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A Preliminarily Study of Antifungal Activity of Some Active Substances from Plant Origin according to *Monilia fructigena*

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Abstract

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During the summer of 2006 year, an in vitro test with conidia of *Monilia fructigena* treated with active substances from plant origin was conducted in Laboratory of "Chemical Protection of Plants" in Agricultural University, town of Plovdiv, Bulgaria. The results shown a potential effectiveness of the plant substances onto this plant pathogen and promising future field investigations with them and eventually formulation as plant protection environmentally friendly pesticides and their possible application in organic agriculture.

Key words : plant protection, naturally friendly pesticides, organic agriculture, plant substances

Introduction

The plant substances are known from years as effective remedy for different disease in humans, animals and plants. Before industrialization age and rise of the synthetically formulated pesticides, the plant water extracts are successfully used for pest management against different plant pests – insects, pathogens, weed (Murray et al., 2001). The *Monilia fructigena* is one of the major plant pathogen in on orchard cultures for the area of South – East Europe, respectively – Bulgaria. Together with *Monilia laxa* every year this plant disease may cause a sever yield decrease in fruit production in variety of orchard cultures. In order to prevent damages from it it's very important to be developed a safe for human, animals and environment biopesticides.

Materials and Methods

Used Biopesticides

Investigated plant substances was follows:

• PA – plant product on base of plant derivated undecilenates in concentrations: 0.1, 0.07, 0.05, 0.01, 0.005, 0.001, 0.0005,

0.0001. 0.00005, 0.00001 %;

• SR – plant product – soap of plant derivated oil from plant of Family *Apiaceae,* in concentrations: 3.0, 1.0, 0.5, 0.1, 0.08, 0.05 %;

• TR – crude ETOH plant extract from plant of Family *Asteraceae* in concentrations: 1.0, 0.5, 0.3, 0.2, 0.1 % ;

Plant Pathogen conidia Preparation

The conidia from infected fruits with *Monilia fructigena* from plum orchard situated in area of Scence Field Research Centre of Agricultural University, town of Plovdiv, Bulgaria was collected in summer of 2006. With fine brush the conidia from infected fruits was removed in flask contained distilled water and the number of conidia was adjusted to 5000 conidia per milliliter with a haemocytometer and in this way, a conidia suspension was prepared.

Conducted Tests

A microscope slides was treated with investigated biopesticides – four slides per pesticide, after drying of them, 0.5 ml of the conidia suspension was drop on every slide (additional four slides was not treated and they was used as control). The slides after than was placed in petri dishes, the bottom of which was covered with wetted with distilled water filter paper. The petri dishes were incubated for 24 h at 24 ° C in light. After incubation the slides was observed with light microscope (object – glass - zoom factor 10x). Four randomly selected observation area from each slide was investigated and the number (respectively – the percent) of germinated conidia was counted. Additionally the conidia was inspected for signs of deformations which are typically for pesticide impact on its. Effectiveness of the plant substances was calculated by using of formulae of Abbott (Abbott, 1925) – as compare of the percent of germinated conidia in control and in treated slides.

Results and Discussion

Figure 1 shows the effectiveness of the plant pesticide PA. The graphic clearly illustrate the strong antifungal effect onto conidia of *Monilia fructigena* even in

