

SIGNIFICANCE OF PROTECTED AREAS FOR THE PRESERVATION OF ENTOMOPATHOGENIC FUNGI

S u m m a r y

Entomopathogenic fungi are a group of microorganisms important for the regulation of arthropod populations both in natural and managed ecosystems. Hence, they have been for a long time of pest control interest and numerous species have been included into integrated pest management (IPM) programmes. Long-term studies on their occurrence in terrestrial habitats showed strong impoverishment of their diversity in agricultural landscape, as compared with forests, in general, and with different legally protected areas, such as national parks, nature reserves, landscape parks, biodiversity refuges and their protected zones. The protected areas as favouring rich diversity of arthropods perform well the function of their pathogens' refuges, thanks to great differentiation of habitats and – what is especially important for the fungi – to maintenance of appropriate humidity conditions in many-layered vegetation. From the total number of 210 species of the entomopathogenic fungi reported within these investigations more than 60% were collected in such legally protected ecosystems or areas deserving protection. Only less than 20 species of entomopathogenic hyphomycetes and entomophthorales occur more or less regularly in one-year cereal and row crops, and not more than 3-5 species significantly influence at times some pest insect populations (for instance

Entomophthora muscae affecting anthomyid flies – mostly *Delia floralis*, *E. planchoniana* and *Pandora neoaphidis* on aphids or *Beauveria bassiana* causing autumnal mortality of the Colorado potato beetle and *Sitona* weevils). Quantitative estimations showed highly significant differences in spore and infected host cadavers densities between arable fields and all other habitats – including perennial crops of clover and alfalfa, extensively utilized meadows, mid-field, shelterbelts and woodlots, swamps and riparian plant communities surrounding water bodies. All these marginal habitats are characterized by greater than cereal and row crops diversities of arthropods and by the increased number of entomopathogenic fungi in agricultural landscape up to about 60 species. However, in structurally simplified landscapes of big fields devoid of afforestations and differentiating them natural or seminatural elements these fungi are by a half less numerous, and only weeds, grassy balks or roadsides, if present, enrich their diversity. Generally, differentiation, immediate proximity of meadows, forests, nature reserves, swamps and abandoned fields or non utilized grasslands, as well as limited tillage and pesticide application, should be considered the main factors contributing to enhancement in agricultural areas of their resources and diversity.