

DISAFA
Dipartimento di Scienze Agrarie
Forestali e Alimentari

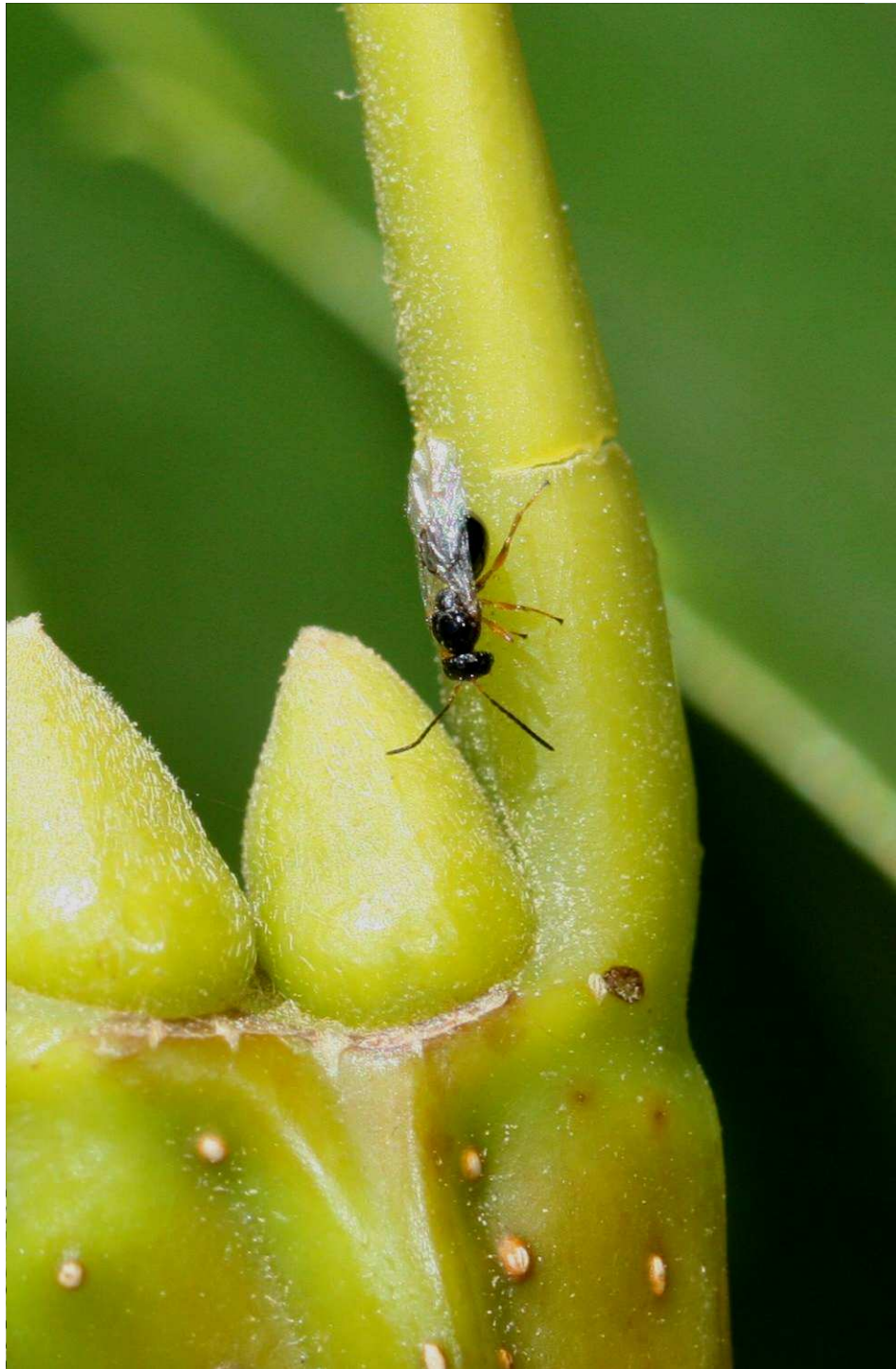
Dryocosmus kuriphilus in Europe
and its
biological control by *Torymus sinensis*

