

Transposable elements in the invasive species *Harmonia axyridis*

Journée d'animation docs et post-docs du CBGP

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Some background



BSc in Biotechnology

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Universidad de Oviedo
Universidá d'Uviéu
University of Oviedo

BSc dissertation

Leuven, Belgium



MSc in Applied Bioinformatics

Cranfield, UK



PhD in Biomedicine

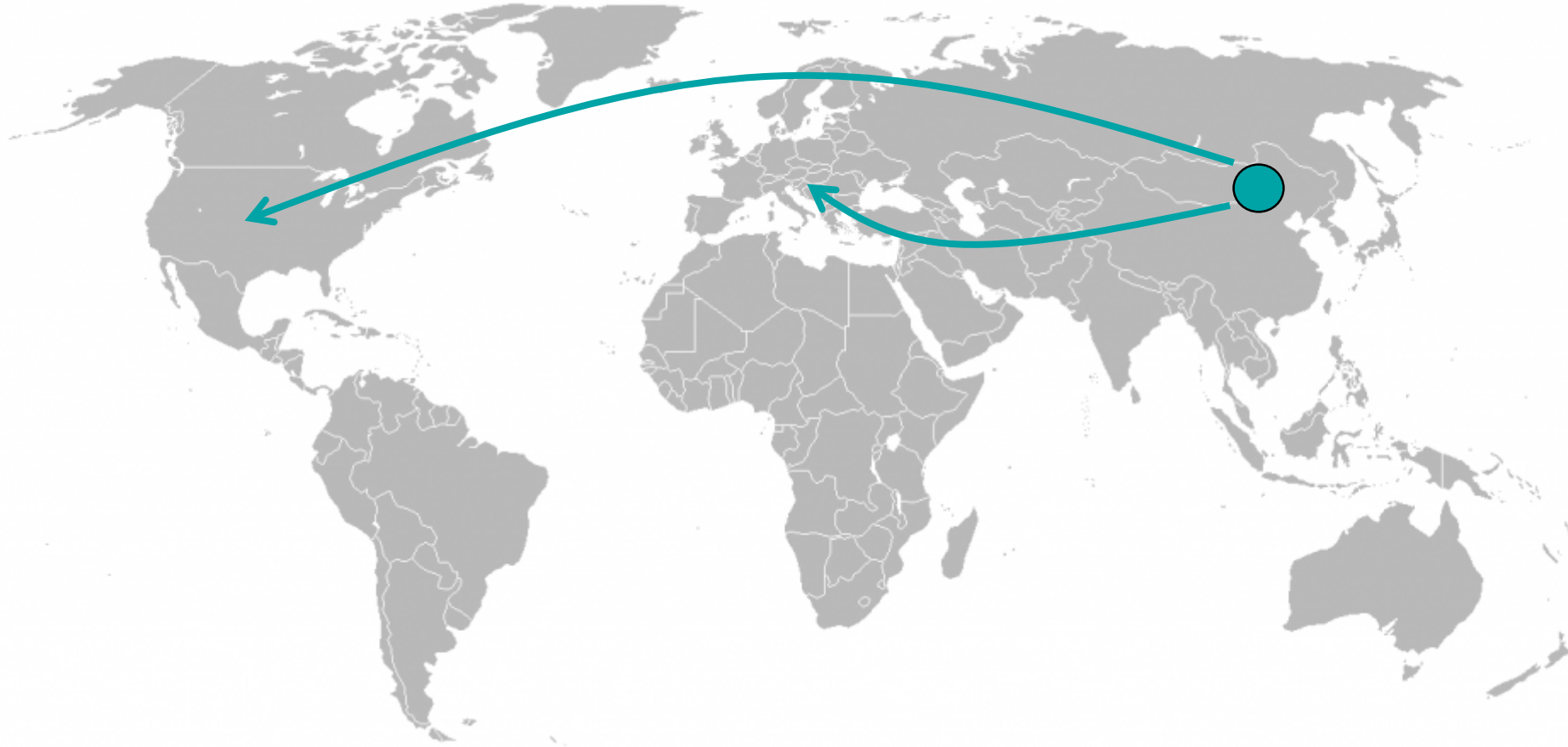
Barcelona, Spain



Identification of the environmental variables driving adaptation in *Drosophila melanogaster* natural populations



