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THROUGH A DOG'S NOSE : CAN SNIFFER DOGS BECOME A NEW TOOL FOR GLOW-WORM SURVEYING ?

Mira Van den Broeck¹, Hilde Vervaecke², Ellen Van Krunkelsven³, Raphaël De Cock¹ & Erik Matthysen¹

Introduction



Ecological detection dogs have proved to be efficient in surveying a variety of inconspicuous species for conservation purposes. Can sniffer dogs be used to detect the European common glow-worms (*Lampyris noctiluca*) larvae to facilitate population surveying and larvae collection? We have tested the detection accuracy in an indoor setting, as well as the detection success in the field.

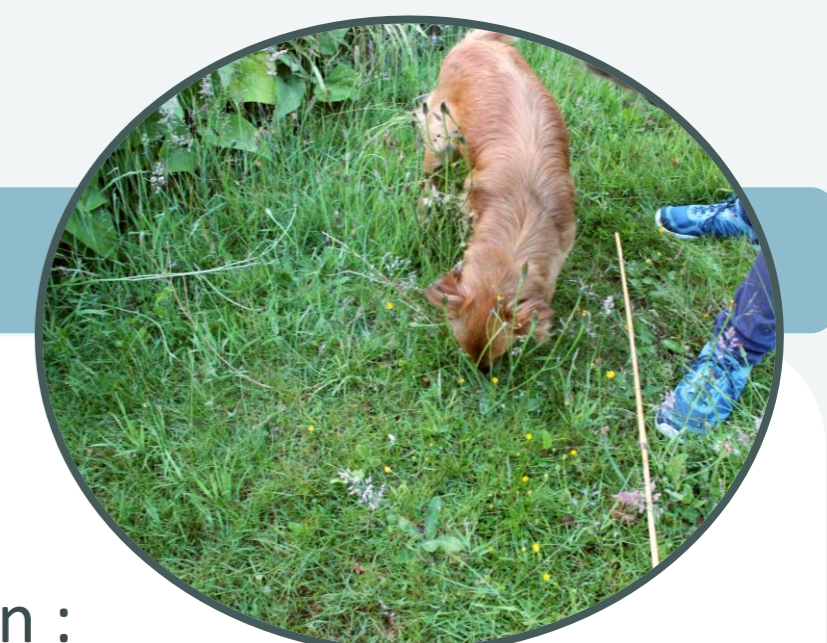
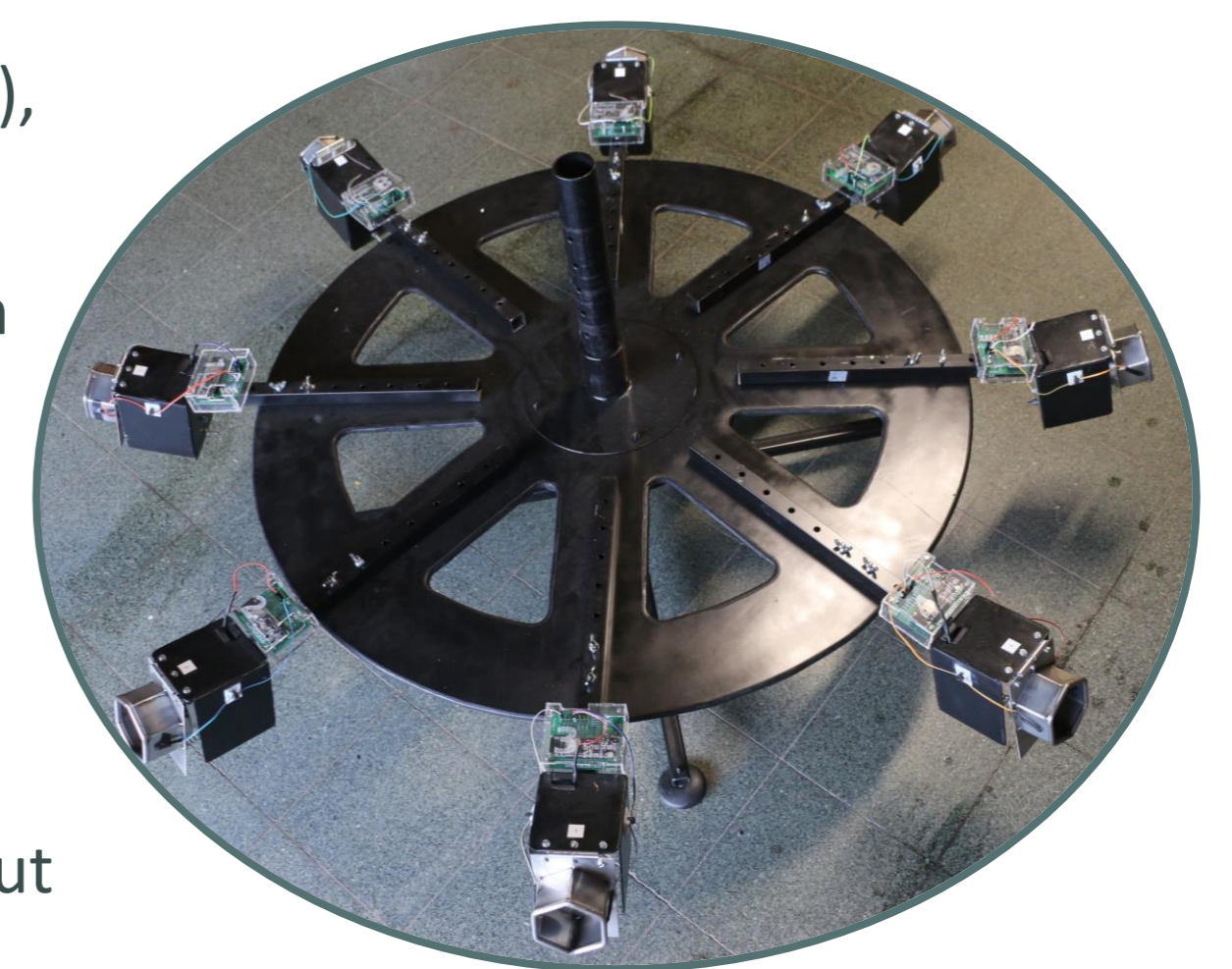
Materials and methods

