

Proposal of a new monitoring method for *Mallota fuciformis* (Diptera: Syrphidae), a saproxylic pollinator

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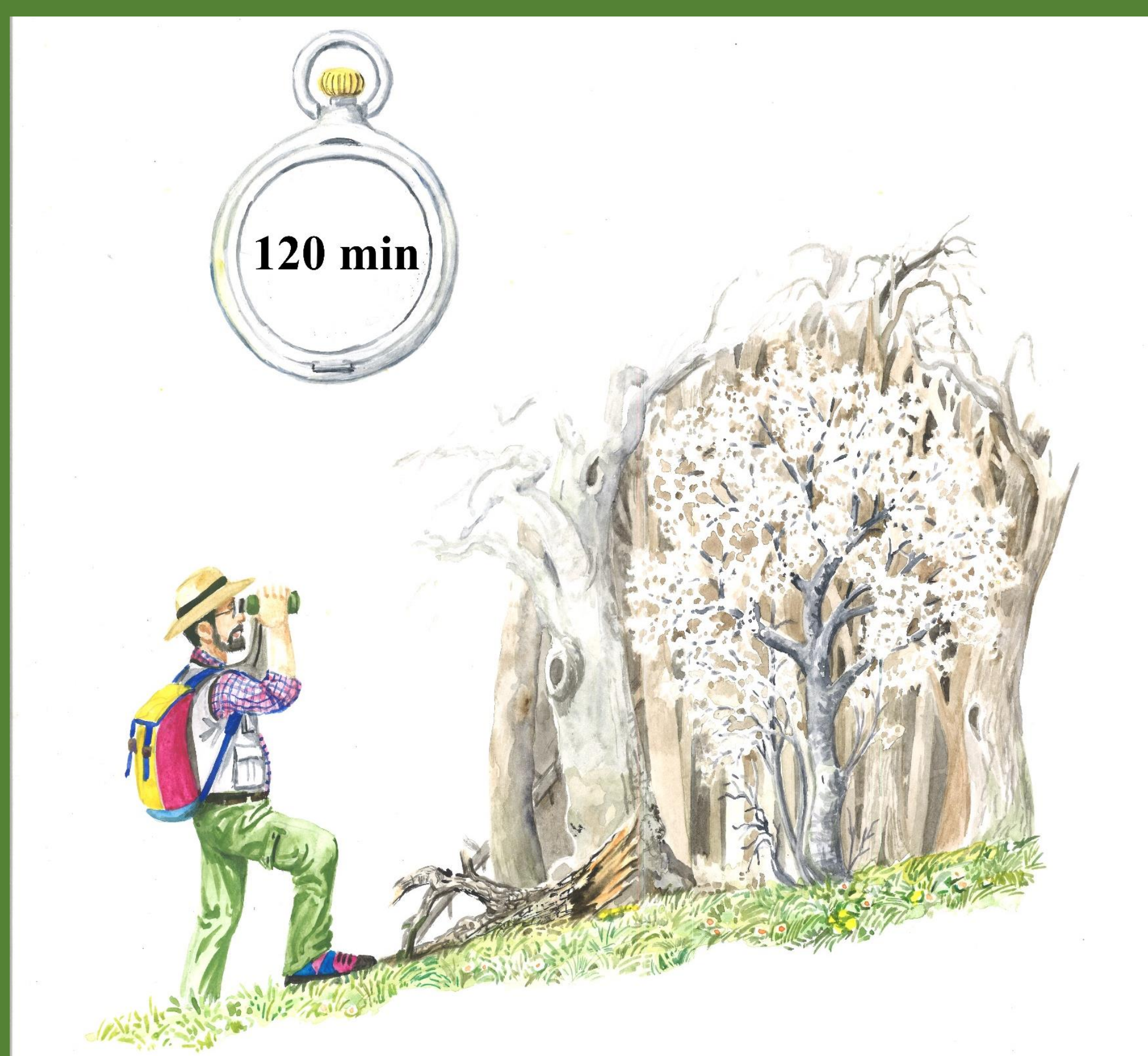
Introduction

Hoverflies play a key role in pollinating and other forest ecosystem services (Doyle et al. 2020). *Mallota fuciformis* Fabricius, 1794, is a saproxylic species listed as threatened in many European countries and internationally recognised as a species of conservation interest (Speight 1989). To detect *M. fuciformis* in oak-hornbeam stands and alluvial forests with oaks along lowland streams, we provide a targeted, fast and effective standardised field protocol. This method follows the proposed EU pollinator monitoring scheme for the development of specific methods to complement the minimum viable scheme (Potts et al. 2021).

