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## Characterization of social behavior in a group of domestic donkeys (*Equus asinus*)

Miina Lööke, Paolo Mongillo, Martina Bortolotti, Simona Normando\*, Lieta Marinelli

Dipartimento di Biomedicina Comparata e Alimentazione, University of Padova, Viale dell'Università 16, Legnaro, PD 35020, Italy

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### ABSTRACT

Although the popularity of domestic donkeys is increasing, the scientific literature on their behavior is still limited. This study investigated the social behavior of a group of 13 donkeys (10 females, 3 geldings, aged 3–13 years) stabled in an Animal Assisted Interventions facility in the North of Italy. Our first aim was to assess the distribution of donkeys' intraspecific social behaviors during daytime and the second aim was to characterize affiliative and agonistic social interactions during peak activity times. Social behaviors were expressed more between 8 and 9 AM than the rest of daytime, mainly reflecting the expression of affiliative behavior. The latter consisted mostly of proximity (55.0% of all affiliative) and following (29.2%). In most cases affiliative behavior was expressed within preferential dyads, composed of either a mother and her offspring or two adult donkeys. This supports the idea that dyadic relationships are a predominant feature of the social organization of the species. However, dyadic interactions were not observed in the oldest sub-adults, suggesting that social preferences undergo a change around the time donkeys reach full growth. Agonistic behaviors were much less common than affiliative ones. The most expressed agonistic behavior was threat (51%), followed by displacement and bite (both 18.5%). They were less expressed by donkeys who were part of an affiliative pair, suggesting that limited expression of agonistic behavior is associated with an actual change in social preferences, not a mere consequence of fewer occasions of conflict over resources. While the study has limitations, the results provide insight into the social behavior of domestic donkeys which could represent a starting point for further research as well as relevant information for donkeys farming.

### 1. Introduction

The donkey population in the southern states of the European Union has decreased markedly in the second half of the twentieth century. In Italy, in particular, populations decreased by more than 95% between 1939 and 1996 (Starkey and Starkey, 2000). Recently, in many Mediterranean Countries, the interest in keeping and breeding donkeys has increased again, due to meat and milk production (Camillo et al., 2018). Donkey milk is considered to be a pharma-food (Garhwal et al., 2022) and it is used in cosmetics production (Cosentino et al., 2013). There has also been an increasing involvement of donkeys in social activities such as Animal Assisted Interventions (AAI), tourism, and leisure (Amendola et al., 2012; Camillo et al., 2018), changing the social conditions in which they are kept. Thanks to these new socio-economical requests, the latest official report established that 33,116 donkey farms were present on the Italian national territory (30/06/

2022; [https://www.vetinfo.it/j6\\_statistiche/#/report-pbi/33](https://www.vetinfo.it/j6_statistiche/#/report-pbi/33)). In the traditional use as pack or draught work animals, the domestic donkey population was mainly represented by single individuals or pairs with little or no possibility of interaction with conspecifics (Camillo et al., 2018). However, modern production farms keep donkeys in large social groups which have a variable sex and age composition (Dai et al., 2018). In light of this, a better understanding of the donkey social organization and behavior has become of interest for the owners of donkeys.

To date, the scientific knowledge on the social behavior of domestic donkeys is scarce and mainly restricted to feral populations. A recent review aiming at investigating the scientific literature on donkey behavior and cognition (De Santis et al., 2021) identified the donkey's intraspecific social behavior as the subject of only six scientific articles (excluding those on sexual behavior and on the mother-foal bond). The social organization of feral donkeys is characterized by a marked flexibility on the basis of resource distribution, habitat size, and topography

\* Correspondence to: Laboratory of Applied Ethology, Dipartimento di Biomedicina Comparata e Alimentazione, University of Padova, Viale dell'Università 16, Legnaro, PD 35020, Italy.

E-mail addresses: [miina.looke@unipd.it](mailto:miina.looke@unipd.it) (M. Lööke), [paolo.mongillo@unipd.it](mailto:paolo.mongillo@unipd.it) (P. Mongillo), [martina.bortolotti@unipd.it](mailto:martina.bortolotti@unipd.it) (M. Bortolotti), [simona.normando@unipd.it](mailto:simona.normando@unipd.it) (S. Normando), [lieta.marinelli@unipd.it](mailto:lieta.marinelli@unipd.it) (L. Marinelli).

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