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# Vector monitoring of *Aedes aegypti* in the Autonomous Region of Madeira, Portugal

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*Aedes (Stegomyia) aegypti* (Linnaeus, 1762) (*Diptera, Culicidae*), is one of the most widespread mosquitoes, and a vector of yellow fever and dengue (*Flaviviridae*), as well as chikungunya (*Togaviridae*) viruses [1]. It was first recorded in the Autonomous Region of Madeira, Portugal, in 2004-2005 [2], not having been found in previous surveys in that region carried out in 1977-1979 [3].

In 2004, the human population in the Santa Luzia division of the city of Funchal, Madeira, complained of aggressive mosquito biting that leftlarge skin papules. Surveys conducted in 2005 led to the identification by the Unit of Medical Entomology, Institute for Hygiene and Tropical Medicine, of *Ae. aegypti* mosquitoes [2]. In 2006, *Ae. aegypti* mosquitoes were collected in six of the administrative divisions of the city of Funchal [2].

Vector control operations carried out by local health authorities have focused on the reduction of breeding sites, insecticidal treatments for immature and adult forms, and public health education towards individual protection and source reduction. However, the mosquito population is still thriving, eggs are found in ovitraps and adults are biting the human population [4].

So far, no endemic or autochthonous cases of mosquito borne diseases have been registered in Madeira. To evaluate the impact of control measures, the proposal of a vector monitoring program will be developed by the Unit of Medical Entomology of the Institute for Hygiene and Tropical Medicine jointly with local Health Authorities

*Ae. aegypti* was present in continental Portugal up to 1956 [5], not having been recorded since [6,7]. It was also common in Spain, following introduction from North Africa. However, it has not been found since 1953 [8]. Its sporadic presence has been recognised in several European countries, namely Britain, France, Italy, Malta, Croatia, Ukraine, Russia and Turkey (dates not given) [9].

The amount of traffic between Madeira and continental Portugal, and other European countries, poses the risk of the re-introduction of this species from Madeira, especially into southern Europe, where climatic conditions are more favourable to its establishment. Climate changes may increase this risk through expanding the species' geographical dispersion, considered to be limited by the January and July 10° C isotherms [10]. However, *Ae. aegypti* larvae can withstand temperatures of 2.5° C [11]. The possibility of the re-introduction of *Ae. aegypti* in continental Europe could be brought about by air or sea traffic. The transport of tyres or containers with plants and flowers (of which Madeira is a great producer) are possible dispersal vehicles, as this species is known to choose a wide variety of containers in which to lay its eggs, which are especially capable of withstanding desiccation [1]. The international norms for vector control in airports, particularly directed to *Ae. aegypti* , namely to control its breeding in the airport and within a perimeter of 400 metres [12], and possibly also to maritime harbours, should therefore be applied.

The establishment of this mosquito species in Europe, possibly favoured by climatic change with global warming [13], raises the concern about the danger of autochthonous arbovirus transmission in Madeira and Europe, namely of dengue or chikungunya, such as the recent outbreak of the latter in Italy [14], due to the increase in travelling to and from endemic areas.

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