

Abstract

Artificial light illuminates the nights and with it many organisms. Apart from some positive effects like human safety, disturbed dark periods can alter species behavior, physiology or morphology. In natural communities, not only individual species are affected, but also species interactions. It is known that nocturnal and diurnal plant-pollinator interactions are altered under artificial light at night (ALAN), but knowledge about the mechanism of how ALAN impacts these interactions is restricted. In this field experiment, we tested the impact of ALAN on eleven Swiss native wildflowers and analyzed how the expression of three morphological floral traits (flower height, floral display size and flower number) was altered by the light. Six out of 12 study sites were artificially illuminated with commercial LED streetlamps. Moreover, we quantified how the light had an impact on diurnal insect visitation and the resulting seeds set for four target species. We found that floral traits were altered by ALAN, while seeds set were reduced for all species by the light. For the number of insect visitations at day, we found no effect of ALAN. We concluded that ALAN altered the expression of some floral traits, but different species reacted in different directions. Consequently, reduced seeds set could be a direct result of the changed morphology of the plants. But there are also other potential mechanisms. Future research should focus on testing the effect of ALAN on a larger selection of floral trait to get a clearer understanding of the mechanisms that are altering plant-pollinator interactions.