

Parasitic infestation on commercially important sardines

In India, sardines (*Sardinella* spp) constitute the single genus with highest level of production¹. Such important fishes are frequently encountered with parasitic infestation. But detailed knowledge on the different parasites of sardine is scanty²⁻⁴. Apart from the oldest records, nothing is known on the parasites that live at the expense of sardines.

During biological observations on the *Sardinella* spp of east coast of India, several sardines with external parasitic infestations were noticed. More than 25 isopod parasites belonging to the genus *Nerocila* were collected from the sardines *Sardinella gibbosa*, *S. albelli* and *S. dayi*. Most of the parasites (83%) were attached on the opercular region. On the caudal region of the sardines the *Nerocila* sp. attachment was 17%. About 79% of the parasites attached on the anterior region was only on the left side of the host fish. The position of attachment was a little angular. The appendages in the anterior region of the parasite were curved and pointed to establish a firm grip of the host tissue. The infected area or area of the attachment of the parasite on sardine was devoid of scales and outer dermal layer. Skin lesion was also observed at the site of attachment. The *Nerocila* sp. was found to carry eggs and larvae in the egg pouch on the ventral side of the trunk. An instance of hyperparasitism (Figure 1) was also encountered. In a specimen of *Nerocila* collected from *S. gibbosa*, a copepode parasite belonging to Lernaecoceriformes *Lernaeconicus* sp. was noticed. The anterior part of *Lernaeconicus* sp. was buried inside tissues under the large egg mass on the ventral side of the host.

$$K = \frac{\text{Body weight} - \text{Gonad weight} (\times 100)}{\text{Length}^3}$$

The condition factor calculated for the parasitized sardines (0.38 ± 0.06) and non-parasitized sardines (0.9 ± 0.04) (collected in the same catch, same season and length range 12–14 cm TL) indicated that the parasitic infestation has affected the K

value. The reduction in K value in the parasitized fishes has been ascribed because of the retardation of the gonadal development due to parasitic infection. This was further reinforced by the maturity studies carried out on the gonads of parasitized and non-parasitized sardines. In all the parasitized sardines the testis and ovary are in early stages of development and in some cases gonadal differentiation had not taken place. But in non-parasitized sardines the testis and ovary had attained maturing conditions just prior to spawning.

In addition to the isopod parasites, Lernaecoceriformes a copepod, parasite, *Peroderma sardinellae*⁵ were also collected in large numbers from *S. albelli*, and *S. sirm.* *P. sardinellae* was found to be a tissue borer making holes (2–4 mm diameter, depth up to inner organs) on the host body. The entire body of the parasite was buried (Figure 2) inside the bore except the egg sac. The bore was mostly (90%) in slanting position. There was no indication of scales on the bore and scales at the margin of the bore showed signs of drilling, with concave eroded margin. The parasite was covered by chitinous jacket and had anastomosing rhizoid structures on their antero-lateral side to absorb nourishment from the host. The condition factor calculated for *P. sardinellae*-infected fish was (0.3 ± 0.03) low when compared with non-parasitized fishes (0.9 ± 0.04). *P. sardinellae*-infected fishes had retarded maturity conditions when compared with non-parasitized fishes in similar lengths group. In the parasitized sardines the length range from 11 to 14 cm TL, the gonadal maturation has not taken place. The gonads remained as immature testis and ovary. But in the non-parasitized fishes the gonads developed pre-spawning conditions both in the males and females.

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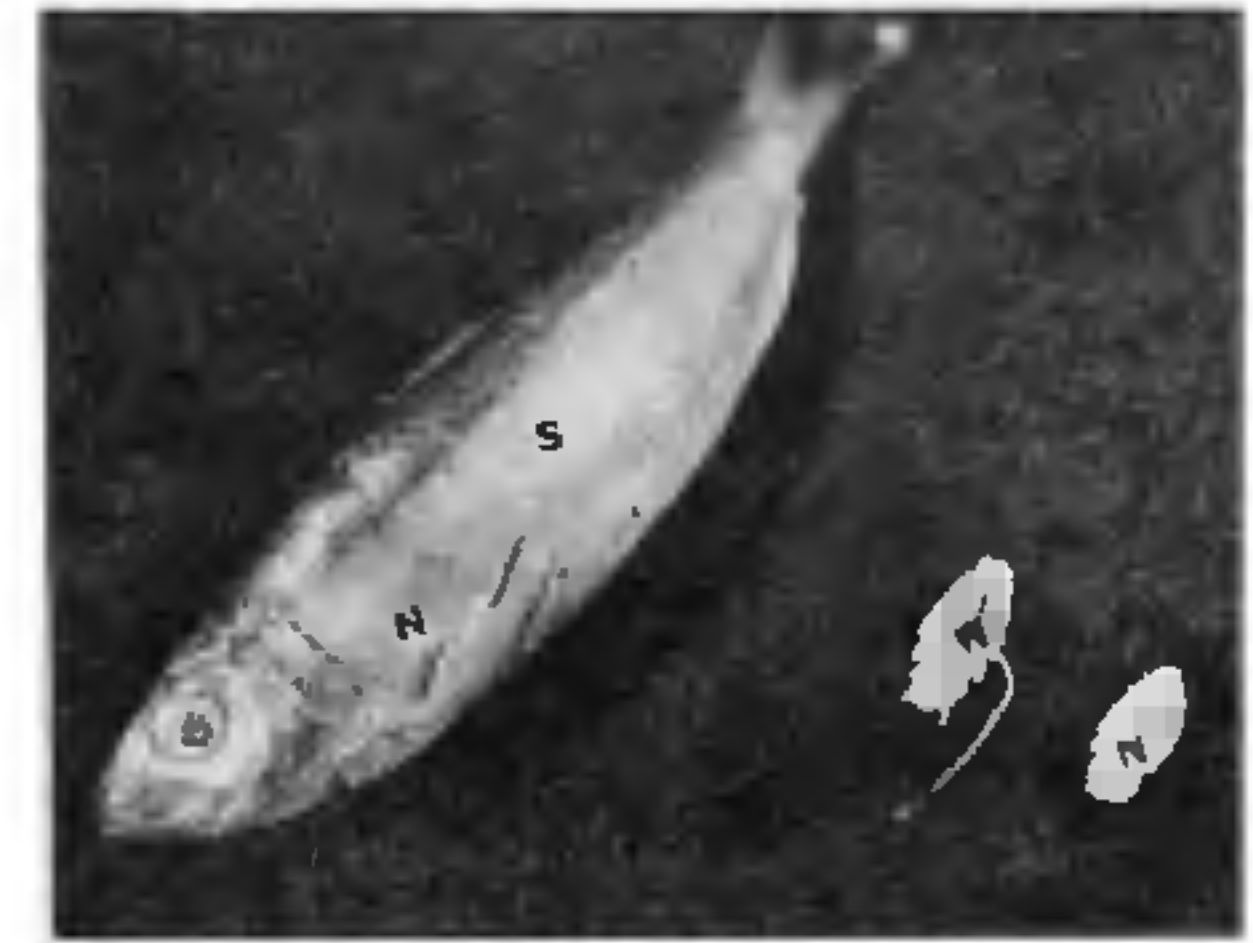


