Preliminary Research on the Efficiency of Some Vegetal Metabolites in Fighting The Mealy Plum Aphid (*Hyalopterus pruni* Geoffroi – *Ord. Homoptera*).

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1. Introduction

Our research on the mealy plum aphid (*Hyalopterus pruni* Geoffroi) is in keeping with the present-day context of using less and less chemically synthesized insecticides and of finding products based on vegetal metabolites to fight the vermin but at the same time not get in conflict with other biotic and abiotic components.

Many similar endeavours have recently been carried out by numerous authors who emphasized the efficiency of some new plant metabolites on different species of insects. Of these, we enumarate: treating the Colorado potato beetle larvae with different plant extracts presented death rates; thus, *Heracleum sosnowskyi* Manden (75–80%), *Artemisia absinthium* L. (70%), *Artemisia dracunculus* L. (47%-L 1, 43%-L2), *Tanacetum vulgare* L. (24%) şi *Levisticum officinale* Koch (33%) (Metaspalu L. et al., 2001); in laboratory, the extracts of *Allium sativum* L., *Taxus baccata* L., *Heracleum sosnowskyi* Manden, *Primula veris* L., *Urtica dioica* L., *Achillea millefolium* L., *Colchicum autumnale* L, *Phaseolus vulgaris* L. şi *Tussilago farfara* L. reduced significantly the development of the common spruce seedlings bark beetle (*Hylobius abietis* L.) (Sibul I. et al., 2001); the extracts of *Ocimum basilicum* L., *Origanum majorana* L. şi *Salvia officinais* L. were proved toxic against larvae of *Spondoptera littoralis* Boisd. (Roman P., 2004); the extract of dry leaves of *Melia azedarach* L., mixed with distilled water, at a temperature of 48ºC, filtered after 24 hours and then applied to the cabbage leaves, managed to destroy 90% of the *Plutella xylostella* L. caterpillars (Berg A,M., 2000); some plants are cabbage butterfly repellent, for example: *Salvia officinalis* L., *Rosemarinus officinale* L., *Hyssopus officinalis* L., *Thymus vulgaris* L., *Anethum graveolens* L., *Artemisia abrotanum* L., *Mentha sp., Tanacetum vulgare* L. (Endersby N.M. et Morgan W.C., 1991); wormwood (*Artemisia abisinthium* L.) and speedwell infusions (*Tanacetum vulgare* L.) tested on *Macrosiphum sp.* Homoptera on potato, *Trialeurodes vaporariorum* West. On cucumber and *Cinaria cupressi* Buckton on white cedar presented a maximum of efficiency (30-40%) (Ciceoi Roxana, 2005); the active elements of medicinal and aromatic herbs caused different degrees of mortality to the species *Acanthoscelides obtectus* Say. (90%), *Mentha piperita* L., (80%), *Hypericum perforatum* L.,

Achillea milefolium L.. *Calendula officinalis* L. (96%), also having a repellent inhibitive effect on nutrition and reproduction (Ecobici Maria Monica et al., 2004).

2. Material and Research Method

We used as material: metabolite aqueous extracts (25 gr. dry plant powder for one litre of water, soaked in a cool place, stirred up and filtered) from different species of local cormophyte species such as: the common ladyfern (*Athyrium filix-femina* (L.) Roth), the fern (*Dryopterix filix-mas* (L.) Schott), the speedwell (*Tanacetum vulgare* L.), the danewort (*Sambucus ebulus* L.), the hedge nettle (*Stachys sylvatica* L.), the monk's hood (*Aconitum vulparia* Reichenb.), the wormwood (*Arthemisia absinthium* L.), the nettle (*Urtica dioica* L.), spring pheasant's eye (*Adonis vernalis* L.), the European birthwort (*Aristolochia clematitis* L.); jars, borcane de creştere, sprayers and shoots with leaves affected by the aphid.

We used the following research methods:

- **the lab experiment**, which consisted in spraying with different metabolite extracts the shoots with leaves placed in jars, at a normal temperature and moisture, each variant being repeated thrice; we observed the ability to aurvive of the mealy plum aphid both in the case of the trated samples and the witness samples; we took into consideration only thefirst three days; we began the experiment on the 10th of September 2007.

- **the „in situ" experiment**, which consisted in spraying with different metabolite extracts the shoots with leaves belonging to plum woody samples (*Prunus domestica* L.) at a normal temperature and moisture (no rain); different samples have been finely sprayed, using extracts from two plants; we began the experiment on the 14th of September 2007.

The Efficiency (**E%**) after the percentages of mortality was calculated according to the Schneider-Orelli formula:

$$E\% = \frac{b-k}{100-k} x100;$$

in which: b = percentage of individuals in the treated sample, and k = percentage of individuals found dead in the witness sample.

3. Results

In the case of the lab experiment, the most efficient results appeared in the variants treated with wormwood extracts (81.25%), speedwell-wormwood (93.7%), speedwell-dwarf elder-wormwood (81.25%), nettle-pheasant's eye-European birthwort (93.7%). A remarkable fact is that the species of predatory insects like the coccinellidae larva (*Scymnus subvillosus* Goeze, *Coccinella septempunctata* L.) and an itonidid (*Aphidoletes aphidiomyza* Rond.).

