

Gene Ecology versus reductionist knowledge systems

A difficult but necessary crossroad in the evaluation of modern biotechnologies

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Gene Ecology is a new interdisciplinary field that is unique in its combination of genetics and biochemistry with bioethics, the philosophy of science, and social studies of science and technology. It builds on innovative work in the areas of genomics, proteomics, food science, ecology, evolution, intellectual property, indigenous rights, participatory technology assessment, and globalisation. This synthetic approach reverses the trend toward the more reductionist qualities of the component sciences. Gene Ecology is rapidly becoming a central discipline for the comprehensive evaluation of modern biotechnologies. The holistic research approach and knowledge system of Gene Ecology spans all biological sciences and includes human-altered environments and societal needs for a sustainable development. However, the product-oriented knowledge system underlying modern biotechnologies is typically using very specific knowledge on functional roles of small DNA-RNA-protein-units and links in order to improve traits and organisms. This more reductionist bottom-up approach tends to forget or overlook the crucial context of the modification. I will give real-world examples of how the two described knowledge systems meet or crash in biosafety research.