

INSIDE JEB

Tiny *Drosophila* home in on forward sounds

A small male *Drosophila melanogaster* fly. Photo credit: André Karwath aka Aka (Own work) [CC BY-SA 2.5], via Wikimedia Commons.

Click your fingers at the back of a silent room and every head will snap around. ‘Sound localization is a basic function’, say Alexandra Batchelor and Rachel Wilson from Harvard Medical School, USA, explaining that our brains calculate the minute time difference between a sound arriving at each ear, or the difference in volume, to determine its direction. According to the duo, tiny *Drosophila melanogaster* – which communicate by beating their wings – should be also able to detect the direction that a sound comes from. They are equipped with a pair of short

air-vibration-sensing antennae, each tipped with a branching structure called the arista, which point in different directions, potentially allowing the insects to detect sound direction; but no one had ever tested their ability. So, Batchelor and Wilson decided to investigate the insect’s hearing.

Allowing female *D. melanogaster* to walk on a fly-sized treadmill with two speakers arranged in front of the insect, one on either side, Batchelor monitored the flies’ reactions as she played a series of short beeping sounds – mimicking the songs of

male *D. melanogaster* – from each speaker. The flies tended to turn toward the sounds. However, when the speakers were arranged behind the insects, they tended to turn away, and they failed to turn when sounds were played from either side. Then Batchelor immobilized the final joint of the antenna on one side with glue and played sounds from a speaker directly in front of the insect. This time, the flies tended to turn away from the antenna that was not glued. When Batchelor and Wilson put all of the information together, they realised that the flies were following a simple rule: they tend to steer away from the antenna with the largest vibrations, which Batchelor and Wilson point out is the opposite of humans that have one ear plugged.

So tiny *D. melanogaster* can determine which directions sounds are coming from, despite the vanishingly small distance between their intriguing ears, and the duo suspects that by turning away from sounds that are behind them, flies are ensuring that they don’t waste time returning to suitors that didn’t come up to snuff.

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