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# Testing the efficacy of *Phlebiopsis gigantea* and *Trichoderma* sp. against spore infection by *Heterobasidion* in log pieces of spruce

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“Sustainable Use of Local Resources (Entrails of the Earth,  
Forest, Food and Transport) – New Products and  
Technologies (NatRes)”



23% *P. abies*  
474–1598 €/ha



*Heterobasidion annosum* s.s.

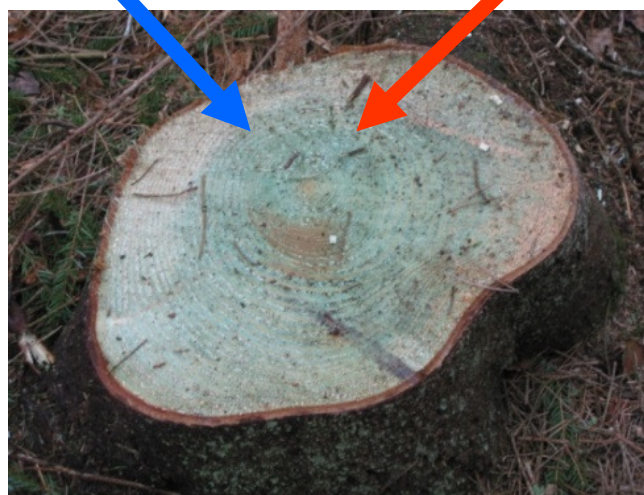




*Phlebiopsis gigantea*



*Heterobasidion* spp.



**Rotstop** since **2007** in Latvia



*Heterobasidion* spp. **36 380** fruit bodies

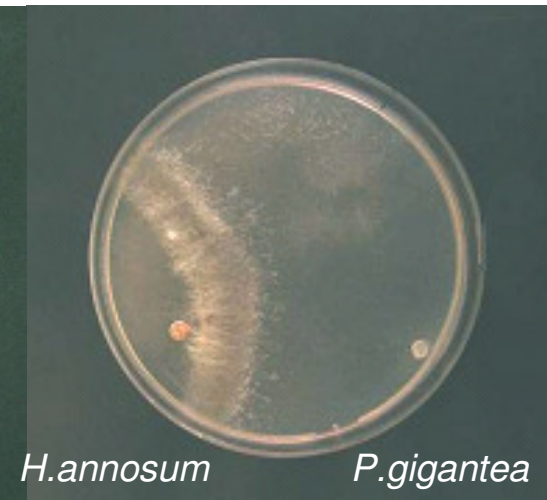
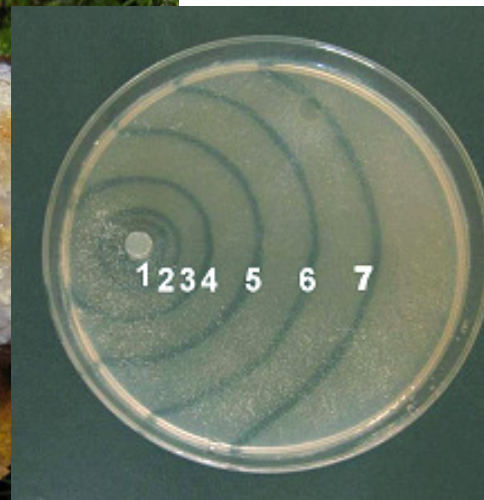
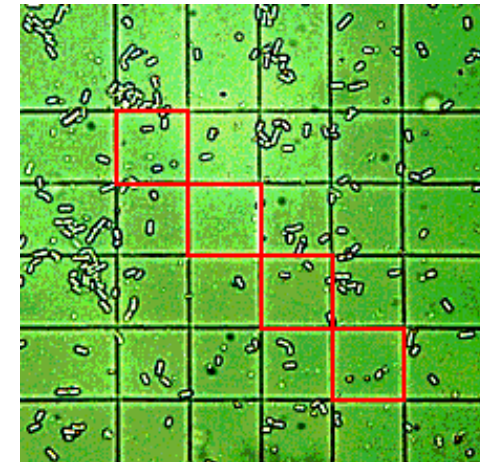


*P. gigantea* **106** strains

# Laboratory testing of *Phlebiopsis gigantea*



- growth rate of *P.gigantea*
- antagonism against *Heterobasidion*
- production of oidia



# Field experiments - growth rate of *P. gigantea*



Number of log pieces:

