

Progetto LIFE+ "Onedeertwoislands" - Meeting finale - Cagliari, 1-2 marzo 2018

Genetic variability of Corsican red deer (*Cervus elaphus corsicanus* Erxleben, 1777)

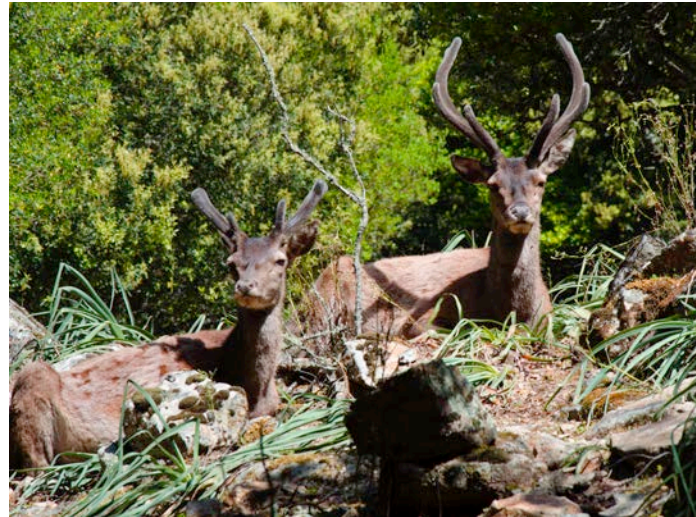
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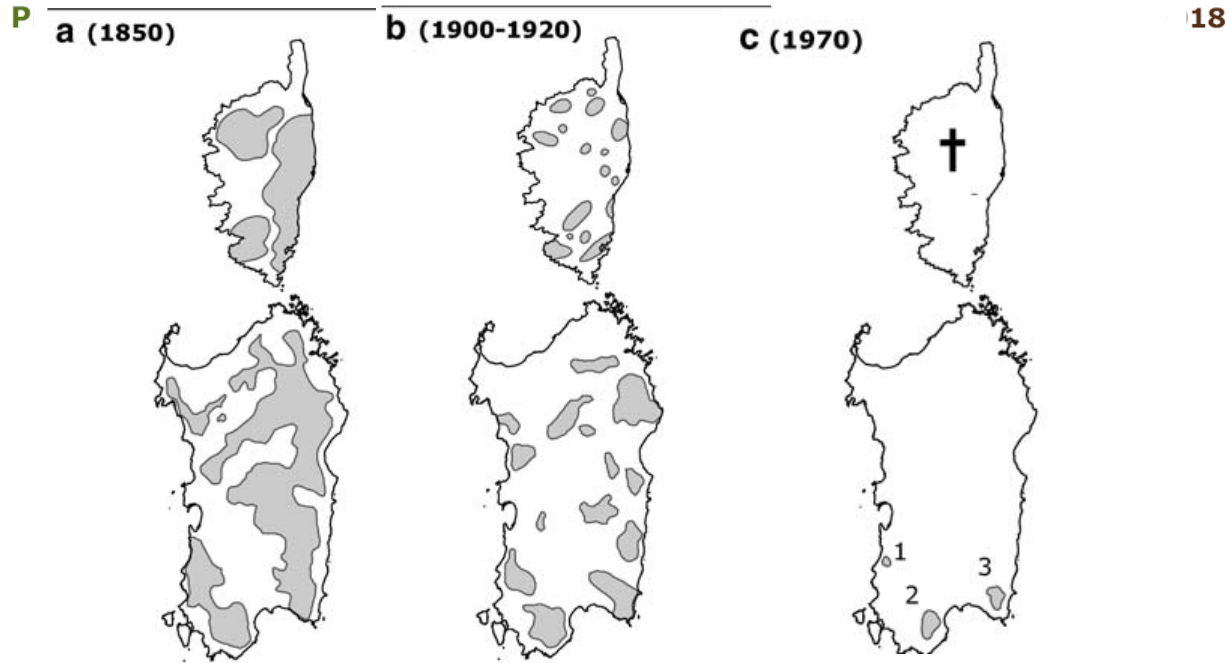
ISPRA

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The Corsican red deer (*Cervus elaphus corsicanus* Erxleben, 1777), endemic to the Tyrrhenian islands of Sardinia and Corsica, is one of the eighteen subspecies of red deer. The subspecies is characterized by a slightly smaller and slimmer size than the peninsular populations.

