

# Pest insects to help produce ethanol

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Pest insects in tropical rainforests can be a valuable natural asset. So believes Lisbeth Olsson, who is hunting for new enzymes in partnership with Vietnamese researchers.

One day last summer Vu Nguyen Thanh called Lisbeth Olsson from FIRI, the Food Industries Research Institute in Vietnam. In searching the internet for interesting partners to work with he had landed on the Chalmers website and found the [industrial biotechnology](#) group.

Lisbeth Olsson, Professor in Bioprocess Technology and head of the group, was pretty surprised but quickly realised that she and Vu Nguyen Thanh had similar goals.

"You could say we had a good scientific personal chemistry between us, and when he presented his cooperation proposal it sounded very interesting."

## Enzymes as catalysts

Together, researchers from Chalmers and Vietnam are now going to search for previously unknown enzymes in the Vietnamese rainforests, and hopefully find enzymes that can act as catalysts in industry. Lisbeth Olsson is especially interested in enzymes that can be used to produce ethanol from Swedish forestry raw materials, as cellulose in the cell walls of trees have to be broken down into [sugar molecules](#) that are then allowed to [ferment](#) and form ethanol.

Traditionally, cellulose is decomposed with the help of sulphuric acid under high pressure and at high temperature, but using enzymes can speed the process, produce fewer undesired by-products and require less energy," she explains.

"Rainforests are full of organisms that are very efficient at breaking down dead plant material, and these include various kinds of [insect pest](#) that live on wood. I am very curious as to what kinds of [enzyme](#) they have in their intestinal flora, which enables them to digest wood fibres so well."

The researchers at Chalmers are also interested in using enzymes to break down various residual products from farming, for which there are many application areas. Apart from producing various fuels, decomposed plant and wood fibres are used for e.g. developing environment friendly chemicals and plastic materials at Chalmers.

Another possible application area for rainforest enzymes is to liberate important nutrients in food and animal feed, something that is of particular interest to the Vietnamese researchers. It will be mostly them who will be going out in the field to gather the enzymes, while the team at Chalmers will work on describing the characteristics of the enzymes and developing methods to duplicate them in laboratories.

## **Increased know-how in Vietnam**

The cooperative project is being supported by the aid organisation Sida, and in the case of Vietnam, it is about getting help to utilise their domestic resources better, and to increase know-how within biotechnology. Chalmers has undertaken to help develop a state of the art laboratory in Vietnam, and to host one or a couple of guest researchers from FIRI. The partnership began in autumn 2011, and Vu Nguyen Thanh visited Göteborg before Christmas to meet his Swedish

colleagues and see what physical resources were available at Chalmers.

"He was incredibly impressed with our laboratories, but even though we work under pretty different conditions and with slightly different types of project, the Vietnamese researchers are on a par with us in terms of science. I think it will be a mutually rewarding exchange."

Provided by Chalmers University of Technology

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