

ENVIRONMENTAL DETERMINANTS OF *CALLIPHORIDAE* AND *SARCOPHAGIDAE* ACTIVITY AND OVIPOSITION ON BAITS

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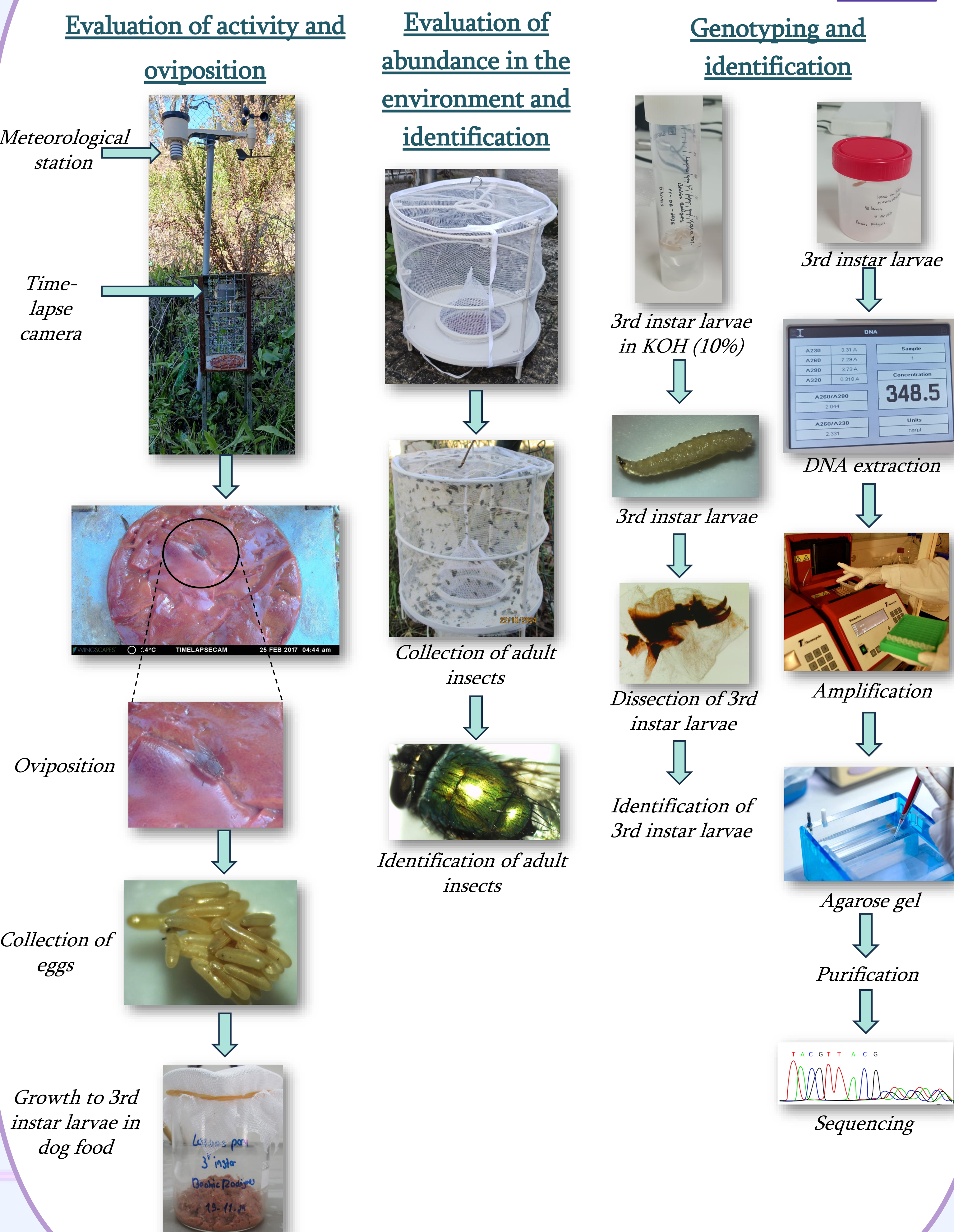
Introduction

Forensic medico-legal entomology employs entomological methods to estimate the postmortem interval (PMI). A key technique involves determining the minimum PMI by assessing the developmental stage of insects found on a corpse. However, this method does not account for the time between death and the first oviposition, known as the pre-oviposition PMI. Estimating the pre-oviposition PMI can be complex, as it requires consideration of environmental conditions at the site, such as temperature and relative humidity as well as the seasonal presence of scavenger insects. While there are methods for estimating minimum PMI, there is a significant lack of knowledge regarding the estimation of pre-oviposition PMI.