It is categorized as least-concern in the Italian Red List, and enlisted in Annexes II and IV of the Habitat Directive, thus requiring protection strategies that ensure the survival of its populations in its restricted distributional range.





At the beginning of the 19th century, the Corsican deer was widely distributed throughout Corsica and Sardinia, inhabiting almost every mountain ranges, albeit with low population density.

Thereafter, since 1920, occurred the fragmentation and the consequent drastic loss of suitable habitat: the prolonged deforestation activity, the pastoral fires, hunting (especially poaching), reduced the distribution ranges to three isolated areas.

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Main aims

- ✓ **Description of genetic variability in *C. e. corsicanus* populations**
- ✓ **Variability comparison between insular and peninsular populations**
- ✓ **Evaluation of the role of functional genes**
- ✓ **Support to conservation and managing plans**

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**BIOLOGICAL SAMPLE TYPE:
Tissue, Blood, Hairs**

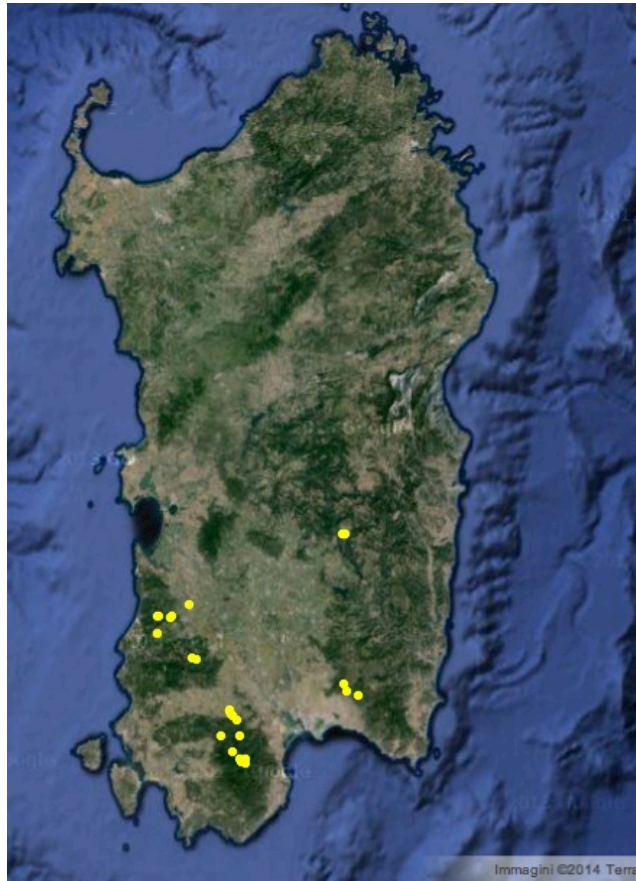
**103 SAMPLES
ORIGIN:**
17 N&C Apennine *
17 Alps *
31 Sardinia *
38 Corsica *

**GENETIC MARKERS:
12 STRs
Growth Hormone (GH) -
partial sequence**



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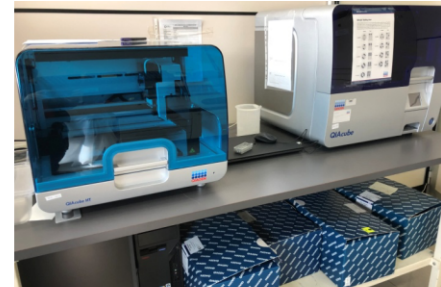
Localization of sampled deer.



