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### Why flies love 'vomit fruit'

ABC Science Online

Tuesday, 24 April 2007

A smelly Polynesian fruit nicknamed the 'vomit fruit' drives away most predators, except a species of fruit fly.

Now scientists in Japan say they know why. These fearless insects have special genes that allow them to bypass the plant's smelly defence system.

And these genes allow the flies to eat the stinky fruit and nest there.

Researchers from [Tokyo Metropolitan University](#) publish their study in the May issue of the journal *PLoS Biology*.

The Tahitian noni shrub (*Morinda citrifolia*) grows in Polynesia, Asia and parts of Australia's tropical north, where its fruit has many names including vomit fruit, cheese fruit and Indian mulberry.

Most flies avoid the fruit and those that land on it die.

It's the ripe fruit's smell, which comes from hexanoic and octanoic acid, that puts them off.

But *Drosophila sechellia* is unusual; it can't resist the fruit.

It feeds on it and lays eggs on it, ensuring a bountiful meal for its young.

Using genetic analysis, the scientists found that *D. sechellia* has two olfactory genes - Obp57d and Obp57e - which were different to corresponding genes in other fruit flies.

"We found, for the first time, the genes that determine the insects' preference [for] their host plants," says Takashi Matsuo, assistant professor of biological sciences at the university.

To show that these were the genes that made the offending fruit so attractive to *D. sechellia*, Matsuo's team bred a closely related species of fruit fly and replaced their olfactory genes with those of *D. sechellia*.



Genetics has the answer to why some fruit flies do anything to avoid this smelly fruit, while others eat it and lay their eggs on it (Image: US National Park Service/Bryan Harry)

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"[They] adopted the behaviour of the donor fly ... replacing the Obp57d and Obp57e genes changed the fly's response to the host toxins," the scientists write.

### Pest control

The researchers hope the discovery can help in the fight against pests.

"We can also begin to understand how to manipulate insects' behaviour by changing their preference for particular substances," they write.

One such application may be to manipulate sensory preferences of mosquitoes, which are drawn to human blood and sweat, scientists say.

with Reuters

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