S14. Systematics and Phylogeography

Convenors: Sergei Subbotin & Wim Bert

Phylogeography of the vector nematode, *Xiphinema index*, using mitochondrial and microsatellite markers highlights its Eastern origin closely linked to grapevine domestication

Van Chung Nguyen[1], Laure Villate[2], Carlos Gutierrez-Gutierrez[3], Pablo Castillo[4], Cyril Van Ghelder[1], Maarten Van Helden[5], Olivier Plantard[6] and Daniel Esmenjaud[1]

[1]INRA, Université Nice Côte d'Azur, CNRS, ISA, France; [2]Université de Bordeaux, France; [3]NemaLab/ICAAM, Instituto de Ciências Agrárias e Ambientais Mediterrânicas & Dept. de Biologia, Universidade de Évora, Núcleo da Mitra, Ap. 94, 7002-554 Évora, Portugal; [4]IAS-CSIC, Cordoba, Spain; [5]UMR SV, Bordeaux, France; 6BIOEPAR, INRA, Oniris, Université Bretagne Loire, 44307 Nantes, France. van-chung.nguyen@inra.fr

The economic impact of the dagger nematode *Xiphinema index* is high in Western vineyards by transmitting the damaging Grapevine fanleaf virus. Our phylogeographical study based on mitochondrial sequences and microsatellite loci used more than 80 *X. index* representative samples collected from the Middle- and Near East, the Eastern-, Central- and Western Mediterranean, and the Western countries (Europe and the Americas). In this mainly (meiotic) parthenogenetic species, the mitochondrial marker *CytB* was first considered for comparison of *X. index* with the related amphimictic vector species *X. diversicaudatum*. *Xiphinema index* exhibits a significantly lower intraspecific molecular variability than *X. diversicaudatum*, in agreement with the respective reproduction modes of both nematodes. We then showed that *CytB*, concatenated with additional mitochondrial genes *ATP6*, *ND4* and *COI*, display a robust phylogeographical pattern consisting in three clades grouping Eastern Mediterranean, Near- and Middle Eastern samples and a single clade grouping samples from Western Mediterranean, Europe and the Americas. The highest mitochondrial polymorphism is observed in one clade of Middle- and Near-East samples that overlaps the Transcaucasia and Southern Caspian Sea region from where grapevine has been presumably domesticated and that likely overlaps the nematode native area. East-to-west nematode dissemination appears to match that of its domesticated grapevine host during the Antiquity mainly by the Greeks and then the Romans. In Western Mediterranean, Europe and the Americas, two close and almost exclusive mitochondrial haplotypes were detected. The first haplotype, found in vineyards from the Southern Iberian Peninsula, Bordeaux and Provence, exhibits a high microsatellite polymorphism. By contrast, the second haplotype contains a single predominant microsatellite genotype surprisingly widespread in most Western countries. This is almost certainly due to its recent dispersal during the massive grapevine replants following the 19th century phylloxera crisis. Our data provide an improved knowledge of *X. index* diversity for future pest control strategies.