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**BOOK OF ABSTRACTS**

## PO036

**THE PREVENTION OF BIOLOGICAL INVASIONS: THE CRUCIAL ROLE OF IMPORT CHECKS AT BORDER INSPECTION POSTS (BIPS). SOME CASE STUDIES**

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The increased international trade with living plants and plant-based products creates possibilities for introduction of organisms to new areas, where they may develop to invasive pests. Italy is particularly exposed due to its exceeding points of entry, geographical position, habitat patterns. Campania Region contributes to the strengthening of controls on imported vegetal goods from Countries not belonging to EPPO region by its Plant Health Service. Goods reaching the BIPs are meticulously inspected, supported by scientific skills of partners involved in the operations (through URCoFi Project). Although many of these goods are recognized as pest-free, several species potentially harmful to our agro-ecosystems were stopped in the last years. Some case studies are reported: At the port of Naples annually, several containers are rejected and sent to the origin because of the infested contents. 1) Inspection on *Ficus microcarpa* from China highlighted the presence of the agaonidae *Josephiella* sp., soft scales *Ceroplastes floridensis* and *Lecanium* sp., while roots were attacked by *Meloidogyne* sp. nematodes. 2) An iconic case is represented by the finding on abachi Cameroonian (*Triplochiton* sp., although was a non-regulated product) of numerous arthropods and pathogenic fungi, which constituted almost an entire ecosystem. 3) In the recently set-up airport phytosanitary post, a Ghanaian passenger's baggage contained some *Solanum aethiopicum* fruits. Several of these fruits showed some holes probably ascribable to carpophagous parasites and laboratory observations allowed recovering some *Lepidoptera* larvae. Molecular analyses on larvae showed the specimens belong to *Leucinodes africensis* (Lepidoptera: Crambidae), a pest of Solanaceae absent in EPPO region. The aforementioned cases show that several interceptions occur every year and that adequate actions (inspections, training courses, information campaigns, agreement with other border institutions) and involvement of human and financial resources can guarantee a prompt and proficient prevention, thus preventing biological invasions by appropriate and timely risky material destruction.

Keywords: Alien pest, biological invasions, plant inspection, point of entry

## PO037

**STORAGE PESTS, ORIGINS AND DISTRIBUTIONS: A QUATERNARY PERSPECTIVE**

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Work on fossil insect faunas from human settlements and records of pests of stored products provide an insight on the spread of species of pests and an understanding of the initial itineraries which led to their current global distributions. This paper will provide an overview of introductions of a few of the main pests to Europe with the initiation of farming, including *Sitophilus granarius*, *Oryzaephilus surinamensis* and *Tribolium castaneum*. It will include discussion of the beginnings and spread of agriculture and the role of the movement and establishment of storage pests to new areas for understating cultural transitions and synanthropic change. Discussion will centre upon significant periods for the spread of pests and their implications. The expansion of the Roman Empire and the feeding of its armies, Norse colonisation, and trade in the medieval and the post-medieval period will be considered from the biogeography of the pest records. The importance of human impact as a driver for the spread of synanthropic faunas and their toll on past societies will be discussed. In addition, preliminary studies from North America will be presented in an effort to understand differences and similarities between the two hemispheres.

Keywords: Fossil insects; storage; biogeography; Holocene; archaeoentomology

## PO038

**THE ALIEN PLANTHOPPER *RICANIA SPECULUM* ACQUIRES FLAVESCENCE DORÉE PHYTOPLASMA, BUT IS UNABLE TO TRANSMIT IT**

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*Ricania speculum* is an alien planthopper accidentally imported from Far East, detected for the first time in the province of Genoa (Liguria, Italy) and spread out in Liguria and Tuscany regions. The species is univoltine in Italy, its overwintering eggs are inserted in linear rows inside thin plant structures (e.g. twigs, leaf ribs, stems). The nymphs have a huge wax tail used like a parasol for covering their bodies when disturbed. *Ricania speculum* is polyphagous on wild and cultivated plants, herbaceous and woody crops. This phloem feeder colonizes, among others, grapevine and Clematis vitalba plants, well-known hosts of Flavescence dorée phytoplasma (FDp), a quarantine phloem-limited pathogen, transmitted by the Nearctic leafhopper *Scaphoideus titanus*, which is one of the main constraint to viticulture in several areas of Europe. Moreover, two Ricaniidae specimens tested positive for the Banana Wilt Associated Phytoplasma (BWAP) in Papua New Guinea. Therefore, the aim of this work was to ascertain if *R. speculum* could act as a vector of FDp. To this purpose, nymphs reared from eggs were allowed to feed on FDp-infected broad beans and, after the completion of the latent period, transferred onto grapevine, broad bean and *C. vitalba* test plants for inoculation. At the same time, a number of adults fed on infected source plants were analyzed by PCR for the presence of FDp to check if the planthopper was able to acquire the pathogen. Transmission experiments to about 50 test plants and PCR analysis of more than 60 adults showed that *R. speculum* is unable to transmit FDp, although some individuals can acquire the phytoplasma and support a low level of its multiplication, as shown by qPCR. In conclusion, although *R. speculum* can damage plants by feeding and egg laying, it should not be regarded as a threat for FDp spread

