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Effect of Copepoda parasites *Caligus longipedis* (Bassett-Smith in 1898) infection in marine ornamental fish *Amphiprion percula* and *Amphiprion clarkii*

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Abstract

Marine ornamental fish culture is an important source of income in coastal communities in India. However, the every year Marine ornamental fish culture industry has suffers many serious disease outbreaks, including some due to pathogenic parasites. In the present study examined *Caligus* genus isolated from cultured two marine ornamental fish larval *Amphiprion percula* and *Amphiprion clarkii*. One *Caligus* species, *Caligus longipedis* were found on the skin surface of the fish larva.

Keywords: Marine ornamental fish, Parasites, *Caligus*, Aquaculture, Fish diseases.

1. Introduction

Marine ornamental fishes are remarkably expensive due to their demand in international markets. But problem due to bacterial, fungal and parasitic infections are the major drawback in captive condition [1, 2, 3]. Among the parasites copepod are commonly found in fish cultured in brackish and marine waters. They cause disease problems in both Pacific and Atlantic fish culture [4, 5, 6] with economic losses due to parasites in salmon culture, alone, estimated to be larger than USD 100 million annually [7]. Because of the need of study, mainly in Vietnam, and the above keeping pace nature of the industry, a particular value of economic loss continuous due to caligid copepods is currently impossible [8]. In brackish-water marine ornamental aquaculture parasites are importance of disease causing agents. The *Caligidae* of genus *Caligus* contains the highest number of species known to parasites was reported India, Taiwan, Japan, Philippines and Indonesia and it's 54% of copepod infestations are *Caligus*, and their impacts range from skin damage and stress-induced mortality of the fish, more than 90 species of *Caligus* genus was reported all over the world [9]. 12 species of copepods of the *Caligus* genus parasites were reported in Vellar Estuary [10]. A *Caligus* was the second species of fish-parasitic Copepoda ever mentioned in the scientific literature and the genus was established in 1785. Chronologically they were number 2, but in big game fishes, they are number 1 - the most common and diverse genus of parasites.

Adult *Caligus* survive without food for 5-8 days at 19-26 °C may simply swim from fish to larval [11]. As a result, this group of pathogens is widespread, particularly in marine and brackish waters of tropical regions, often resulting in serious health problems for fish, including heavy mortalities [12]. The present study was enough to cause stress to fish. At advanced level of infection, these become skin injury and then large open wounds [13, 14]. The large open wounds possible to connected with secondary bacterial infections [15]. Additionally, parasitic copepods may serve as vectors of viral and bacterial diseases of fish, for example *Aeromonas sp* and *Vibrio sp* [16]. This result will be a basic data for parasitic study and for prophylaxis this disease causing agents in marine aquaculture.

2. Materials and Methods

During a routine observation of the larval tank incidence of parasitisation in some a number of larvae were observed. One species of *Caligus* genus (*Caligus longipedis*) was isolated and examined during the present study. The parasites were removed with the help of fine forceps and placed in vials containing 5% formalin and 75% ethanol to store in further use.

3. Result and Discussion

A parasite infection of clown fish *Amphiprion percula* (Fig 1) and *Amphiprion clarkii* (Fig. 2) infected in one species of Copepoda parasites *Caligus longipedis* (Fig 3) at the same time copepod parasites was observed in the Parangipettai coastal waters (India), for the period of June 2012. Based on our morphological observations, the lernaeid parasitic copepod was uncertainly identified as *Caligus longipedis*. Copepoda was found attached on the middle of the body surface, directly embedded into the body of the fish. The fish appeared otherwise healthy and the congregation of large copepods had produced no obvious lesions.

3.1. Characters of *Caligus longipedis*

It has moderately separated lunules. The cephalosome is more than 1/2 of the total body length. The genital complex is wider than long and much longer than the abdomen. The caudal rami are as long as the abdomen. Microscopically, it differs from all other members of the genus except *C. robustus* by having crescent-shaped sclerotized areas on the last segment of the inside branch of leg 2. Maximum Female is 3.8-5.5 mm and male 2.4-5.5 mm, geographic Range its available in worldwide. This parasite occurs on a number of inshore fishes. Its abundance offshore is less certain (Location in Host - External surface).



