Key 2 – Key to Insects Orders

Notes:
- This key covers insect orders commonly and occasionally observed. However, it does not include all orders. Key #1 is similar, but easier, being limited to insect orders commonly associated with gardening and landscape maintenance.
- This simplified key covers insects showing common characteristics for the order. Species with atypical appearances will not work with this simplified key.

1a. Wings present. — go to 2
1b. Wings absent. — go to 9

(1a) 2a. One pair of membranous wings. The insect may look like a fly or bee. (Look carefully for a second pair of wings hidden beneath the front pair.) — Diptera (flies) [details page 313-4]
2b. Two pair of wings present. — go to 3

(2b) 3a. Front and hind wings not similar in texture. Front wings parchment-like, shell-like or leathery or thickened. Hind wings more delicate or membranous. — go to 4
3b. Front and hind wings similar in texture. Either membranous, transparent or covered with powdery-like scales. — go to 7

(3a) 4a. Chewing mouthparts. — go to 5
4b. Piercing-sucking mouthparts. — go to 6
5a. Leathery front wings, without veins, lay over body in a shell-like fashion, making a straight line between wings. Hind wings membranous. No cerci (tail-like appendages). —– **Coleoptera** *(beetle)* [details page 313-2]

5b. Front wings more or less parchment like with a network of veins. Hinds wings membranous, usually broad with folds like a fan. Hind leg enlarged for jumping —– *Orthoptera* *(grasshoppers, crickets, katydids)* [details page 313-15]

5c. Front wings more or less parchment like with a network of veins. Flattened bodies, thread-like antennae — *Blattaria* *(cockroach)* [details page 313-2]

5d. Front wings more or less parchment like with a network of veins. Front legs modified to catch and hold prey. —– *Mantodea* *(mantids)* [details page 313-14]


6a. Front wings thickened at base but membranous and overlapping at tips, so that the wings form a triangle pattern on the back. Beak-like mouthparts usually easily visible and appears to arise from front of head, ahead of eyes. —– *Hemiptera* *(true bugs)* [details page 313-7]

6b. Wings membranous folded tent-like at rest. Beak-like mouthparts not very visible and appear to arise from the area between the front pair of legs. —– *Homoptera* *(leafhoppers, treehoppers)* [details page 313-8]
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(3b)  7a. Wings membranous — go to 8

7b. Wings usually covered with powdery-like scales. Mouthparts in the form of a coiled up tube beneath the head. — *Lepidoptera* (butterflies, moths) [details page 313-12]

7c. Wings very narrow and fringed with hair. Tiny insect (less than 1/8 inch). Foot ending in balloon-like swelling. — *Thysanoptera* (thrips) [details page 313-17]

7d. Wings covered with fine hairs, held roof-like over body at rest. Looks like moth with hairy wings. Long antennae extended back over body. — *Trichoptera* (caddisfly) [details page 313-18]

7e. Body membranous — go to 8

(7a)  8a. Piercing-sucking mouthparts. Beak-like mouthparts not very visible and appear to arise from the area between the front pair of legs. Wings generally held roof-like over body when at rest. — *Homoptera* (aphids, cicadas, leafhoppers, psyllids, treehoppers, whiteflies) [details page 313-8]

8b. Front wing usually larger than hind wing. Wings may be connected. Chewing or chewing sucking mouthparts. Bee, wasp, hornet like. — *Hymenoptera* (bees, wasps, hornets, wings ants) [details page 313-9]

8c. Large wings in comparison to petite body. Wings usually with many veins and cross veins, held roof-like over body when at rest. Mouthparts chewing. No cerci (tail-like appendages). — *Neuroptera* (lacewing) [details page 313-14]


8e. Tiny (less than 1/8 inch). Wings held roof-like over body when at rest. Veins prominent. Hair-like antennae as long or longer than body. Whitish body. — *Psocoptera* (book lice) [details page 313-16]
8f. Insect dominated by very large eyes. Wings elongated, highly veined. Slender, needle-like body. Chewing mouthparts used to capture and consume prey in flight. —*Odonata* (dragonflies and damselflies) [details page 313-15]

8g. Elongated wings fold flat over body when at rest. Long thread-like antennae. Two tail-like filaments. —*Plecoptera* (stonefly) [details page 313-16]

8h. Front wings large and triangular shaped. Hind wings small and rounded. Held vertical over body. Two-very long tail-like filaments. —*Ephemeroptera* (Mayfly) [details page 313-6]

