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Acid mucopolysaccharide — capable of inhibit digestive enzyme. Intestinal-trematode are not digested by their host enzyme presence of acid and alkaline phosphatase. (Yamao -1952, Lewert & Dusarik -1961)

Presence of esterase (Nimmo-Smith, Stander-1963) occurrence of aminopeptidase, reported in Cyathocotyle bushiensis (Caecal parasite of duck) by (Exasmus and Ahman -1963)

Histochemical analysis of spines of F. hepatica & Echinostoma revolutum show that this is formed scleroprotein and high content of cystine.

Nematode cuticle =>

Structure and composition

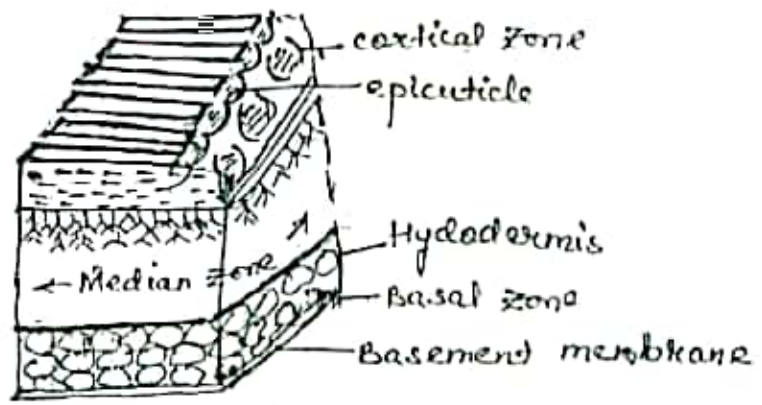


Fig => Cuticle of Nematoda.

The nematode body wall consist of cuticle, hypodermis and body wall musculature the outermost covering is cuticle, a complex structure of great functional significance to the animal. Cuticle also lines the buccal cavity, oesophagus, anus, cloaca, excretory pore and vagina. Overlying, the cuticle in free living and parasitic nematode, a carbohydrate rich surface, coat (5mm - 20nm) in thickness. The surface coat may be important in evasion of the immune response in parasites of animals.

The cuticle itself consists of three regions — cortex, median and basal zone. The exact boundary of each zone may be difficult to distinguish. The cortical zone is covered by a thin layer called epicuticle about 20 nm thick. The lipoprotein epicuticle appears in electron micrograph as trilaminar membrane but it is not a cell membrane, just beneath the epicuticle, a cortical region contains a highly resistant protein called cuticulin, stabilized by disulfide crosslinks. The inner cortical zone as well as outer zone in the cuticle are primarily of collagens, a protein type also abundant in vertebrate connective tissue. Even by electron microscopy one can distinguish structures in the middle zone although some researchers have reported fine striations.

The basal zone is composed of two - three fibrous layers, each of parallel strands of collagen running at an angle of 75° to the longitudinal axis of the worm - strands of 2nd fibrous layer at an angle of about 135° to those of 1st layer thus forming a lattice like arrangement. The fibrous layers are important component of the hydrostatic skeleton in large nematoda. The strands themselves are not extensible but they do allow longitudinal stretching and compressing of the overlying cuticle by changes in the angles between the layers.

Beneath the basal zone is a basement membrane a layer of fine fibrils that merge hypodermis. Ring like depressions called annules, occur in the cuticle to enhance flexibility of the animal. These annules are more prominent in some species than in others. The cuticle of the passive parasite juvenile of nematodes is quite different in structure from that like Ascaris sp.

Note ⇒ In its usual connotation the term "cuticle" means another covering but unfortunately in the mind of biologist it appears as a non-living secreted layer. For this reason, the cuticle of nematode and cestode with knowledge of electron microscopy, the cuticle is elongated variously by different authors some as epithelium other as 'tegument'

Chemical composition ⇒

As a result of investigation of numerous workers it has been established that the chemical composition of nematode cuticle apart from others; consists predominantly of proteins with traces of lipids & carbohydrates. 20 amino acids have been found on chemical analysis of the protein in the cuticle of several species of nematode. Chemical evidence for the lipid content in the epicuticle have been obtained. The external cuticle layer has complex chemical composition in the large parasitic nematode. It has been reported that apart from a thin layer of lipid and traces of carbohydrate, the external cuticle layer is made up of protein which are peculiar in that they are similar to keratin in their sulphur content and resemble collagen in X-ray diffraction pattern. It also contain quinone and polyphenol.

Chemically the matrix layer consist of proteins, which resemble collagen. A non-specific esterase acid, mucopolysaccharide and some lipid have also been detected in this layer. Basal layer of the nematode cuticle have the characteristics of collagen. Nematode cuticle perhaps best described as been made up of secreted collagen.


Inorganic substance ⇒

In addition to proteins, carbohydrate, lipids and combination of these. Certain inorganic substances are found in nematode. Weinland (1901) and Flury (1912) have

reported that inorganic substance comprises (0.70 to 0.78%) of the fresh weight and 1.0 to 5.1% of the dry weight of Ascaris sp. lumbricoides (Nematode)

Roger's (1945) reported that in the body fluid of A. lumbricoides are found traces of potassium, magnesium, Na, Fe, Cu, Zn, Cl^- and P. Among these, Na^+ is most abundant found to be followed by Cl^- .

(Ref. → General Parasitology → T.C. Cheng,
Foundation of " → Roberts
&
Janovy)


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