



# Behavioral characteristics of the Apuan Alps Dog: a pilot study

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**Abstract:** The Apuan Alps Dog, an ancient breed from Tuscany and Liguria, was evaluated behaviorally using the Italian version of the C-BARQ. A total of 141 questionnaires were collected, with items grouped into 12 subscales. The results revealed high trainability (3.9/5), strong attachment and attention-seeking behavior (3.5/5), and elevated excitability (2.15/4), while scores for aggression and fear remained low. These traits reflect the breed's herding origins, characterized by arousal and responsiveness, while also supporting its increasing role as a companion dog. Nevertheless, its exuberance may present challenges for inexperienced owners.

**Key Words:** behavior, dog, questionnaire, C-BARQ

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## Introduction

The Apuan Alps Dog has historically been present in the regions of upper Tuscany and Liguria, where it was primarily employed in the management of sheep, goats, and cattle.

This breed descends directly from the ancient Alpine Shepherd, considered the ancestral progenitor of European herding dog populations.

Following a period of demographic decline associated with the reduction of traditional herding activities, the Apuan Alps Dog has re-emerged and is now distributed throughout the mountainous territories of eastern Liguria and northern Tuscany. The highest concentrations are reported in the Lunigiana and Lucca areas, where traditional pastoral practices have been comparatively well preserved, supporting the maintenance of local breeds (Dadousis et al., 2021; Giuliotti et al., 2023; Giuliotti et al., 2024). In June 2020, the breed was formally recognized by the Italian National Kennel Club (ENCI) as an ancient regional breed.

The ENCI breed standard characterizes the Apuan Alps Dog as “alert, active, and lively, always ready for action”. In addition to its innate aptitude for herding, it possesses qualities of property guarding and livestock defense against small predators (e.g., *Vulpes vulpes*) and potential intruders. Similar behavioral versatility has been reported in other Italian herding breeds such as the Maremma-Abruzzese Sheepdog, whose working performance and behavioral responses have been objectively assessed through aptitudinal testing and GPS monitoring (Bellini et al., 2022). While typically docile and even-tempered, some individuals exhibit natural wariness towards strangers, a trait consistent with other sheepdog breeds (Bellini et al., 2022)."

Despite its ancient origins, systematic research on the behavioral characteristics of the Apuan Alps Dog remains limited. This is particularly relevant given the gradual decline of its functional role in herding and the increasing frequency with which it is selected as a companion animal.

The present study aimed to investigate the behavioral tendencies of the Apuan Alps Dog through the administration of a structured questionnaire to owners, with the objective of providing a deeper understanding of the breed's behavioral profile.

## Materials and methods

For this study, the validated Italian version of the C-BARQ, as described by Clovis et al. (2024), was employed. The questionnaire was disseminated online via social media platforms and breed club websites and further circulated among Apuan Alps Dog breeders and owners through word of mouth.

An introductory section was included to collect demographic information, such as the dog's name, breed, date of birth, sex, and, when applicable, the date of castration or neutering.

The C-BARQ employs two distinct response formats depending on the behavior assessed. Items in sections 1, 4, 6, and 7 evaluate the frequency of specific behaviors using a six-point ordinal scale (0 = not applicable, 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always), thus providing an index of behavioral consistency over time. Items in sections 2, 3, and 5 instead assess the intensity or severity of behaviors, irrespective of frequency, on a five-point scale (0 = none, 1 = mild, 2 = moderate, 3 = intense, 4 = severe). In general, higher scores indicate more problematic behaviors, with the exception of the trainability scale, where higher values correspond to a desirable trait.

The original 92 C-BARQ items were aggregated into 12 behavioral subscales.

## Results

A total of 141 questionnaires were collected, of which 77 referred to female dogs, including 29 sterilized individuals. Among males, only 3 were reported as neutered. The average age of the animals was  $4.50 \pm 3.12$  years. The mean values ( $\pm$  S.D.) obtained for each behavioral subscale are presented in Table 1.

1	TRAINABILITY	Frequency scale (0-5)	$3.90 \pm 1.07$
2	STRANGE DIRECTED AGGRESSION	Intensity scale (0-4)	$1.01 \pm 0.43$
3	OWNER-DIRECTED AGGRESSION	Intensity scale (0-4)	$0.15 \pm 0.08$
4	DOG RIVALRY	Intensity scale (0-4)	$0.65 \pm 0.30$
5	STRANGER-DIRECTED FEAR	Intensity scale (0-4)	$0.73 \pm 0.16$
6	NON-SOCIAL FEAR	Intensity scale (0-4)	$0.96 \pm 0.32$
7	DOG-DIRECTED FEAR	Intensity scale (0-4)	$0.63 \pm 0.27$
8	TOUCH SENSITIVITY	Intensity scale (0-4)	$0.52 \pm 0.44$
9	DOG-DIRECTED AGGRESSION	Intensity scale (0-4)	$1.65 \pm 0.56$
10	SEPARATION-RELATED BEHAVIORS	Frequency scale (0-5)	$1.57 \pm 0.26$
11	EXCITABILITY	Intensity scale (0-4)	$2.15 \pm 0.33$
12	ATTACHMENT/ATTENTION-SEEKING	Frequency scale (0-5)	$3.50 \pm 0.63$

