Domestic cat damage to plant leaves containing iridoids enhances chemical repellency to pests

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Figure S1. Remaining weights of silver vine leaves after damage treatments by cats or manually, related to Figures 1B. Fresh silver vine leaves (ca. 5 g aliquot) were assigned to three treatment groups: intact as negative controls (I; n = 6), licked and chewed by cats (C; n = 11), and manually crumpled and torn as positive controls (M; n = 6). In the feline damage treatment, the leaves placed in individual test cages were damaged by the typical feline response including licking and chewing for about 10 min. Each leaf in the manual-damage treatment was crumpled by crushing in the experimenter’s gloved hand and torn into quarters to simulate damage by cats. Then, the manual-damaged leaves were left on the clean floor of test cages for 10 min (24 °C, humidity of ~40%) during the light photo period. Intact leaves were left on the clean floor of test cages for 10 min (24°C, humidity of ~40%) without any other treatment. All of the leaves were weighed before and after treatment, and the remaining weights calculated as a percentage of start weight (mean ± SE %). Points are individual values. The reduction in weight after licking and chewing by cats (4.1 ± 0.9%) was not significantly different from manually damaged leaves (3.6 ± 0.4%) or from intact leaves (0.5 ± 0.1%), indicating that cats swallowed minimal, if any, silver vine.
Figure S2. The behavioral patterns of the feline response toward the silver vine leaves, related to Figures 1B. Timing of licking and chewing (purple) and rubbing and rolling (gray) in response to intact leaves (n = 6 cats). Approximately 5 g of the leaves were placed on the cage floor, and the timing of licking and chewing and rubbing and rolling was analyzed using BORIS ver. 7.10.7. Cats C, E, and F first exhibited rubbing and rolling before licking and chewing.
Figure S3. GC/MS total ion chromatograms (TIC) of headspace from intact and damaged silver vine and catnip leaves, related to Figures 1D and 3C. (A) GC/MS TIC of headspace from intact silver vine leaves, silver vine leaves damaged by cats, and silver vine leaves damaged manually. (B) GC/MS TIC of headspace from intact catnip leaves and catnip leaves damaged manually. Chemical profiles of other volatile compounds, in addition to iridoids, differed markedly between intact and damaged leaves of both plants.
Female *Aedes albopictus* mosquitoes in an acrylic chamber that had air vents and was connected with a plastic bag as a shelter (18–26 mosquitoes per chamber; n = 6 chambers per stimulant) were provided with an open Petri dish treated with a test stimulus. Ten and twenty minutes after introduction of the stimulus, the percentage of mosquitoes in the shelter [(the number of mosquitoes that had moved into the shelter) / (total number of mosquitoes in the chamber and shelter) × 100%] was calculated.