



BIOFA
Bio-Farming-Systems

Milsana®

*A *Reynoutria sachalinensis* based plant extract for preventive control of powdery mildew*

Annual Biocontrol Industry
Meeting Lucerne



Contents

- Basics
- Mode of action
- Actual and potential uses

23.10.2007

Frank Lehnhof

Basics - product history

- Mid/End of 80ies: Dissertation of Mrs. Herger about plant extracts and their properties for plant protection
- 1987: Product use patented by BASF AG
- 1991: Registration of Milsana[®] as plant strengthener, sales through BASF AG and Compo GmbH mainly in Germany and the Netherlands
- 1998: Milsana[®] production and rights assumed by Dr. Schaette AG for Europe and KHH BioSci, Inc. (USA) for America and Asia
- 2003: Biofa AG gets exclusive sales rights for Europe

Basics - *Reynoutria*



← Mrs.
Annegret
Schmitt

Reynoutria sachalinensis

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Basics - *Reynoutria*

- *Reynoutria sachalinensis* (Polygonaceae) = Giant knotweed, Sachalin knotweed
- Troublesome weed
- Perennial
- Main active ingredient is physcion, an anthraquinon, which is mainly found in the green plant material
- Selection of plants with high content of physcion
- Cultivation as permanent crop in Germany
- Several cuttings per year are possible

Basics - product

- Extraction from dried plant material
- Alcoholic extract most effective
- Formulation as stabil final product with good shelf-life

- Product european-wide tested in EU-Project Biocombi (1999-2002)
- Listing of environmental properties and advantages

Basics - product

- Effective at low percentage concentration
- Better penetration capacity and higher efficacy in combination with a wetting agent (**Trifolio S forte**)
- Preventive treatments recommended due to the mode of action

Mode of action

1. Induced Resistance

Preconditioning of plant defences,
leads to increased pathogen defence and reduction of
disease attack.

2. Induced Tolerance

Leads to a higher yield that is not dependent on the level
of infection.

