CALIGUS SCIAENAE N. SP. PARASITIC ON *SCIAENA GLAUCA* FROM MADRAS

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As against the exhaustive studies of British parasitic copepods by Scott,[7] of American forms by Wilson[9] and European species by Brian[2b] and Hansen,[4] our knowledge of copepods parasitic on Indian fishes is poor. Bassett Smith,[1] Kirtisinghe,[5] Thompson,[8] Wilson[9] and Brian[2a] and Grey have recorded and described a few forms. Hence a full description of this parasitic caligid copepod was deemed not superfluous.

This parasite was found attached to the tip of a gill filament of the first gill of *Sciæna glauca.* It measures 1·7 mm., the setæ of the anal plates included. (The frontal area is 1 mm.; the cephalothorax ·7 mm.; abdomen ·7 mm.; the anal plates and setæ ·2 mm.). The frontal region is marked by the possession of two large lunules visible even dorsally. Examined ventrally each sucker appears like a deep spherical cup. The rim of the cup is turned in to form a flat shelf. This edge of the sucker is not entire, being cut up anteriorly and the two cut ends overlapping each other to a slight extent. The entire lunule is clearly formed by the folding of the edge of the frontal plate. Medially the anterior border of the frontal area shows a projection on the ventral side. This projection is a median sucker-like fold of the frontal edge and occurs just where the frontal filament would have been during the Chalimus period in the development. The persistence of this sucker along with the well-developed lunule shows that it has just passed the Chalimus stage. The frontal area is also marked by the occurence of the 1st antennæ whose basal joint appears continuous with it.

The cephalothorax is almost circular in shape being ·7 mm. long and ·75 mm. broad (Fig. 1). The cephalic area is marked off from the thoracic area by a semi-circular groove. The carapace as well as the rest of the body appears whitish, transparent and free from colour marks. The posterior edge of the cephalothorax area extends dorsally over the free thoracic segment which is clearly visible from the ventral aspect. With the convex form of the cephalothoracic shield and the flattened or slightly hollowed form of the sternal plate of the third thoracic segment, a cupping adhesion

can be effected by the body of the parasite whenever necessary. The fact that the cephalothorax is formed of ten segments (the seven-segmented cephalon as well as three segments of the thorax united with it) is obvious from the ten pairs of appendages found on the ventral side. On the dorsal side the double median eye can be made out.

