

Abstract

Due to global climate change and human interventions, the environment is changing rapidly. This brings many stress factors that organisms must adapt to. One of the adaptive mechanisms currently widely discussed is rapid evolution, i.e., hereditary change based on natural selection occurring at an ecologically relevant pace. This work deals with the synthesis of knowledge about rapid evolution, the methodology of its research, and its role in the adaptive processes of plants to anthropogenic pollution, focusing on heavy metals in soil and artificial light at night. The collected studies indicate that heavy metals exert strong selective pressure that can lead to the separation of a tolerant population from the original within a few generations. However, the significance of artificial light at night as a selective factor for plant evolution has not yet been studied. Although individual studies deal with adaptive evolution in phototactic insects in response to artificial light at night, extensive research has not been conducted here either. From the general examination of the effects of artificial light at night on organisms (especially animals), both direct and indirect impacts on their functioning are evident, many of which have not yet been described in detail. Thus, the direct and indirect impacts of artificial light at night on plants should be the subject of further research, as should its potential role in rapid evolution.