

Mosses as a food component of groundhopper *Tetrix ceperoi*

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INTRODUCTION

Tetrigidae (groundhoppers) are small, short-horned Orthoptera with an elongated pronotum, which covers the abdomen and hind wings (Kočárek et al. 2005). Generally, Tetrigidae belong to the least-studied groups of Orthoptera (Hochkirch et al. 2006), when especially their ecological preferences and food biology is almost unknown. Tetrigidae are known to feed on algae, lichens, mosses, small plants and detritus, but there are published only a few concrete data about their food biology (Podgornaya 1983, Paranjape et al. 1987). In some species, as *Tetrix ceperoi* (Bolivar, 1887), the food preferences has not yet been studied in detail.

We carried out a preliminary analysis of the food composition by the dissection of the alimentary tract contents of *T. ceperoi*.



Fig 2: Habitat of *T. ceperoi* near Bzenec-Přivoz

Tab. 1. Frequency of the moss species in the gut content of *T. ceperoi* individuals

Moss species	Number of <i>T. ceperoi</i> specimens					
	♂(ind.)	♂(%)	♀(ind.)	♀(%)	Σ(ind.)	Σ(%)
<i>Barbula</i> sp. (<i>B. convoluta</i> or/and <i>B. unguiculata</i>)	6	31.6	6	35.3	12	33.3
<i>Bryum argenteum</i>	4	21.1	6	35.3	10	27.8
<i>Bryum caespiticium</i>	15	78.9	17	100	32	88.9
<i>Ceratodon purpureus</i>	6	31.6	7	41.2	13	36.1



Fig 1: *T. ceperoi* is a West-Mediterranean species, which reaches the north-eastern edge of its range in Central Europe. In the Czech Republic, the species has been reported for the first time in 2002 (Holuša & Holuša 2002) and up to now we know only few localities in southern Moravia. *T. ceperoi* is restricted to damp, warm habitats, such as dune valleys, sand pits or heath ponds in the territory of the Czech Republic



Fig 3



Fig 4

Fig 3, 4: Details of the most frequent moss species in the gut content of *Tetrix ceperoi*. Fig 1: *Bryum argenteum*; Fig 2: *Bryum caespiticium*

MATERIAL AND METHODS

The groundhoppers have been collected in the sand pit near Bzenec-Přivoz in SE Moravia (48°55'40.67"N, 17°16'47.37"E) by sweeping and immediately stored in ethylalcohol. Together with the insects, the samples of all visually different terrestrial mosses have been collected, that were subsequently identified to species level. Altogether, 21 males and 18 females of *T. ceperoi* have been used for dissections of their alimentary tract and the analysis of its content. The dissections have been made by the cutting of the abdomen cavity by thin forceps and taking out the oesophagus, crop and proventriculus. The permanent microscopic preparations of the alimentary tract content have been made with the use of Hoyer's solution (Anderson 1954). For the comparison and determinations of the tissue fragments in alimentary tract contents, the permanent microscopic preparations of the leaves of each moss species taken from the same locality have been made by the same method.

RESULTS

At least four mosses species have been found to be a component of the diet of *T. ceperoi*: *Bryum argenteum*, *B. caespiticium*, *Ceratodon purpureus*, *Barbula* sp. (*B. convoluta* or/and *B. unguiculata*), when the total number of epigeal mosses detected at the locality was 13 species. The most frequent moss in gut of *T. ceperoi* was *Bryum caespiticium* (in gut of 88,9 % specimens – see Tab. 1), which was also the dominant moss at the locality with dominance of 70 %. Altogether, the presence of at least one fragment of one moss species has been detected in 89,8 % of specimens, fragments of vascular plants (grasses) has been found in 20% of specimens (only females) and algae in 25% of specimens. Organic detritus was present in all specimens and occasionally some animal fragments have been found (sclerotised parts of unidentified beetle larvae). The average number of moss species detected simultaneously in gut content of one specimen was 1.5 in males and 2.0 in females, when the maximal number was 4 moss species (see Fig. 5).

