



ENBE 2025



**XXI International Meeting of the
Portuguese Association for Evolutionary
Biology**

BOOK OF ABSTRACTS

18th-19th December 2025

Bragança



ENBE 2025

**XXI International Meeting of the Portuguese
Association for Evolutionary Biology**

Bragança

Title: Book of abstracts of the XXI International Meeting of the Portuguese Association for Evolutionary Biology

Editors: M. Alice Pinto, Ana Rita Lopes & Dora Henriques

Published by: Instituto Politécnico de Bragança

ISBN: 978-972-745-368-9

Design: Ana Rita Lopes

ENBE 2025

XXI International Meeting of the Portuguese Association for Evolutionary Biology

18th-19th December 2025

Bragança, Portugal

Edited by

M. Alice Pinto

Dora Henriques

Ana Rita Lopes

Instituto Politécnico de Bragança, Portugal

December, 2025

POSTER 17 WHY SINGLE SNP ANALYSES FAIL: EPISTATIC STRUCTURAL EFFECTS IN HONEY BEE CYP336A1.....	73
POSTER 18 UNRAVELLING THE IMPACT ON ZEBRAFISH OFFSPRING AFTER PARENTAL EXPOSURE TO BISPHENOL S	75
TOPIC 3 EXPERIMENTAL EVOLUTION AND ADAPTATION	76
POSTER 19 PAST SELECTIVE HISTORY INFLUENCES ADAPTATION TO ORAL INFECTION IN DROSOPHILA MELANOGASTER.....	76
POSTER 20 THERMAL TOLERANCE AND INVASION SUCCESS OF <i>VESPA VELUTINA NIGRITHORAX</i>	77
POSTER 21 LONG-TERM EVOLUTION EXPERIMENTS FULLY REVEAL THE POTENTIAL FOR THERMAL ADAPTATION.....	78
POSTER 22 ADAPT, ADJUST OR MOVE: CAN THE SPIDER MITES <i>TETRANYCHUS CINNABARINUS</i> DO IT ALL IN RESPONSE TO HEAT?	79
POSTER 23 DO MATING SYSTEMS SHAPE THERMAL FERTILITY?	80
POSTER 24 THE EGG OR THE CHICKEN? REVISITING AGLOMERULISM AND THE EMERGENCE OF ANTI-FREEZE GLYCOPROTEINS, RENAL FUNCTION, AND WATER BALANCE IN NOTOTHENIIDS	81
POSTER 25 LANDSCAPE-SCALE GENOMIC RESPONSES OF THE WESTERN HONEY BEE (<i>APIS MELLIFERA</i>) TO PESTICIDE PRESSURE.....	82
TOPIC 4 CO-EVOLUTION, HOST-PATHOGEN AND PARASITE EVOLUTION	84
POSTER 26 EVOLUTION OF AMITRAZ RESISTANCE IN <i>VARROA DESTRUCTOR</i> : HISTORICAL ASSESSMENT OF THE F290L MUTATION IN IBERIAN POPULATIONS.....	84
POSTER 27 PATHOGENS AGAINST THE MACHINE: EVOLUTIONARY SHIFTS OF <i>PHYTOPHTHORA INFESTANS</i> ACROSS EUROPEAN BIOREGIONS AND THEIR IMPLICATIONS FOR PREDICTIVE MODELLING	85
POSTER 28 HIGH PREVALENCE OF THE F290L AMITRAZ-RESISTANCE ALLELE IN <i>VARROA DESTRUCTOR</i> POPULATIONS FROM PORTUGAL	86
POSTER 29 HOW DOES THE EVOLUTION OF DIRECT AND INDIRECT INTERACTIONS AFFECT ECOSYSTEM RESILIENCE?.....	87
POSTER 30 INTRA-POPULATION VARIABILITY IN A DARWINIAN SELECTION PROGRAM FOR <i>VARROA</i> RESISTANCE IN <i>APIS MELLIFERA IBERIENSIS</i>	88
POSTER 31 BENCHMARKING LAMP PRIMER DESIGN PLATFORMS FOR PYRETHROID RESISTANCE SNP DETECTION IN <i>VARROA DESTRUCTOR</i>	89
POSTER 32 NO EVIDENCE FOR A TRADE-OFF BETWEEN HOST AVOIDANCE BEHAVIOUR AND PATHOGENICITY TOWARDS ECOLOGICALLY ASSOCIATED BACTERIA IN <i>CAENORHABDITIS ELEGANS</i>	90
TOPIC 5 HYBRIDIZATION, INTROGRESSION, AND PHENOTYPIC DIVERSITY	91
POSTER 33 DOG INTROGRESSION IN THE WOLF GENOME: RANDOM PROCESS OR KEY GENOMIC REGIONS?	91
POSTER 34 NEW ASSESSMENTS ON GEOGRAPHIC AND SEXUAL SKULL VARIATION IN THE SUBGENUS <i>CHARRONIA</i> (<i>MARTES FLAVIGULA</i> AND <i>MARTES GWATKINSII</i>) (CARNIVORA; MUSTELIDAE).....	93

Organisation

Instituto Politécnico de Bragança (IPB)

