Abstract

Forest subshrubs Pyroloideae are important models to study mixotrophy – a strategy where both carbon from photosynthesis and fungal one is used. Due to their initial mycoheterotrophy it was impossible to germinate these plants outside natural habitats neither for study of their physiology, medicinal purposes nor for their conservation. Thanks to our novel cultivation method which yields high germination percentages, it was possible to study germination and post-germination ontogenesis of Pyroloideae. It is necessary to break strong dormancy of seeds by bleach and acid and to sow seeds on complex media amended by soluble carbohydrates. Cold stratification turned out to be unnecessary while cultivation in dark was crucial. Many convergencies with orchids were observed, mainly that dust seeds with tiny embryo arrested at globular stage germinate into undifferentiated structures functionally similar to orchid protocorms, from which only one meristem emerges. On the contrary to orchids, the first meristem formed is the root meristem and much later, adventitious shoots appeared. Inability of young plants to grow in the absence of soluble carbohydrates and elevated amount of ^{13}C stable isotope in tissues of adult plants growing in natural habitats compared to surrounding autotrophic controls suggests, that germinating Pyroloid plants are mycoheterotrophic and adult plants are mixotrophic. Roots, rhizomes and leaves of *P. minor* were not significantly different in ^{13}C content.