

## Short Communication

# First observation of a reddish-coated Italian Wolf *Canis lupus italicus* Altobello 1921 in Abruzzo, Lazio and Molise National Park (Carnivora: Canidae)

Tania Bascucci<sup>1</sup>, Alice Veronese<sup>2</sup>, Paolo Iannicca<sup>3</sup>, Davide Magnaghi<sup>4</sup>,  
Samuele Romagnoli<sup>5\*</sup>

**Abstract** - During an observation in the Giovenco Valley (Abruzzo), an Italian wolf *Canis lupus italicus* displaying a reddish-orange coat was documented. The individual, a subadult male in good condition, showed typical morphological traits of the subspecies; however, the presence of free-ranging dogs in the area does not exclude a hybrid origin. Based on the literature, two hypotheses were proposed: a genetic mutation affecting coat pigmentation or wolf-dog hybridization. In the absence of clear diagnostic traits of hybridization, genetic analyses are therefore required. This case highlights the importance of monitoring hybridization and managing stray dog populations for the conservation of the Apennine wolf.

**Key words:** central Apennines, conservation, hybridization, wolf.

**Riassunto** - Prima osservazione di un lupo apenninico *Canis lupus italicus* Altobello 1921 con mantello rossiccio nel Parco Nazionale di Abruzzo, Lazio e Molise (Carnivora: Canidae).

Durante un'osservazione nella Valle del Giovenco (Abruzzo) è stato documentato un esemplare di lupo apenninico *Canis lupus italicus* dalla colorazione rossastro-aranciata. L'individuo, un maschio subadulto in buone condizioni, presentava caratteristiche morfologiche tipiche della sottospecie, ma la presenza di cani vaganti nell'area non esclude un'origine ibrida. Sulla base della letteratura sono state formulate quindi due ipotesi: una mutazione genetica legata alla produzione di pigmenti del mantello o la presenza di ibridazione cane-lupo. In assenza di chiari tratti diagnostici di ibridazione si rendono quindi necessarie analisi genetiche. Il caso evidenzia l'importanza del monitoraggio dell'ibridazione e della gestione del randagismo per la conservazione del lupo apenninico.

**Parole chiave:** Apennino centrale conservazione, ibridazione, lupo.

Hybridization is a significant risk to wolf conservation and may be underestimated due to the difficulty in recognizing diagnostic traits (Stronen *et al.*, 2022). However, in some cases, unusual phenotypes can be easily identifiable. During a wildlife observation session

carried out in the Giovenco Valley (Abruzzo, S Italy) on 19 October 2024 at 8:50 a.m., we observed an Italian wolf *Canis lupus italicus* Altobello 1921 (Altobello, 1921) with a distinctive reddish-orange coat.

During the observation, the weather was cloudy, and the light was ideal to assess the coat colour with a telescope while maintaining an appropriate distance to avoid disturbance and to ensure unaltered behaviour (Steinberg, 2022). The observation lasted over thirty minutes, providing us with the opportunity to assess key diagnostic traits of the species, such as the facial mask, head shape, and ear morphology (Ciucci & Boitani, 1998), which were clearly visible (Fig. 1 a-c). The observed wolf, a subadult male (Fig. 1b) appeared in good health conditions with no obvious signs of debilitating infestations by ectoparasites. The individual was alone in an open area situated on the border between the territories of two packs, numbering 7 and 8 individuals respectively (Iannicca, *pers. com.*). One of these packs is often observed near the rural village of Aschi (Giovenco Valley) where their *rendezvous* site is located. The Giovenco Valley, where we observed the wolf, is a mosaic of small villages and rural areas, sometimes

<sup>1</sup> Sportello Lupo Rimini, Via Gradizza 49, 47923 Corpolò di Rimini (Rimini), Italia.

<sup>2</sup> Via Luigi Galvani 2B, 20043 Vanzago (Milano), Italia.

<sup>3</sup> Ecotur, Via Piave 9, 67032 Pescasseroli (Aquila), Italia.

<sup>4</sup> Via Biennio 31, 22040 Lurago d'Erba (Como), Italia.

