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Swiss researchers confirm lethal effects of genetically modified Bt toxin on young ladybird larvae

Counter-research based on flawed methodology

Zürich/Braunschweig - 27.02.2012 - Swiss researchers of the Swiss Federal Institute of Technology (ETH) in Zürich confirm earlier findings that the *Bacillus thuringiensis* (Bt) toxin Cry1Ab produced for pesticidal purposes by genetically modified (GM) Bt maize increases mortality in the young ladybird larvae (*Adalia bipunctata* L., two-spotted ladybird*)* in laboratory tests. These ladybird larvae are typical 'non-target' environmental goods which are not supposed to be harmed by the GM maize. On February 15, the research team headed by Dr. Angelika Hilbeck published the results of additional tests[i] after their first publication in 2009[ii] was strongly criticized by proponents of GM crops in a coordinated attack in the scientific journal "Transgenic Research".[iii] Following the well known pattern described by the U.S. science journalist Waltz[iv], the counter-articles tried to discredit the 2009 research as "pseudo-science", and presented their own research aimed at disproving the original work. Trigger for this concerted attack was the policy response by the German government which issued a ban in spring 2009 on the commercial planting of a GM maize that expresses the tested Bt toxin, based - among many others - on the results of the earlier 2009 study with *A. bipunctata*.

The Swiss researchers also investigated why the counter-research could not repeat their first results and arrived at a simple conclusion. „We could show that the protocols applied by Alvarez-Alfageme et al. 2011 were significantly different to our earlier studies and much less likely to detect adverse effects of the toxins than those by Schmidt et al. 2009, and our follow-up studies", explains Dr. Hilbeck. „When testing the protocols by Alvarez-Alfageme et al. 2011 with Bt-susceptible target organisms, the European corn borer larvae, they were hardly damaged by the Bt toxin - this clearly disqualifies the method for detecting negative Bt effects on non-target organisms."

In an accompanying commentary, the authors noted that the reaction of GM crop promoters to results of risk research is often based on double standards.[v] As long as the results seemingly support the claims of no risk, poor quality science is accepted, and receives very little scrutiny. For example, no comparable criticism was voiced in cases where the selected test organisms, larvae of the green lacewing, without any doubt were not able to ingest the offered Bt toxin - thus consistently producing false negative results. While the U.S. Environmental Protection Agency in recent years has acknowledged the unsuitability of the lacewing tests for GM crop risk assessment, they still constitute the basis for GM Bt crop approvals, and for 'sound science', by European authorities.

"It is time to move beyond the rather 'dogmatic denial' and 'shooting the messenger' stages of the debate and onto the more mature stage of scientific discourse where a meaningful examination of scientific 'surprises'dominates the discussion", said David Gee, senior adviser on science, policy and emerging issues to the European Environmental Agency.

„It is surprising that the European authorities, after implementing biosafety legislation which is based on the precautionary principle and demands scientifically robust ecological risk research and assessment for two decades, still rely on the systematically flawed protocols and on data developed and promoted by the biotechnology industry and their cooperating scientists", said Professor Brian Wynne, of the UK Centre for Economic and Social Aspects of Genomics (Cesagen) at Lancaster University.

Prof Wynne continued: "We do not need biosafety research embedded in the visions of the biotechnology industry that supports unsustainable industrialised agriculture. Instead we need independent research like Hilbeck's which assesses the specific environmental effects of genetic engineering, uses sensitive methodologies and helps indicate the potentially damaging effects on biodiversity as well as on agricultural diversity, of the industrial production systems which GM agriculture only intensifies. In addition to the urgently needed support for genuinely independent biosafety research, EU and member-state authorities should be taking seriously the benefits of crop diversity, multifunctional agriculture and

agricultural policies which develop productive European food systems under sustainable agro-ecological conditions".

"The unnecessary controversy on the *Adalia* experiments highlights the need for agreed protocols and environmentally relevant risk research and assessment. We urge the European authorities to overcome their reliance on expertise from one sector only – industry-embedded - when setting the standards for approval of GM organisms", Dr. Hartmut Meyer, coordinator of the European Network of Scientists for Social and Environmental Responsibility (ENSSER), concluded. "In addition, a revision of the current approvals for commercial growing of GM plants is necessary".

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The European Network of Scientists for Social and Environmental Responsibility (ENSSER) brings together independent scientific expertise to develop public-good knowledge for the critical assessment of existing and emerging technologies. The objective of ENSSER is the advancement of public-good science and research for the protection of the environment, biological diversity and human health against adverse impacts of new technologies and their products. ENSSER advocates benign and peaceful use of scientific discoveries and technological developments, while expanding diverse approaches to assess their utility and safety in society. More information available at: http://www.ensser.org

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