Method

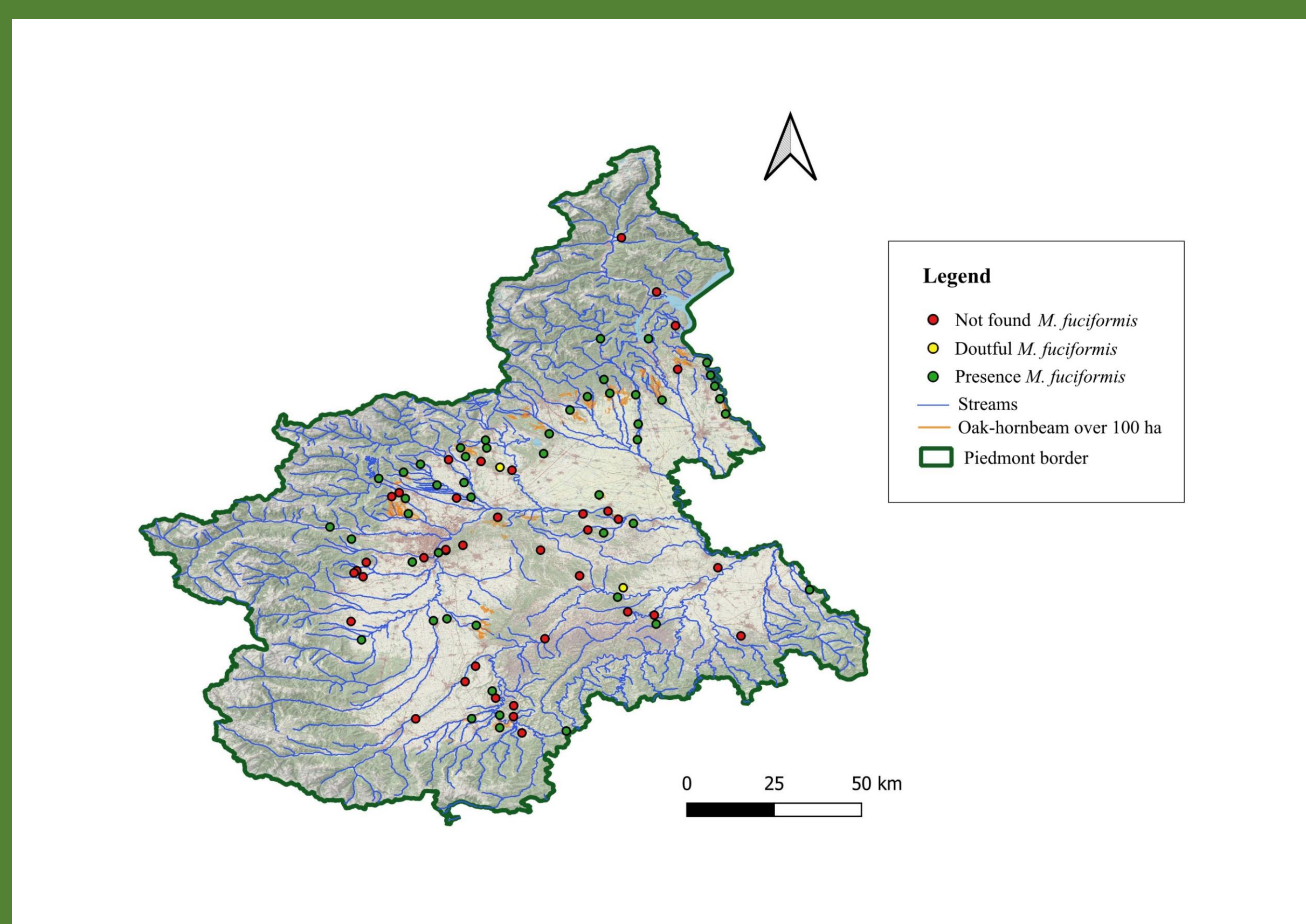
Observation plots with binoculars in front of flowering *Prunus* plants, in the second half of March, near target wooded stands.

