

Preliminary genetic characterization of *Spodoptera frugiperda* from maize fields in Cabo Verde

Carla Tavares^{1,2,3*}, Paola Sierra Baquero^{2,5,6}, António Mexia², Elsa Borges Silva^{1,4}, Filipa Monteiro^{2,4,5*}

¹ CEF, Forest Research Centre, School of Agriculture, University of Lisbon, Tapada da Ajuda, 1349-017 Lisbon, Portugal

² LEAF, Linking Landscape, Environment, Agriculture and Food Research Center, School of Agriculture, University of Lisbon, Tapada da Ajuda, 1349-017 Lisbon, Portugal

³ DGASP-MAA - General Direction of Agriculture, Forestry and Livestock- Ministry of Agriculture and Environment, Praia, Cabo Verde

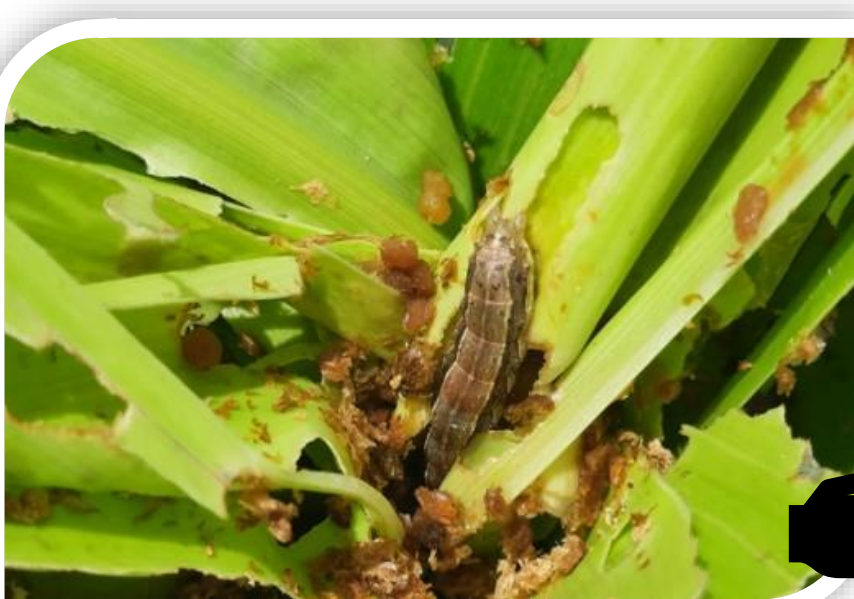
⁴ Associated Laboratory TERRA, School of Agriculture, University of Lisbon, Tapada da Ajuda, 1349-017 Lisbon, Portugal

⁵ CE3C, Centre for Ecology, Evolution and Environmental Changes & CHANGE - Global Change and Sustainability Institute, Faculty of Sciences, University of Lisbon, Campo Grande, 1749-017 Lisbon, Portugal

⁶ AGROSAVIA - Colombian Corporation for Agricultural Research, Agustín Codazzi, Cesar, Colombia

*carlatavares@isa.ulisboa.pt, fmonteiro@isa.ulisboa.pt

INTRODUCTION & AIM



Spodoptera frugiperda (Lepidoptera: Noctuidae), an invasive pest in West Africa threatening agricultural production

Accurate pest identification are crucial for developing effective management strategies. This study aims to:

- ✓ Characterize *S. frugiperda* population, identifying its strains diversity in maize fields across Cabo Verde
- ✓ Study potential migration routes within the archipelago

METHODS

Specimen Collection

Larvae samples collected from maize fields (Fig. 1)

