



### Differences of soil quality observed in three biogenic structures of 'soil engineers' in Matara

Gunawardhana, D.C.E., Nisansala, M.K.T., Sandamali, W.M.I. and Munasinghe, D.H.N.

Department of Zoology, University of Ruhuna, Matara, Sri Lanka.

✉ dnm@zoo.ruh.ac.lk

Soil organisms are ecologically important as they help to maintain the stability of soil ecosystem. Earthworms, termites and ants are the main 'soil engineers' that form biogenic structures of soil, earthworm casts, termite mounds and ant heaps respectively.

Quality of soil in termite mounds, earthworm casts and ant heaps was analyzed using six replicates from each biogenic structure. Water holding capacity was estimated by allowing absorbing water into a soil sample. To determine the moisture content and organic matter content soil samples were heated up to 105°C and 350°C respectively. This procedure was conducted until a constant mass is obtained. The mean values of water holding capacity varied as  $22.93 \pm 0.84$  for termite mounds,  $21.02 \pm 1.58$  earthworm casts and  $22.51 \pm 2.21$  ant heaps. Recorded mean values for moisture content was  $13.21 \pm 0.18$ ,  $7.45 \pm 0.36$ , and  $12.74 \pm 0.27$  for termite mounds, earthworm casts and ant heaps respectively. Highest mean value ( $7.79 \pm 0.09$ ) for organic matter content was recorded from soil sample of ants heaps, the lowest ( $6.37 \pm 0.14$ ) was from earthworm casts and the termite mounds showed intermediate ( $7.37 \pm 1.29$ ) value.

Statistical analysis of One way ANOVA indicated that moisture content was significantly varied among soil samples derived from three types of biogenic structures. For organic matter content significant variation was only reported between soil samples that were taken from earthworm casts and ant heaps. Water holding capacity did not show significant variation among three soil groups. According to soil triangle method, soil types in the earthworm casts, termite mounds and ant heaps belonged to loam-soil, loamy sand- soil and sandy loam soil respectively.

**Keywords:** soil engineers, biogenic structures, termites, earthworms, ants