

TITLE: FOOD PREFERENCE EXPERIMENTS WITH THREE COLLEMBOLAN SPECIES ON BT AND NON-BT MAIZE.

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Environmental impact of genetically modified maize plants on the soil biota is poorly known. This is a matter of regret, because on average about 5-6 metric ton ha⁻¹ residues of Bt-maize enter into soil on more than 40 million ha worldwide.

Near-isogenic and Bt-maize (DAS-59122-7) were grown in an experimental field in Nagykovácsi, Hungary in two consecutive years. DAS-59122-7 maize produces Cry34Ab1, Cry35Ab1 and PAT proteins. In the first year the inner part of the site was planted Bt-maize and in the external part with the near-isogenic maize. In the second year a traditional maize breed (Zamora) was planted too. Food preference tests were performed in the laboratory with different parts (root, stem, leaf) of the three maize breed (Bt, near-isogenic and Zamora). Three different collembola species were used in the tests (*Folsomia candida*, *Folsomia fimetaria* and *Heteromurus nitidus*). Paired choice assays were conducted. The animals were tested individually, one collembola was put in a Petri-dish of 3 cm diameter. Filter paper was put on the bottom and kept wet continuously. Hundred milligrams of near-isogenic and Bt-maize was placed oppositely in the arena. Fecal pellets in the 1 cm radius circle around the maize were counted after 8 days. 35 replications were applied in every cases.

All three collembola species preferred Bt-maize leaves over near-isogenic maize ones (*F. candida*: 107±34 and 70±17 fecal pellets on Bt and near-isogenic, respectively, p=0.001, *F. fimetaria*: 81±25 and 51±18 fecal pellets on Bt and near-isogenic, respectively, p=0.004, *H. nitidus*: 88±31 and 59±22 on Bt and near-isogenic, respectively, p<0.001). *F. fimetaria* had no preference on stem (13±8 and 17±11, Bt and near-isogenic, respectively, p=0.27), the other two species preferred the Bt opposite to the near-isogenic maize stem (*F. candida*: 68±22 and 55±19 fecal pellets, Bt and near-isogenic, respectively, p=0.053, *H. nitidus*: 22±12 and 14±8 fecal pellets, Bt and near-isogenic, respectively, p=0.013). At the case of the root only one collembola species (*F. candida*) was tested, but all three maize breed were offered in all possible combinations. *F. candida* preferred the root of the Zamora over the near-isogenic maize root (67±19 and 49±15 fecal pellets, Zamora and near-isogenic, respectively, p=0.023), but did not selected between the roots of Bt and near-isogenic maize (54±17 and 68±19 fecal pellets, Bt and near-isogenic, respectively, p=0.09) between the Bt and Zamora (48±13 and 53±13, Bt and Zamora, respectively, p=0.39). It is concluded that the presence of Bt-toxin of the DAS-59122-7 Bt-maize did not affect the food preference of the examined collembola species. Cellulose, hemicellulose and lignin contents of the near-isogenic maize was found (marginal significant) higher than that of Bt-maize. This finding might a reason of the food preference results.

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