

Short Communication

The golden jackal *Canis aureus* L. 1758 (Carnivora: Canidae) on the Tuscan Apennines

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Abstract - We report the first observations of the golden jackal on the Tuscan Apennines (Italy). We observed two individuals 15 times in the district of Prato, between 21 November 2021 and 5 January 2022. Their presence has been assessed through camera traps at the edge of an urbanized area. The southernmost presence data for Italy reported in the literature is documented for Emilia-Romagna, about 200 km north from Prato, while a recent unpublished report records its presence in northern Lazio, about 300 km south. These observations highlight the need to increase the research effort to monitor the expansion of the golden jackal along the Italian peninsula more efficiently.

Key words: carnivore, climate change, distribution, range expansion.

Riassunto - Lo sciacallo dorato *Canis aureus* L. 1758 (Carnivora: Canidae) sull'Appennino Toscano.

Qui riportiamo la prima osservazione di sciacallo dorato sull'Appennino toscano (Italia). Tra il 21 novembre 2021 e il 5 gennaio 2022 abbiamo osservato 15 volte due individui nell'area di Prato. La loro presenza è stata valutata attraverso fototrappole ai margini di un'area urbanizzata. Il dato di presenza più meridionale per l'Italia riportato in letteratura è documentato per l'Emilia-Romagna, circa 200 km a nord di Prato, mentre una recente segnalazione inedita ne registra la presenza nel Lazio settentrionale, circa 300 km a sud. Queste osservazioni evidenziano la necessità di aumentare lo sforzo di ricerca per monitorare con maggiore efficienza l'espansione dello sciacallo dorato lungo la penisola italiana.

Parole chiave: cambiamenti climatici, carnivoro, distribuzione, espansione di areale.

The golden jackal *Canis aureus* L. 1758 (Carnivora: Canidae) is a medium-sized mammalian carnivore whose European distribution has been mostly confined to the southeastern part of the continent (Trouwborst *et al.*, 2015). This species underwent to a remarkable expansion in Europe during the last century, which brought it from the most southeastern Balkan areas to the northern countries (Tóth *et al.*, 2009; Trouwborst *et al.*, 2015; Spassov & Acosta-Pankov, 2019; Torretta *et al.*, 2020). Besides the potential good protection policy offered by the European countries (Trouwborst *et al.*, 2015), the strong expansion of the golden jackal may have been promoted by multiple factors, such as the transformation of land use (Šálek *et al.*, 2014), climate change (Fabbri *et al.*, 2014) and reduction of natural competitors (Liberg *et al.*, 2012; Lapini *et al.* 2021).

Reproductive populations of the golden jackal in Italy are mainly known from Friuli-Venezia Giulia (Fabbri *et al.*, 2014; Torretta *et al.*, 2020) with sporadic observations also from other areas of its Italian distribution (Lapini *et al.* 2021). Until recently, the presence of the golden jackal south of the Po Valley was not documented in the scientific literature (Lapini *et al.*, 2018).

We observed for the first time two individuals of golden jackal on Tuscan Apennines, in the district of Prato (Fig. 1). The area is located on Monteferrato (Fig.1), an ophiolitic hill formation with elevations ranging from 100 m to 400 m a.s.l., and characterized by sub-Mediterranean climatic conditions (Chiarucci *et al.*, 1998). This hill is located about 200 km south from the southernmost observation for Italy reported by Lapini *et al.* (2018). Indeed, this area seems to be particularly suitable for the species, as it offers shelters into the dense vegetation and abundant food thanks to the municipal landfill site (Pecorella, 2021). The presence of the two individuals was assessed using camera traps placed in a forest at the edge of an urbanized area. Individual identification carried out thanks to the pattern of fur on the muzzle, made it possible to establish that they were two individuals recorded 15 times between 21 November 2021 and 5 January 2022 (Fig. 2). Considering the limited home range known for the species (≤ 15 km²: Mihelič & Krofel, 2012) and the relatively low probability of encounters, ours is certainly a noteworthy observation.

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Received for publication: 5 February 2022

Accepted for publication: 4 April 2022

Online publication: 20 October 2022

Currently, our record represents the first record for the golden jackal in Tuscany. As far as Italy is concerned, the southernmost record for this canid was obtained with camera traps in Lazio, in the Circeo National Park (about 300 km south of ours) in the period 6-21 May 2020. However, the confirmation of this sighting only came on 2 February 2022 after the re-examination of the images obtained in 2020. For details of the case, see Ferri & Lapini (2022).

These observations confirm that the Italian distribution of the species is larger than we previously thought and that the knowledge gap is probably due to an unbalanced sampling effort, as already highlighted by some authors (Lapini *et al.*, 2018; Torretta *et al.*, 2020). The reason for the range expansion of the golden jackal in Italy is not clear in all its aspects, but Polemio & Casarano (2008) hypothesized that the species is moving towards areas with more suitable climatic conditions.



Fig. 1 - Map showing the area where the two golden jackals have been observed in Tuscany. The precise coordinates are omitted for species conservation reasons (Lunghi *et al.*, 2019). / Mappa che mostra l'area in cui sono stati osservati i due shiacalli dorati in Toscana. Le coordinate precise sono omesse per motivi relativi alla conservazione della specie (Lunghi *et al.*, 2019).

