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Literature Reviews

Barthlott, W., Fischer, E., Frahm, J.P. & Seine, R. 2000, First Experimental Evidence for Zoophagy in the Hepatic *Colura*, *Plant Biol.*, 2: 93-97.

For the first time, the entrapment of protists (primitive, unicellular organisms that can neither be classified as plants nor as animals) in the so-called water sacs (highly differentiated hollow lobules characteristic of several foliose liverworts) of a recently described species of *Colura* (Lejeuneaceae, Hepaticae, i.e. liverworts) has been observed directly. *C. zoophaga* from the Aberdare Mountains in Kenya, growing on twigs of *Cliffortia nitida* (Rosaceae) is able to capture and retain the ciliate *Blepharisma americana*. The protists might be killed by complete desiccation, a process that frequently occurs in the natural habitat of the investigated liverwort without killing the liverwort. Decomposition of the prey is likely to occur by the action of bacteria, and digestion products may easily be taken up through the uncultured epidermis of the liverwort. The carnivorous syndrome of *C. zoophaga* is incomplete, the most obvious "deficiency" being an apparent lack of specific attraction of protozoa in comparison to other bryophytes (i.e. mosses, hornworts, and liverworts). Even mosses that are hitherto unsuspected of carnivorous tendencies seem to attract the protozoa at the same rate as *Colura*. A distinction between plant carnivory (a syndrome observed only in vascular plants that have cuticles and specific mechanisms of nutrient uptake and redistribution) and zoophagy (Greek for "eating animals", describing perhaps a quite widespread phenomenon among plants, distinguished from carnivory by the lack of a series of features like specific attraction and digestion) seems a useful approach to the strange behaviour of hepatics presented in this paper. The term "zoophagous" is rather problematic, however, because it insinuates that metazoa (i.e. true multicellular animals) are eaten, while in the investigated case only protists were captured. It will be difficult to assess the specificity and importance of animal nutrition to hepatics (or to bryophytes in general), because plants that do not use roots for the uptake of nutrients (cf. the bromeliads that likewise have been suspected of carnivory) are generally adapted to the opportunistic utilization of any organic matter eventually "trapped" by their vegetative organs. (JS)