Spruce = 116

Pine = 106

6 – 33 replicates

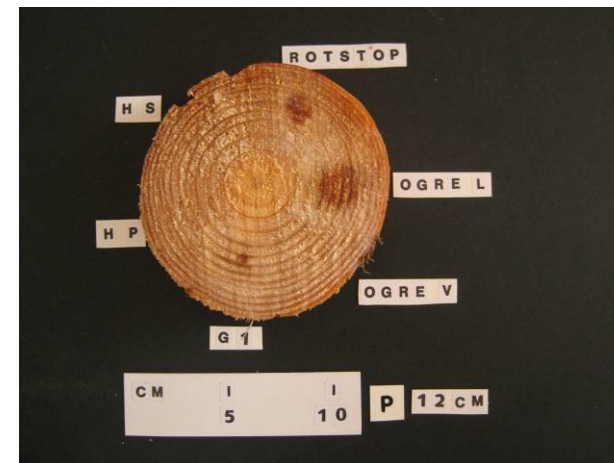
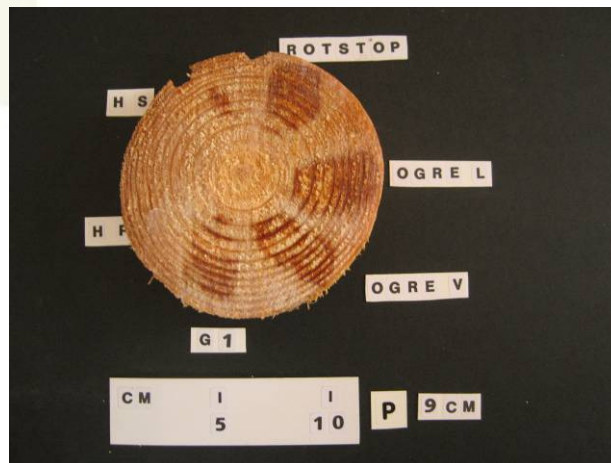
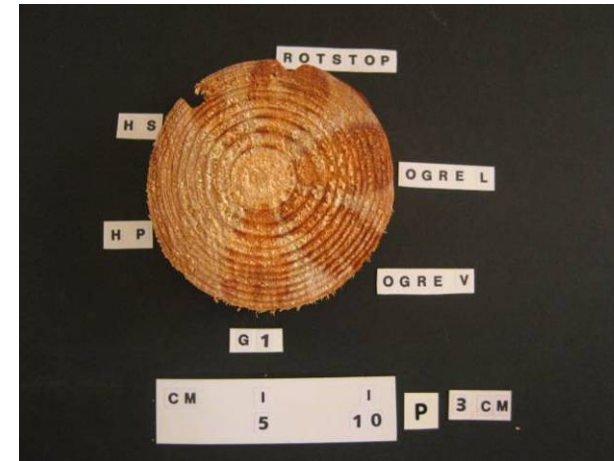
59 *P. gigantea* strains



