken by the tea plants from the soils often watered. The amount of water has no effect on Cd uptake.

The Pb concentration sharply decrease from road side to 100 m in land. The Black Sea teas show different trace elements concentrations with respect to World teas.