WELCOME

TO

DEPARTMENT OF SERICULTURE

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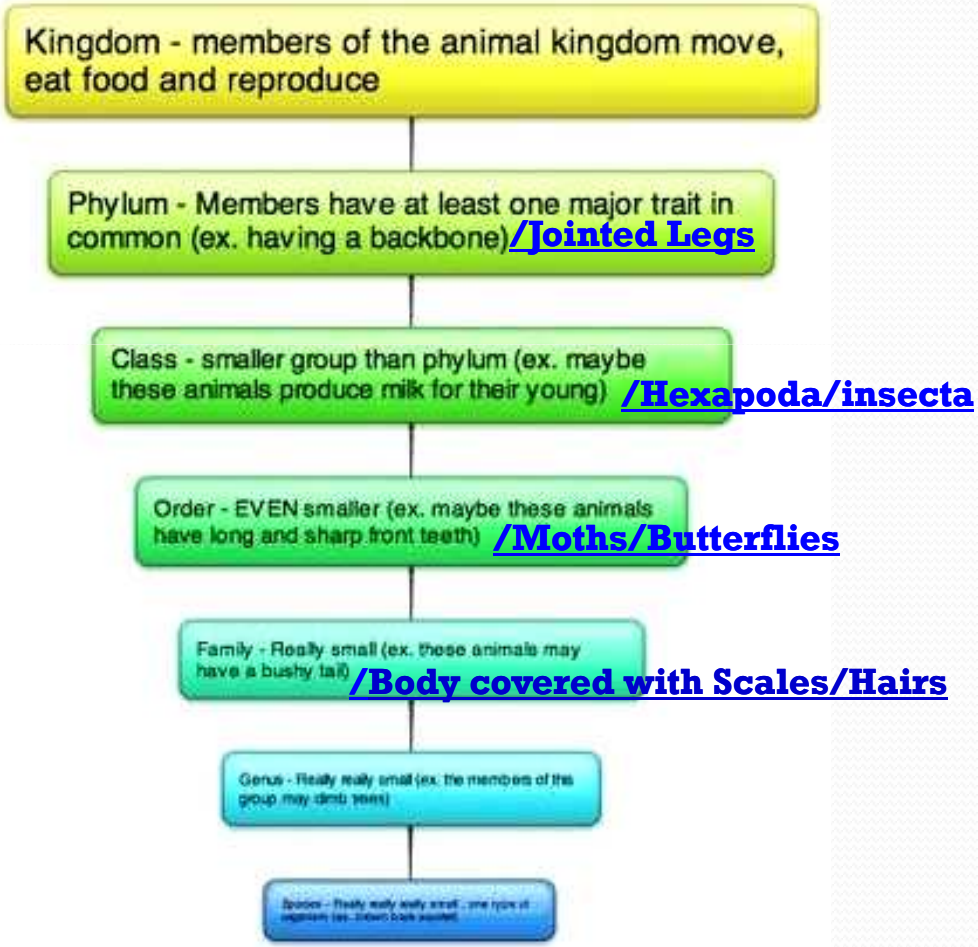
Classification of Sericigenous Insects

Scientific Classification is a system used to classify all living things starting with the largest grouping called a Kingdom and continuing down to the smallest grouping called Individual.

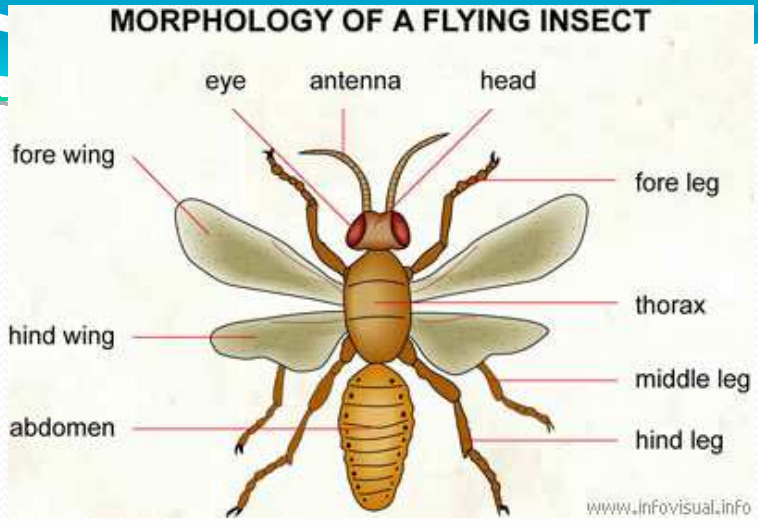
Scientific Classification

- **Kingdom**
- **Phylum**
- **Class**
- **Order**
- **Family**
- **Genus**
- **Species**