Training of one dog to discriminate larvae from other odours: between November 2021 – April 2022.

Indoor tests : A larva was placed in a jar, that was put in a carousel, along with 7 other jars with other odours. During each session (n=6), about 6 trials were performed (n_{tot}= 37 trials), using a different larva for each trial. The position of the larva was blinded to the handler. The dog searched freely and was only rewarded for correct positive indications, after which the trial was ended. Errors were scored but not rewarded.

Field tests:

-  **By day** : A larva was placed within a 1m x 1m square in grass. Detection time was scored for the handler (visual search) and the dog, with max. 3 minutes per square.
-  **By night** : When a larval glow was seen, the dog was asked to search the area of about 1m² around it.





Results

Indoor tests

Table 1. CP = correct positive, CN = correct negative, FP= false positive, FN = false negative

Sessions	trials	CP	CN	FP	FN
6	37	37	145	3	6

 **Accuracy** (overall proportion of correct indications)
⇒ (CP + CN)/total sniffed pots = **95%**

 The **probability** that all the 37 CP were due to **chance** is

$$\frac{n!}{x!(n-x)!} \pi^x (1 - \pi)^{n-x} = 1.93 \times 10^{-18}$$

Field tests

 **By day** :

Larva found in :

- **12/12** trials by the dog (after 55.33 seconds on average)
- **3/12** trials by the handler

 **By night** :

Larva found in :

- **3/12** trials in forest litter
- **1/1** trials in grass substrate

Conclusions

The sniffer dog can **accurately detect** and **discriminate** glow-worm larvae in **indoor settings** and in **grassy substrates** in the field. In forest litter, larva detection was not highly successful. Generally, the larvae seemed to emit very little scent as detection was only possible when the dog's nose was in close proximity with a larva in outdoor settings. Further training on forest substrate and testing in the field is needed; however, our results suggest that glow-worm larva surveying could be possible using sniffer dogs.

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