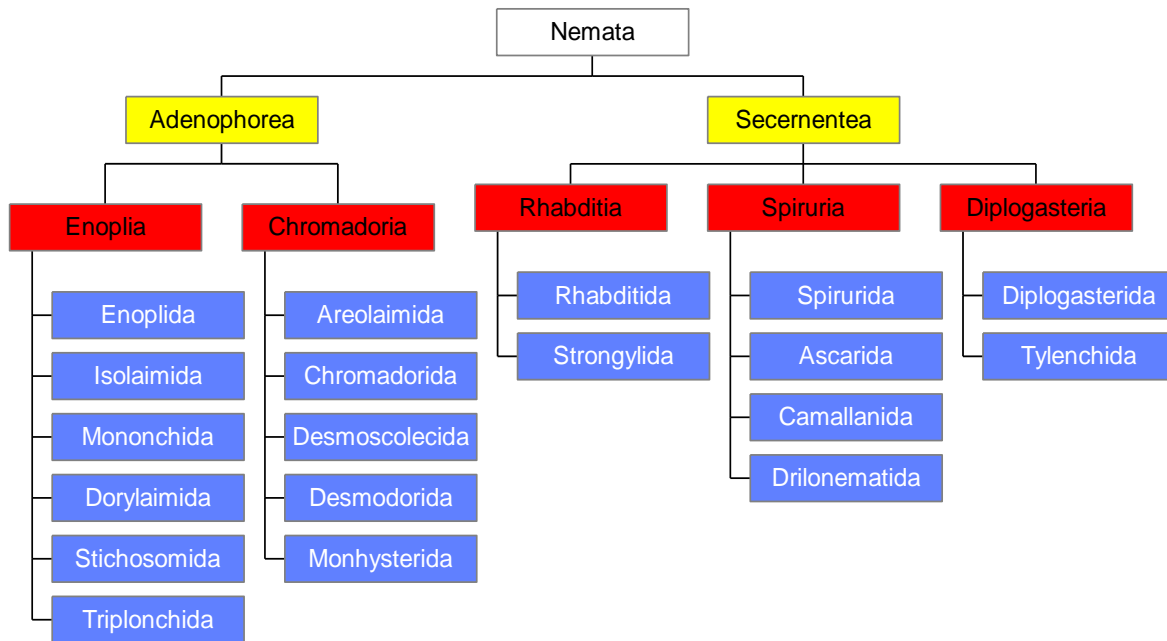


Lecture 08 - Taxonomy of Plant Parasitic Nematodes

Nematodes are placed in the group invertebrata, Kingdon Animalia. Under separate phylum, Nemata / Nematoda, which consist of two classes, Secernentea and Adenophorea.

Classification of Nematodes



Diagnostic characters of class Secernentea and Adenophorea

Secernentea (Phasmida)

Amphidial opening is on the head near the lip region.

Lateral canals open into the excretory duct

Oesophagus is divided into procorpus, median bulb, isthmus and basal bulb.

Male tail with bursa (Caudal alae)

Glands are absent Phasmids are present

Adenophorea (Aphasmida)

Amphids open behind the head i.e. post labial

Lateral canals and excretory duct end in a cell

Oesophagus is cylindrical with an enlarges glandular base

Male tail lacks bursa but possess genital paillae.

Caudal glands are present Phasmids are absent

The mesenterial tissues are less developed

The mesenterial tissues are well developed

The plant parasitic nematodes are included in the orders *Tylenchida* of class *Secernentea* and *Dorylaimida* of class *Adenophorea*.

Order: *Tylenchida*

Stoma armed with a protrusible spear or stomatodtylet. *Oesophagus* consists of a procarpus, media bulb with sclerotized valvular apparatus, nerve ring encloses the narrow isthmus and with a basal bulb. It consists of two super families namely *Tylenchoidea* with *Tylenchida* and *Aphelenchina* as suborders and *Criconematoidea*.

Differences between *Tylenchoidea* and *Criconematoidea*

Character	<i>Tylenchoidea</i>	<i>Criconematoidea</i>
Labial region	Lips are hexaradiate, Labial frame work present	Labial region is poorly developed, labial plate is present
Stylet	Conus, shaft and knobs are variable in shape and size	‘Criconematoid’ type stylet long and anchor shape knob which lies in base of metacarpus
Oesophagus	Narrow procarpus, round metacarpus with valve, isthmus followed by glandular basal bulb	Pro and metacarpus amalgamated to a single unit, short isthmus, the post carpus reduced, appears as ‘set-off’ smaller than pro and metacarpus
Deirids	Present (2 pair)	Absent
Female gonad	Single or two ovary; post uterine sac (PUS) is present	Single ovary with posterior vulva; PUC absent

Male gonad	Single testis, caudal alae is present	Single testis; caudal alae rare
Phasmid	Erratically present in tail region	Not known

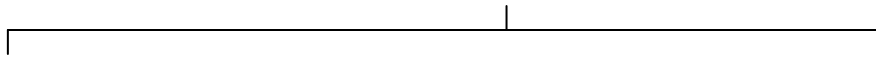
Difference between *Tylenchina* and *Aphelenchina*

Character	<i>Tylenchina</i>	<i>Aphelenchina</i>
Lip	Varying in shape	Set- off
Annules	Faint to strong annules	Faint annules
Stylet	Well developed; one dorsal and two sub ventral knobs	Weakly developed; no stylet knobs
Oesophagus	Three parted	Three parted with square shaped median bulb
Gland bulb	Abutting, dorsal, ventral or dorso – ventral overlapping on intestine	Only dorsal overlapping
Gland opening	Behind the stylet knob in procorpus	Opens in the median bulb
Female	One or two; vulval position vary	Single ovary; vulva posterior
Male	Bursa present	Bursa rare
Spicule	Weak to strong sclerotization is seen with gubernaculum	Rose thorn shape spicule present

Order : *Dorylaimida*

The labial region is set off from body contour. The stoma is armed with a movable mural tooth or a hollow axial spear. *Oesophagus* is divided into a slender, muscular anterior region and an elongated or pyriform glandular posterior region. Females have one or two reflexed ovaries; males have paired equal spicules, gubernaculum rare. The order is divided into three sub orders namely *Dorylaimina*, *Diptherophodrina* and *Nygolaimina*. The former two suborders containing the plant parasitic nematodes.

Sub order



Dorylaimina

Diptherophodrina

Stylet with flangers or guiding ring,
long and straight

Teeth like spear, solid, short
and ventrally curved.

Family : Longidoride

Genus : *Longidorus*: amphids pouch like, slit like opening, spear extension without flanges, guiding ring located near the spear tip.

Genus : *Xiphinema* : amphids funnel shaped wide opening, spear extension with flanges, guiding ring located near the spear base.

Family : Trichodoridae

Genus : *Trichodorus*” Long curved onchiostylet, female rectum runs parallel to the longitudinal body axis and the anus lies sub terminally. Male tail curved bursa absent, vaginal sclerotization strong, lateral pores present near vulva.