
-Short Communication-

Seasonal variation of parasitic infections in fish *Johniuss dussumieri* (Perciformes: Sciaenidae)

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Abstract: A total of 534 individuals of *Johniuss dussumieri* were examined for helminth infection from January 2015 to December 2015. Out of 534 fishes, 289 were infected with helminth parasite and prevalence rate was 63%. Maximum prevalence of trematodes infection was 92% in August and September while the minimum was 40% in January. It concluded that there was a higher presence of diversified parasitic infection. Consumption of fish in the regular diet is growing. Therefore it is necessary to have high quality fish consumption.

Keywords: Trematodes, Infection, Intensity, Edible Fishes, Karachi Coast

Introduction

The balanced proliferation in the biosphere's inhabitants gradually effects in all characteristics of our life. Fish is a main nutritional food resource that consists of low cholesterol protein to roughly sixty percent of the population of the world (Sichewo *et al.*, 2013). Developed countries fulfill thirty percent of their annual animal protein through fish (Abisoye *et al.*, 2011).

Standard growth of the fish is coupled with parasites infestation which impacts the fish size (reduced size) resulting in changing the behavior making the fish more prone to infections (Thomas, 2014). Both endo and ectoparasites are said to be more common in fishes but former is unsafe and has a detrimental impact on the host (Ashraf and Zafar 2013). Consumption of parasite infested fish leads to diseases like diarrhea (Sichewo *et al.*, 2013). It is crucial to garner more attention to this hazardous issue of parasite infested fish in the preset fish population. This study's aim is to investigate the prevalence of helminth parasites with specific reference to the incidence of Trematodes in fishes caught from the coast of Karachi. The rising demand for food can be tackled by utilizing seafood. Fish contain unsaturated fatty acids that may decrease tenderness all over the body. Tenderness in the body destructs the blood vessels which eventually results in heart diseases due to parasite infested sea water and fresh water fish species. Helminths are one of the

major group of parasites. Besides the increasing demand of fish as a food source; parasites can also participate in the socio- economic loss in the fish industry. Fishes are said to be infected with 3 groups of helminths, the Acanthocephalan (spiny-headed worm), Nematode (round worms), and the Platyhelminthes (flat worms).

Trematodes are the most common and important parasites in fish. The medical image of trematode prevalence depend upon size and mostly the worms which are existing in the host and parasitized tissue or organs The pathogenic injuries created may be confined or general, generally both. The earlier involves to create ulcers, sloughing of tissue and formation of an abscess.

In fishes mature trematodes mostly are present in the stomach and intestine. Some of them present in bile ducts, liver and other organs. Therefore, significance of fish trematodes cannot be ignore specifically since fish is a cherished source of nutrition. Due to pollutions the mortality rate in fishes particularly in young fishes causes enormous commercial damage. The reason for this study is to support the fisheries department to maintain a record that would allow field biologists to deal with these issues and focus their resources into areas of concern.

Materials and Methods

A total of 534 specimen of *Johniuss dussumieri* collected from different fish markets of Karachi Sindh from January 2015 to December 2015. The healthy and infected fish is being shown in Figures 1 and 2 respectively. The fishes were dissected and slit open from along the mid ventral line by utilizing sharp scissors and a scalpel. Incision was also made in the intestine area and was thoroughly analyzed through the microscope and binocular (Cable, 1963).

Parasites called helminth were present when it was analyzed microscopically and macroscopically. Trematode parasites from major groups were separated as well as counted (Cable, 1963). Prevalence of endoparasites in fish was measured by percentage formulae.



Fig. 1: Anatomy of *Johniuss dussumieri*.



Fig. 2: *Johniuss dussumieri* with inflammation, sunken eyes, inflammatory jaw and surrounding areas.

Results

534 individual fishes were observed in which a total of 289 were helminth parasite infected and 249 were free from parasitic infection. The highest parasitic abundance of 82% was recorded in June whereas the lowest rate was recorded at 25 % in March (Tab. 1) and (Figs. 3 and 4). The mean was calculated as 24.08 ± 13.21 by using Statistical Package of social science (SPSS) software.

The number of Trematodes collected from infected fishes were 183, minimum were reported in the month January 2015 and maximum number of Trematodes in the month of August and September .The maximum trematodes occurrence was of 92% from August and September. The minimum trematodes occurrence was 40% in the month of January and its mean was 15.25 ± 9.697 .

