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**The biology and control of *Caligus* sp.,
an ectoparasite of the adult milkfish
Chanos chanos Forskal**

Einstein M. Laviña

One unidentified species of copepod belonging to the genus *Caligus* of the family *Caligidae* was found to infest the adult milkfish broodstock kept in canvas tanks at the SEAFDEC research station in Mag-aba, Pandan, Antique. The parasites were first noticed on June 14, 1976 when one adult milkfish (locally called *sabalo*) died in one of the tanks and was found to be heavily infested on all its fins, opercular area and the rest of the body surface. These parasites were later found on another sabalo from the same broodstock as well as on additional sabalos caught from the wild by means of an otoshi-ami net.

The female *Caligus* sp. is of moderate size, usually 3.8–4.8 mm in length, and its carapace a little less than two-thirds of this length. The male measures about two-thirds the length of the female. The body parts of both sexes are more or less similar in proportion except for the genital segment which is shorter than wide and has a more pointed lateroposterior projection in the male. The second antenna, the first and second maxillae, and the first and second maxillipeds differ to a certain degree between the sexes.

The fertilized eggs of *Caligus* sp. are extruded by the female through a pair of oviducal openings at the posterior end of the genital segment and form a pair of egg strings covered by a cuticular material. Incubation period lasts for 26-38 hours before the eggs are hatched. Bearing three pairs of appendages which are primarily used for swimming, the first nauplius molts into a second nauplius within 20-30 minutes. The second naupliar stage last for 5-6 hours and the larva molts to a copepodid stage.

The parasites most probably infested the milkfish in the open sea and were brought into the tanks attached to the adult milkfish captured from the wild. Subsequent examinations of adult sabalos caught from the wild showed the presence of few *Caligus* parasites on the body surface especially on the fins of adult milkfish. Within the tanks, the parasites reproduce and reinfect their hosts.

To control the parasites infesting the adult milkfish, tests were made using the chemical (2, 2, 2-trichloro-1-hydroxyl)-phosphonic acid-dimethylethol (Neguvon) at a concentration of 0.25 ppm. Table 1 shows the results of the treatments. It is noted that a concentration of 0.25 ppm of Neguvon maintained for 12-24 hours in the sabalo-containing tanks in a closed water system but with aeration is effective in controlling the parasites. Fish mortality during the experiment was due to inadequate aeration in the tanks.

Table 1. The effect of 2, 2, 2-trichloro-1-hydroxyl phosphonic acid-dimethylethol (Neguvon) at 0.25 ppm on *Caligus* sp. infesting adult milkfish *Chanos chanos* Forskal.

Treatment number	Date of treatment	Number of host individuals used	Duration of treatment (hr)	Presence of <i>Caligus</i>	
				Before the Experiment	After the Experiment
1	Aug. 10 1976	1 juvenile	24	milkfish artificially infested with 8 <i>Caligus</i>	No parasite left
2	Aug. 12	3 adults	24	fish infested with <i>Caligus</i>	No parasite left
3	Aug. 13	11 adults	23	fish infested with <i>Caligus</i>	No parasite left
4	Aug. 14	16 adults*	18	fish infested with <i>Caligus</i>	No parasite left
5	Aug. 14	7 adults	12	fish infested with <i>Caligus</i>	No parasite left
6	Aug. 14	20 adults**	12	fish infested with <i>Caligus</i>	No parasite left

* 2 fish died during the treatment due to inadequate aeration

** 12 fish died during the treatment due to inadequate aeration

