Morphology

Soil mites are relatively small (60 µm to 5 mm), have rounded or elongated bodies and are covered in a rigid structure, called exoskeleton or cuticle. Adult mites and nymphs have usually four pairs of legs, while larval stages have three pairs. They lack jaws and use the chelicerae and pedipalps to grab their food. Chelicerae are diverse in form, which reflects mites' varied feeding habits. Some have 1 or 2 pairs of simple eyes in their outer covering. Being blind, they generally rely on physical and chemical sensing during navigation through the small soil pores.

Taxonomy

Mites (Acari) are an ancient lineage that have been known since the Devonian period, at least. Traditionally, they belong to the class Arachnida, together with spiders. There are roughly 40, 000 described soil-living species and more than half of them live on or in the ground and comprise up to 40 % of all soil microarthropod species.

Microhabitat

Soil mites occupy practically all natural soil substrates and have a world-wide distribution. starting from the surface of the litter down to 2 - 3 m in mineral soil. Their normal abundance in undisturbed ecosystems varies from a few hundred individuals in the arctic and tropical deserts up to one million per square metre in temperate mixed forests. Mites are among the first animals to colonise emerging mineral and organic substrates. They disperse in various ways, including: transport on mammals, birds and insects as well as by wind or flowing water. Mites contribute to the cycles of carbon and in soil is fairly prevalent. Acariform mites have a feed on microbes and the remains of plants and animals through omnivory to predation. Parasitiform mites are predominantly predaceous surviving by preying on other organisms.

Diversity, abundance and biomass

In undisturbed systems, hundreds of mite species can be found in one square metre of soil. However, little is still known about general distribution patterns of mite species globally. However, they seem to be related to climate, availability and quality of organic matter, intensity of disturbance and the geological history of individual regions.

An exceptional persistence in nature

• Mites can withstand doses of radioactivity 100 times higher than those that would kill a human being.

• In heavily disturbed ecosystems, such as cities or industrial areas, soil mites can be the last indicator of primary habitats.

• This means that it is still possible to reconstruct the vegetation type and landscape conditions based on the mite communities remaining in the degraded areas.

• Oribatid mites have hard exoskeletons that often fossilise.

• That is why fossil mite assemblages, together with pollen analyses, are used by scientists as an additional tool for palaeogeographic (the study of past geography) reconstructions.

Farming Secrets says: Mites are great survivors and play an important role in nutrient breakdown

Ref: A Global Atlas of Soil Biodiversity p 51