

Insect Nomenclature & Classification

Scientific Nomenclature

- Caroles Linnaeus (1707 – 1778) in his **10th edition of systema nature**
- published in 1758 used the binomial system of nomenclature for the first time
- This double naming in **latin** one for the **genus** and the second for the **species**
- In 1842, Strickland published a code of nomenclature in English **Strickland code**
- Another code called **‘Dall code’** was evolved by the Americans in 1877
- 1901 at Berlin, an international code of zoological nomenclature was evolved
- At the 16th session of International congress of Zoology in Washington, the latest international code of Zoological nomenclature was approved
- The same was revised and published in 1964

Holotype : The descriptions of unrecorded species should be based on a single specimen whether it be a male or female

Allotype : The opposite sex specimen which is described along with the holotype

Neotype: A specimen later designated to replace a holotype, If the latter can be documented as lost or destroyed

Syntype: A group of specimens thought to represent a species, as designated or indicated by the author(s) of the original description

Paratype: Other specimens of the species kept along with the holotype and allotype

Topotype: Specimen(s) collected from the same location as the holotype

If the same name is given by different scientists to different organisms, it is called **Homonymy**

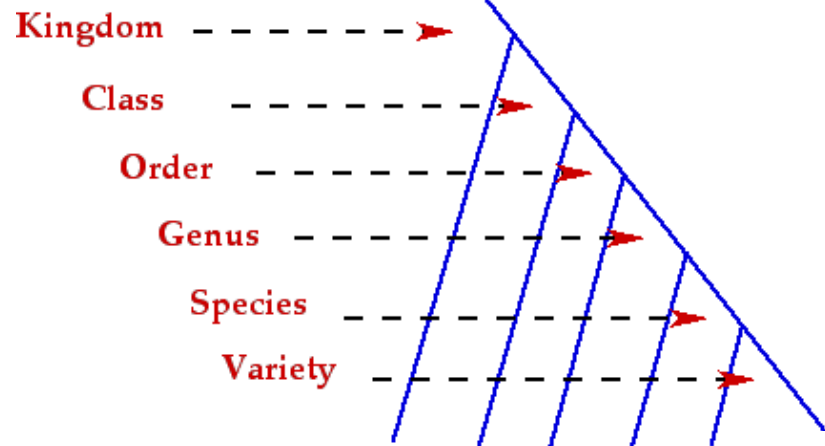
- The names are to be given in **Latin**
- **Authors name** in full should be written at the **end of species name** without any punctuation
- The generic name has to be a simple or compound word
- The supraspecific categories ends with