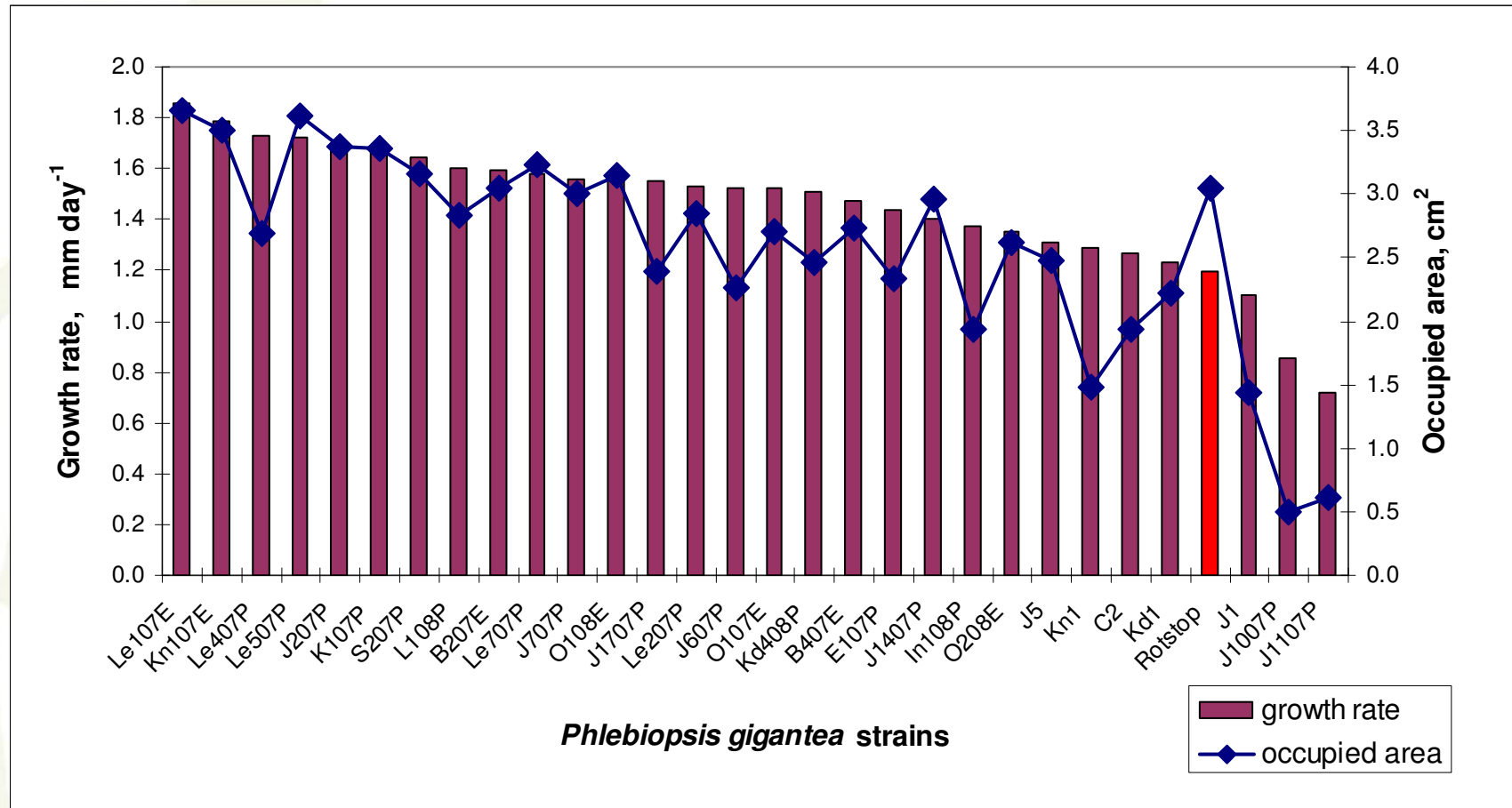
“Pit” method



# Growth rate of *P. gigantea* in *P. sylvestris*



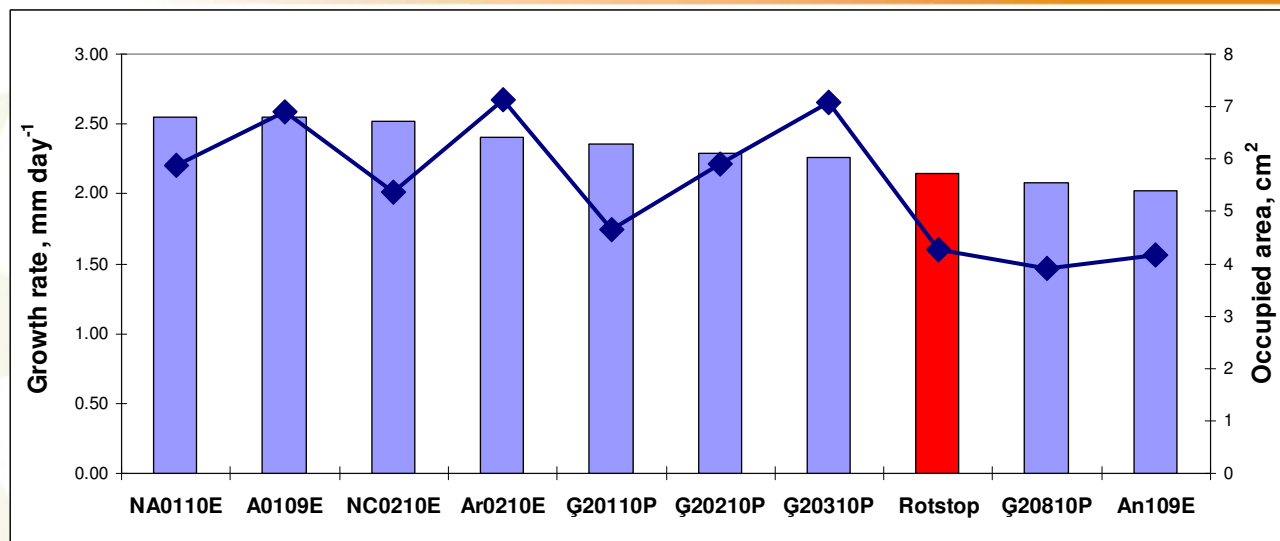
# Growth rate of *P.gigantea* in *P. abies*