Modes of action

Effects of the extract

before infection

after infection

Reactive oxygen species

Reactive oxygen species

Papilla formation

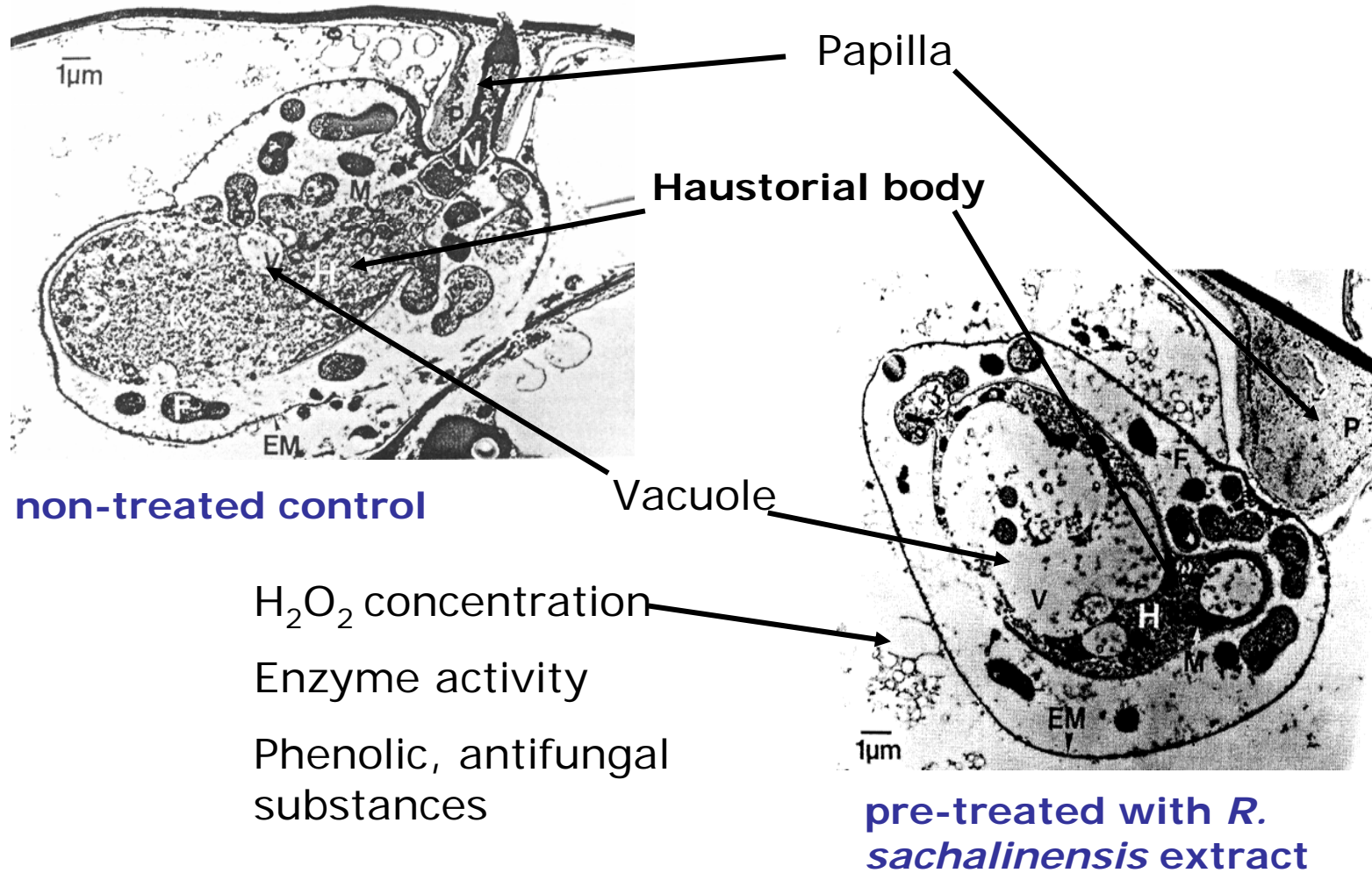
Enzymes phenolic
pathway

Enzymes phenolic
pathway

Phytoalexins

Vacuolisation of haustoria

Cucumber / *Sphaerotheca fusca*



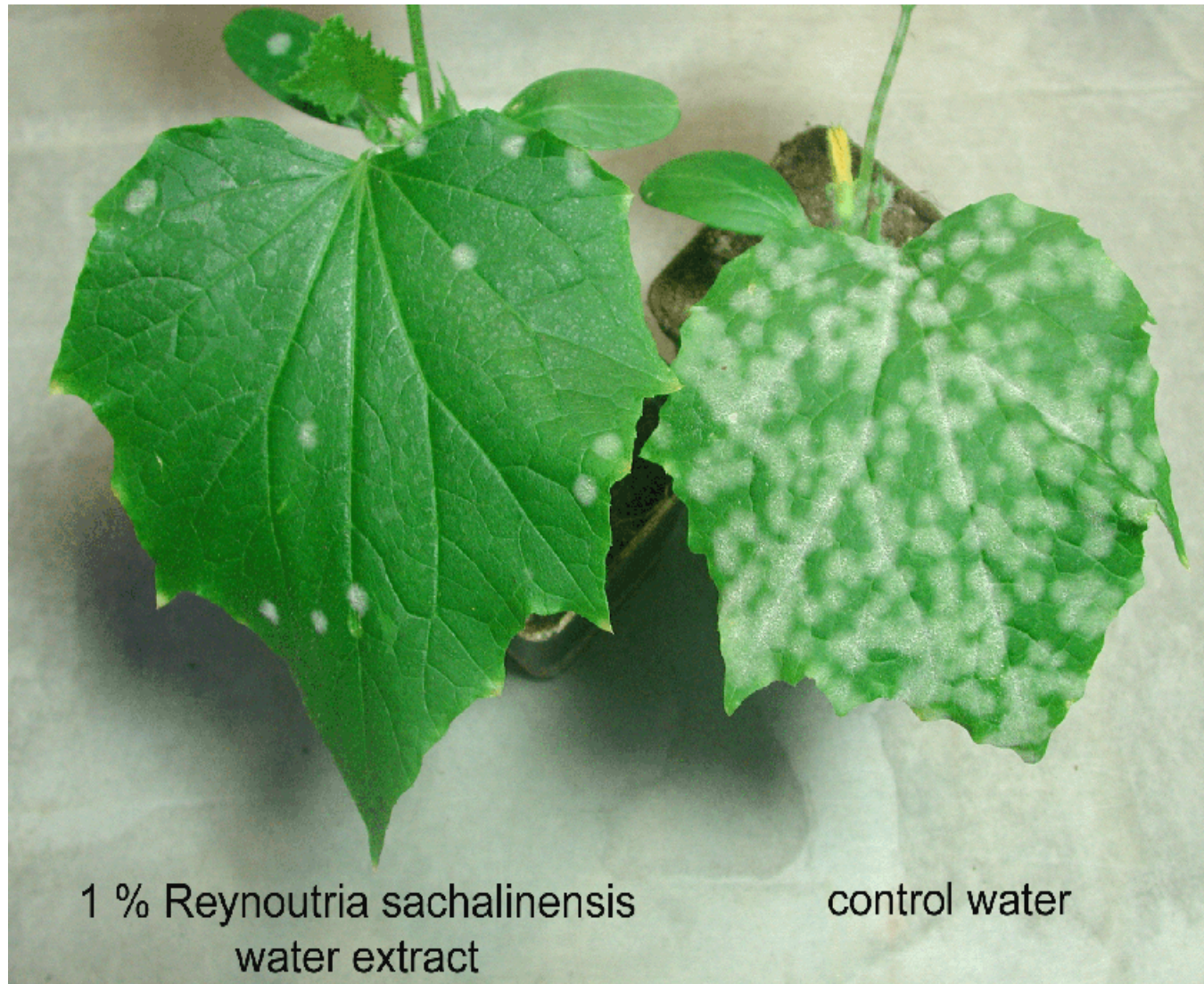
After Herger, 1991
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Effects resulting in:

- Inhibition of spore germination
- Disturbance of haustorial nutrient intake
- Reduction of conidia forming
- Reduction of conidia vitality and viability

- Increased chlorophyll content in leaves
- Retarded senescence of plants



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Water-treated control



Application of *R. sachalinensis*
alcoholic extract in 7-day
intervals

Actual and potential uses

Under glasshouse conditions

Powdery Mildew	cucumber, tomato, peppers, begonia, barley, pot-herbs	++
	lamb's lettuce, rose, apple	+

In open field

Powdery Mildew	cucumber, vine, strawberry	++
	acer, rose	+

++ = very good efficacy

+ = good or satisfying efficacy (partly depending on the variety)

Actual and potential uses

Under glasshouse conditions

Powdery Mildew	cucumber, tomato, peppers, begonia, barley, pot-herbs	++
	lamb's lettuce, rose, apple	+
Botrytis	young pepper- and tomatoplants, ornamental growings	++
	flowers of begonia and cucumber	+
Tobacco mosaic virus	tobacco	+
Anthraco nose	common bean	+

In open field

Powdery Mildew	cucumber, vine, strawberry	++
	acer, rose	+
Botrytis	strawberry	++
	vine	+



Many thanks to Mrs. Annegret Schmitt (BBA) for
providing me with lots of scientific information
and some of the pictures

and

Thank you for your attention!

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www.biofa-farming.com