

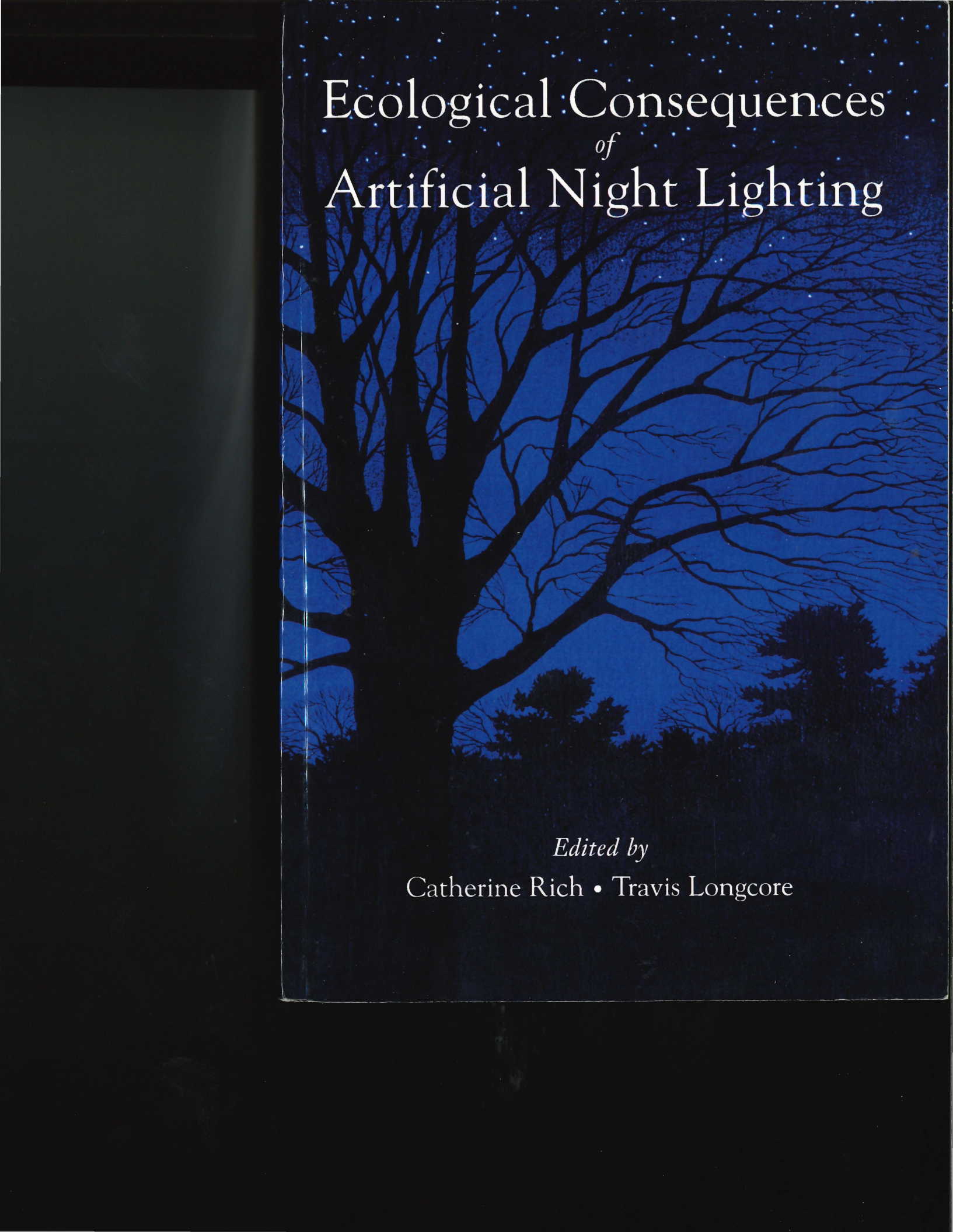
## *Chapter 16*

# Physiology of Plant Responses to Artificial Lighting

Winslow R. Briggs

Plants are continuously bombarded by biotic and abiotic signals from their environment. Biotic signals include attacks by insects and pathogens and grazing by larger herbivores. Abiotic signals include temperature changes, changes in water availability, nutrient limitation, osmotic stress, and changes in the light environment. In the long course of evolution, plants have developed exquisite mechanisms for detecting and responding to these many signals. This chapter is concerned with those signals that arise from the light environment, of which artificial night lighting is a part. The focus of this chapter is plant photoreceptors, which are the molecules that detect light signals, and the consequent physiological responses to light. Some possible consequences of the excitation of photoreceptors by artificial lighting are discussed. This chapter does not consider the spillover effects on plants of the disruption of ecological interactions (e.g., herbivory, pollination) that may be caused by artificial night lighting, rather concentrating on the physiology and growth of plants themselves.

Although there is an extensive literature on the effects of light spectral



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