

Poster: Taxonomy and Morphology

## **Take a swipe at the fly: fruit fly (Diptera: Tephritidae) identification through mobile applications**

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**Background:** Morphological identification of adult insects traditionally relies on the use of dichotomous keys which are generally not easily accessible and/or problematic to be used by the non-specialist. The lack of easy and readily available tools hampers a swift and timely identification, of crucial importance in detection and surveillance programmes. Contemporary digital and communication technology offers possibilities for the development of alternative identification tools. Within the framework of two projects (EU Horizon 2020 project 818184 FF-IPM; and STDF PG 567 project F<sup>3</sup>) the development of such tools is envisaged.

**Methods:** We aim to develop mobile applications that can be downloadable on smartphones, for a number of selected species tailored to the needs of the respective projects. The development starts from existing multi-access (i.e. non-dichotomous) identification keys for frugivorous fruit flies, developed on the Lucid platform. In addition, enhanced high-resolution images will be taken for further annotation and illustration of diagnostic morphological characters. Dedicated datasheets and hyperlinks with relevant information will be added.

**Results:** Two mobile applications were developed. One application includes 23 target species of the genera *Ceratitis*, *Bactrocera* and *Zeugodacus* that are considered of importance for the EU. The list was compiled after consultation with local NPPO's, EPPO and other potential end-users. A second application comprises 29 major fruit fly pest species of the genera *Ceratitis*, *Trirhithrum*, *Bactrocera* and *Zeugodacus*, occurring in different regions in Africa, including the islands in the western Indian Ocean. Both applications are developed along similar lines with a pre-key allowing selection to genus level, and subsequent keys to targeted species within each genus. The platform used allows for selection of any characters that the user is comfortable with, or that are visible on the specimen to be identified. Alternatively, the automated selection of optimal characters will guide the user through the identification process. The African key also provides possibilities to define a subset according to the geographical region. Datasheets provide information on general description, biology, distribution, management and host plant range. Hyperlinks to different sources on the internet provide additional information as well as libraries of virtual collections through high resolution images.

**Conclusion:** The developed keys are freely accessible and downloadable both for Apple and Android mobiles. It is anticipated that they will facilitate identification of targeted fruit flies for the non-specialist. It is also hoped that they will allow involvement of non-professional citizens in surveillance of pest species including potential invasive ones.

**Keywords:** taxonomy; species identification; market access; invasive pests