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PLANT EXTRACTS, INFUSIONS AND DECOCTIONS AS FACTORS LIMITING FEEDING ACTIVITY OF *DEROCERAS LEAVE* (O. F. MÜLLER, 1774) (GASTROPODA: PULMONATA: AGRIOLIMACIDAE)

EWA DANKOWSKA, IWONA KŁOSEK

Chair of Plant Protection Methods, A. Cieszkowski Agricultural University, Zgorzelecka 4, 60-198 Poznań, Poland (e-mail: kmor@post.pl)

ABSTRACT: The possible deterrent effect of extracts, infusions and decoctions of leaves of 11 plants on feeding activity of *Deroceras leave* (O. F. Müller) was studied in the laboratory. Leaves of the geranium *Pelargonium* × *hortorum* and *Dieffenbachia seguine* had the strongest deterrent effect.

KEY WORDS: *Deroceras laeve*, feedings activity, pest, plants, infusions, extracts, decoctions

INTRODUCTION

Slugs as pests may appear in masses which in greenhouses often leads to considerable damage to plants and consequently to decreasing their decorative and commercial value.

In recent years plant protection has favoured natural methods and means; increasing attention has been paid to plants and their derivatives as possible means of limiting the pest feeding (PISAREK 2003, DANKOWSKA 2005, 2006, DANKOWSKA & BENDOWSKA 2006, DANKOWSKA & ROBAK 2006).

MATERIAL AND METHODS

Extracts, infusions and decoctions of leaves of eleven plants were tested in the laboratory for their ability to limit feeding activity of *Deroceras laeve* (O. F. Müller, 1774). The experiment included four replicates; it was conducted in Petri dishes 12 cm in diameter, lined with three layers of damp filter paper. Fresh pulverised plant material (5 g) served to prepare decoction, infusion and extract using 100 ml of water. Fragments of 9 cm^2 area (3 × 3 cm) cut out of white cabbage leaves were submerged for 5 minutes in thus prepared liquids, and then offered to slugs. Control leaves were submerged in water. Each replicate used five slugs of equal size and age. The leaf fragments were weighed before offering them to the slugs and again after 7 days. The results were statistically analysed using Duncan test at $\alpha = 0.05$; the percentage of consumed mass, palatability index (ratio of percent of consumed leaf mass in each experimental variant to the percent of mass consumed in control) and deterrence index, considering the relation between quantity of food eaten in experimental variants and that eaten in the control, were calculated.

The absolute deterrence index (KIEŁCZOWSKI et al. 1979) was calculated according to the formula:

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

where: K – leaf mass eaten in control (g), T – leaf mass eaten in experimental variant .

RESULTS AND DISCUSSION

The list of examined plants and the leaf mass consumed by *D. laeve* are presented in Table 1, the percent of mass consumed, palatability index and the absolute deterrence index (adi) in Figs 1–3.

Among the tested plants *Pelargonium × hortorum* and *Dieffenbachia seguine* proved to be the most effective. The mean palatability indices for the two plants were the smallest, of 0.40 and 0.45, respectively. In the