Harmonia axyridis



Harlequin ladybug
Harmonia axyridis

20th century: introduced in North America and Europe as biological control

1988, 2001: invasive species in North America and Europe

Nowadays: present worldwide except Antarctica



Reference genome

7 long-read assemblies
chromosome level

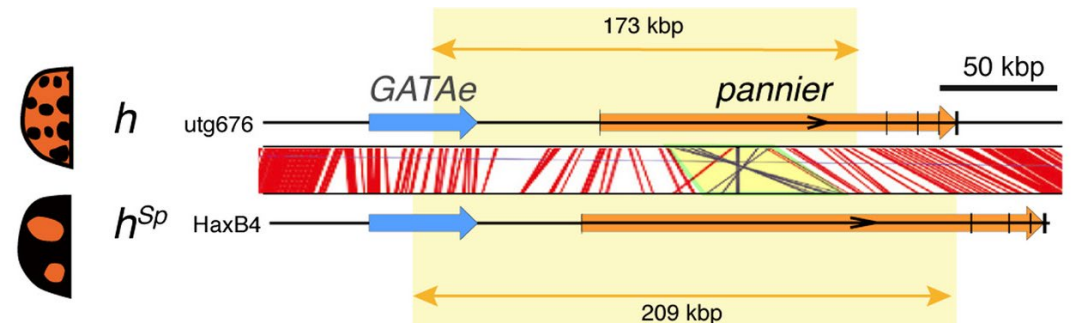


Reference genome

7 long-read assemblies
chromosome level

Color morph

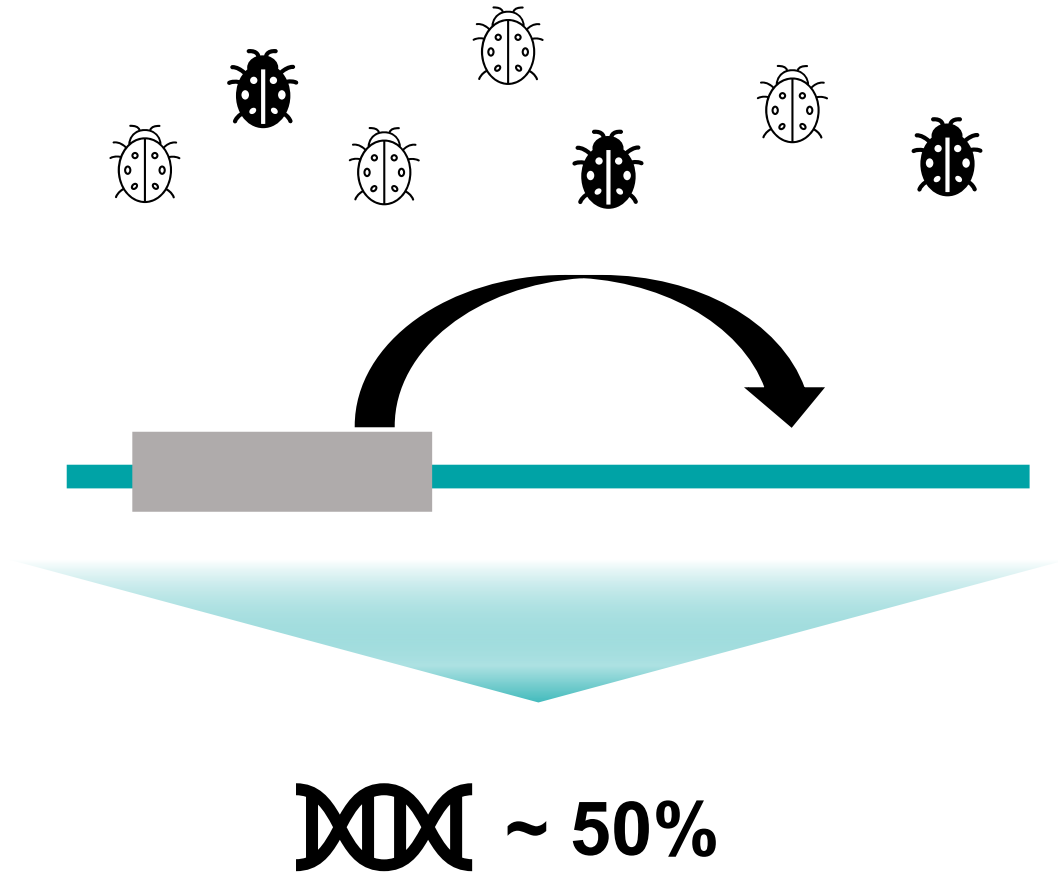
- Pigmentation of elytra is regulated by the transcription factor *pannier*
- Highly diversified DNA sequences within the first intron
- Serves as evolutionary model for the color pattern diversification



Transposable Elements



- “Mobile DNA sequences capable of replicating themselves within genomes independently of the host cell DNA” Wells and Feschotte 2020
- Virtually present in all **eukaryotic genomes**
- **Variable proportion** in eukaryotes genome (1-90%)
- Strong potential to affect **genes expression**
- TEs shown to **respond to abiotic and biotic stress** conditions contributing to host **genome evolution** and host **genome adaptation**





TE *de novo* identification

- **RepeatModeler2** (Flynn et al. 2022)
 - Recon
 - RepeatScout
 - LrtHarvest
- **RepeatMasker**
- **Tedenovo (REPET)** (Flutre et al. 2011)



TE library curation

- **Cd-hit**
- **Blast+**
- **Bedtools**
- **Pfam and HMM databases**
- **MAFFT**
- ...

Based on Goubert et al. 2022



TE genotyping

- **PopoolationTE2** (Kofler et al 2016)
- **MEGANe** (Kojima et al. 2022)

Thank you

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Harmonia axyridis



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