Tribe **-ini**

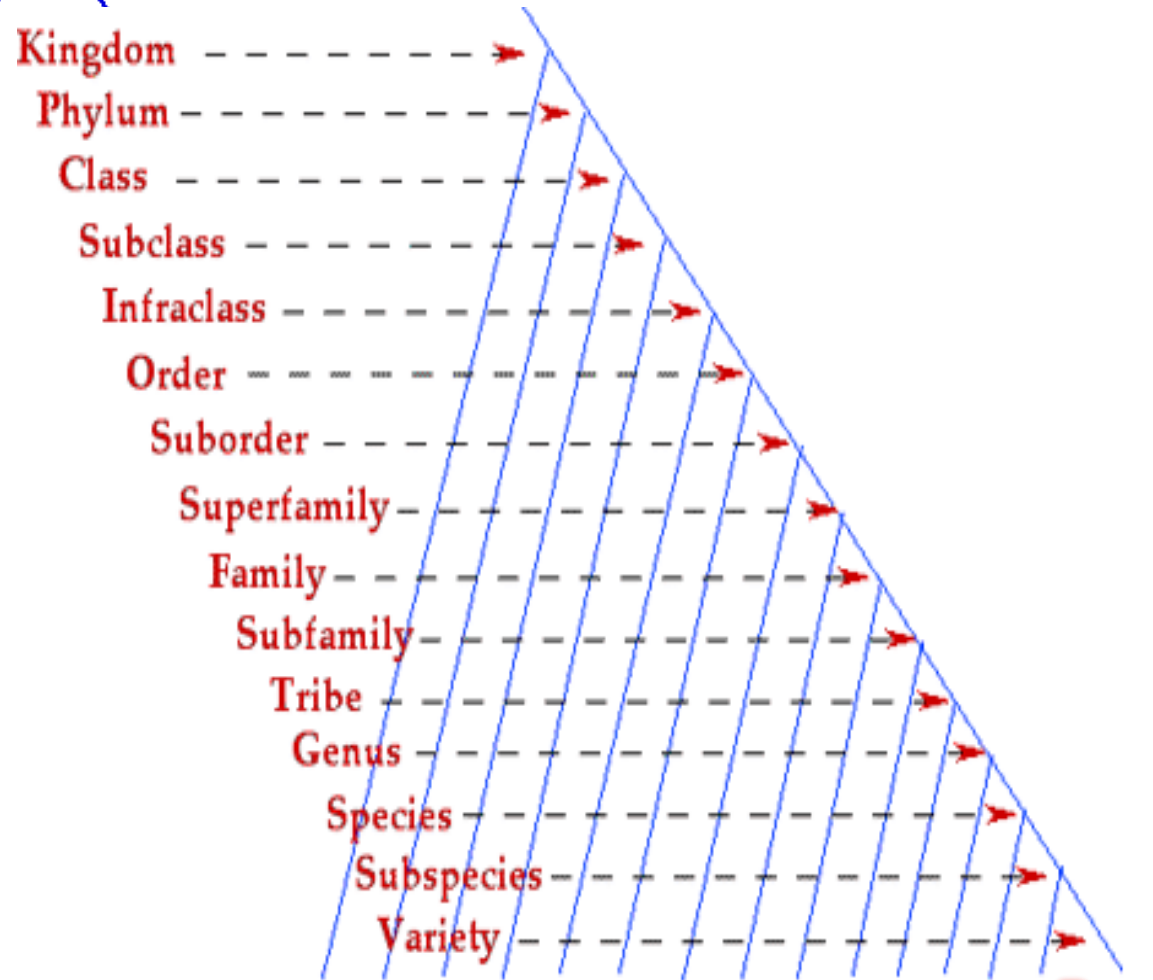
Sub family **-inae**

Family **-idae**

Super family **-oides**



Linnaean Hierarchy in 10th Edition of Systema Naturae (1758)



Categories Used in More Modern Classifications

Classification of insects:

The basic biological unit in the classification is species

Species: These are a group of individuals which are similar in their structure, capable of interbreeding and producing fertile off spring, but at the same time reproductively isolated from other groups

Subspecies: is an aggregate of phenotypically similar populations of a species, inhabiting a geographic subdivision of the range of a species and differing taxonomically from other populations of the species

Genus : A group of species having some definite similar characters or relationships is called a genus

Subfamily: is a group of allied genera to form a subfamily

Family: is a taxonomic category containing a single genus or a group of genera of common phylogenetic origin which is separated from related families by a decided gap. Such families showing similar characters form order.

The classification of animals was first started by **Aristotle** (384-322BC)

Linnaeus is considered as the father of the classification of animals and plants, classified insects into only seven orders viz Coleoptera, Hemiptera, Lepidoptera, Neuroptera, Diptera, Hymenoptera and Aptera

- **Jeannel** recognized **40** orders
- **Brues, Melander and carpenter** recognized **27** orders
- **Imms and pruthi** gave **29** orders
- **Essig and Mani** listed **33** orders
- **Ross** **28** orders

Sub Class: Apterygota -Primitive wingless insects with pregenital abdominal appendages ,with no or slight metamorphosis, malpighian tubules are rudimentary, no pleural suture in the thoracic region and monocondylic mandibles

Sub class: pterygota- Insects with developed wings and showing definite metamorphosis, pregenital appendages are absent , A pleural suture divides the thoracic pleura in to episternum and epimeron and dicondylic mandibles

Division 1: Exopterygota (Hemimetabola). Metamorphosis simple, wings develop externally, Immature stages (nymphs) usually resemble adults in structure and habits

Division 2: Endopterygota (Holometabola). Metamorphosis complex accompanied by a pupal instar, wings develop internally. Immature stages (larvae) differ from adult in structure and habit.

