

Course: Rhizosphere Fauna (selective course)

Level one – Program Biotechnology

Title of Lecture number nine 15/4/2020

Introduction to soil macrofauna (4)

By

Prof. Dr. Gad Hamada Hassan Rady

Plant Protection Department

Ants

Ants may occur in great numbers in soils and on their surfaces. Ants are effective predators, influencing herbivore populations and plant productivity. As with termites, ants modify soil chemical and physical properties by transporting food and soil materials during feeding and mound and gallery construction.

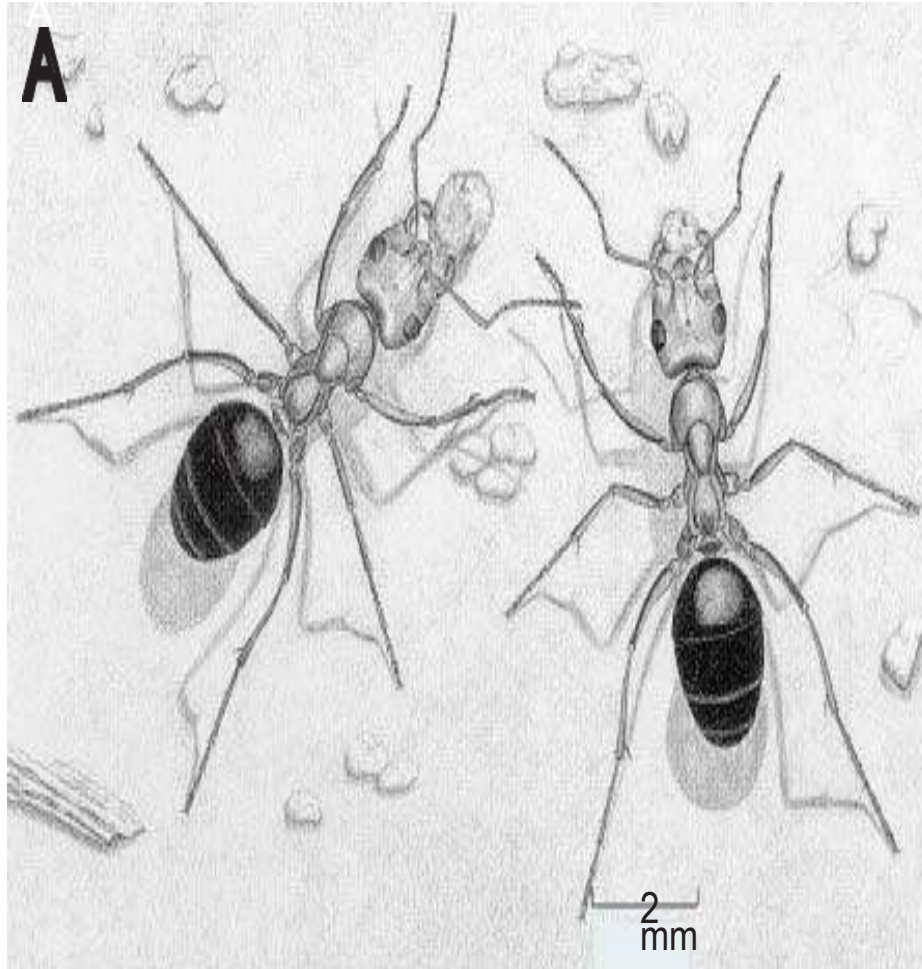
In agriculture generally seen as pests, ants may protect crop herbivores such as honeydew-secreting *Homoptera* or act directly as herbivores themselves. Their beneficial role as effective predators should also be noted.

Where they are abundant, ants modify the physical structure of the soil through the creation of systems of galleries and chambers. This activity influences soil porosity, aeration, infiltration and drainage and creates habitats for smaller organisms.

The activities of ants can also influence the soil chemistry by increasing the amounts of organic matter, P, K and N in the mounds. The physical changes and the elevated chemical status of many soil materials associated with mounds induce greater mineralization activity by decomposers and root and mycorrhizal growth.

