

Summary of indirect sand fly sampling between 2010-2020 in Sicily and unusual findings even in winter

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Background

The sand flies are the vectors of *Leishmania spp.*, the aetiological agents of human and animal leishmaniasis. The life cycle of sand flies is closely linked to climatic and environmental conditions. Their period of activity has been recorded between May and October [1]. Sicily's geographical position in the centre of the Mediterranean and its biodiversity makes it a suitable area for the development and spread of many vector species and their pathogens; indeed, it is an endemic region for leishmaniasis. According to the National Arbovirology Plan (PNA), vectors such as Culicoides and Mosquitoes are monitored, the purpose is to demonstrate the presence and circulation of sand flies found unintentionally in the same sampling areas.

Materials and methods

Sampling was conducted from January to December from 2010 to 2020. The traps were activated for one night from sunset to the following sunrise on a fortnightly basis as required by the NAP. The traps used, as necessary for other vectors, were Black Light, positioned in sheltered locations near livestock sites, also frequented by dogs (major host of *Leishmania*). The distinction and counting of sand flies from other insects was performed morphologically. The sites monitored are located at altitudes between 10 and 940 meters above sea level; they have similar environments characterised by plants alternating with anthropic woods capable of providing suitable habitats and maintaining ideal conditions for the development of the immature stages of the sand flies.

Results

The results of this indirect sampling show the presence of the sand flies in all years and all over the year (Figure 1) and their increase is probably due to the extraordinary adaptive capacity of these vectors and also to the climate changes seen. We also have findings of trophism by female sand flies even in the winter months.

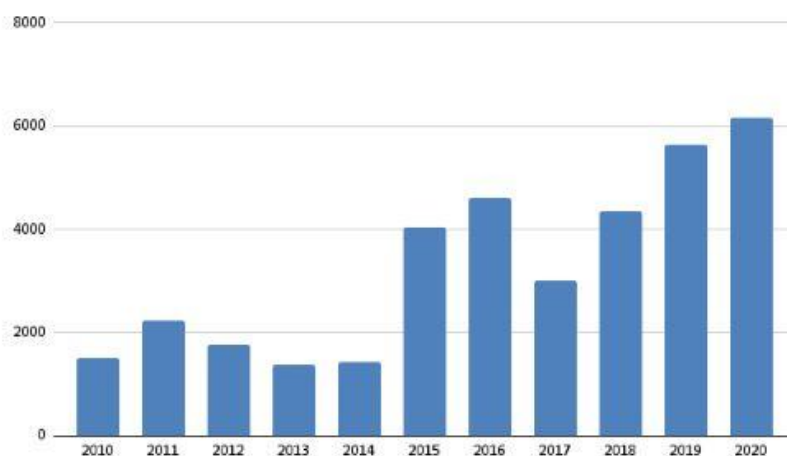


Figure 1. Average values of *Phlebotomus* captured in Sicily from 2010 to 2020.

Conclusion

The survey revealed the finding of sand flies during all months of the year in the areas covered by the bluetongue surveillance plan. This suggests the need to implement sand fly monitoring activities in sites linked to the presence of the main *Leishmania* reservoir hosts, to increase knowledge of the circulation and transmission of the zoonosis in the region. The results, in addition to being fundamental for updating data on vector populations, will be used to create predictive models of phlebotomus population dynamics in Sicily that will allow the implementation of targeted prevention plans with the collaboration of all human, veterinary and environmental health in a one-health perspective.

Funding: Department of Health.

Conflict of interest: The authors declare no competing interests.

References

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