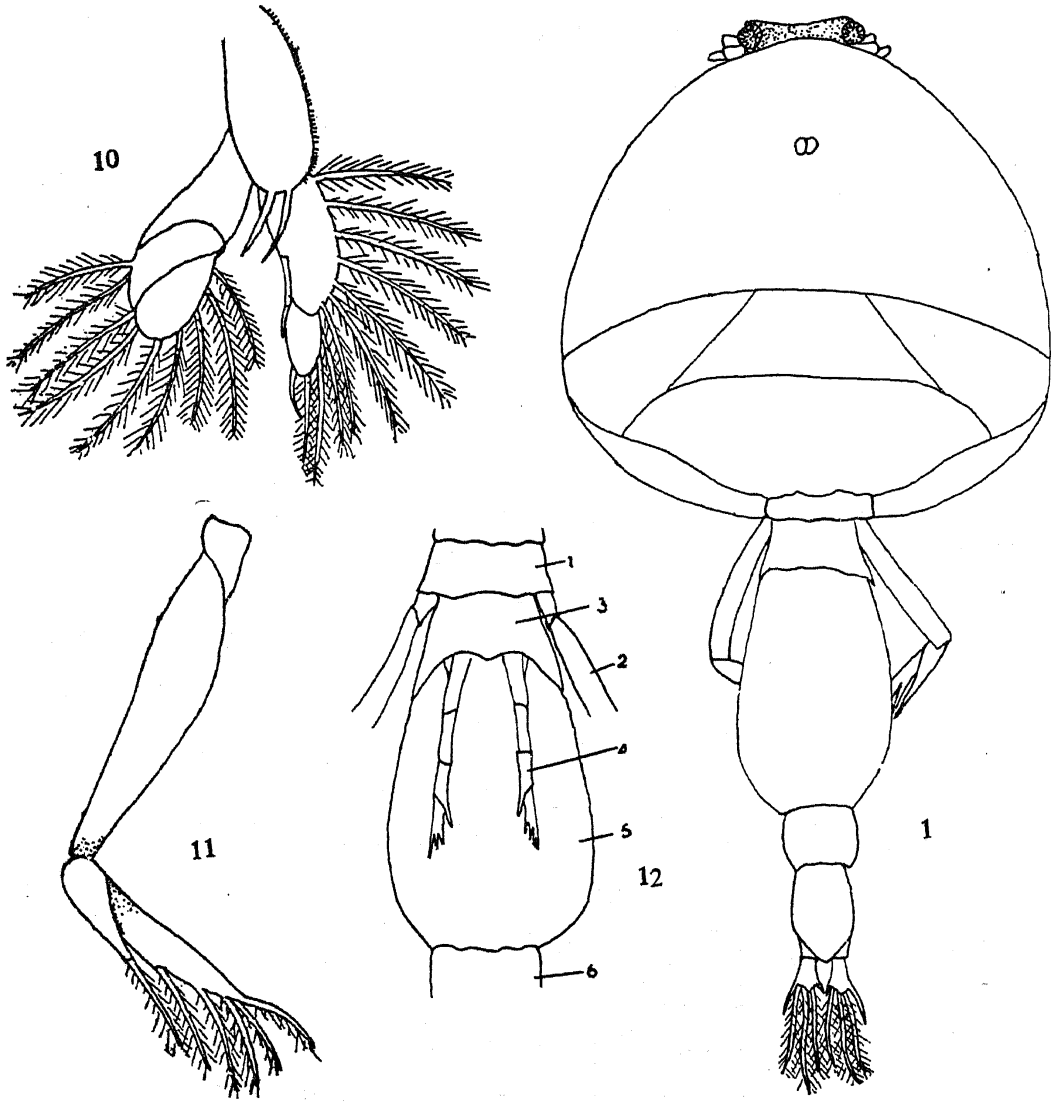

FIG. 1. Dorsal view of *Caligus sciænæ* × 73·3.
FIG. 10. III Swimming leg.
FIG. 11. IV Swimming leg.
FIG. 12. V Thoracic legs and the genital segment:
1. Free thoracic segment. 4. Vestigial fifth leg.
2. Fourth swimming leg. 5. Genital segment.
3. Fifth thoracic segment. 6. Second abdominal segment.

1*st Antenna* (Fig. 2) is three-jointed, the basal joint being as broad as the lunule itself. It is heavily armed with about fifteen stout spines while

the distal joint is long, slender and bears two spines on its body and four spines at its distal end.