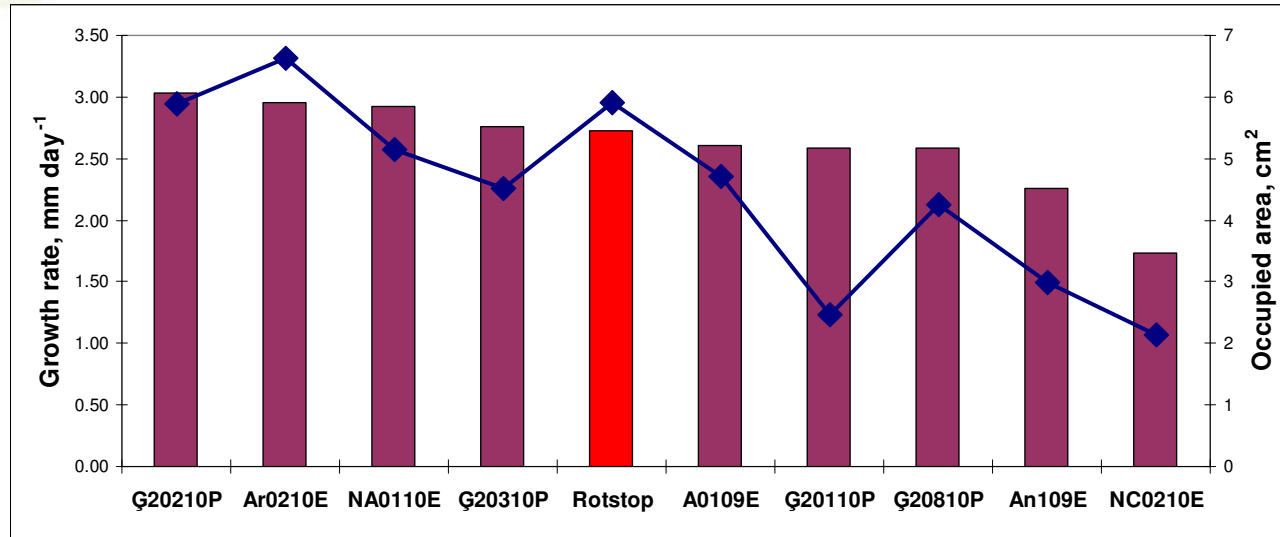


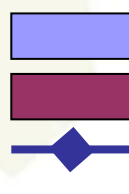
# Growth rate of *P. gigantea*

*P. sylvestris*



*P. abies*




  
 growth rate
   
 occupied area

*P. gigantea* strains

# Field experiments –antagonism against *H. annosum*



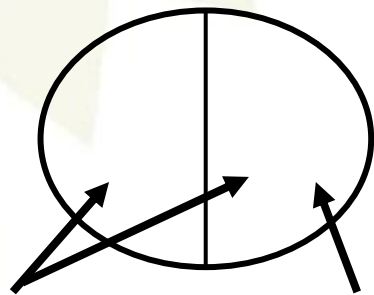
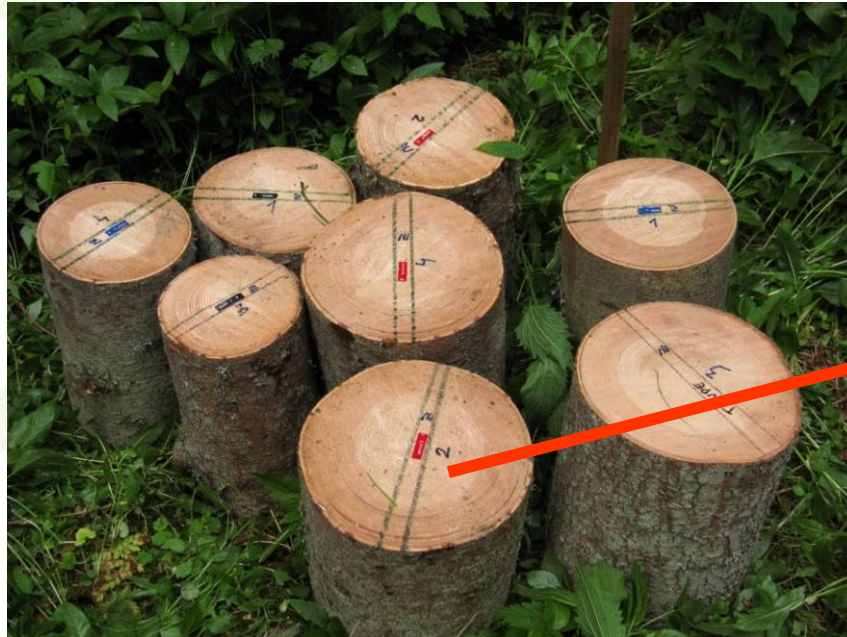
Number of log pieces: 219

4 – 12 replicates

10 *P. gigantea* strains



# Basidiospore infection by *Heterobasidion parviporum*



*H.annosum*

*P.gigantea*  
suspension

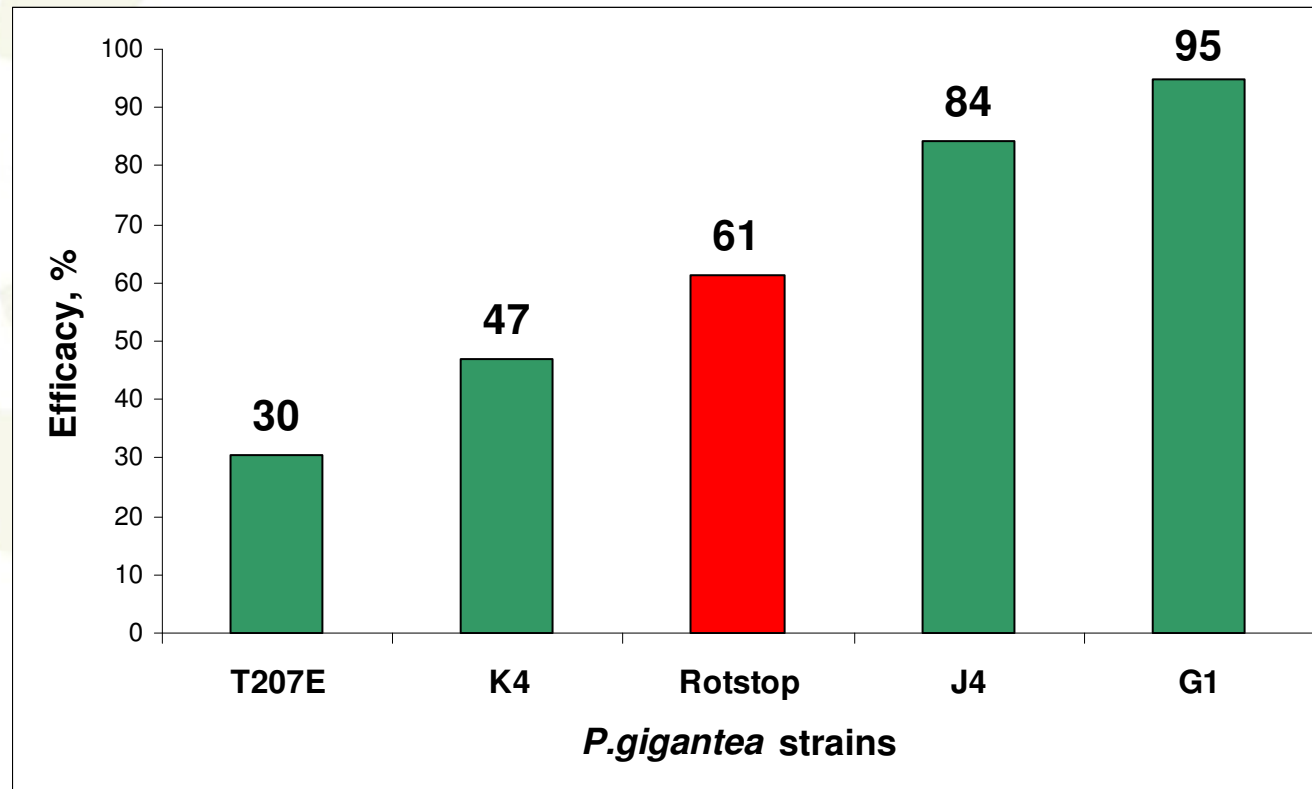
- 4 *P.gigantea* strains
- 8 billets for each isolate (total 32)
- exposed 5 days in forest stand
- incubated for 3 weeks on field + 1 week in laboratory

