

## **RECOMMENDED INSECT CLASSIFICATION FOR UGA ENTOMOLOGY CLASSES (2025)**

In an effort to standardize the hexapod classification systems being taught to our students by our faculty in multiple courses across three UGA campuses, I recommend that the Entomology Department adopts the basic system presented in the following textbook:

Triplehorn, C.A. and N.F. Johnson. 2005. Borror and DeLong's  
Introduction to the Study of Insects. 7th ed. Thomson Brooks/Cole,  
Belmont CA, 864 pp.

This book was chosen for a variety of reasons. It is widely used in the U.S. as the textbook for Insect Taxonomy classes, including our class at UGA. It focuses on North American taxa. The authors were cautious, presenting changes only after they have been widely accepted by the taxonomic community.


Below is an annotated summary of the T&J (2005) classification. Some of the more familiar taxa above the ordinal level are given in caps. Some of the more important and familiar suborders and families are indented and listed beneath each order. Note that this is neither an exhaustive nor representative list of suborders and families. It was provided simply to clarify which taxa are impacted by some of more important classification changes. Please consult T&J (2005) for information about taxa that are not listed below.

Unfortunately, T&J (2005) is now badly outdated with respect to some significant classification changes. Therefore, in the classification standard provided below, some well corroborated and broadly accepted updates have been made to their classification scheme.

Feel free to contact me if you have any questions about this classification. If you see an important omission that should be added, please let me know.

Thank you.

Sincerely,

  
Joseph V. McHugh

ANNOTATED CLASSIFICATION OF HEXAPODA  
2025

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**PROTURA**

Corduliidae

**COLLEMBOLA**

Gomphidae

Libellulidae

**DIPLURA**

Campodeidae

Japygidae

Suborder: **Zygoptera**

Calopterygidae

Coenagrionidae

Lestidae

*Note: Entognatha is a paraphyletic group that is no longer recognized in formal classification. The three entognathous orders were raised to the level of class.*

**INSECTA (=ECTOGNATHA)**

*Note: Historically, the term **INSECTA** has been used to refer to more or less inclusive groupings of hexapods. It is occasionally used as a synonym for **PTERYGOTA** only. It is often used synonymously with **HEXAPODA**. The most widespread use of the term today, however, is as a synonym of **ECTOGNATHA**. As such, it would include all of the hexapods that have an ectognathous cranium.*

*The order Thysanura was used historically to represent both the silverfish and bristletails until that group was found to be paraphyletic and Microcoryphia was pulled out and recognized as a separate order. Today, the remaining Thysanura are usually referred to as the order Zygentoma, although the old name still appears in Triplehorn and Johnson (2005).*

**Microcoryphia**

Machilidae

Meinertellidae

**Zygentoma**

Lepismatidae

Nicoletiidae

**PTERYGOTA**

*Note: While **PTERYGOTA** is considered to be a natural group by most systematists, **APTERYGOTA** is not. As such **APTERYGOTA** is no longer recognized in formal classifications.*

**Ephemeroptera**

**Odonata**

Suborder: **Anisoptera**

Aeshnidae

**NEOPTERA**

*Note: The jury is still out on whether the higher-level group **PALEOPTERA** (Odonata + Ephemeroptera) is monophyletic and worthy of formal recognition in classification. The higher-level group **NEOPTERA**, which includes all of the taxa listed below, is broadly accepted as monophyletic and is recognized formally.*

**Plecoptera**

**Phasmida**

Pseudophasmatidae

Diapheromeridae

*Note: In the Eastern U.S., the species previously placed in Heteronemiidae are all now placed in Diapheromeridae.*

**Mantophasmatodea**

*Note: This is the recently discovered order of insects from west Africa that was first reported in 2002. They are commonly referred to as “gladiator insects”.*

**Grylloblattodea (=Grylloblattaria)**

Grylloblattidae

*Note: In the past, **DICTYOPTERA** (Mantodea + Blattodea + Isoptera) was recognized as an order of insects. Today, it is still thought to be a natural (i.e., monophyletic) group, but it is recognized in classifications at the rank of superorder now.*

**Mantodea**

Coptopterygidae

Liturgusidae

Mantidae

Mantoididae

Thespidae

Note: *Mantidae* was split up. There now are four families that occur in the Southeast.

