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B.Sc HONS (Zoology) Part I Paper I

Topic- structure and life history of Wuchereria bancrofti

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Q. Give a brief account of the structure and life history of Wuchereria bancrofti.

Ans. Habit and Habitat : Wuchereria bancrofti is an important filarial parasite of man having world wide distribution, specially common in tropical countries. The adult nematodes live in the lymphatic vessels and glands lying in coils.

Structure : They are creamy white, filiform and cylindrical lying in complicated coils. The sexes are separate. Female worms are 65-100 mm long and 0.25 mm in girth. Males are smaller, 40 mm in length and 0.1 mm in diameter. The anterior end of the body tapers to a fine head slightly swollen at the tip which bears mouth. Mouth is a simple opening devoid of lips. It leads into an oesophagus which is partly muscular and partly glandular. The tail in male is curved and has two unequal spicules and a number of papillae. The female possesses a vulva disposed anteriorly and provided with an ovjector. The male and female worms couple and fertilization is internal.

Development of fertilized egg occurs within the mother. The gravid worm gives birth to a large number of small first larva called microfilaria. They are shed in the blood and lymph of the host.

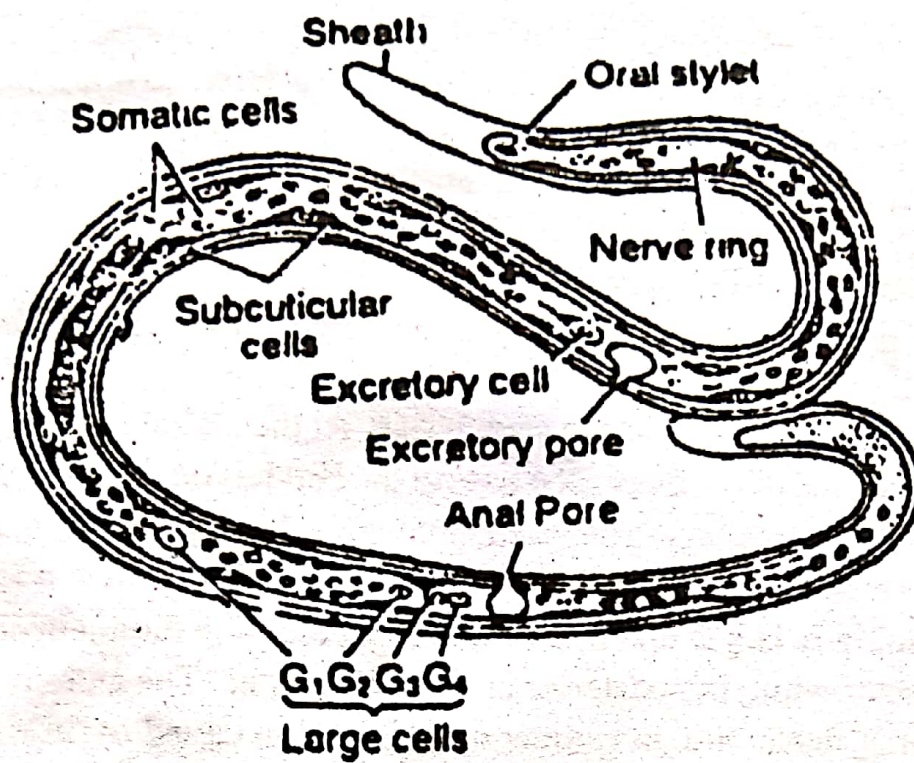


Fig. Microfilaria of W. bancrofti

Microfilaria : They are colourless, transparent elongated larvae enclosed in a thin sheath which projects prominently beyond both the ends of the larva. They are 225 to 300 μ long and 10 μ in diameter. The cuticle is thin and straited and is secreted by a single layer of subcuticular cells. The anterior end is blunt bearing a distinct caphatic and rudiments of adult buccal cavity with oral stylet. The posterior end is pointed. The body contains nuclei of cells which are used as definite landmarks in the identification of the species. A nerve ring is seen near the anterior end behind which at some distance is the excretory pore with the excretory cell situated a little behind. The body column is provided with somatic cells and a series of usually 4 large celled—the genital rudiment. Near the posterior end is the anal spot. The tail is devoid of nuclei.

Life Cycle : The female worm gives birth to a large number (about, 1000) of microfilariae which appear in peripheral blood during the night usually between 10.00 P.M. and 2.00 A. M. During the day they are rarely found in blood. Further development in the larva occurs only when they are ingested by a female mosquito. If larvae are ingested by a female culex that has sucked human blood containing them, the mosquito phase of this life cycle begins.

In the midgut of culex, the sheath of the microfilaria is lost within 2—6 hours of the blood meal. The microfilaria penetrate through the midgut with the help of the stylet and reach the thoracic muscles through the haemocoel. They lie lengthwise in these muscles and shorten into a sausage shaped larva 125 μ - 250 μ long.