88 points investigated in Piedmont region (Northwestern Italy).



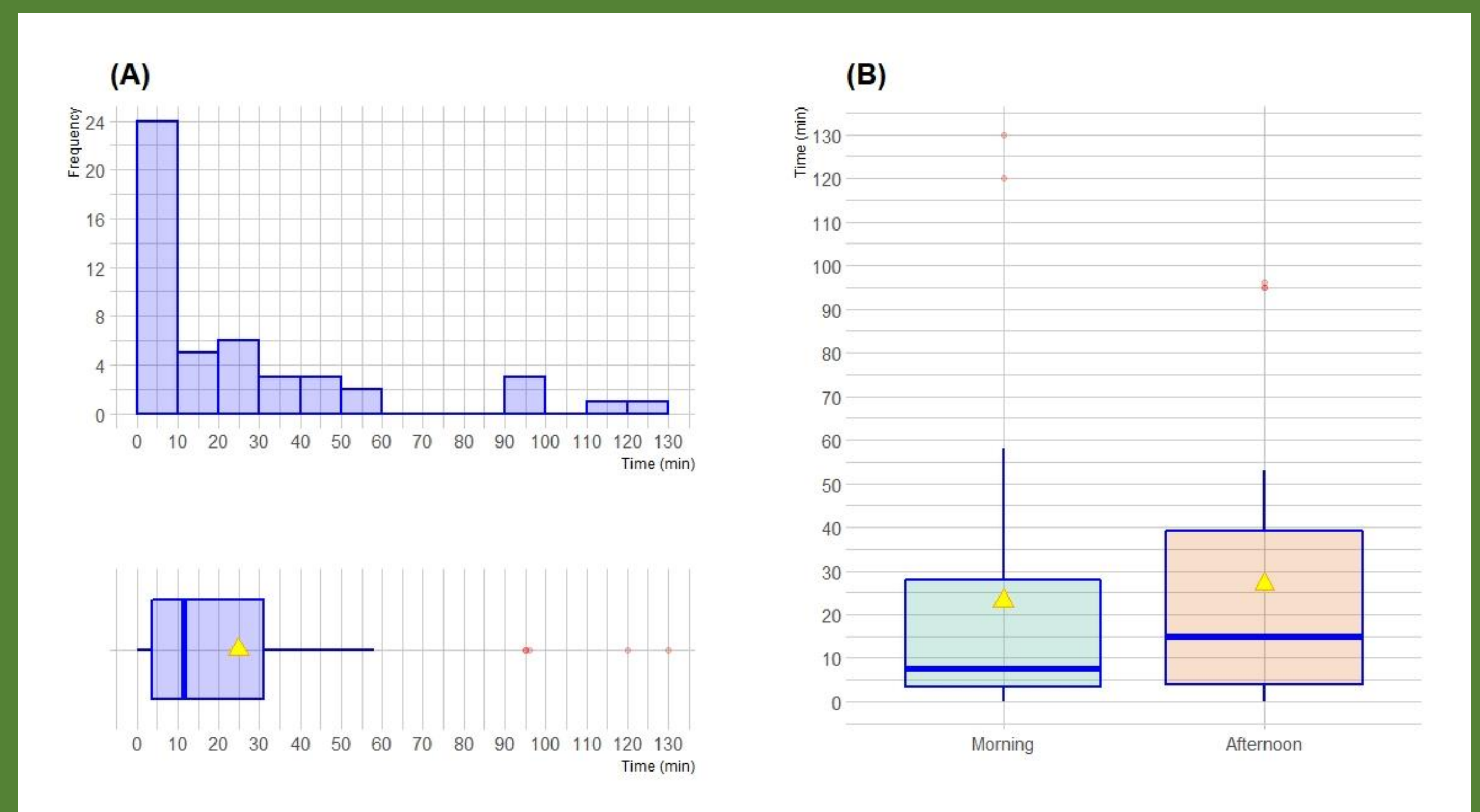
Results

48 sites were positive in term of presence of *M. fuciformis*, prior to this study, the species was only known to occur at 4 sites.

