

Research on Nosema disease in honeybees in Vietnam



Talk outline

- Microsporidian species:
 - *Nosema apis* and *Nosema ceranae*
- *Nosema ceranae* in Vietnam
- Control

1. Microsporidian species in honeybees

➤ Microsporidia species in European honeybees *Apis mellifera* and *Apis cerana*:

- *Nosema apis* Zander (1909)
- *Nosema ceranae* Fries (1996)

Microsporidian species in honeybees

A.mellifera and *A.cerana*

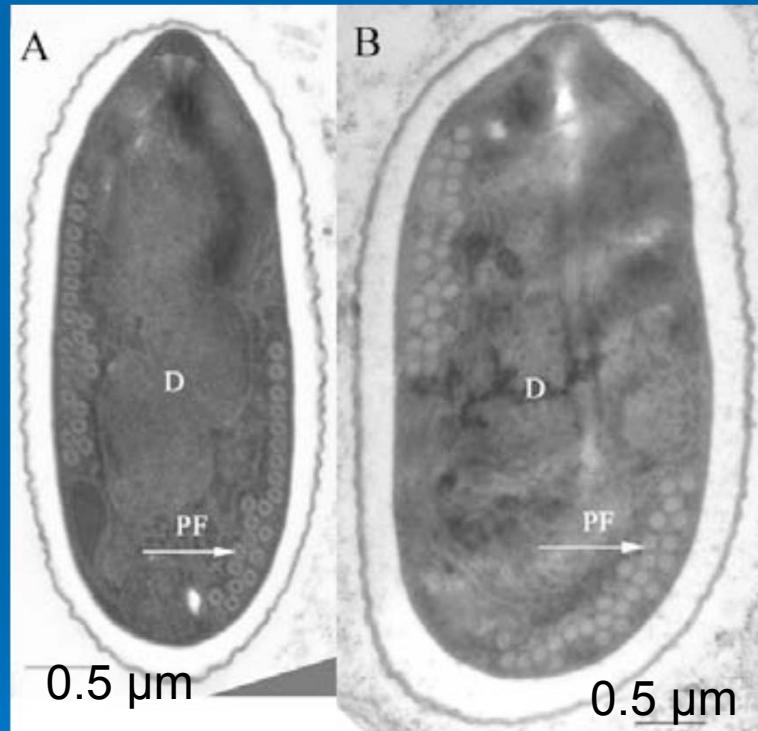


Fig 1. (A) *Nosema ceranae*;
(B) *Nosema apis*
Photos: Ingemar Fries

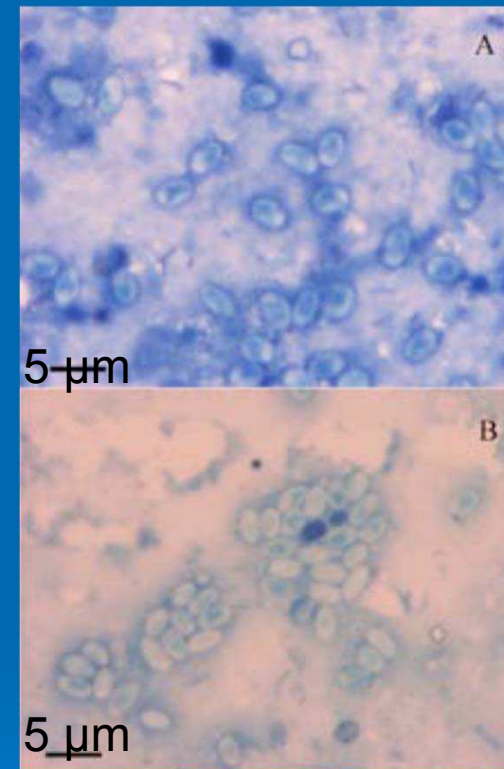


Fig 2. Spores
Photos: Martino Higes

Distribution

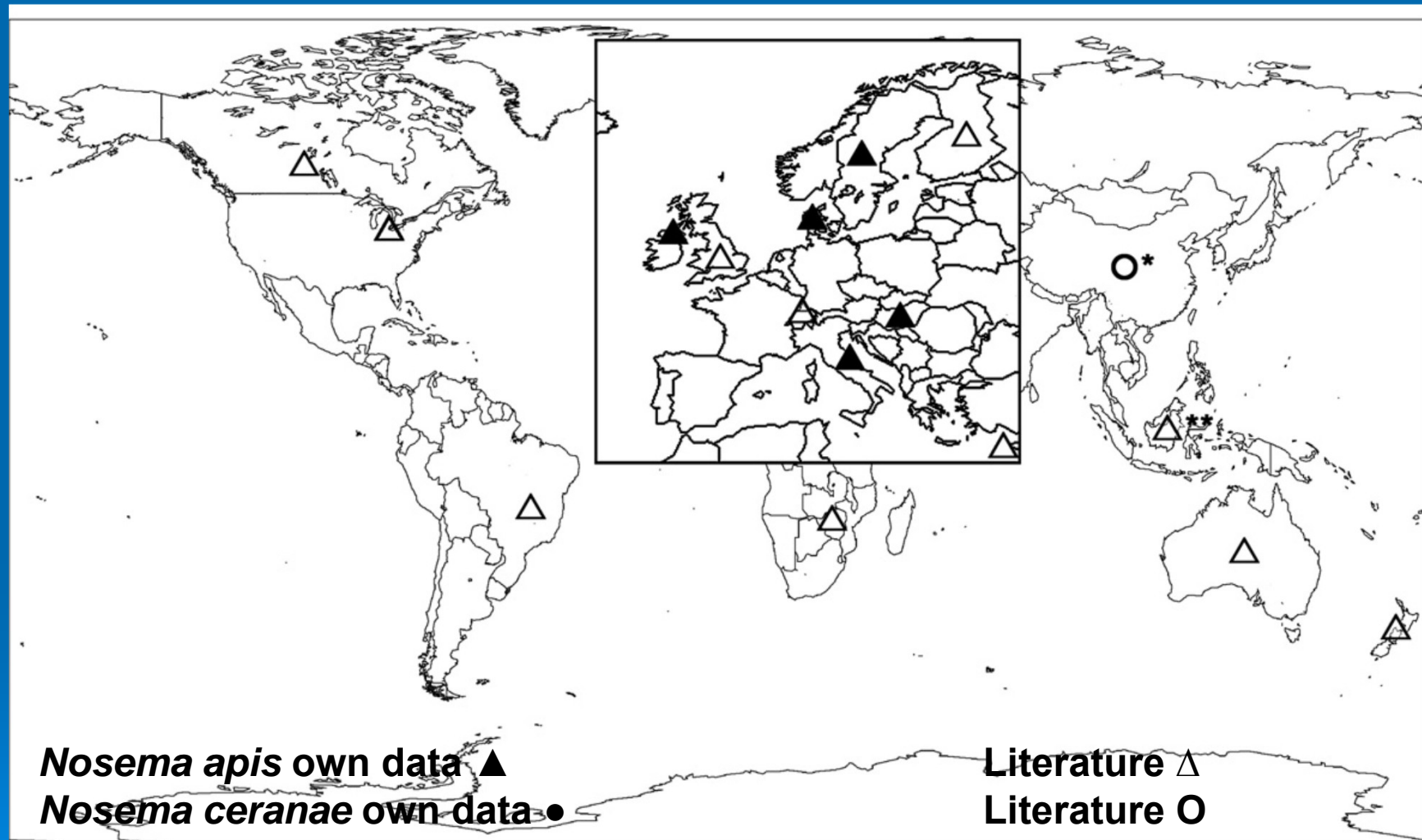


Fig. 3. Post-January 2003 world distribution of *N. apis* (triangles) and *N. ceranae* (circles) in honey bees Klee,...Naneti, Tam, Chinh..., Fries & Paxton (2007) *J. Invert. Path.* 96: 1-10