Fig 1: *Caligus longipedis* infected *Amphiprion percula* larval

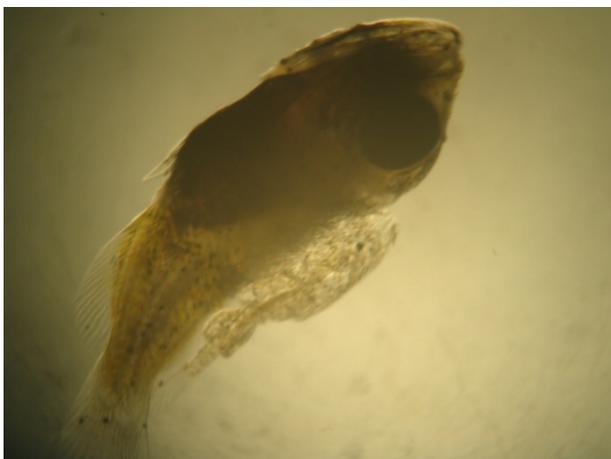


Fig 2: *Caligus longipedis* infected *Amphiprion clarkii* larval

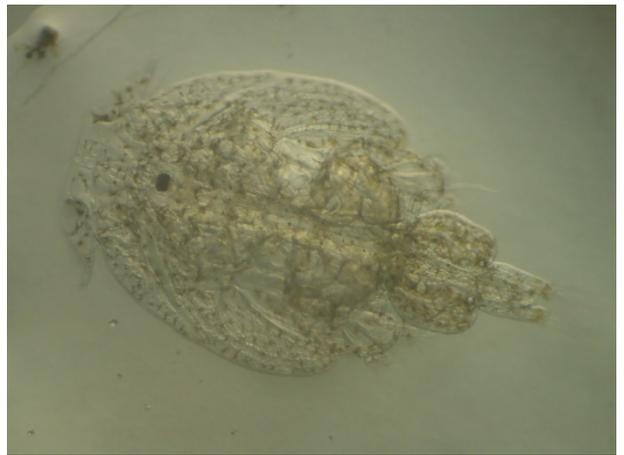


Fig 3: Microscopic image of *Caligus longipedis* parasite

Diseases is now a main constraint to aquaculture, diseases have caused losses of USD 1.3 million for cage cultured grouper, snapper and seabass in all over the countries [17]. Even though copepod parasites has been recorded from throughout the world. The copepod genus *Caligus* are mainly known as marine fish parasites in all over the cultured fishes and wide fishes. The majority of the parasitic copepods are identified to have high host specificity [18]. Wooten *et al.*, 1982 [4] reported families of Caligidae are commonly found on fish cultured in brackish and marine waters. They cause disease problems in both Pacific and Atlantic fish culture. Johnson *et al.*, 2004 [7] indicate that losses in grouper culture in areas of Southeast Asia may be routinely as high as 75%. The maximum number of *Caligus* genus, species known to parasitize in fish.

There are a small number of studies of *Caligus* spp. from Vietnam. Rajkumar 2006 [19] investigated a copepod parasite on *Stolephorus commersonii* experimental in the portonovo coastal waters (India), during June 2004. Toksen 2007 [20] reported one species of Copepoda on cultured seabass in Turkey. Purivirojku *et al.*, 2008 [21] reported these ten species caligus, four species of ergasilus and six species of lernanthropus on the Gulf of Thailand. A ten species of caligus and two species lernanthropus are reported on velar estuary in parangipettai, southeast coast of India [9]. Venmathi Maran *et al.*, 2009 [10] found ten species Caligidas genes and four species Lernanthropidae on Marine Fish Cultured in Floating Cages in Malaysia. Vo *et al.*, 2008 [22] investigated on two species of caligus *E. coioides* and *E. bleekeri* on Wild and Cultured Grouper in Vietnam. In the present study one species of caligus genes *Caligus longipedis* found in two species cultured marine ornamental fish larvae *Amphiprion percula* and *Amphiprion clarkii*, and its cause high number of mortality in marine ornamental fish culture in India.

4. Conclusion

In the present study was investigated Copepoda parasites *Caligus longipedis*, however a routine observation of the larval tank of *Amphiprion percula* and *Amphiprion clarkii* and this two tank fishes are infected in one species of Copepoda parasites *Caligus longipedis* infection. The parasite is attached on the body surface of the marine ornamental fish larval and it is damaged the body surface to cause the mass mortality in the ornamental fish industry.

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