

What is an insect?



Arthropods comprise a phylum, or group, of animals with jointed legs and their skeleton on the outside covering the soft internal organs. Insects are arthropods with well-defined head, thorax and abdomen, three pairs of legs, antennae, and one or two pairs of wings. Mites and spiders are very common arthropods sometimes confused with insects, but they have only two body regions, eight legs, and no antennae.

Insects appeared on earth over 400 million years ago and have been evolving ever since into the largest and most diverse group of organisms. More than a million species of insects are known, but many remain to be discovered. Estimates of how many insect species remain to be discovered vary widely from three million to 30 million. Insects and mites include many species that are major plant feeders. Some also carry important diseases of man, animals or plants.

Where are insects found?

Insects are found in almost all terrestrial habitats of the planet including polar areas where a few species are found on birds or lichens. Many insects are especially adapted to fresh water and a few can be found in the oceans. Every plant has its own array of insects and mites, chewing or sucking its leaves, or visiting flowers to take pollen or nectar in exchange for pollination. Many other insects and mites are predators or parasites of the plant feeders.



How do insects and mites harm plants?

Most insects have formidable jaws to chew plant tissues, but some insects, and all mites and true bugs have sucking mouthparts to ingest plant juices.

Some insects and mites form galls, some are vectors of plant diseases, and others attack seeds, roots, flowers, buds or fruits. Insects are our main competitors for food and other plant products.

The immature stages of insects are often very different from the adult stage (example: caterpillar → butterfly), and frequently have different habits. Very often it is the immature stage that is the most damaging.



definitions

arthro•pod: any invertebrate of the phylum Arthropoda, having a segmented body, jointed limbs, and usually a chitinous shell that undergoes moltings, including the insects, spiders and other arachnids, crustaceans, and myriapods.

in•sect: any animal of the class Insecta, comprising small, air-breathing arthropods having the body divided into three parts (head, thorax, and abdomen), and having three pairs of legs and usually two pairs of wings.

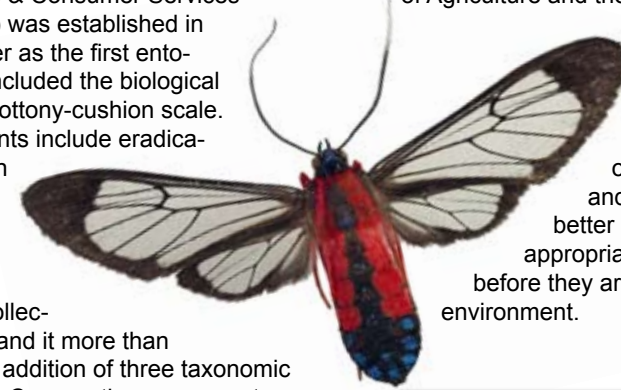
mite: along with the tick, belongs to the class Arachnida. Mites are among the most diverse and successful of all the invertebrate groups.

true bug: a wingless or four-winged insect of the order Hemiptera, especially of the suborder Heteroptera, including the bedbug, louse and chinch bug, having mouthparts adapted for piercing and sucking.

History of the Entomology Section

To help combat the multitude of insect pests in Florida, the Florida State Plant Board (now the Florida Department of Agriculture & Consumer Services Division of Plant Industry) was established in 1915 with Dr. E. W. Berger as the first entomologist. Early projects included the biological control of whiteflies and cottony-cushion scale. Other notable achievements include eradications of the Mediterranean fruit fly (numerous times since 1929 and most recently in 1998) and the giant African snail (1969).

The division's insect collection was started in 1915, and it more than doubled by 1953 with the addition of three taxonomic entomologists to the staff. Cooperative agreements with the state's universities in 1959 have helped make the current Florida State Collection of Arthropods (FSCA) museum a world center for insect taxonomy.



Goals of the Entomology Section

- Provide accurate identifications of arthropods to the division's plant protection specialists and other customers.
- Build the Florida State Collection of Arthropods into a world class arthropod museum. The FSCA now contains more than 9 million prepared specimens.
- Provide rapid identification to assist in the prevention of colonization or the regulation of foreign arthropods.
- Provide training and information to plant protection specialists and others to help control, eradicate and prevent the spread of pests.
- Make scientific investigations of the biology, biological control and taxonomy of arthropods.



- Survey and identify the Florida fauna.
- Build the biosystematic library and publish taxonomic literature.
- Provide regulatory oversight for the introduction and movement of arthropods in the biological control of plant pests.

