

## EFFICACY EVALUATION OF CERTAIN "BIO" PRODUCTS ON POWDERY MILDEW PATHOGENS ON TOMATOES AND MELONS IN LABORATORY CONDITIONS

### EVALUAREA EFICACITĂȚII UNOR PRODUSE „BIO” FAȚĂ DE AGENȚII PATOGENI CARE PRODUC FĂINAREA LA TOMATE ȘI PEPENI GALBENI ÎN CONDIȚII DE LABORATOR

**ȘOVĂREL Gabriela<sup>1</sup>, COSTACHE M.<sup>1</sup>, SCURTU I.<sup>1</sup>, VELEA M.<sup>2</sup>**  
e-mail: gabriela\_sovarel@yahoo.com

**Abstract.** *The purpose of this experiment was to study the biological efficacy of "bio" products Mimoten 0.3% (80% Mimosa tenuifolia extract) and Zytron 0.15% (20% citric seeds extract), on tomatoes and melons against Erysiphe sp. and Sphaerotheca fuliginea, respectively. The experiments were carried out in "wet chambers" (in thermostat at  $26 \pm 2^{\circ}\text{C}$  and 60 -70% RH) on detached leaves with similar levels of the attack degree from tomato and melons plants attacked by Erysiphe sp. on tomatoes and Sphaerotheca fuliginea on melons. The combination of Mimoten 0.3% + Zytron 0.15% products had the best efficacy in controlling of both pathogens Erysiphe sp. on tomatoes (76.3%) and Sphaerotheca fuliginea on melons (65.4%).*

**Key words:** tomatoes, melons, Erysiphe sp., Sphaerotheca fuliginea

**Rezumat.** *Scopul acestei experiențe a fost evaluarea eficacității biologice a produselor „bio” Mimoten 0,3% și Zytron 0,15%, la tomate și pepeni galbeni față de agenții patogeni Erysiphe sp. și respectiv Sphaerotheca fuliginea. Experiențele s-au efectuat în „camere umede” (la termostat  $26 \pm 2^{\circ}\text{C}$  și 60 -70% umiditate atmosferică), pe frunze detașate, care prezentau atac de Erysiphe sp. la tomate și Sphaerotheca fuliginea la pepeni galbeni, cu niveluri asemănătoare ale gradului de atac. Combinația de produse Mimoten 0,3% + Zytron 0,15% a avut eficacitatea cea mai bună atât în combaterea agentului patogen Erysiphe sp. la tomate (76,3%) cât și Sphaerotheca fuliginea la pepenii galbeni (65,4%).*

**Cuvinte cheie:** tomate, pepeni galbeni, Erysiphe sp., Sphaerotheca fuliginea

## INTRODUCTION

Powdery mildew diseases are one of the most important plant pathological worldwide problems. Important crops, including cereals, grapevine, a number of vegetables species and ornamentals are among their major targets (Agrios, 2005). The need for new control strategies for the management of powdery mildews has led researchers and growers to explore suitable environmentally friendly alternatives or complementary to chemicals, biological control being the most

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<sup>1</sup>Research - Development Institute for Vegetable and Flower Growing Vidra, Romania

<sup>2</sup>Holland Farming Agro SRL, Romania

investigated of these approaches (Bélanger and Labbé, 2002). The strains of *Bacillus subtilis* provided disease control for powdery mildew disease, caused by *Podosphaera fusca* on melon seedlings similar to that achieved with the mycoparasite-based products AQ10® (*Ampelomyces quisqualis*) and Mycotal® (*Lecanicillium lecanii*), or the fungicide azoxystrobin (Romero *et al.*, 2007).

## MATERIAL AND METHOD

There was studied the biological efficacy of "bio" products Mimoten 0.3% (80% *Mimosa tenuifolia* extract) and Zytron 0.15% (20% citric seeds extract), on tomatoes and melons against *Erysiphe* sp. and *Sphaerotheca fuliginea*, respectively.

Mimoten is a natural extract of *Mimosa tenuifolia* for controlling pathogens such as *Sphaerotheca fuliginea*, *Botrytis cinerea* and *Alternaria* spp. It is applied as foliar during the vegetation period. It does not require a pause between application and harvest.

Zytron is a natural extract of citrus seeds with preventive and curative action in the control of pathogens *Sphaerotheca fuliginea*, *Erwinia* sp. and *Sclerotinia* sp. The ionic activity of the extract allows penetration of the cell walls of the microorganisms, destroying them without affecting the plants and fruits. In the post-harvest period it increases the shelf life of fruits and vegetables.