Characters of Phylum Arthropoda (Arthro-Joint, Poda –Foot)

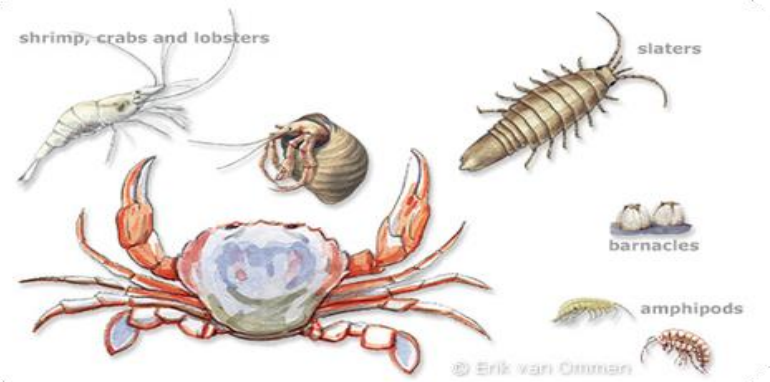
- a. The segmented body
- b. Bilateral symmetry
- c. Paired jointed appendages usually terminates in a class
- d. Chitinous exoskeleton
- e. Ventral nervous system and
- f. Dorsal heart
- g. Haemocoelic body cavity
- h. Muscles are composed of striated fibres, ciliated epithelium absent
- i. Open type of circulatory system

It is the largest phylum in the animal kingdom. Besides insects, many creatures like crayfish, crabs, lobsters, centipedes, millipedes, spiders, mites, ticks, scorpions etc come under this category