Figure 1. Sardines (S) parasitized by the isopod *Nerocila* sp. (N). An isolated *Nerocila* sp. infected by *Lernaeconicus* sp. showing hyperparasitism.

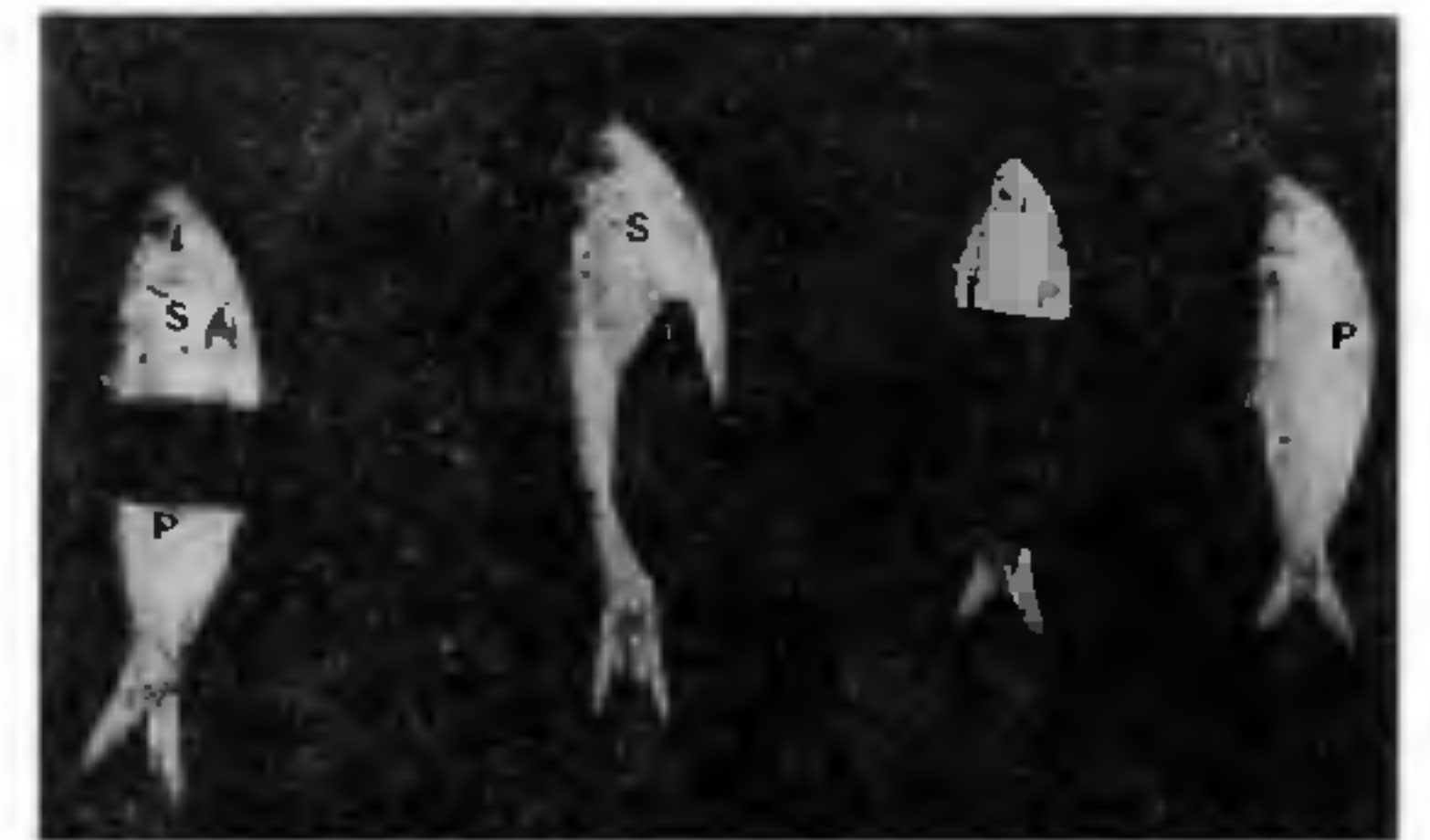


Figure 2. Sardines (S) parasitized by *Peroderma sardinellae*. The parasites are buried inside the host tissue, only the egg strings are seen outside.

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