

B.SC. ZOOLOGY (H)

SEMESTER- 2

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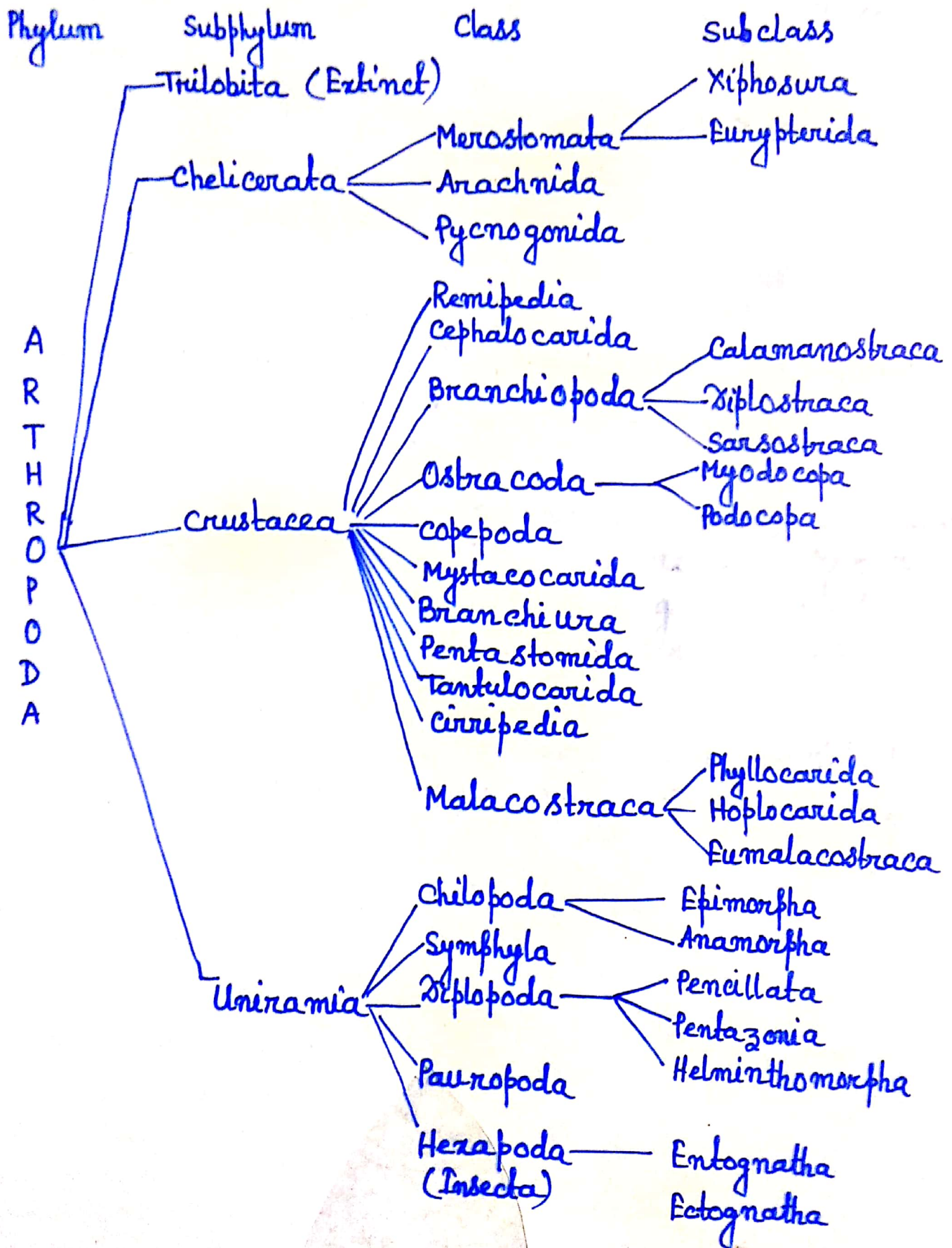
CORE COURSE: NON CHORDATES II- COELOMATES - CC2-3-TH

TOPIC: GENERAL CHARACTERISTICS AND CLASSIFICATION OF ARTHROPODA
UPTO CLASSES (RUPPERT AND BARNES, 1994)

Here, I am providing the scheme of classification of Arthropoda as per Ruppert and Barnes, 1994. Along with the scheme, general characteristics and subphylum characteristics are provided. But you have to read also the class characteristics. You may read it from Ruppert & Barnes Text Book or from Introduction to General Zoology, Vol. 1 by Chaki, Kundu and Sarkar or any book where this classification scheme is followed.