Aims

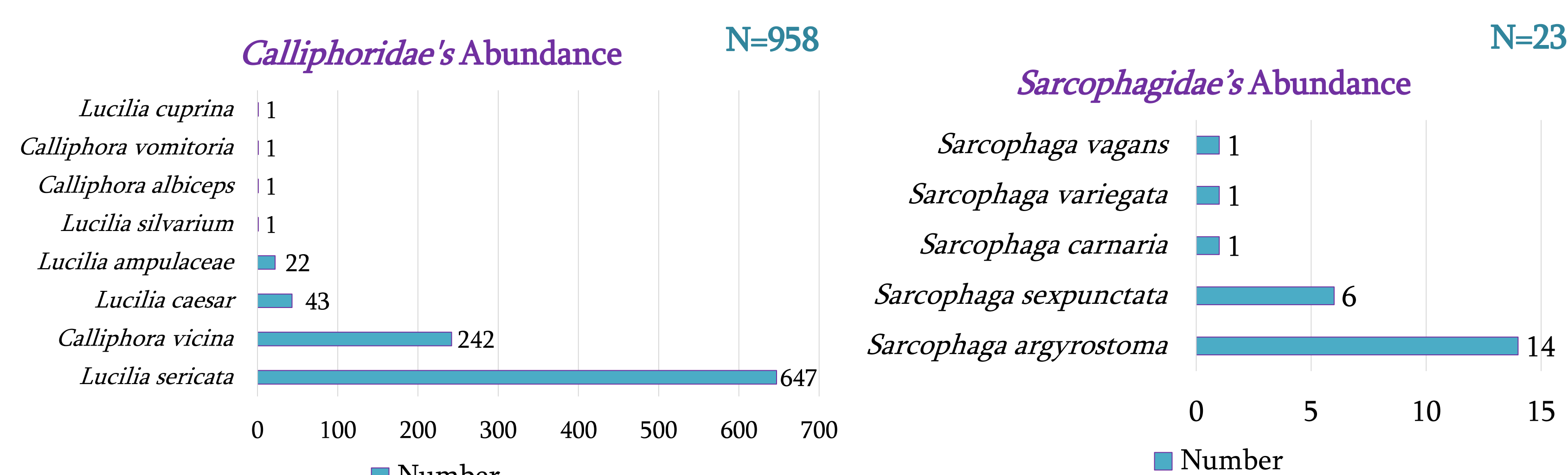
To address this gap, the present study investigates the effect of meteorological conditions and the abundance of two well-documented scavenger insect families, *Calliphoridae* and *Sarcophagidae*, on their activity and time to oviposition.

