

# **PHYLUM-CHAETOGNATHA**

## **GENERAL CHARACTERS:**

The chaetognaths, or arrowworms, are coelomate animals of relatively small size, with a straight, slender, transparent body displaying perfect bilateral symmetry. Most conspicuous of the external features are the fins, paired lateral and single caudal thin horizontal extensions supported by rays and serving for flotation and equilibration rather than for locomotion. The anterior end forms a well – delimited head bearing a pair of eyes and on either side the characteristic grasping spines (hooks), hard curved spines used in seizing prey and operated by a complex musculature inside the head. The head is also typically armed with arcs of small spines anterior to the mouth. A feature peculiar to the phylum is a fold of body wall that can be drawn over the dorsal and lateral surfaces of the head like a hood. The nervous system consists of ganglia in the head connected by a pair of circumenteric commissures with a large ventral trunk ganglion. The digestive system is a straight tube extending from the mouth located ventrally on the head to the anus found somewhat anterior to the tail fin. The chaetognaths are hermaphrodites, the paired ovaries are situated in the trunk immediately anterior to the tail septum. Testes lie in the tail region posterior to tail septum.

## **TAXONOMY**

The systematics of this phylum is unusually simple, owing to the small number of striking differences among the specimens. Thus, the highest rank which might be used in grouping the integrants of this phylum is that of genus. Further more, the species included in each of the genera are separated by means of slight differences in the position of the various morphological structures, which are closely related to each other. Therefore, any other systematic division of this phylum would be quite arbitrary. Though Tokioka in 1965 proposed a new classification dividing the Phylum into classes, orders,

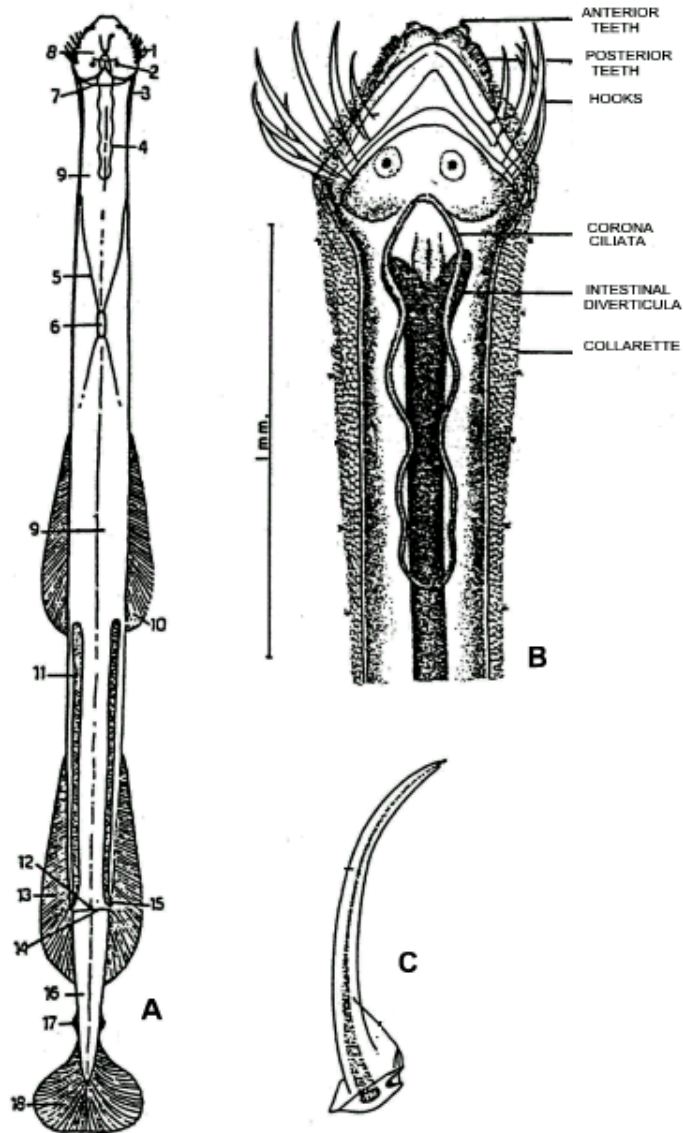
suborders and families in the conventional way has not been accepted by other Taxonomists due to reasons given above. As per the widely accepted classification chaetognaths are allocated into a total of seven genera of which *Spadella* and *Bathyspadella* are benthic. The planktonic genera are *Eukrohnia*, *Krohnitta*, *Pterosagitta*, *Sagitta* and *Heterokrohnia*. All planktonic genera except the last are represented in the Indian Ocean.

