Population dynamics of the invasive Asian tiger mosquito *Aedes albopictus* near the edge of its expanding range

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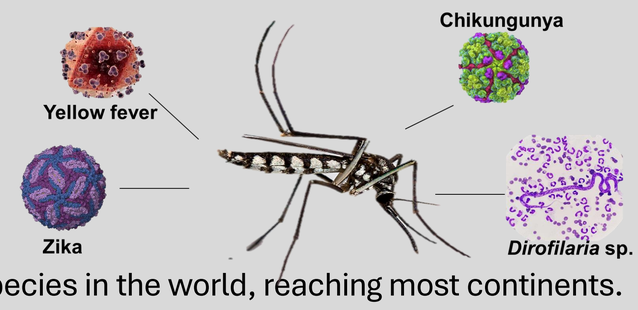
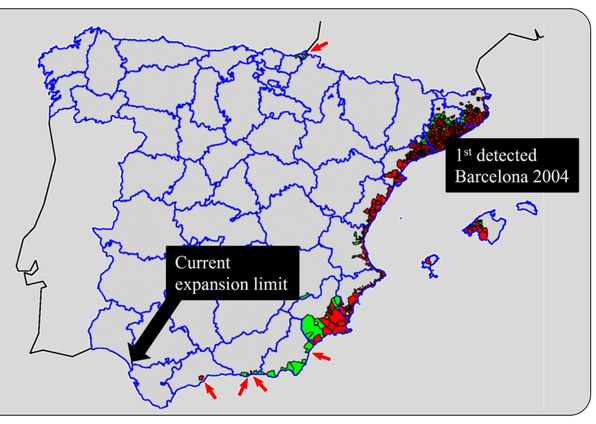
INTRODUCTION

- Emerging infectious diseases (EIDs) pose an increasing global threat.
- *Aedes* mosquitoes are primary vectors for many EIDs.
- Among them, the Asian Tiger mosquito ***Aedes albopictus*** is a notable vector pathogens causing several concerning diseases.



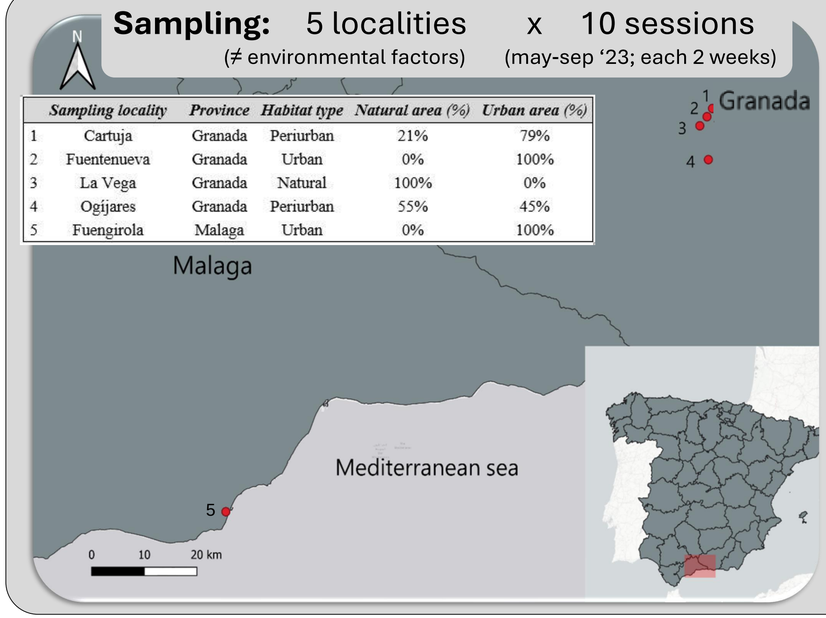


- Yet, ***Ae. albopictus*** is one of the most invasive mosquito species in the world, reaching most continents.
- In Spain, it was first detected in 2004 in Barcelona province.
- Currently, southwest Andalusia represents the western edge of the expanding distribution range.

