

Exploring genomics and immunity of the Cape Verde stray dogs

Ana Elisabete Pires^{1,2,3}, Ana Róis⁴, Jéssica Vendas⁵, Ludmilla Blaschikoff³, Helena Palma⁶, Inês Pires⁶, Joana Catita¹, Margarida Alves^{1,2,7}, Fernanda Simões⁸, Octávio Serra⁸, Catarina Ginja^{3,9}, David Ramilo^{1,2}, André Pereira^{1,2,5,10}

¹Research in Veterinary Medicine (I-MVET), Faculty of Veterinary Medicine, Lusófona University, Lisbon University Centre, Portugal.

²Veterinary and Animal Research Centre (CECAV), Faculty of Veterinary Medicine, Lusófona University, Lisbon University Centre, Portugal.

³BIOPOLIS-CIBIO - Research Centre in Biodiversity and Genetic Resources/InBIO - Research Network in Biodiversity and Evolutionary Biology, Porto, Portugal.

⁴EPCV - School of Psychology and Life Sciences, Lusófona University, Lisbon, Portugal.

⁵Superior School of Health, Protection and Animal Welfare, Polytechnic Institute of Lusophony, Lisbon, Portugal.

⁶Faculty of Veterinary Medicine, Lusófona University, Lisbon University Center, Lisbon, Portugal.

⁷CBIOS – Research Center for Biosciences and Health Technologies, Lusófona University, Lisbon, Portugal.

⁸INIAV - National Institute of Agrarian and Veterinarian Research. Biotechnology and Genetic Research Unit. Oeiras and Braga, Portugal.

⁹CIISA - Centre for Interdisciplinary Research in Animal Health, Faculty of Veterinary Medicine, University of Lisbon, Lisbon, Portugal.

¹⁰GHTM - Global Health and Tropical Medicine, Associate Laboratory in Translation and Innovation Towards Global Health, LA-REAL, Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa, Lisbon, Portugal.

Objectives: During the maritime exploration period, the Portuguese transported domesticated food animals and probably dogs, between regions, such as Europe, South America and Africa. Our main goals are to understand animals' mobility over time, evolutionary paths of dog populations/breeds and to explore the present-day global genomic diversity, particularly their immunity-related genes. Aligned with the One Health concept, this research aims to identify the main pathogens affecting Cape Verde stray dogs, an insular African population, and their genomic polymorphisms and ancestry.

Material and Methods: Blood samples from 20 unrelated stray dogs from Cape Verde were collected during a neutering campaign organised by animal welfare NGOs - Animais de Rua and Simabô. Ectoparasites were collected and stored in 70% alcohol for identification. Genomic DNA was extracted from blood. Through outsourcing services, shotgun resequences (~10x covered) will be generated. Genomic data will be processed and combined with other worldwide genomes from Portuguese and Brazilian native dogs. Genomic diversity indicators, population structure, ancestry, differentiation and adaptation (e.g. immunity) will be assessed using standard methods. MHC/DLA class II genes' (DLA-DQA, DRB, DQB) haplotypes and Toll-Like Receptor SNPs will be characterized. Vector-borne pathogens were assessed through microscopic detection and will be confirmed by molecular screening.

Results: DNA concentration varied between 14.86 to 95.44 ng/uL. Ectoparasites were collected from 16 dogs (80%), including fleas (*Ctenocephalides felis*, *Echidnophaga gallinacea*), lice (*Heterodoxus spiniger*), and ticks (*Rhipicephalus* spp.). Blood smears revealed that most dogs (70%, *n*=14) were infected with at least one pathogenic agent, including *Hepatozoon canis* and bacteria from the *Ehrlichia/Anaplasma* genus.

Conclusion: Preliminary data indicate that stray dogs in Cape Verde are heavily burdened by both ecto- and hemoparasites requiring better veterinary care and

highlighting potential public health risks. This project aligns with Lusófona University's mission to develop leading research and collaborations with Portuguese-speaking countries.

Keywords: Dog genomics, Ancestry, Immunity genes, Cape Verde archipelago's stray dogs, Vector-borne diseases.

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