THE POLLEN-COLLECTING ACTIVITIES OF SOME ANDRENID BEES

by

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Information about the pollen-collecting activities of bees is usually based on field observations. From such records it cannot be inferred whether pollen was actually collected, as bees, especially the males, also may visit flowers to suck honey or to rest. One may expect more exact data from an analysis of the pollen actually carried by the bees.

This paper deals with a study on bees of the genus *Andrena*. Some species of this genus are supposed to be oligolectic. Pollen loads were taken from preserved collection specimens and the pollen was prepared following the usual methods for the study of recent pollen.

In the greater part of the samples taken one type of pollen proved to be dominant. Apparently a bee tends to visit only one species of flower per flight. Whether a species of bee always collects from the same flower species remains to be seen. A large number of specimens should be examined before conclusions can be drawn. Also the bees should be collected at different sites so as to eliminate the influence of the local flora. We also have to take into account the floral succession throughout the season. Early flying species are restricted in their choice of supplier of pollen (e.g. *Salix*) but as the season advances other plants come into flower and may be preferred.

When a sample contained less than 5% of a different kind of pollen this was considered a contamination, either due to the preparing technique, or to unintentional addition to the normal pollen load when the bee rested on or came into contact with other plants.

The results have been compared with flower records from Van der Vecht (1928) and Stöckhert (1933).

A. florea is supposed to visit *Bryonia* only. This was confirmed by analysis of pollen loads (9 specimens).

A. fuscipes has been recorded mainly from *Calluna*, but also from *Cirsium*, *Jasione*, *Erica* and *Epilobium*. On the four specimens examined only *Calluna* was found.

A. hattorfiana is said to visit *Knautia* and also *Scabiosa*, *Trifolium*,

Taraxacum, *Cichorium* and *Armeria*. In 36 samples from widely different localities *Knautia* was found to be highly dominant. *Centaurea* and other composites were found also.

A. denticulata seems to visit mainly composites, viz., *Senecio*, *Crepis*, *Hieracium*, *Hypochoeris*, *Solidago*, *Heracleum*, *Achillea* and *Centaurea*, but also *Selinum*, *Jasione* and *Lythrum*. In two samples only Compositae liguliflorae, Compositae tubuliflorae and *Centaurea* were found.

A. ovatula for its first generation is known from *Salix*, *Potentilla verna*, *Stellaria media*, *Ajuga reptans*, *Brassica rapa*, *Genista anglica*, *Taraxacum*, *Trifolium* and *Veronica*. For the second generation there are records known from *Calluna vulgaris*, *Potentilla silvestris*, *Thymus serpyllum*, *Medicago*, *Melilotus*, *Jasione*, *Chrysanthemum vulgare* and *Heracleum*. The 15 analysed pollen loads were all taken from summer-generation specimens and were found to contain mainly Papilionaceae pollen in five different types, e.g. *Dorycnium*, *Trifolium*, *Vicia* and *Lotus*. One sample contained, beside the types mentioned, 37% *Sedum*, a second sample 6% Caryophyllaceae, and a third 5% *Cistus*. In 27 samples yet to be analysed quantitatively the same preference for Papilionaceae seems to exist.

A. haemorrhoa is recorded to visit mainly *Salix* and *Taraxacum*, but also *Viburnum*, *Ribes*, *Crataegus*, *Trifolium*, *Potentilla* and *Berberis*. The four specimens examined, all collected in April, carried mainly *Salix*. At that time of the year only few plants are flowering. As the species flies from March till June there is no reason to presume that *Salix* is the only important source of pollen.

Of *A. truncatilabris* no flower records are known to me. Eleven samples were examined and all contained Cruciferae pollen, in eight of these samples even 98% or more. In three samples Labiatae were found: 86%, 58% and 36%; the first of these samples also contained 7% *Vicia* pollen.

A. bicolor has two generations. The first generation is recorded to fly on *Salix*, *Potentilla*, *Capsella*, *Sinapis*, *Taraxacum*, *Tussilago*, *Veronica* and *Stellaria*, the second on *Campanula*, *Jasione*, *Berteroa*, *Thymus*, *Convolvulus*, *Malva* and *Rubus*. In the samples taken from this species of *Andrena* Cruciferae, Compositae liguliflorae and *Campanula* were found most frequently (in 11, 7 and 7 out of 23 samples, respectively). Other pollen grains met with were from *Potentilla* (in 2 samples), *Rubus* (2) and other Rosaceae (2), Compositae tubuliflorae (2), *Malva* (2), *Salix* (1), Ericaceae (1), *Bryonia* (1), *Crataegus* (1), *Cistus* (1), *Nuphar* (1), Labiatae-*Prunella* type (1), Umbelliferae (1) and *Ornithogalum* (2 samples from the same locality).

Some more species have been examined, but the specimens available for investigation were too few, as the collection that could be used for my studies

(Rijksmuseum van Natuurlijke Historie, Leiden) has been made for purely taxonomical purposes and the specimens consequently have been largely cleaned of pollen.

From the results reported upon above it is apparent that the analysis of pollen loads will add many a species to the known flower records of the *Andrena* species obtained in the field. The many additional records for *A. bicolor* form an excellent example. The question whether a species is as oligolectic as it was supposed to be is less easily answered. In the case of *florea* the earlier observations are clearly confirmed, and, to a certain extent, this also can be said of *hattorfiana* and *fuscipes*. As to the other species, statistical methods may bring to light preferences for certain types of flowers; with *denticulata*, *truncatilabris* and *bicolor* the results of the present study already seem to point in that direction.

We should, however, realize that whether an Andrenid bee really selects certain species of flower is still a question, that remains to be seen. The selection of a suitable nesting site might be of primary importance, while the bees then visit all plants flowering nearby to collect pollen. And for a clarification of that problem we have to return, once again, to the indispensable field observer for more observations.

References

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