The experiments were carried out in "wet rooms" (in thermostat at  $26 \pm 2^{\circ}\text{C}$  and 60 -70% RH) on detached leaves with similar degrees of attack from tomato and melons plants attacked by *Erysiphe* sp. and *Sphaerotheca fuliginea*.

The experimental variants, both for tomatoes and melons, were:

1. Mimoten 0,3%
2. Zytron 0,15%
3. Mimoten 0,3% + Zytron 0,15%
4. Untreated check

Treatments were applied as foliar spraying on 10.09.2016 on melons and 20.09.2016 on tomatoes. Observations on the frequency and severity of the attack, on the basis of which the degree of attack was calculated, were made before and 7 days after treatments. The efficacy of the products was calculated using the Abbot formula.

## RESULTS AND DISCUSSIONS

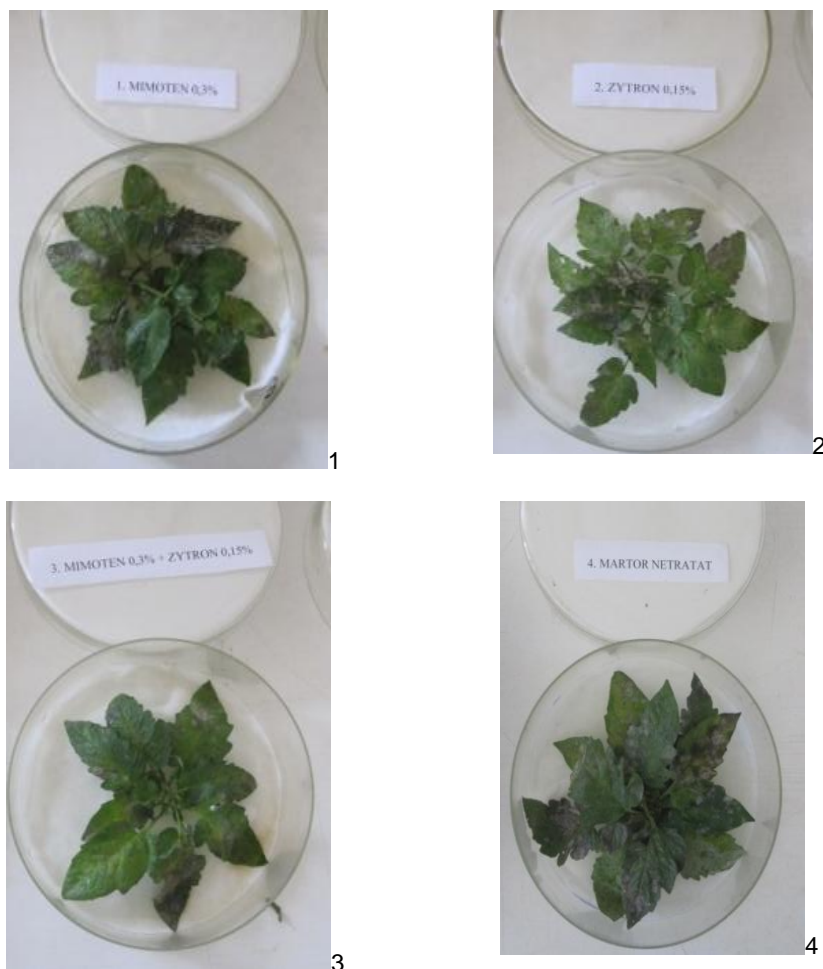
The best results were obtained with the combination of Mimoten 0.3% + Zytron 0.15% for both tomatoes and melons (tab. 1). In tomato the degree of attack of pathogen *Erysiphe* sp. decreased from 49.4% to 12.2%, and in melons the attack of the pathogen *Sphaerotheca fuliginea* decreased from 67.5% to 33.7%, 7 days after application of the treatments with this combination of products.

In tomatoes, after 7 days of treatment, the degree of attack decreased from 54.3% to 21.4% for the variant with Mimoten 0.3% and from 52.6% to 19.5% for Zytron 0.15% (fig. 1 and fig. 2).

