

Color Variation in Some Common Species of Bumble Bees (Hymenoptera, Bombidae)

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Introduction

Since the coloration of the pile of bumble bees is of such importance in the separation of species it seems well to note any deviation in color pattern from that which is regarded as typical. Some species have a wide variation of color pattern and when such variations are of more or less common occurrence they have been described as "color variants." Other species are remarkably stable in their coloration and it is mainly with these species in which the color pattern seldom varies that this article deals. These variations are for the most part discontinuous colorations, usually of a different color, and not an overlapping or encroachment of the pile of one portion onto that of another portion. All of the specimens reported in this paper are in the collection of the author unless otherwise noted.

Variant Individuals

Bombus (Bombias) auricomus (Robertson).—On May 15, 1952, a queen of this species was taken on rose acacia by the author at West Lafayette, Indiana. The specimen has a broad apical fringe of yellow pile on the fourth abdominal tergite, the yellow color of the fringe being considerably lighter than the yellow pile present on the second and third abdominal tergites. It is very common for individuals of *B. auricomus* to have the first abdominal tergite covered with yellow pile in varying proportions but seemingly quite uncommon for any of the abdominal tergites after the third to bear other than black pile, especially if this coloration is discontinuous. Males of the species rarely have some yellow on the fourth abdominal tergite according to Franklin (1).

Bombus (Separatobombus) griseocollis (DeGeer).—A color condition frequently met with in examining bumble bees is the presence of a small tuft of white, yellow or ferruginous pile located conspicuously on some one of the abdominal tergites which typically is covered with black pile. This type of aberrant coloration has been termed "flecking" by the author simply as a matter of convenience in describing it.

On May 20, 1953, a queen of *B. griseocollis* was collected by the author as she visited rose acacia. On the extreme left side of the second abdominal tergite is a small, but very noticeable, tuft of white pile.

Bombus (Pratobombus) bimaculatus Cresson.—Two queens, both from the Purdue Student Collection and labelled Lafayette, Indiana, differ markedly in coloration from the typical species and its described color variants. One queen has the yellow pile of the second abdominal tergite extending to the apical margin on the left side only; the other queen has an apical median patch of white pile on the second abdominal tergite, discontinuous with the basal median patch of yellow pile on that tergite.

Bombus (Pratobombus) impatiens Cresson.—*Bombus impatiens* might be considered somewhat unique in that it is one of the very few species in the subgenus *Pratobombus* not to have described color variants. The yellow pile of the abdomen is usually confined to the first tergite in both sexes; however, it is not too uncommon for the yellow pile of the first abdominal tergite to overlap onto the second. In a few instances, the yellow pile on the second tergite occupies fully as much of this tergite as it does in certain specimens of *Bombus bimaculatus*. When this is the case students often confuse the two species. The two species are readily separated by the difference in the length of the malar space, differences in the labrum, etc., but these characters are seldom listed in the available keys to the species. A number of specimens of *B. impatiens* with yellow pile on the second abdominal tergite have been taken in Indiana.

A distinct color variation is noted in two queens of this species taken in West Lafayette during the spring of 1952. One individual was collected by Mr. Charles Ash, the other by an unidentified student. Both specimens have the entire right half of the second abdominal tergite covered with bright ferruginous pile. The left half of this tergite is covered with black pile in both specimens.

A male taken October 6, 1952, in West Lafayette has an apical fringe of whitish pile on the second abdominal tergite. This fringe is very broad on the right half of the tergite and includes the basal portion of the third tergite on this side. The third abdominal tergite has an apical fringe of ferruginous pile extending completely across the tergite, the extreme left portion being a white blotch continuous with the ferruginous fringe.

"Flecking" is quite common in this species, the following examples being noted:

A queen, which escaped capture (May 15, 1952), had an apical, median, ferruginous patch on the second abdominal tergite. Two other queens from the Purdue student collection exhibit this same coloration.

Two workers, one from West Lafayette, Indiana, collected by the author and the other from Hole-In-Rock (Douglas Co.), Kansas, collected by Dr. W. R. Enns, have an apical, median white patch on the second abdominal tergite.

A queen observed May 12, 1952 visiting rose acacia on the Purdue University campus had an apical fringe of white pile on the left side of the second abdominal tergite but this individual escaped.

Bombus (Pratobombus) perplexus Cresson.—In addition to the aberrant colorations reported above, it may be of importance to note the coloration of the pleurae in three workers of *B. perplexus* taken by Mr. Charles Ash in Berrien Co., Michigan. In all three specimens the pleurae are yellow to the leg bases. Individuals so colored cannot be run through most of the keys since typically the pleurae of *B. perplexus* females are dark.

Bombus (Fervidobombus) americanorum (Fabricius).—A queen taken in Clay Co., Indiana on June 14, 1953 by Mr. Bill Butt has an apical, median patch of yellow pile on the fourth abdominal tergite.

Psithyrus (Laboriopsithyrus) laboriosus var. *citrinus* (Smith).—This color variant differs from the typical form (in the male) by having the first three abdominal tergites yellow instead of only the first two. An

unlabelled male, taken from the Purdue Student Collection, has a basal median patch of light yellow pile extending almost to the apical margin of the fourth abdominal tergite.

Distribution Notes

Neither Franklin (1) nor Milliron (2) recorded *Psithyrus (Laboriopsithyrus) variabilis* (Cresson) from Michigan. The author has three females in his collection taken at the Michigan Dunes State Park on June 10, 1950. This species is an inquiline in the nests of *Bombus americanorum*.

Bombus (Subterraneobombus) borealis Kirby has previously been reported from Marshall and Lake Counties, Indiana. A queen of this species was taken by Prof. R. T. Everly of the Purdue Agricultural Experiment Station in LaGrange County, Indiana on August 27, 1952 visiting red clover. On August 13, 1953, Mr. Everly again collected this species on red clover north of Howe in LaGrange County. A total of five specimens were taken including one queen, three workers and one male. This is the first record of a male of *B. borealis* from Indiana. A worker was taken visiting red clover in Noble County by Mr. Everly on August 12, 1953.

Literature Cited

1. FRANKLIN, HENRY F. 1912. The Bombidae of the New World. Trans. Amer. Ent. Soc. 38:177-486.
2. MILLIRON, HERBERT E. 1938. The taxonomy and distribution of Michigan Bombidae, with keys. Papers Mich. Acad. Sci. Arts and Letters 24:167-182.