

## Detection of intraguild predation by *Harmonia axyridis* on native coccinellids by alkaloids

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Many laboratory studies have showed that the invasive ladybird *Harmonia axyridis* is an intraguild predator of other ladybird species. However its real impact is poorly known in natural conditions where multiple prey species occur and where preys have the opportunity to escape. To monitoring intraguild predation (IGP) of coccinellids in natural conditions, we propose here a new method based on alkaloid detection by Gas Chromatography - Mass Spectrometry. As many ladybird species are chemically defended by alkaloids, these compounds can be used as predation tracers. In laboratory experiments, alkaloids from native species : adaline, calvine, precoccinelline, propyleine, were unambiguously detected in fourth instar larvae of *H. axyridis* which had ingested respectively one first instar larva of *Adalia bipunctata*, *Adalia decempunctata*, *Calvia quatuordecimguttata*, *Coccinella septempunctata* or *Propylea quatuordecimpunctata*. Prey alkaloids in the predator decreased in time, however traces were still detected when the fourth instar *H. axyridis* larvae had become pupae and adults. Alkaloid traces were found in the exuviae as well. The GC-MS analysis of alkaloid content in *H. axyridis* larvae from samplings in semi-natural and agricultural habitats confirms intraguild predation in natural conditions, allowing to follow interactions between this invasive species and native ladybird species.

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