9a. Piercing-sucking mouthparts. — go to 10

9b. Chewing mouthparts. — go to 11

9c. Rasping-sucking mouthparts. Tiny (less than 1/8 inch), slender insects. Balloon-like swelling on end of foot. Often noticed by scarring and deformation of leaves and flowers where it feeds. —*Thysanoptera* (thrips) [details page 313-17]

10a. Bug-like with jointed beak. Mouthparts usually easily visible and appear to arise from front of head, in front of eyes. —*Hemiptera* (true bugs) [details page 313-7]

10b. Bug-like with jointed beak. Mouthparts not very visible and appear to arise from the area between the front pair of legs. —*Homoptera* (aphids, cicadas, leafhoppers, etc.) [details page 313-8]

10c. Tiny, hard bodied, flattened sideways, covered with bristles that project backwards. Large hind legs designed for jumping, fast moving. —*Siphonaptera* (fleas) [details page 313-17]
10d. Small, flattened parasites of animals and people. Forelegs with claw designed to grasp hair or feathers. Head narrower than thorax. — *Anoplura* (sucking lice, including head lice and body lice) [details page 313-1]

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(9b) 11a. Larva-like (caterpillar-like, grub-like, maggot-like). — go to 12

11b. Bug-like with tail-like features (cerci, filaments). — go to 15

11c. Ant-like. — go to 16

11d. Dragon-like. — go to 17

11e. Tiny, bug-like. — go to 18

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(11a) 12a. Caterpillar-like: soft bodied, three pair of legs on thorax, fleshy leg-like prolegs on abdomen. — go to 13

12b. Grub-like: head capsule, three pair of legs on thorax, no legs on abdomen. — typical of *Coleoptera* (beetle grub) [details page 313-2]

12c. Legless — go to 14

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(12a) 13a. Up to five pair of prolegs on abdomen. — *Lepidoptera* (butterfly and moth caterpillar) [details page 313-12]
13b. Six or more pair of prolegs on abdomen. —— *Hymenoptera* (sawfly larva) [details page 313-6]

(12c) 14a. Maggot-like: no legs, no head capsule, mouth-hooks. —— typical of *Diptera* (fly maggot) [details page 313-5]

14b. Legless with enlarged head area. —— typical of *Coleoptera* (borer larva) [details page 313-2] and some *Hymenoptera* larva [details page 313-9]

(11b) 15a. Elongated flattened body with distinct forceps-like pinchers (cerci). —— *Dermaptera* (earwigs) [details page 313-4]

15b. Hind legs designed for jumping. Antennae tread-like. One pair of tail-like cerci on most adults. —— *Orthoptera* (grasshoppers, crickets, katydids) [details page 313-15]

15c. Flattened body, long thread-like antennae. —— *Blattaria* (cockroaches) [details page 313-2]

15d. Front legs designed for grasping and holding prey. Body elongated. Long, thread-like antennae. —— *Mantodea* (mantids) [details page 313-14]

15e. Very elongated, stick-like insect. —— *Phasmida*, (walkingstick) [details page 313-16]

15f. Two or three long, tail-like cerci. Fast moving. Small 1/4 to 1/2 inch. —— *Zygentoma* (Silverfish, firebrats) [details page 313-18]

15g. Tiny (1-2 mm) soft-bodied insect. “Springtail” often present, used to jump. —— *Collembola* (springtail) [details page 313-4]
(11c) 16a. Three distinct body segments. Ant like with narrow ant waist. Elbowed antennae. —– *Hymenoptera* (ant) [details page 313-9]

16b. Looks like a fat ant with out a narrow waist. Creamy white. Straight beaded antennae. —– *Isoptera* (termite) [details page 313-11]

(11d) 17a. Generally dark colored with bright markings and spines. Lacking jaw as in 17b. —– *Coleoptera* (lady beetle larva) [details page 313-2]

17b. Forward-projecting, curved pointed jaws designed to grasp prey, which they crush and suck out the insides of their prey. —– *Neuroptera* (antlion) [details page 313-14]

17c. Aquatic nymphs. —–

* Coleoptera (aquatic beetle larva) [details page 313-2]

* Diptera (mosquito larva) [details page 313-5]

* Ephemeroptera (Mayfly naiads) [details page 313-6]

* Odonata (dragonfly and damselfly naiads) [details page 313-15]

* Plecoptera (stonefly naiads) [details page 313-16]

* Trichoptera (caddisfly naiads) [details page 313-18]
18a. Tiny parasite of birds. Flattened body. Head as wide or wider than thorax. — *Mallophaga* (chewing or biting lice) [details page 313-13]

18b. Tiny, less than 1/8 inch. Hair-like antennae as long or longer than body. Whitish body. — *Psocoptera* (book lice) [details page 313-17]