Table 1. The efficiency of metabolic products tested in laboratory

No.	Variant and doses	Mortality %		E%
		1day	3days	
1.	Faster 10 EC, 0,02% - insecticidal witness	1-2	100	**100**
2.	*Athyrium filix-femina*	18-20	20	**0**
3.	*Dryopteris filix-mas*	0	20	**0**
4.	*Tanacetum vulgare*	30	35	**1.25**
5.	*Sambucus ebulus*	50	55	**31.2**
6.	*Stachys sylvatica*	15	40	**25**
7.	*Aconitum vulparia*	20	55	**43.7**
8.	*Artemisia absinthium*	85	90	**81.2**
9.	*Urtica dioica*	2	7	**0**
10.	*Adonis vernalis*	1-2	40	**25**
11.	*Aristolochia clematitis*	10-12	10	**0**
12.	*Tanacetum vulgare+Artemisia absinthium*	15	95	**93.7**
13.	*Tanacetum vulgare+Sambucus ebulus+Artemisia absinthium*	25	85	**81.2**
14.	*Urtica dioica+Aristolochia clematitis*	5-8	40	**25**
15.	*Urtica dioica+Adonis vernalis+Aristolochia clematitis*	40	90	**93.7**
16.	Non-treated (witness sample)	0	20	**-**

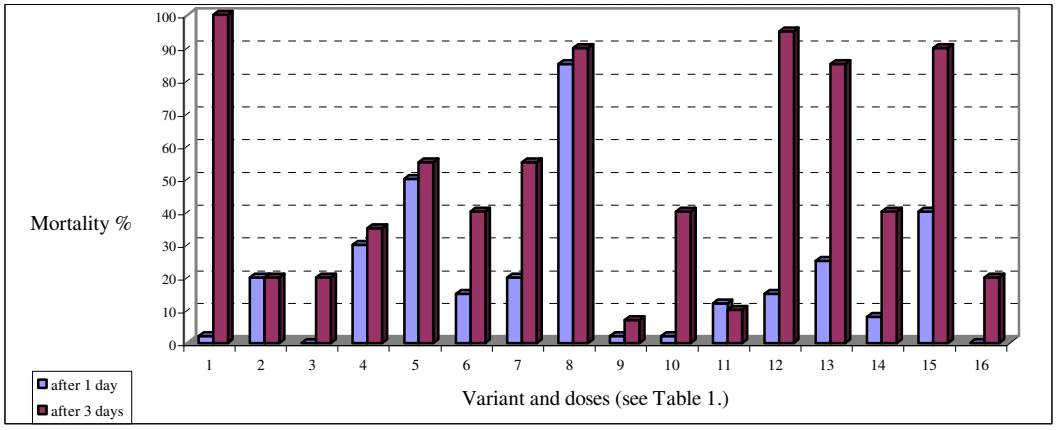

Fig. 1. The efficiency of metabolic products tested in laboratory

Fig. 2. The mealy plum aphid (*Hyalopterus pruni* Geoffroi)

Fig. 3. The mortality of *Hyalopterus pruni* at one day after the treatment with

Fig. 4. The mortality of *Hyalopterus pruni* on 1 day after the treatment with danewort extract

wormwort (absynth) extract

Fig. 5. The mortality of *Hyalopterus pruni* after the treatment with speedwell and wormwort extract

Fig. 6. The mortality of *Hyalopterus pruni* after the treatment with speeedwell, danewort and wormwort extract

Fig. 7. The itonidid predator *Aphidoletes aphidiomyza* Rond, unaffected by extracts

In the case of the field experiment, we only chose two extracts (of wormwort and danewort), used both separately and mixed. The results gave emphasis to the efficiency of the danewort and danewort-wormwort extracts (Table 2).

Table 2. Efficiency of some metabolites in the field experiment

No.	Variant and doses	Mortality %, after 1/3days		E%
		1 day	4 days	
1.	*Arthemisia abinthium*	40	100	**100**
2.	*Arthemisia absinthium* + *Sambucus ebulus*	95	100	**100**
3.	*Sambucus ebulus*	100	100	**100**
4.	Non-treated	15	20	**-**

4. Conclusions

A comparison between our results the results of similar experiments using metabolite extracts of wormwood (absynth) and speedwell on aphids, which took

place at the University of Agronomical Sciences and Veterinary Medecine from Bucharest (Ciceoi Roxana, 2005), highlights the fact that the extracts are less efficient (wormwood - max. 35.30%; speedwell - 40.25%). What the two experiments have in common is the fact the predatory insects remained unaffected by these metabolite extracts.

The conclusions resulting from these experiments are:

- in laboratory, the metabolites of the plants under study had various effects (a high degree of efficiency in combinations such as wormwood-speedwell and wormwood-speedwell-dwarf elder, as well as the extract of wormwood (absynth) alone (81.25% - 93.70%);

- the results of the field experiments confirmed the lab results for the dwarf elder and wormwood;

- these metabolites did not affect the entomophagous fauna found on the shoots with leaves under treatment;

- different species of local cormophytes contain metabolites worth studying.

The research was carried out as part of the grant no. 768 CNCSIS/2007.

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Abstract

Preliminary Research on the Efficiency of Some Vegetal Metabolites in Fighting The Mealy Plum Aphid (*Hyalopterus pruni* Geoffroi – *Ord. Homoptera*).

The paper presents the results of treating shoots with leaves overrun with the mealy plum aphid (*Hyalopterus pruni* Geoffroi) both in laboratory and in the field, using different metabolites extracted from local plants.

Keywords: vegetal metabolites, *Hyalopterus pruni*, wormwood (absynth), dwarf elder, speedwell.

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