Methodology



Results & Discussion

Evaluation of environmental conditions on abundance

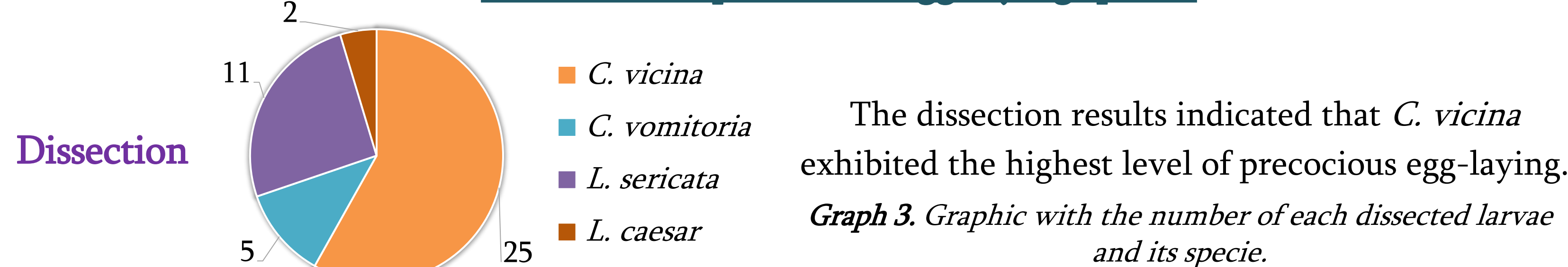


Graph 1. Graphic with the *Calliphoridae*'s family environment abundance during all trials.

Graph 2. Graphic with the *Sarcophagidae*'s family environment abundance during all trials.

In the family *Calliphoridae*, the most prevalent species was *L. sericata*, followed by *C. vicina* and *L. caesar*. Meanwhile, within the family *Sarcophagidae*, the most prevalent species was identified as *S. argyrostoma*, followed by *S. sexpunctata*, with the remaining species exhibiting balanced abundance.

Evaluation of precocious egg-laying species



Graph 3. Graphic with the number of each dissected larvae and its specie.

Evaluation of time to pre-oviposition by Kaplan-Meier models

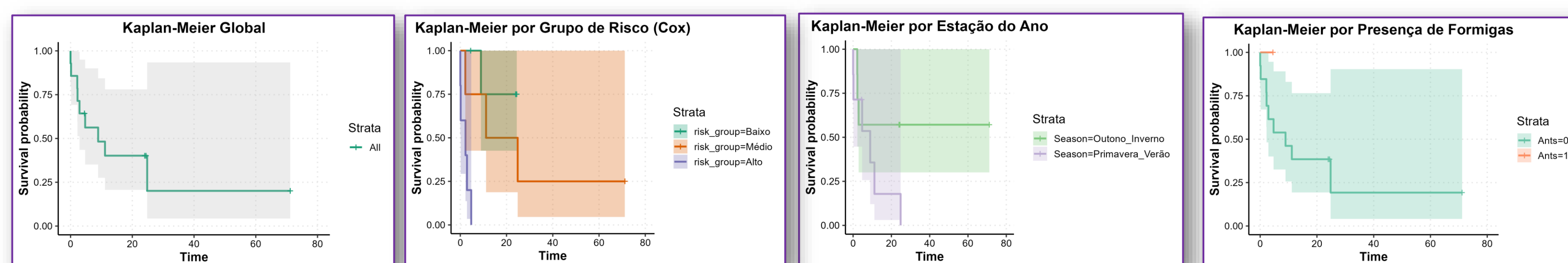


Fig 1. Image of the Global Kaplan-Meier survival curve for time to oviposition.

Fig 2. Image of the Kaplan-Meier by risk group (Cox model).

Fig 3. Image of the Kaplan-Meier curve by season.

Fig 4. Image of the Kaplan-Meier curve by presence of ants.

In circumstances characterised by environmental conditions that deviate from the norm, the Kaplan model displays a mean time of 10.4 hours for the pre-oviposition. Conversely, the Cox model exhibits a mean time of 8.9 hours for the same period when standardised environmental conditions are applied. In the presence of biotic factors, such as the presence of ants, there is an observed increase in the duration to oviposition. A subsequent decrease in oviposition duration, could be attributed to rising temperatures and humidity levels.

Final Remarks

The implementation of the aforementioned methodologies resulted in the attainment of the objective under scrutiny. Consequently, it was possible to determine that, in the given environmental circumstances, the species that are predominantly present are *C. vicina* and *L. sericata* of the *Calliphoridae* family, and *S. argyrostoma* and *S. sexpunctata* of the *Sarcophagidae* family. In an additional finding, it was demonstrated that the species that deposits its eggs the earliest is *C. vicina*. The approach adopted in this study incorporated a Kaplan-Meier model to estimate the pre-oviposition period, exhibiting a mean time of 10.4 hours for deviated environmental conditions and 8.9 hours for standardized conditions. This approach has the capacity to increase the precision of post-mortem interval estimations in forensic entomology.

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