Table 1. Leaf mass consumed by *D. laeve*

Plant	variant	Mean leaf mass (g)		
		initial	final	consumed
Chelidonium majus L.	extract	3.51	3.16	0.35 cde
	infusion	3.24	2.93	0.31 bcd
	decoction	2.58	2.03	0.55 efg
Hedera helix L.	extract	2.43	2.25	0.18 abc
	infusion	2.77	2.63	0.14 abc
	decoction	2.19	1.92	0.27 abcd
Ranunculus repens L.	extract	3.47	3.30	0.17 abc
	infusion	2.61	2.16	0.45 def
	decoction	3.14	2.59	0.55 efg
Phytolacca americana L.	extract	3.27	2.99	0.28 abcd
	infusion	3.31	3.02	0.29 bcd
	decoction	3.41	3.19	0.22 abc
Dieffenbachia seguine (Jacq)	extract	3.99	3.83	0.16 abc
	infusion	4.14	3.98	0.16 abc
	decoction	3.99	3.82	0.17 abc
Pelargonium × hortorum (Bailey)	extract	3.87	3.65	0.22 abc
	infusion	3.29	3.25	0.04 a
	decoction	3.59	3.45	0.14 abc
Quercus robur L.	extract	1.51	1.41	0.10 ab
	infusion	1.56	1.45	0.11 ab
	decoction	1.57	1.45	0.12 ab
Aesculus hippocastanum L.	extract	1.67	1.07	0.60 fg
	infusion	1.78	1.26	0.52 efg
	decoction	1.55	1.01	0.54 efg
Sambucus nigra L.	extract	1.47	0.68	0.79 h
	infusion	1.60	0.89	0.71 gh
	decoction	1.48	0.94	0.54 efg
Taxus baccata L.	extract	2.74	2.57	0.17 abc
	infusion	2.62	2.47	0.15 abc
	decoction	3.22	3.11	0.11 ab
Rhododendron sp.	extract	3.39	3.21	0.18 abc
	infusion	2.47	2.28	0.19 abc
	decoction	3.12	2.91	0.21 abc
control		2.90	2.64	0.26 abcd
smallest significant difference			0.18	

a,b,c – mean values marked with the same letter do not differ statistically significantly at $\alpha = 0.05$

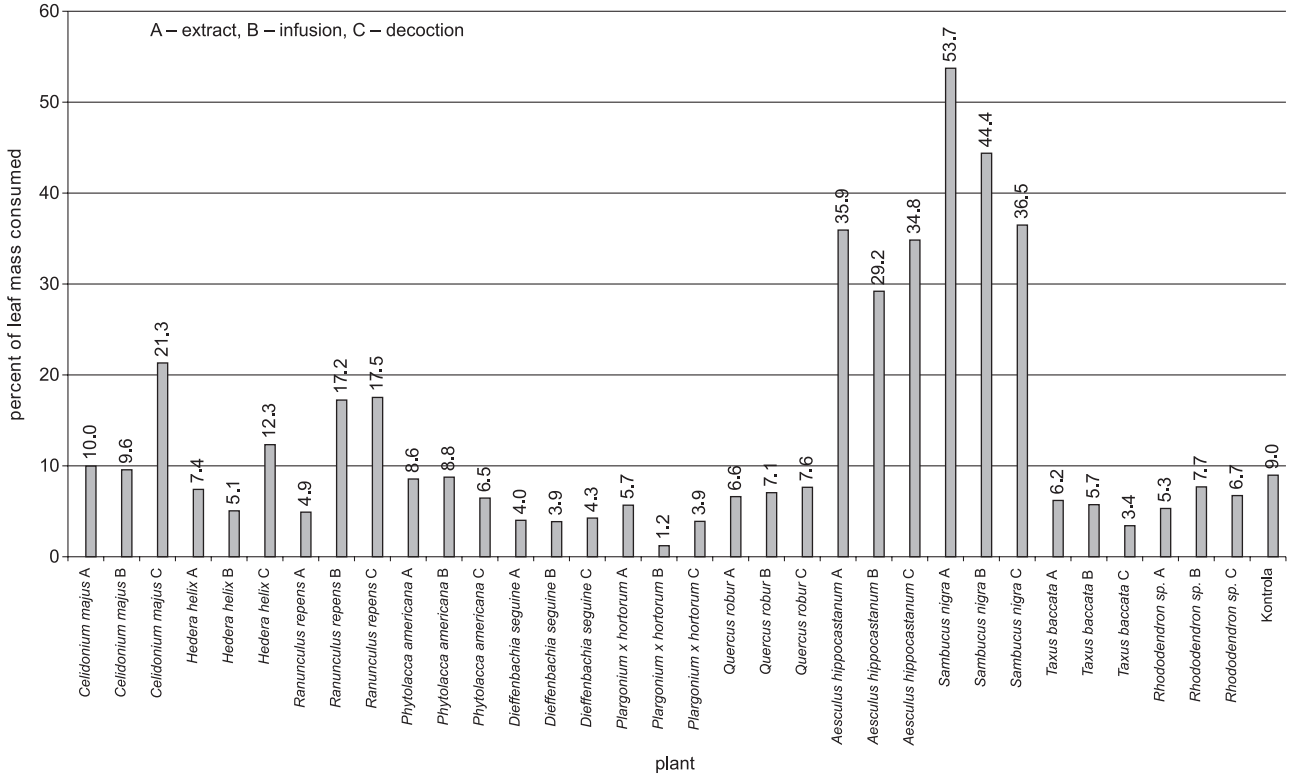

Fig. 1. Percent of leaf mass consumed by *D. laeve* in experimental variants using various plants

