

Morphological Differences of
Prothoracic Spiracles Between
Three Strains of *Apis Mellifera*
(L). Existence of a Resistance
Mechanism Against *Acarapis*
Woodi (R).

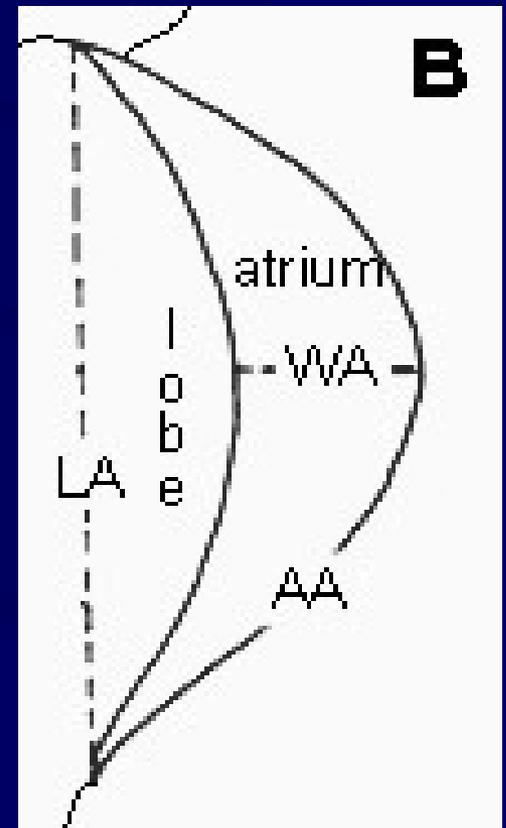
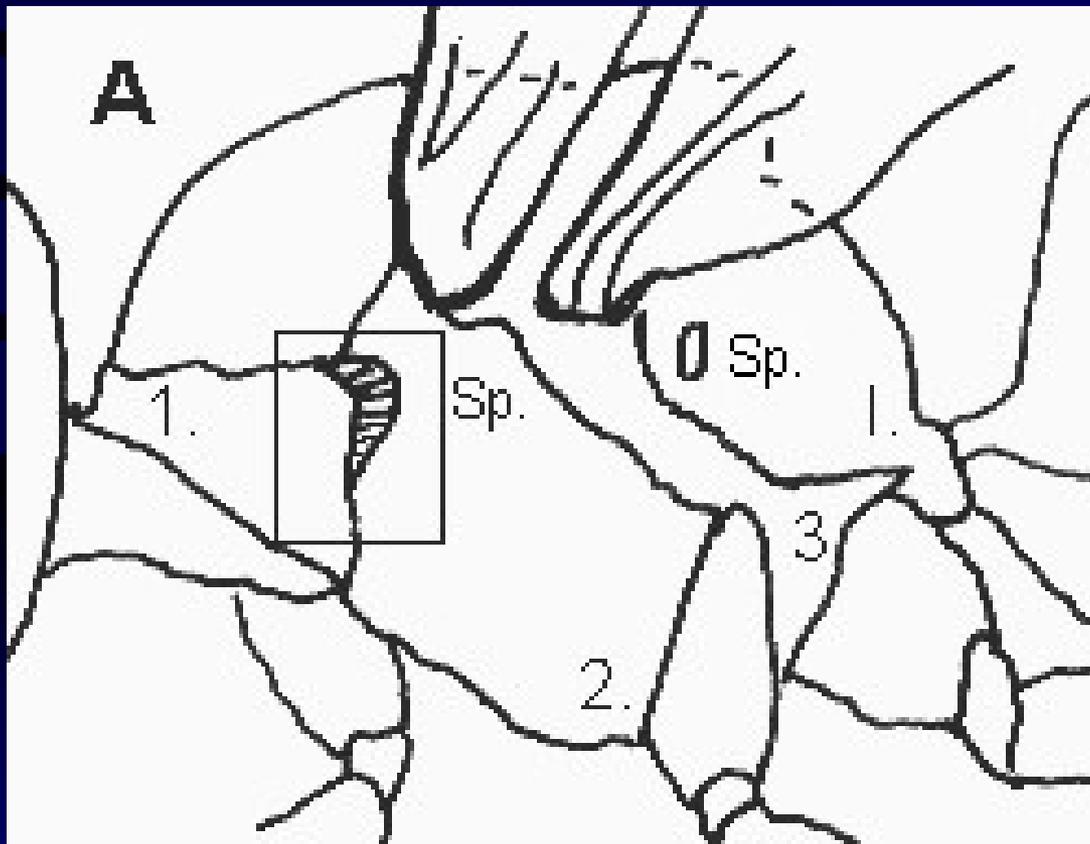
G. Theopilidis, F. Hatjina*,
A. Gregorc, N. Pappas,
St. Zaharioudakis,
A. Thrasyvoulou

