

Observations of *Halictus confusus* Smith (Hymenoptera:
Halictidae) on Woodland and Field Flowers¹

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Abstract

The native bee (*Halictus confusus*) has been recorded from at least 165 host plant species. Observations were made of a local nest population for 4 years. These indicated that the flowers visited by bees during the warm months of the year reflected availability and, possibly, selectivity. Events of 1964 were typical and are reported.

Spring beauty (*Claytonia virginica* L.), toothwort (*Dentaria laciniata* Muhl.), dandelion (*Taraxacum officinale* L.), and winter cress (*Barbarea vulgaris* R. Br.) were visited most frequently during April and May. Nectar and pollen were obtained principally from white clover (*Trifolium repens* L.) and red clover (*T. pratense* (Mill.) Schreb.) during the summer period of nest expansion.

The native bee, *Halictus confusus*, is a polylectic species with a wide range of floral hosts throughout the growing season in the eastern United States (3). While studying the ecological life history of this species at the Purdue University Entomological Research Area near West Lafayette, Indiana, in 1964, observations were made of the interrelationship of a nesting population of *H. confusus* and plants having conspicuous flowers within 200 yards of the nesting site from April to October.

Although *H. confusus* has been recorded on at least 165 species of plants (1, 2, 3), this extensive floral record does not reflect the utilization of regional flora by a local nesting population. In the results reported here, only 22 plant species were frequented in the forage area by the bee colony investigated, and only 6 species were considered important to colony nutrition (Table 1).

During April, the newly-emerged queen bees showed a marked preference for spring beauty (*Claytonia virginica* L.) in the woodland areas adjacent to the colony site on a field hilltop. At this time, the trees were still without foliage and the forage area of the woodlands was well lighted in favorable weather. Most of the floral visits to spring beauty were for nectar to be used in personal nutrition, although several observations of pollen feeding and one sighting of pollen collection on the scopae were recorded on this plant. Pollen collection was indicative

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of early nest provisioning for the next brood generation. Toothwort (*Dentaria laciniata* Muhl.), which bloomed at the same time and in the same areas, was also visited by the females but to a lesser extent.

TABLE 1. *Plants visited by Halictus confusus Smith in the Purdue University Entomological Research Area, 1964.*

Host plant	Range of observation dates	No. days bees observed	Plant product collected ¹
Spring beauty ²	April 8-26	3	N
Toothwort ²	April 23-26	2	N
Dandelion ²	April 23-May 20	6	P
Redbud	May 3	1	N
Winter cress ²	May 4-18	8	P
Shepherd's purse	May 6	1	N
Mouse-ear chickweed	May 18	1	N
Blackberry	May 22	1	N
White clover ²	May 22-July 30	11	P
Yarrow	June 5	1	N
Hop clover	June 9	1	N
Red clover ²	June 10-July 29	15	P
White sweet clover	June 19	1	N
Crown vetch	June 27	1	N
Wild rose	June 29	1	N
Yellow sweet clover	July 3	1	N
Wild carrot	July 13-16	2	N
Daisy fleabane	July 16	1	N
Horse nettle	July 19	1	N
Japanese lespedeza ³	September 5	1	N
White heath aster ³	September 18	1	N

¹Symbol (P) denotes pollen and nectar being collected, while (N) represents nectar only.

²Multiple observations on date of observations.

³Only male(s) observed on host plant.

As these woodland flowers waned in late April, the bees shifted suddenly to dandelion (*Taraxacum officinale* (L.) Weber) as this flower attained a conspicuous bloom in the fields near the nesting site during the last week of April and the first few days of May. The visits to dandelion blossoms were primarily for personal nutrition. About the first week of May, winter cress (*Barbarea vulgaris* R. Br.) began to bloom in large conspicuous stands in nearby orchards and fields. As it became common, *H. confusus* females deserted the dandelions and for the next several weeks were found on the blossoms of this plant during favorable weather. Coincidentally, provisioning of brood cells in the nests became commonplace as this floral species began to bloom. The pollen and nectar collected from winter cress probably provided

more than 95% of the material from which the pollen balls of the first brood were fashioned by the overwintered females. By the end of the third week in May, the last utilization of this plant was witnessed as it entered a fruiting stage.

During late May, flowers in the nearby fields and orchards were scarce and the bees were observed spending more time than usual in the field, presumably searching for the few winter cress blossoms still left or looking for alternate sources of nutrients. At this time, the longest flights of 1964 took place with 10 flights for pollen, taking from 60 to 138 minutes, whereas the seasonal average was about 30 minutes. At this time, single observations were recorded for mouse-ear chickweed (*Cerastium vulgatum* L.) and blackberry (*Rubus* sp.), suggesting that a search for a preferred floral host was in progress.

At the conclusion of this period of flower scarcity, the females became inactive and the nests became sealed as the adults remained in the nests with their developing broods. This period extended from May 26 to June 6, 1964. As the first brood-worker females emerged, conspicuous flowers were in bloom in the forage areas, such as yarrow (*Achillea millefolium* L.), daisy fleabane (*Erigeron strigosus* Muhl.), and white daisy (*Chrysanthemum leucanthemum* L.). Although a few visits were recorded to these composites (white daisy visited by *H. confusus* on June 5, 1965), the summer workers favored white clover (*Trifolium repens* L.) and red clover (*T. pratense* (Mill.) Schreb.) as the major sources for nectar and pollen during the June and July nest expansion and provisioning period. During this time, *Halictus ligatus* Say, a related species coexisted with *H. confusus* by nesting in the same nesting site. However, interspecific competition was apparently avoided in part by preference of floral hosts since *H. ligatus* was common on the flowers of yarrow, daisy fleabane, and white daisy and uncommon on white clover and red clover, just the opposite of *H. confusus*.

Halictus confusus adults were observed 1 to 3 times only on redbud (*Cercis canadensis* L.), shepherd's purse (*Capsella bursa-pastoris* (L.) Medic.), hop clover (*T. agarium* L.), white sweet clover (*Melilotus alba* Desa.), wild rose (*Rosa* sp.), yellow sweet clover (*M. officianalis* (L.) Lam.), horse nettle (*Solanum carolinense* L.), wild carrot (*Daucus carota* L.) in the order first observed in the field.

In late summer and fall as clovers became scarce, the newly-emerged males and females fed on the available flowers, such as Japanese clover (*Lespedeza lineata* (Thumb.) H. and A.) and white heath aster (*Aster ericoides villosus* (Mich.) Voss). Since these females were destined to be the overwintering brood, they did not construct cells and collect pollen provisions.

The only other nutrient observed to be collected by *H. confusus* was perspiration, presumably for the salt content. Although Stevens (4) reported this species to be a common "sweat bee" in North Dakota, the behavior of "sweat bees" in feeding on the perspiration of one's bare skin was not observed in *H. confusus*, nor could it be induced. In the nesting site, *Dialictus imitatus* (Smith) and a larger species,

probably *D. zephyrus* (Sm.), were common "sweat bees" on hot and humid days but were not joined by *H. confusus* individuals. The manner in which this species fed upon perspiration was to land on artificial objects that had been handled such as stakes, paper bags, etc., and feed upon the perspiration residue. There was one record of a female *H. confusus* hovering about the eyes of the observer for several minutes in the manner of an eye gnat.

Some species of flowers seemed to be visited for nectar only. In central Indiana, five species of milkweed were observed to have male and female bee visitors for nectar only. Whorled milkweed (*Asclepias verticillata*) was quite attractive to *H. confusus* during midsummer in the general Lafayette, Indiana, area. Both sexes transported pollinia in interblossom transfer, but these were never found in pollen balls within a nest.

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