# Basidiospore infection by *Heterobasidion annosum* s.s.



2 *P. gigantea* strains  
7 replicates (spruce, pine)  
5 control billets (spruce, pine)

# Efficacy of *P. gigantea* in *P. abies*



# Stump treatment



35 *Pinus sylvestris*

42 *Picea abies*



## Efficacy of *P.gigantea*,%

	Latvian strain G1	Rotstop
<i>Picea abies</i>	71	79
<i>Pinus sylvestris</i>	70	70

# *Trichoderma* spp.?



21°C

15°C

4°C

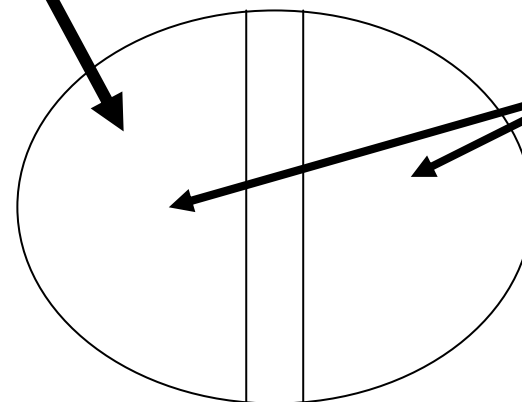
24 isolates



# Methods for testing antagonistic ability

## Variants of treatment:

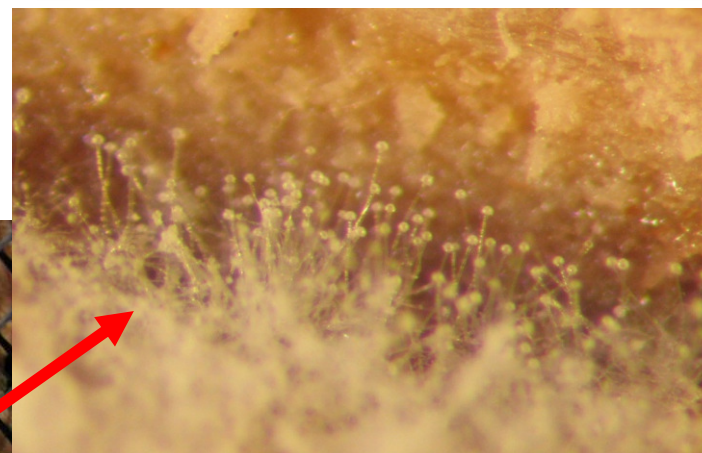
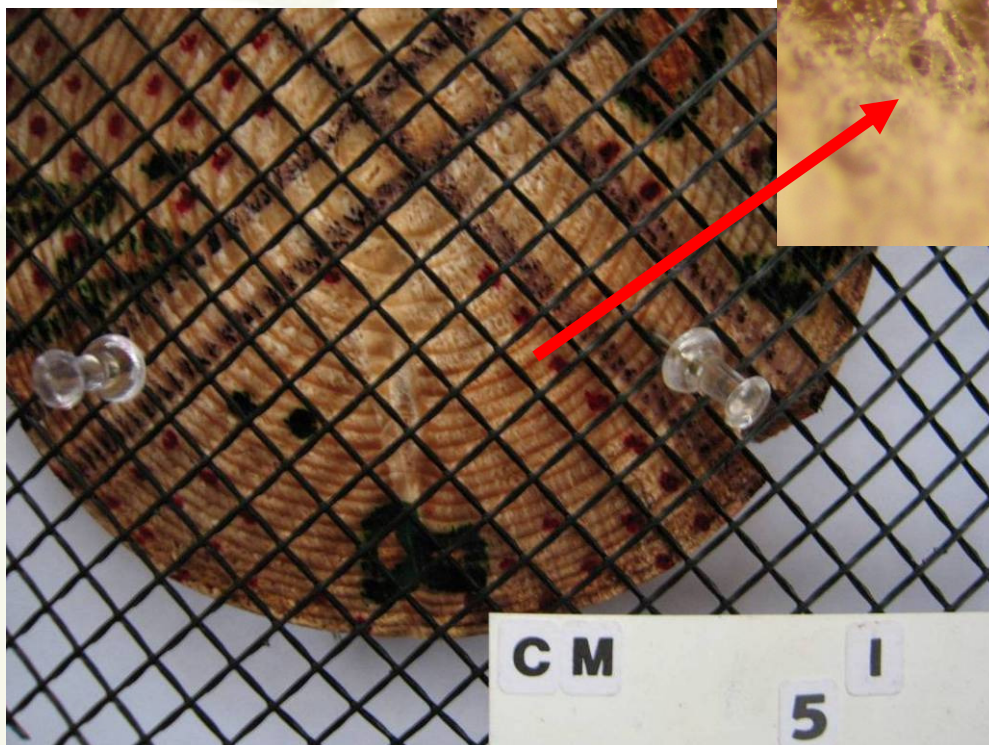
1. *P. gigantea* strain **PG1** (5000 oidia mL<sup>-1</sup>)
2. *P. gigantea* strain **PG2** (5000 oidia mL<sup>-1</sup>)
3. *T. viride* (10<sup>6</sup> cfu mL<sup>-1</sup>)
4. **PG1** + *T. viride*
5. **PG2** + *T. viride*