## Blattodea

Blaberidae  
Blattidae  
Cryptocercidae  
Ectobiidae  
Rhinotermitidae  
Kalotermitidae

Notes:

1) **Blattodea** classification has undergone dramatic revision. For decades there was growing phylogenetic evidence from multiple sources that termites (**Isoptera**) arose from the middle of the roach clade (**Blattodea**). Today, termites are widely recognized as highly modified, social roaches and are classified as part of **Blattodea**. The exact rank for the termite group is still unsettled, but they are often recognized at or near the level of superfamily. Until the familial ranks of the roach clade stabilize more, I recommend that we recognize the **Isoptera** as the superfamily **Termitoidea** (of **Blattodea**).

2) *Cryptocercus* was removed from **Polyphagidae** and is now recognized as a family, **Cryptocercidae**.

3) **Blattellidae** has been reduced to a subfamily within **Ectobiidae**.

## Dermaptera

Anisolabididae (=Carcinophoridae)  
Forficulidae  
Labiduridae  
Spongiphoridae

## Embiidina (=Embioptera)

### Orthoptera

Suborder: **Caelifera**

Acrididae  
Romaleidae  
Tetrigidae  
Tridactylidae

Suborder: **Ensifera**

Gryllacrididae  
Gryllidae  
Gryllotalpidae  
Mogoplistidae  
Tettigoniidae

Note: Historically many of the lower neopteran orders (*Mantodea*, *Blattaria*, *Isoptera*, *Dermaptera*, *Phasmida*, etc.) were considered to be families of a much **more inclusive order Orthoptera**. Today the order is restricted to the taxa in the suborders *Caelifera* and *Ensifera* (i.e., grasshoppers, crickets, katydids, etc.).

## Zoraptera

Zorotypidae

## Psocodea

Pediculidae  
Pthiridae  
Psocidae  
Liposcelididae

Notes:

1) The true lice (**Phthiraptera**) were traditionally divided into two orders **Mallophaga** and **Anoplura**. Phylogenetic studies show that **Mallophaga** is paraphyletic if **Anoplura** is not included within it. To complicate matters, it is clear that all of **Phthiraptera** falls within the **Psocoptera** (bark lice) clade. True lice and bark lice are now recognized within one order, **Psocodea**, which includes 7 suborders.

## Thysanoptera

### Hemiptera

Suborder: **Auchenorrhyncha**

Acanaloniidae  
Cercopidae  
Cicadellidae  
Cicadidae  
Delphacidae  
Dictyopharidae  
Flatidae  
Fulgoridae  
Issidae  
Membracidae

Note: The old concept of *Cercopidae* was split into 3 families: *Aphrophoridae*, *Cercopidae*, and *Clastopteridae*

Suborder: **Sternorrhyncha**

Aleyrodidae  
Aphididae  
Asterolecaniidae  
Coccidae

Diaspidae  
Eriococcidae  
Eriosomatidae  
Kermisidae  
Margarodidae  
Psyllidae

Suborder: **Heteroptera**

Alydidae  
Anthocoridae  
Aradidae  
Belostomatidae  
Berytidae  
Blissidae  
Cimicidae  
Coreidae  
Corixidae  
Cydnidae  
Gelastocoridae  
Geocoridae  
Gerridae  
Hydrometridae  
Lygaeidae  
Miridae  
Naucoridae  
Nepidae  
Notonectidae  
Pachygronthidae  
Pentatomidae  
Plataspidae  
Pleidae  
Reduviidae  
Rhopalidae  
Rhyparochromatidae  
Scutelleridae  
Thyreocoridae  
Tingidae

Notes:

1) The old 2-order classification system for the true bugs (**Hemiptera & Homoptera**) was replaced. Homoptera is not monophyletic and is no longer formally recognized in classifications. Instead, the entire group of true bugs is considered one order, Hemiptera sensu lato. What was Homoptera is now represented by two suborders, (Sternorrhyncha & Auchenorrhyncha), within the new, more inclusive order Hemiptera. What was the old Hemiptera is now recognized as the suborder Heteroptera within the more inclusive order Hemiptera. A fourth suborder of true bugs, Coleorrhyncha, occurs only in austral

regions of the world. It is evolutionarily intermediate between the Auchenorrhyncha and Heteroptera.

2) **Lygaeidae** was broken up into 10 separate families. Some of the new families are **Geocoridae**, **Blissidae**, **Cymidae**, **Rhyparochromidae**, and **Pachygronthidae**.

**ENDOPTERYGOTA**  
**(=HOLOMETABOLA)**

**Neuroptera**

Suborder: **Planipennia**

Chrysopidae  
Coniopterygidae  
Hemerobiidae  
Mantispidae  
Myrmeleontidae

Suborder: **Megaloptera**

Corydalidae  
Sialidae

Suborder: **Raphidioptera**

Raphidiidae

Notes:

- 1) *Ascalaphidae* has been subsumed within *Myrmeleontidae*.
- 2) Currently, the order **Neuroptera** is used in two different senses. In the broader sense it includes the familiar members, as well as **Megaloptera** and **Raphidioptera**. As a result, the three former orders (o.) are reduced to subordinal ranks (s.o.) within *Neuroptera sensu lato* as follows:  
o. *Megaloptera* = s.o. *Megaloptera*;  
o. *Raphidioptera* = s.o. *Raphidioidea*;  
o. *Neuroptera* = s.o. *Planipennia*.  
Each of the three suborders is thought to form a natural (i.e., monophyletic) group, so this is simply a ranking issue.

**Coleoptera**

Suborder: **Archostemata**

Cupedidae  
Micromalthidae

Suborder: **Adephaga**

Carabidae (incl. Cicindellidae,  
Rhysodidae, Paussidae)  
Dytiscidae  
Gyrinidae

Haliplidae  
Noteridae

Suborder: **Polyphaga**

Bostrichidae (incl. Lyctidae)  
Brentidae  
Buprestidae  
Cantharidae  
Chrysomelidae (incl. Bruchidae)  
Cerambycidae  
Cleridae  
Coccinellidae  
Cucujidae  
Curculionidae (incl. Scolytidae,  
Platypodidae)  
Dermestidae  
Elateridae  
Elmidae  
Endomychidae  
Erotylidae (incl. Languriidae)  
Heteroceridae  
Histeridae  
Hydrophilidae  
Lampyridae  
Lucanidae  
Lycidae  
Meloidae  
Melyridae  
Mordellidae  
Nitidulidae  
Passalidae  
Phalacridae  
Phengodidae  
Ptilodactylidae  
Ptinidae (incl. Anobiidae)  
Rhipiphoridae (=Rhipiphoridae)  
Scarabaeidae  
Scirtidae (=Helodidae)  
Staphylinidae (incl. Pselaphidae,  
Scaphidiidae, Silphidae)  
Tenebrionidae (incl. Lagriidae,  
Alleculidae)

**Notes:**

*The classification of Coleoptera has had much revision since T&J (2005). Many families were redefined by splitting or lumping to reflect phylogenetic relationships. Here are some of the more dramatic changes.*

1) **Curculionidae** has been extensively redefined. **Platypodidae** and **Scolytidae** fall out as internal branches of the weevil evolutionary tree. They now are recognized as subfamilies (Scolytinae and Platypodinae) of Curculionidae. Other weevil groups were raised to familial-level status and removed from Curculionidae, including: **Nemonychidae** (pine flower weevils), **Belidae** (cycad weevils), **Anthribidae** (fungus weevils), **Attelabidae** (leaf rolling weevils), and **Brentidae** straight snout weevils).