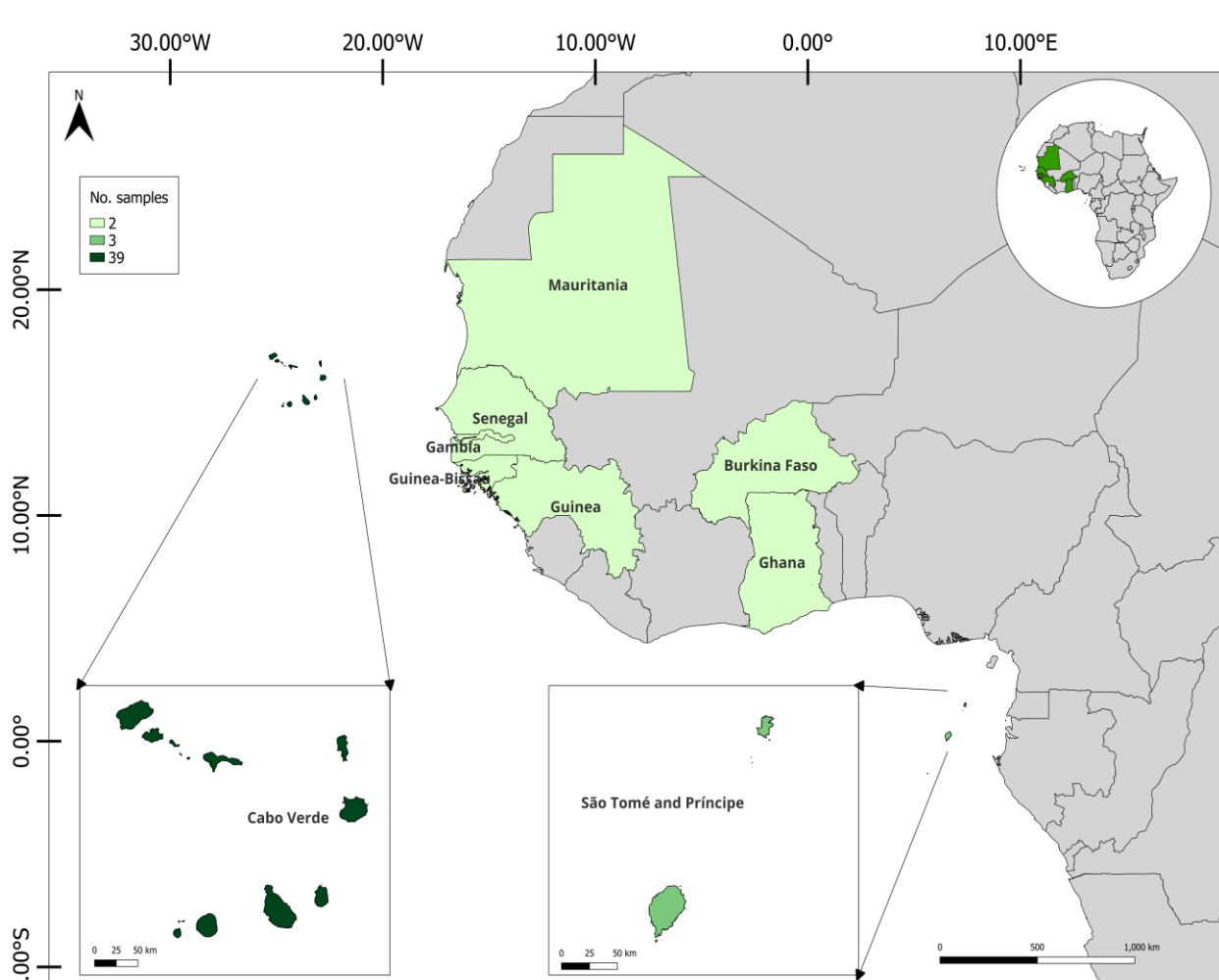


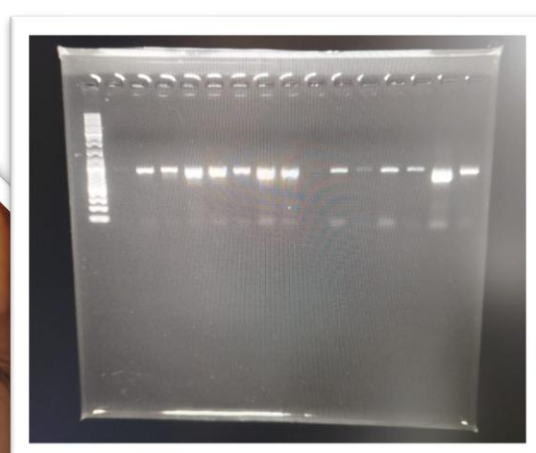
Figure 1. Sampled *S. frugiperda* in West Africa countries: Cabo Verde islands (39), Burkina Faso (2), Ghana (2), Gambia (2), Guinea (2), Guinea Bissau (2), Mauritania (2), Senegal (2) and São Tomé & Príncipe (3).

DNA Barcoding

Genomic DNA extraction



PCR amplification with universal primers targeted to *COI* gene



Sanger sequencing, sequence editing by BioEdit and alignment with reference data from NCBI and BOLD System databases

Sequence & Phylogenetic Analysis

From the total 86 sequences (including 3 *Spodoptera exigua* outgroups and 27 *S. frugiperda* from nucleotide databases), about 74 were analyzed by Maximum Likelihood (ML) in MEGA software with 100 bootstrap replicates to determine evolutionary relationships and strain identification.

