

TOPIC:

2) Mosquito-borne diseases (dengue, malaria, fiebre amarilla, zika, chikungunya)

APPROACH:

2. Vector biology and eco-epidemiology

Oviposition activity of *Aedes aegypti* in a temperate city of Argentina and its implications on local transmission of dengue.

Keywords: mosquito-borne diseases; vector biology; eco-epidemiology; oviposition; *Aedes aegypti*; temperate city; local transmission; dengue.

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The global incidence of the disease caused by the dengue virus has significantly increased throughout the last decades, becoming an emerging public health issue. Buenos Aires City, located in the temperate region of Argentina, has been affected by dengue epidemics during 2009, 2016 and 2020, with increasing number of cases. The main vector of dengue and other diseases such as Zika, Chikungunya fever and yellow fever is the mosquito *Aedes aegypti*, and the transmission of dengue is expected to be positively related to the abundance of this vector. The aim of this study is to analyze how the incidence of dengue cases during the last epidemic of dengue is related to the abundance of *Aedes aegypti* in different administrative districts within Buenos Aires City. The oviposition activity was monitored with ovitraps (n=218) distributed across Buenos Aires city, in the context of the monitoring program performed by our research group through a covenant with the city's government. The period analyzed in this study was the summer season 2020, from January 1st to March 20th (11 weeks), when the monitoring was interrupted because of the Covid-19 pandemic. The data of dengue cases for the 2020 period were obtained from the Weekly Epidemiological Bulletin published by the government of Buenos Aires City. The oviposition activity was calculated as the proportion of positive records (i.e. number of times a trap had eggs divided by the total number of times the trap was active). Cumulative oviposition activity was calculated for each administrative district (Comuna) as the mean activity of all ovitraps in the Comuna. Three epidemiological variables were considered for each Comuna: the autochthonous/imported case relationship, the total number of cases, and the number of cases per 100000 inhabitants or prevalence. The relationship of these variables with the oviposition activity was analyzed. Oviposition activity varied among Comunas (20.7-80), as well as the autochthonous/imported case relationship (2.7-49.8), the total number of cases (23-1459), and the prevalence (16.4-641.6). A positive relationship of the three epidemiological variables with oviposition activity was observed. Epidemiological variables increased drastically at oviposition activity values over 60%. We discuss the effect of social-environmental heterogeneities within Comunas, and the spatial distribution of entomological and epidemiological variables. According to the results, we emphasize the importance of focusing prevention in areas with the highest oviposition activity, together with deepening

control measures, which may reduce oviposition activity to levels below the threshold that allows for high transmission rates.