



### **Morphology**

Rotifers are minute multicellular organisms (0.05 to 3 mm long). Their mostly transparent body is subdivided into a head, trunk, and a foot. They have three easily visible unique features:

- 1) their anterior ciliary organ called the corona (or crown);
- 2) a specialised food processing apparatus made of strong muscles and a set of hard jaws (the mastax with trophi);
- 3) a unique and well developed cuticle (the lorica), giving the animals a pseudo-segmented appearance, that can be exquisitely ornamented. The head and foot can be retracted inside the trunk if the animal is disturbed or if the environment dries out.

### **Taxonomy**

Rotifers (phylum Rotifera) are related to other worm-like organisms. Recent studies in DNA evolution have revealed that the parasitic worms of the phylum Acanthocephala are their closest relatives, if not themselves a group of specialised rotifers. Scientists recognise three groups of Rotifera, but only one, the **Bdelloidea**, is an important soil inhabitant.

### **Microhabitat**

Like many other minute organisms, rotifers have an absolute requirement for a water matrix during their active phase. They inhabit the capillary water retained between soil particles, litter or mosses, where they feed on bacteria or small algal cells. They are filter-feeders (i.e. feed by filtering food particles from water) or browse the bacterium film for particles. A few are predators of ciliates or of other rotifers, or suck out the content of cells after piercing the cell wall. Although they need water to live actively, the bdelloids, which are the most successful soil rotifers, have an extraordinary ability to survive prolonged periods of desiccation through a process called anhydrobiosis. In this state they not only survive adverse conditions but can also be easily transported to other habitats. Because of this and their reproductive features they are very effective at colonising and recolonising areas. Most rotifers, in particular bdelloids, can only be identified while alive. This has hampered their study significantly, to the extent that *little is known of their role in the functioning of soil systems*.

### **Diversity, abundance and biomass**

There are about 2 030 described species. They can be extremely abundant in moist soils and mosses but can occur in dry soils as well. They live in virtually every terrestrial habitat, from the Poles to the Equator, mostly near the soil surface.

### **Bdelloid rotifers, a female affair**

- Rotifers usually have distinct male and female organisms and sexually distinct male and female forms, with the females always being larger than the males. They reproduce sexually.
- Among rotifers, there is a particular group, the bdelloid rotifers, that originated around 80 million years ago, and there are now about 460 morphologically distinct species. These have evolved entirely without sexual reproduction and are assumed to have reproduced without sex for many millions of years. Males are absent and females reproduce only by parthenogenesis.
- The ability to acquire new functions has been achieved by incorporating DNA fragments of other organisms, such as bacteria, algae and fungi into their genome.
- These findings overturn current thinking that reproduction without sex is less likely to endure evolutionary changes than sexual reproduction.

***Farming Secrets says: Yet Another Reason For Retaining Moisture in Your Soil***

*Ref: A Global Atlas of Soil Biodiversity p 47*