Feral breeds in Italy

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6 feral populations in Italy

- Giara Horse
- Asinara Donkeys
- Asinara Horses
- Asinara Goat
- Tavolara Goat
- Caprera Goat
- Molara Goat

- Montecristo Goat

- Tremiti Goat

SARDINIA

TUSCANY

PUGLIA ?
Feral and wild populations on the Asinara Island

• Donkeys:
  – White donkey (Asino dell’Asinara) (150 animals)
  – Grey donkey (250 animals)

• Goats > 1000 (6000 have been already removed from the Island).

• Horses 100

• Mouflons (number unknown)
Asinara Island

– The Island is 52 km\(^2\) in area.
– The name is Italian for "donkey-inhabited".
– The island is located off the north-western tip of Sardinia.
– The Island is mountainous in geography with steep, rocky coast. Trees are sparse and low scrub is the predominant vegetation.
– It's part of the national parks system of Italy, in 2002 the island was converted to a wildlife and marine preserve.
– In 1885 the island became a Lazaretto and an agricultural penal colony (till 1998). About 100 families of Sardinian farmers and Genoese fishermen who lived on Asinara were obliged to move to Sardinia, where they founded the village of Stintino.
Asino dell’Asinara (Asinara Donkey)

Origins:
- Uncertain but oral records report the presence of white donkeys on the island since the end of XIX century.
- The appearance of the white coat in more recent times is probably due to a random mutation that spread to all the population.

Morphology: it is small and the size is similar to the Sardinian donkey; the most important difference is the white coat, that probably belongs to a form of incomplete albinism.

<table>
<thead>
<tr>
<th></th>
<th>Males and Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (cm)</td>
<td>80-105</td>
</tr>
<tr>
<td>Thoracic circumference (cm)</td>
<td>100</td>
</tr>
<tr>
<td>Foreleg circumference (cm)</td>
<td>11-13</td>
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</table>

Total population about 200-250 donkeys: Asinara 150 + ex situ 50-100 (Sardinia, Tuscany and Emilia).
Asinara: genetic characteristics


- Eight Italian donkey breeds: Asinara (ASI; n = 36), Sardo Grigio (SAG; n = 36), Amiatino (AMI; n = 48), Ragusano (RAG; n = 40), Grigio Siciliano (GRS; n = 30), Martina Franca (MAF; n = 31), Romagnolo (ROM; n = 27) and Pantesco (PAN; n = 30). 16 microsatellite loci in 258 individuals from these breeds were typed.

- A FIS value of 0.134 (P<0.001) detected in Asinara, indicates a significant level of inbreeding in this breed.
The Sardinian breeds, Asinara and Sardo Grigio, shared some distinctive genetic traits that separated them from the remaining Italian donkeys. Asinara and Sardo Grigio, in fact, were assigned to the same cluster by both the Neighbor-net and the Bayesian assignment.
The Asinara grey donkeys

The grey donkey of Asinara has not been characterized till now. They live in the northern part of the Island and compared with white ones (that live in the southern part) are more undomesticated and difficult to go near. The northern part of the Island is rocky and steep while the southern part is more accessible.

Till 1998, when the penal colony was shut down, the two groups of donkeys were strictly separated. Since 14 years ago there has been in the central part a large contact between the two populations. This situation could lead to the risk of losing the original genetic traits of both breeds.
Capra di Caprera (Caprera goat)

• Group of feral goats with morphological traits very similar to the Sardinian Goat breed.
• Unclear information about the history of these goat population.
• A genetic study by mitochondrial DNA characterization has been carried out by the University of Sassari.
Caprera Island

• It is the second largest island in the Maddalena archipelago and has a surface of 15.7 km² and 45 kilometres of coastline. Monte Teialone is the highest point (212 m).
• The Island has been declared a natural reserve for the particular species of seabirds living on.
• The island's name is linked to that of Giuseppe Garibaldi, an Italian patriot and fighter who lived in the 19th century and was one of the fathers of the Italian independence. He bought the island in 1855 and died there in 1882.
• The island was probably given its name because of the numerous wild goats living on it (capra means "goat" in Italian).
Capra di Caprera (Caprera Goat)

Sardinian Goat
Cavallino della Giara (Giara horse)

- The Giara evolved in an area of south-central Sardinia noted for a stony basaltic plateau, 4500 ha at about 500-600 metres above sea level. The Giara Plateau has sides that are steep cliffs, and the difficulty of access and the isolated location have protected the wild stock in recent centuries.
Giara Horse characteristics

• Due to this harsh environment, the horse is small, averaging between 115 to 135 cm, but hardy and able to acclimate to unfavorable conditions.
• Coat color: most are bay, chestnut or black.
• The total population is estimated at around 6-700 individuals.
Management of the Giara Horse

• In the past, once a year the horses were assembled by the owners for the branding and some animals were kept and broken in.

