The Art and Science of Taxonomy as Applied to Arthropods

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A Discussion About Names and Classification

In order to get a grasp on the diverse realm of arthropods, it is necessary to have a system of classification.

Kingdom
  Phylum
    Class
      Order
        Family
          Genus
            Species

You don't have to know the exact level of taxon (class, order, family), but a sense of which group any individual belongs in is important (not all flies are mosquitoes, but all mosquitoes are flies).

Why names?

1. knowledge is power
2. no fear (pronunciation, mistakes, complexity) - names are nothing to be afraid of
3. when we know a thing's name, we remember it better
4. a bug is just a bug and a bird is just a bird if it doesn't have a more specific name
5. learning names gives us a sense of familiarity, of ownership
6. the more species we know well, the more likely we are to notice something new

That said, one of the most common mistakes made is to jump to the first species in a general guide or list that looks similar. ALWAYS check for possible look-alikes. There are more species of arthropods than we ever imagine.

You will never see all insects, or know all about them. This is part of the fun and can also be very frustrating. Sometimes you will never know a particular bug beyond the order or family. Low expectations are frequently helpful. Knowing the genus should be cause for congratulations and species designations are icing on the cake. It is like a puzzle that will never be completely solved.

The best way to learn lots of names and "faces" is to make a collection. Traditional ways of doing this are: 1. collect dead insects, 2. make sketches and take notes, and/or 3. keep a list. Other exercises to accomplish the same end are: 1. photograph the creatures, 2. collect images clipped out of magazines or discarded books, and/or 3. gather images off the internet for your personal reference.

It's All About Organization

Even people who think they are not very organized need to develop a system when it comes to learning to identify arthropods. Otherwise, insects and their relatives will remain hopelessly diverse and confusing. If you have 20 books, you can set them all on a shelf together in any order and find the one you want. If a library did that with thousands of volumes, think of how hard it would be to locate what you wanted!

We name everything and, by applying a name to a particular thing or individual, we then "know" and remember that same thing or individual better than if it remained nameless. Unfortunately, only certain insects and spiders have standard common names, so the next best thing is to learn the scientific one. You can always make up a name to help you remember an insect, but don't expect anybody else to know what you mean when using it.

With some groups, such as butterflies, all species have an accepted and "official" common name. This is true for all vertebrates too, as well as Odonates (dragonflies and damselflies), and a good number of plants. It is MUCH harder to learn scientific names if a well-used common name exists.

Learning to deal with scientific Latin:

Don't worry about pronunciation - try anyway. (NO FEAR) Latin is a dead language, and many names are made up so they aren't real words. You cannot murder something that is already dead! As long as you can communicate (sound it out, or even spell if necessary) slight differences don't matter.

Many categories above the species level have common names, such as Hemiptera = true bugs. This applies least to genus, but even some of those have common names.

The levels above species are arbitrary. They are meant to show evolutionary relationships and might change with additional research and knowledge. The species name is the least likely to change and mostly does so if somebody accidentally renames it AFTER somebody else already had. The most frequent changes occur at the genus level, but families also shift and morph as species and genera are added, split, subtracted, or redefined.

The better you know the local fauna, the more upper levels you can skip and arrive at the specific identification. However, because there are so many different insects, the chance of seeing something new is very good. Then you might have to start at a very general level (such as insect or other) and work your way down.

Don't forget clues other than body morphology, such as movements, feeding behavior, location and context.

Looking through photos takes a lot of time, so it is best to narrow as quickly as possible to get to the most refined level possible. Illustrated keys are sometimes helpful, but text-only keys are often very difficult to successfully negotiate.

Analogy: sorting mail by country, state, county, city, street, address. You are constantly getting closer to the individual identity by reducing the choices available.

Bugguide.net is excellent for learning the "tree" - use the BROWSE tab!

While it would be nice if every category, from Order to Genus, had a similar number of units within it, life is just too messy for that. Some Orders are very small while some Genera are HUGE. For example, some moth families have only 1 representative species in the US, while others have over 1,000.

Groupings between the major categories - suborder or subfamily (superfamily too!) These are just a way to help group similar categories within a large and diverse one. Examples of very useful subfamilies are found in grasshoppers, nymphalid butterflies, and leaf beetles.

Life Cycle Considerations

The fact that most insects look different at different stages of their life greatly increases the number of forms you must recognize. It helps to know what kind of larvae, nymphs, or grubs go with which adults, but immatures will always remain difficult.

Fact: insects with wings are ADULTS. They do not grow bigger by molting again, and their form does not change significantly. However, many adult insects do not have wings. It's never simple.