



Confirmation of *Aedes koreicus* (Diptera: Culicidae) in Belgium and description of morphological differences between Korean and Belgian specimens validated by molecular identification

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Abstract

In 2008, specimens resembling *Aedes* (*Finlaya*) *koreicus* (Edwards) (also *Ochlerotatus koreicus* or *Hulecoeteomyia koreica*) were found in Belgium during a national mosquito survey (MODIRISK). Small but consistent differences were, however, observed between the specimens described from Peninsula Korea and those found in Belgium. To achieve the correct identification a detailed morphological comparison was made between the Belgian specimens and reference material from Korean mainland and island populations housed at the Smithsonian Institution (Walter Reed Biosystematics Unit (WR-BU), Washington, USA). The identification was furthermore supported by molecular evidence based on the ND4 region (mtDNA) of available Korean and Belgian mosquito specimens. Morphological and molecular comparison confirmed the initial identification of *Aedes koreicus*. Based on morphological characteristics, the species collected in Belgium most likely originated from Jeju-do, an island south of the Korean Peninsula. The observed dissimilarities between Korean and Belgian specimens resembled a number of morphological differences mentioned previously between female adults collected on the Korean Peninsula and Jeju-do. This is the first report of *Aedes koreicus* outside its natural distribution range. A correct and rapid identification of new invading and spreading vector species is crucial for the implementation of effective control measurements. Hence a correct and easy accessible description of all possible variations of species arriving in new areas is highly recommended. Therefore, a comparative morphological study on the Smithsonian material of the species from Korean mainland, island population and from Belgium is given, pictures of the main aberrant characteristics and scanning electron microscope images of all stages of the species are included and molecular confirmation of the identification based on the mtDNA ND4 region is provided.

Key words: *Aedes koreicus*, morphological comparison, egg structure, molecular identification, ND4, Republic of Korea, Belgium

Introduction

Species of the genus *Aedes* Meigen in general are known for their invasive potential since the eggs of this genus can tolerate long desiccation periods therefore surviving transport across international borders. This trait has not only an impact on native biodiversity but also on human health as numerous members of this genus are potent vectors for different mosquito-borne diseases (Cook *et al.* 2005; Kearney *et al.* 2009). In the last decade, several exotic *Aedes* species were reported from central and northern Europe; including *Aedes* (*Stegomyia*) *albopictus* (Skuse) (or *Stegomyia albopicta*), *Aedes* (*Ochlerotatus*) *atropalpus* (Coquillett) (or *Ochlerotatus atropalpus*) (Scholte *et al.* 2009, 2010), *Aedes* (*Finlaya*) *j. japonicus* (Theobald) (also *Ochlerotatus j. japonicus* or *Hulecoeteomyia j. japoni-*