

Broad-spectrum pollination of *Plectranthus neochilus*

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ABSTRACT

The pollination ecology of *Plectranthus neochilus* Schltr. is discussed and compared with that of another garden plant, *Plectranthus barbatus* Andr.. Pollinators and flower visitors of *P. neochilus* include members of the Megachilidae, Anthophoridae, Syrphidae, Bombyliidae, Sphingidae, Apidae.

RESUME

EVENTAIL DE POLLINISATION DE PLECTRANTHUS NEOCHILUS

L'écologie de la pollinisation de *Plectranthus neochilus* Schltr. est discutée et comparée avec celle d'une autre plante de jardin, *Plectranthus barbatus* Andr. On a relevé, parmi les insectes qui pollinisent et visitent les fleurs de *P. neochilus*, des représentants des Megachilidae, Anthophoridae, Syrphidae, Bombyliidae, Sphingidae, Apidae.

INTRODUCTION

The insect-plant relationships of plants under cultivation are often very different from those of the same species growing under natural conditions. The "wild" pollinators may be absent in gardens and the successful transference of an outbreeding plant will then depend on either its potential for vegetative reproduction or on the plasticity of its pollination strategies.

This paper assesses the plant-insect relationships of *Plectranthus neochilus* Schltr., an indigenous species cultivated in gardens in the Pretoria area.

GENERAL MORPHOLOGY

P. neochilus is mostly a perennial, decumbent to erect, often much branched and bushy (Fig. 1), unpleasantly aromatic, 12-50 cm tall herb (Codd, 1975). Although it is variable in vegetative characters it is relatively constant in floral characters. The inflorescence is a 4-angled spikelike raceme 3-4 cm long when in the bud stage. It is composed of 4 rows of densely imbricate, ovate, acuminate bracts (Fig. 2A). Flowering proceeds by the gradual opening of each verticil of flowers. This is accompanied by the shedding of the bracts surrounding each verticil and by the elongation of the rhachis between the opened verticils (Fig. 2C). Thirteen spaced verticils can be seen in Fig. 2C, with the rhachis also clearly visible between the verticils. Open flowers can be seen in Fig. 2B.

POLLINATION ECOLOGY

Over a period of three weeks plants of *P. neochilus* were observed in the Pretoria National Botanic Gardens, Brummeria. They cover large areas in massed displays, a feature seldom found in the wild. These displays are rich sources of nectar and attract numerous insect visitors such as bees, hoverflies and butterflies. The following insects represent the commonest visitors:

Megachilidae.....	<i>Megachile maxillosa</i> Guér. <i>Megachile chrysorrhoeae</i> Gerst. <i>Megachile</i> sp. (leaf cutter) <i>Megachile combusta</i> Sm. <i>Megachile</i> sp. cf. <i>combusta</i> Sm.
Anthophoridae.....	<i>Xylocopa caffra</i> (L.) <i>Xylocopa senior</i> Vachal <i>Xylocopa sichele</i> Vachal <i>Anthophora</i> sp.
Apidae.....	<i>Apis mellifera</i> L.
Syrphidae.....	<i>Asarcina</i> cf. <i>rostrata</i> Wied.
Bombyliidae.....	unidentified flies
Sphingidae.....	<i>Macroglossum trochilus</i> (Hbn.)

Of these insects, only the bees effectively worked the pollination mechanism every time. The syrphids, bombylids and sphingids insert their probosci without touching either the androecium or gynoecium.

In all cases, the bees landed on the horizontal lower boat-shaped lip of the flower, depressing it and exposing the stamens and stigma (which then rubbed against the lower abdomen as the insect began



FIG. 1.—*Plectranthus neochilus* growing among rocks 8 km S.E. of Barberton. Note the large number of inflorescences. Photo: L. E. Codd.

