

[J Invertebr Pathol.](#) 2011 Oct;108(2):131-4. doi: 10.1016/j.jip.2011.07.003. Epub 2011 Jul 23.

Polar tube protein gene diversity among *Nosema ceranae* strains derived from a Greek honey bee health study.

[Hatjina F¹](#), [Tsoktouridis G](#), [Bouga M](#), [Charistos L](#), [Evangelou V](#), [Avtzis D](#), [Meeus I](#), [Brunain M](#), [Smagghe G](#), [de Graaf DC](#).

Abstract

Honey bee samples from 54 apiaries originating from 37 geographic locations of Greece were screened for *Nosema apis* and *Nosema ceranae*. Furthermore 15 samples coming from 12 geographic locations were screened also for *Paenibacillus* larvae and *Melissococcus plutonius* and seven honey bee virus species, for the first time on a nation-wide level. There was a tendency in finding proportionally higher spore counts in samples from apiaries that suffered important colony losses. *P. larvae* bacteria were identified in two samples and each of the tested bee viruses could be detected in at least one of the examined samples, with IAPV, CBPV and SBV being the least abundant and BQCV and DWV being the most abundant. In the study we focused on polymorphism of a *N. ceranae* gene encoding a polar tube protein (PTP) as similar genes were proven to be highly polymorphic in the microsporidian parasites *Encephalitozoon cuniculi* and *Encephalitozoon hellem*. The polymorphism observed in the PTP gene sequences from a single sample (bee hive) was unexpected and can thus be considered to be a major obstacle for genotyping.