



FURTHER STUDIES ON THE EFFECT OF PLANT INFUSIONS ON THE FEEDING OF *DEROCERAS LAEVE* (O. F. MÜLLER, 1774)

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ABSTRACT: The effect of ten plant infusions on feeding of a pest slug *Deroceras laeve* (O. F. Müll.) was tested in laboratory conditions. Infusions of ginger, cumin, garlic and dropsy were found to limit the slug feeding, while oregano infusions stimulated it.

KEY WORDS: pests, slugs, *Deroceras laeve*, feeding, plant infusions

INTRODUCTION

New methods and possibilities of protecting crops from slug feeding are still being sought. Recently, infusions or extracts of various plants have been increasingly used (KOZŁOWSKI et al. 2004, DANKOWSKA 2005, PISAREK 2005). A great majority of higher plants produce chemical compounds which may affect living organisms. They may to a lesser or greater extent limit

feeding of many animal species (ŁAKOTA & KWIATKOWSKI 1993). At the same time, they as much less harmful to the useful entomofauna and to humans, compared to synthetic compounds.

The aim of this study was to test infusions of 10 spice or aromatic plant species with respect to their effect on feeding of *Deroceras laeve* (O. F. Müller, 1774).

MATERIAL AND METHODS

The experiments were conducted in the Chair of Plant Protection Methods, Agricultural Academy, Poznań. They consisted in laboratory testing of infusions of cumin, ginger, basil, savory, oregano, thymes, marjoram, mint, garlic and dropsy. Portions of 5 and 10 g of dry plant matter were poured over with 100 ml boiling water and left covered for 24 hours. Following filtering through filter paper, fragments of white cabbage leaves (*Brassica oleracea* var. *capitata*) of 3 × 3 cm were dipped for 5 minutes in the infusion, and then placed in Petri dishes of 10 cm diameter, lined with three layers of damp filter paper. The leaves from control dishes were dipped in water. Each combination was run in four replicates, using five slugs of the same age and size. Prior to placing in the dishes and after the experiment (7 days) the leaves were weighed.

The following parameters were calculated based on the data: percentage of consumed leaf mass, palatability index (ratio of consumed mass of infusion-treated leaf to mass of non-treated leaf) and absolute deterrence index (ADI). ADI was calculated according to the formula of KIEŁCZEWSKI et al. (1979).

$$ADI = \frac{(K - T)}{(K + T)} \times 100$$

K – mean mass of control leaf consumed (mg)

T – mean mass of leaf of a given combination consumed (mg)

The results were statistically analysed with Duncan test at $\alpha = 0.05$.

RESULTS AND DISCUSSION

A comparison of the effect of the studied infusions on feeding of *D. laeve* based on the difference in the consumed leaf mass is presented in Table 1, and based on the percentage of consumed leaf mass, palatability index and ADI – in Figs 1, 2 and 3.

The effect varied between the infusions (Table 1, Figs 1–3). The infusion of 5 and 10 g ginger gave the best results. The percentage of mass consumed was 11.35 and 11.67, respectively, the palatability index 0.46 and 0.47, and ADI 14.31 and 18.49. The proportion of leaf mass consumed was also small when using

infusions of 5 and 10 g cumin (13.04 and 16.13), 5 g garlic (17.75) and 10 g dropsy (15.11). In the case of oregano infusions, the proportion of leaf mass consumed was high and amounted to 47.48 and 42.40, while the palatability index was close to 2.

In laboratory conditions the infusions of ginger, cumin, garlic and dropsy limited feeding of *D. laeve*, but these results should be tested in greenhouse conditions. Oregano infusions, on the other hand, had a stimulating effect on the slug feeding.