Phylum arthropoda is classified into

1. Crustacea (crusta-shell):

eg: prawns, crabs, wood louse



2. Arachnida (Arachne-spider):

eg: scorpion, spider, ticks, mites



3. Chilopoda (chilo-lip, poda-legs):

eg: centipedes



4. Diplopoda (diplo-two, poda-legs):

eg: millipedes



6. Trilobita (an extinct group)

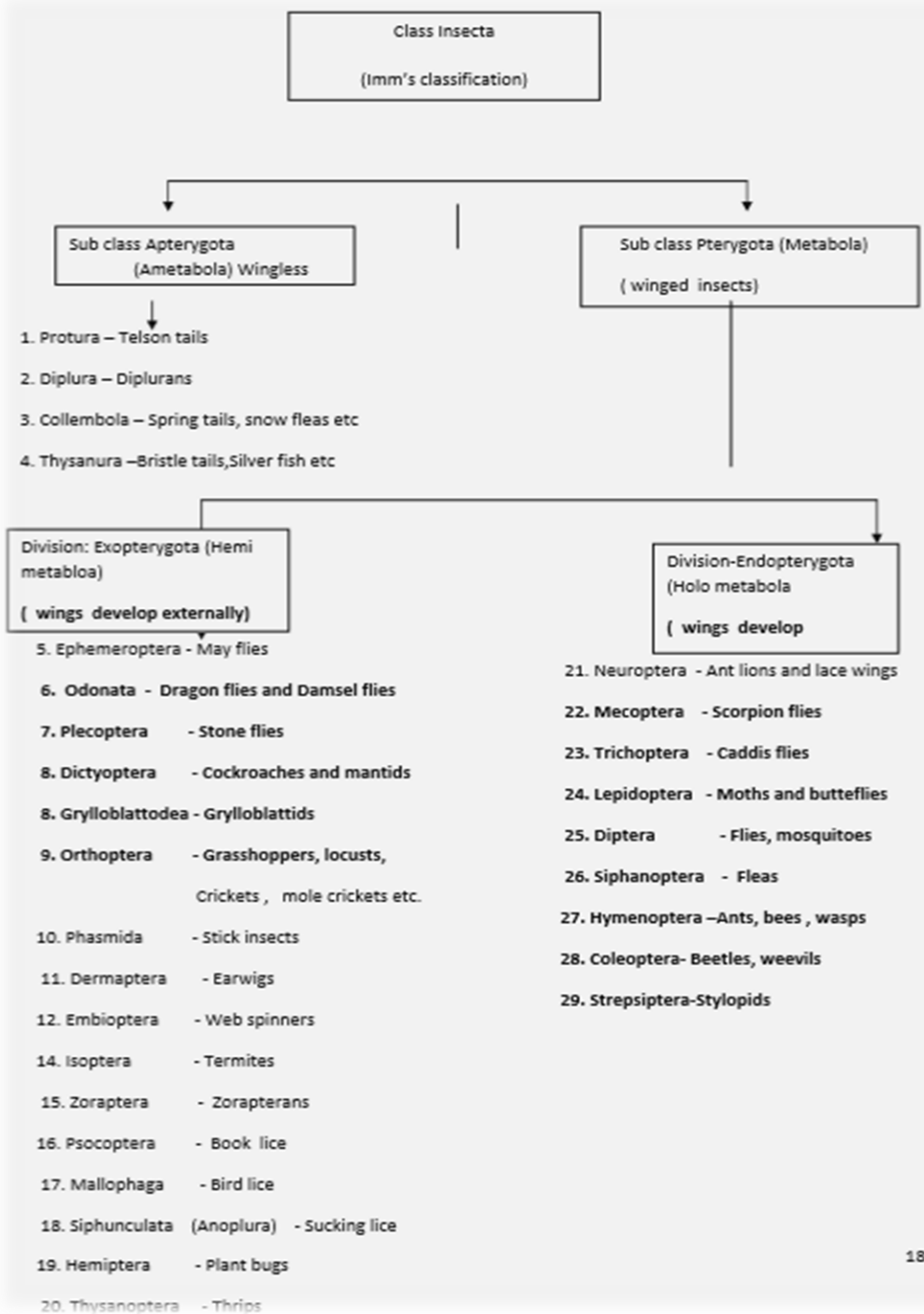


7. Hexopoda (hexa-Six; poda-legs)

eg. insects

Characters of Class insecta

1. Body divided in to head, thorax and abdomen
2. Possess three pairs of legs, hence the name Hexapoda
3. Presence of one or two pairs of wings
4. A pair of antennae
5. Respiration by means of internal air tubes known as trachea
6. Genital opening situated at the posterior end of the body
7. Presence of metamorphosis(incomplete/complete) during development
8. Possess exoskeleton made up of hard cuticle
9. Excretion is mainly by malpighian tubules which help in maintaining ionic balance



Characters of Sub Classes:

Apterygota(Ametabola)	Pterygota(Metabola)
Small and primitive insects	Developed insects
Primarily wingless	Winged and secondarily wingless
Mouth parts are hidden in the head	Mouthparts are exposed
Mandibles articulate with head at single point -Monocondyle	Mandibles articulate with head at two points -Dicondyle
Malpighian tubules are absent or rudimentary	Malpighian tubules are present
Adults have pregenital abdominal appendages	Adults without pregenital abdominal appendages
Pleural suture in thorax is absent	Pleural suture divides thoracic pleuron into episternum and epimeron
Metamorphosis is simple or absent	Metamorphosis is present and variable
Abdominal segments are more in number (11 or 12)	Abdominal segments are secondarily reduced (8 to 10)
Adults moult several times	Adults do not moult

Characters of divisions of Sub class Pterygota

Exopterygota(Hemimetabola)	Endopterygota(Holometabola)
Wings develop externally	internally
Metamorphosis simple and incomplete	Complete and complex
Immature stages (nymphs) resemble adults in structure and habits	Immature stages (lava) differ adults in structure and habits
No pupal instar	Pupal instar present



Protura



Diplura



Collembola

Thysanura



Ephemeroptera



Odonata





Plecoptera



Grylloblattidae



Grasshoppers x 5



Mole Cricket x 10



Big Crickets x 10



Small Crickets x 10

Orthoptera



Dictyoptera



Dermaptera



Embioptera



Zoraptera



Isoptera



Phasmida



Mallophaga



Psocoptera



Siphunculata



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Heteroptera



leafhopper
(Cicadellidae)



plant hopper
(Auchenorrhyncha)



whitefly
(Aleyrodidae)



mealybug
(Pseudococcidae)



treehopper
(Membracidae)