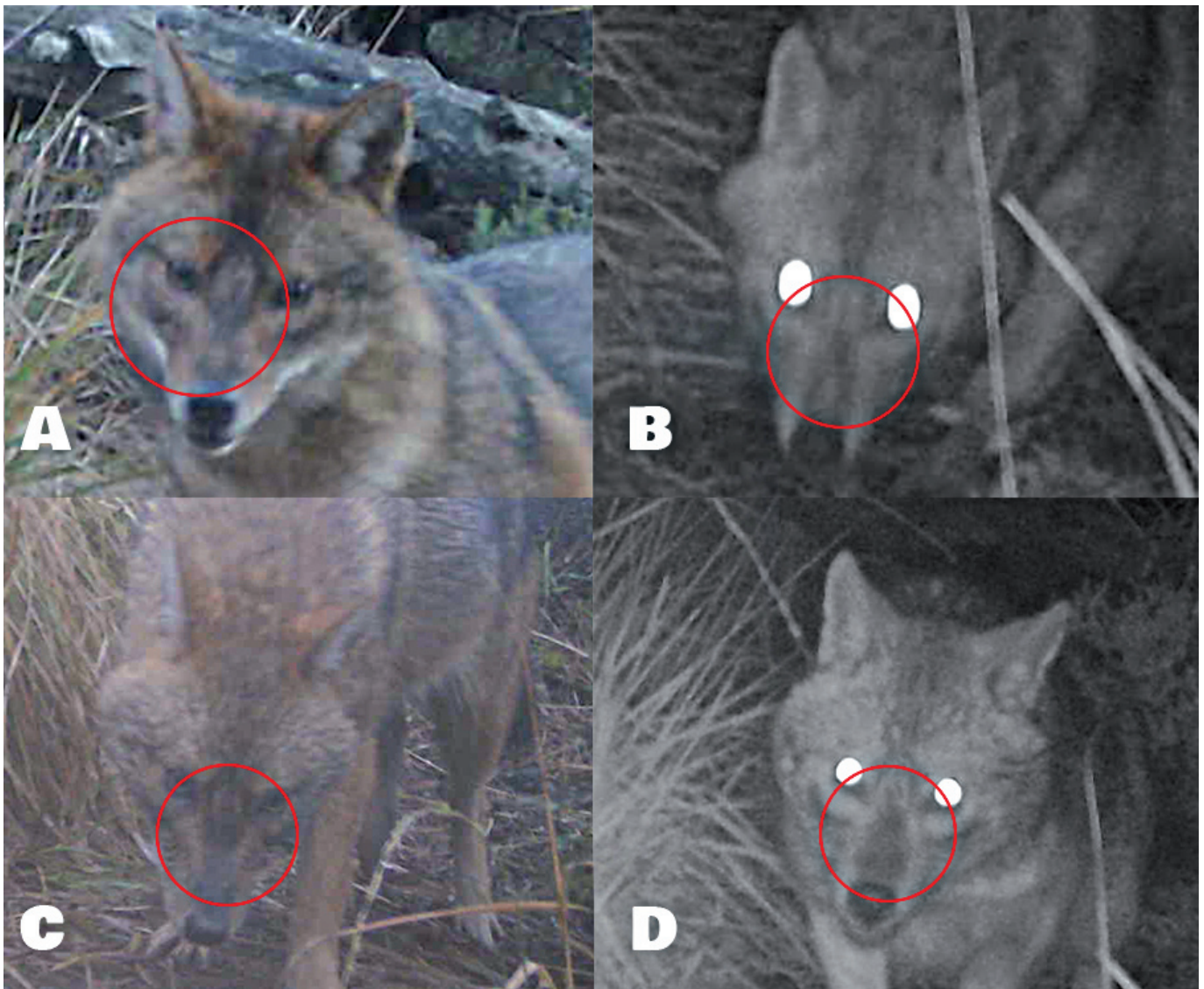


Fig. 2 - The first (A-B) and the second (C-D) of the two golden jackals observed in Tuscany. Individual recognition was carried out by the pattern of the muzzle fur (in the area indicated by the red circle). Photo taken with Victure HC300 trail camera. The full video of the observation can be seen at <https://www.youtube.com/watch?v=B0wO4i4SNXA>. / Il primo (A-B) e il secondo (C-D) dei due sciacalli dorati osservati in Toscana. Il riconoscimento individuale è stato effettuato attraverso il disegno del pelo del muso (nell'area indicata dal cerchio rosso). Foto scattata con la trail camera Victure HC300. Il video completo dell'osservazione può essere visto su <https://www.youtube.com/watch?v=B0wO4i4SNXA>.

However, we warn that this expansion can potentially bring to a conflict with local farmers and hunters, as they may see this animal as a possible predator of livestock or game animals (Markov & Lanszki, 2012; Ćirović *et al.*, 2014). To avoid the potential conflict with local human communities, informative campaigns, along with a revision of the legal protection of the species, should be rapidly put into act (Liberg *et al.*, 2012; Trouwborst *et al.*, 2015).

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