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LABORATORY WORKFLOW PROCESS

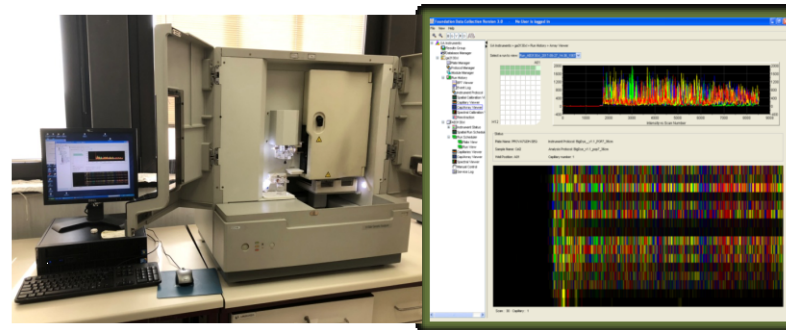
1. Automated DNA extraction



2. DNA Amplification



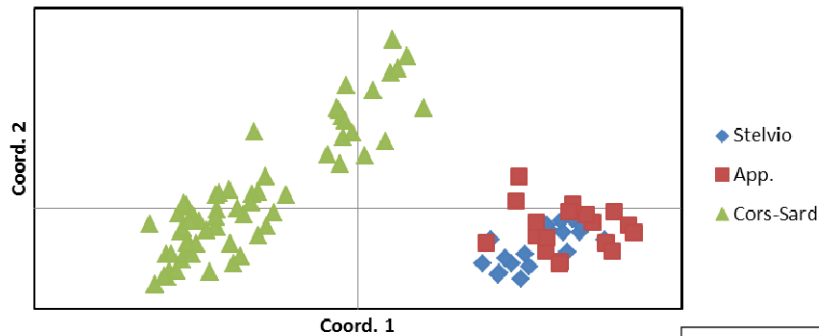
3. Fragment analysis & Sanger sequencing



