



## Research evidence to support monitoring, diagnosis and management of *Epitrix* spp.

Several flea beetles from the genus *Epitrix* (Coleoptera: Chrysomelidae) are considered serious pests to the potato industry and some EU markets do not accept tubers with any amount of flea beetle damage.

The EU has implemented emergency measures to prevent the introduction and spread of *Epitrix* species known to feed and cause damage on potato tubers and foliage. The *Epitrix* species concerned include: *Epitrix cucumeris*, *Epitrix subcrinita*, *Epitrix tuberis* and *Epitrix papa*.



The Euphresco project 2016-F-218 ‘*Epitrix* (flea beetle) species, life cycles and detection methods (EPITRIX II)’ contributed to develop new knowledge to support the monitoring, diagnosis and management of these important pests, thus contributing to the implementation of the EU emergency measures.

Several volatile organic compounds (VOC’s) suitable for use in lure traps were assessed (Boavida *et al.*, 2018). Traps baited with Z3-6:Ac/Linalool (1:1) attracted significantly more *E. papa* and *E. cucumeris* adults than the control. Adding (E)- $\beta$ -ocimene to Z3-6:Ac/Linalool (1:3) increased the attractiveness of the mixture. The lure could greatly improve the efficacy of traps and thus enhance surveillance activities.

Morphological identification of *Epitrix* species is difficult, and some species (e.g. *E. cucumeris* and *E. papa* which coexist in Portugal) are difficult to distinguish. The EPITRIX II consortium continued the work initiated in the [EPITRIX I](#) project to validate molecular tests to support diagnosis. To comply with the Nagoya protocol and its requirement for the exchange of biological material between countries, a Material Transfer Agreement was developed, that allowed the exchange of specimens and DNA to support test development whilst ownership is retained within the country of origin. This Material Transfer Agreement could be helpful for exchange of material that is needed for other collaborations in plant health.





The newly described *E. papa* is regarded as the species of most concern to the EU potato industry. However, until recently, little was known about this species including its origin, which still remains a mystery. The EPITRIX II project has gathered new information on the biological traits and phenology of this pest (Boavida *et al.*, 2019). Temperature effects on its life cycle were studied and a model was created to predict the period of adult emergence and larval activity, which is crucial to improve the current pest management strategy. This model highlights that in Portugal, crops are most at risk of commercial tuber damage during the emergence of the second larval generation. Where crop rotation is carried-out, the early spring insecticide sprays currently recommended may therefore be replaced by later sprays which target the second larval generation, preserving natural enemies and spring pollinators. It was also demonstrated that *E. papa* is able to develop in a range of temperatures (15°C-30°C), which indicates that this species could survive in northern Europe. A trade-off between longevity and fecundity in females at temperatures  $\leq 15^{\circ}\text{C}$  was noted, supporting findings on other *Epitrix* species and possibly explaining how overwintering females can survive for longer time by delaying or interrupting egg production. Similarities in the life cycle and behaviour of *E. papa*, the North American species *E. tuberis* and the Peruvian species *Epitrix yanazara* were observed. Similarities with species which are well understood and controlled in other countries can help refine preparedness and control measures.

Project ID: *Epitrix* (flea beetle) species, life cycles and detection methods ([EPITRIX II](#))

Boavida C, Santos M, de Bruin A, Mumm R, Costa G, Booij K (2019). Searching attractants for the detection of potato *Epitrix* species. *Revista de Ciência Agrarias* 41: 125-132 DOI: <https://doi.org/10.19084/rca.17077>

Boavida C, Santos M, Naves P (2019). Biological traits of *Epitrix papa* (Coleoptera: Chrysomelidae: Alticinae), a new potato pest in Europe, and implications for pest management. *Agricultural and Forest Entomology* 21(4): 379-387 DOI: <https://doi.org/10.1111/afe.12344>