Review of ten-years presence of Aedes albopictus in Spain

The tiger mosquito was first detected in 2004 near Barcelona, although maybe it had arrived one or two years before. Since then, its distribution has been spreading and, in 2014, it has been found in almost all provinces of the Spanish Mediterranean coast and Gipuzkoa province (Basque Country). The most affected region is Catalonia, maybe just because it is where it has been longer, and the second one, the Valencian Comunity.

From the beginning, the number of positive municipalities continually has increased year by year. The pattern of occupation has combined a progressive increase, in the periphery of distribution, with long jumps to remote areas. Illustrative examples of long jumps were the detection in Altafulla (Tarragona province) 44 km from the first record and, above all, in the coast of Orihuela (Alicante province) 300 km. Likewise, detections in Balearic Islands (200 km from mainland) or in Alhaurín de la Torre (Malaga province), 280 km from the nearest known point (Águilas, Murcia province).

Historical record of positive municipalities by years (2004–2014).

Along of this time, none systematic study has been made in Spain but rather the known data are result of partial studies made by different research teams with diverse aims or interests. So, the main objective was to compile all published and unpublished information about tiger mosquito in Spain and show them as a whole. And to offer the most updated data, the results of 2014 samplings were incorporated.

Information about biology of *Ae. albopictus* is included, as altitude range and the seasonal

variations as pseudo-phenologies. Because the most used sampling method is the oviposition traps (where the females lay eggs), the data are really not about the amount of caught adults but the amount of layed eggs. The pseudo-phenologies really show the reproductive activity variations which would be related to populational variations.

Pseudo-phenologies from Catalonia, Balearic Islands and the Region of Murcia are shown. Assuming latitudinal variations, the oviposition begins about the end of April/early May. The populational peak is placed about the end of August in northern places and it shifts to September/October in the southern ones. The activity finishes between the end of October/end of November, although in Murcia the reproductive activity does not end completely and few positives, with few eggs, have been recorded in winter.

About public health impact, although, at present, no autochthonous cases of dengue and chikungunya have happened, the presence of tiger mosquito in Spain has created a new scenario of epidemiological risk since imported cases of these diseases are regularly detected in Spain. Above all since the establishment of chikungunya in the Americas, in 2013, because the high connections between both Latin America and Spain.

So, the current incidence of the tiger mosquito on Spanish public health is restricted to the biting nuisance, although few studies have been carried on about.

The legal situation of the tiger mosquito is complicated because it is included in the official list of invasive species and any related action (even control) on these kind of species depends of the environmental authorities since they are framed in the environmental laws. Then, the higher authorities have eluded the responsibility of control and, in the last instance, the local authorities (municipal governments) have had to face the problem, since they are more directly pressed by citizens.

As conclusion, on one hand, the distribution has been increased and many types of environments and geographical areas have been occupied, contrary to earlier risk models. On the other hand, urgent policies are needed from central, regional and local governments for proposing measures to avoid the occupation of large part of Spanish territory.

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