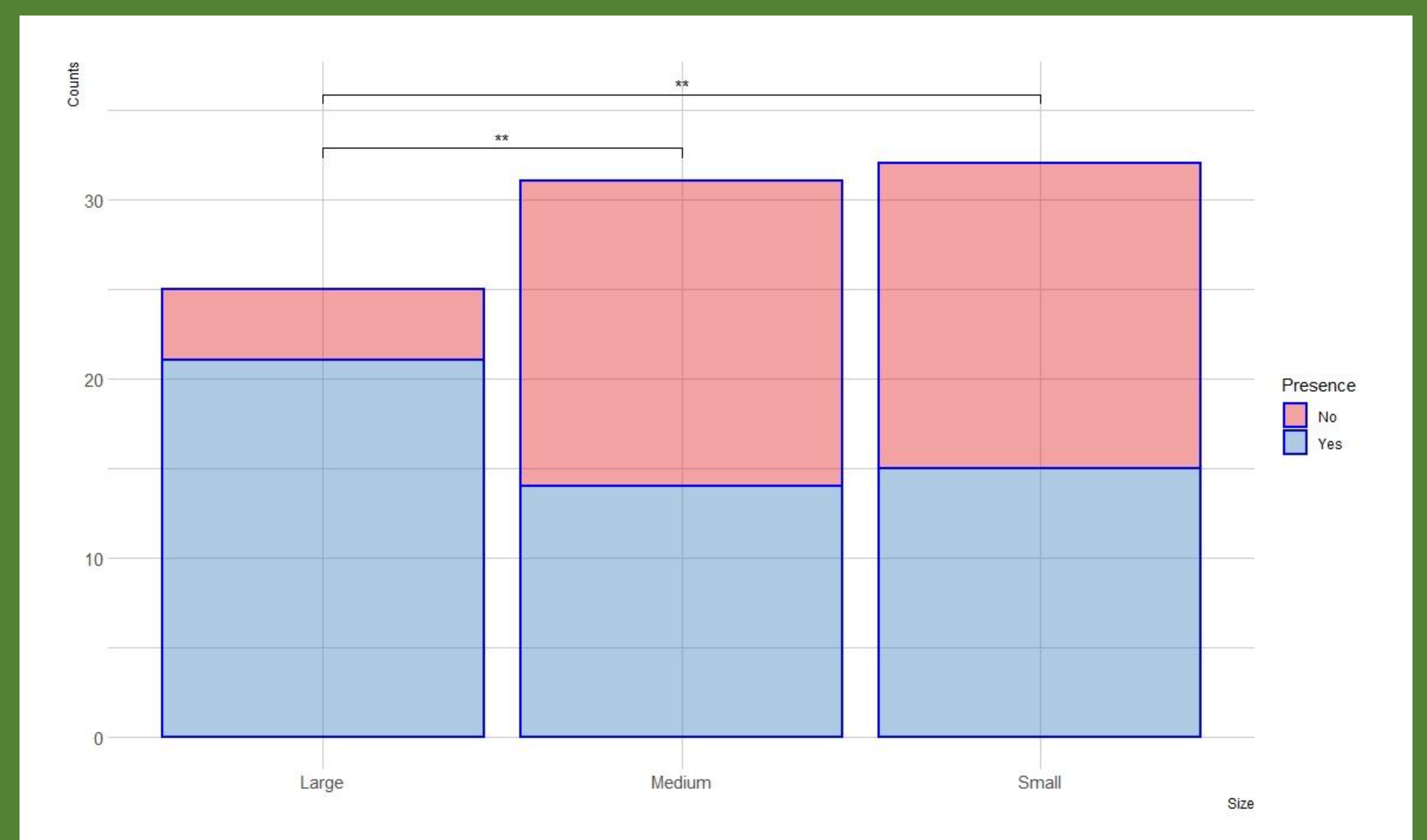


The strengths of this protocol are:

- it can easily be applied by non-expert operators following a very short training session, even in a **citizen-science** perspective;
- it **does not involve the killing** of any specimens to collect data;
- it is **very efficient**, as it allows the target species to be observed in a short period of time.