1. Statistical Analysis

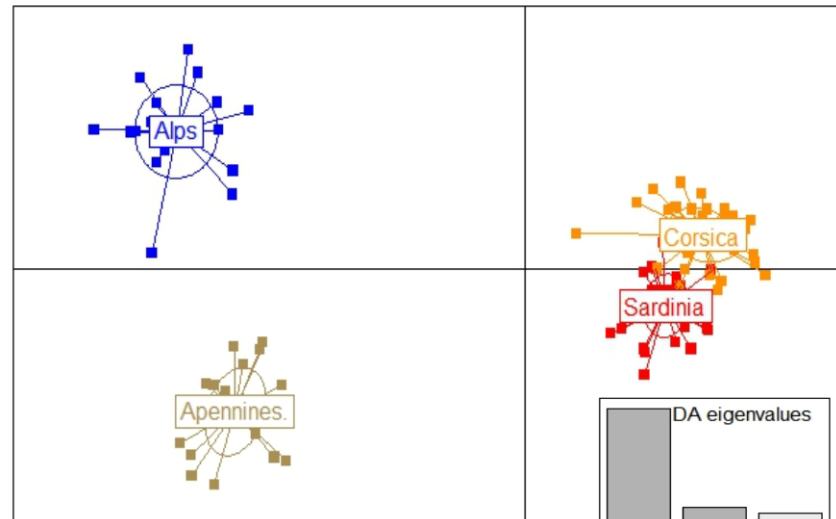
STRs GENETIC VARIABILITY

Principal Coordinates

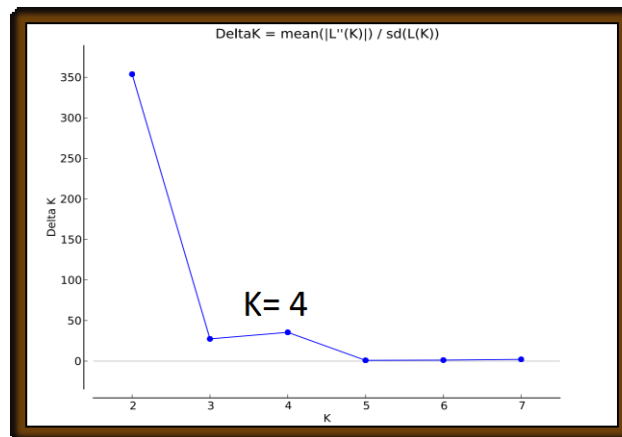
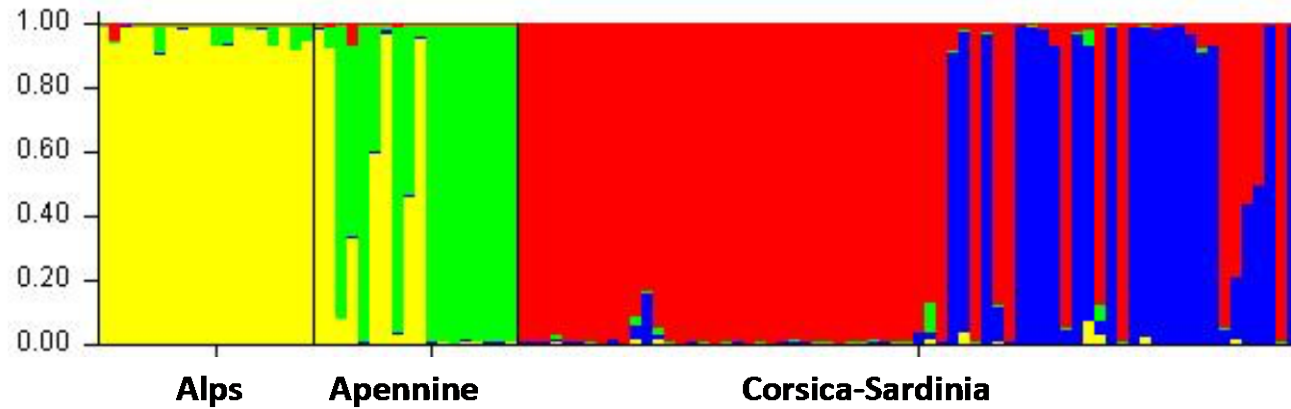


Principal Component Analysis
PCA

Discriminant Analysis of
Principal Components
DAPC



STRs STRUCTURE RESULTS



Best K value

GH Hormone results

- ✓ Predominant aplotype type B in all the samples,
- ✓ Insular population variant B presented 3 intronic allelic polymorphisms

Reference GB AMo49993.1

1. Guanine (**G**) position 262 (*wild type: A*)
2. Adenine (**A**) position 304 (*wild type: G*)
3. Thymine (**T**) position 509 (*wild type: A*)

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Variability among *C. e. corsicanus* populations

All loci resulted 100% polymorphic, both in Sardinian (27) and Corsican (n. 33) individuals. The following table shows the values of allelic richness and of heterozygosity observed and expected for the two islands.

		Na	Ne	Ho	He
Sardinia	Mean	3,750	2,427	0,454	0,558
	SE	0,348	0,158	0,047	0,032
Corsica	Mean	3,813	2,375	0,478	0,534
	SE	0,356	0,204	0,037	0,037

Na mean number of alleles; *Ne* = effective number of alleles;
Ho observed heterozygosity; *He* = expected heterozygosity.

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CONCLUSIONS

- ✓ STRs are useful for subspecies and population identification
- ✓ Reduced genetic variability in *C. e. corsicanus* insular population
- ✓ Unique aplotype variant B retrieved in all the populations
- ✓ Three intronic allelic polymorphisms in *C. e. corsicanus*
- ✓ Need to improve the study of functional genes

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Thanks for the attention