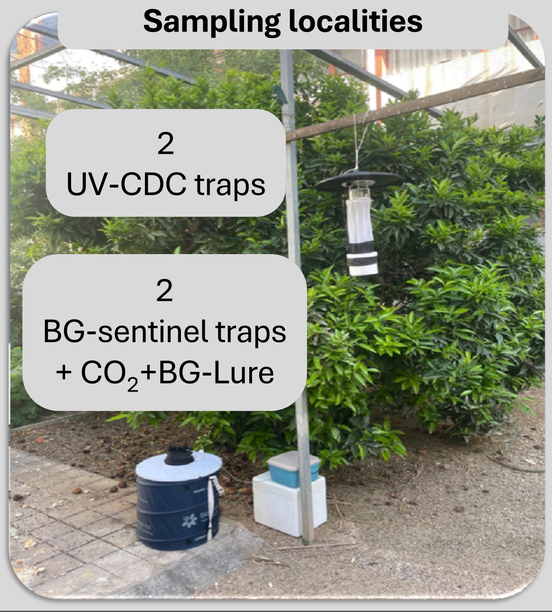
METHODS

Sampling: 5 localities x 10 sessions
(≠ environmental factors) (may-sep '23; each 2 weeks)

	Sampling locality	*Province*	*Habitat type*	*Natural area (%)*	*Urban area (%)*
1	Cartuja	Granada	Periurban	21%	79%
2	Fuentenueva	Granada	Urban	0%	100%
3	La Vega	Granada	Natural	100%	0%
4	Ogíjares	Granada	Periurban	55%	45%
5	Fuengirola	Malaga	Urban	0%	100%



Sampling localities



Species identification

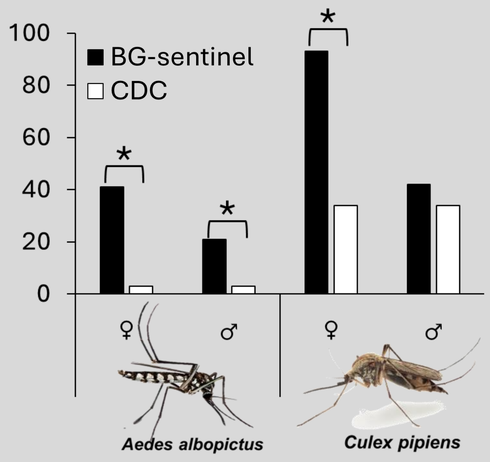
Specific aims:

1. Estimate the abundance of *Ae. albopictus* and the most abundant autochthonous mosquito, *Culex pipiens*, using different sampling traps.
2. Assess the effect of sex, locality, and seasonality on *Ae. albopictus* captures.

RESULTS & DISCUSSION

1. Estimating abundance of *Aedes albopictus* and *Culex pipiens*: BG-sentinel traps vs. UV-CDC light traps

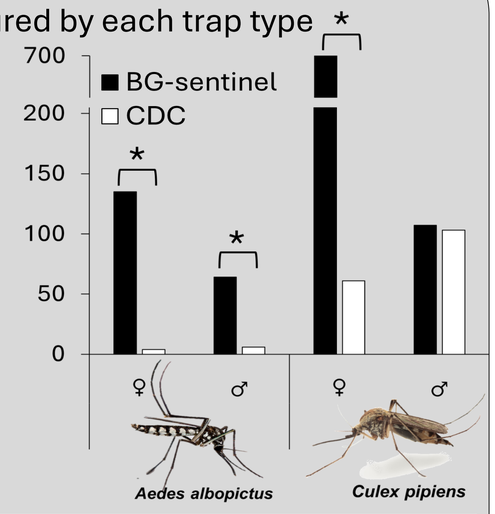
a) Successful capture events: % of traps with at least one mosquito individual.



Except for *Cx. pipiens* adult males, **BG-sentinel traps are more efficient**, both in terms of prevalence and abundance, at capturing mosquito individuals of the two species.

