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Pollen productivity and fertility of pollen in the genus Fagopyrum mill

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Abstract

In recent years, a lot of hopes to improve buckwheat breeding are set on interspecific hybridization. To improve the efficiency of hybridization and in further successful seed reproduction of plants the quantity and quality of pollen released are of great importance. The objective of this paper was a comparative evaluation of pollen productivity and fertility of Fagopyrum esculentum Moench, Fagopyrum tataricum (L.) Gaertn. and Fagopyrum giganteum Krotov pollen. In this paper was used a comparative-embryological method and iodine method for pollen fertility determination. The development of anther in all three species happened in a similar manner, the difference was in the number of developing mother cells of microspores in the anther nest. Here were calculated average and potential pollen productivity of a flower, and p/o ratio of three representatives of Fagopyrum Mill. Realization of potential pollen productivity prevents violations during embryological processes. All three representatives of the genus revealed pauses in the development of sporogenous tissue and abnormalities in meiosis. Cytomixis was found only in Fagopyrum esculentum. The number of normally developed stamens in Fagopyrum esculentum and Fagopyrum giganteum was close to eight and in Fagopyrum tataricum samples was 4.9 and 6.0. The weakening of control over the development of Fagopyrum tataricum outer circle stamens is due to the fact that pollen from autogamous species produces more than it is necessary for its self-pollination. In all three species was discovered significant percentage of sterile pollen. Even in favorable for the plant's growth and development conditions the pollen fertility of Fagopyrum tataricum and Fagopyrum giganteum tetraploid sample did not exceed 56 %. On the example of Fagopyrum esculentum there was proved a significant impact of drought on pollen fertility.

Keywords

Embryological processes, Fagopyrum, P/o ratio, Pollen fertility, Pollen productivity