B-85: Effect of fire on soil micro-organism activity

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Fire due to burning of vegetation results in increase of soil temperature and depletion of soil moisture. It effects the activity of soil micro-organisms.

The effect of fire on microbial activity in soil subjected to burning vegetation and to intense heat in an oven at 65°C for 7 h was studied.

Before sampling, any stubble and vegetation on the soil were burnt on the soil surface. Samples were collected at Hindagala, Udaperadeniya, Matale, Dambulla and Maha-Illupallama. As control, 5 soil samples were taken from adjacent sites. Soil samples were dried in an oven at 65°C for 7 h. The burnt soil, oven-heated soil, and untreated soil (control) were used in the experiment.

A laboratory experiment was conducted to evaluate the microbial activity of these soils. After re-wetting the soil to 60% of moisture holding capacity, microbial activity was measured by trapping the CO_2 produced. The determination was continued till the micro-organism activity reduced appreciably.

Microbial activity was very low at the early stages, in all 5 soils. Oven-heated soil at temperature 65°C showed the lowest microbial activity. In all other samples, microbial activity increased continuously and reached maximum activity on the third day of the experiment.

Oven drying the soil, or burning stubble on the soil surface showed significant differences from the control. This was an effect of relatively high temperature, and the moisture content of the soil on micro-organism activity.