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COMMON PLAY: FUNGI, PLANTS, INSECTS – INTRODUCTION

Holistic viewpoint is necessary in order to get an insight into the title known interaction problems. Constant variability of the world was long ago postulated by Heraklit. Later also Anaxymander from Milet and Lucretius considered that all things are interrelated and changing in space and time. The first modern mentioning of interaction is linked with H. Müller observation in 1751 when he noted that bees can pollinate flowers of tulips. Two years later Otto von Munchhausen found that fungus basidiocarps were inhabited by animals. De Barry introduced the term symbiosis in 1879. He explained it as long and common life of two different organisms. Some years thereafter (1882) Koch formulated his famous postulates concerning pathogenic organisms. Ideas of K. S. Mereżkowski and Lynn Margulis led to formulation of the serial endosymbiotic theory (SET) that explained origin of mitochondria and plastids. J.E Lovelock proposed in 1979 very famous Gaia conception. The South African J. C. Smuts (1870-1950) is considered as a founding father of holism. He published in 1926 his most important work "Holism and Evolution". Recently holistic ideas are coming back to vigor. According to this conception, a fundamental feature of the world is the existence of "wholes" made of interrelated natural objects, both of animate and inanimate. The "wholes" represent thus more than the sum of their constituents, which are in fact not real, and exist only as abstract analytical distinctions. Also Alfred Lotka, one of the creators of

Lotka-Volterra's theory of competition, represented in fact holistic approach. Although holistic ideas are generally acceptable, those oriented metaphysically are often rejected (also the undersigned does not agree with metaphysical ideas in holism). It is difficult to accept the idea that Gea should be considered as a superorganism. However, treatment of the Earth as a giant self-controlled ecosystem seems to be justified. Thus, according to hypothesis of Lovelock and Margulis, biosphere can be regarded as a kind of controlling system helping to sustain the Earth in a homeostatic state. Lovelock's ideas appeared very inspiring, and the global ecology as well as the Earth system science arose thanks to him. Studies on interactions between particular organisms can be considered as a step towards recognition of multiple relationships. This is a dynamically developing branch of science. Also Polish scientists have importantly contributed to this field. F. Kamiński was the first scientist who correctly interpreted micorrhiza. W. Siemaszko investigated interaction between fungi and insects. The most known Polish scientist in this field is K. Pirozynski who worked in Canada.

At least eight types of interactions can be distinguished: (1) competition – both partners mutually limit each other; (2) neutralism – partners do not influence each other; (3) symbiosis – non-antagonistic (mutualism) interaction profitable for both partners (obligatory); (4) proto-cooperation – interaction profitable for both partners (facultative or non-obligato-

ry); (5) symbiosis antagonistic (parasitism) – only one partner is profitable, the other one is exploited; (6) predation – one of the partners is killed and consumed; (7) comensalism – one partner is profitable but the other one is not exploited; (8) amensalism – one partner is limited while the other one is neither profitable nor exploited.

In fact, the situation is more complicated. One should keep in mind that multiple interactions take place throughout the life cycle of the host.

In this volume mutualism, parasitism and intermediate situation in natural and agricultural environments will be discussed in a series of review articles. Some of them were presented as lectures at a seminar entitled 'Interactions between fungi, plants and insects', held in Białowieża (4–5 October 2003). Attention is paid not only to interaction between fungi, arthropods, nematodes and plants but also to some interactive processes emerging wherefrom. The important role of various protected areas in preservation of the diversity of entomopathogenic fungi is presented by S. BAŁAZY. Classification of arbuscular mycorrhizal fungi Glomeromycota, is discussed by J. BŁASZ-

KOWSKI. There are presented also fundamental interactions between slime molds and insects (A. DROZDOWICZ), transitions between parasitism and mutualism of plant endophytes (A. CHLEBICKI), interactions among cambiphagous insects, ophiostomatoid fungi, and plants (R. JANKOWIAK), tritrophic interactions between nematode, plant and nematophagous fungi (D. SOSNOWSKA). A little known phytophagous mites of entomopathogenic fungi are described by C. TKACZUK, R. MIĘTKIEWICZ, and S. BAŁAZY. Finally, an enemy release hypothesis and symbiotic drift are discussed by A. CHLEBICKI.

Knowledge of interactions between organisms is very important from practical point of view. It can help to design new strategies and methods for controlling of parasitic infections of plants and animals. However, some organisms used for biocontrol should be used with caution. Distribution of such organisms might pose a hazard to human health. Therefore further studies on multiple interaction between plants, fungi, insects, bacteria and humans are necessary.