*H. annosum* s.l.  
(2S+2P; 500 conidia mL<sup>-1</sup>)



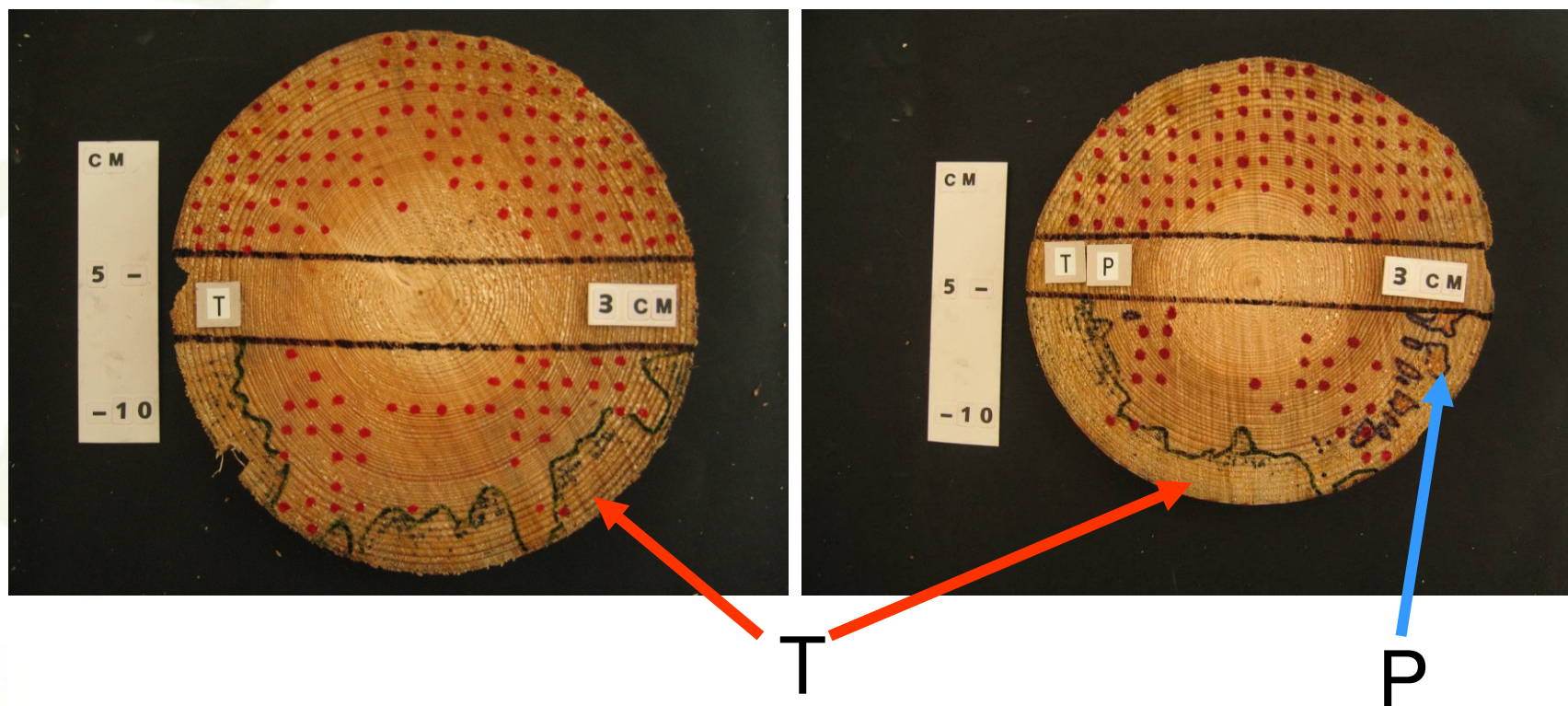
# Assessment of the presence of *Heterobasidion*



