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The Effects of soil-dwelling Ants on the Structure of Mediterranean Soils

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Through their nest-building activities, soil-dwelling ants can act as environmental engineers, having a large effect on soil physical and chemical properties, such as texture, infiltration, porosity and nutrient concentrations. The ants bring material to the surface and also affect the aggregation of soil particles, but their impact on soil aggregation and soil aggregate stability is not well understood. These are important properties as improved aggregation supports and maintains soil porosity, thereby contributing to more stable burrows, better drainage and improved regulation of the atmosphere within the nest. On the soil surface, aggregated soil is more resistant to slaking, reducing the availability of material than can be transported by overland flow.

We present a study of the impact of ants on a range of soils sampled on a E-W transect across the Mediterranean (Spain, Italy and Greece), measuring soil physical and chemical properties but with special attention to soil aggregation and soil aggregate stability. Ant-affected soils were compared to control sites with no visual ant activity. There were significant differences in levels of organic carbon and inorganic nutrients between nest soil and controls. We observed differences in texture, soil aggregation and soil aggregate stability, including micro-aggregation and micro-aggregate stability, induced by ant activity. We conclude that ant activity can have important consequences for soil structure.