The Bumble Bees of Florida, *Bombus* spp.[1]

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Introduction

Most bumble bees are large, social bees that produce annual colonies. Mated queens overwinter in the soil and emerge from hibernation in early spring when they feed on spring flowers and search for a suitable location, such as a former rodent burrow in the soil, to begin their colonies. These are beneficial insects that pollinate many native and ornamental plants. They can sting severely, so problem nests near human dwellings should be removed by experienced pest control operators.

Figure 1. Adult bumble bee, *Bombus* sp.

Distribution

All of the social bumble bee species found in Florida range as far north as Canada (Laverty and Harder 1988). Bumble bees are less common in southern Florida. None are known from the Florida Keys. Two species, *Bombus griseocollis* and *Bombus pensylvanicus*, are known from Collier County whereas a third species, *B. impatiens*, has been collected in western Palm Beach County.

Description

Bumble bees are easily recognized by the corbicula (pollen basket) on the hind tibiae in the females. Honey bees are the only other bees in Florida with this structure, but are easily recognized by their smaller size, hairy eyes, and lack of hind tibial spurs. Large carpenter bees are often misidentified as bumble bees, but these are readily distinguished from bumble bees primarily due to the absence of pubescence on the dorsum of the carpenter bee abdomen, which is somewhat shiny.

The five species of bumble bees found in Florida are usually separated by the pattern of the black and yellow pubescence.

A number of non-social *Bombus* species lost their social behavior and the ability to collect pollen, and are now cleptoparasites on colonies of pollen-collecting *Bombus* species. These cleptoparasitic species were previously listed as being in the genus Psithyrus (ITIS 2011), and are now

1. This document is EENY-050 (originally published as DPI Entomology Circular No. 353), one of a series of the Department of Entomology and Nematology, UF/IFAS Extension. Original publication date August 1998. Revised December 2011 and December 2014. Reviewed January 2018. Visit the EDIS website at http://edis.ifas.ufl.edu. This document is also available on the Featured Creatures website at http://entomology.ifas.ufl.edu/creatures.

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sometimes listed as a sub-genus. The parasitic species are easily distinguished by the lack of the corbicula. The most common of this group found in Florida is B. variabilis.

Figure 2. A bumble bee, *Bombus* sp., with full pollen basket.
Credits: Tony Wills, en.wikipedia.org

Figure 3. A bumble bee emerging backwards from her nest.
Credits: 'Pahazzard,' en.wikipedia.org

Biology and Life Cycle

Once a nest site is found, the social bumble bee queen collects pollen and lays her first brood of worker eggs. Workers emerge about 21 days after the eggs are laid and take over the duties of pollen and nectar collection as well as colony defense. The size of the workers increases with each new brood. A third caste of bumble bees, the males, is usually produced in midsummer.

List of Social Species in Florida

Bombus bimaculatus Cresson 1863, the twospotted bumble bee. Its range extends from Ontario to Maine, south to Florida, and west to Illinois, Kansas, Oklahoma, and Mississippi. Florida county records include Alachua, Clay, Franklin, Highlands, Lake, Levy, Marion, Okaloosa, and Orange.

Figure 4. Adult female twospotted bumble bee, *Bombus bimaculatus* Cresson.
Credits: John Baker, en.wikipedia.org

Bombus fraternus (Smith) 1854, the southern plains bumble bee. Its range extends from New Jersey to Florida, and west to North and South Dakota, Nebraska, Colorado and New Mexico. Florida county records include Alachua, Franklin, Gadsden, Levy, Liberty, Orange, and St. Johns.

Figure 5. Adult female southern plains bumble bee, *Bombus fraternus* (Smith).
Credits: Johnny N. Dell, www.insectimages.org

Bombus griseocollis (DeGeer) 1773, the brown-belted bumble bee. Its range extends from Quebec and Maine to Florida, and throughout the American West (DL 21011). Florida county records include Alachua, Clay, Collier, Highlands, Marion, and Osceola.

Figure 6. Adult female brownbelted bumble bee, *Bombus griseocollis* (DeGeer).
Credits: Charles Schurch Lewallen

Bombus impatiens Cresson 1863, the common eastern bumble bee. This species is native from Ontario to Maine and south to Florida and was introduced in California and in British Columbia, Canada (EOL 2011). Florida county records include Alachua: Bradford, Calhoun, Escambia, Franklin, Jackson, Gadsden, Highlands, Levy, Liberty, Okaloosa, Orange, Palm Beach, Polk, and Santa Rosa.

Figure 7. Adult female common eastern bumble bee, *Bombus impatiens* Cresson.
Credits: David Cappaert, Michigan State University; www.insectimages.org

Bombus pensylvanicus (DeGeer) 1773, the American bumble bee. Its range extends from Quebec and Ontario, Maryland south to Florida, then west to Minnesota, South Dakota, Nebraska, Colorado, New Mexico, and Mexico (Anonymous 2011). Florida county records include Alachua, Bradford, Collier, Escambia, Flagler, Highlands, Lake, Lee, Levy, Marion, Orange, Putnam, Sarasota, and Santa Rosa.