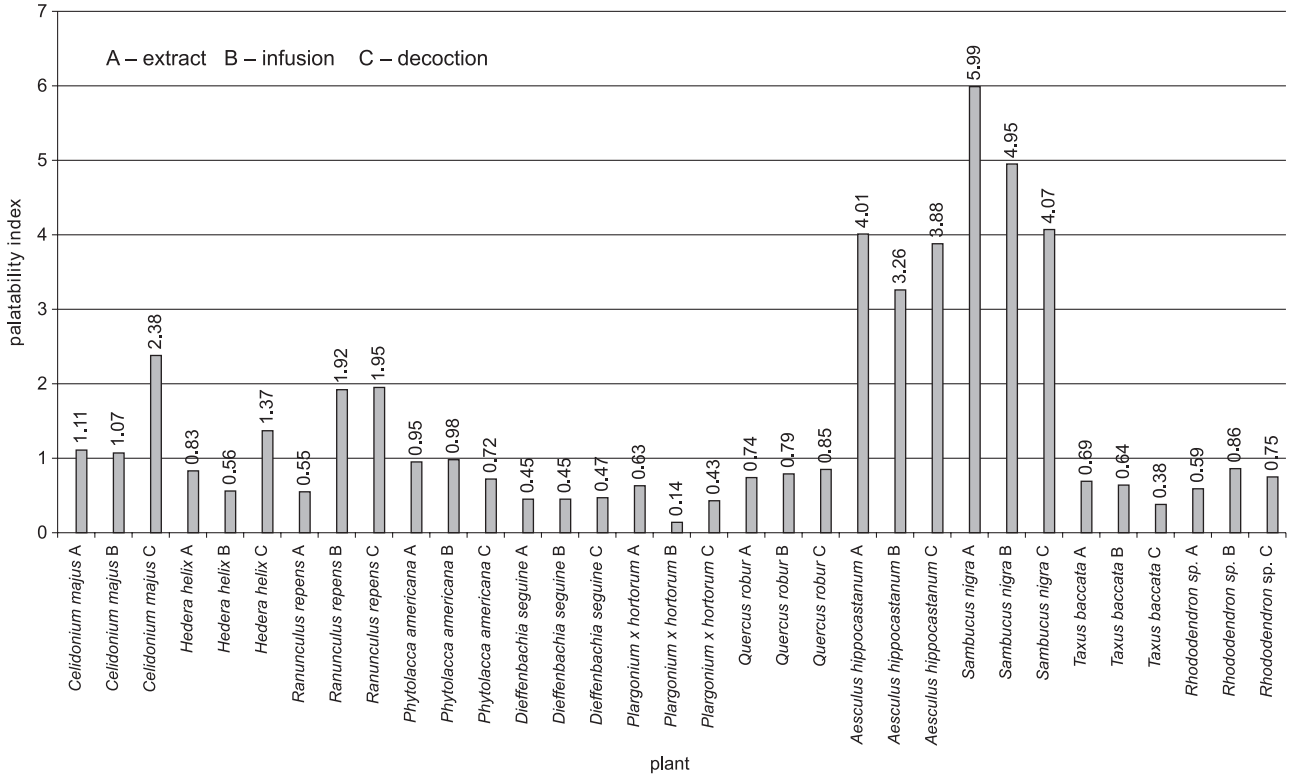

Fig. 2. Palatability of various plant derivatives used in the experiment

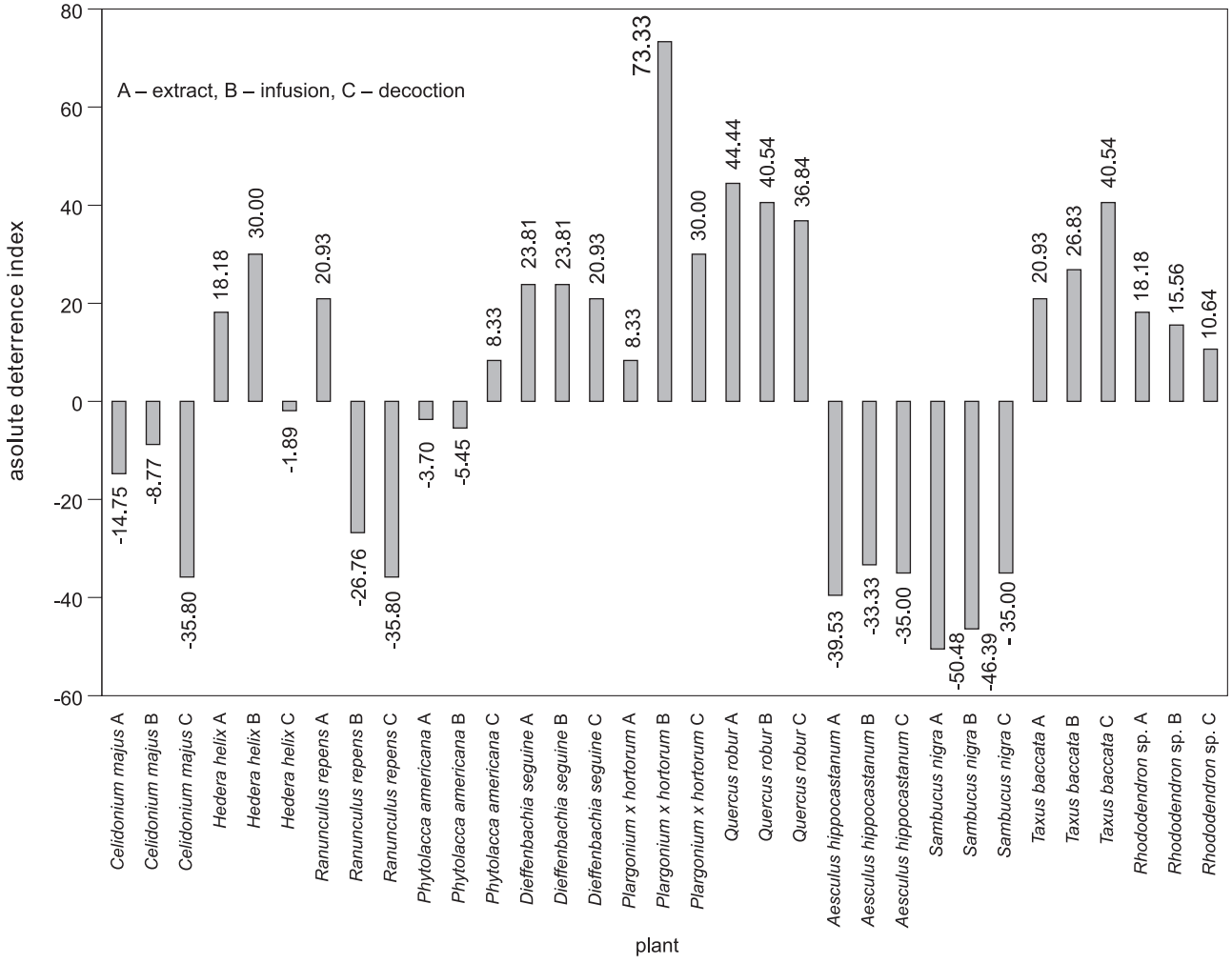

Fig. 3. Absolute deterrence index of various plant derivatives used in the experiment

studies of DANKOWSKA & ROBAK (2006) the palatability index for *Dieffenbachia* was also low – 0.32. *Sambucus nigra* showed the highest palatability index (5.0). Similar results were obtained by DANKOWSKA (2006). The highest deterrence index value (73.33) was that obtained for the infusion of *Pelargonium × hortorum*.

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