

# Evaluation of the Birch Tar Oil potential on the control of the insect pest *Myzus persicae* (Sulzer) (Homoptera: Aphididae)

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**COST FP0901, Hamburg, 19-21 August 2010**

# AGRICULTURAL UNIVERSITY OF ATHENS

## **AUA in brief:**

**AUA ([www.aua.gr](http://www.aua.gr))  
is the largest Agricultural  
University and the third  
oldest University in Greece.**



**It has 7 departments and  
41 fully equipped laboratories.**

# AGRICULTURAL UNIVERSITY OF ATHENS

## **AUA in brief:**

**The main areas of competence are plant health, food quality & safety and natural resources management.**



**It has a long standing interest in the development of innovative pest control strategies with various laboratories studying complementary aspects of pest biology and control.**

**COST FP0901, Hamburg, 19-21 August 2010**

# AGRICULTURAL UNIVERSITY OF ATHENS

## Departments:

- Crop Science
- Animal Science and Aquaculture
- Agricultural Biotechnology
- Food Science and Technology
- Agricultural Economics and Rural Development
- Natural Resources Development and Agricultural Engineering
- Basic Sciences



COST FP0901, Hamburg, 19-21 August 2010

# Laboratory of Agricultural Zoology & Entomology

## Mains topics in Research:

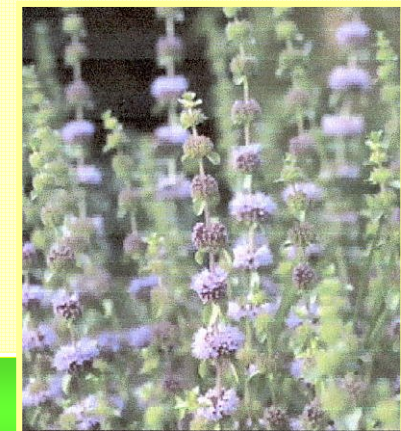
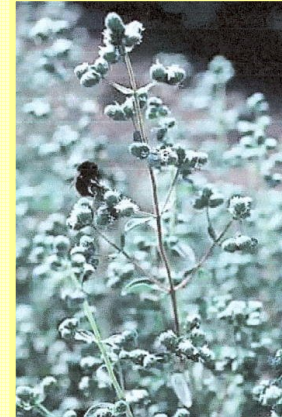
- 1) Systematics
- 2) Bioecology (life table)
- 3) Climatic adaptations (temperature thresholds, photoperiodic responses and seasonal activity)
- 4) Trophic relationships (predation, parasitism, IGP)
- 5) Damage potential
- 6) IPM and Biological Control of insect and mite pests.