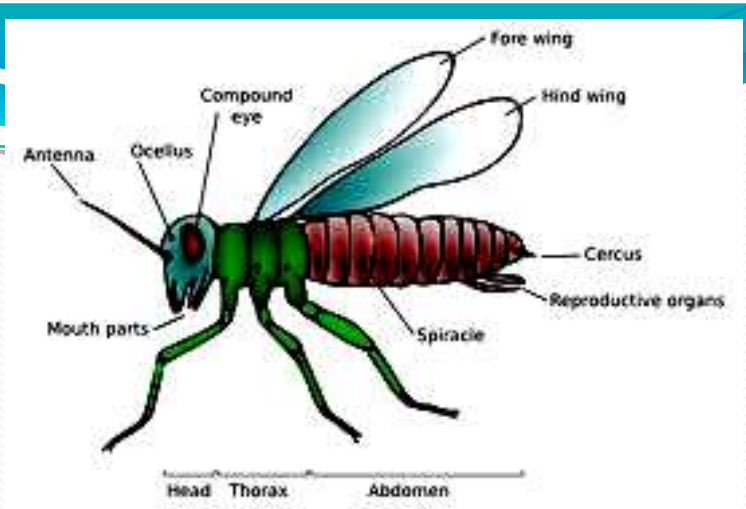
Class Insecta

The insects comprise the largest and most highly developed group in the phylum Arthropoda.

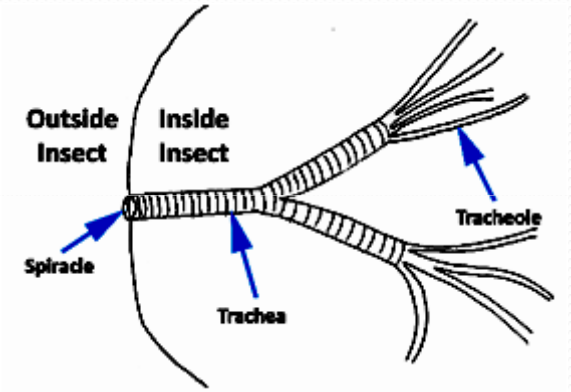


- **Body can be divided into head, thorax and abdomen.**
- **Head consists of 6 segments, compound eyes, a pair of antennae and mouth parts.**
- **Thorax comprises 3 segments, each bearing a pair of legs, 2nd & 3rd segments bear a pair of wings each.**

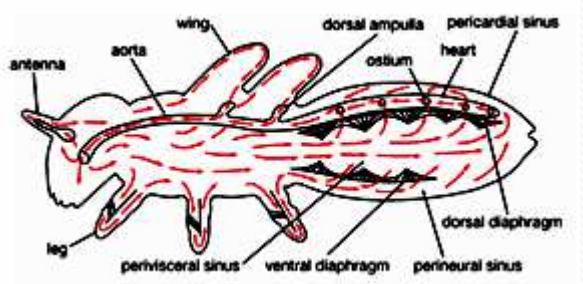
- **Abdomen comprises 7-11 segments & No Appendages –**
  (A part or organ, such as an arm, leg, tail, or fin, that is joined to the axis or trunk of a body)



- **Respiration by trachea.**

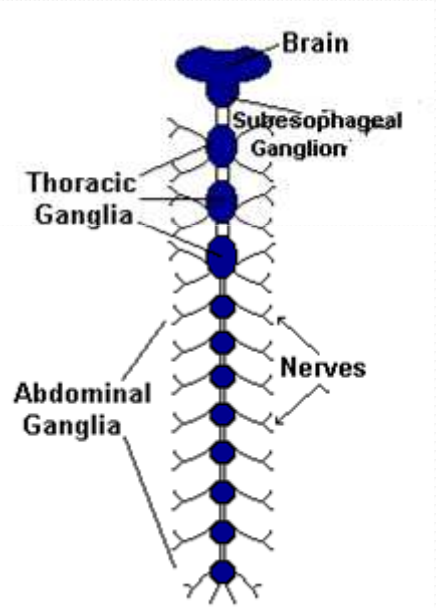


- **Circulation is of simple & open type.**



Excretion by Malpighian Tubules.

The nervous system –2 large ganglia (brain) & ganglionated ventral nerve cord.



Exoskeleton made of a substance called chitin.

Insects belong in the Kindgom Animalia, Phylum Arthropoda

class Insecta / Hexapoda

Subclass:Apterigota

4 Orders

1.Protura

2.Thysanura

3.Aptera

4. Collembola

Sub Class: Pterigota

S. Order: Exopterigota

18 Orders

1.Orthoptera

2. Grylloblastodea

3. Blattaria

4. Phasmida

5. Mantodea

6. Dermaptera

7. Diploglossata

8. Plecoptera

Isoptera 10.Zoraptera

11.Embioptera 12.Corrodentia

13.Mallophaga 14.Anoplura

15.Ephemerida 16. Odonata

17. Thysanoptera18. Hemiptera

S. Order: Endopterigota

11 Orders

1. Meghaptera

2. Neuroptera

3. Raphidiodea

4. Mecoptera

5. Tricoptera

6. Lepidoptera contains 1. Homoneura 2. Heteroneura

7. Coleoptera

8. Streiptera

9. Hymenoptera

10. Diptera

11. Siphonoptera

Contains 2 super family 8 families

Contains 21 super family

9.