Distribution

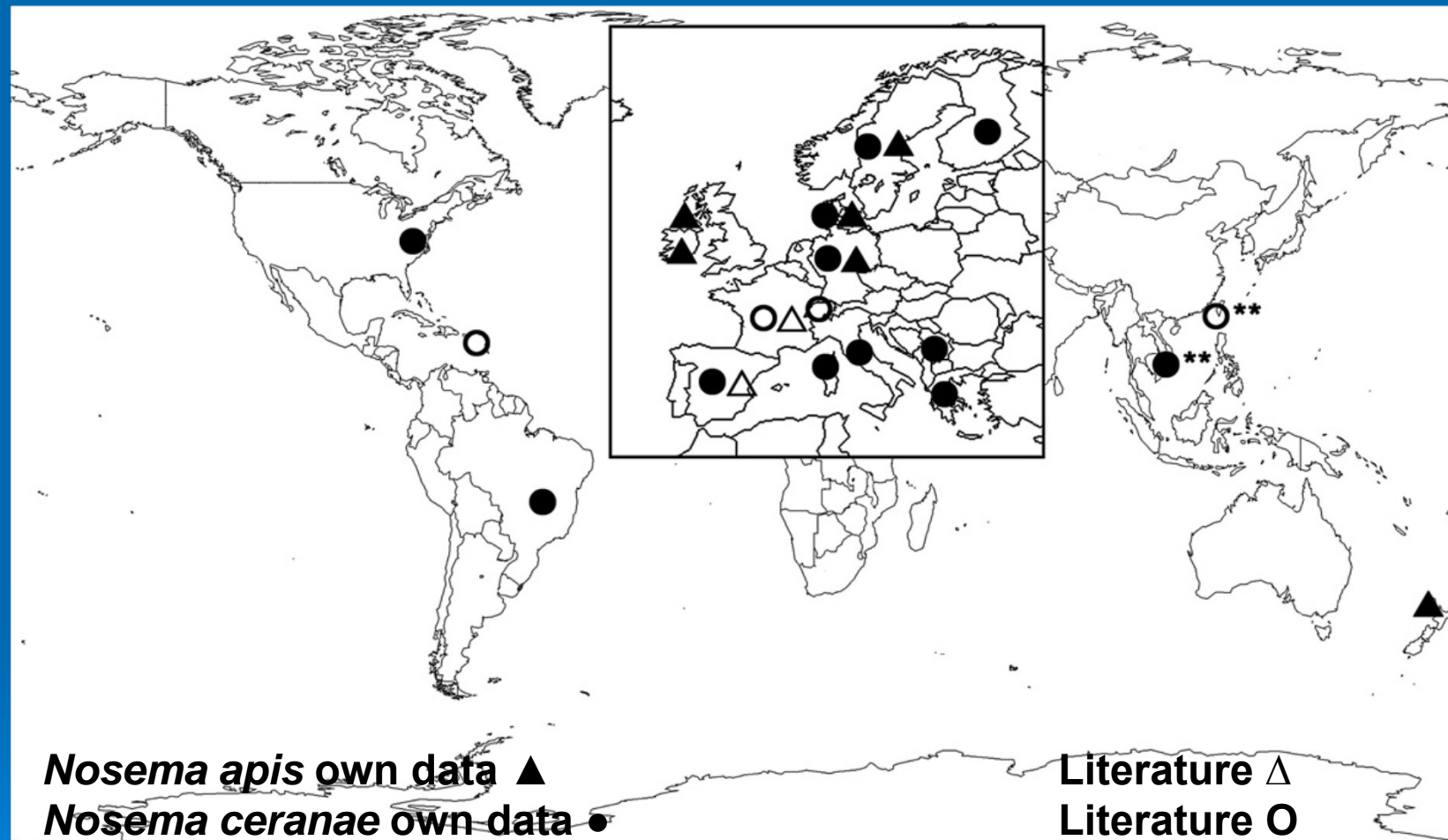


Fig. 4. Post-January 2003 world distribution of *N. apis* (triangles) and *N. ceranae* (circles) in honey bees Klee,...Naneti, Tam, Chinh..., Fries & Paxton (2007) *J. Invert. Path.* 96: 1-10

Epidemiology

- Soiled comb is the primary source of infection
- Extended confinement of bees is a risk factor
- Infected spores remain viable in fecal deposits from one season to the next
- As combs are cleaned for the expanding brood production increasing number of bees become infected

(Robert Paxton, 2009)



