Effect of insect order, cognitive load, and observer age on quality of pollinator monitoring data

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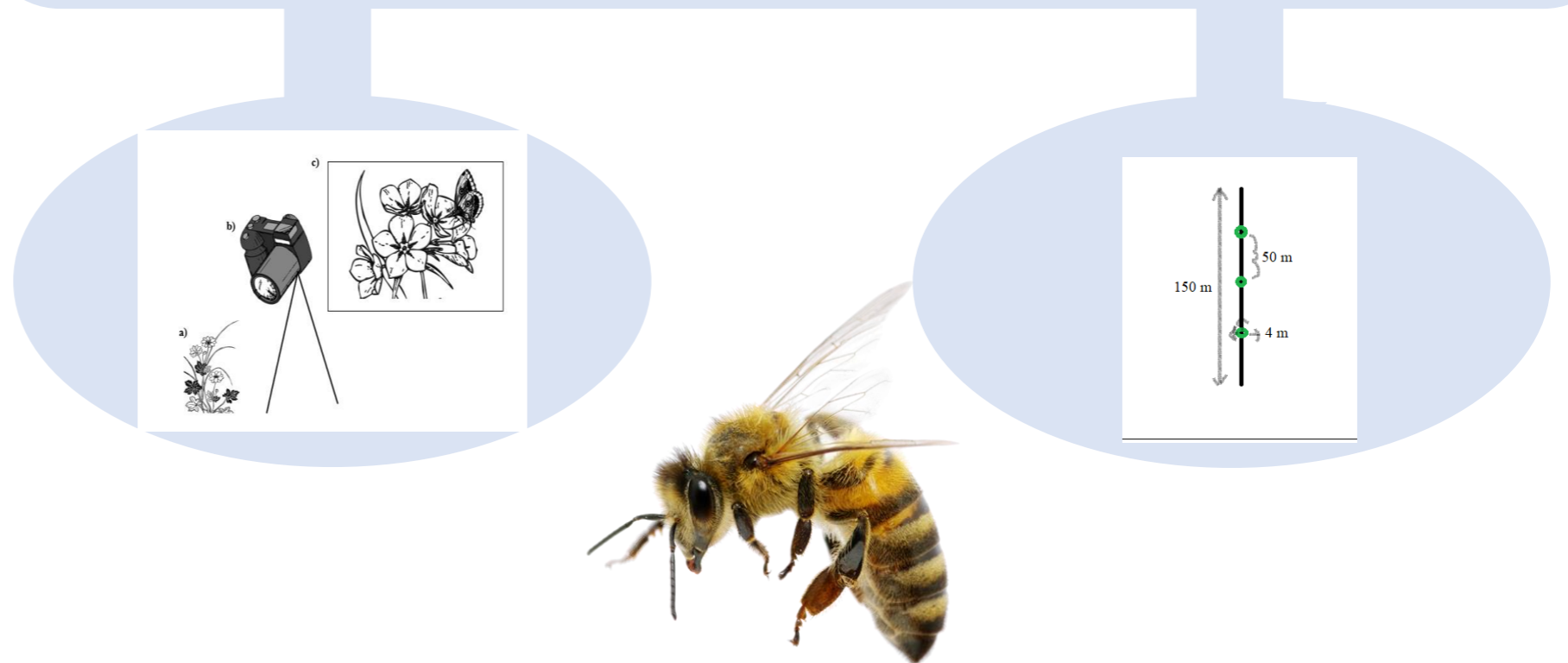
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Background

Citizen science has started to be more integrated in pollinator monitoring. Citizens can be trained relatively quickly to collect samples of species to higher taxon as well as getting similar results to scientists. However, citizen science is often met with doubts from stakeholders. There is a disagreement between researchers. Some believe that citizens can collected data comparable with researchers meanwhile other believe it is impossible.

AIM: In this thesis I assess the quality of citizen generated data in pollinator monitoring.

METHODS

I recorded a video of 50x50 cm patches of four different flower species and cut them into three videos. 50 volunteers preformed a digital F.I.T-count, that is observing 3 videos, each 10 minutes, of flowers being visited by pollinators

The transect walk in this thesis was conducted during lunch-time 2021-07-02 when the weather was sunny and wind still. Ten volunteers performed three 150 meters transect walk with a pace of 50 m/min and looked for insects within a 4 meters hemispehere
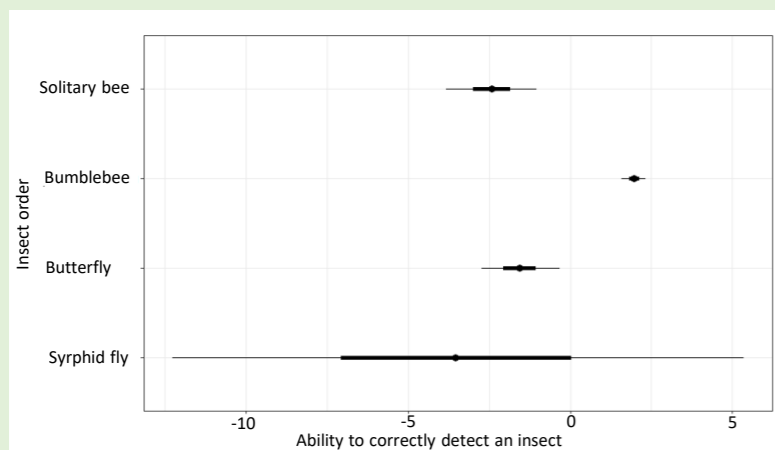
Results