2) **Staphylinidae** now includes a few groups that were once recognized as separate families, including **Pselaphidae**, **Scaphidiidae**, **Micropeplidae**, **Silphidae**, and **Dasyceridae**.

3) **Scarabaeidae** has been divided into many new families, including **Bolboceratidae**, **Geotrupidae**, **Glaresidae**, **Hybosoridae**, **Pleocomidae**, and **Trogidae**. The most familiar scarab groups (Scarabaeinae, Melolonthinae, Aphodiinae, Rutelinae, Dynastinae, and Cetoniinae) remain in Scarabaeidae though.

**Strepsiptera**

Stylopidae

*Note: Strepsiptera was once considered to be a family (Stylopidae) of Coleoptera. The phylogenetic placement of this order is controversial. It is currently recognized at the ordinal level as the sister taxon to Coleoptera.*

**Mecoptera**

Bittacidae  
Meropeidae  
Panorpidae

**Siphonaptera**

*Note: phylogenomic analyses are recovering Siphonaptera embedded within the Mecoptera clade. It is likely that the fleas will be subsumed within Mecoptera in future classifications.*

**Diptera**

Suborder: **Nematocera**

Bibionidae  
Cecidomyiidae  
Ceratopogonidae  
Chironomidae  
Culicidae  
Mycetophilidae  
Psychodidae  
Ptychopteridae

Simuliidae  
Tipulidae

Suborder: **Brachycera**

Asilidae  
Bombyliidae  
Calliphoridae  
Diopsidae  
Ephydriidae  
Hippoboscidae  
Muscidae  
Mydidae  
Phoridae  
Pyrgotidae  
Rhagionidae  
Sarcophagidae  
Sepsidae  
Stratiomyidae  
Syrphidae  
Tabanidae  
Tachinidae  
Tephritidae

**Trichoptera**

**Lepidoptera**

Attevidae  
Bombycidae  
Cossidae  
Crambidae  
Drepanidae  
Erebidae (incl. Arctiidae &  
Lymantriidae)  
Geometridae  
Hesperiidae  
Lasiocampidae  
Limacodidae  
Lycaenidae  
Noctuidae  
Nymphalidae  
Papilionidae  
Pieridae  
Psychidae  
Pterophoridae  
Pyralidae  
Saturniidae (incl. Citheroniidae)  
Sesiidae  
Sphingidae  
Tortricidae

Yponomeutidae

**Major family changes:**

1) *Erebidae* now includes *Arctiidae*, *Ctenuchidae*, and *Lymantriidae*.

2) *Crambidae* has been removed from *Pyralidae* and is now recognized at the family level.

3) *Nymphalidae* now includes *Heliconidae*, *Morphidae*, *Danaidae*, *Satyridae*, and *Libytheidae*.

4) Some species formerly classified within *Yponomeutidae* (e.g., *Ailanthus* Webworm moth) have been moved into *Attevidae*.

**Hymenoptera**

Suborder: **Symphyla**

Cephalidae  
Cimbicidae  
Pamphiliidae  
Siricidae  
Tenthredinidae

Suborder: **Apocrita**

Andrenidae  
Apidae (incl. Anthophoridae,  
Xylocopidae, Bombidae)  
Bethyidae  
Braconidae  
Chalcididae  
Chrysididae  
Colletidae  
Crabronidae  
Cynipidae  
Diapriidae  
Dryinidae  
Eucharitidae  
Evaniidae  
Figitidae  
Formicidae  
Gasteruptiidae  
Halictidae  
Ichneumonidae  
Megachilidae  
Mutillidae  
Pelecinidae  
Perilampidae  
Pompilidae  
Proctotrupidae  
Rhopalosomatidae

Sapygidae  
Scelionidae  
Scoliidae  
Sphecidae  
Torymidae  
Tiphidae  
Vespidae

***Major family changes:***

- 1) *Apidae* now includes *Anthophoridae*,  
*Xylocopidae*, and *Bombidae*.