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ANTHER EATING BY SNAILS AND SLUGS IN STREPTOCARPUS

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SUMMARY

One snail species, *Zonitoides arborius*, and one slug species, *Deroceras laeve*, were discovered seeking anthers of streptocarpus cultivars for food. There are no indications that their foraging movements induce self- or cross-pollination (malacophily).

1. INTRODUCTION

In the course of our experiments with streptocarpus one of us (M.G.N.) discovered that a snail and a slug species were feeding on anthers of streptocarpus cultivars and that such did not happen occasionally. Since little is known about the pollinating behaviour of *Streptocarpus* species and streptocarpus cultivars (Gesneriaceae) (HILLIARD & BURTT 1971, ZEVEN 1972) we decided to investigate whether pollination was induced by these foraging movements.

A further reason was to see whether we could continue our practice of not bagging the streptocarpus flowers. So far the very few insects in the greenhouse never visited the flowers and there was no danger of illegitimate pollination.

2. MATERIAL AND METHODS

Plants of the streptocarpus cultivars (clones) Constant Nymph, Blue Nymph, Netta Nymph and Purple Nymph (see for description BROERTJES 1969, ARNOLD 1972) were put in a glass-isolated compartment (60 × 60 × 60 cm) in our streptocarpus greenhouse. Snails and slugs were collected from plants in this greenhouse and placed in the compartment. As the latter could hold only two plants at that time the above procedure was repeated 43 times, while the snails and slugs were collected about once in the two weeks.

It was observed that the plants continued flowering and that the gastropods also ate the anthers of the experimental plants, so we concluded that the new environment suited both the plants and the gastropods.

The reason for choosing plants of the above cultivars was that they are functionally male sterile (ZEVEN 1971). Should the gastropods induce pollination, the ovary would then develop into a fruit.

Each flower, of which a gastropod had eaten the anthers, was marked and

the development of the ovary was recorded. As a control measure each experimental plant was self-pollinated by hand to check possible self-incompatibility.

IDENTIFICATION OF THE SNAIL AND THE SLUG SPECIES

Specimens of both species were presented to Mr. H. P. M. G. Menkhorst at Rotterdam for identification. He identified the snail species as *Zonitoides arborius* Say (Zonitidae) and the slug species as *Deroceras laeve* O. F. Müller. *Z. arborius* is occasionally observed in greenhouses in the Netherlands, while *D. laeve* is common in greenhouse and fields in our country. During the day both species hide under leaves, moist peat-dust and the like. In the evening they appear and start moving to the flowers to feed on anthers. During the night they return to hide. Their tracks are marked by a slimy substance.

RESULTS AND DISCUSSION

The number of flowers per cultivar with eaten anthers and the number of fruits set on visited flowers are given in *table 1*. This table also shows the success after self-pollination. It is not clear why no fruits were set after hand-pollination on 'Purple Nymph' in this experiment as this cultivar in other experiments did produce fruits after self-pollination.

It is concluded that neither the snail nor the slug induce self-pollination of the investigated cultivars. In plants of completely fertile cultivars it will be difficult to investigate the phenomenon as self-pollination is common with them. Whether malacophily occurs with wild species in their native habitat – the genus *Streptocarpus* is native to Africa south of the Sahara (HILLIARD & BURTT 1971) – needs to be examined.

Handbooks on pollination (e.g. FAEGRI & VAN DER PIJL 1971, KNUTH 1895,

Table 1. Number of flowers visited by snails (anthers eaten), number of flowers self-pollinated and number of fruits developed.

Cultivar	No. of flowers visited by snails	% of ripe fruits	No. of flowers selfed	No. and % of ripe fruits	
Constant Nymph	36	0	8	7	87.5
Blue Nymph	27	0	10	6	60.0
Netta Nymph	6	0	2	2	100.0
Purple Nymph	7	0	4	0	0
Total	76	0	24	15	62.5

MEEUSE 1961, PROCTOR & YEO 1973, STANLEY & LINSKENS 1974) do not mention anther feeding by snails and slugs and our report may, therefore, be the first one.

KNUTH (1895) reviews the literature on malacophily. Although snails and slugs may transport pollen, especially in such flowers where male and female flowers stand close together and the animals can easily move on these parts like *Anthurium* sp. it is not a common occurrence. Snails and slugs have been reported to eat flower parts other than the anthers and may cause pollination, but all cases reported seem to be incidental ones. Modern handbooks still refer to the data compiled by Knuth, so apparently no new cases have been reported. Thus FAEGRI & VAN DER PIJL (1971) refer to the example of malacophily of *Rohdea japonica* (PROCTOR & YEO (1973) write *Rhodea*) as "a notorious and obscure case" which needs verification. AIRY SHAW (1966) is also cautious about this case as he writes "said to be fertilized by snails crawling over the flowers".

Our investigation shows that malacophily does not occur in four cultivars of streptocarpus.

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