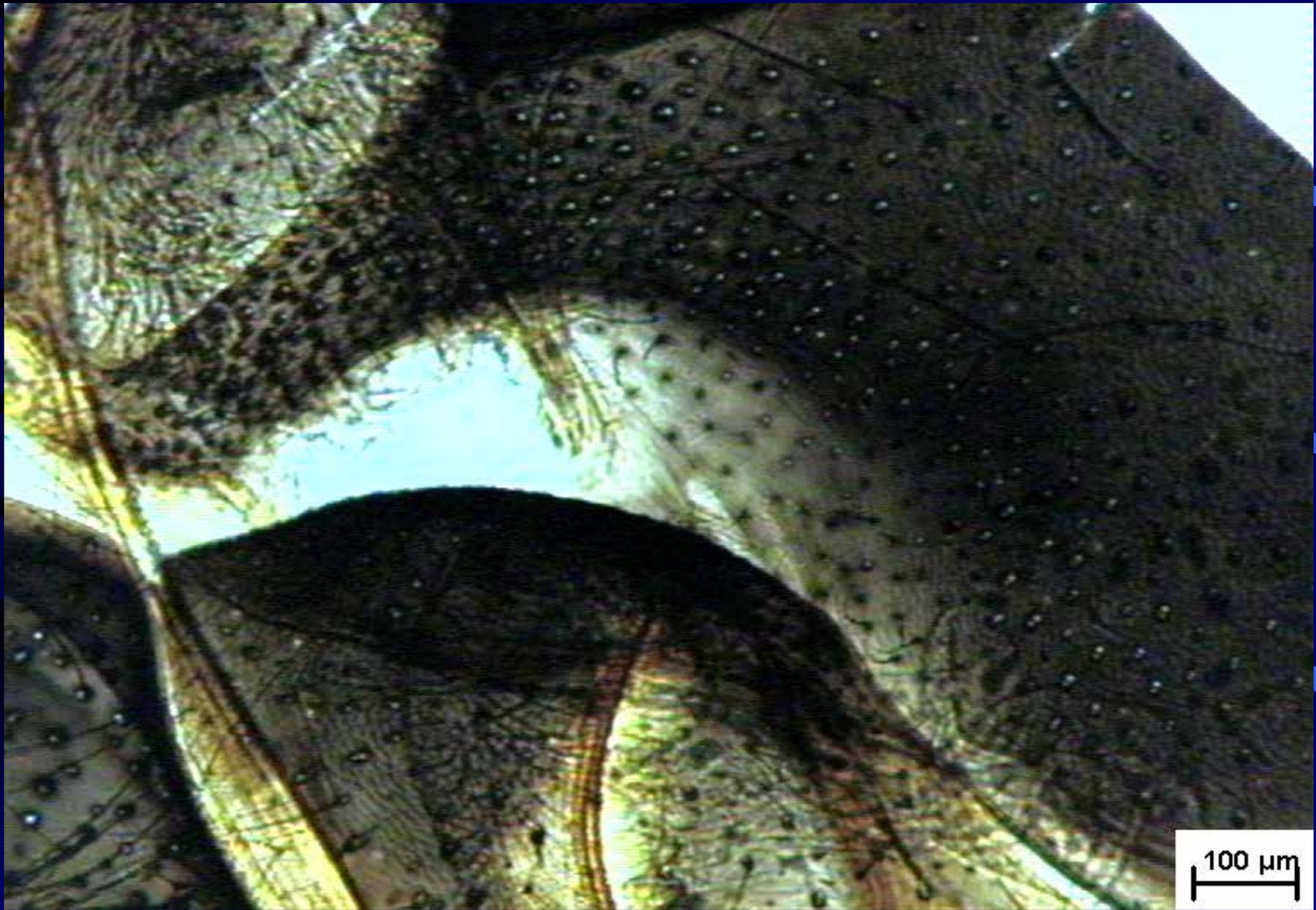
* *Hellenic Institute of Apiculture,
Greece*