*Heterobasidion* spp.  
conidiophores

7 x 7 mm

# Area occupied by *P. gigantea*, *Trichoderma* and *Heterobasidion*

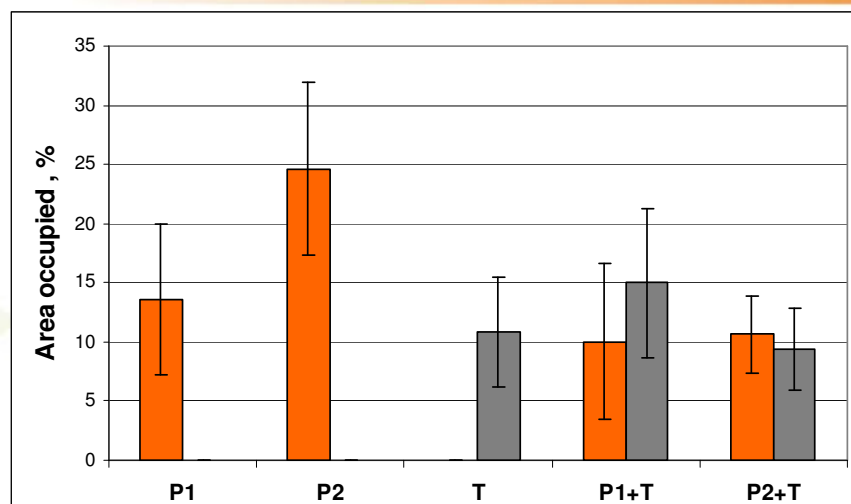


9 replicates (total 45 billets)

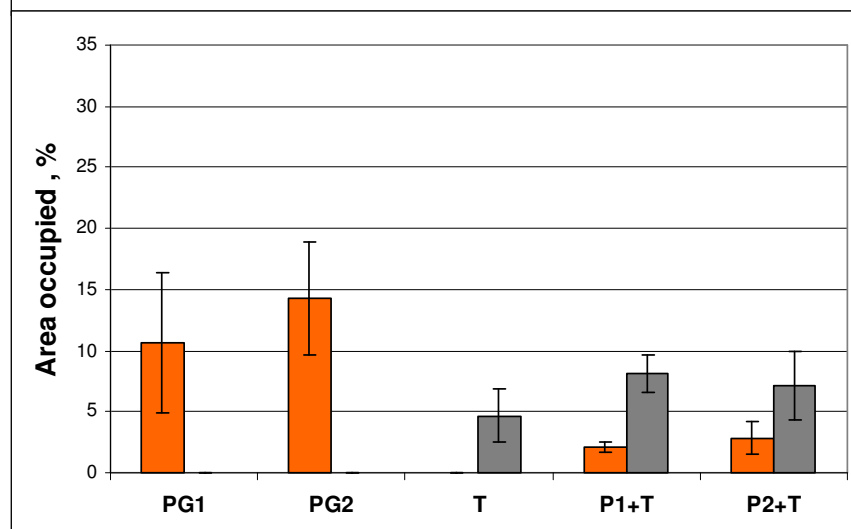
# Area occupied by *P. gigantea* and *T. viride*