<sup>5</sup> Ecoway Travel, Via San Clemente 23, 20099 Sesto San Giovanni (Milano), Italia.

\* Corresponding author: Samuele.Romagnoli.Natura@gmail.com

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Davide Magnaghi, Samuele Romagnoli

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Fig. 1 - Three photographs (A-C) of the observed reddish-coated wolf showing diagnostic traits. B) The same individual urinating, showing that it is a subadult male. / Tre fotografie (A-C) che mostrano i caratteri diagnostici del lupo appenninico dal mantello rossiccio osservato. B) Lo stesso individuo mentre urina, dimostrando che si tratta di un maschio subadulto.

abandoned or still exploited, and wild mountains. Dogs are often used to guard livestock or property and it is not uncommon to come across them roaming the area. The presence of both dogs and wolves in the same area prevents us from ruling out the possibility that the animal observed might be a hybrid.

The literature about hybrids and coat colour variation is based on observations like the one we carried out and on genetic analyses. In Europe, cases of wolf-dog hybrids have also been documented, with percentages ranging from 1% to 13%, depending on the population under examination (Hindrikson, 2017). Many authors emphasize the need for a cautious approach in interpreting these characteristics, as they are not always related to recent crosses, and propose the support of genetic analysis for accurate identification (Dziech, 2021; Molinari, 2014). Molinari (2014) analysed the phenotypic variability observed in Italian wolves, focusing on atypical traits such as light coat colours (blonde, yellowish), hind leg spurs, and white patches, which are considered potentially indicative of hybridization with dogs. Other authors (Ciucci *et al.*, 2003, Galaverni *et al.*, 2017) suggested that melanic coat, the presence of white claws and of spurs on the hind legs are not typical of the Italian wolf population, but are characteristic of various types and breeds of dogs, such as the Belgian Shepherd, the Abruzzo Mastiff, the Saint Bernard, and the Bernese Mountain Dog.

Based on literature we identified two hypotheses possibly explaining the unusual coloration of the wolf we observed. The first, and most likely, is that the specimen resulted from a hybridization event between a wolf and a domestic dog, either as a first-generation hybrid or due to the introgression of domestic dog genes. Similar phenotypes have been documented in the Piedmont Apennines, in the southeastern area of the Alessandria province (AL-F78), and in the Alpi Cozie Park in the Turin province (TO-M367). Both examples displayed an atypical pale coat (Avanzinelli *et al.*, 2022). However, a comparison with photographs of these two specimens led us to conclude that they differ significantly from the wolf observed in Abruzzo (see Fig. 1 a-c). The coat colour is brighter, and the tail lacks the characteristic black tip present in TO-M367. These differences, along with the absence of diagnostic hybrid traits (Ciucci, 2012), lead us to consider another possible explanation: a genetic mutation resulting in a higher production of pheomelanin relative to eumelanin in the animal's coat (Johnson *et al.*, 2014). However, this hypothesis seems much less probable. The impact of this unusual coloration on the wolf's social behaviour should also be further investigated. In fact, coloration has been shown to influence social behaviour in wolves (Cubaynes *et al.*, 2022). In September 2025, the reddish wolf was observed again by another guide in the same place together with a female (Santucci P., *pers. com.*).

The phenomenon of stray dogs in Italy is a cause for great concern, as it often leads to overcrowding of kennels and shelters and, particularly in southern regions, in inadequate management practices. Awareness-raising campaigns aimed at preventing dog abandonment contribute to addressing the underlying causes of the issue; although a gradual improvement has been observed,

the problem remains particularly acute in the South. It is therefore recommended that resources be strategically allocated to the Abruzzo, Lazio, and Molise National Park in order to provide targeted training for owners of livestock guardian dogs, which are often allowed to roam freely with herds, especially in areas inhabited by wolf populations.

In conclusion, while the hybridization hypothesis appears plausible, the possibility of a genetic origin underlying the unusual coloration of this individual cannot be definitively excluded without genetic analysis. Nevertheless, our finding highlights the importance of ongoing monitoring for managing the phenomenon of hybridisation and its implications for the conservation of the Italian wolf.

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