POPULATION ECOLOGY OF SOIL ARTHROPODS IN A DRY MEDITERRANEAN ECOSYSTEM AS RELATED TO SOIL ORGANIC MATTER

By

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Reclamation of desert areas, by using Aswan High Dam storage water for increasing crop and livestock production, needs at first the study of desert ecosystems from different points of view, one of these studies is the ecology of invertebrate soil fauna in these ecosystems, since they play a role that is increasingly recognized in recycling of nutrients in the soil and hence they are responsible for increasing and maintaining soil fertility.

The area chosen is a non–saline inland depresssion located between the third and fourth ridges, the latter is locally named Khashm El–Aish. This area is about 83 Km west of Alexandria and 12 Km to the south of the sea.

Three stands with different groups of vegetation covers were selected soil animals were collected by means of the sieving method with a sieve of 1 mm mesh. Soil samples were also collected for the determination of soil moisture % and organic matter %.

The major groups found in the study area are : Crustacea (Isopoda), Polyphagidae (sand roaches), Heteroptera, Neuroptera, Hymenoptera, Diptera (larvae), Lepidoptera (larvae), Carabidae Curculionidae, Tenebrionidae, Scarabaeidae, Myriapoda, scorpions, spiders and Mollusca (land snails).

The arrangement of soil fauna groups according to several variables-such as mean density, index of species abundance, absolute frequency and absolute importance value shows that *Heterogamia syriaca* (Polyphagidae, Dictyoptera) is the most abundant species in the area.

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Multiple regression coefficients show that physiological ambient temperature and soil moisture % are improtant fectors affecting the densities of soil fauna groups, while organic matter (gm/m²) and soil moisture % at surface are less important factors affecting these densities.

Relationship of the population densities of these groups with the actual pF category in the soil profile shows that these groups benefit from relativve humidity of the soil rather than the amount of moisture percent.

The use of Sörenson's similarity coefficient shows that the presence of species under similar sides of the shrubs is of similar grouping on the other hand Gleason's similarity coefficients shows that the mean densities of species are more related to the species of shrub cover.

Diversity indices show that *Anabasis* has the highest species diversity while *Thymelaea* has the lowest one.

By comparing the mean density and variance, we find that the variance of all groups under all shrubs has values larger than the means of densities of that group. Thus we can say that the population of these groups tend to be aggregated in all cases.