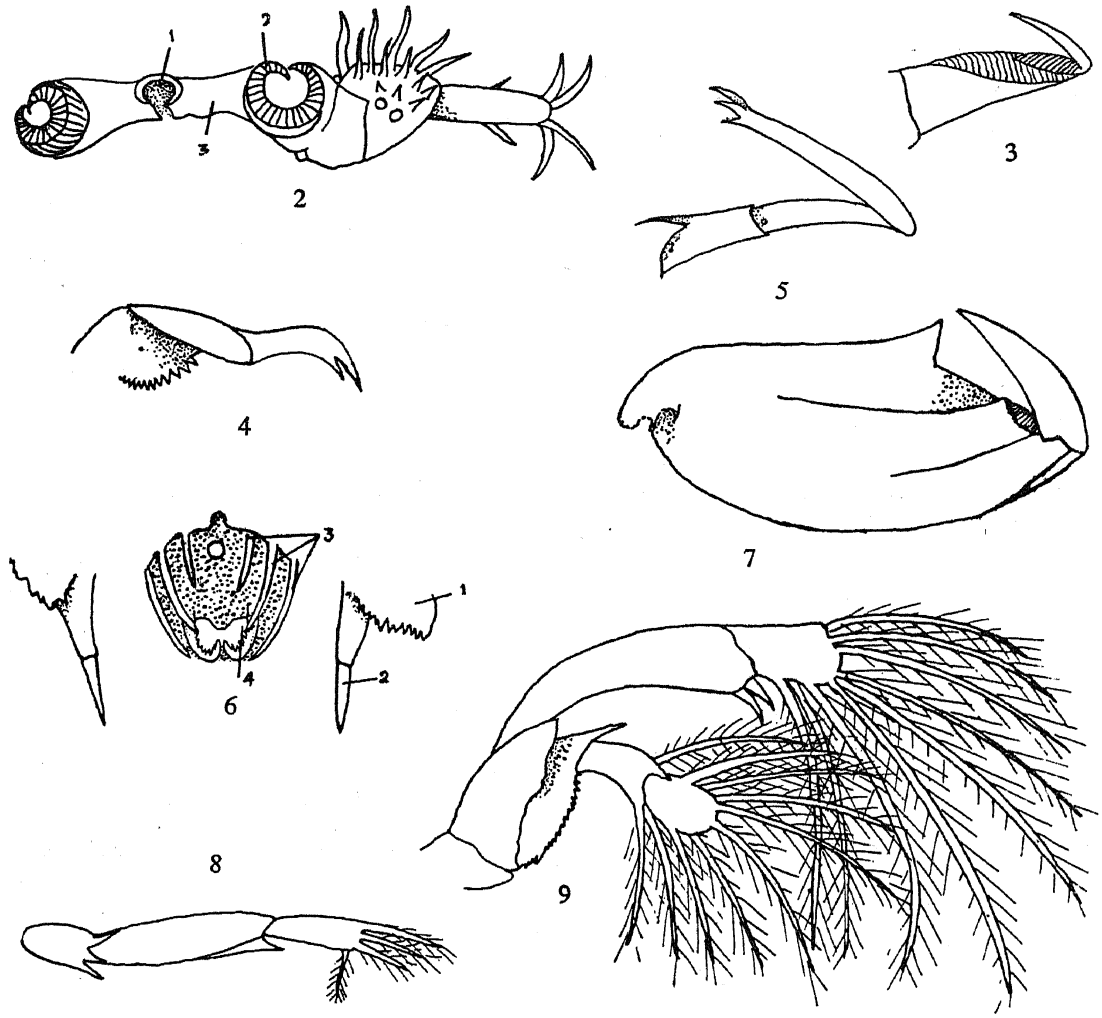

FIG. 2. Frontal Plate and Antenna: 1. median sucker. 2. lunule. 3. frontal plate.

FIG. 3. II Antenna.

FIG. 4. I maxilla.

FIG. 5. I Maxillipede.

FIG. 6. II Maxillae and mouth tube:

1. Exopod of maxilla.
2. Endopod of maxilla.
3. Chitinous rods of mouth tube.
4. Mandible.

FIG. 7. II Maxillipede.

FIG. 8. I Swimming leg.

FIG. 9. II Swimming leg.

2nd Antenna (Fig. 3) is two-jointed, the prcximal joint being stouter than the distal, which is long, slender and terminates in a sharp curved spine. On the inner side are seen two grooved plates.

Mandible is long and slender, toothed like a saw with the distal tip curved inwards. The mandibles are connected with the mouth tube, in the posterior part of which the teeth at the tips of the mandibles can be made out. The lateral walls of the tube are supported by three rods on each side, there being no transverse rods supporting the lower lip. The mouth is reniform in outline.

1*st Maxilla* (Fig. 4) is attached more outwards than the base of the second antenna but a little posterior to the front edge of the mouth tube containing the mandibles. It consists of two distinct joints. The basal joint is short and stout made stouter by the occurrence of toothed plate or lamina representing the exopodite or palp (F. Scott). The distal joint is very decidedly hooked and with its two sharp recurved spines must help in attachment. Wilson described only a simple claw; the occurrence of two in the parasite is noteworthy.

2*nd Maxilla* which is nearly as long as the first maxilla has a columnar base and tapers to a blunt point (Fig. 6). A small many-toothed lamina at the base probably represents the exopodite of this appendage (Wilson describes two setæ and considers them as endopodites and the main structure as the exopod).

1*st Maxillipede* (Fig. 5) is a very prominent appendage. It is distinctly three-jointed. The first two joints are long and stout while the third is longer and more slender, and appears to be capable of considerable movement. It ends in three sharp claw-like spines. There is a single-toothed plate at the base, indicating the endopod.

2*nd Maxillipede* (Fig. 7) arises nearer the mid-line and consists of two distinct joints. The basal joint is large and swollen and flattened. It bears a distinct tooth on its anterior border in this form, the terminal claw-like part folding like a knife-blade. At the outer part of the stout basal joint where the rest of the limb folds back can be seen a toothed bony plate rising from the posterior border of the base. At the very bottom of the basal joint on the medial aspect can be seen another toothed plate, not unlike those described before in the maxillæ. As this occurs on the medial aspect it is probably homologous to the endopod.

