

# Freefall -- aphids' survival strategy

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As soon as aphids feeding on a plant sense the heat and humidity in a mammal's breath, they drop to safety before they are inadvertently ingested together with the plant the animal is feeding on. These findings by Moshe Gish and colleagues, from the University of Haifa in Israel, show both how accurate aphids are at detecting this threat and how effective their escape behavior is. The work was just published online in Springer's journal *Naturwissenschaften – The Science of Nature*.

Many insects seek food and shelter on plants that may in turn be eaten by mammalian herbivores, who also accidentally ingest the resident insects. Gish and colleagues examined how the aphid *Uroleucon sonchi* L. deals with the danger of incidental predation by mammalian herbivores - in this case a goat. They were also interested in how the aphids' escape behavior might be affected by environmental conditions.

The researchers collected 16 Sow thistle plants, which they infested with aphids collected from wild populations. They allowed a mature domestic goat to feed on a plant for a short time before being removed. They counted the number of aphids on each plant before the goat came into contact with it, and the number of aphids that were found on the ground after the plant was eaten. One of the researchers also breathed slowly and gently on the plants to mimic mammalian herbivore breath. Once again, the authors counted the aphids that dropped.

They found that most of the aphids in the colony survived the ingestion of the plant by the feeding goat: 76 percent were found intact on the floor or in the plant pots. When the aphids were exposed to the

researcher's breath, they also dropped off the plants immediately. Additional laboratory experiments revealed that aphids escape to safety by sensing the combination of heat and [humidity](#) in the herbivore's breath and immediately dropping off the plant in large numbers. Gish and team's experiments also showed that as ambient temperature rose, the aphids' ability to sense the herbivore's breath, or their willingness to drop off the plants, weakened.

The authors also looked at the aphids' ability to find an alternative host plant after dropping to the ground. Three-quarters (74 percent) of the [aphids](#) found a new host plant as they moved systematically towards the stems of neighboring plants, suggesting that *U. sonchi* is well adapted to the consequences of dropping off host [plants](#).

Gish and team conclude: "Our research reveals a threat detection mechanism and an efficient evasive behavior that allow the aphid *U. sonchi* to survive mammalian herbivore feeding. The breath of the herbivore appears to be the key player in this defense mechanism, as it is an almost certain indicator of the proximity of an herbivore snout."

**More information:** Gish M et al (2011). Avoiding incidental predation by mammalian herbivores: accurate detection and efficient response in aphids. *Naturwissenschaften – The Science of Nature*  
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