Abstract

Castor bean (Ricinus communis L.) is cultivated mainly for biodiesel production because of its oil-rich seeds; it is assumed to be an anemophylous species. But pollination deficit can lead to low productivity often attributed to other reasons. In this paper, we investigated pollination requirements, pollination mechanism, occurrence of pollination deficit, and the role of biotic pollinators in a large commercial plantation of castor bean. Our results show that R. communis bears a mixed breeding system favoring selfing by geitonogamy, although the wind promotes mostly outcrossing. We also found that the honey bee (Apis mellifera L.) foraging on castor bean can both transfer pollen from male to female flowers within the same raceme and boost the release of airborne pollen by male flowers. Both situations increase geitonogamy rates, raising significantly fruit set and seed yield. This is the first report of an animal foraging activity increasing seed yield in an anemophilous and geitonogamous crop and elucidates the role of biotic pollinators in castor bean reproduction.

Keywords

Oleaginous crop, pollination deficit, pollination requirements, seed yield, wind insect-assisted pollination.