

Morphological studies of *Chilodonella cyprinid* (Moroff 1902) from freshwater fishes

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Abstract: In the present study morphology of *Chilodonella cyprinid* from fresh water fishes have been described, occurring in particularly on the gills and in a later stage on its skin. The relative prevalence of this protozoan parasite among different fresh water fishes from Aurangabad were analysed. Overall percentage of prevalence for the whole year was 41.55 %. This parasite showed highest prevalence in the months of November to February, moderate in July to October whereas minimum prevalence was recorded in the March to June

Key Words: *Chilodonella cyprini*, gills, fishes, prevalence.

1. INTRODUCTION:

Aquaculture is one of the most economically important applied strategies all over the world. The diseases caused by parasites can be lethal based on the extent of damage to the body organ, the organ of the body affected and also the virulency of the pathogen. Several species of protozoans infects human and inhabit the body as commensals or parasites.. Fishes are one of the most beneficial food and nutritional resources to human and other organism. But this fishes are facing various risks factors responsible for fish diseases due to infection of the microorganisms such as fungi, bacteria, virus and protozoa (Kabata 1985). *Chilodonella cyprini* is fresh water or ecto-parasite of fish. It mainly attacks the gills and skin of fish. Infected fish may be lethargic, show the increase gill movements and fishes will stay near the water surface gasp for air. The fish will rub against the objects and become inactive. Sometime skin has milky appearance due to an increased mucus secretion. In severe infestation skin may be swollen and flake off. Poor water condition can accelerate the disease (Arday Huck 2002).

2. MATERIALS AND METHODS:

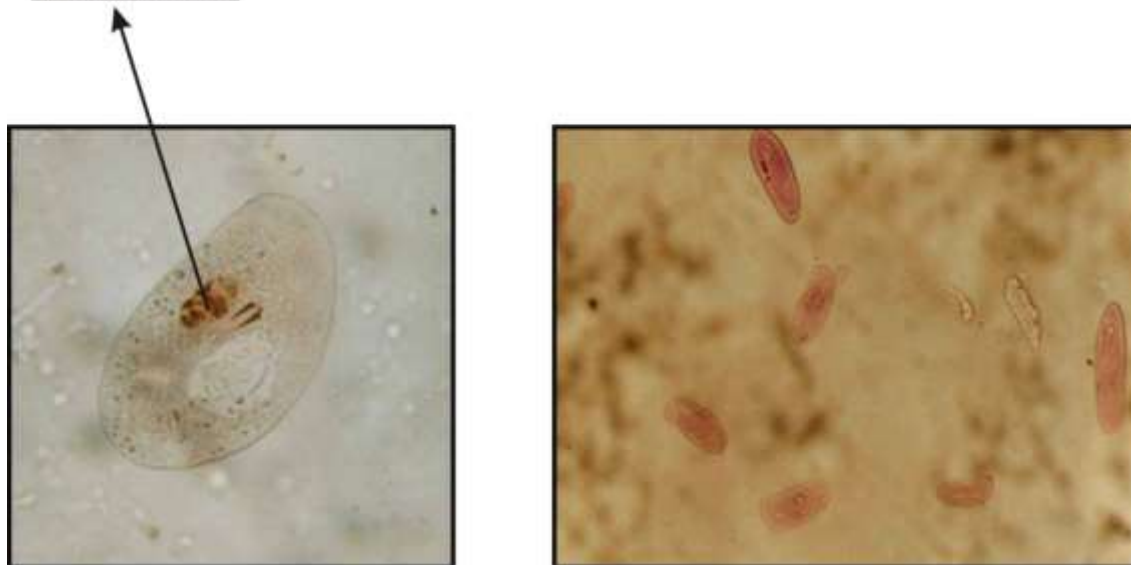
Water samples were collected in bottles while fishes were collected in a jar and brought to the laboratory. Samples were then examined for presence of ciliated protozoa and drop of water had taken on the slide from the water samples heavily infected with protozoa. A skin scrape had taken using a wooden spatula to gently lift off a slime/mucus samples from the skin of fish. The mucus sample is put on to a glass microscope slide then a drop of pond water is added and observed under microscope. Fixation is done in Schaudinn's fluid and stained with tungsto phosphoric haemato xylene stain.