The honey bee strains used:

- Ø *Apis mellifera macedonica* is a sub-species in North Greece, which shows resistance to *Acarapis woodi*
- Ø In South Greece, since *Apis mellifera ligustica* has been introduced, tracheal mite infestations have become severe
- Ø *Apis mellifera carnica*, which is also susceptible to *Acarapis woodi*, was used in this study for comparative reasons

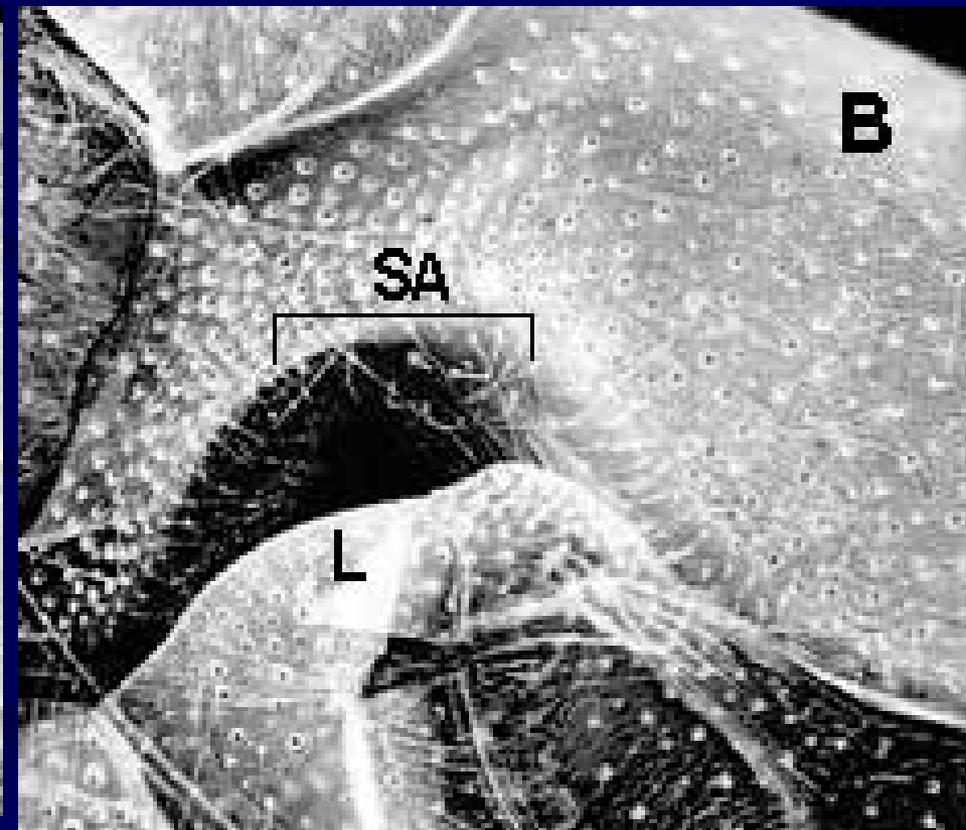
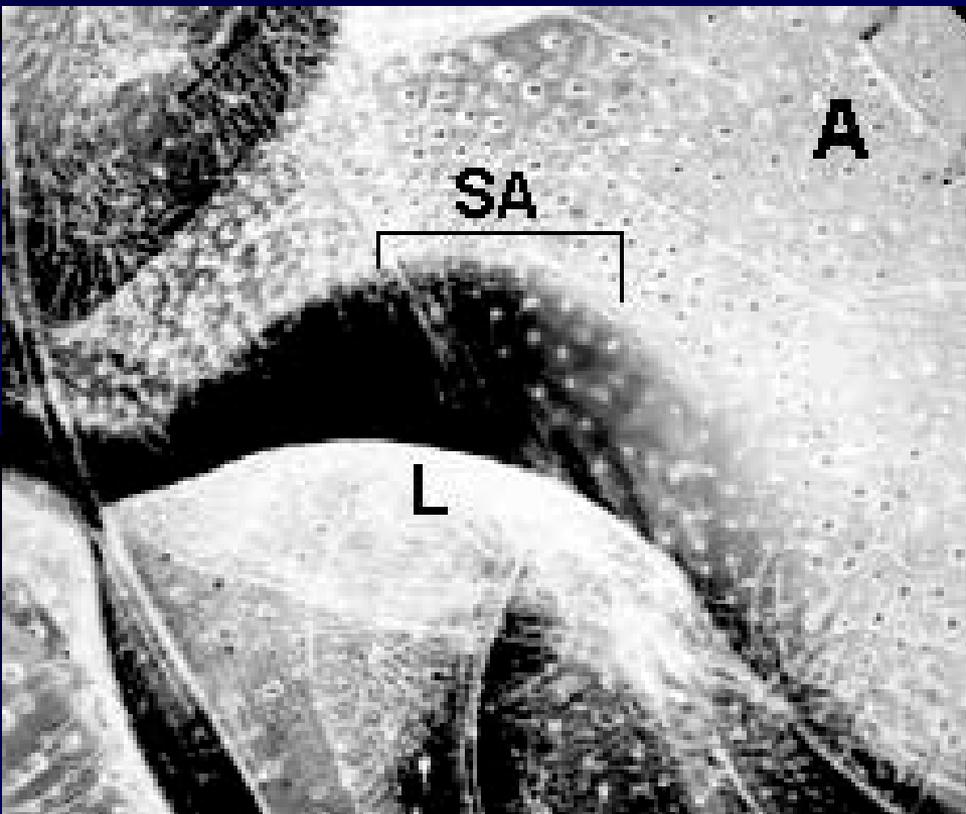
Location of thoracic spiracles and dimensions measured