Homoptera



winged
adult



aphids
(Aphididae)

wingless adult



spittlebug
(Cercopidae)



cicada
(Cicadidae)



male

scale insects
(Coccoidea)

female scale
covering





Nuroptera



Mecoptera



Trichoptera



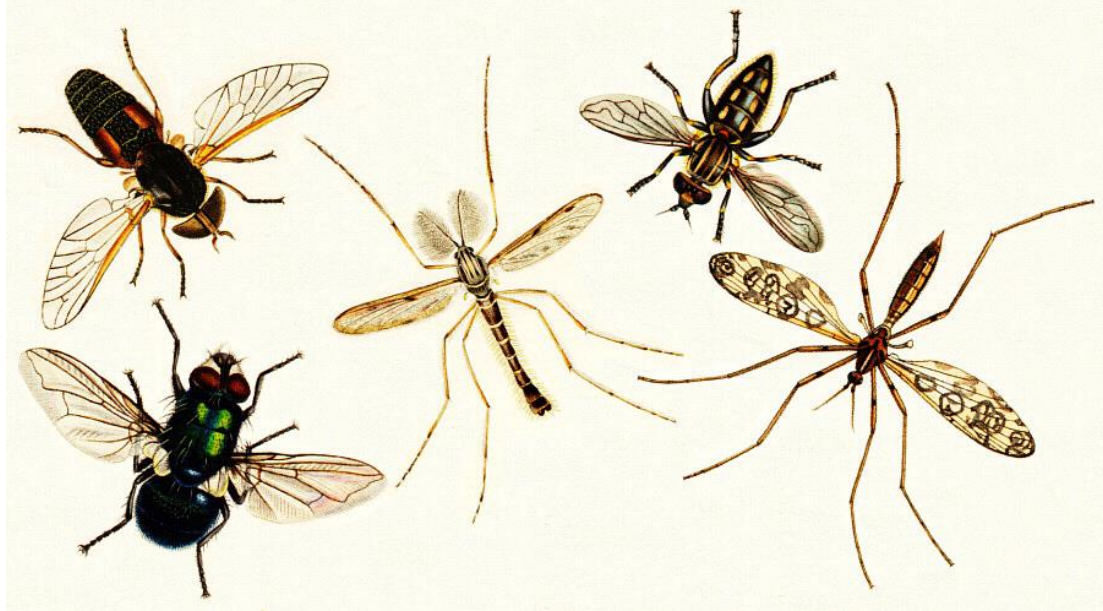
Siphonaptera

Strepsiptera



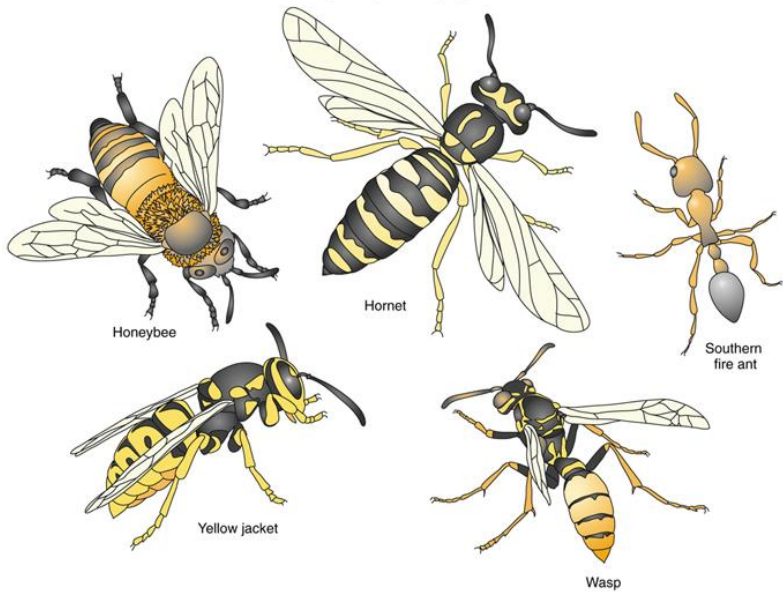


Lepidoptera



Diptera

Hymenoptera stinging insects



Hymenoptera



Coleoptera