3. RESULTS AND DISCUSSION:

Chilodonella belong to Order *Chlamydomontida* (Deroux, 1976) the ciliates which included in this order have peculiar characteristics i.e. "body typically dorso-ventrally flattened, may adhere to substrate by thigmotactic ventral somatic cilia, which are typically ventrally disposed in two roughly equal fields which may be separated midventrally. *Cyrtophorids* feed mainly on bacteria, but some are histophagous and many are found in nature in association, generally as ectosymbionts or epibionts. Several species may be harmful to fishes (Lom, 1970). In the family *Chilodonellidae* (Deroux 1970) the right ventral somatic kineties arch preorally to the left so that anterior preoral kinetal arcs of all, right ventral somatic kineties continuous with more posterior parts of those kineties and body tapers at anterior end. It includes eight genera i.e. *Chilodonella*, *Phascalodon*, *Pseudochilodonopsis*, *Thigmogaster*, *Trithigmotma*, *Chilodonatella*, *Odontochlamys* and *Phyllotrichum*. Genus *Chilodonella* has many species, as it is parasitic as well as free living in nature. Genus *Chilodonella* is first reported by Strand (1928) and is a member of Class *Phyllopharyngea* (de Puytorac et al 1974). This class includes the ciliates which possesses the ciliated stage with somatic kineties mostly as monokinetids that each have a lateral kinetodesmal fibril, a reduced (or absent) transverse microtubular ribbon and some what convergent postciliary ribbon extended posterior ward to accompany ribbons of more anterior monokinetids, ribbon – like subkinetal nematodesmata arise from somatic monokinetids, extending beneath kineties as subkinetal ribbons, which in *Cyrtophorids* and *Chonotrichs* probably extend anteriorly and in *Rhynchodids* and *Suctorians* posteriorly, oral region with radially arranged microtubular ribbons (*phyllae*), which in *Cyrtophorids*, are enclosed by large, rod shaped nematodesmate of hexagonally packed microtubules held together near the cell membrane by filaments. Subclass *Phyllophoryngia* – (de Puytora et al 1974) in this Subclass trophonts

are free swimming, may be sessile but usually not sedentary. Cilia are mainly on ventral surface .Oral ciliature is typically composed of one pre oral kinety and two circumoral kineties, with true Cytostome and cytopharynx with 'phyllae.' The macronucleus is heteromerous.

Macronucleus



Photomicrograph: A- *Chilodonella cyprinid* stained with Haematoxyline stain

3.1. CHILODONELLA CYPRINI:

Outline shape of the body is oval to reniform with anterior left hand rostrum. Body is dorsoventrally flattened, ventral surface is flat dorsal surface arched except for an anterior flattened region. It measures about 110 to 130 um in length. Somatic cilia restricted to ventral surface consisting of several longitudinal kineties. There are 18 to 20 kineties' of these somatogenic kineties run in a straight course down to the middle from the cytostome. To the right of which eight or nine kineties run frequently as far as the level of the cytostome. The anterior part of the dorsal surface flattened with only one transverse row of cilia (also referred as dorsal bristles.). Cytopharynx is straight and is wider anteriorly and narrowing posteriorly (this oral basket or cytopharynx is supported by a protrusible basket of trichites held together in a membrane; there are 12 to 14 trichites (cytopharyngeal rod) forming a tube). There is a line of bristles extends to the beak from the anterior end of the cytopharynx. The pre –oral kinety furthest from the aperture lies obliquely along the suture line beneath the latter pre – oral kineties. There is a left field of longitudinal kineties which are positioned only on the left of the oral aperture i.e. there is a central zone posterior to the aperture which is devoid of cilia. Macronucleus is oval with a regularly characteristic concentric structure, which is situated in the middle of the body. Micronucleus is small and spherical situated near the macronucleus. There are numerous contractile vacuoles. The comparison of *Chilodonella cyprinid* with earlier species is given in table one. *C. cucullulus* (Muller 1786) *C. ucinata* (Ehrenberg, 1838) *C. caudata* (Stokes, 1885) *C. capucina* (Penard, 1932) *C. cucullulus* (Shaikh 2008) *C. capucina* (Deshmukh, 2011) *C. cyprini* (Moroff, 1902). Present species is similar to *C. cyprini* (Moroff, 1902).

