EVALUATION OF SOIL TESTS FOR PREDICTING TOXIC ELEMENTS STATUS IN SOME EGYPTIAN SOILS

BY

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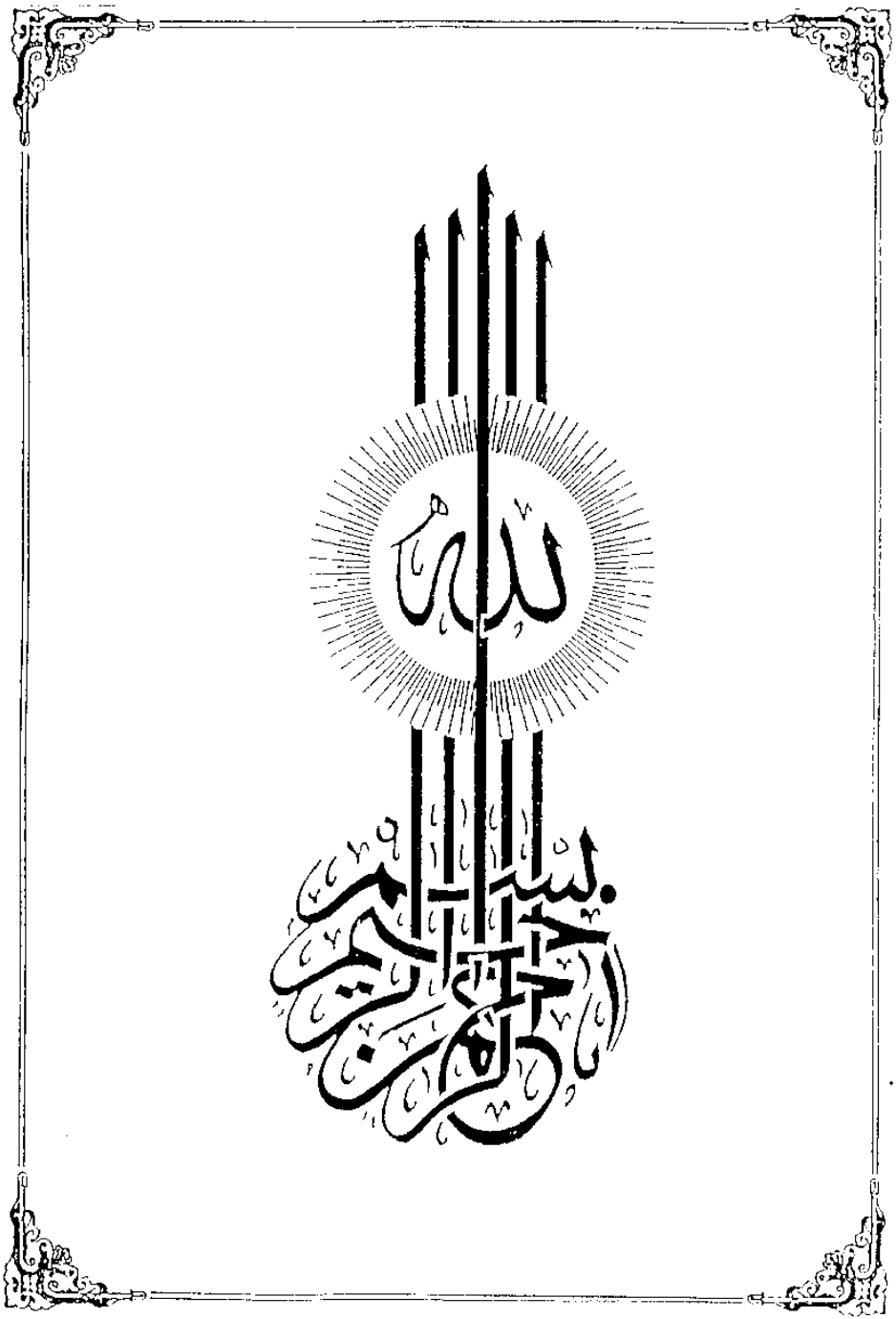

APPROVAL SHEET

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ABSTRACT

SHERINE SHEHATA MOURID Evaluation of soil tests for predicting toxic elements status in some Egyptian soils. Unpublished M.Sc., University of Ain Shams, Faculty of Agric., Department of Soil Science, 1999 .

Total and extractable heavy metal contents varied widely between soils of different locations and pollution sources and within the same location and reflected soil parent material and type and level of pollution .

The lower values of Pb, Cd, Ni and Co characterized sewage treated sandy soils of El-Gabal El-Asfar while higher values characterized the industrially polluted soils . The effect of prolonged irrigation with sewage effluent on heavy metal accumulation was quite evident.

The distribution of different heavy metal fractions varied with the heavy metal, the soil texture and the source of pollution. Most soil Pb was in the carbonate fraction specially in sewage treated soils and the sulfide fraction . Cd predominated in the sulfide fraction and in the exchangeable and soluble fractions specially in sewage treated soils with sulfide is the dominant fraction specially in the industrially polluted soils .

The heavy metal fraction that contributed most to the uptake differed with the source of pollution . In the industrially polluted soils, this fractions were sorbed Pb, exchangeable Cd, Ni, carbonate and sorbed Co accounting for 62, 74, 80 and 87 % of the variations in the uptake . In sewage treated soils, however, these fractions were Pb sulfide, Cd carbonate, organic Ni and exchangeable Co accounting for 95, 99, 85 and 96 % of the variations in the uptake .

EDTA was the most reliable soil test to estimate Pb and Cd bioavailability in the investigated soils especially sewage treated soils . Both DTPA and EDTA , in general, successfully estimated Ni bioavailability in all polluted soils, although DTPA proved superior in

soils affected by industrial wastes . In industrially polluted soils, however, DTPA was superior to assess Co bioavailability while in sewage irrigated soils EDTA is recommended .

Key words: Soil tests, bioavailability, heavy metal, toxic elements.

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