Florida Biological Control Laboratory

The laboratory is a cooperative facility of the Division of Plant Industry, the U.S. Department of Agriculture and the University of Florida. Two quarantine units are available to receive and process exotic beneficial arthropods and nematodes that prey upon or parasitize pest arthropods or noxious plants. Laboratory and field research is conducted to better determine the utility impact and appropriateness of the exotic organisms before they are released into Florida's environment.

Available Publications

- **Entomology Circulars** - presently issued several times a year (over 400 available)
- **Arthropods of Florida and Neighboring Land Areas** - 15 volumes of faunistic studies
- **Occasional Papers of the Florida State Collection of Arthropods** - eight volumes of taxonomic or bibliographic monographs
- Reprints of journal publications by staff scientists

Services

- **Tours** of the Florida State Collection of Arthropods Museum can be arranged for schools and other educational programs. Contact: (352) 372-3505 Ext. 434
- **Arthropod identifications** for the public can be obtained by submitting specimens. For sample-submission information, call 1-888-397-1517 or visit www.fl-dpi.com
- **Insect taxonomy projects** benefit from the wealth of biological materials maintained at the Florida State Collection of Arthropods Museum.



Resources and Technical Staff

The Florida State Collection of Arthropods is one of the ten largest arthropod museums in North America with over 9 million prepared insect specimens including 340,000 slide mounts of mites, scale insects, whiteflies, thrips and other insects.



Technical Staff

Greg S. Hodges, Ph.D., Chief, Bureau of Entomology, Nematology and Plant Pathology

Michael C. Thomas, Ph.D., Section Administrator Beetles

G.B. Edwards, Ph.D.
Spiders, other Arachnids, Centipedes, Millipedes, Thrips and Pill Bugs

Susan E. Halbert, Ph.D.
True Bugs, Aphids, Leafhoppers and Planthoppers

John B. Heppner, Ph.D.
Immature Insects, Moths and Butterflies

Philip Lake
Quarantine Officer

Paul Skelley, Ph.D.
Snails, Slugs, Grasshoppers and Roaches

Gary J. Steck, Ph.D.
Fruitflies, other Flies (Lovebugs, Gnats, Mosquitoes), Termites and Minor Orders

Cal Welbourn, Ph.D.
Mites, Ticks and Chiggers

Emeritus Entomologists

Harold Denmark, Ph.D.

Frank Mead, Ph.D.

Lionel A. Stange, Ph.D.

Howard Weems, Ph.D.

Robert Woodruff, Ph.D.

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Resident Research Associates

Byrd K. Dozier - Buprestidae (Coleoptera)

John M. Kingsolver, Ph.D. - Bruchidae (Coleoptera)

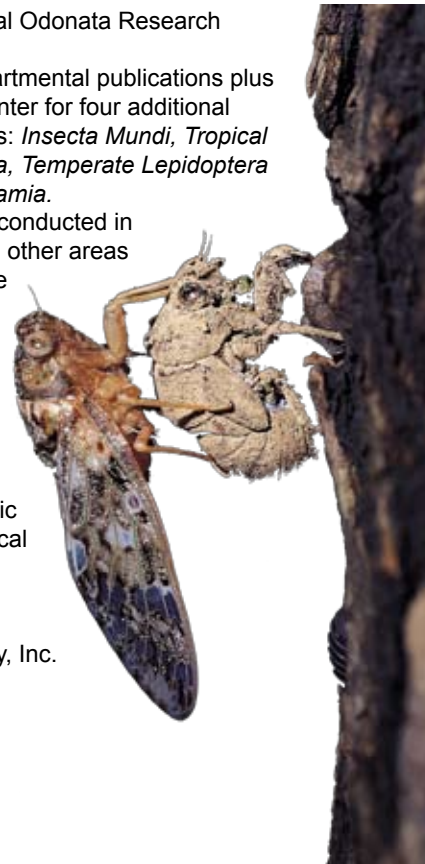
William J. Mauffray, Sr. - Odonata

Charles C. Porter, Ph.D. - Ichneumonidae (Hymenoptera)

Research Associates - over 300 located worldwide

Other Resources

- International Odonata Research Institute
- Three departmental publications plus editorial center for four additional publications: *Insecta Mundi*, *Tropical Lepidoptera*, *Temperate Lepidoptera* and *Peckhamia*.
- Field work conducted in Florida and other areas to study live insects and collect critical material.
- Outstanding library of taxonomic and biological works.
- Center for Systematic Entomology, Inc.



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DACS-P-01601

Entomology

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