Dr Ambra Quacchia

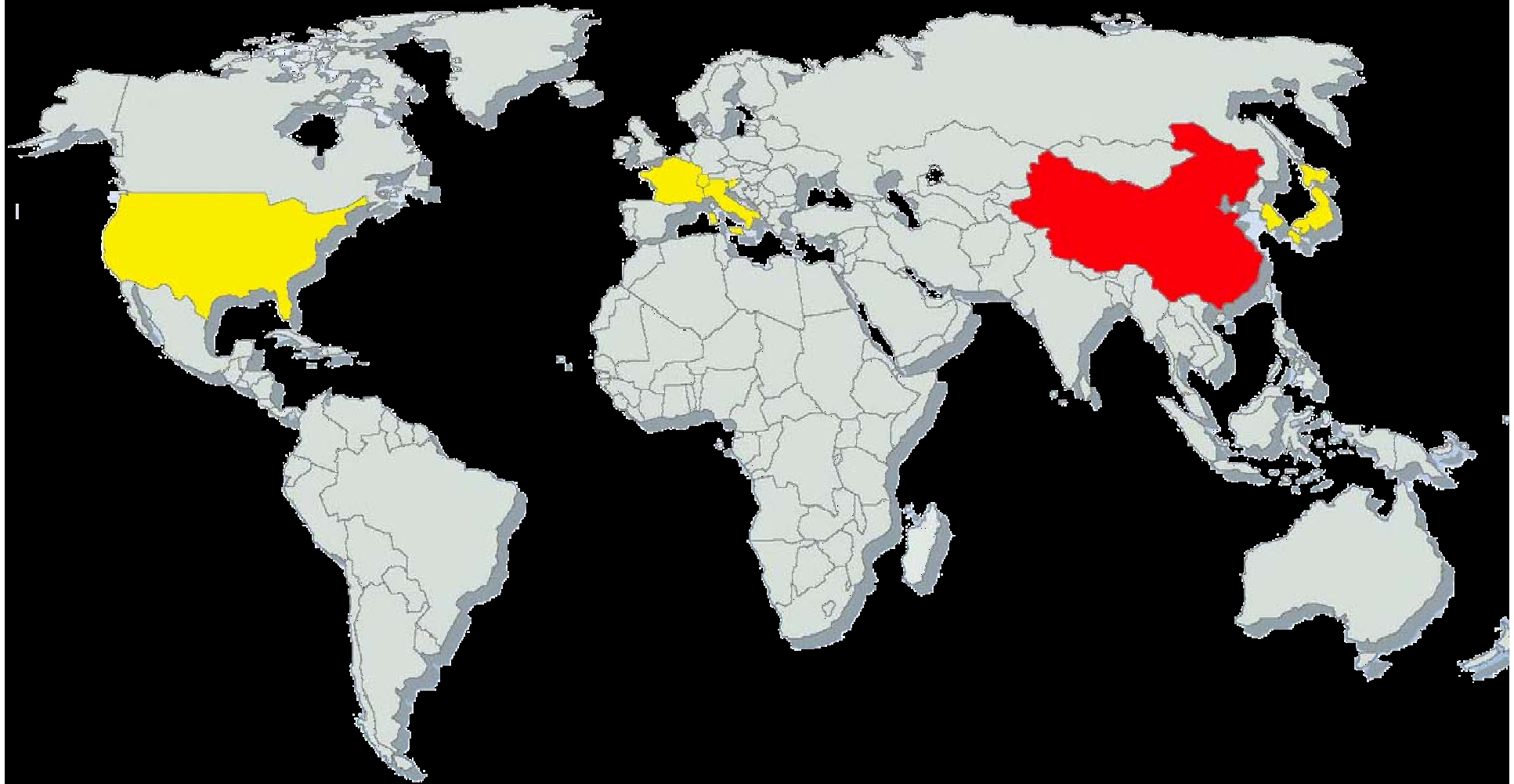
Ponferrada SPAIN, November 16th 2012

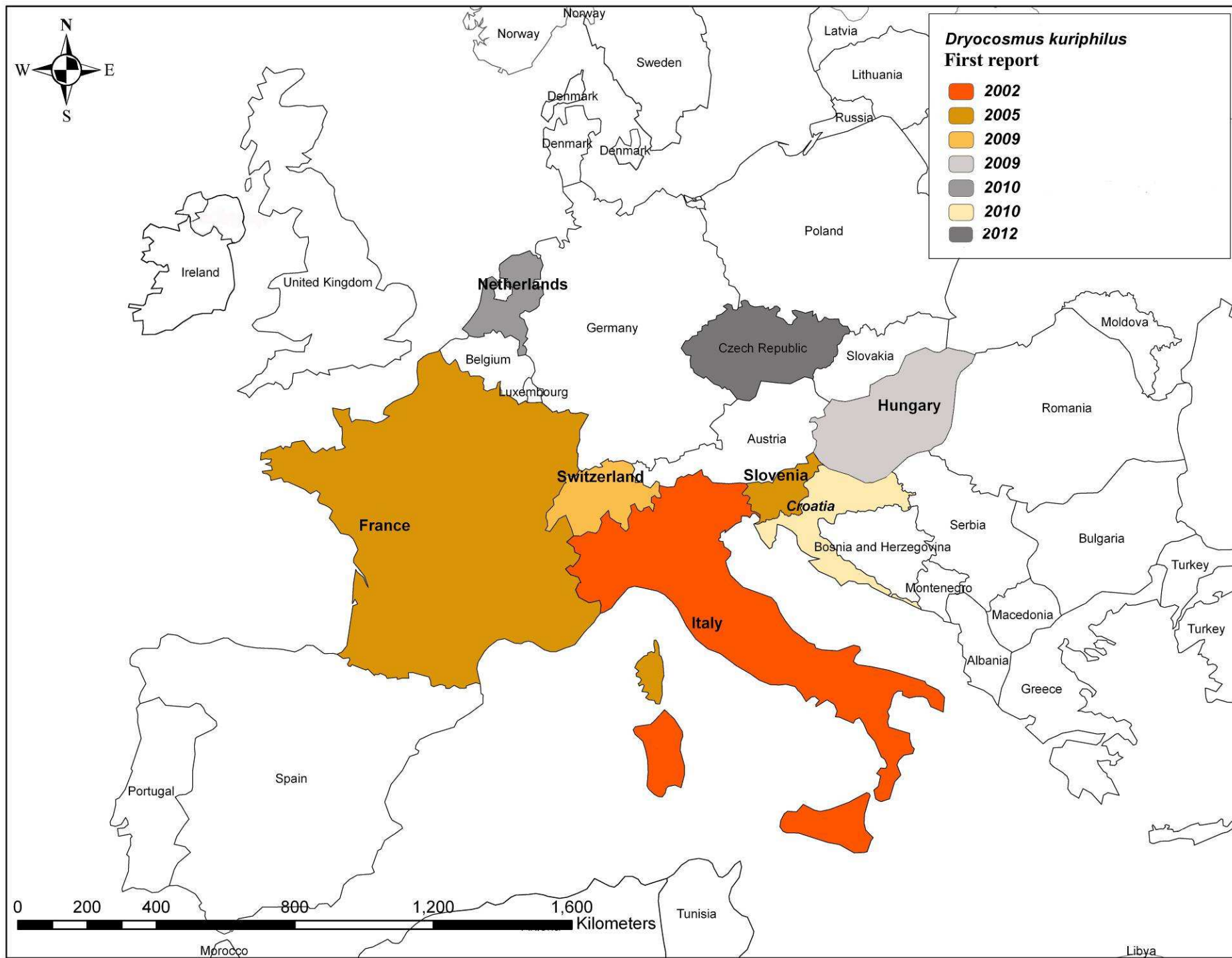






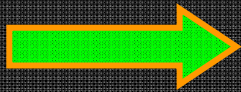
Diffusion of *Dryocosmus kuriphilus*





How was it introduced ?

Asia



Piemonte
Region

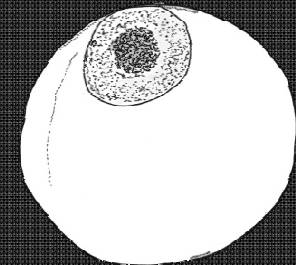
Trade of young plants



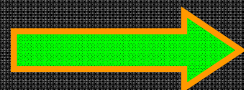
Buds are
asymptomatic



first instar
larva



Piemonte
Region



Italy

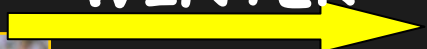
Adults flight
Human transportation
Trade of young plants

Reduction of photosynthetic area
Stop of the shoot growth