FIGURE 11

- A) Ants moving soil (from Nardi, 2003); B) a black ant transporting soil out of the nest



Myriapoda

The group of Myriapoda comprises all soil invertebrates with more than seven pairs of legs. The largest myriapods are divided into two classes: Chilopoda (centipedes) and Diplopoda (millipedes).

Millipedes and centipedes are found on the soil surface, in the litter layers, under tree stumps and decaying logs where they can find food and humidity. Most have a limited ability to penetrate the soil. They move through it by displacing it in all directions.



A millipede from Guadeloupe.



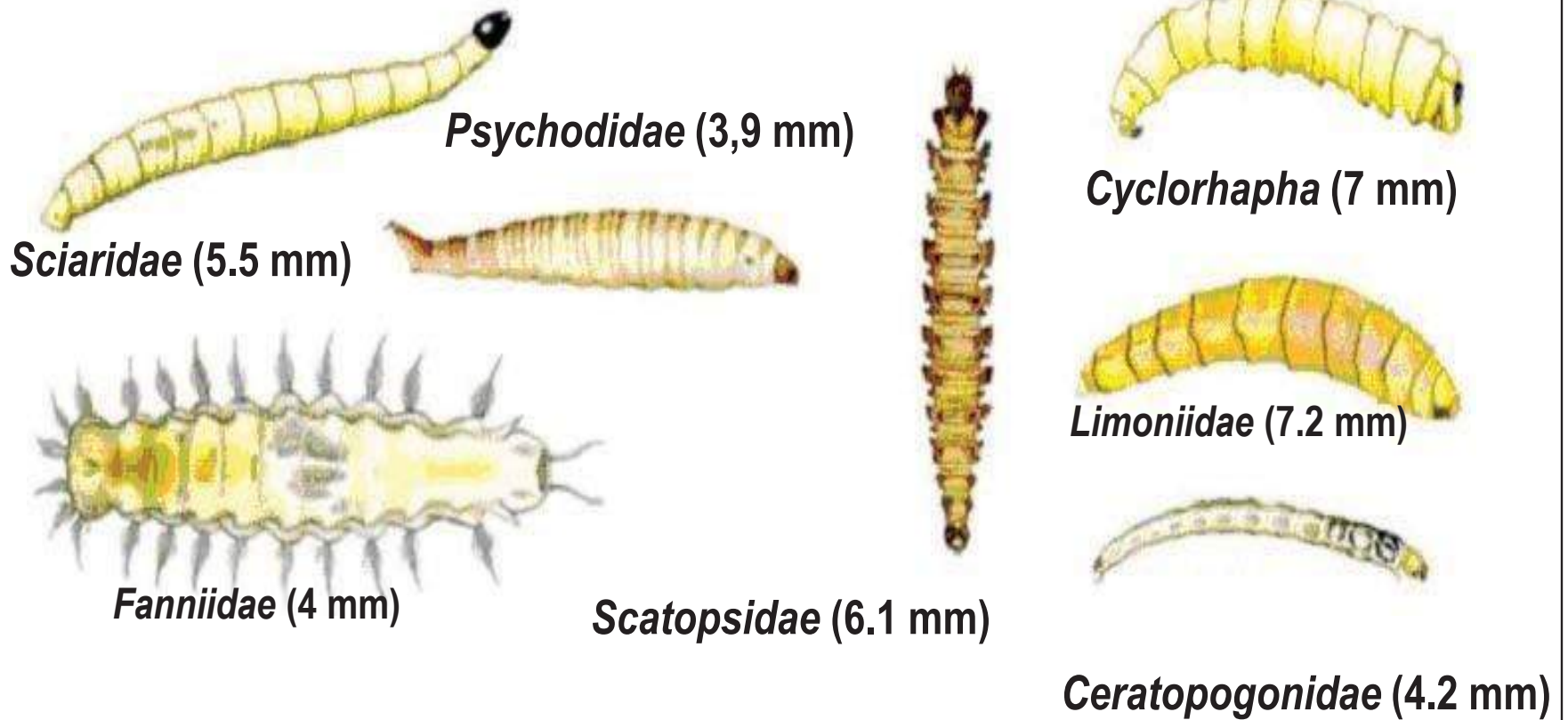
A scolopendra (centipede).

