

Research paper on experiment on pill bug to assess its inclination towards turn-a...

[Environment](#)



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Materials and Methods

Animals

Armadillidium vulgare, common name pill bugs have been used in this experiment. These are the isopods and not the insects. They have 7 pair of legs and an exoskeleton. The bugs prefer damp places and are generally found under plant debris and logs. They have a tendency to roll into ball when disturbed.

Apparatus

Paper has been used to make alleys in which the bugs were made to walk. The alleys were of varied length, with the long alley being 23 cm long and short alley 3 cm long. The width of alleys was 1 cm each. 1 cm cubes were used to block the alleys and to induce forced alternations for the bug. The coloured paper strip was used to darken the one side of the alley. The alleys were constructed in the manner to not to let bug escape from the alley.

Procedure

The bug was softly introduced in the longer alley. The bug started walking towards the other end and in the middle; its motion was restricted by introducing the cube blocking bug's way. With the introduction of cube in middle of the alley, bug was forced to alter its way and turn right into alley. After this, a second cube was placed into the alley and this cube restricted only the forward motion of the bug with the left and right turn remaining open. This made bug to decide to go left or right. The trials were repeated 16 times.

Before the introduction of the first obstruction in the form of cube, bug was made to run one long alley and then the cube was placed for the bug to make forced alternation of its route. The second cube placed to restricted straight movement of bug forced the bug to make the decision to either turn left or right. The end of the alley was altered by the use of coloured paper with the dark colour representing the dark environment. The light coloured paper represented the illuminated environment. The bug's tendency to make alternation towards light or dark environment is tested with the usage of dark coloured paper.

Results

The experiment that was conducted using the longer alley illustrates certain unique characteristics with the bugs. To start with, the bugs seemed quite reactive to the obstructions. When the obstructions forced the bugs to make a right turn, the next decision-making point had the bug making a left turn. The bugs seemed to make an alternation to the turns made hitherto with making the left turn when given the choice between the left and right turn as

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the bug was previously forced to take right turn. Any forced turn was registered by the bugs and it influenced the next free choice turn. It was therefore easy to develop a correlation between the turn alternations and the previously forced turns on the bugs.

This derives the result that pill bugs shows an inclination towards turn-alternating ($p < 0.001$) and the turn-alternating behaviour affects by the darkness with the bug alternating towards the light from the dark. When the bugs were forced to turn without the presence of the paper, they demonstrated their alternating decisions which were influenced by the forced turn. From these results, it was possible to determine the manner in which the bugs made decisions based on forced left to light or forced right to dark.

Figure Legends

Figure 1 demonstrates the number of pill bugs that alternated based on forced left to light or forced right to dark.

Figure 2 demonstrates the reaction of the bug on forced left and right turns to light upon stumbling on another obstruction but with free decision opportunity.