Conservation genetics in *Acrocephalus brevipennis*

Helena R. Batalha, David J. Wright, Iain Barr, Nigel J. Collar, and David S. Richardson
School of Biological Sciences, UEA, Norwich Research Park, NR4 7TJ, UK

Background

- Genetic factors play an important role in the survival of populations, and conservation strategies should take such factors into account[1,2].
- Management units provide a genetic basis for defining conservation priorities within species[3,4,5].
- The Cape Verde warbler (CVW), is an endangered bird endemic to three islands in the Cape Verde archipelago[6].
- **Total population < 3000 birds[6]**
- **S. Nicolau < 20 breeding pairs!**

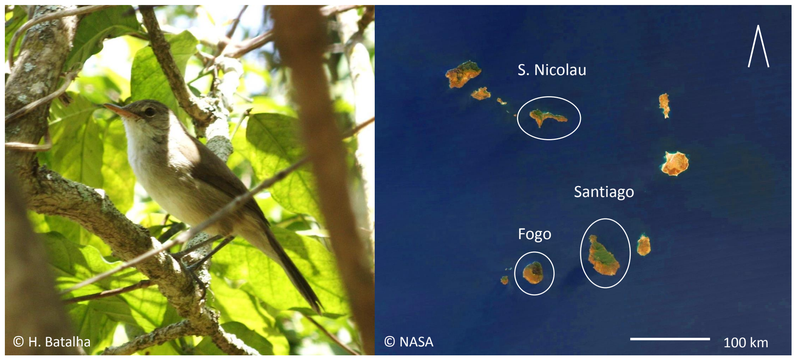

Figure 1 – Left: male *A. brevipennis,* Fogo, 2016. Right: Cape Verde islands with populations of the bird.

Overall aims

We used the cytochrome b (1150 bp) and 13 microsatellite loci to

- Assess the genetic divergence between the CVW and its sister species, the greater swamp warbler *Acrocephalus rufescens* (GSW)
- Understand relationships between CVW populations
- Measure genetic diversity within each population

Results

- Divergence: pairwise F_{ST} from 0.06 and 0.27 for microsatellites, and 0.26 and 0.45 for cytochrome b (all $P < 0.0001$), with S. Nicolau being the most divergent.
- Bottlenecks: all Garza-Williamson's M test values < 0.31, with the lowest for S. Nicolau.

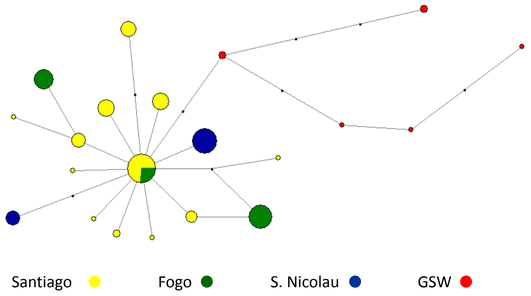

Figure 2 - Haplotype network based on the cytochrome b. Black dots represent intermediate mutations, with 1bp between consecutive haplotypes.

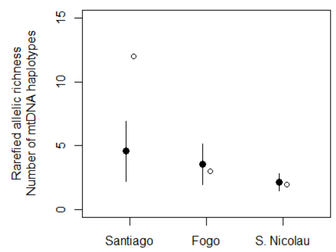

Figure 3 - Rarefied allelic richness (full circles; error bars = SD) and number of haplotypes (empty circles) for each of the CVW populations.

Species / population split	tMRCA	95% HPD
Cape Verde / greater swamp warbler	292 Kya	67–872 Kya
S. Nicolau / Santiago & Fogo	199 Kya	40–615 Kya
Santiago / Fogo	165 Kya	32–511 Kya

Table I – Time to the most recent common ancestor (tMRCA) of the CVW and the GSW populations, based on the cytochrome b; HPD = highest posterior density; Kya = thousand years.

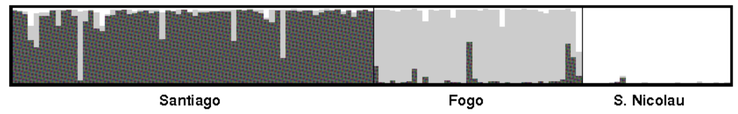

Figure 4 – STRUCTURE plot showing 3 distinct genetic clusters in the CVW populations.

Conclusions

- Gradient of decreasing genetic diversity: Santiago > Fogo > S. Nicolau.
- Low diversity within the species.
- Considerable divergence among the three populations.
- Evidence of population bottlenecks, especially on S. Nicolau.
- Populations became isolated from each other about 165-199.000 years ago.
- **The three populations should be treated as different management units.**

Original research article
Batalha HR, Wright DJ, Barr I, Collar NJ, Richardson DS (2016) Genetic diversity and divergence in the endangered Cape Verde warbler *Acrocephalus brevipennis*. In review.

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