S. F. *Bombycoidea* - 7 families

***family Bombycidae* – Mul. S. W.**

S. family *Saturnioidea* 3 families

family *Saturnidae* - all Non Mul. S W

Kindgom Animalia

Phylum Arthropoda

Class insecta / hexapoda

Family *Bombycidae* – MULBERRY SILKWORM – *Bombyx mori*

Family *Saturnidae* – NON MULBERRY SILKWORMS – Tasr, Eri, Muga

MULBERRY SILKWORM CLASSIFICATION

CLASS – INSECTA

ORDER- LEPIDOPTERA

SUPER FAMILY – BOMBYCOIDEA

FAMILY- BOMBYCIDAE

Eg.,

1. ***BOMBYX MORI*** **– CULTIVATED SILKWORM**

2. ***BOMBYX MANDARINA*** **– WILD ANCESTOR OF CULTIVATED SILKWORM**

NON MULBERRY SILKWORM CLASSFICATION

CLASS – INSECTA

ORDER- LEPIDOPTERA

SUPER FAMILY – SATURNIOIDEA

FAMILY - SATURNIDAE

Eg.,

1. ***Antherarea pernyi* – The Chinese tasar silkworm**

2. ***Antherarea mylitta* - The Indian tasar silkworm**

3. ***Antherarea yamamai* – The Japanese tasar silkworm**

4. ***Antherarea assamensis* – The Indian muga silkworm**

5. ***Philosamia ricini* – The Indian eri silkworm**

Lepidoptera

Includes:

Butterflies and Moths

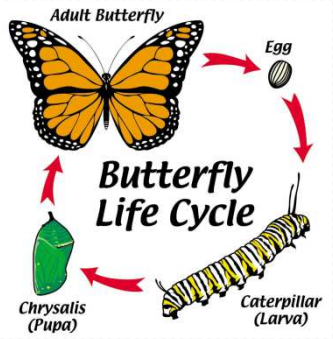
- silkworm
- Budworm/Bollworm
- Pink Bollworm
- Tomato Hornworm
- Monarch

Characteristic features of the order Lepidoptera

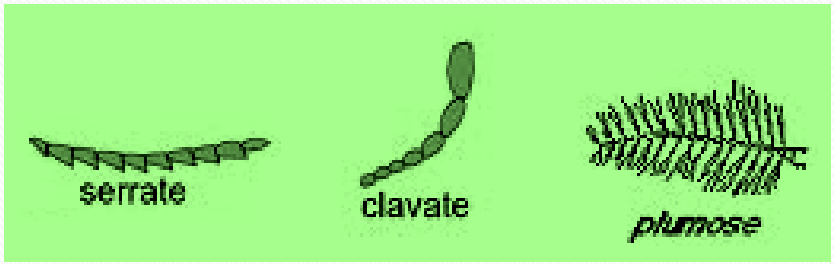
- **Medium to large sized flying terrestrial insects.**

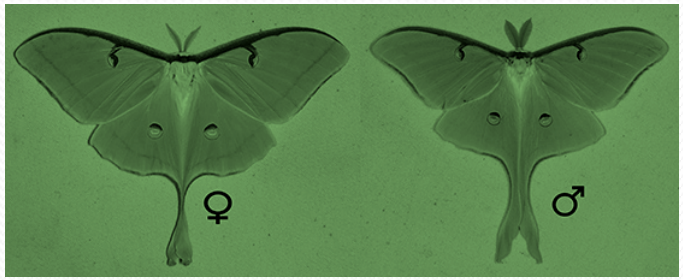
- **Presence of flat overlapping scales & hairs, covers body and wing.**

- **Metamorphosis is complex, eyes are large with 2 or more ocelli.**

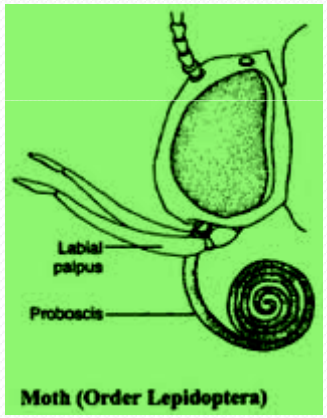


- **The antennae variable; often clavate/ serrate/ hooked/ plumose. In males it is large.**

