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A multi-access identification key to fruit flies (Diptera, Tephritidae) of economic importance in Europe

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The professional identification of adult insects necessarily relies on the use of dichotomous morphological identification keys which are generally not easily accessible or of problematic interpretation for non-specialists. The lack of readily available tools represents a major hiccup for the routine detection and monitoring of agricultural pests, for which timely and reliable identification is of major importance for pest management. Within the framework of the FF-IPM project (EU Horizon project Nr 818184), we developed an interactive multi-access (i.e. non-dichotomous) identification key for fruit flies (Diptera, Tephritidae) of economic importance in Europe. The key is available on a Lucid3 platform, in which multiple features can be chosen at different steps of the identification process (multi-access). Differently from the dichotomous keys, our key allows overcoming a number of problems related to the identification of specimens with damaged or missing body parts. The key contains 51 features and 118 character states in total. Each feature, character state and species is linked to detailed illustrations and/or high-resolution pictures, facilitating its use by non-specialists. The key includes 23 target insect species separated in two groups and corresponding to the genera *Bactrocera*, *Dacus*, *Zeugodacus* on one hand and *Ceratitis* on the other. A “pre-key” is also available for the initial identification of insects belonging to these two groups. The morphological diagnosis of a species is complemented by dedicated hyperlinks with relevant information on its geographic distribution and host plant preferences. Hyperlinks to the digital images of the Virtual Collection of the Royal Museum for Central Africa, to the formal description of the species and to informal factsheets will further facilitate the species diagnosis to a larger public of users. The key is freely accessible online or downloadable for offline use through the website of the Royal Museum for Central Africa (<https://fruitflykeys.africamuseum.be/>). A mobile application for the key is currently being developed.