**loss of production
general decay of the tree**

WINTER



AUTUMN



SUMMER

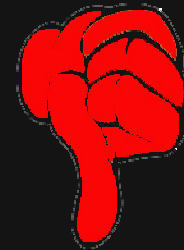


SPRING

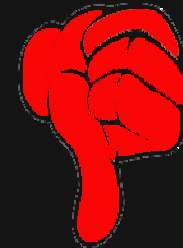


Options for the control of *Dryocosmus kuriphilus*

Physical methods In case of eradication purpose



Chemical control Environmentally not feasible
Expensive
Largely ineffective



Resistant varieties Talk of Prof Botta

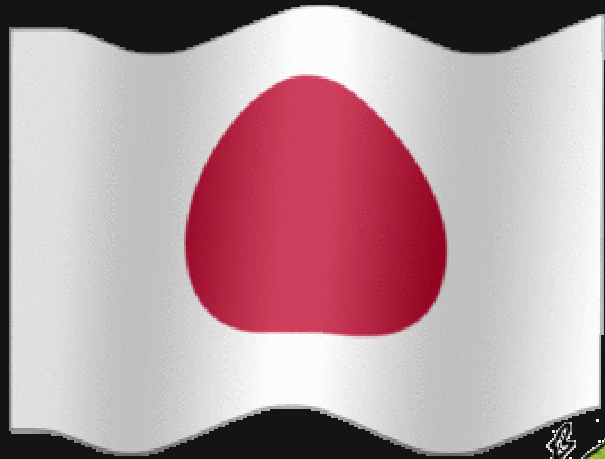
Biological control

Small starting investment
Long lasting benefits
Environmentally friendly



Why biological control of the CGW
by releasing *T. sinensis*?