Nosema ceranae in Vietnam

- First time *Nosema* disease found *N. apis* spores in the infected European honeybee *A. mellifera*. The spores identified by light microscope (Koeniger et al, 1997)
- All of the 6 infected honeybees from province Gia Lai, Hung Yen, Hai Duong (2 samples of *A. mellifera* and 4 of *A. cerana*) caused by *N.ceranae* detected by RT-PCR (N=6) (Klee et al, 2007)
- All of the infected honeybees from 6 provinces (N=24, 15 samples *A.mellifera* & 9 samples *A.cerana*) caused by *N. ceranae* only

Epidemiology of *N.ceranae* in Vietnam

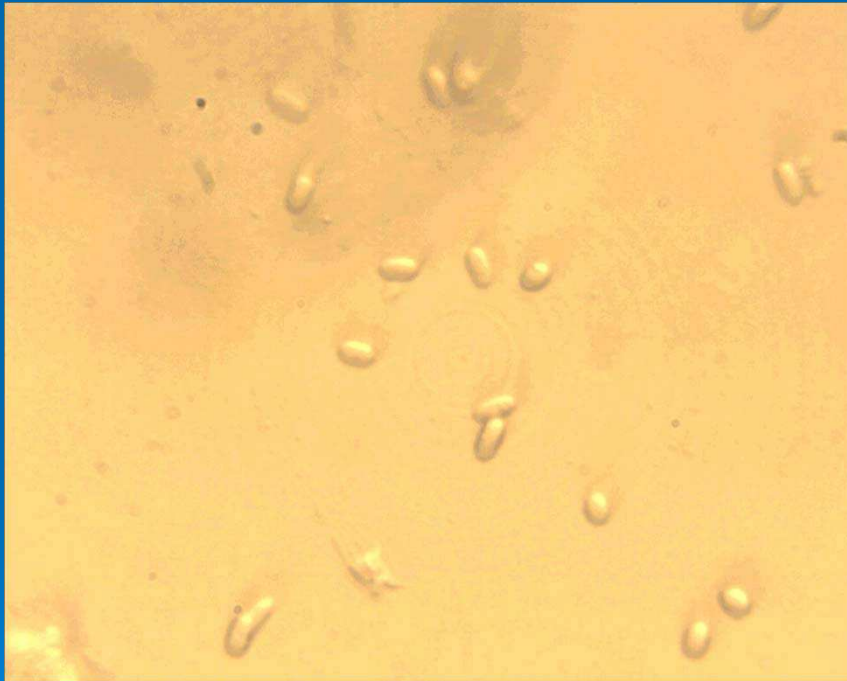


Fig 5. *N. ceranae* spore 400X
Photo: Dinh Quyet Tam

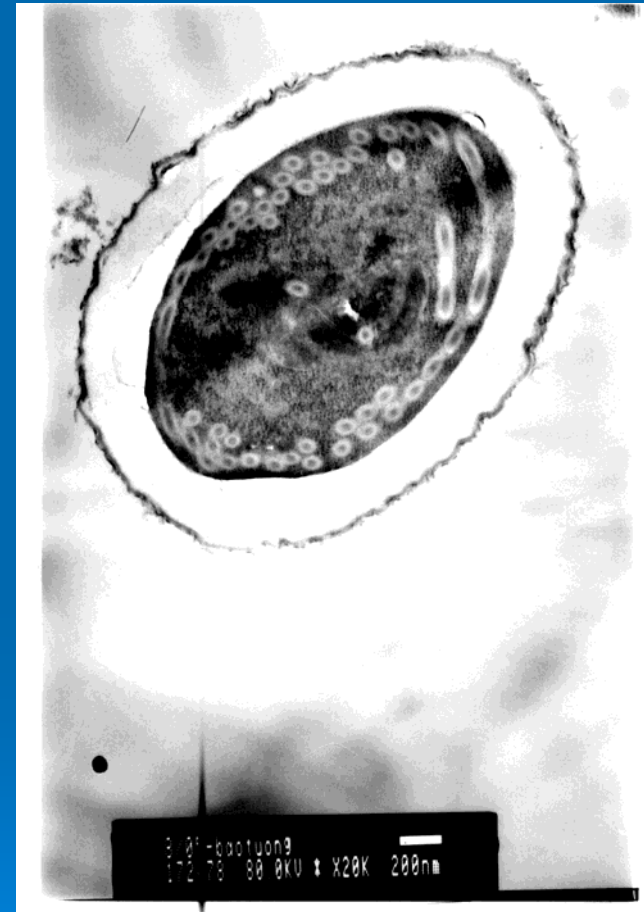


Fig.6. *N. ceranae* 38,000X
Photo: Dinh Quyet Tam

Epidemiology of *N.ceranae* in Vietnam