Table 1. Effect of plant infusions on the mass of leaf consumed by *Deroceras laeve*

Infusion	Mean leaf mass [mg]		
	initial	final	difference
Cumin 5 g	2.814	2.360	0.454 abcd
Cumin 10 g	3.406	2.962	0.444 abcd
Ginger 5 g	3.743	3.318	0.425 a
Ginger 10 g	3.341	2.951	0.390 abc
Basil 5 g	2.439	1.836	0.603 bcde
Basil 10 g	1.930	1.137	0.793 ef
Savory 5 g	2.663	1.918	0.745 def
Savory 10 g	2.458	1.712	0.746 def
Oregano 5 g	1.470	0.772	0.698 cde
Oregano 10 g	2.396	1.380	1.016 f
Thymes 5 g	2.601	2.098	0.503 abcde
Thyme 10 g	1.984	1.486	0.498 abcde
Marjoram 5 g	2.195	1.467	0.728 def
Marjoram 10 g	2.651	2.014	0.637 bcde
Mint 5 g	2.020	1.533	0.487 abcde
Mint 10 g	1.935	1.489	0.446 abcd
Garlic 5 g	1.961	1.613	0.348 ab
Garlic 10 g	1.708	1.150	0.558 bcde
Dropsy 5 g	2.518	1.893	0.625 bcde
Dropsy 10 g	3.242	2.752	0.490 abcde
Control	2.286	1.719	0.567 bcde
NIR – LSD			0.268

a, b, c, d, e, f – means marked by the same letter are not statistically different according to Duncan test ($\alpha = 0.05$)