1941

Introduction of the CGW from
China into Japan

Research in Japan

Torymus sinensis

the only Chinese parasitoid species known to be

Host specific

**Well synchronized
with *D. kuriphilus***

Effective



Host range

Japan and USA

No records of *T. sinensis* emergence from oak galls

Laboratory tests



**No
oviposition**

Italy

Oak galls rearing



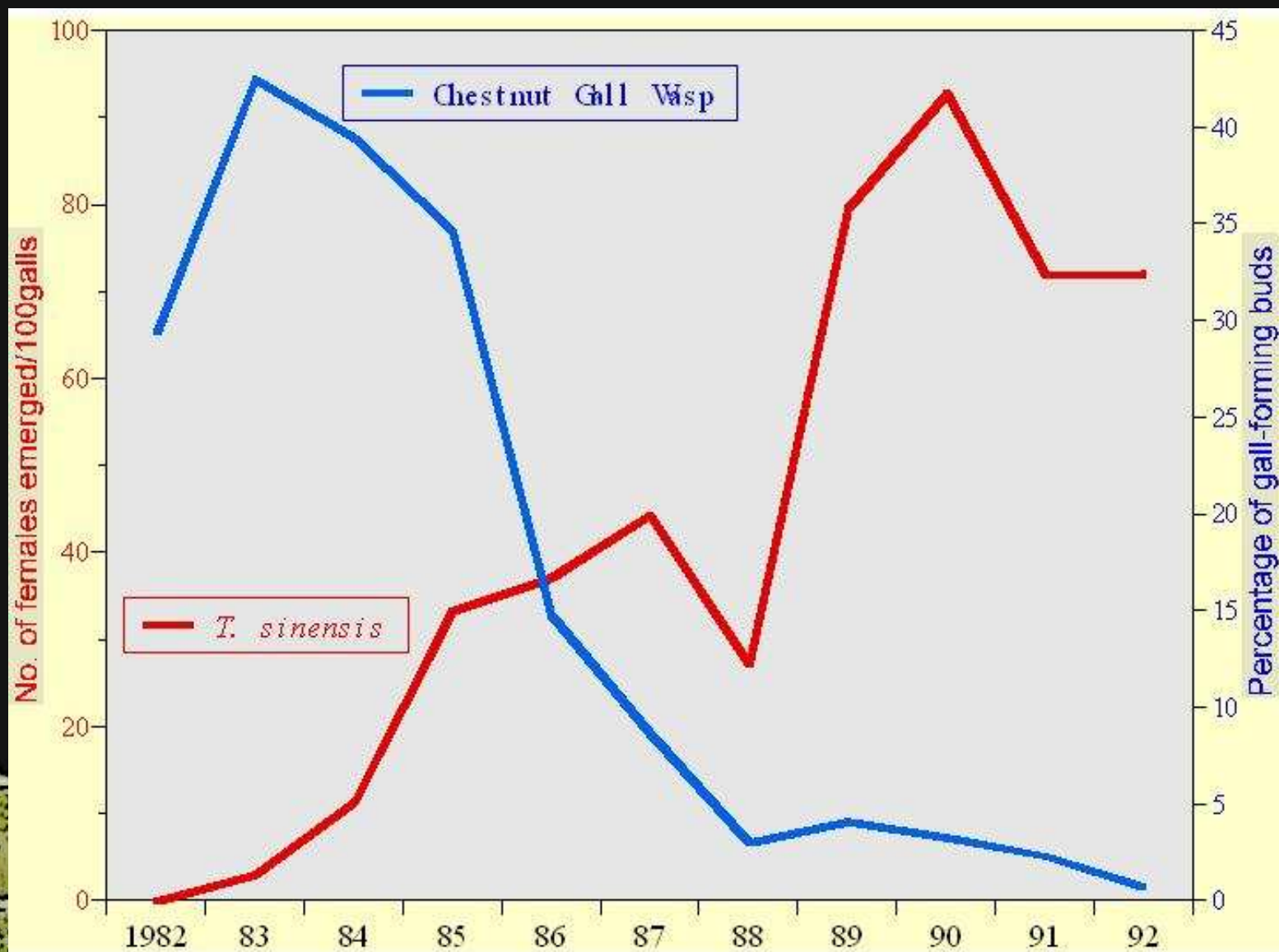
**No
emergence**

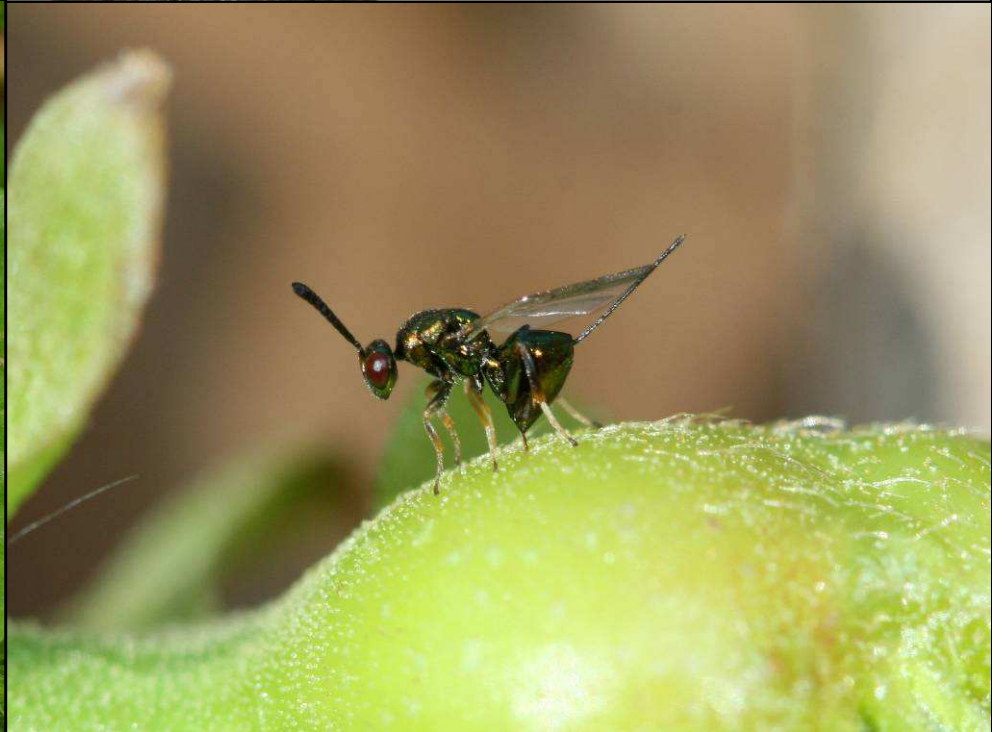




**Biological cycle of
*Torymus sinensis***

Introduction of *Torymus sinensis* From China into Japan





Introduction of *Torymus sinensis* in Italy