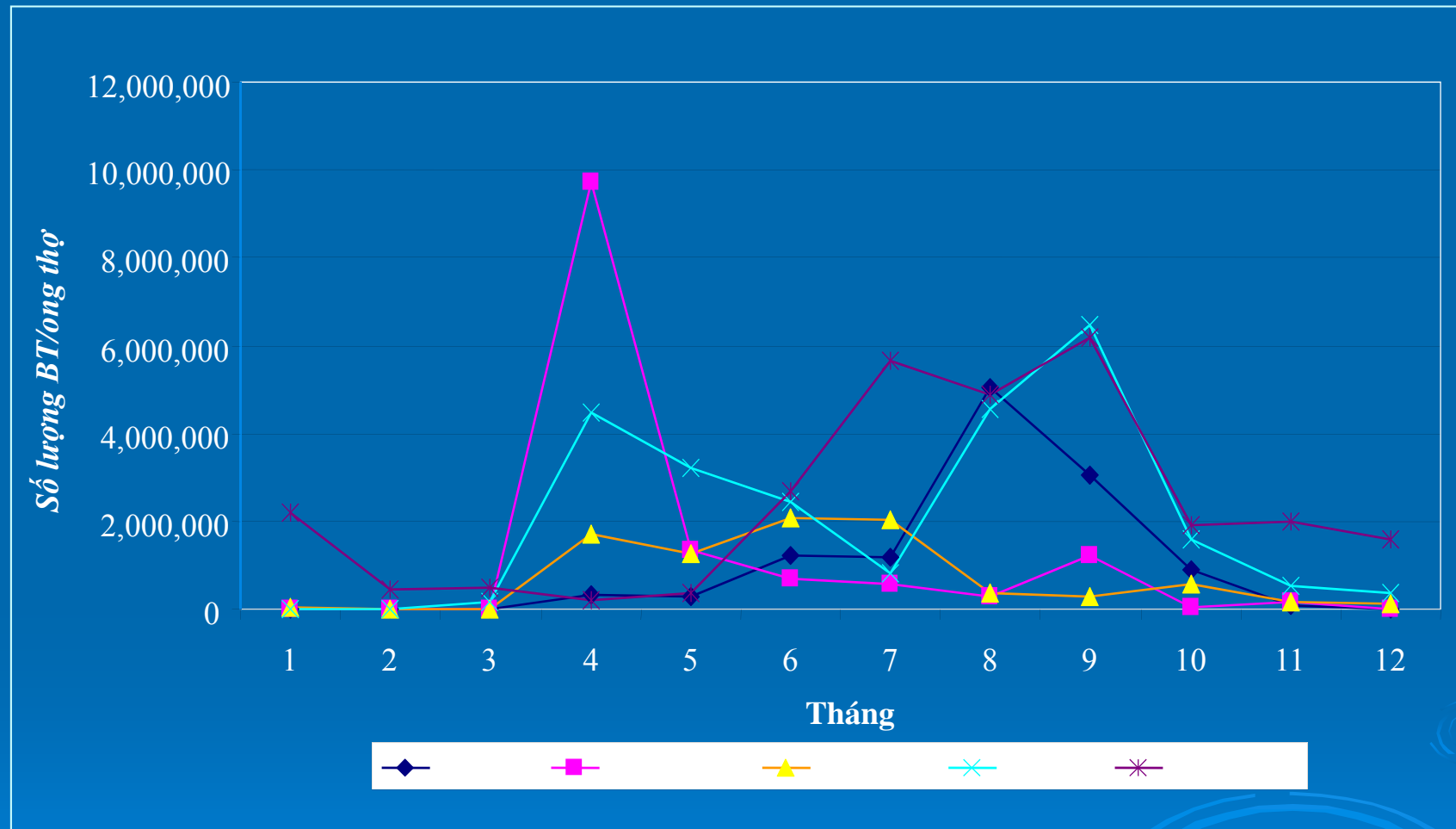
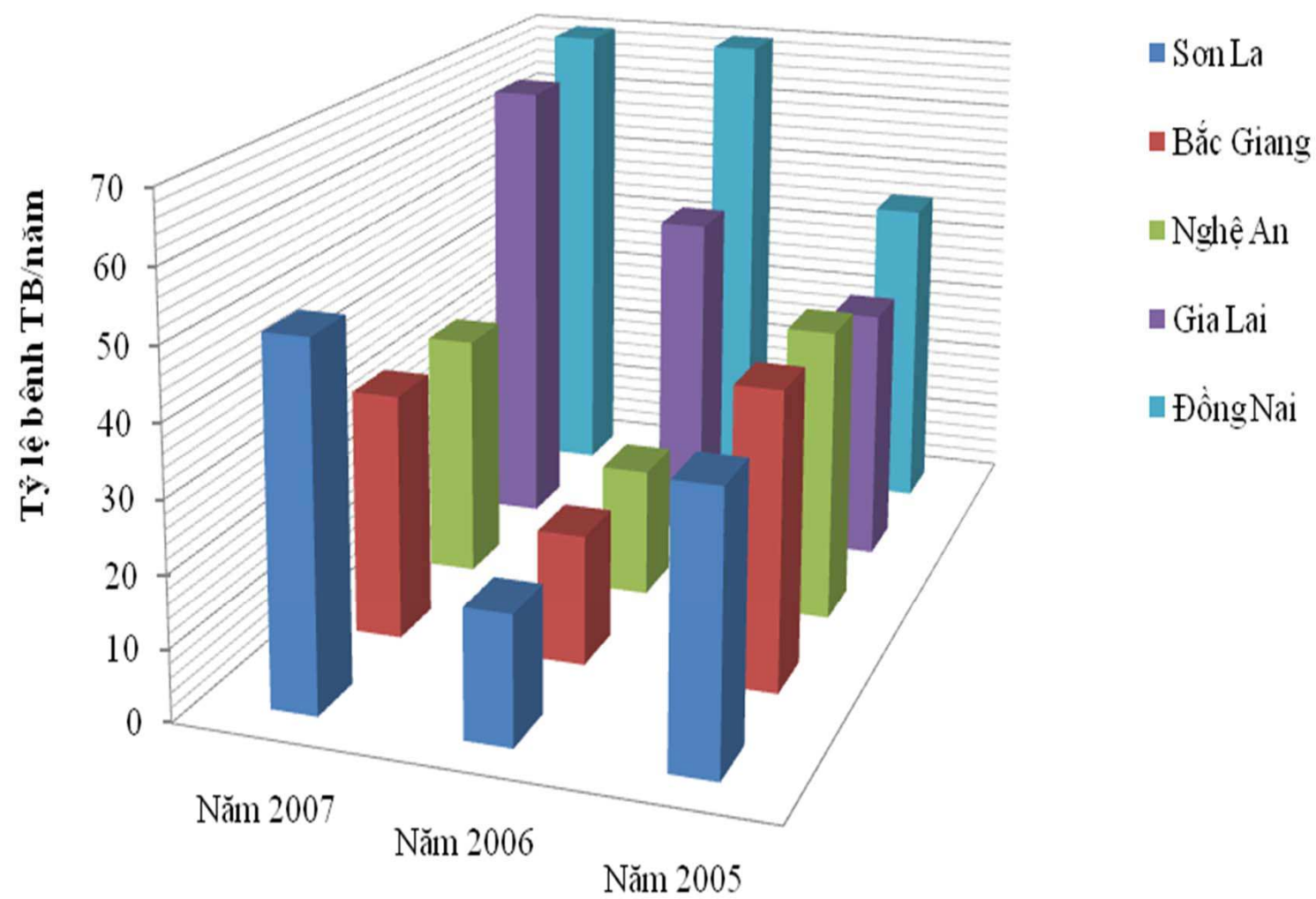



Fig. 7. Dynamic of number of spore *Nosema* spp. in *A. mellifera* in Vietnam (2005-2007)



Control

- Beekeeping management:
 - Keep healthy colony
 - Good nectar and pollen
 - Do not re-used infected frame
 - Fumagiline
 - Organic acid: Acetic, Oxalic
 - Herbs
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Thank you very much!

