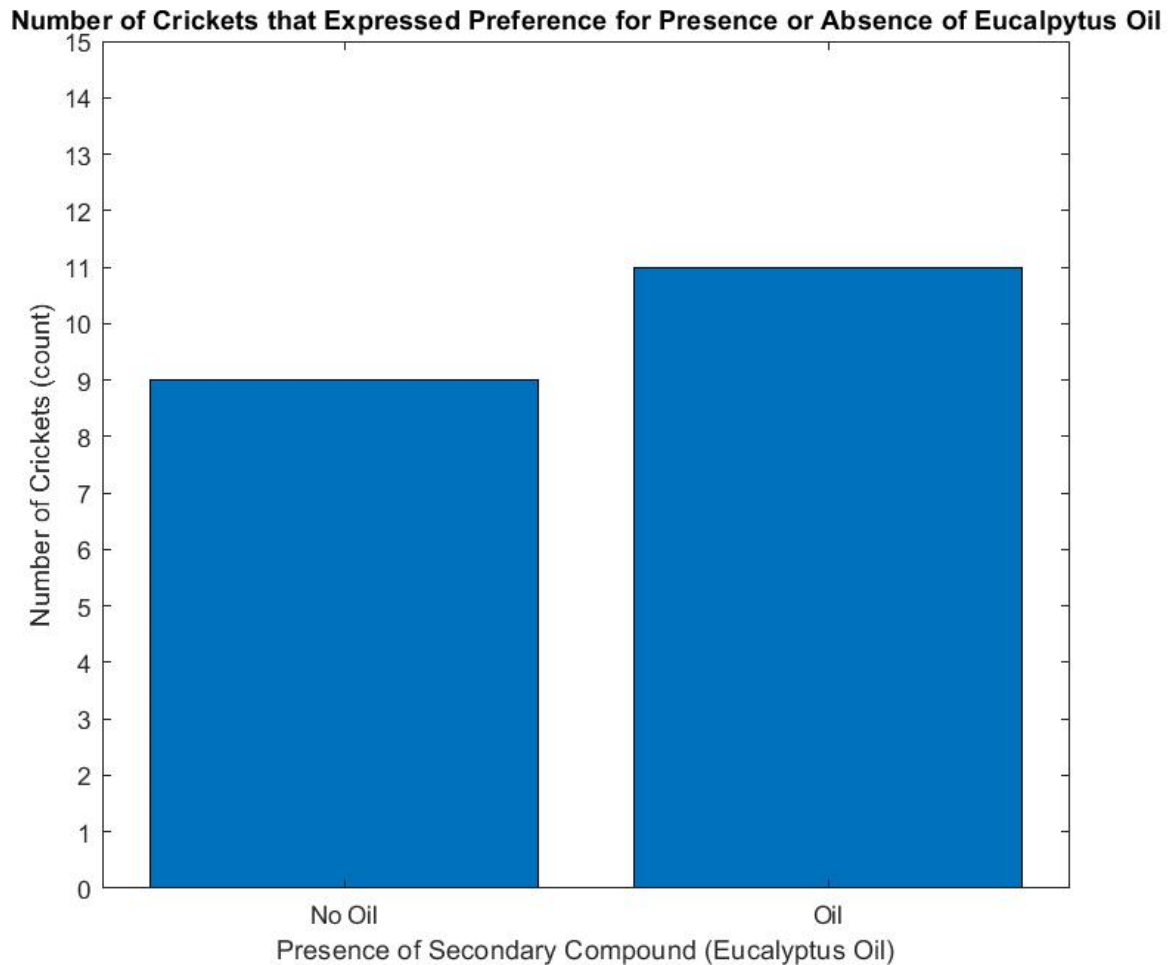


Figure 1



The objective of this experiment was to investigate if crickets would express preference for or avoidance of Eucalyptus oil.

The hypothesis was that the crickets would avoid eucalyptus oil. For each trial, the independent trial was the placement of the eucalyptus oil, and the dependent variable was the cricket's response. Control variables included the number of crickets per trial (1 cricket), the air in the chamber (aired out before every trial), our own presence (leaned away from the cricket, and not staring at it), the acclimation time (30 seconds), the observation time (2 minutes), and all of the equipment. Uncontrolled variables which may have had an effect included the sex of the cricket, the temperature of the observation chamber (it was whatever the room temperature was, and may have changed over time), and perhaps most significantly, the movements of other people in the room.

The control treatment was the no oil treatment, and the experimental treatment was the oil treatment, both of which are defined in the methods section.

The sample size was 20 crickets.

The materials used in this experiment were 20 crickets, a large holding container, a small holding container, the testing chamber (which consisted of a plastic stage, two cylindrical plastic chambers, and two plastic gates separating the stage from the other chambers), an excess of circular pieces of parchment paper, an excess of small paper towel squares, a dropper full of eucalyptus oil, tape, and a timer.

The method was as follows.

First, we set up the observation chamber. One cylinder was labeled “A”, and the other “B”. Tape was placed on the floor of each of chambers A and B, and a piece of parchment paper was placed on top of the tape. This was to prevent the cricket from going under the parchment paper, and to make the testing chamber easier to clean. Then, one paper towel square was placed in the center of each chamber. A small drop of eucalyptus oil was placed on the paper towel square in chamber A, saturating the square with oil; this was the oil treatment. The other paper towel square was left alone; this was the no oil treatment. This setup was reset every five trials, and on each reset, we alternated the chamber labeled “A” and “B”. Note that the oil treatment was always in the chamber labeled “A”.

Now, for each trial, a cricket was placed in the stage, and was allowed to calm down from being handled for 30 seconds. Then, the gates were lifted, and the 2-minute timer was started. Observations made on the cricket were (1) the time the cricket spent in each chamber, (2) the presence or absence of escape behavior, (3) the number of crossings between the chambers, and (4) the cricket’s first choice of chamber. Notes on the crickets movement through the chamber were also taken. The data that actually determined the “choice” of the cricket was the amount of time spent in each chamber, where the chamber in which the cricket spent the most time was taken to be its choice. If the times spent in the two chambers were equal (which in principle happens with probability 0), then we would take the cricket’s choice to be the no oil treatment. After the observation period, the cricket was corralled back onto the stage, sealed in the stage, and then transferred to the small holding chamber, where it was then moved to the used cricket bin.

Contrary to the hypothesis, the majority of crickets tested showed a preference for the oil treatment. This was unexpected, because eucalyptus oil is a secondary compound, a compound produced by plants to repel insects; moreover, if a cricket ever made direct contact with the eucalyptus oil, it displayed negative taxis with respect to the oil. Fortunately, the notes on the cricket behavior offer an explanation as to why this was the result. Despite the 30 second acclimation period, every cricket tested displayed escape behaviors, such as trying to crawl under the parchment paper and walking along the wall. It may be the case that the majority of the crickets associated the smell of eucalyptus oil with a path to the outside, and so they spent more time searching for an exit in chamber A than in chamber B.