Fly larvae

Flies (Diptera) larvae are a very diverse group with an extremely wide range of food sources. They feed on decaying plant material but they tend to be internal feeders on dead plant and animal remains. Sometimes, they can become predominant in soils and may realize an important reduction in litter mass.

FIGURE 12

Different types of Diptera larvae

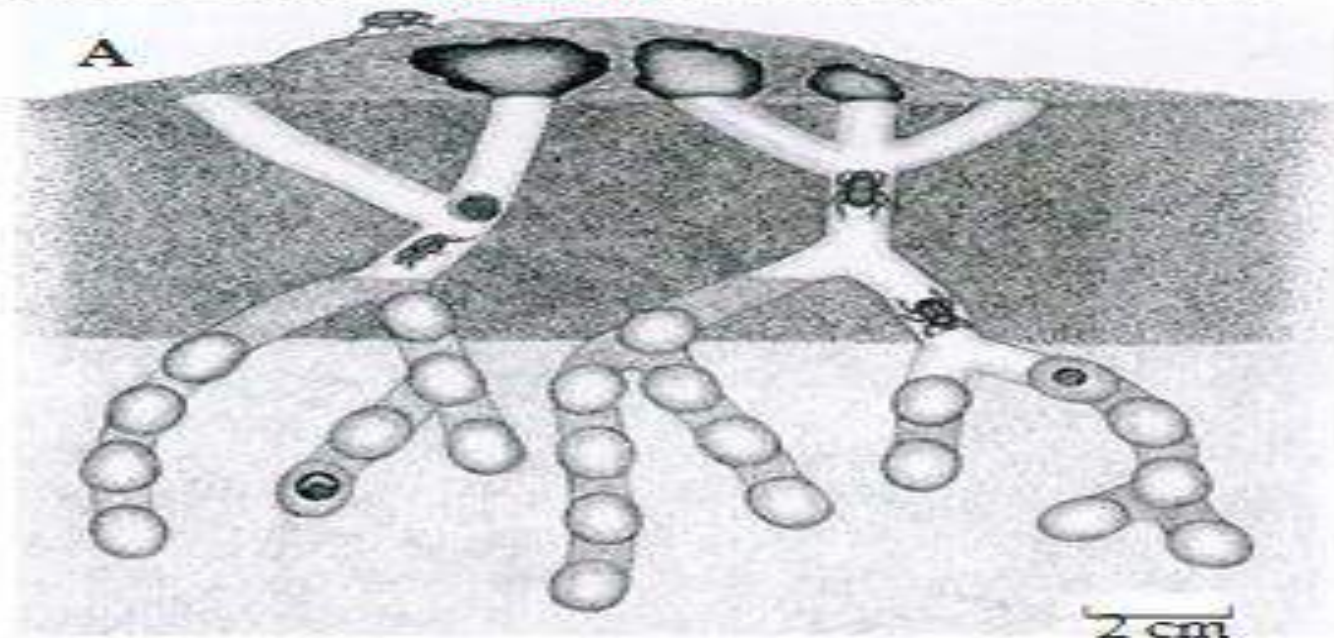


Beetles

Beetles (Coleoptera) are the most diverse group of organisms in the world (with perhaps 3-5 million species). They differ widely in size (1-100 mm) and in the ecological roles they have in the soil and the litter. They have a similarly high diversity of feeding habits, and soil beetles can feed on fungi, plant roots, other invertebrates, buried wood, dung, corpses and other rotting organic matter. They have a wide range of feeding habits, being saprophagous, phytophagous or predators.

FIGURE 13

Activity of dung-beetles: A) subvertical galleries (from Nardi, 2003); B) white grub



B