• Then the horses became common property and now are totally feral:
  – about 200 horses belong to the «Istituto di Incremento Ippico della Sardegna». Periodically the animals are checked and *ex situ* nuclei have also been established.
  – The remaining 400-500 horses belonged from the Comunità Montana, that was recently suppressed and the local Communes became responsible for the animals.
  – There isn’t a clear plan to manage the new situation.

Mitochondrial DNA haplotypes in each breed.

<table>
<thead>
<tr>
<th>Breed</th>
<th>N samples</th>
<th>N haplotype</th>
<th>Haplotype</th>
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<tbody>
<tr>
<td>GRH</td>
<td>5</td>
<td>2</td>
<td>16, 17</td>
</tr>
<tr>
<td>HFL</td>
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<td>5</td>
<td>1, 19, 20, 21, 22</td>
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<td>ITR</td>
<td>5</td>
<td>3</td>
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<tr>
<td>LPZ</td>
<td>5</td>
<td>5</td>
<td>1, 6, 8, 18, 21</td>
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<tr>
<td>MAH</td>
<td>5</td>
<td>5</td>
<td>4, 5, 6, 7, 8</td>
</tr>
<tr>
<td>SRH</td>
<td>5</td>
<td>4</td>
<td>1, 3, 14, 15</td>
</tr>
<tr>
<td>TBH</td>
<td>5</td>
<td>5</td>
<td>9, 10, 11, 12, 13</td>
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Capra di Tavolara (Tavolara Goat)

A group of feral goats very similar to Sardinian Goat breed lives on the Island, but no precise information is available.
Tavolara Island

- Located off the North-West coast of Sardinia, the Tavolara Island is a limestone massif 5 kilometres long and 1 kilometre wide, with steep cliffs except at its ends. Its highest point, Monte Cannone, is 565 metres above sea level.
- Together with the Islands of Molara and Molarotto and the “Punta Coda Cavallo” Peninsula, the Island is included in a marine protected area.
Capra di Molara (Molara Goat)

• A group of feral goats very similar to Sardinian Goat breed lives on the Island, but no precise information is available.
Molara Island

- Located off the North-West coast of Sardinia, the Island is 3.4 km$^2$ in area.
- Together with the Islands of Tavolara and Molarotto and the “Punta Coda Cavallo” Peninsula, the Island is included in a marine protected area.
Capra di Montecristo (Montecristo Goat)

- This goat population is precious as it represents a unique example of survival of animals introduced in the first stage of domestication. An analogous situation is revealed only in Crete and in some small Greek Islands.

- The introduction of this goat to the Island was in ancient times, probably in the same period when the Muflon were introduced, about 6000 years ago.
Montecristo Island

- Area 10.39 km²
- Highest elevation 645 m
- Nowadays the island has only two permanent human inhabitants, both nature reserve keepers. In addition, agents of the State Forestry Corps from Follonica live there in alternating shifts of two weeks at a time.
- The state nature reserve Isola di Monte Cristo is a biogenetic reserve of 1,039 hectares established in 1971.
- Today it belongs to the Tuscan Archipelago National Park. It was also awarded the European Diploma of Protected Areas in and recognized as a site of pan-European interest.
Capra di Montecristo (Montecristo goat)

The first complete study of Montecristo Goat was carried out in 1986 by the Istituto Nazionale di Biologia della Selvaggina, (today ISPRA). The study showed that about 300-350 animals were present at that time.

However the same study determined that the maximum sustainable population for the Island should be 100 goats. So a culling program was carried out and between 1975 and 2006 801 goats were culled (423 males and 375 females).
Capra di Montecristo (Montecristo goat)

- The goat population shows an unbalance in favor of male individuals.
- Females give birth once a year to only one kid and the fertility rate is about 40%.

- The genetic variability is higher than would be expected considering the isolation. This probably means that the colonization of the Island happened at different times and animals of various origins were subsequently introduced. A documented introduction was in 1898 (at that date Montecristo were a royal game preserve and goats, wild boars and mouflons were released).
San Nicola Island (Tremiti archipelago)

- Area 42 ha - Highest elevation 75 m.
- San Nicola is where most of the population resides.
- The Isole Tremiti are an archipelago in the Adriatic Sea, north of the Gargano Peninsula. They constitute a comune of Italy’s Province of Foggia and form part of the Gargano national park.
- Very little information about this goat population that could have been recently introduced in the Island.

Capra Garganica (Garganica Goat)
Mouflon

- Mouflon were introduced to the islands of Corsica, Sardinia, Rhodes and Cyprus during the neolithic period, perhaps as animals at the early stage of domestication. Here they have naturalized in the mountainous interiors of these islands over the past few thousand years, giving rise to the subspecies known as European mouflon (O. aries musimon).

- They are now rare on the islands, but **are classified as feral animals by the IUCN**.

- They were later successfully introduced into continental Europe, including Spain, France, Germany, central Italy, Switzerland, Austria, the Netherlands, the Czech Republic, Poland, Slovakia, Hungary, Bulgaria, Romania, the Canary Islands, and even some northern European countries such as Sweden and Finland.