BG-sentinel traps+CO_2+BG-Lure traps' visual and olfactory attractants better meet mosquitoes the sex-and-species specific behaviors [1,2,3].

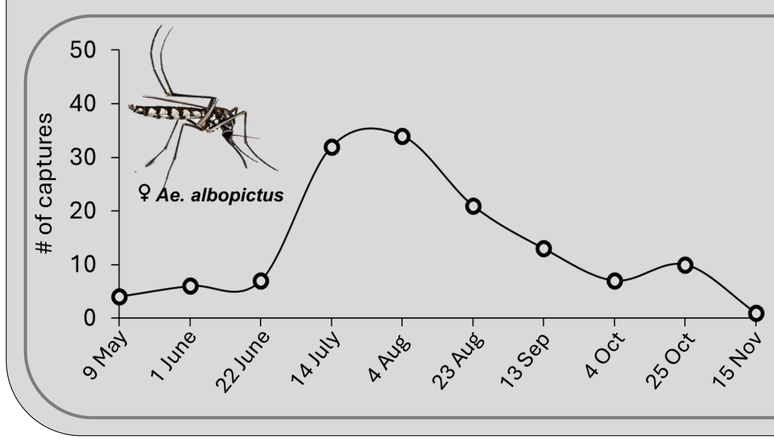
b) Abundance: Total number of individuals captured by each trap type



2. *Aedes albopictus*: assessing role of sex, locality, and seasonality on BG-sentinel captures.

Table 1. Best fitted GLM for the log+1 transformed data of the number of *Ae. albopictus*

Aedes albopictus (R^2 = 0.24)						
Independent vbles.	*df*	*Deviance*	*Resid.Df*	*Resid.Dev*	*F value*	*p value*	η^2
Location	4	12.2704	94	52.268	5.5169	< 0.001***	0.18
Sex	1	3.9496	98	64.538	7.1031	< 0.001**	0.06

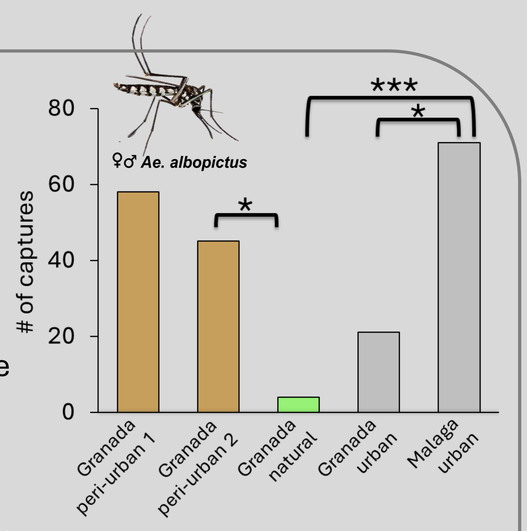


NO effect of seasonality
(Full model: *p* value > 0.05)

Yet, the peak of abundance occurred from mid-July to late September, with almost the 75% of captures, similarly to other areas of southern Europe[3,4,5].

The role of sampling locality

The highest abundance of *Ae. albopictus* was found in the Bioparc zoological garden, sited in the urban area of Fuengirola (Malaga province).



Zoological gardens may provide suitable habitats for mosquitoes, including the invasive *Ae. albopictus*, in terms, for example, of:

1. Breeding sites: small waterholes in plant surfaces; e.g. cut stems of lucky bamboo

2. Host diversity: allowing vectors' maintenance and reproduction

3. Exotic vegetation: mimicking landscapes from southeast Asia where the specie originates.

4. Climatic characteristics: mild weather

CONCLUSSIONS

- *Aedes albopictus* is a significant human nuisance in invaded areas, acting as a vector for local and imported pathogens.
- This mosquito species was introduced in Spain in 2015 but, nowadays, is current established in southwest Andalusia.
- Our findings underscore the significance of trap type, sex, and location in capturing this invasive mosquito species.
- These insights are crucial for monitoring and surveillance efforts aimed at averting its potential role in transmitting local and imported pathogens in invaded areas.

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