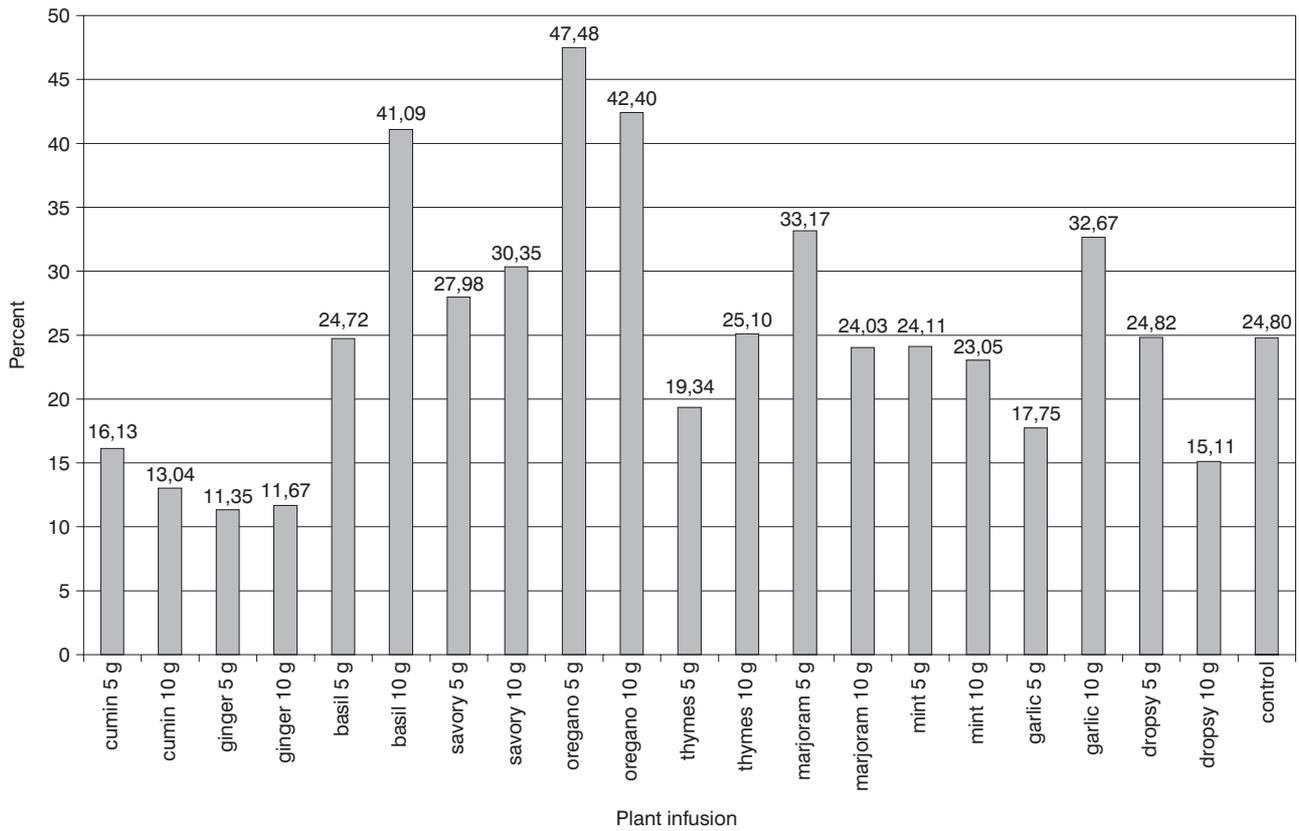


Fig. 1. Percentage of leaf mass consumed by *Deroceras laeve*

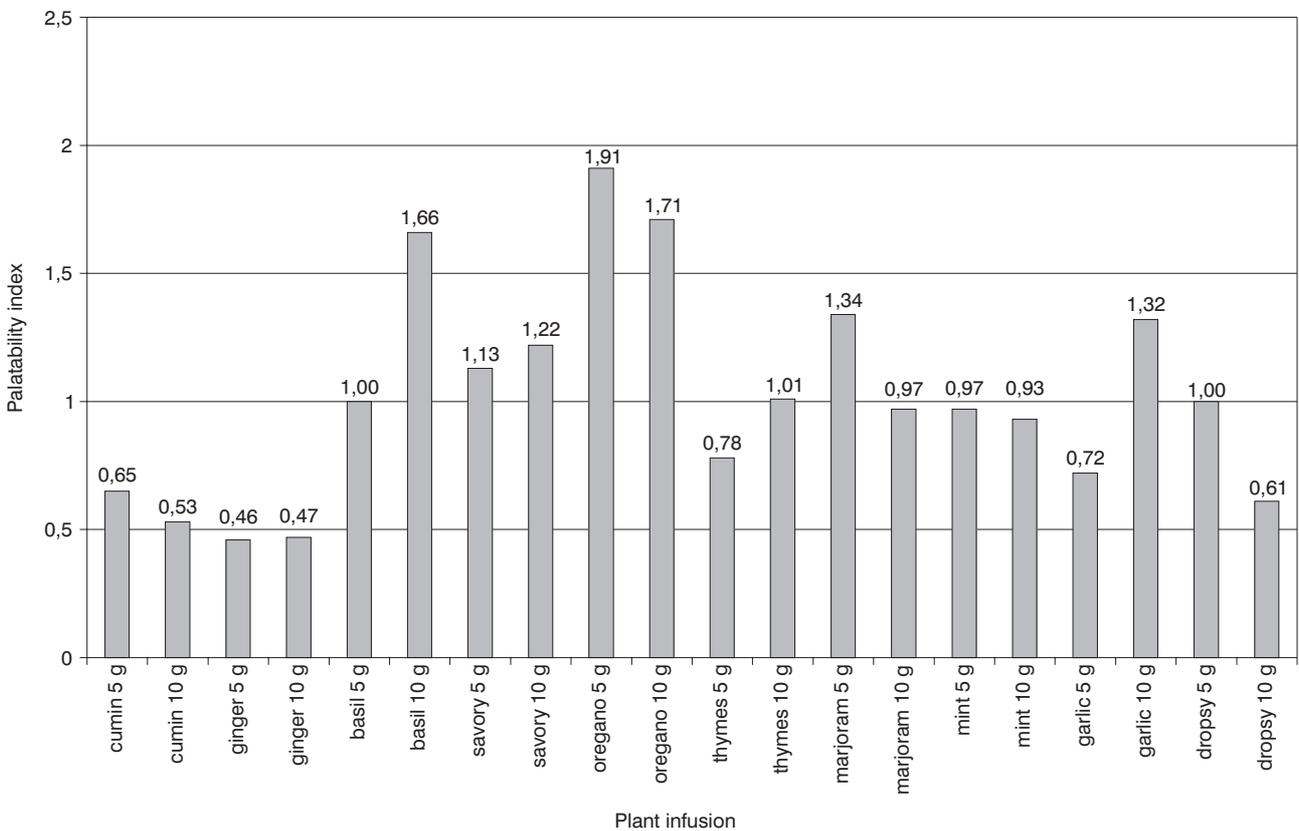


Fig. 2. Palatability index for the studied plant species