Project started in 2003

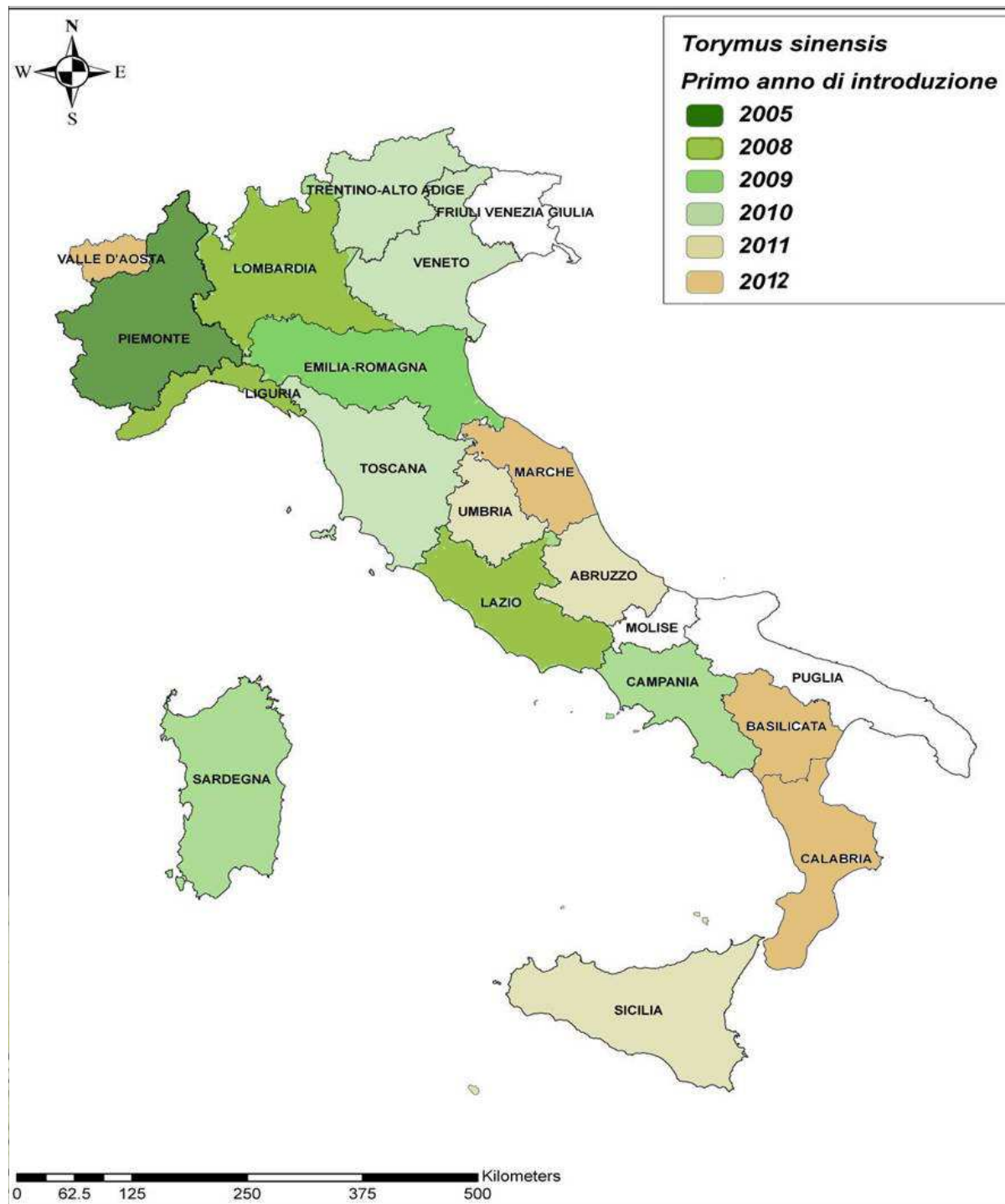
First releases in 2005



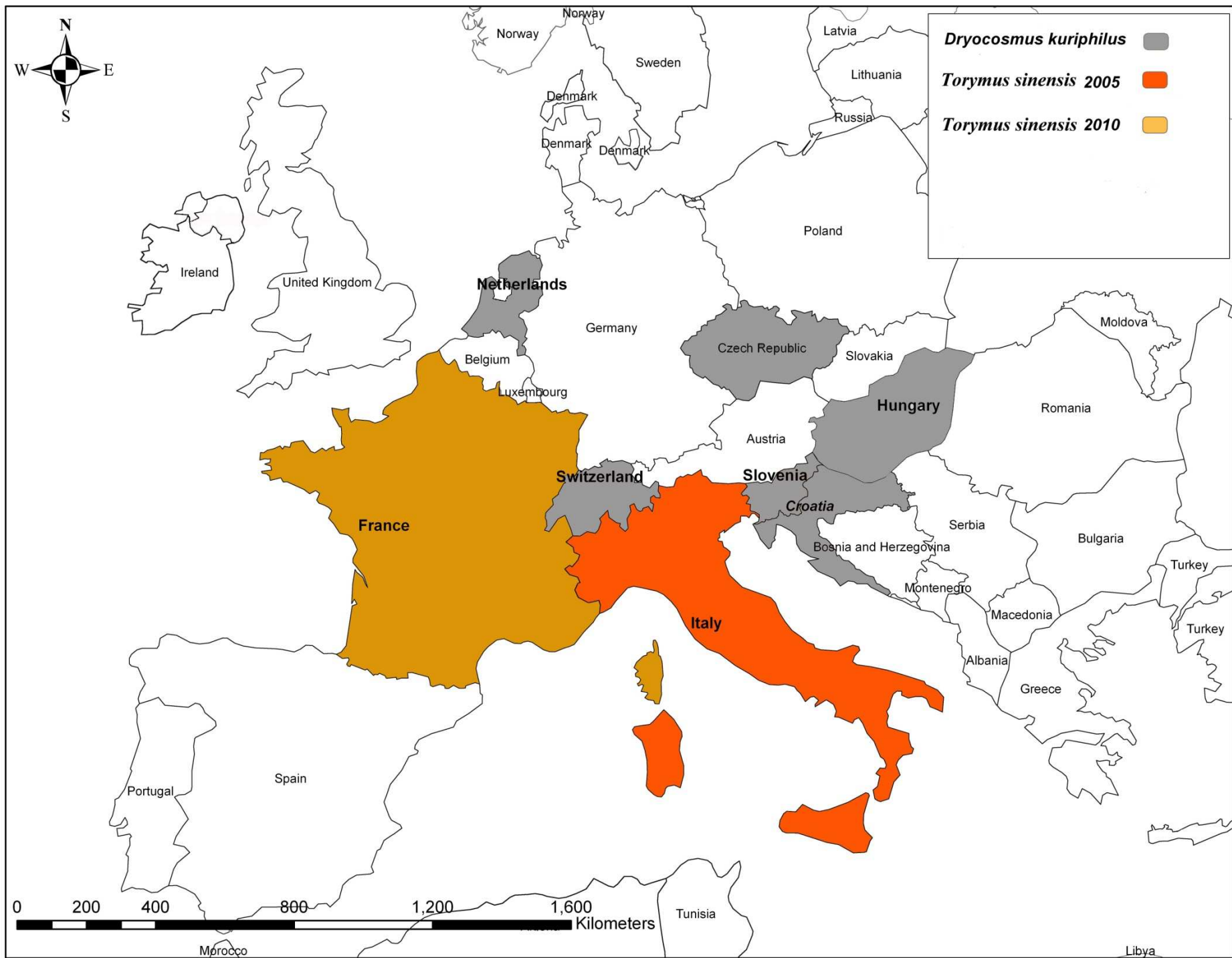
National Agricultural
Research Center of
Ibaraki







All the parasitoids
released from 2009
were only of Italian origin



How did we get enough specimens
to be released in Italy?

