STUDIES ON CARYOPHYLLIDEAN CESTODE PARASITES OF SOME CATFISHES AND HISTOPATHOLOGY OF THE HOST

ABSTRACT

REBA BHATTACHARJEE, M. Sc.

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SUMMARY

1. Exploration of the edible cat-fishes, **Clarias batrachus** and **Heteropneustes fossilis**, for their caryophyllidean fauna revealed that, nine different types of caryophyllids parasitize these piscine hosts of north-east India. While eight of them represent the subfamily Lytocestinae and belong to the genus **Lytocestus**, only one represents the subfamily Djombanginae and belongs to the genus **Djombangia**. Out of the eight **Lytocestus** spp., four, namely **L. indicus, L. birmanicus, L. filiformis** and **L. longicollis** are already known forms representing new locality record and the remaining four appear new to science. These have been named as **L. clariae** n.sp.; **L. attenuatus** n.sp.; **L. assamensis** n.sp. and **L. heteropneustii** n.sp. The validity of the new species has been discussed.

The spectrum of the parasitic infection was more diversified in **C. batrachus** in comparison to **H. fossilis** which also shares the same benthic habitat, since only a single species of **Lytocestus** was obtained from the latter, throughout the period of caryophyllidean faunistic survey.

2. Scanning electron microscopic studies on the surface fine topography of **L. indicus** and **D. penetrans**, the two most commonly occurring types revealed a dense and uniform covering of microtriches throughout the surface of the body, without showing any regional differentiation with regard to their morphology.

3. Histochemical studies on **L. indicus** and **D. penetrans**, the two most apparently pathogenic species, indicates towards a similarity in the distributional pattern of the different metabolites between the two species.

While in both the carbohydrates, proteins and lipids showed a generalised pattern of distribution in the tegument, parenchyma, reproductive organs as well as the scolex gland cells, differences occurred with regard to glycogen and lipid in the eggs of two species. The vitelline cell nuclei in the egg of **L. indicus** contained a higher concentration of glycogen than lipid, but those in case of **D. penetrans** had lesser concentration of glycogen and higher of lipid. Besides, another distinguishing feature between the two species is that, in the vitelline lobes of **L. indicus** usually 3 to 4 patches of glycogen masses were observed whereas in **D. penetrans** only few cells of the vitelline lobe became vacuolated and stained positively for glycogen.

DNA concentration appeared to be higher in the eggs of **D. penetrans** as compared to **L. indicus.**

4. Incidence pattern for the different caryophyllid types recovered appeared to be species specific. Even for the most frequently occurring types like **L. indicus, L. birmanicus, L. filiformis** and **D. penetrans,** seasonal fluctuation was distinct. While there occurred low incidence of infection during the summer months, the peak period of incidence obtained by the different species was during late winter or early spring months. Only a single species, **L. assamensis** n.sp. depicted its peak during autumn.

The prevalence of infection was more in the male hosts than in the female host fishes. However, though host reactions or immunity stimulated by temperature appears to be responsible for the population dynamics within the vertebrate host, the general incidence picture is more a function of temperature than any other factor.

5. Based on histopathological changes **D. penetrans** was found to be the most highly pathogenic type, producing large nodules in the intestinal wall as a result of complete penetration. Like **D. penetrans, L. indicus** is also the burrowing type, but its penetration was

not as deep (i.e., up to the serosa), as that of **D. penetrans**, but was restricted only up to the muscularis layer. Hence **L. indicus** is comparatively less pathogenic causing ulceration of the affected tissue. In severe cases of pathogenicity however, hyperplasia of the muscularis was observed.

Pathogenicity due to multiple infection comprising several species of caryophyllids was minimum, since only the denudation of the mucosal folds was observed. Similar host reaction was also produced due to **L. assamensis** n.sp. infection, which appeared singly and not along with multiple infection and occupied a considerable length of the intestine.

Thus extent of damage was maximum due to a single worm of **D. penetrans** and minimum due to multiple invasion of the caryophyllids.