RESULTS & DISCUSSION

Species identification

- All analyzed samples were confirmed as *S. frugiperda*

Sequence and phylogeny analysis

- Three distinct groups identified (Fig. 2):

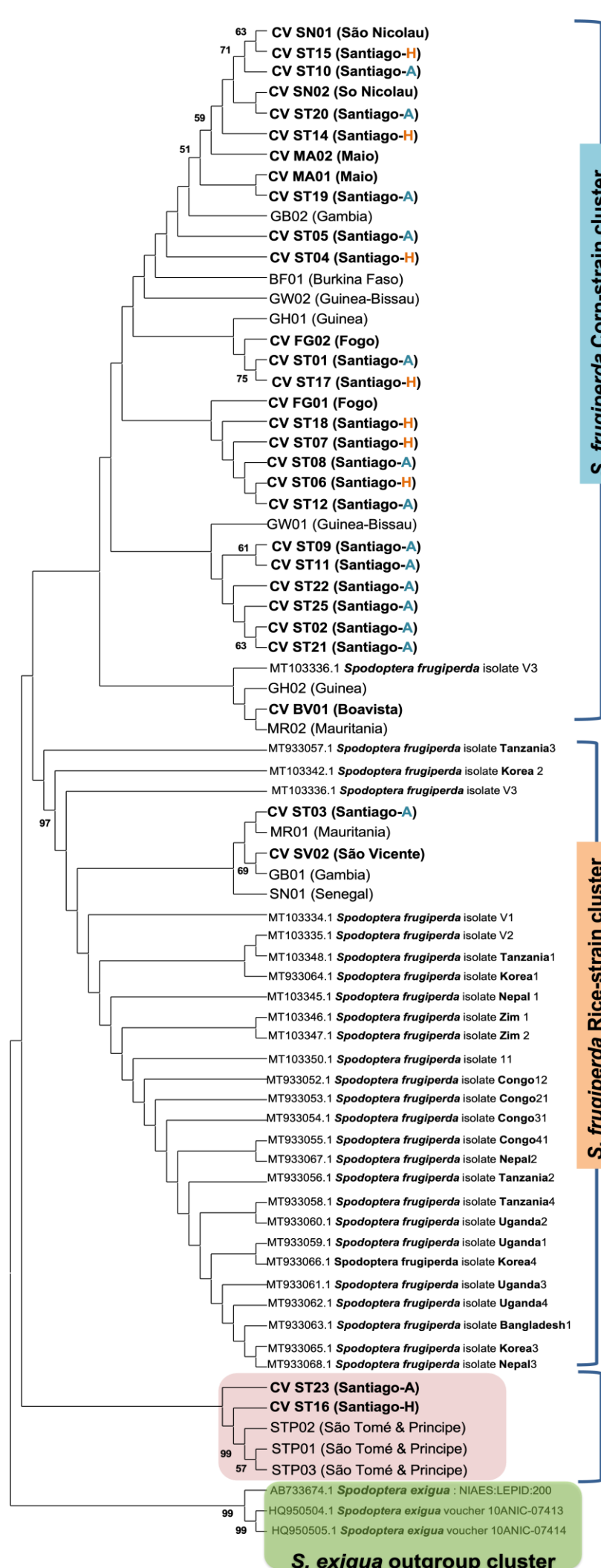


Figure 2. Phylogenetic tree of 74 *S. frugiperda* sequences by ML (100 bootstraps). Bootstrap values ≥ 50 are indicated.



Distinct *S. frugiperda* haplotypes detected in Cabo Verde within islands and agroecological zones

- Genetic/strain variability in *S. frugiperda* populations across Cabo Verde islands and within agro-ecological zones - Arid/semiarid (A) & Humid/subhumid (H) in Santiago island
- Evidence of strain overlap in maize: presence of Corn-strain dominant, but Rice-strain detected in Santiago (ST03) and São Vicente (SV02)
- Distinct group was detected, its should be the hybrids or third lineage, samples from Santiago (CV ST16 & CV ST23) similar to São Tomé (STP01, STP02 & STP 03)

Evidence of multiple migration events within the arquipelago

Evidence of early migration in Cabo Verde from São Tomé and Príncipe (1st African record of *S. frugiperda* in 2016), and followed with regional diversity and expansion

CONCLUSION / FUTURE WORK

- ✓ Genetic data indicate multiple migrations, strain coexistence, and regional dispersal of *S. frugiperda* in Cabo Verde, highlighting the need for genetic monitoring in pest management
- ✓ Future work will use genome-wide markers to refine strain identification and analyze hybridization and migration dynamics

ACKNOWLEDGMENTS

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