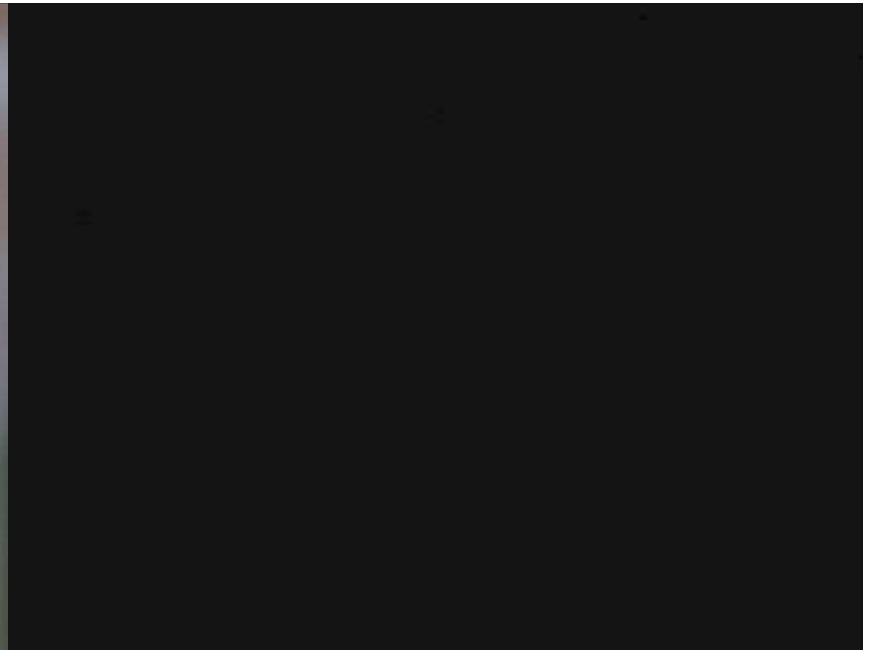


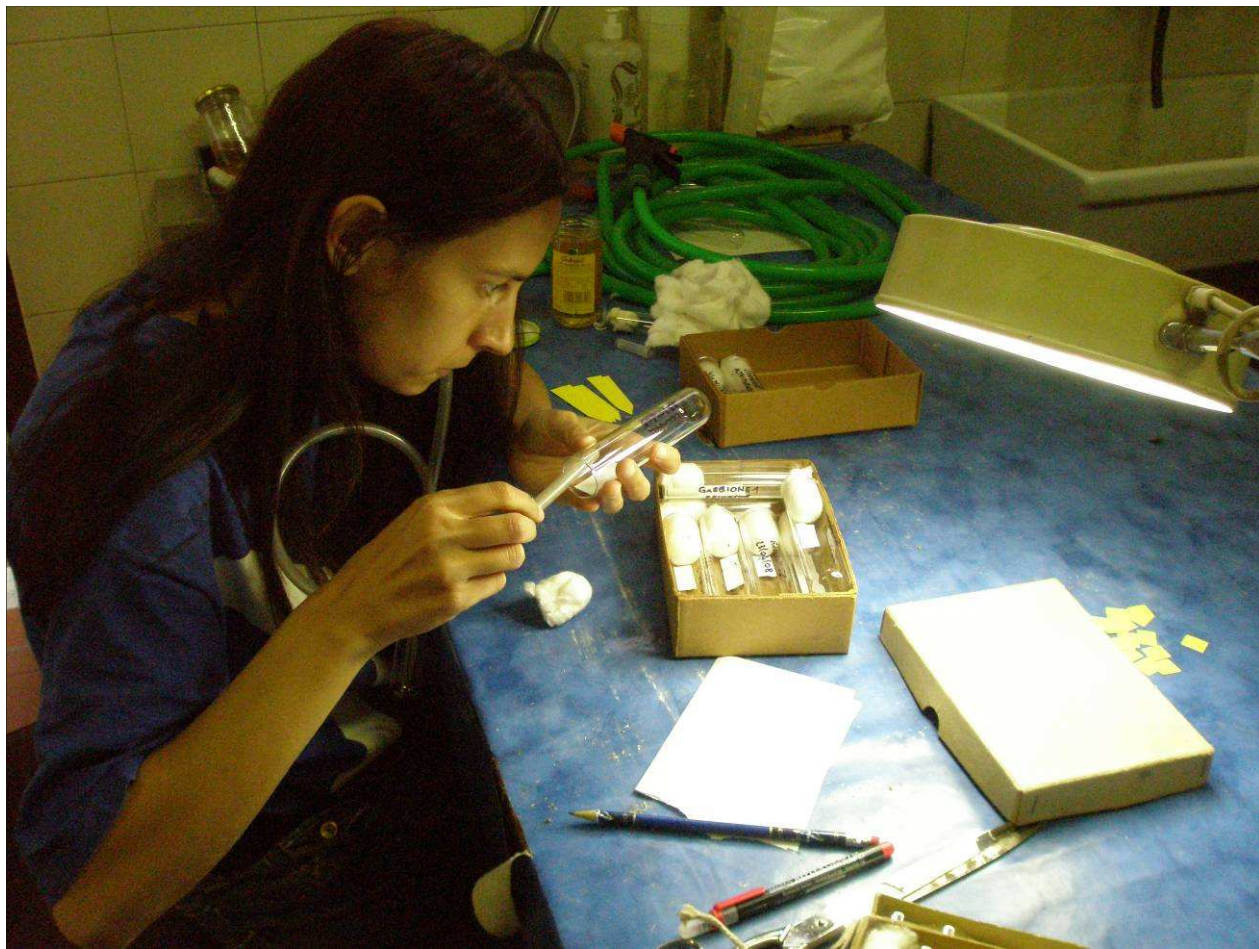














T. sinensis population increases

but

what is happening in the wood?