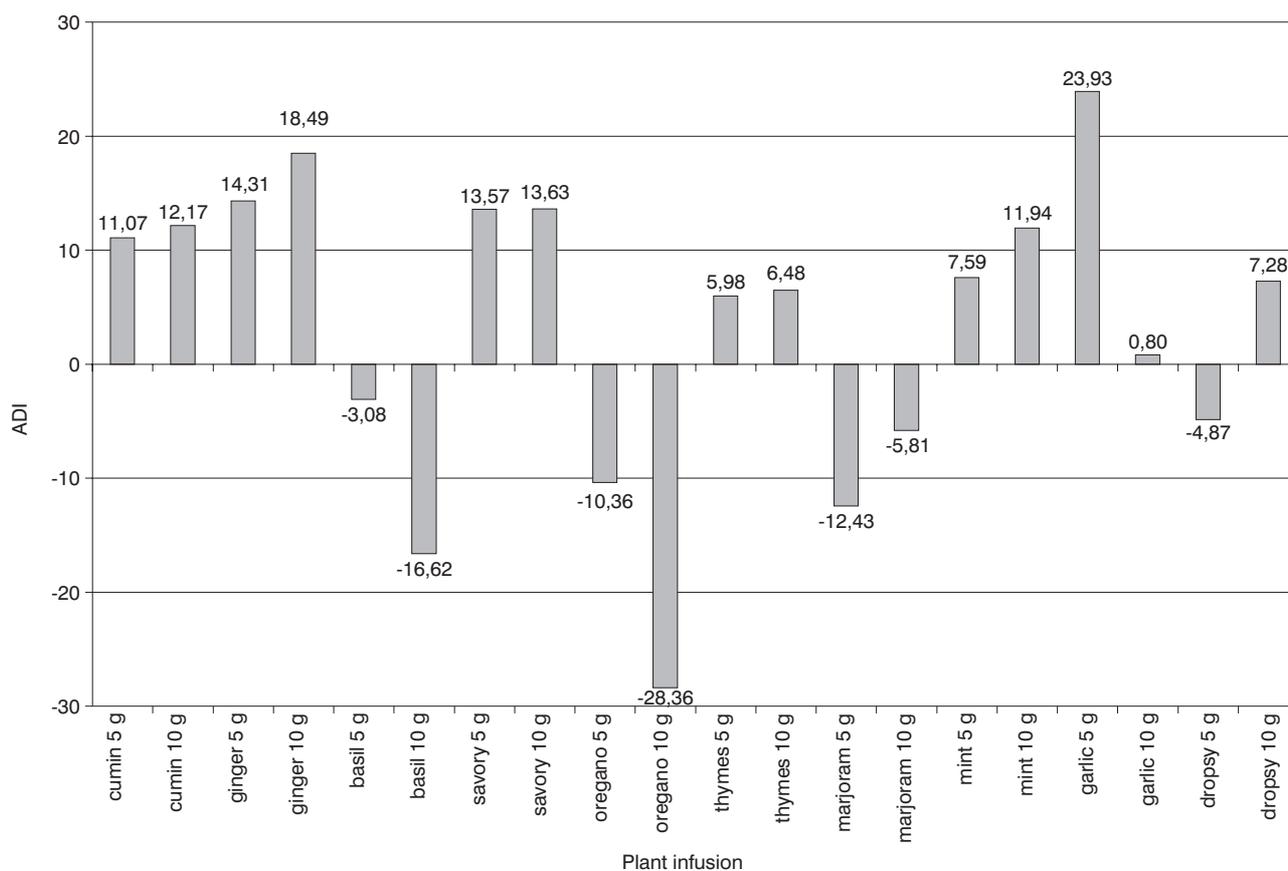


Fig. 3. Absolute deterrence index for the studied plant species

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