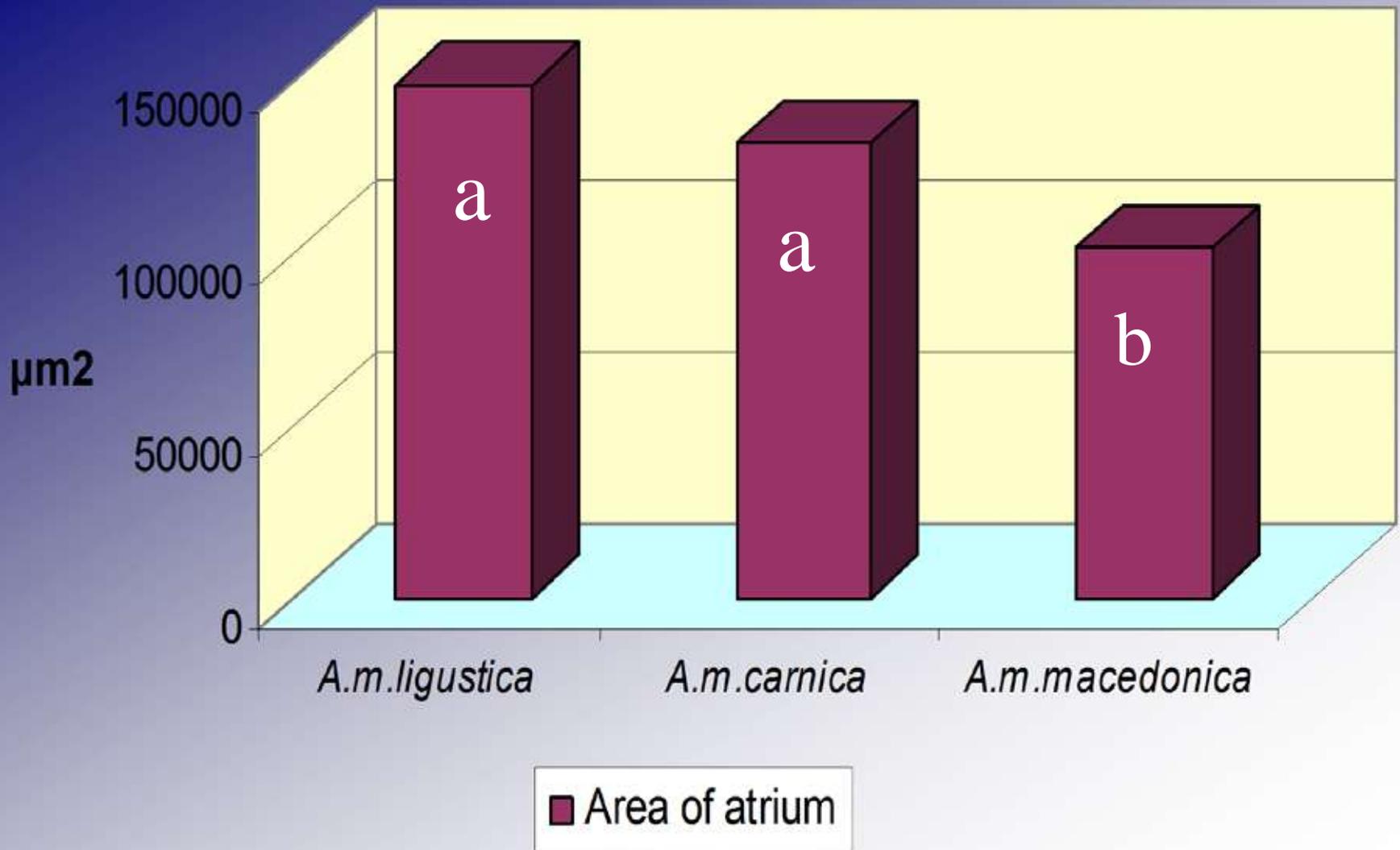


100 μm

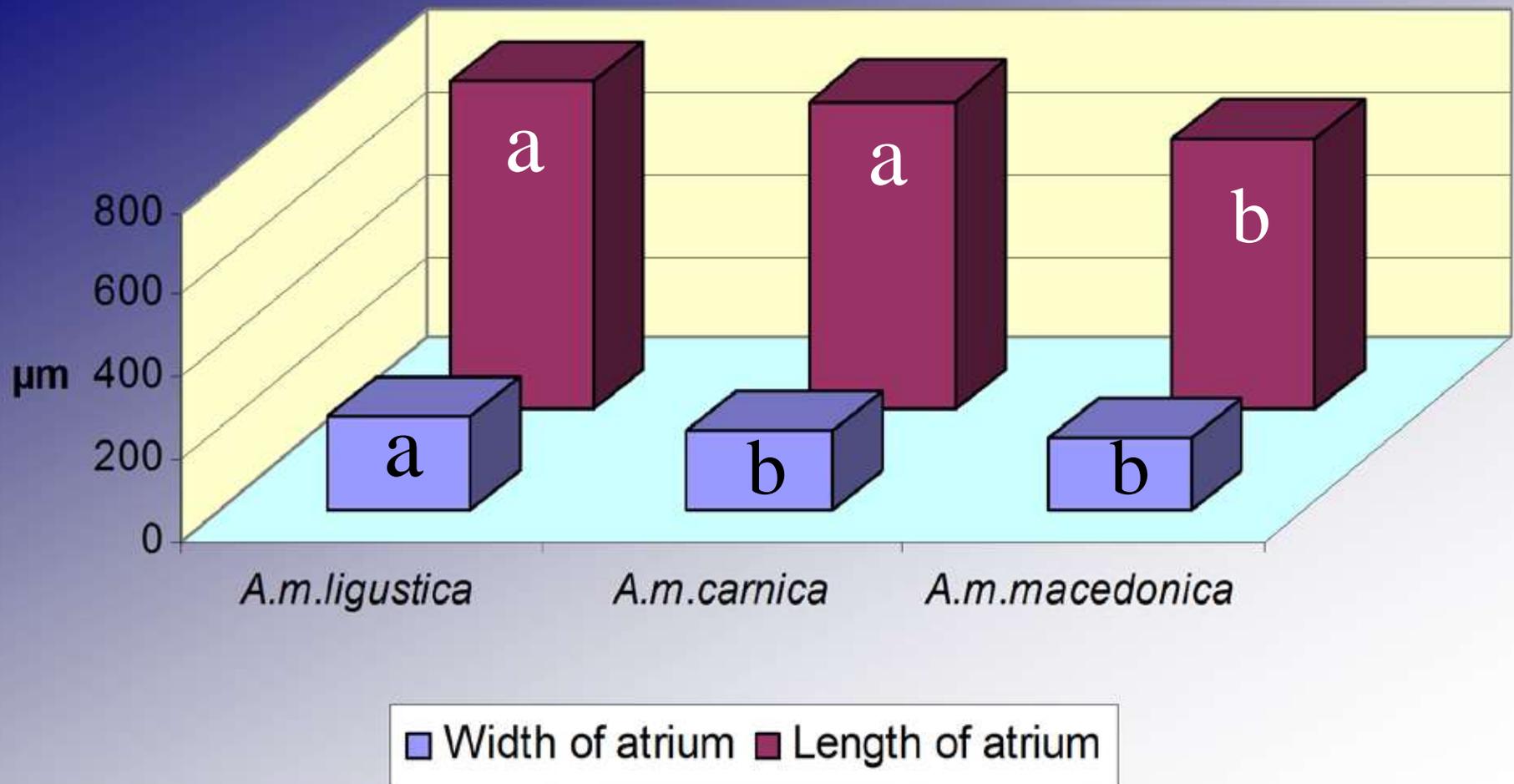
Thoracic spiracles of *A. m. ligustica*
(A) and *A. m. macedonica* (B)