Discussion

Several features consisting of physical and biological features of a host is said to define the fish's parasitic arrangement (Khanum *et al.*, 2008). There is a lack of material, though, concerning pathogenic, distribution and effects control of most of the parasitic diseases when it comes to the fish population. During the entire span of the study, the strength of infection was noted and the highest presence of trematodes was recorded from August and September whereas the lowest infection was observed in January. One of the reasons for these consequences are produced by the environment of Karachi having a warm climate in summer and autumn which makes parasites incapable to living in this temperature, but in spring the climate is very appropriate for parasites. Tedila and Fernando, (1970) observed that in the autumn season fish become infectious and in late winter peak prevalence is recorded, which started decreasing in March and was zilch from August till September. Gautam Kumari *et al.* (2018) studied that Seasonal variation in helminth parasites of snakeheads *Channa punctatus* and *Channa striatus* (Perciformes: Channidae) in Uttar Pradesh, India. These variations may be attributed to various environmental and biological factors including parasite life cycle and immune level of host. Asifa Wali *et al.* (2016) studied about the distribution of helminth parasites in intestines and their seasonal rate of infestation in three freshwater fishes of Kashmir. All the three parasites showed higher prevalence during summer and the least prevalence during winter. Parasitic infections were prevalent more in male fishes compared to females. The presence of the parasites had reduced the condition coefficient of the infected fishes in both water bodies. The study also showed that some of the physicochemical features showed a significant positive correlation with the prevalence.

Ghaffar (2008) studied that temperature has an effect on fishes and the temperature effect is a significant factor for the prevalence rate of parasites

Tab. 1: Seasonal Index of Parameters in Fishes of Karachi Coast from January to December 2015.

Month	A	B	C	D	E	F
January	43	20	47%	8	0.400	40%
February	50	26	52%	15	0.570	58%
March	60	15	25%	10	0.667	67%
April	20	8	40%	5	0.625	63%
May	35	18	51%	9	0.500	50%
June	66	54	82%	38	0.704	70%
July	60	42	70%	26	0.619	62%
August	21	14	67%	13	0.929	92%
September	45	25	56%	23	0.920	92%
October	25	27	45%	17	0.630	63%
November	60	29	54%	12	0.414	41%
December	54	11	55%	7	0.636	64%
Total	534	289		183	0.633	63%
Prevalence Rate			63%			
Standard Deviation		13.215		9.697	0.136	
Mean		24.083		15.250	0.626	

A: No. of Fishes Examined; B: No. of Fishes Infected with Helminths Parasites; C: Prevalence Rate %; D: No. of Trematodes Collected, E: Mean Intensity of Trematodes, F: Mean % Intensity of Trematodes

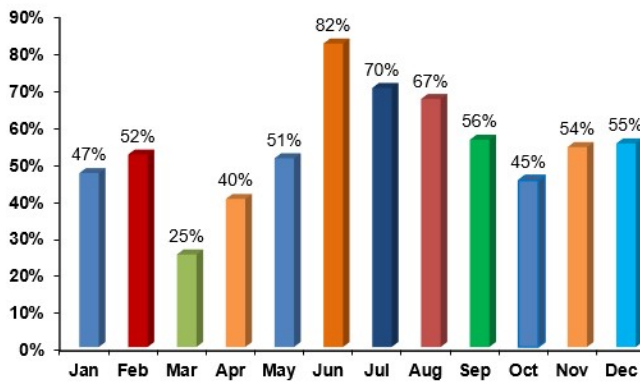


Fig. 3: Prevalence rate of fish infected with helminth parasites.

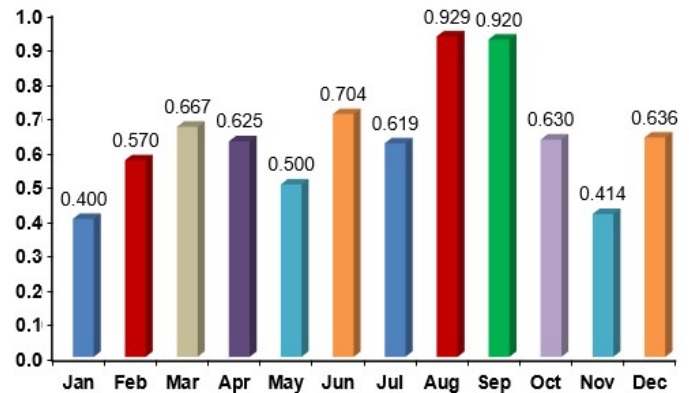


Fig. 4: Mean intensity of trematodes.

where the infestation rate increase in the hot environment or temperature. The same study has also been observed by Kelle (1977) Fatima and Bilqees, (1989). Bussmann and Ehrich (1979). The highest rate of parasitic infection may be due to seasonal changes (Peek, 2012).

Conclusion

The current study concluded that there is an immense diversity when it comes to endoparasites present in fishes and infected fishes are able to cause any harm for human health so, always use the small sized fish because small fish contain better taste, well for health and possess reduced amount of unhygienic fish than older and big fish. Therefore studies should be conducted to effectively summarize the effect of endoparasites in infested fishes, focusing on edible fishes consumed by human. Combination of all the aspect discussed above, consist of mismanagement of marine resources and lack of enforcement of

environmental laws which need proper attention from the fisheries department and the Ministers of food and environment.

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