

IIKC: an interactive identification key for *Culicoides* (Diptera: Ceratopogonidae) females from the western Palaearctic region

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The genus *Culicoides* (Diptera: Ceratopogonidae) encompass more than 1,300 biting midge species in the world with approximately 60 species being implicated in pathogens transmission. Since the last decade the spread of several serotypes of bluetongue virus throughout western Europe and around Mediterranean basin, and recently the emergence of the Schmallenberg virus have pointed out the lack of entomological taxonomic expertise including an updated morphological key, able to discriminate vector species among the *Culicoides* diversity. IIKC, interactive identification key for *Culicoides*, is a database of taxonomic knowledge edited with the Xper2 software which automatically produces the interactive multi-entry key. Validated by a trial carried out by six entomologists with variable degrees of experience in identifying *Culicoides*, we presented here an update of IIKC.

For each *Culicoides* species included in IIKC, we have created a distribution map at country scale for the west Palaearctic region. The maps have been added to the specific species datasheet and available at any time of the identification process. Two species *C. manchuriensis* and *C. ibericus* recently recorded in France have been added. The updated version includes 100 species and 10 morphological variants, 61 descriptors and 947 pictures, scheme or maps. A dedicated website has been developed (www.iik-culicoides.net) and offers the following services to users: (i) browse the database of characters and species online, (ii) identify online without local install, (iii) download and install the key onto personal computer according to the following operating systems available i.e. Windows XP/Vista/7, MacOSX and Linux. The computerization of such a key allows an easy way to add newly recorded species, new species or synonymies, or new discriminant characters. In parallel, the internet released offers the easiest way to share the updates.

Initially developed for female biting midges because of their epidemiological importance, the main perspective is to include a male morphological database to produce an interactive key for both sexes. The extension of IIKC through the Palaearctic region as a whole feels practically an achievable perspective, as well as for others biogeographical regions.