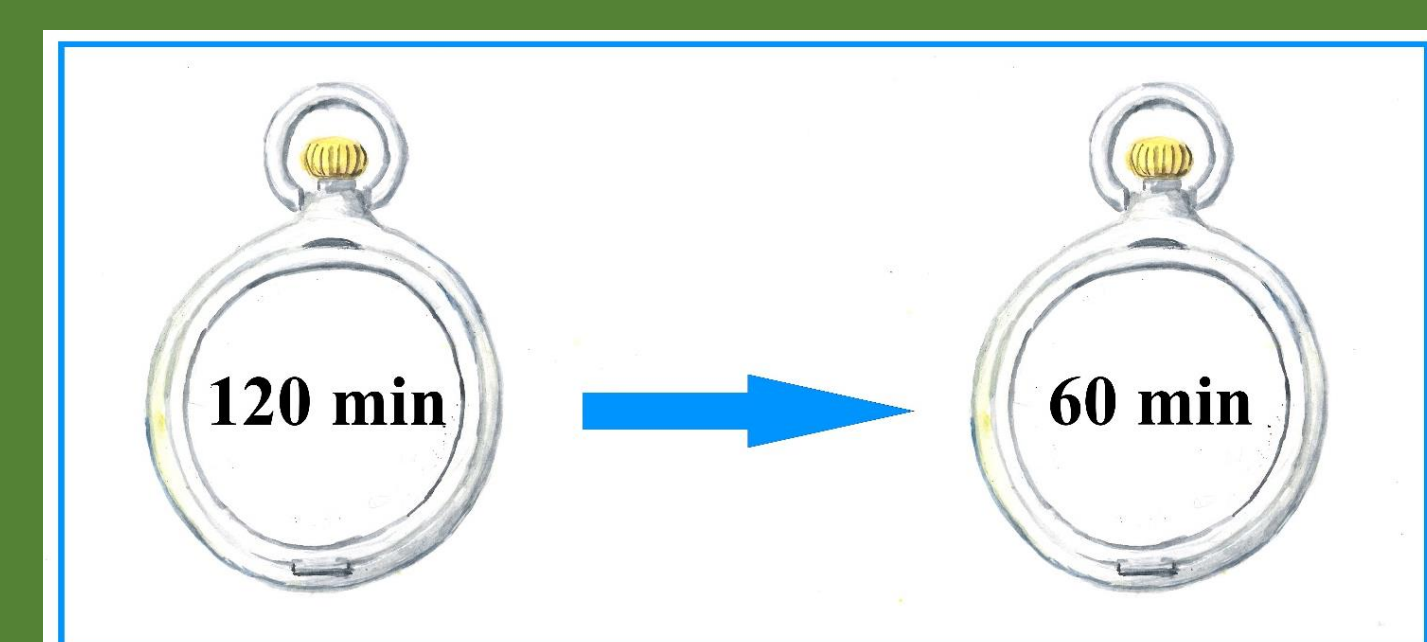
Histogram and boxplots show the distribution of the total collected data. In the boxplots the mean is indicated by the yellow triangle, and the median by the blue thick line.



The brackets link the groups compared using Pearson's chi-square test. Large stands >100 ha, small wooded area <25 ha.

Discussion

The presence of flowering *Prunus* is a necessary element without which surveys cannot be carried out. The selection of *Prunus* must be made carefully because it can affect the results. It must be as close as possible to the forest under investigation and as far away as possible from other blooming *Prunus* in order to avoid the 'dilution effect'. **For the target species, in accordance with the detection time obtained in results, we propose an observation time of 60 minutes.** Observations should be carried out by direct sight and with the aid of binoculars in order to assure a fast field identification. A further extensive use of this methodology could concern the assessment of the ecological connectivity of lowland forest networks.



Take home message

Observational points can be an integrative approach in long-term pollinator monitoring

Future perspective:

Mallota fuciformis could be a good bioindicator for assess forests network connectivity