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What is the role of selective abortion in maintaining high levels of cross pollination in Epidendrum secundum (Orchidaceae)?

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Abstract
Selective abortion of fruits and/or seeds is an evolutionary mechanism that can prevent effects of inbreeding depression in plant populations. This project verifies the existence and possible patterns of selective abortion in Epidendrum secundum by conducting pollinations experiments. The results indicates that this species do not have inbreeding depression and do not show the expected patterns of selective abortion.

Key words:
Selective abortion, Inbreeding depression, Plant reproductive biology.

Introduction

Inbreeding depression is a process that can affect plants populations leading to high rates of self-pollination and loss of genetic diversity. An evolutionary mechanism that can decrease these effects is self-incompatibility. But in contexts of fluctuations in pollinators' population self-incompatibility can represent a risk of extinction. In populations that present both autogamous and allogamous plants, we can find mechanisms that favor cross-pollination. One possible mechanism is the selective abortion of fruits and/or seeds, but there aren't many studies about that hypothesis in Angiosperms. This project aims to investigate the occurrence of this phenomenon in the species *Epidendrum secundum* (Orchidaceae).

Results and Discussion

The experiments were performed in 3 cultivated populations of *Epidendrum secundum*, with total of 60 experiments manipulating 232 flowers. There were 4 treatments, with different combinations of self-pollination and cross-pollination (as summarized in Image 1), to verify the difference in production and abortion of fruits and seeds. A total of 96 fruits were aborted, but they didn't match with patterns of abortion due time between pollinations or pollen source found in previous studies. In fact, latest pollinations were maintained more often, and there were more abortions in fruits of the first pollination in 2 of 3 treatments that involves time between pollinations as a factor. In the case of pollen source, both treatments that had both self and cross-pollinations showed greater rate of abortion of cross-pollinated fruits, unlike the expected. Means of seed viability for each treatment are summarized in Chart 1. High development of self-pollinated fruits an high rates of self-pollinated seed viability in all treatments also suggests that the populations studied were not under influence of inbreeding depression.

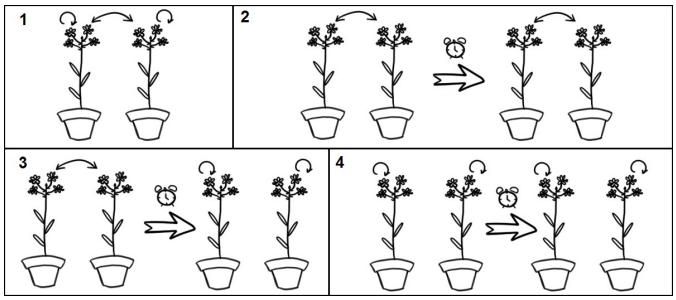

Image 1. Diagram summarizing the 4 treatments.

Image 2. Flowers of *Epidendrum secundum*.

Chart 1. Means of seed viability (%) for each treatment. MSV1 and MSV2 are means for each of the two parts of the treatments. (s) represent self-pollination and (c) represent cross-pollination.

Treatment	MSV1 (%)	MSV2 (%)
1	64,7 (s)	69,4 (c)
2	91,2 (c)	77,5 (c)
3	79,5 (c)	78,7 (s)
4	66,9 (s)	74,8 (s)

Conclusions

The experiments shows that the abortions occurred in *Epidendrum secundum* do not follow the patterns presented in previous literature.

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