1*st swimming leg* (Fig. 8) as well as the second and third swimming legs indicate the thoracic segments which have united with the cephalon. The first leg however is uniramous like the fourth leg. It is three-jointed. The basal joint is short and stout. Its outer margin bears three sharp spines while the fourth spine borne by the body projects tailward. The second joint is longer by half the length of the first and bears a spine at its outer

margin. The distal joint bears three straight spines pointing outwards and a fourth spine directed backward. These spines are provided with fine hairs. The second and third joints represent the exopod.

2nd swimming leg (Fig. 9) has a short stout basal joint bearing both the exopod and the endopod. The inner ramus of the limb is three-jointed. The first joint has a toothed posterior edge and bears a spine at its outer margin; the second joint is shorter and bears a tooth at its outer edge while the third is flat, broad and orbicular. It is fringed with nearly ten long plumose setæ. The exopod is longer chiefly due to the first two joints which are similar to those of the endopod. The third joint bears on its posterior edge about the middle of its length, two short spines and at its distal margin bears eight long plumose setæ.

3rd swimming leg (Fig. 10) is attached farther from the mid-line because of the enlargement of the sternal plate of the segment. The natatory function of this appendage is unmistakable for even the basal segment is broad and flat. It is fringed on the outside by numerous short hairs and also bears two long plumose setæ on the ventral side of the outer edge. The endopod is foliaceous and three-jointed. The outer two joints bear nearly ten long plumose setæ. The exopod is also three-jointed, the outer two joints bear nearly ten long plumose setæ.

4th swimming leg (Fig. 11) is uniramous, the endopod being absent. It is four-jointed. The basal segment is stout as in the other legs. The first joint of the exopod is by far the longest forming nearly half the length of the limb. The second joint is short but is produced into a long spine at its outer margins while the third is slender bearing four apically directed spines with a fifth spine at the distal end. All the spines or setæ are plumose.

5th swimming leg (Fig. 12) represents a fifth thoracic segment as pointed out by Wilson. This occurs on the ventral side of the "genital segment". But as can be seen in the form described in this paper, these appendages really spring from the front part of the "genital segment". This anterior part of the segment is separated from the genital segment proper by a distinct groove. Therefore the genital segment is regarded as really the 1st abdominal and not as the fifth thoracic segment as Wilson has done.

The abdomen is three-jointed. The genital segment is nearly twice as broad as the succeeding segment, and nearly four times as long. There are no vestiges of appendages or other indications to show that this genital segment may be a composite of two segments fused into one. The segment behind it is broader than long while the third and last segment is longer than

broad. It ends in an obtuse point on either side of which the anal plates occur. Each lamina bears three long plumose setæ on its posterior side and two stouter spines one at each of the posterior corners. The absence of special structures on the antenna and of special plates on the 1st maxillipede usually used for prehension by the male, make it probable that the parasite is a female. The size of the genital segment also does not contradict such a conclusion. The persistence of the median sucker (the relic of the frontal filament of the Chalimus stage in development) as well as the absence of any trace of the egg strings, both argue the immature condition of the subject. This also serves to explain the occurrence of the fifth pair of thoracic legs (though in an unusual condition and position, being pressed against the body) whereas these usually disappear in a mature female. The occurrence of this species of *Caligus* on *Sciæna glauca* of the Madras Coast is noteworthy since *Caligus* (*Sciænophilus* Van Beneden) *Benedeni* sp. nov. described by Bassett Smith,[1] was taken from *Sciæna diacanthus* from Bombay and later recorded from Ceylon by Thompson.[7] This species, *C. Benedeni,* differs from the form described in this paper in having the cephalothorax only a fifth of the whole length and being much less broad than the genital segment; the lunules being very small; the basal part of the 1st antenna having only twelve plumose setæ and the second joint having two long spines; the 1st pereiopod having three long end bristles and three moderately long plumose setæ on its posterior border; the genital segment being rather long than broad; and the abdomen being single-jointed. In view of these differences the present form is described as *Caligus sciænæ,* n. sp. in this paper.

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