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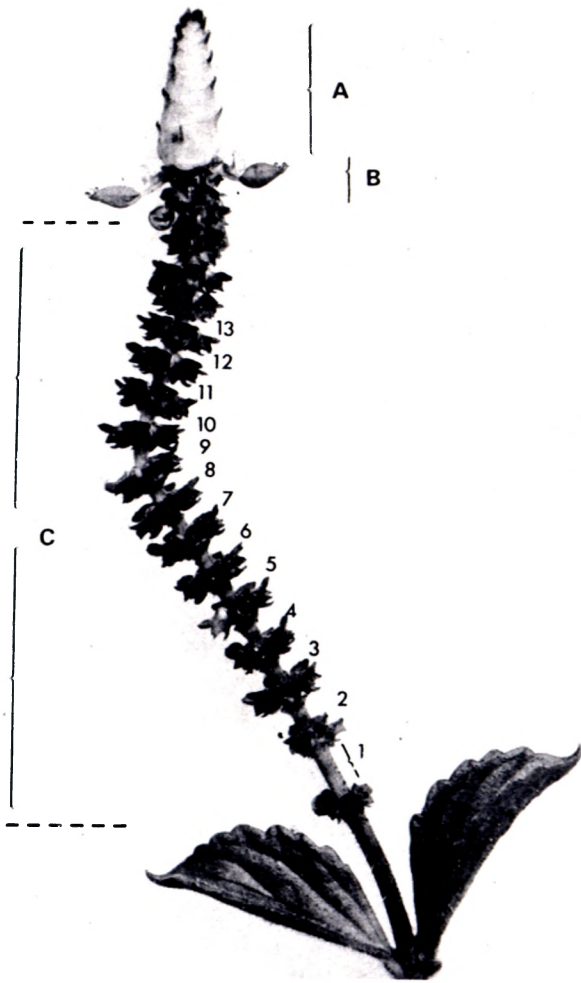


FIG. 2.—*Plectranthus neochilus*: A, region of densely imbricate, ovate, acuminate bracts; B, region of opening flowers; C, region of opened verticils showing gaps between the verticils (numbered 1–13). *Pole Evans* 4775, cultivated at Prinshof (1954–01–19).

feeding). The most active feeding times were between 11h00 and 14h00., especially on calm, bright and sunny days.

Scott Elliot (1891) recorded the following insects on *P. ecklonii* Benth.: *Apis mellifera* collecting pollen, a bombylid sucking and effecting cross-fertilization, as well as two lepidoptera.

Although the flower beds could not be observed continuously, it was clear that, as the inflorescences gradually opened and expanded, there were definite changes in the numbers and types of insects seen visiting the plants over a three week period. It is apparent that the gradual opening of the inflorescence verticil by verticil, the abundant nectar production, the small flowers, and many inflorescences on a single plant all ensure a steady visitation by pollinators over a long period.

During two months of observations in the wild, however, only megachilid bees have been observed visiting *P. neochilus*.

Plectranthus barbatus Andr. is an attractive garden plant cultivated in various parts of the world and, according to Codd (1975), it has become semi-naturalized in parts of South Africa. This plant is grown in the Pretoria National Botanic Gardens in the vicinity of *P. neochilus*, which is a less robust plant with smaller flowers. Of the insects visiting *P. neochilus*, only *Xylocopa sichelae* Vachal, *X. senior* Vachal and *Macroglossum trochilus* (Hbn.) also visited *P. barbatus*, the latter two very rarely. Both species of *Plectranthus* are new feeding records for *M. trochilus* (Hbn.).

It may be concluded that *P. neochilus* possesses inherent features, which have enabled it to be visited by a broader spectrum of insect visitors in cultivation than in the wild. The limited "garden strategy" of *P. barbatus* needs further investigation, particularly with reference to its original habitat.

ACKNOWLEDGMENTS

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UITTREKSEL

Die bestuiwings-ekologie van Plectranthus neochilus Schltr. word bespreek en vergelyk met die van 'n ander tuinplant, *P. barbatus* Andr.. Bestuiwers en blombesoekers van *P. neochilus* sluit lede van die Megachilidae, Anthophoridae, Syrphidae, Bombyliidae, Sphingidae en Apidae in.

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