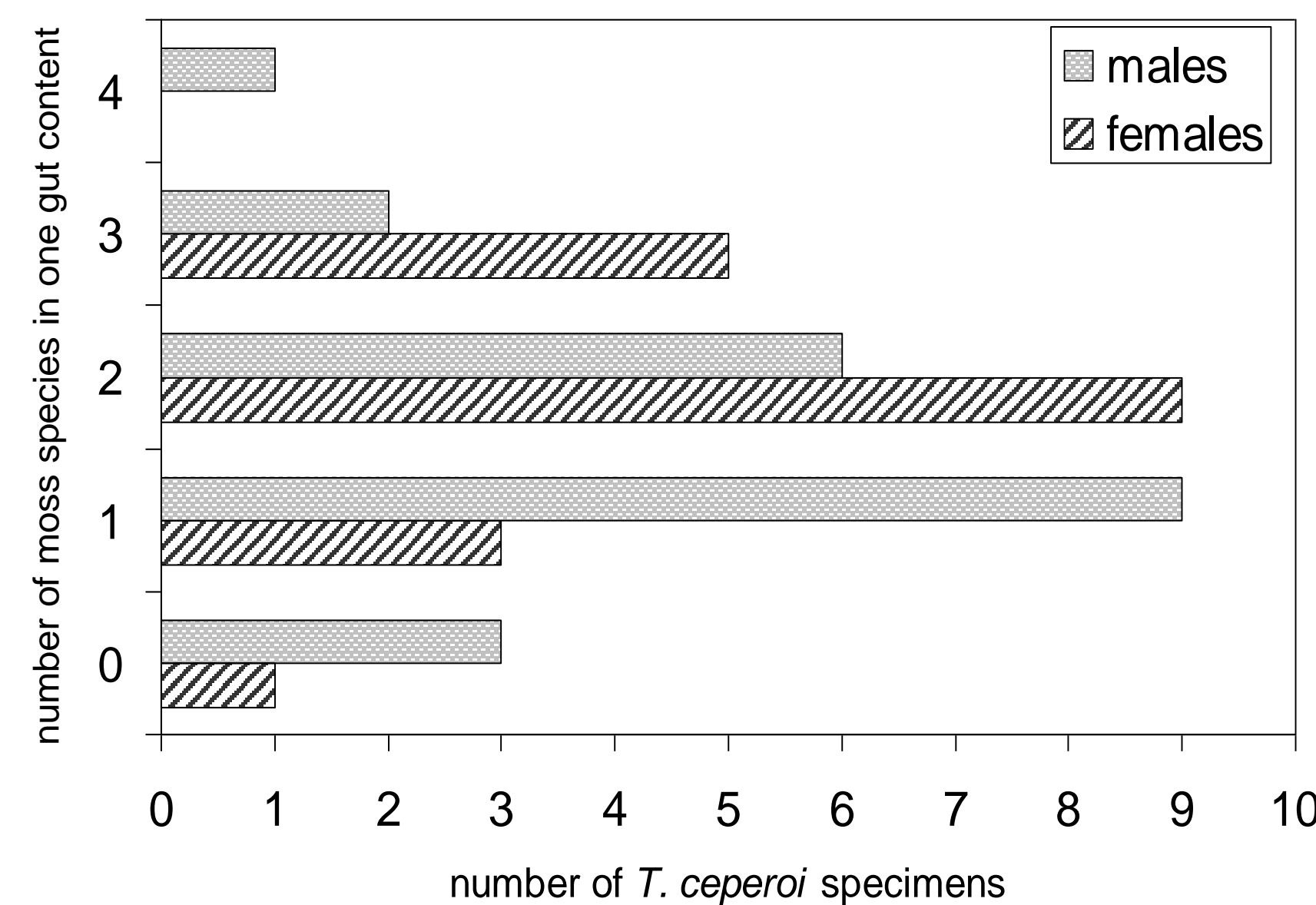


Fig 5: Number of moss species simultaneously detected in gut content of *T. ceperoi*