Centro de Investigação de Montanha (CIMO)

Laboratório Associado para a Sustentabilidade e Tecnologia nas Regiões de Montanha (SUSTEC)

Associação Portuguesa de Biologia Evolutiva (APBE)



Sponsors



Novogene



Committees

Organising committee

M. Alice Pinto (CIMO/IPB, Bragança) – Chair
Ana Rita Lopes (CIMO/IPB, Bragança)
Dora Henriques (CIMO/IPB, Bragança)
Carolina Peralta (MPI-EvolBio, Germany)
Manuel Curto (CIBIO, Vairão)
Rita Ponce (ESE-IPS Setúbal, ICNOVA, Lisboa)
Susana Almeida (CCMAR/CIMAR LA, Faro)
Vitor Sousa (CE3C/FCUL, Lisboa)
Xana Sá Pinto (CIDTFF/UA, Aveiro)

Scientific committee

M. Alice Pinto (CIMO/IPB, Bragança) - chair
Ana Rita Lopes (CIMO/IPB, Bragança)
Carolina Peralta (MPI-EvolBio, Germany)
Dora Henriques (CIMO/IPB, Bragança)
Élio Sucena (ce3c/FCUL, Lisboa)
Filipe Castro (CIIMAR/UP; Porto)
Mónica Marques (CIIMAR/UP; Porto)
Patrícia Beldade (CE3C/FCUL, Lisboa)
Rita Ponce (ESE-IPS Setúbal, ICNOVA, Lisboa)
Rui Faria (CIBIO, Vairão)
Sara Magalhães (CE3C/FCUL, Lisboa)
Susana Almeida (CCMAR/CIMAR LA, Faro)
Vitor Sousa (CE3C/FCUL, Lisboa)
Xana Sá Pinto (CIDTFF/UA, Aveiro)

Student volunteers

Aicha Meliani (CIMO/IPB, Bragança)
António Pérez-Pérez (CIMO/IPB/CIAPA, Bragança)
Carlos Yadró (CIMO/IPB, Bragança)
Daniela Barbosa (CIMO/IPB, Bragança)
Fernanda Li (CIMO/IPB, Bragança)
Larissa Cunha (CIMO/IPB, Bragança)
Maíra Costa (CIMO/IPB, Bragança)

POSTER 28| HIGH PREVALENCE OF THE F290L AMITRAZ-RESISTANCE ALLELE IN *VARROA DESTRUCTOR* POPULATIONS FROM PORTUGAL

Costa, M (1); Sánchez, S (1); Lopes, AR (1); Yadró, CA (1); Pérez-Pérez, A (2); Martín-Hernández, R (2); Higes, M (2); Pinto, MA (1); Henriques, D (1)

(1) CIMO, LA SusTEC, Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal; (2) IRIAF—Instituto Regional de Investigación y Desarrollo Agroalimentario y Forestal, Centro de Investigación Apícola y Agroambiental (CIAPA), Marchamalo, Spain

Keywords: *Varroa destructor*; Resistance; Mutation; Oct β 2R; F290L.

Abstract

The Western honey bee (*Apis mellifera*) has a crucial role in pollination and apicultural production but faces a major threat from the ectoparasitic mite *Varroa destructor*. This parasite causes varroosis and acts as a vector for multiple viruses, undermining colony health and survival. Chemical control relies mainly on two classes of synthetic acaricides: pyrethroids (fluvalinate and flumethrin) and formamidines (amitraz). However, the repeated and prolonged use of these compounds has promoted the development of resistance in *V. destructor* populations. Amitraz resistance has been associated with mutations in the Octopamine-like β -adrenergic receptor (Oct β 2R), including N87S (France), Y215H (USA), F290L (Spain), and Y337F (Turkey). Until now, the distribution of these resistance alleles had not been investigated in Portugal. To address this gap, mites collected from different regions of the country were analysed through DNA extraction, PCR with specific primers, and Sanger sequencing. The results revealed an unexpectedly high frequency (98.3%) of the F290L allele, which has also been reported in Spanish populations, suggesting a strong potential selective pressure resulting from the prolonged use of amitraz. This atypically high frequency raises important questions regarding the origin and evolutionary trajectory of this resistance allele in Portugal. Therefore, a retrospective analysis of mite samples collected before the widespread adoption of amitraz is proposed. This approach will clarify whether the F290L allele was already present in ancestral *V. destructor* populations or whether its current prevalence arose from recent selective pressure. Integrating this data will be essential for understanding the evolutionary dynamics of resistance and for supporting the development of more effective monitoring and management strategies against this parasite.

Acknowledgements/Funding

This work was supported by the project “MITE- Varroa e vírus transmitidos: Monitorização de mutações e desenvolvimento de ferramentas moleculares inovadoras” funded by National Beekeeping Programme 2023-2027; FCT/MCTES (PIDDAC): CIMO UID/00690/2025 (10.54499/UID/00690/2025) and UID/PRR/00690/2025 (10.54499/UID/PRR/00690/2025); SusTEC, LA/P/0007/2020 (DOI: 10.54499/LA/P/0007/2020).