Researchers cause evolution of number sense in fruit flies

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fruit fly

(Phys.org) -- For most of history, people have thought that human beings were the only organism capable of understanding numerical relationships or to use those relationships as a form of information, other than to discern the obvious; a pack of wolves is far more dangerous than one going it alone, for example. More recently however, researchers have discovered that many other animals have the ability to determine differing numbers of thing, and some with bigger brains have even demonstrated an ability to count. But thus far, no one has tried to cause numerical understanding to come about in an organism that doesn't appear to have one naturally. Till now that is. A group of researchers from the US and Canada have been working with fruit flies and appear to have caused them, through repeated exposure to negative stimuli, to evolve a means for discerning the difference between the numbers of

light flashes they are exposed to.

The researchers recently presented their study and results to the First Joint Congress on Evolutionary Biology, and said in part that through their efforts they had caused an evolutionary change to come about in a species of fly that allowed them to associate the number of flashing lights with being shaken.

To cause the evolutionary change to come about the researchers subjected a group of fruit flies to what they called twenty minute training sessions. Each was exposed to a certain number of flashes of light, some of which coincided with a vigorous shaking doled out by means of an electric toothbrush (something they don't like apparently). The team discovered that no matter how many training sessions a fruit fly received it was never able to associate the number of light flashes with the shaking. But by breeding the fruit flies and training their offspring as well, they found that after forty generations, the fruit flies developed an ability to discern the difference and to react accordingly. In short, they'd evolved an ability to determine the difference in the number of occurrences of something in their environment and to respond to it in ways that made sense to them.

The next step will be to study the insects to see what changes came about in their DNA as a result of their training, which might be of use in trying to figure out why some people with a condition known as dyscalculia aren't able to understand counting or simple math.

More information:
via Nature blog