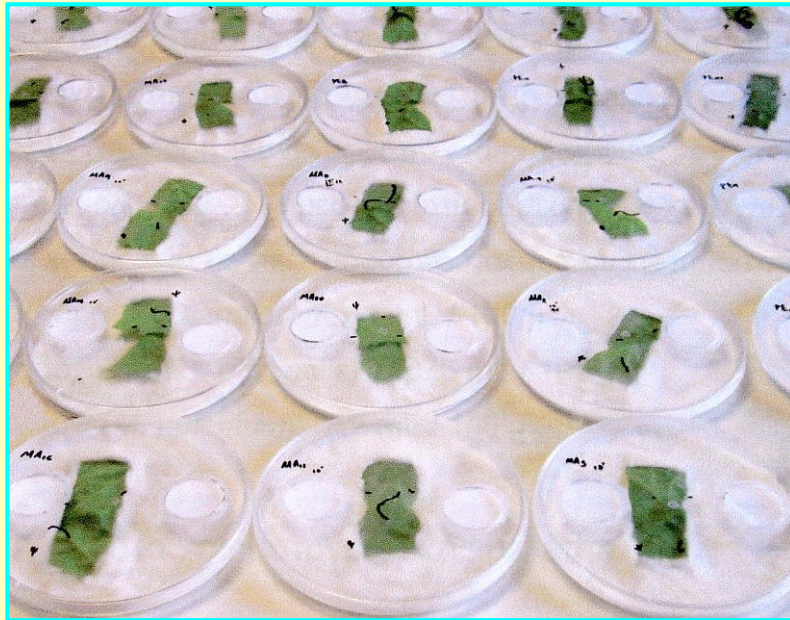
# Research activities related to FP0901

## STUDIES ON THE INSECTICIDAL POTENTIAL OF PLANT EXTRACTS AND ESSENTIAL OILS

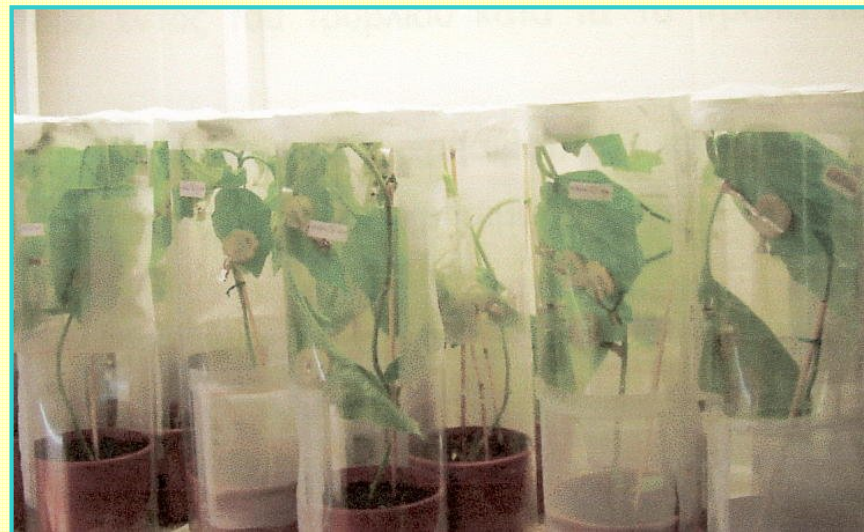
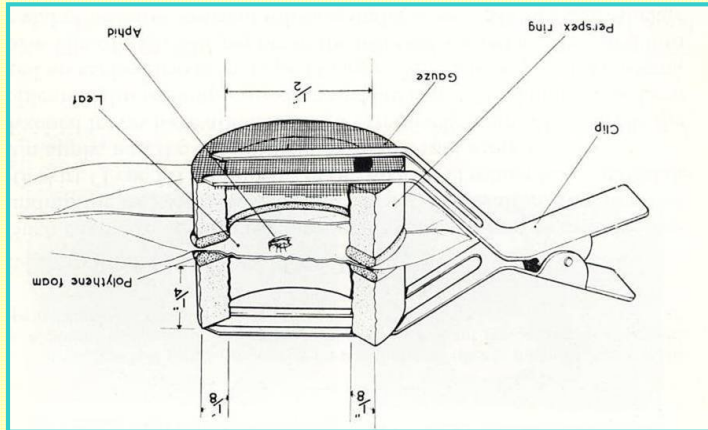
- ❖ Studies on aphids and their predators under controlled conditions
- ❖ Records on the longevity, fecundity immature development and mortality rates
- ❖ Behavioural studies



# M & M



# M & M





**Life table parameters of *Myzus persicae* on eggplant when sprayed with the nettle extract or with deionized water (control treatment), at 25°C**

<b>Population parameter</b>	<b>Nettle extract</b>	<b>Control</b>
$R_0$	24.772	33.213
$T$	12.149	12.753
$r_m$	0.317	0.331

**Gaspari M., D. Lykouressis, D. Perdikis and M. Polissiou. 2007. Nettle extract effects on the aphid *Myzus persicae* and its natural enemy the predator *Macrolophus pygmaeus* (Hemiptera: Miridae). *Journal of Applied Entomology* 131: 652-657.**

## **THE BIRCH TAR OIL IN PEST MANAGEMENT**

**Recent evidence indicates that:**

- ❖ Birch tar oil may effectively control growth of potato late blight fungi (*Phytophthora infestans*) (Tiilikkala et al. 2009)**
- ❖ It effectively repelled slugs and snails and egg laying psyllids (Lindqvist et al. 2010)**
- ❖ It has low potential against beetles and mite pests (Lindqvist et al. 2009)**

## **EVALUATION OF THE BIRCH TAR OIL ON THE CONTROL OF THE INSECT PEST *MYZUS PERSICAE***

- ❖ **The oil received by MTT Finland**
- ❖ **The spraying material used in the experiments was prepared by diluting the appropriate amount of the oil (0.25, 0.5, and 1%) in deionized water and it was immediately applied.**
- ❖ **All treatments were not detectably phytotoxic.**

## **EVALUATION OF THE BIRCH TAR OIL POTENTIAL ON THE CONTROL OF THE INSECT PEST *MYZUS PERSICAE***

- ❖ **Twenty aphid nymphs were placed on each of two upper leaves of each eggplant (40 nymphs per plant in total).**
- ❖ **As control treatment, plants and insects were sprayed with deionized water following identical procedure.**

