

# Training protocol: research dogs for *Boletus* mushrooms

Alice D'Adamo<sup>1\*</sup>, Marcella Zilocchi<sup>1</sup>, Alessio Lugliè<sup>2</sup>,  
Chiara Mariti<sup>1</sup>, Angelo Gazzano<sup>1</sup>

<sup>1</sup> *Dipartimento di Scienze Veterinarie Università di Pisa*

<sup>2</sup> *Centro Cinofilo Nosework Servizi Cinofili*

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**Abstract:** The present study describes the main steps and results of a training program designed to train dogs for finding mushrooms of the *Boletus* genus. Two adult female dogs, a Labrador Retriever and a Rottweiler, were trained by Clicker Training method. For the training, intact and frozen mushrooms to ensure their preservation were used. The training process includes a basic education phase. After this, there was a phase in which the signalling targets are taught, the signals will be used by the subjects to indicate the finding of a mushroom. In the next phase the dog learns olfactory research. Simulated research on whole and fresh mushrooms are organized with progressively increasing difficulty to simulate an exit in woods with the placement of various mushrooms.

The final phase involves olfactory discrimination towards other mushrooms species and poisonous species. Our results demonstrate that dogs can be trained for mushroom detection.

**Key Words:** research dog training; mushroom; *Boletus*; olfaction.

\* *Corresponding Author:* [alicedadamo@gmail.com](mailto:alicedadamo@gmail.com)

## Introduction

Olfaction, the act or process of smelling, is a dog's primary special sense; in fact, dogs have always represented an excellent aid for humans in research activities. For these reasons, dogs can be trained to detect a wide variety of odours.

The present study describes the main steps and results of a training program designed to training dogs for finding mushrooms of *Boletus* genus which includes the species: ***Boletus edulis***, ***Boletus aereus***, ***Boletus aestivalis***, ***Boletus pinophilus***.

## Subjects, materials and methods

Two females and adult dogs, a Labrador Retriever and a Rottweiler, were trained by Clicker Training method (operant conditioning) to scent and recognize porcini mushrooms of *Boletus* genus. Both dogs were subjected to 60 minutes of training session, twice a week, for about three months.

For the training were used intact and frozen mushrooms to ensure their preservation; at the beginning they were placed inside perforated plastic tubes to facilitate the dog's smell perception, after, mushrooms were used fresh and placed in environments that simulated those of research.

The training process includes a basic education phase, that consists of common obedience exercises such as "sitting", "down", "stay" and conduct, useful for handle the dog in freedom during the research activity. After this, there was a phase in which the signalling targets are taught, that will be used by the subjects to indicate the finding mushroom. In this case the signal "down" for a subject and "barks" for the other one.

In the next phase the dog learns olfactory research: the dog wears her discriminating element previously chosen, useful to create an association between the dressing and the beginning of the activity; the sample of smell is prepared and positioned in the perforated tube while the dog is watching us; the dog is left free to move to the tube, driven by her innate curiosity; reinforcement is given when the dog sniffs the sample. This exercise allows the dog to fix that peculiar smell in her memory, therefore it represents a fundamental phase for the success of the research.

The “find” signal is introduced each time the search exercise begins. It proceeds with olfactory discrimination that consists in adding a second empty tube, so the subject learns to look at the tube with the specific smell.

When the signal is learned, it is possible to proceed by asking the dog the signalling behavior after she identifies the correct tube, then the spontaneous execution of the signal can be expected.

Simulated research on whole and fresh mushrooms are organized with progressively increasing of the difficulty to simulate an exit in woods with the placement of various mushrooms.

The final phase involves olfactory discrimination towards other mushrooms species and poisonous species.

During the training it is always important to consider the environmental variables such as the distortions caused by the air currents, the type of ground and the weather conditions that can affect, positively or negatively, the perception of the smell by the operating subject.

## Results

The subjects’ training allowed us to observe their attitudes and limits, in relation to the different characteristics of breed and character, with consequent differences in the speed of learning and expectations on the level of preparation desired and obtained during the working period.

Both subjects completed the learning of the signaling targets and the simulated mushroom research. They showed a good predisposition and a constant enthusiasm and perseverance to ending the exercise of research, without ever highlighting forms of stress (Mariti et al., 2012).

A problem encountered in the training of the Labrador Retriever was her tendency to collect and report the mushrooms when it was removed from the tube used in the previous sections, however the Labrador Retriever obtained more effective research skills than the Rottweiler.

## Discussion

Our results demonstrate that dogs can be trained for mushroom detection.

The observation of the different results achieved by the two subjects in terms of olfactory research capacity, led us to carry out an analysis of how breed differences could have affected the different effect of training. In fact, several scientific studies affirm that the selection of brachycephalic dogs caused a decrease of olfactory capacity probably due to the negative impact of the skull’s size on the movement of air through small nasal passages (Polgár et al., 2016; Johnen et al., 2017), and that a larger size of the olfactory epithelium and therefore a greater number of neurons, which characterizes the mesocephalic profile of the Labrador Retriever, contribute to a better perception of smell compared to brachycephalic profile of Rottweiler (Quignon et al., 2012).

## Conclusions

This study shows that the two subjects have responded positively to the proposed work sessions, therefore it shows that dogs can be trained to detect the mushrooms smell.

## References

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### Protocollo di addestramento per cani da ricerca di funghi del genere *Boletus*

Alice D'Adamo<sup>1\*</sup>, Marcella Zilocchi<sup>1</sup>, Alessio Lugliè<sup>2</sup>, Chiara Mariti<sup>1</sup>, Angelo Gazzano<sup>1</sup>

<sup>1</sup> *Dipartimento di Scienze Veterinarie Università di Pisa*

<sup>2</sup> *Centro Cinofilo Nosework Servizi Cinofili*

#### *Sintesi*

Il presente studio descrive le fasi principali ed i risultati di un programma di addestramento per cani per la ricerca di funghi del genere *Boletus*.

Due femmine adulte di Labrador Retriever e di Rottweiler sono state addestrate col metodo del Clicker. Per l'addestramento sono stati usati funghi freschi e surgelati per assicurare la conservabilità.

L'addestramento comprende una fase di educazione di base a cui segue una fase in cui sono appresi i segnali che il cane emetterà per segnalare il ritrovamento del fungo. Nella fase seguente il cane apprende le modalità della ricerca olfattiva. Ricerche simulate con funghi freschi interi, di specie diverse, sono organizzate con difficoltà progressivamente crescente per creare una situazione simile a quella di una ricerca in un bosco

La fase finale consiste nella discriminazione olfattiva di funghi di altre specie e velenosi.

I nostri risultati dimostrano che i cani possono essere addestrati per il rilevamento di funghi.