The presence of anterior fins separates the genus *Sagitta* from *Pterosagitta*, *Krohnitta* and *Eukrohnia*. The last three have only one set of paired fins, extending in *Eukrohnia* from the tail to the level of the ventral ganglion; in *Krohnitta* to the posterior part of the trunk and in *Pterosagitta* to the posterior septum. In the genus *Sagitta*, the following characteristics of the anterior paired fins should be related to those of the posterior fins: size, extent of the rayed region, and position relative to the posterior paired fins and the ventral ganglion. The posterior fins should be examined with respect to their extent along the trunk or the tail segment, their position relative to the seminal vesicles and the extent of the rayed region.

For the identification of the Chaetognath species, importance was given only to non-meristic characters. Meristic characters are unreliable due to considerable overlapping and their variability with age, season and geographic localities. The shape and extent of the corona ciliata was also not taken into consideration for species determination as it usually does not persist in preserved material. The characters taken into consideration for the analysis of the species are listed below.

1. Nature of the body – flabby or turgid.
2. Characteristics of the muscles – thin, thick or wide.
3. Degree of transparency – opaque, translucent or transparent.
4. Total length from tip of the head to the tip of the tail excluding the tail fin.
5. Ratio of the tail segment to the total length.
6. Size of the head compared to that of the body.

7. Shape and position of the fins along with the rays in the fins – totally or partially rayed.
8. Presence or absence of the intestinal diverticula.
9. Shape and position of the eye and disposition of the pigmented region.
10. Position and extent of collarete.
11. Shape of the seminal vesicles and their position related to the tail fin and to the posterior part of the posterior fins.
12. Shape and extent of the ovaries and shape and arrangement of the ova in the ovaries.



**A typical chaetognath After Hyman, 1959**

A - *Sagitta* (ventral view); B - Details of head;

C - One of the grasping spines (hook)

1. Grasping spines; 2. Eyes; 3. Collarette; 4. Corona ciliata;
5. Circumenteric connectives; 6. Ventral ganglion;
7. Head-trunk partition; 8. Head; 9. Trunk; 10. Anterior lateral fins;
11. Ovary; 12. Anus; 13. Posterior lateral fins; 14. Trunk-tail partition;
15. Female gonopores; 16. Tail; 17. Seminal receptacles; 18. Tail fin.

## PHYLUM – CHAETOGNATHA

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Genus : *Eukrohnia*

*Eukrohnia bathypelagica*  
*Eukrohnia fowleri*  
*Eukrohnia hamata*  
*Eukrohnia minuta*

Genus : *Krohnitta*

*Krohnitta pacifica*  
*Krohnitta subtilis*

Genus : *Pterosagitta*

*Pterosagitta draco*

Genus : *Sagitta*

*Sagitta bedoti*  
*Sagitta bipunctata*  
*Sagitta bombayensis*  
*Sagitta decipiens*  
*Sagitta enflata*  
*Sagitta ferox*  
*Sagitta gazellae*  
*Sagitta hexaptera*  
*Sagitta lyra*  
*Sagitta macrocephala*  
*Sagitta madhuprathapi*  
*Sagitta maxima*  
*Sagitta minima*  
*Sagitta nairi*  
*Sagitta neglecta*  
*Sagitta oecania*  
*Sagitta pacifica*  
*Sagitta planctonis*  
*Sagitta pulchra*  
*Sagitta regularis*  
*Sagitta robusta*  
*Sagitta serratodentata*  
*Sagitta tasmanica*  
*Sagitta zetesios*