## EVALUATION OF THE BIRCH TAR OIL POTENTIAL ON THE CONTROL OF THE INSECT PEST *MYZUS PERSICAE*

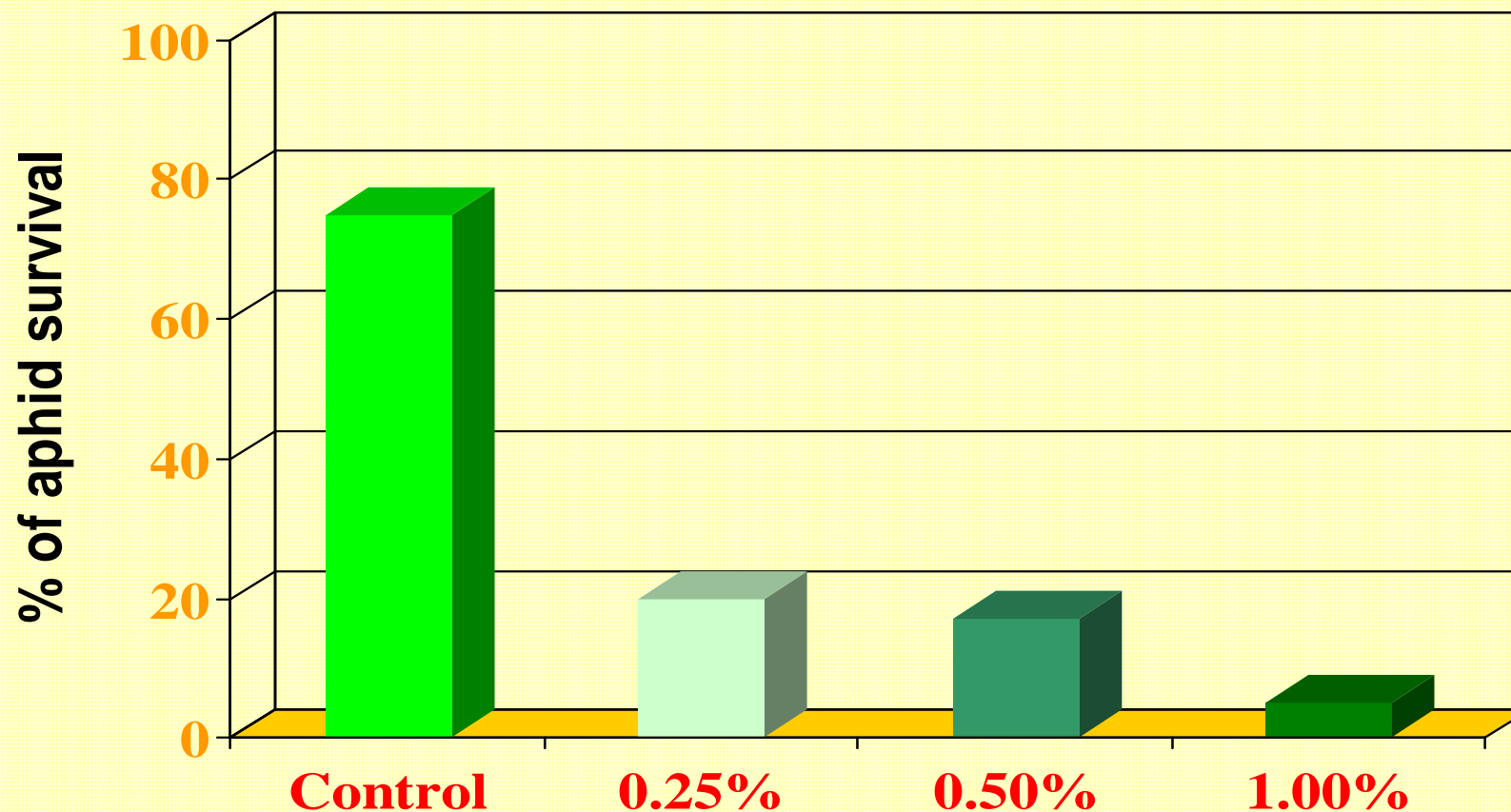
- ❖ After treated, each plant was enclosed in a whole plastic PVC cage with two square lateral openings which, together with the top opening, were covered with fine muslin to allow ventilation.
- ❖ The cages were kept at  $25 \pm 2^{\circ}\text{C}$ .



## **EVALUATION OF THE BIRCH TAR OIL POTENTIAL ON THE CONTROL OF THE INSECT PEST *MYZUS PERSICAE***

- ❖ **Observations regarding the aphid survival were taken at 24 h intervals after the treatment.**
- ❖ **In total 4 records were taken.**

## RESULTS



Lindqvist I, Lindqvist S., Tuovinen T., Nissinen A., Korpela S., Tiilkkala K., Hoppula K., Kaupinnen S., Setälä H. and Perdikis D. 2009. The potential of botanical birch tar oil for insect pest control. In: K. Tiilikkala and Segerstedt M. (eds) Birch Tar Oil – A New Innovation As Biological Plant Protection Product. MTT Agrifood Research Finland, Jokioinen, Finland. pp. 54-72.

## **CONCLUSIONS**

- ❖ **These results are considered to be promising**
- ❖ **However, additional laboratory experiments on aphid life traits such as longevity, fecundity, behavioural aspects should be conducted and followed by larger scale experiments, so that to realize the potential of this oil in aphid control under realistic field conditions.**
- ❖ **In addition, the active components have to be searched and evaluated**
- ❖ **whereas the phytotoxic ones should be detected and removed.**