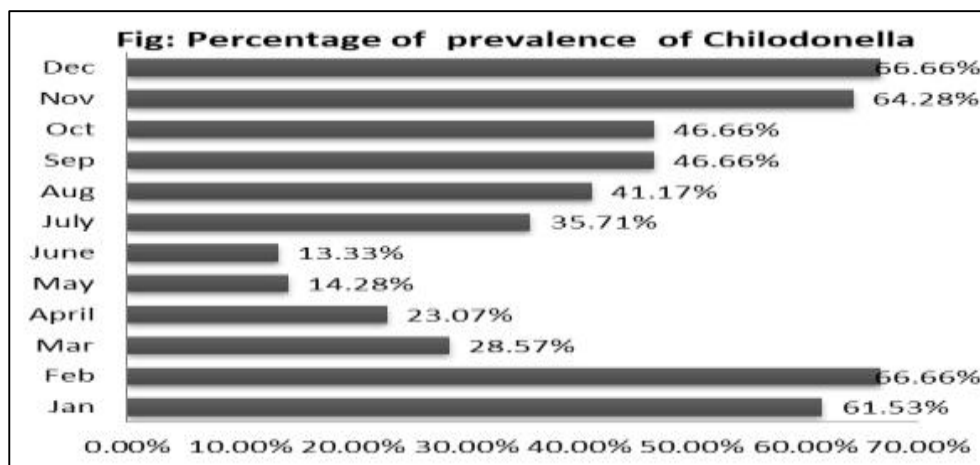
Particulars	<i>C. cucullulus</i> Muller 1786	<i>C. ucinata</i> Ehrenberg, 1838	<i>C. caudata</i> Stokes, 1885	<i>C. capucina</i> Penard, 1932	<i>C. cucullulus</i> Shaikh 2006	<i>C. capucina</i> Deshmukh, 2011	<i>C. cyprini</i> Moroff, 1902	Present Species
Habitat	Fresh brackish water	Fresh Water	Stagnant water	Fresh Water	Fresh Water	Fresh Water Fish	Skin & gills of cyprinid fishes	Fresh Water fishes

Body shape	Ovoid & both ends are rounded	Ovoid & both ends are rounded	Ovoid anterior, rounded, post .,pointed	Ovoid both end rounded	Ovoid both end rounded	Ovoid both end round	Ovoid post end with depression	Ovoid & both the ends rounded
Body size	300µ in diameter	90µ in long	45µ long	60µ	158µ	45µ long	70µ	130µ long
Ciliary rows	20	11	-	20	13	19	12	12
Cytostome	Oval or round	Oval or round	Oval or round	Oval or round	Oval or round	Oval or round	Oval or round	Oval or round
Contractile vacuole	8	2	6	2	2	2	2	2
Macronucleus	Round to ovoid	Round to ovoid	Round to ovoid	Round to ovoid	Oval	Round to ovoid	Round to ovoid	Ovoid
Micro nucleus	Spherical	Spherical	Spherical	Spherical	Spherical	Spherical	Spherical	Spherical

Table 1: Comparison of present species with the species of Genus *Chilodonella*

Table 2: Showing Monthwise /Seasonal changes in ciliate *Chilodonella* sp

Months	Number of sample examined	<i>Chilodonella cyprini</i>	Percentage of prevalence
Jan	13	08	61.53%
Feb	12	08	66.66%
Mar	14	04	28.57%
April	13	03	23.07%
May	14	02	14.28%
June	15	02	13.33%
July	14	05	35.71%
Aug	17	07	41.17%
Sep	15	07	46.66%
Oct	15	07	46.66%
Nov	14	09	64.28%
Dec	12	08	66.66%
Total	168	77	41.55%



This parasite showed highest prevalence in the months of November to February (64.28%; 66.66%; ; 61.53%; 66.66%), moderate in July to October (28.57%; 23.07%; 14.28%; 13.33%) whereas minimum prevalence was recorded in the March to June (28.57%; 23.07%; 14.28%; 13.33%) This pattern of incidence of the parasite was peak in winter months moderate in monsoon whereas least in summer months. (Table 2 and Fig .1).

3.2. RECOMMENDATIONS: *Chilodonella* tolerates a variety of different water temperatures than other protozoan parasites. For the productivity of pond, fish farm or aquarium, we should repeatedly analyze the water for the incidence of such parasites and examine the entire body for ulcers, change in colorations or other problem that ascend when fish are stressed. Poor water quality will cause stress and weaken the immune system of fish. The severe infestation may leads to death of fish but the healthy fish will be able to fight most disease and parasite. The purpose of our study is to increase the understanding of diseases of the aquarium, teleost, and condrichthys fishes by characterizing pathogens or parasites. For the future investigation, it is advised that the study of interactions between parasites and their host to be done. Many researchers suggested different kinds of chemical control to treat fish diseases but taking consideration of fish health they should give priority to biological control, if the condition is worst or intense than treat them with chemical control.

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