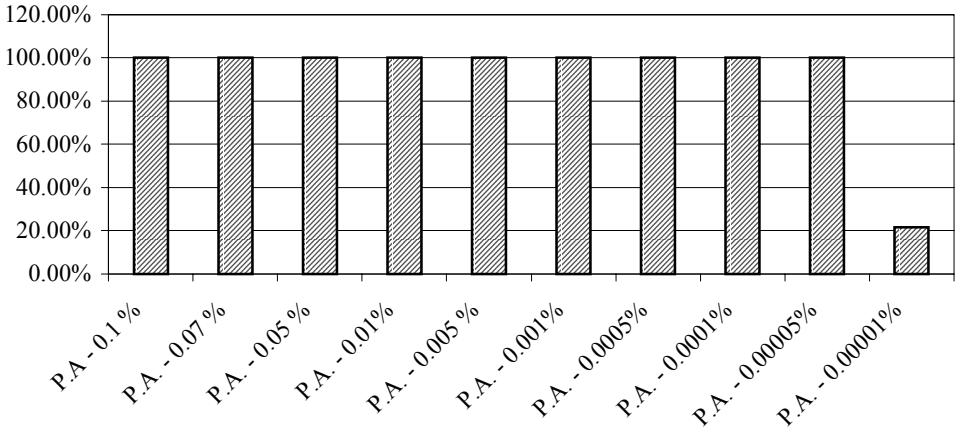

Fig. 1. PA - Effectivenes against *Monilia fructigena*

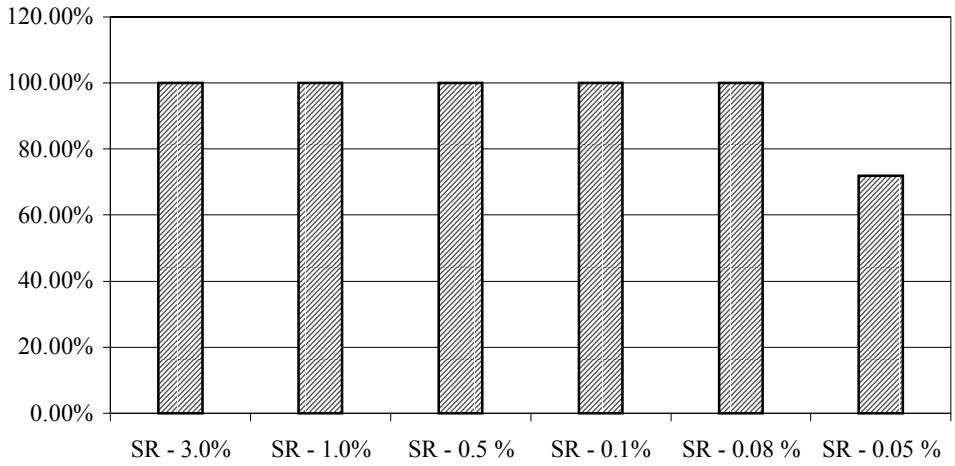

Fig. 2. SR - Effectiveness against *Monilia fructigena*

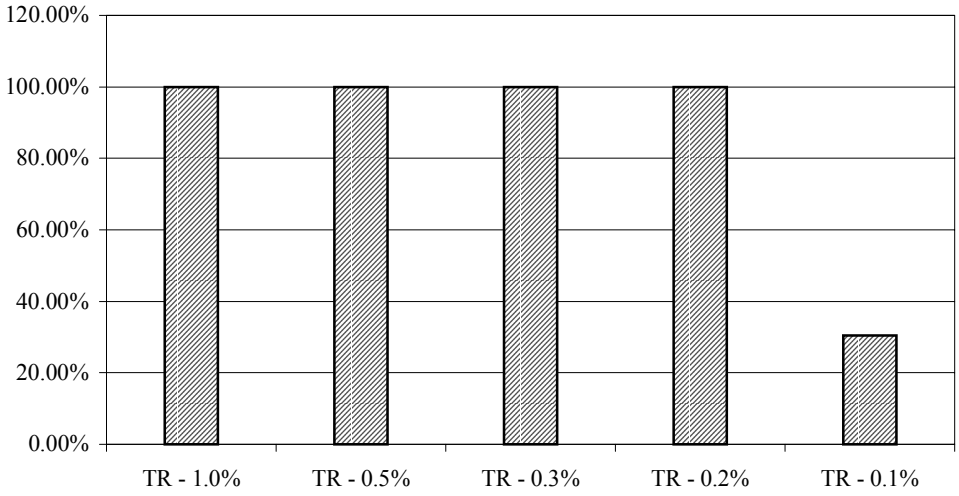

Fig. 3. TR - Effectiveness against *Monilia fructigena*

0.00005 % concentration. The conidia in treated slides were strongly deformed.

The next figure (Figure 2) shows the effect of the plant soap SR – it can provide satisfactory control on conidia of plant pathogen in 0.08 – 0.06 % concentration. The last figure (Figure 3) illustrate the effectiveness of the plant extract TR – even the fact that this is the crude plant ETOH extract it show effect on conidia in 0.2% concentration. The all of investigated plant substances shown a excellent antifungal effect according to conidia of *Monilia fructigena* in conducted in vitro tests in very low concentrations. So this is the sign for their future purification and formulation as plant protection products and tests them in real field conditions. With atten-

tion must be guided with plant soap SR, because as soap it may cause a phytotoxic effects on plants – in this case a preliminarily tests for evaluation for adverse plant effects must be conducted with plant deri-vate product SR. In addition must be mentioned that the decreasing concentrations shown in figures are due to that, the substances was tested from highest to lowest concentration during of the tests.

Conclusions

For the first time, the effectiveness of products (PA, SR, and TR) according to conidia of *Monilia fructigena* is reported. These pesticides are completely new, environmentally friendly and applicable in organic agriculture. The future investigation of the products will be conducted in order to be confirmed the reported results, especially – real field tests.

References

Abbott, W. S., 1925. A method of computing the effectiveness of an insecticide. *Journal of Economic Enthomology*. **18:** 267-271.

Batra, L. R., 1991. World species of *Monilinia* (Fungi): Their ecology, biosystematics and control. *Mycol.Mem.* **16:** 1 – 246.

Byrde, R. J. W. and H. J. Willetts, 1977. The Brown rot fungi of fruits: Their biology and control, *Pergamon,* Oxford, 246 pp. (Pl).

Ogawa, J. M. and H. English, 1991. Diseases of temperate zone tree fruit and nut crops, University of California, Division of Agriculture, *Nat. Resources Publication*, 3345 pp. (Pl).

Schlosser, E., 1996. Materials for alternative plant protection. *J. Environ. Sci. Health*. **B31, 3:** 391 – 397.

Qasem, R. J. and H. A. Abublan, 1996. Fungicidal activity of some common weed extracts against different plant pathogenic fungi. *J. Phytopathology*, pp. 144 - 157.

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