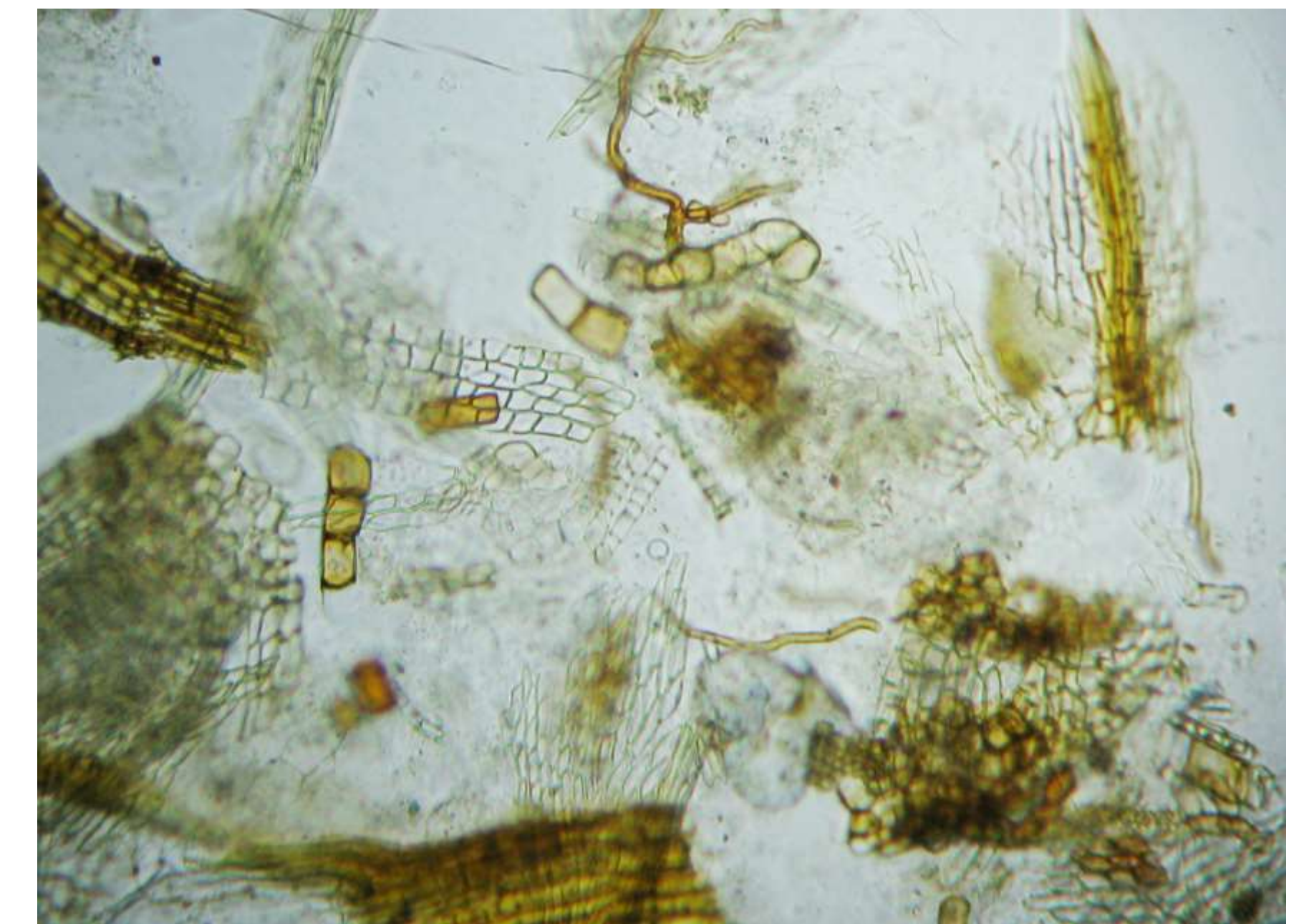


Fig 4: Fragments of mosses *Bryum caespiticium* in preparation from alimentary tract of *T. ceperoi*

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