Figure 8. Adult female American bumble bee, *Bombus pensylvanicus* (DeGeer).
Credits: 'Skoch3', Wikipedia

Bombus terricola Kirby 1837, the yellow-banded bumble bee. Originally, this species extended from Nova Scotia to Florida, west to British Columbia, Montana and South Dakota. While once common, it has declined dramatically since 1990 (Anonymous 2011). No specimens seen from Florida, but recorded from Florida by Mitchell (1962).

Figure 9. Adult female yellow-banded bumble bee, *Bombus terricola* Kirby.
Credits: Mardon Erbland

Key to the Bumble Bees in Florida

1. Antenna with 12 segments; abdomen with six visible terga; tip of abdomen pointed, with stinger; corbiculae on hind tibiae (not *Psithyrus*); active all summer; females (queens and workers) 2

1'. Antenna with 13 segmenta; abdomen with seven visible terga; tip of abdomen round, no stinger; hind tibia lack corbiculae; active from middle of summer till winter; males 7

2. Hind tibia relatively slender, without corbicula; clepto-parasitic forms . . . . . *B. variabilis*

2'. Hind tibia with well developed corbicula (pollen-collecting *Bombus* spp.) 3

3. Posterior half of scutum and all of scutellum with black pubescence (Figure 10-2) . . . . . *B. pensylvanicus*

3'. Posterior half of scutum and scutellum with some yellow pubescence 4

4. Dorsum of thorax with a conspicuous, transverse band of black pubescence between wing bases (Figure 10-1) . . . . . *B. fraternus*

4'. Dorsum of thorax without transverse black band between wing bases 5

5. Tergum II of abdomen entirely black (Figure 10-3) . . . . . *B. impatiens*

5'. Tergum II of abdomen with yellow pubescence medially at base (Figures 10-4 and 5) 6

6. Lateral ocellus distinctly below supraorbital line (Figure 10-6) . . . . . *B. griseocollis*

6'. Lateral ocellus at level of supraorbital line (Figure 10-7) . . . . . *B. bimaculatus*

7. Hind tibia convex, densely pubescent on outer surface; gonostylus much exceeding apex of gonocoxites; clepto-parasitic forms . . . . . *B. variabilis*

7'. Hind tibia somewhat flattened, sparsely pubescent on outer surface; gonostylus not much exceeding apex of gonocoxite (pollen-collecting *Bombus* spp.) 8

8. Eyes usually converging above, lateral ocelli nearer margins of eyes than to each other; malar space no more than 1/4 basal width of mandible 9

8'. Eyes about parallel, lateral ocelli closer to each other than to eye margins; malar space about as long as basal width of mandible 10

9. Malar space nearly obliterated; eye nearly touching base of mandible . . . . . *B. fraternus*

9'. Malar space distinct; eye somewhat removed from base of mandible . . . . . *B. griseocollis*

10. Dorsum of thorax with a median band of black pubescence . . . . . *B. pennsylvanicus*

10'. Dorsum of thorax entirely yellow pubescent or with median patch of black hairs that don't reach tegulae 11

11. Segment two of abdomen entire black pubescent . . . . . *B. impatiens*

11'. Segment two of abdomen with at least some yellow pubescence . . . . . *B. bimaculatus*

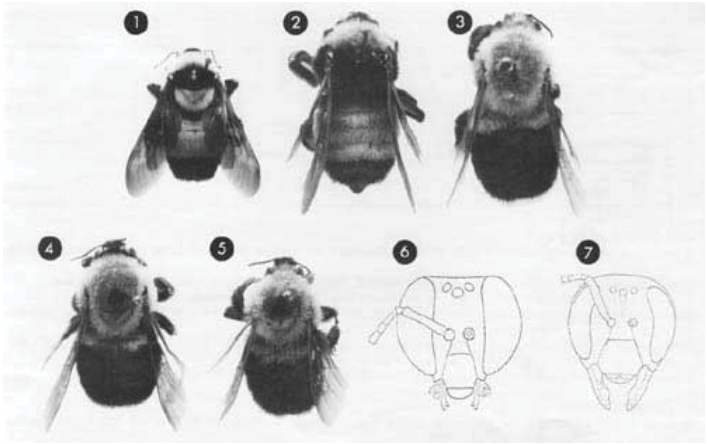

Figure 10. Figures of Florida *Bombus* spp. 1. *B. fraternus*, 2. *B. pensylvanicus*, 3. *B. impatiens*, 4. *B. griseocollis*, 5. *B. bimaculatus*, 6. *B. griseocollis*, 7. *B. bimaculatus*.
Credits: Division of Plant Industry

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