## Discussions

Analysis of the initial data provides a preliminary definition of the fundamental behavioral characteristics of the Apuan Alps Dog. As expected for a herding breed, subjects demonstrated high trainability (Turcsán et al., 2011), with a mean score of 3.9 out of 5. This trait was accompanied by elevated excitability (mean score: 2.15 on a 0–4 scale) and a strong tendency to seek attention (mean score: 3.5 on a 0–4 scale). Attention seeking is probably to be understood as a search/proposal for activity, since animals of this breed are endowed with a notable exuberance of character and a great desire to get to work on some tasks proposed by the owner (Lenkei et al., 2021).

The elevated arousal observed in this breed reflects an adaptive trait aligned with its historical selection for livestock herding (Jeong et al., 2024), where sustained alertness and responsiveness confer clear advantages. Rather than indicating pathological hyperactivity, this behavioral profile is more accurately characterized as pronounced exuberance. Nonetheless, such traits can pose challenges for inexperienced or sedentary owners, given the dog's continuous need for stimulation. Effective management, therefore, should extend beyond physical exercise to include cognitive enrichment, such as scent work or problem-solving activities (Zilocchi, 2008; Duranton & Horowitz, 2019), which offer valuable outlets for channeling psychophysical energy and supporting overall well-being. This is an aspect that should not be underestimated, as it can have serious repercussions on the owner–dog relationship, potentially resulting in the dog's relinquishment to a shelter. Fortunately, such an outcome does not necessarily represent a life sentence. Numerous studies have investigated canine behavior (Gazzano et al., 2025) and explored strategies for its modification, employing not only behavioral therapies but also the use of psychotropic nutraceuticals (Giuliano et al., 2024).

Regarding social relationships with conspecifics, the results obtained suggest an absence of significant issues in this behavioral domain. Scores related to rivalry, direct aggression toward other dogs, and fear of responses toward conspecifics were notably low. Nonetheless, this should not diminish the importance of implementing an appropriate intraspecific socialization protocol, particularly during the critical early developmental period, the first four months of life (Battaglia, 2009).

A similar observation can be made regarding social relationships with people. Scores for fear and aggression toward strangers, as well as for touch sensitivity, are notably low. Although this breed is not generally considered suspicious of unfamiliar individuals, implementing an appropriate interspecific socialization program remains essential, particularly given the protective instincts characteristic of these dogs (Serpell & Jagoe, 2016).

A final consideration concerns separation-related behavior (Flannigan & Dodman, 2001). The low scores observed indicate that dogs of this breed typically maintain well-balanced behavior in their owners' absence. Nevertheless, this aspect should not be underestimated, as signs of separation distress are often minimized or misinterpreted by owners as mere stubbornness or attention-seeking, when in fact they may develop into clinically significant separation anxiety (Mariti et al., 2013; Mariti et al., 2021).

## Conclusions

The data presented in this study represent the first available findings for this recently recognized breed. Despite the limitations associated with the small sample size, the results provide a preliminary outline of a behavioral profile characterized by an active and cooperative temperament, with minimal tendencies toward intra- or interspecific aggression and few separation-related issues. However, the breed's high excitability should be carefully considered, as inadequate management of this trait may lead to challenges in the owner–dog relationship.

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## Caratteristiche comportamentali del Cane delle Alpi Apuane

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### Sintesi

Il Cane delle Alpi Apuane, antica razza autoctona delle regioni Toscana e Liguria, è stato oggetto di una valutazione comportamentale mediante la versione italiana validata del questionario C-BARQ. Sono stati analizzati 141 questionari, con gli item suddivisi in 12 sottoscale comportamentali. I risultati evidenziano un'elevata addestrabilità (media 3.9/5), una marcata tendenza all'attaccamento e alla ricerca di attenzione (3.5/5) e un'elevata eccitabilità (2.15/4), mentre i punteggi relativi ad aggressività e paura risultano complessivamente bassi. Tali caratteristiche riflettono la selezione storica della razza per attività di lavoro in contesto rurale, che ne ha favorito la reattività e la prontezza, confermandone al contempo la crescente idoneità come cane da compagnia. Tuttavia, la sua vivacità può richiedere una gestione attenta da parte di proprietari con minore esperienza.