Robilante

2005

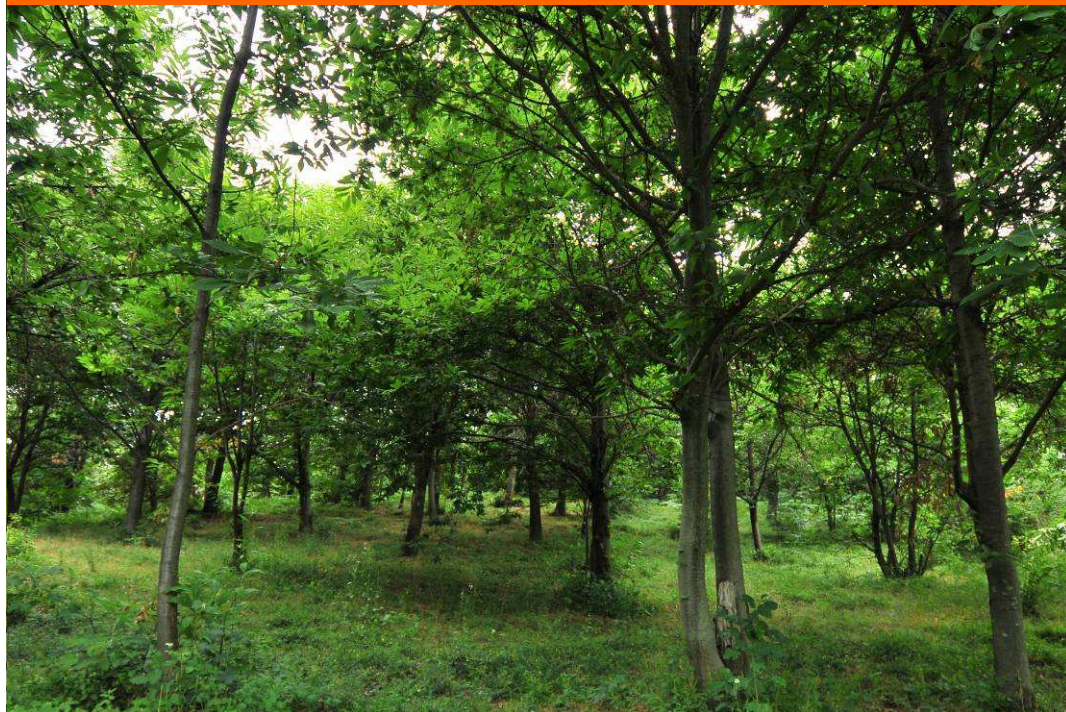
2012



Peveragno

2005

2012

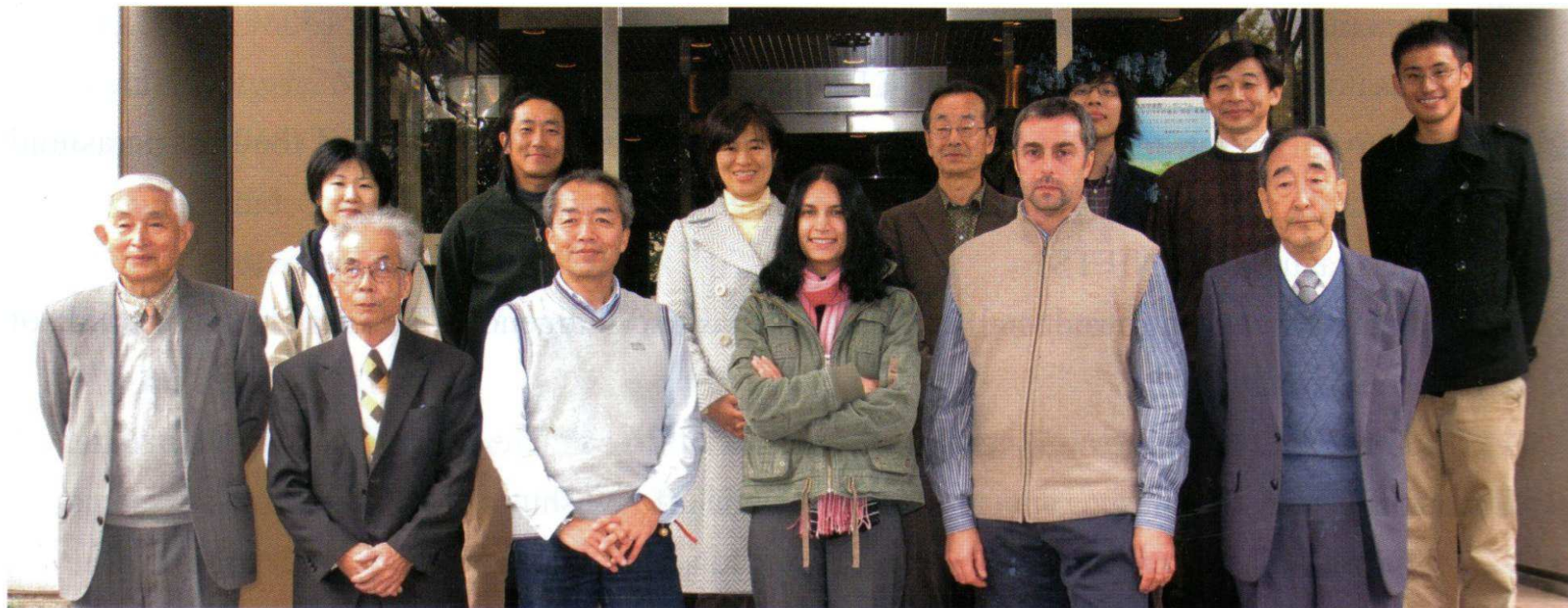


Boves

2005

2012





Front: Yôzô Murakami, Akio Ôtake, Seiichi Moriya, Ambra Quacchia, Giovanni Bosio, Kenji Umeya

Rear: Kaori Yara, Masatoshi Toyama, Midori Tuda, Masakazu Shiga, Nakatada Wachi, Yoshihisa Abe, Kazunori Matsuo

Photo by N. Morimoto: November 24, 2009