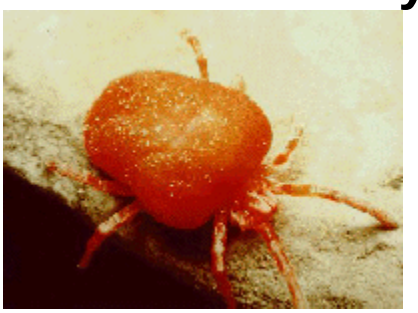
Chapter XXI —Subcohort Hydrachnidia



(True water mites)

- (Williams & Feltmate, 1992)
  - Superphylum Arthropoda
    - (jointed-legged metazoan animals [Gr, *arthron* = joint; *pous* = foot])
  - Phylum Entoma
  - Subphylum Chelicerata
  - Class Arachnida
  - Subclass Acari (mites)
  - Order Acariformes
  - Suborder Prostigmata (= suborder Trombidiformes, = suborder Actinedida)
  - Cohort Parasitengona
  - Subcohort Hydrachnidia- (= Hydrachnida, = Hydracarina) (True water mites)

The Hydrachnidia are not the only aquatic mites, but they are the most successful group of mites found in freshwater. The mites form a considerable part of the lasiophil fauna. They inhabit almost every aquatic habitat, and densities frequently exceed 200 mites/sq.metre. Water mites are frequently brightly coloured and sometimes relatively large (over 2 mm), making them more conspicuous than other aquatic mites, and thus exaggerating their already significant predominance. However, there is in fact a tendency for all the species recorded from the lasion to be small; 49 percent are under 1 mm long, whereas in the littoral fauna as a whole only 29 percent are as small as this.

Many water mites exhibit bright colour patterns, containing greens, blues, oranges or reds. Red predominates among species in the “primitive” Hydrovolzioidea, Hydrachnoidea, Eylaoidea, and Hydryphantoidea, and often the term *the red water mites* is used to denote this ancestral stem. Fish and invertebrates will eat water mites, but the brightly coloured species are apparently distasteful and predators learn to reject them.

The Hydrachnidia are among the most numerically abundant and taxonomically diverse of the freshwater aquatic mites. Several factors have probably contributed to their success:

- Their parasitic association with insects greatly increases their dispersal.
- Presumably, when the Chironomidae underwent rapid species radiation, so did the species of mites that parasitized them.
- Mite larvae feed on a different food source (either a different species or a different life history stage) from that of the deutonymph and adult. This trait adds energy from a different resource and minimizes competition between instars. (An analogous argument has been advanced as one of the factors contributing to the success of holometabolous insects).
- The resting stages are ideally suited for diapause, and several groups (e.g., *Arrenurus planus*) use these stages to avoid unfavourable conditions. (Again, an analogous argument has been applied to holometabolous insects).

- The ability to swim, restricted among mites to species of Hydrachnidia, greatly contributes to their dispersal and allows for a broader diversity of life styles.

Habitats

Species of Hydrachnidia are common in such lentic waters as swamps, marshes, ponds, and the littoral and profundal zones of lakes. They are often associated with vegetation or with the top few millimetres of substrate, but they can also lead a planktonic existence. Water mites are common, too, in the erosional and depositional zones of rivers, and the air-water interface at the margins of various water bodies harbours a variety of these mites. Some species are adapted to live in such extreme environments as thermal springs, glacial meltwater rivers, temporary pools, waterfalls, and in groundwater buried within gravel banks of streams (interstitial habitats). A few species can inhabit oceans and inland saline waters, although most are limited to **freshwater.**

Water mites in lentic waters are often free-swimming and conspicuously coloured, but many interesting species are cryptic, clinging to vegetation or buried in the substrate. There is also a distinctive fauna deep within gravel beds of lotic waters. Wet moss and other vegetation in bogs, springs, seepage areas, and at the margins of various water bodies harbour a characteristic mite fauna.

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