

## **Abstract**

Vegetative incompatibility is a process occurring during vegetative growth in filamentous fungi which can prevent fusion of hyphae between individuals. In case of hyphal fusion between two individuals with genetically incompatible combination of alleles of vegetative incompatibility genes (i.e. *het* or *vic* genes), the newly-emerged heterokaryotic cell is destroyed via programmed cell death, which can be mediated in various ways. The purpose of this mechanism can be to preserve the genetic individuality of an individual or to prevent the transmission of a deleterious cytoplasmatic elements (e.g. mycoviruses). Exploring the vegetative incompatibility genes plays an important role for example in the induction of sexual state *in vitro* or in the study of speciation mechanisms in fungi. On the molecular-genetic level, vegetative incompatibility has been so far described in detail only in three ascomycete species. This thesis aims to summarize our knowledge concerning the significance of vegetative incompatibility and genetical mechanisms that underlie this process.

**Key words:** vegetative incompatibility, *het* genes, *vic* genes, *mat* locus, programmed cell death, *Neurospora crassa*, *Podospora anserina*, *Cryphonectria parasitica*