If anyone needs the latter part, I will provide it.

Arthropod Classification: Rupert and Barnes, 1994



Salient features: (gk. arthron; joint; podos, feet)

1. Body metamERICALLY segmented and bilaterally symmetrical.
2. Anterior segments specialized to form a distinct head.
3. Body covered with thick, tough and non living chitinous exoskeleton usually consisting of carbohydrate and protein.
4. A pair of externally jointed appendage usually present in each segment.
5. Exhibit moulting or ecdysis to shed off the old skeleton and to develop new exoskeleton from the underlying epidermis.
6. Musculature with distinct striped muscle.
7. Body cavity (coelom) much reduced and acts as haemocoel.
8. Mouth and anus present almost at both extremities.
9. Heart located on the dorsal side of the alimentary canal.
10. Circulatory system open type.
11. Respiratory pigment Cu containing haemocyanin.
12. Excretory organs either Malpighian tubules or sacculi.
13. CNS includes a dorsally placed brain and two solid, ventral nerve cord with segmental ganglia.
14. Eyes either compound or simple.
15. Dioecious with sexual dimorphism.
16. Eggs centrolecithal and cleavage superficial.
17. Development either direct or indirect.

Subphylum - Trilobitomorpha

1. Extinct marine arthropods, size varies from 10 mm to 60 cm.
2. Body divided into prozoma and opithosoma.
3. It also distinguished into three lobes by two longitudinal furrows.
4. A pair of many jointed antennae represent the preoral appendage.
5. Remaining appendages uniform and unspecialised.
6. Each leg with eight segments.

Approximately 4000 species have been described from the fossil record, that are grouped under five class. Among them class-Trilobita posses largest number of species.

Class - Trilobita

1. Body dorso ventrally flattened and divided into three lobes by two longitudinal furrows.

Subphylum - Chelicerata (Gk. chele, talon/claw)

1. Body divided into anterior prosoma (Cephalothorax) and posterior opisthosoma (abdomen)
2. Cephalothorax entirely or partially covered by dorsal carapace, bearing uniramous appendages
3. First pair of appendage chelicerae (chele, claw) helps in feeding, second pair of appendage chelate leg like or feeler like pedipalps helps in various functions and the remaining four pairs of walking legs.
4. Eyes simple with median ocelli.
5. Mouth anteroventral, gut straight with two to many pairs of digestive diverticula arising from the midgut region.
6. Development direct.

Subphylum - Crustacea (L. Crusta, shell)

1. Primarily marine, several freshwater (13%) and a few terrestrial (3%) often with calcareous exoskeleton.
2. Body divided into either head, thorax and abdomen or cephalothorax and abdomen.
3. Head bears a pair of compound eyes on movable jointed stalk and sometimes with a small median dorsal naupliar eye (a median eye, characteristic of larval form, may persist in the adults of some crustaceans).
4. Cephalic appendages five pairs with first two pairs of antennae (first pair being the antennules), one pair of mandibles and the remaining two pairs of maxillae.
5. The cylindrical or leaf shaped appendages typically biramous with different shape and size.
6. Respiration through gills usually associated with the appendages.
7. Excretory organs paired consisting of an end sac, an excretory canal and a short excretory duct located at head.
8. Dioecious
9. Development through several larval stages.

Subphylum - Uniramia (L. unus, one; ramus, branch)

1. Body either divided into head and trunk or head, thorax and abdomen.
2. Head bears one pair each of antennae, mandibles and maxillae; sometimes with an additional pair of maxillae and an upper lip or labrum.
3. Head includes lateral ocelli, frequently organised into compound eyes, at times with median ocelli.
4. Trunk bears pair of walking legs in each segment.
5. Abdominal appendages greatly reduced or absent.
6. All appendages unramous.
7. Tracheal respiratory system.
8. Excretory organ - Malpighian tubules.