

**Induced indirect defense of plants against herbivores and
its application in pest control.**

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【Outline of survey】

Plants are known to defend themselves against herbivores and pathogen directly by producing toxins, digestability reducers, repellents etc. Further, plants defend themselves against herbivores indirectly by producing so-called “herbivore-induced volatiles” that attract carnivorous natural enemies of the herbivores. This defense is called induced indirect defense against herbivores. Here, we focused on the molecular mechanisms involved in this defense. We also focused on its application in pest control. The following two projects are planned.

- (1) Role of plant oxilipin pathways in induced indirect defense against herbivores.
- (2) Effects of herbivore-induced plant volatiles on the interaction networks in ecosystems.

【Expected results】

One of the important viewpoints in understanding biodiversity in ecosystem is the viewpoint of interaction networks that involve direct and indirect interactions. One of the objectives of this study is to clarify the mechanisms involved in induced indirect defense of plants against herbivores. We also focused on induced direct defense as well. To do so, we could understand the total defense systems of plants against biotic stress. The results would also be useful for sustainable agriculture program.

【References by the principal investigator】

Kaori Shiojiri, Kyutaro Kishimoto, Rika Ozawa, Soichi Kugimiya, Soichi Urashimo, Genichiro Arimura, Junichiro Horiuchi, Takaaki Nishioka, Kenji Matsui, and Junji Takabayashi (2006) Changing green leaf volatiles biosynthesis in plants: an approach for improving plant resistance against both herbivores and pathogens. Proceedings of Natural Academy of Science, USA 103: 16672-16676

【Term of project】 FY2007– 2011

【Budget allocation】 21,200,000 yen
(2007 direct cost)

【Homepage address】

None