**Efficacy of some biological products for controlling *Erysiphe* sp. on tomatoes and *Sphaerotheca fuliginea* on melons**

Variant	Tomatoes - <i>Erysiphe</i> sp.			Melons - <i>Sphaerotheca fuliginea</i>		
	Degree of attack before treatments (%)	Degree of attack, 7 days after treatments (%)	Efficacy (%)	Degree of attack before treatments (%)	Degree of attack, 7 days after treatments (%)	Efficacy (%)
Mimoten 0,3%	54,3	21,4	58,4	61,3	40,4	58,6
Zytron 0,15%	52,6	19,5	62,1	62,5	43,7	55,2
Mimoten 0,3% + Zytron 0,15%	49,4	12,2	76,3	67,5	33,7	65,4
Untreated check	48,5	51,5	-	63,4	97,5	-

**Fig. 1** Degree of attack of pathogen *Erysiphe* sp. on tomatoes leaves, before applying the bioproducts



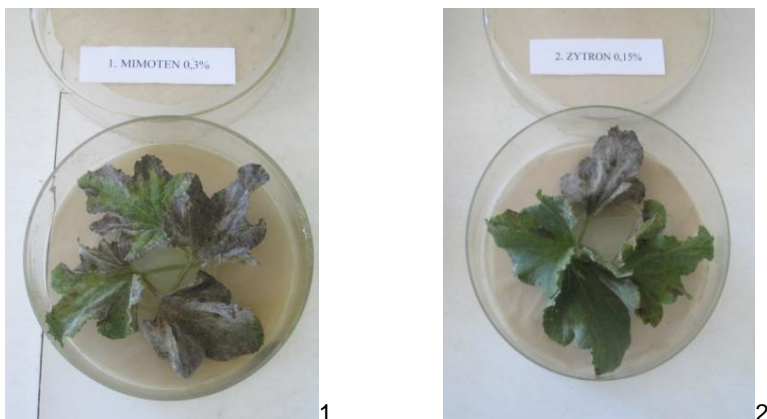
**Fig. 2** Degree of attack of pathogen *Erysiphe* sp. on tomatoes leaves, 7 days after applying the bioproducts (1. Mimoten 0,3%; 2. Zytron 0,15%; 3. Mimoten 0,3% + Zytron 0,15%; 4. Untreated check)

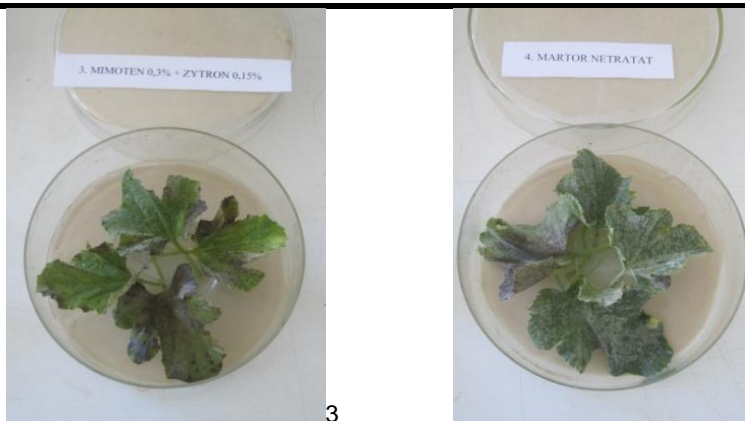
In melons, after 7 days of treatment, the attack decrease from 61.5% to 40.4% at Mimoten 0.3% and from 62.5% to 43.7% at Zytron 0.15% (fig. 3 and fig. 4).

At the some time degree of attack on untreated check increase from 48.5% to 51.5% on *Erysiphe* sp. and from 63.4% to 97.5% on *Sphaerotheca fuliginea*.



**Fig. 3** Degree of attack of pathogen *Sphaerotheca fuliginea* on melon leaves, before applying the bioproducts





**Fig. 4** Degree of attack of pathogen *Sphaerotheca fuliginea* on melon leaves, 7 days after applying the bioproducts (1. Mimoten 0,3%; 2. Zytron 0,15%; 3. Mimoten 0,3% + Zytron 0.15%; 4. Untreated check)

## CONCLUSIONS

The combination of Mimoten 0.3% + Zytron 0.15% products had the best efficacy in both controlling *Erysiphe* sp. in tomatoes (76.3%) and *Sphaerotheca fuliginea* in melons (65.4%).

The combination Mimoten 0.3% + Zytron 0.15% products can be an alternative solution for the using of chemical products for control of powdery mildew diseases.

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