Figure 1. Posterior distribution (the mean and 25/75% and 5/95% quantiles) of students (n=15) ability to identify an order dependent on its proportion in a string. A positive value indicates that it becomes easier to identify the order as its proportion in the segment increases.

Figure 2. Posterior distribution (the mean and 25/75% and 5/95% quantiles) of children's (n=35) ability to identify an insect order dependent on its proportion in a string. A positive value indicates that it becomes easier to identify the order as its proportion in the segment increases.
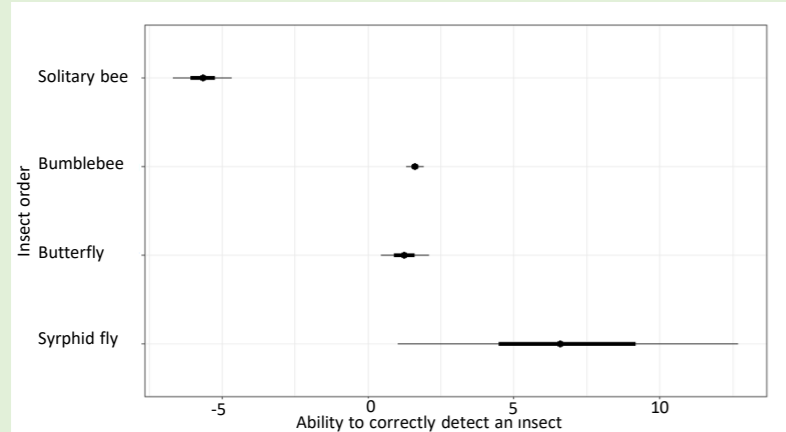
- Bumblebees have a positive estimate (1.96) which indicates is easy for students (n=15) to identify a bumblebee (Figure 1).

- Bumblebees (1.62), syrphid flies (6.79), and butterflies (1.26) have positive estimates which indicates it is easy for children (N=35) to identify bumblebees, syrphid flies, and butterflies (Figure 2).

- Syrphid flies have a positive estimate (1.11) which indicates it is easy for adults (n=10) to identify syrphid flies (Figure 3).

Figure 3. Posterior distribution (the mean and 25/75% and 5/95% quantiles) of children's (n=35) ability to identify an insect order dependent on its proportion in a string. A positive value indicates that it becomes easier to identify the order as its proportion in the segment increases.
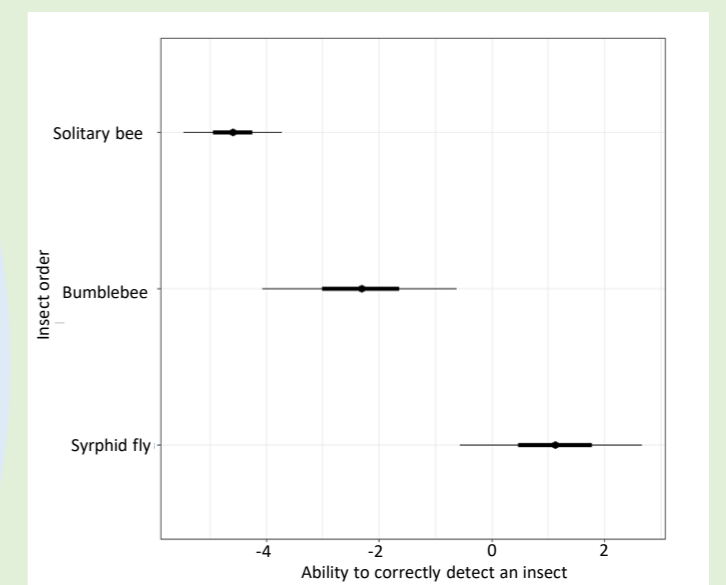
Conclusion

- The quality of citizen generated data in pollinator monitoring varies depending on age, cognitive load, and insect order.

- The citizens who participated in this thesis could monitor syrphid flies, bumblebees, and butterflies digitally since all of them have positive estimates (Figure 1, 2, 3).

- However, my results do also show that citizens can not be used for monitoring solitary bees.

WHAT NEXT?

There is much more to be done in order to increase citizen generated data quality in pollinator monitoring and possible and further avenues of studies might be:

- Further research on which methods is most suitable for citizens when it comes to generate high data quality.

- Deeper research over if digital monitoring (video recordings) is a possibility for monitoring syrphid flies, butterflies, bumblebees, and solitary bees.