The sausage shaped larva measures 1.5 - 2.0 mm in length and 20 - 30 μ in diameter. The tail atrophies and the gut is formed, the larva moults. As these changes take place, the larva moults again and becomes infective. The

formation of the infective stage takes about 10 – 14 days and occurs best at 27 – 28°C and a relative humidity of 90%. The infective larva of *Wuchereria* is a filariform larva. Only a small proportion of the microfilariae ingested by the mosquito reach the infective stage. The infective larva have the thoracic muscles and pass into the head of the mosquito and finally into the proboscis. They escape on to the skin and penetrate the skin through the bite wound made by the mosquito on human skin. The infective larva enters the lymph vessel and coils up in the lymph gland. A mosquito becomes infective when it possesses the infective larvae in sufficient number. A mosquito can be infective only if at least 15 microfilaria are present in every 20 ml of human blood.

Economic importance : The parasite causes filarial fever, mental depression, headache etc. Accumulation of living and died *Filaria* blocks the lymphatic system which results in the inflammation of lymph glands. In some cases, the obstruction of lymph vessels may result in elephantiasis in the arms, legs and scrotum of mammal.

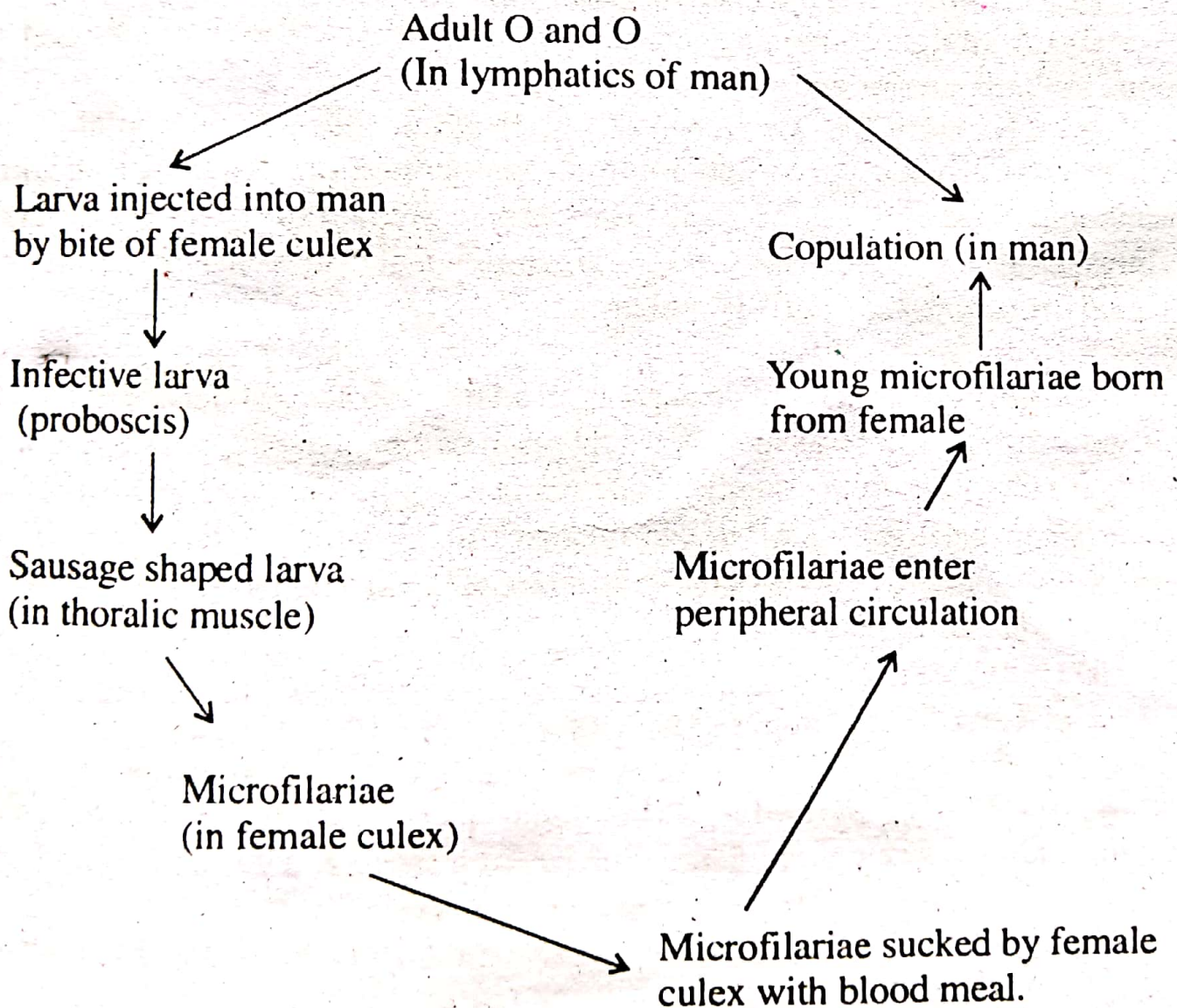


Fig. Life cycle of *W. bancrofti*