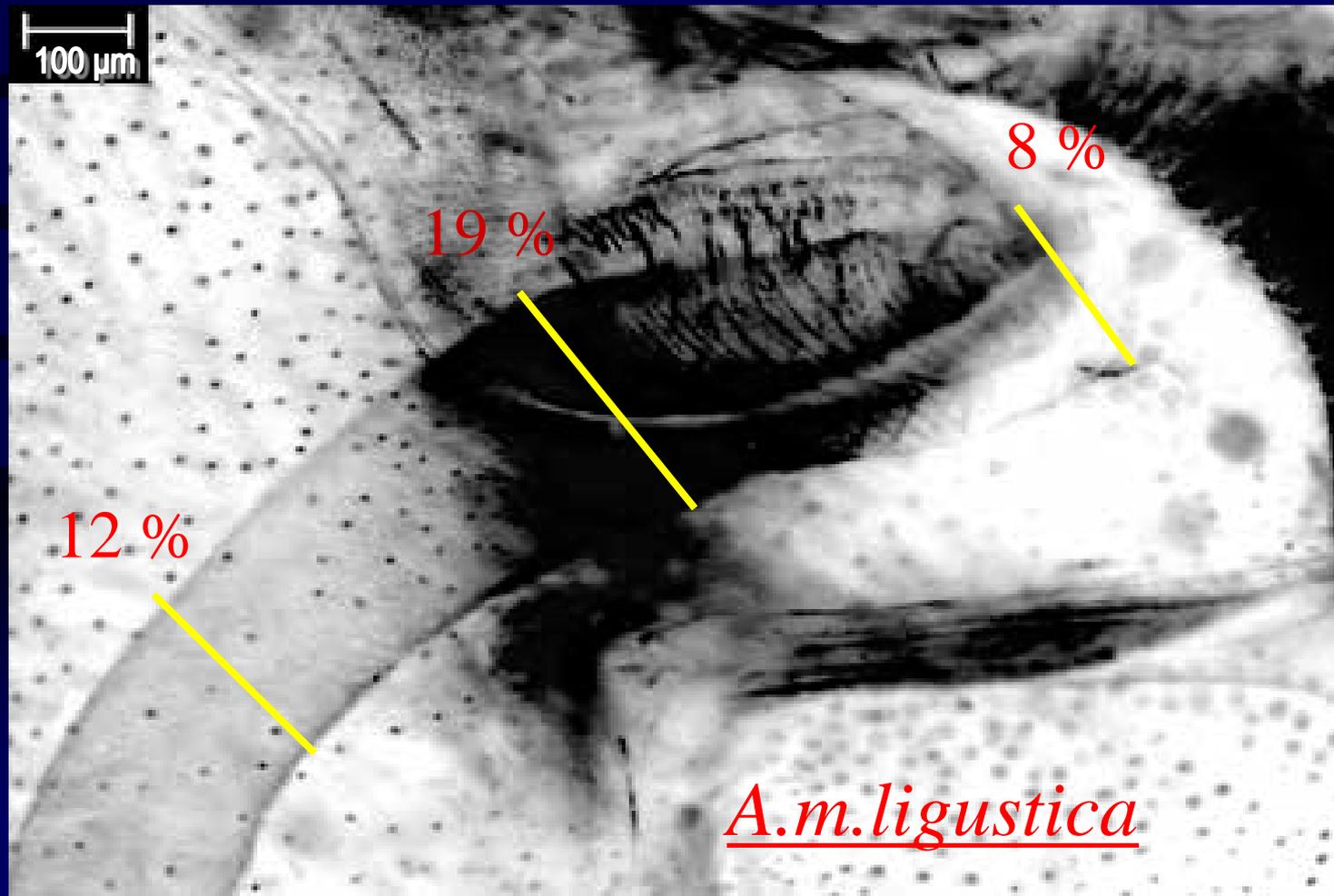
Results: Area of atrium

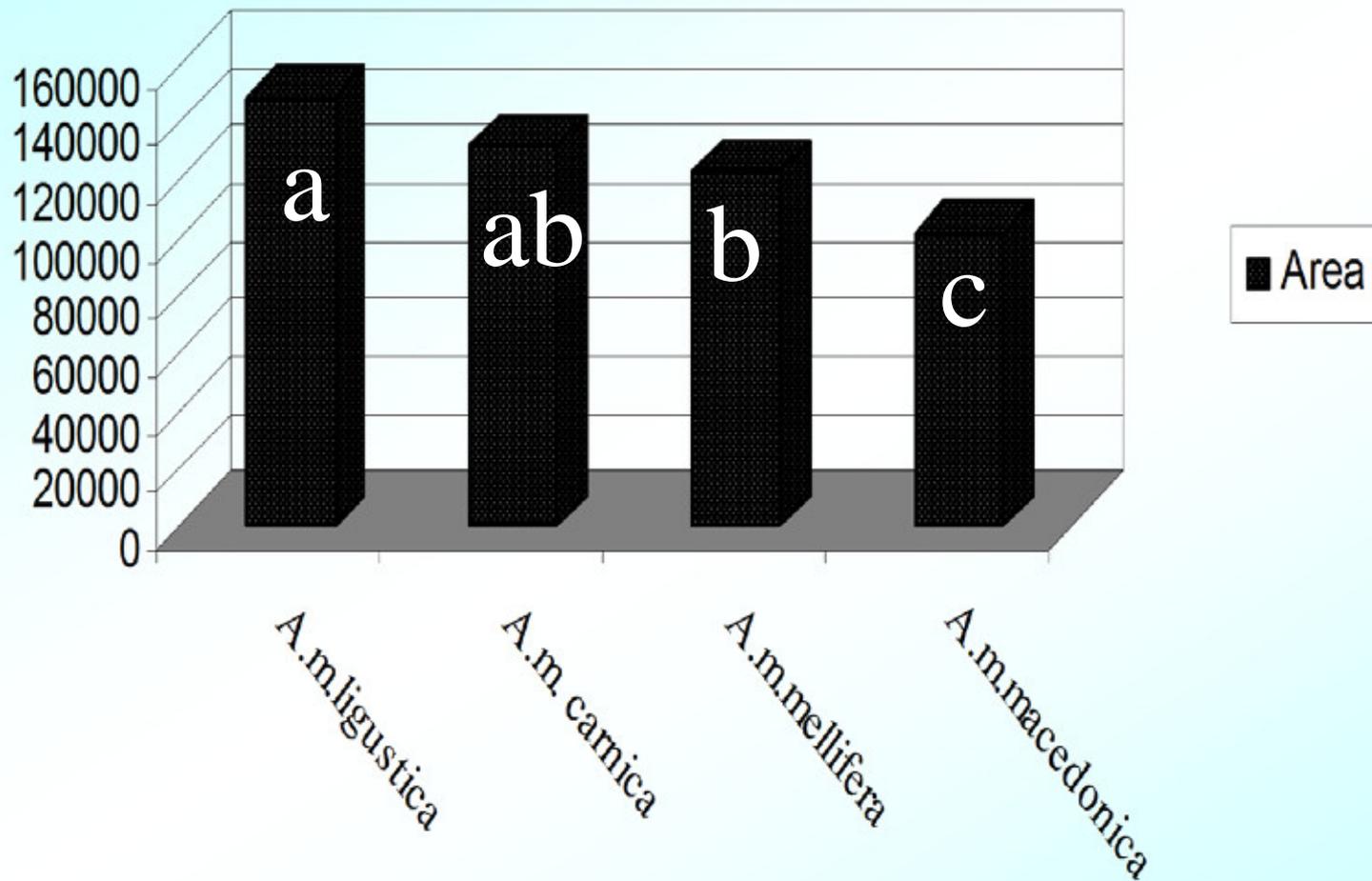


Results: Length and Width of atrium



Results: Cross-diameter of the trachea of *A. m. macedonica*





Important points:

A.m. macedonica has significantly smaller spiracle and trachea compared to *A. m. ligustica* and *A. m. carnica*

Acarapis woodi has never been observed to parasitise in the trachea of *A. m. macedonica*:

- I. either can not enter the trachea at all
(small size of atrium+ dense setae)
- II. or has difficulties in entering and when it does, is not reproductive

The small size of the atrium could be a major resistance mechanism

A.m. macedonica seems to have the desirable properties, along with its other qualities (profitability, gentleness, over-wintering with small populations, small tendency to swarming) to be conserved and then used as the basic stock in breeding programs for resistance to *Acarapis woodi*

The Buckfast bee also shows resistance to *Acarapis woodi* but it does get infected over the years

Bees without frontiers



- ↑ We used to say that the local bees are the best for their environment (*A.m. macedonica* in N. Greece, *A.m. cecropia* in S. Greece, *A.m. adami* in Grete)
- ↑ However, beekeepers tend to introduce other strains of bees to the local one (*A.m. ligustica*, Buckfast) with questionable genotype
- ↑ Hybridization is unavoidable and the purity of the local strains is in jeopardy. Is still a

Bees without frontiers



- ↑ Because we want to continue working with the strains we want, in any part of the world
- ↑ Because we do not want to jeopardize the existed biodiversity
- ↑ Each country ought to conserve the properties and characteristics of the local bee strains in special conservation areas, to be used as controlled gene pools for the specific strains



Thank you!

100 μm