3 cm




8 cm



Treatment variant

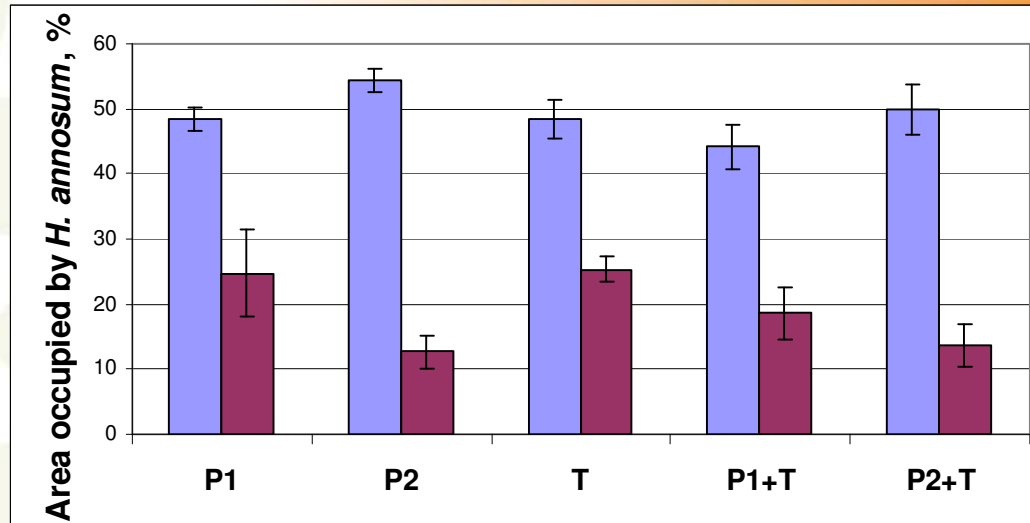
 P – *P. gigantea*

 T – *T. viride*

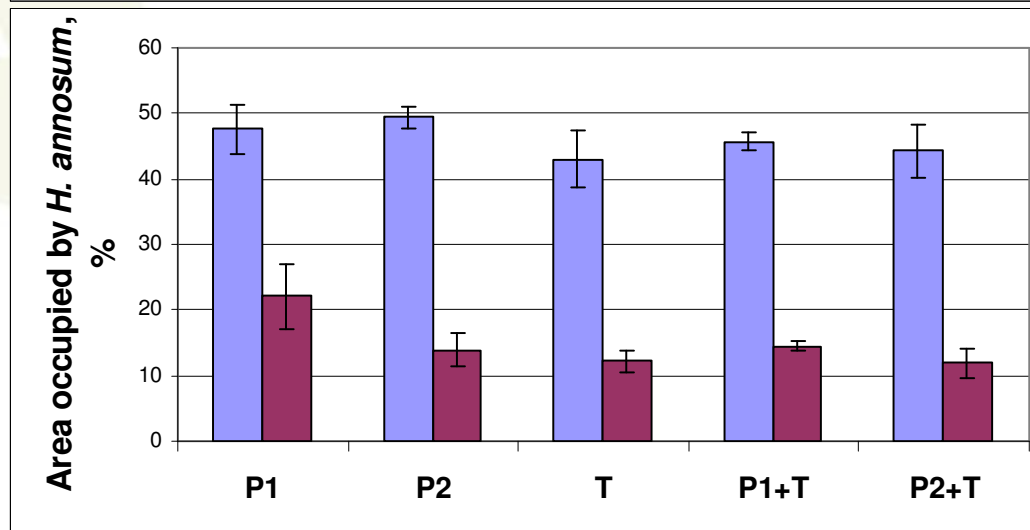
# Area occupied by *Heterobasidion*



3 cm



8 cm



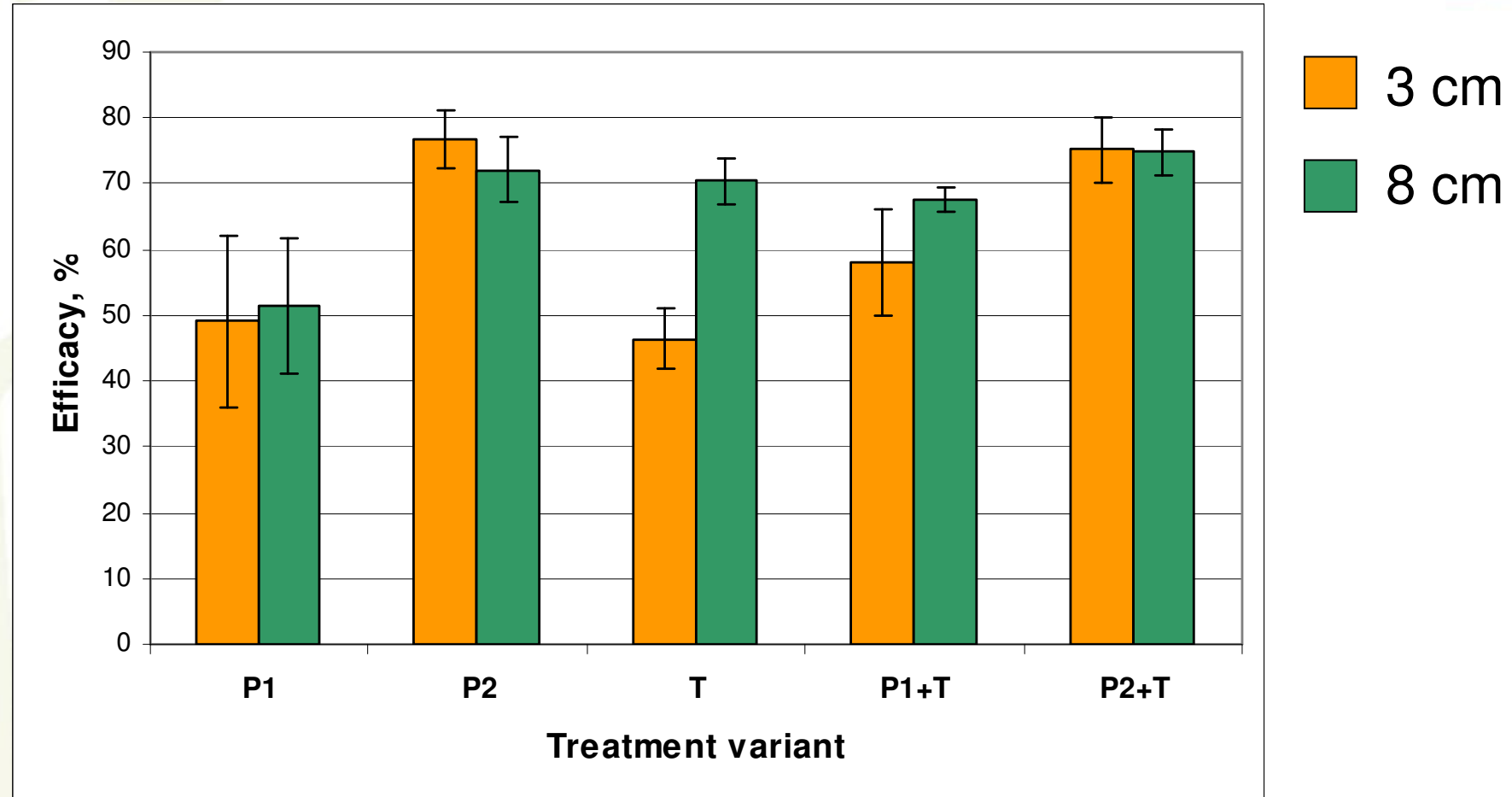
Treatment variant

Control sector  
Treated sector

P – *P. gigantea*

T – *T. viride*

# Efficacy of suspensions against infection by *Heterobasidion*



P – *P. gigantea*

T – *T. viride*



*H. parviporum*



*Perennipora subacida*

## *P. gigantea* fruit bodies



Area 170 x 35 cm

Paldies par uzmanību!  
Kiitos huomiosta!



Thank you for your attention!