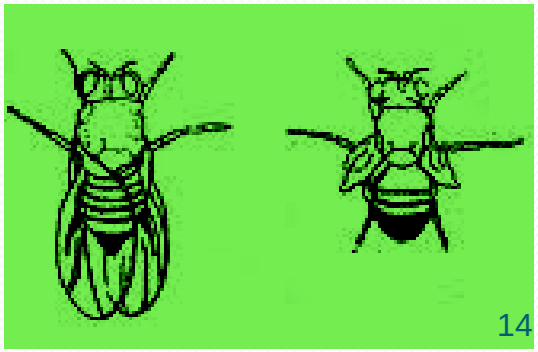




- **Mouth parts is siphoning type in adults.**

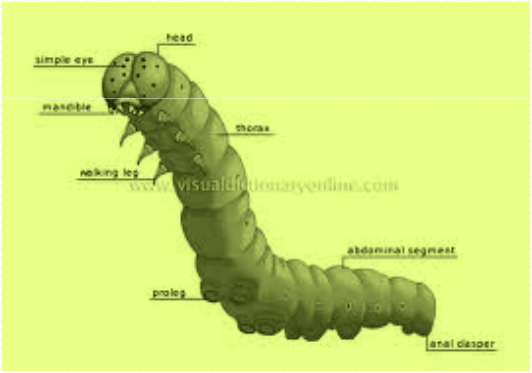


- **They have two pairs of wings; rarely vestigial.**



- **The caterpillars are terrestrial, smooth, hairy, spiny, mandibulate/chewing mouth parts & phytophagus.**

- **3 pairs of thoracic legs, 2-4 pairs of abdominal legs are present.**



- **The pupae is enclosed in either earthen/silken cocoon/mud/faces.**

Charactristic features of family *Bombycidae*

- **The moths are medium sized, robust and densely covered with hairs or scales**

- **Antennae are bipectinate in both the sexes. Large in males**

- **The larvae are smooth with a densomedian horn / anal horn.**

- **Pupates in silken cocoons. May be white/coloured.**

- **This group contains all mulberry silkworms.**

Characteristic features of family *Saturnidae*

- **The adults are medium to large.**

- **The entire body and wing bases are covered with soft hairs.**

- **The wings often with transparent eye spot at the centre.**

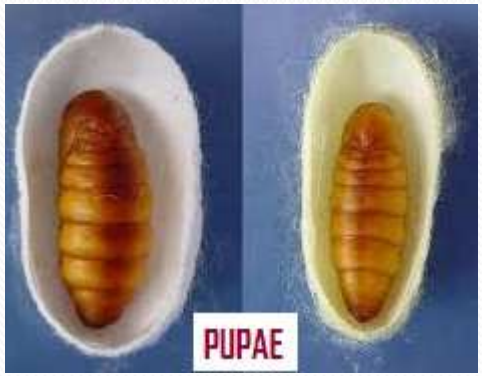
- **Antennae are prominent, bipectinate in both sexes & large in males..**

- **The larvae often conspicuously armed with long hairs, tubercles & spines. & polyphagous.**

- **The cocoons are dense.**

- **This group contains all non mulberry silkworms.**

Definition/meaning



Definition/meaning continued……

Fecundity :- **Total number of eggs laid by a female moth after mating.**

Hatching %:-The number of larvae hatched from disease free layings.

$$\text{Hatching percentage} = \frac{\text{No. of eggs hatched in a laying}}{\text{Total no. of eggs per laying}} \times 100$$

Larval Duration:- **Total duration in hours from the time of hatching to that of spinning.**

Definition/meaning continued.....

Cocoon yield

Yield of cocoons by number:- **This represents the survival rate of larvae that spin cocoons.**

$$\text{Yield of cocoons by number} = \frac{\text{Total no. of cocoons harvested}}{\text{Total no. of larvae brushed}} \times 10{,}000$$

Yield of cocoons by weight:- **It is the total quantity of good cocoons in kilograms obtained for a standard unit of 10,000 larvae brushed.**

$$\text{Yield of cocoons by weight} = \frac{\text{Total wt. of cocoons}}{\text{Total no. of cocoons harvested}} \times \text{yield of cocoons by number}$$

Definition/meaning continued……

Filament length: **Total length of filament (meters) of single cocoon reeled using epprouvette (A reeling device for monococoon reeling).**

Denier: **Denier is the thickness of the filament and can be calculated using the following formula.**

$$\text{Denier} = \frac{\text{Weight of the reeled silk}}{\text{Length of the reeled silk}} \times 9000$$

Leaf-Cocoon Ratio**: Units of mulberry leaf required to produce one unit of cocoons.**

Acknowledgements/References
to

1. Internet
2. College Entomology by E O Essig, India,1982.
3. Sericulture Manual II, FAO, Rome, 1987.
4. Sericulture Manual III, FAO, Rome, 1987.