Keywords: Insect vectors; Grapevine; Clematis vitalba; Ricanidae

## PO039

**APHROPHORIDAE (HEMIPTERA) VECTORS OF *XYLELLA FASTIDIOSA* PAUCA OQDS JUVENILE QUANTITATIVE SAMPLING**

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Few Aphrophoridae, namely *Philaenus spumarius*, *P. italosignus* and *Neophilaenus campestris* transmit *Xylella fastidiosa pauca* ST53 causing the Apulian OQDS episode. Vector control is the effective, least impacting and sustainable action to manage and contain insect-borne pathogens. One of us (Porcelli) presented the first draft of a Aphrophoridae vector control strategy during the Symposium in Gallipoli. The same author proposed a more elaborated scheme for EFSA and in PONTE H2020 project kick-off. The strategy targets juvenile spittlebugs for vector control also because they are out of the olives trees, unable to transmit and far in time from transmission risks, pretty delicate and susceptible to several control means, relatively easy to count ex ante and ex post control action, with a control window wide enough to allow a second chance in case of first control action failure. Vector population size is one of the few key factor needed to shape a rational control strategy, but traditional adult sweeping net sampling or juvenile seeking by a looking glass do not gather the needed quantitative data. From 2016 we faced the need for novel sampling techniques focused on juvenile spittlebugs because naiades and nymphs are into the spittle and almost immotile, thus appearing the best possible instars for population measure. First experiments by flotation consisted in collecting herbs in olive orchards, either managed or abandoned, and in urban areas from within a transect and to wash the plants in water until any further juvenile was sieved out from the bath. Reducing the transect size from 0.25 to 0.04 m<sup>2</sup> and adding NaCl and Sucrose to increase the juvenile floating we suggest a method simple and effective that recorded the highest Aphrophoridae juvenile population (about 10,470,000 per ha). Flotation demonstrated striking differences in population among managed, unmanaged groves and urban environments.

Keywords: Xylem-sap feeders, xylematic bacteria, alien invasive pest, plant disease, Mediterranean, CoDIRO, AcquaSamPling, Italy

#### PO040

##### ENVIRONMENTAL NICHE UNFILLING AND DIET NICHE SHIFT IN THE INVADDED AREA BY THE SOLITARY WASP *ISODONTIA MEXICANA* (HYMENOPTERA: SPHECIDAE)

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One of the important questions in invasion ecology is to evaluate if an alien species has occupied the same native ecological niche in the invaded areas (niche conservatism), if it has occupied only a part of it (niche unfilling), or if it has changed its niche (niche shift). Here, we tested these three alternatives of niche occupation pattern in the American wood-nesting, solitary wasp, *Isodontia mexicana* (Hymenoptera: Sphecidae), which was first detected as alien species in France in 1960 and now present in most Europe. In particular, after having updated the current distribution of *I. mexicana*, we estimated 1) the environmental space occupied in both native and invaded range, subsequently predicting its potential global distribution, and 2) the diet niche (prey use) occupied in both native and invaded range. The wasp lives in areas of the Northern hemisphere with moderate and stable temperature, rather humid, and at low altitudes. The environmental space occupied in the invaded areas is included in, but does not overlap with, that occupied in the native areas, suggesting a process of niche unfilling of the invaded range. On the other hand, the wasp, which is restricted in hunting only gryllids and tettigoniids, tends to maintain its prey preference in the invaded areas, albeit also extending the prey spectrum, suggesting niche shift. *I. mexicana* could also live in other temperate areas, mainly in the Southern hemisphere, particularly on the coasts. However, geographic (oceans) and/or climatic (e.g. mountain chains) barriers would allow the species to reach these potential areas only through human trade activity. Thus, *I. mexicana* could still occupy new areas by active dispersion, but confined to Europe. If new introductions will occur in extra-European areas, the species would easily find suitable prey, given the potential to expand its diet spectrum within the two hunted orthopteran families.

Keywords: Environmental niche, BIOCLIM, prey use, wasp, invasion

#### PO041

##### THE PROJECT ALIEM "ACTION POUR LIMITER LES RISQUES DE DIFFUSION DES ESPÈCES INTRODUITES ENVAHISSANTES EN MÉDITERRANÉE" IN SARDINIA

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Human activity and global trading have promoted biological invasions of exotic pests in new environments, which is an important cause of biodiversity loss. In this framework, the project ALIEM "Action Pour Limiter les risques de diffusion des espèces introduites Envahissantes en Méditerranée" involves institutional partners from five territories of France and Italy and aims to develop adequate instruments for early detection of invasive pests and a cross-border observatory for flora and fauna. The model invasive species studied in order to achieve the goals of the project are the European hornet, *Vespa crabro*, the Asian hornet also known as yellow-legged hornet, *Vespa velutina*, and the red palm weevil, *Rhynchophorus ferrugineus*. The Asian hornet is a honeybee predator originating from China that was introduced accidentally into Europe in 2004 and at the moment has not been reported in Sardinia. The European hornet has presumably established in Sardinia since 2010. The monitoring of both species is required in view of the potential impact of *V. velutina* on honeybees and other social hymenopterans, also considering that the introduction of alien generalist predators may impact the food-web by changing the inter-specific relations through predation and/or competition. For this reason, the relationship between prey (*Apis mellifera ligustica*) and predator (*V. crabro*) will be evaluated through behavioral observations in an apiary context. The red palm weevil is a major pest of palms that has established in Europe in the '90. It has been recently observed also in the dwarf palm, *Chamaerops humilis*, the only native West Mediterranean palm species. In view of the ecological importance of *Ch. humilis*, extensive monitoring on cultivated and wild dwarf palms has been carried out, together with behavioral experiments.

Keywords: *Vespa crabro*, *Vespa velutina*, *Chamaerops humilis*, alien species