Honey Bee Behaviour During a Solar Eclipse

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HOBOS
HONEYBEE ONLINE STUDIES

Did you watch the solar eclipse on 20 March? If so, did you wonder if it could affect your bees? Jurgen Tautz did and he has found out.

The bee research station in Würzburg has allowed HOBOS to gather data from a bee colony during a solar eclipse for the first time ever. Decisive factors that affect the general flying behaviour of a bee colony include the brightness and the air temperature outside of the bee hive. Uniquely occurring spectacles of nature offer a wonderful opportunity to better comprehend existing assumptions on the factors that influence honey bee behaviour when honey bees depart on flights. One such spectacle was the solar eclipse on 20 March 2015, when approximately 80% of the sun in Germany was covered by the moon. Luckily, the sky above the research station in Würzburg was cloudless for the entire day. So these were ideal conditions for observing the flight data of the HOBOS bee colony throughout the day (shown in figure 1) and for collecting data and video recordings during a solar eclipse, thought to be the first of their kind.

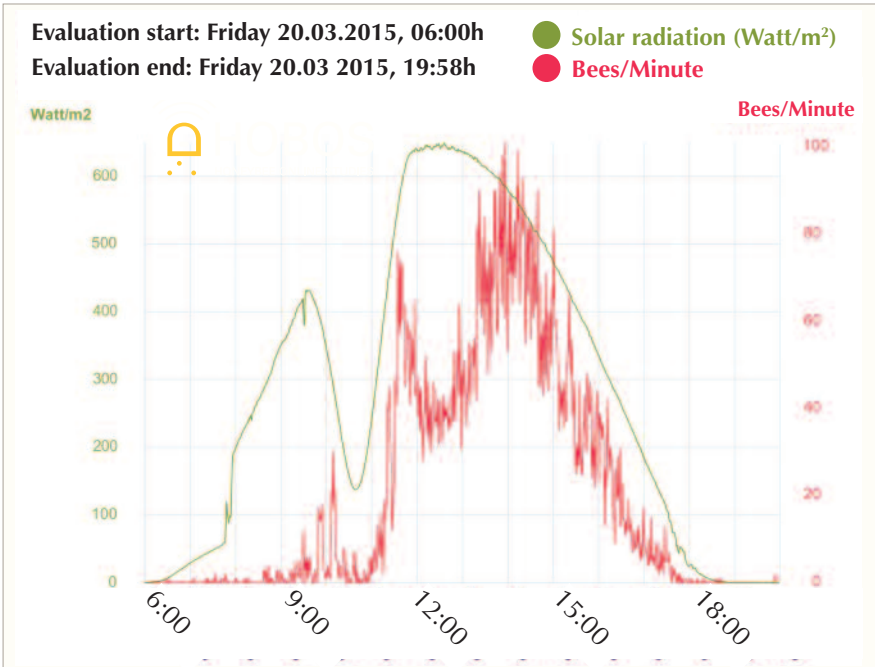

Figure 1: HOBOS data. Behaviour of bees during a solar eclipse. The flight activities begin to increase noticeably on the morning of 20 March around 9:30 am. As the solar eclipse began and it became darker as a result, the bees' activities also decreased and remained extremely reduced throughout the solar eclipse. The reduction in flight activity commenced as soon as the brightness was lower than 400 watts/m². Only as the re-emerging sun reached a brightness of 400 watts/m² did the bees' flight activities begin to increase once more. The bees also reduced their flying ventures in the evening when the brightness level falls below the 400 watts/m² mark.

How can the observations shown in figure 1 be verified? One possibility is to wait for the next solar eclipses in 2026 and 2039. Another option is to analyze the day before the solar eclipse, in this case 19 March 2015.

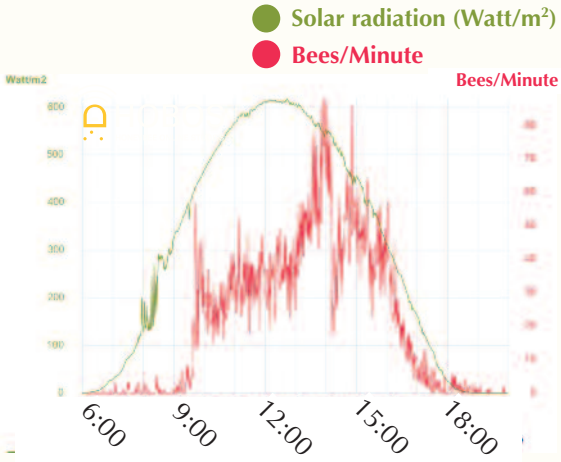

Figure 2: HOBOS data. New concepts for bee research. Further research is required to investigate any possible correlations with the outside temperature. There is also the question of whether the start of the flights in the morning and their end in the evening are caused by different triggers.

Figure 2 shows that on the day before the solar eclipse a brightness level of approximately 400 watts/m² triggered the flight activity in the morning and caused it to drop in the evening. The brightness threshold of the flight trigger could also depend on the season. Other causes for fluctuations in flight activities that are discernably not brought about by changes in brightness could be due to other exogenous factors (which can be tested by taking into account other HOBOS parameters) or even due to internal control mechanisms within the bee colony, such as demand for more nectar, etc. Careful observation will allow us to better understand some of these fascinating influences on bee behaviour.

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