RESEARCH ARTICLE

POPULATION DYNAMICS OF HELMINTH PARASITE IN FISHES FROM SOLAPUR AND OSMANABAD DIST (M.S) INDIA.

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Abstract

The present study deals with the population dynamics of helminth parasites in fishes from different places of Solapur and Osmanabad dist M.S (India) during August 2015 to July 2016. Helminth parasites were recovered from fishes. This report summaries the percentage of incidences, intensity, density and index of infection. The high prevalence occurs in summer season especially in the month of March and May, while low prevalence occurs in winter season followed by rainy season. The present study indicates the seasonal infection of helminth in fishes.

Introduction:

Fishes are important animals in ecosystem. They are useful source of human food as well as the source of income. These edible fishes are known to harbor a number of helminth parasite which cause deterioration in their health, hence their market and nutritive value is affected. Parasite can have a wide range of impact on the ecology of their hosts in terms of health (Atme and Owen, 1967) behavior (Milinski 1984, Moore 1984) sexual selection (Howard and Michella, 1990 Watve and Sukumar, 1977) and regulation of the host population (Freeland 1983) parasitic infection tends to decrease the growth rate of the fish. The damage caused by helminths to their hosts is generally related to intensity of infection and depth of parasite penetration with host tissue. Seasonal fluctuation, locality, age, size and sex of the host also determine the parasitic community diversity and burden. Polyanski, 1957 suggested that the diet, lifespan, mode of life, population density and size of the host are the main factors which determine the variety of parasitic species as well as intensity and prevalence of infection. Many authors have carried out studies on the helminth parasites and population dynamics of those occurring in Piscean host and work on different aspects of parasites. The study of population dynamics can be used as the biological basis of method to regulate population of parasite.

Material and Methods:

The freshwater fishes are collected from fish market of different places of Solapur and Osmanabad dist. The helminth parasites were collected, preserved, processed to a permanent slide and identified under compound microscope while drawings are made with the aid of camera lucida. The identification was made with the help of “systema Helminthum” Vol II “Helminths of vertebrates” by Yamaguti (1961).

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Population dynamics of helminth parasites were determined by following formula

- Incidence of Infection = \frac{\text{Infected hosts}}{\text{Total hosts examined}} \times 100
- Intensity of Infection = \frac{\text{Number of parasites collected in a sample}}{\text{Number of infected hosts}}
- Density of Infection = \frac{\text{No. of hosts infected} \times \text{No. of parasite collected}}{\text{Total hosts examined}}
- Index of Infection = \frac{\text{No. of hosts infected} \times \text{No. of parasite collected}}{(\text{Total hosts examined})^2}

Population Dynamics of Helminth Parasite in fresh water Fishes from Solapur and Osmanabad District during the year Aug.2015 to July 2016

| Month | Name of Parasite | No Of Host examine | No of host Infected | Total No of Host Infected | Total no parasite Collected | Incidence | Intensity | Density | Index of infection | Habitat /locality |
|-------|------------------|--------------------|---------------------|---------------------------|----------------------------|-----------|-----------|---------|------------------|------------------|
| Aug.15| Cestode           | 50                 | 32                  | 28                        | 27                         | 56        | 0.96      | 0.54    | 0.302            | Barshi           |
|       | Trematod         | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode         | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
| Sept.15| Cestode        | 45                 | 17                  | 10                        | 10                         | 22.2      | 0.22      | 0.049   |                  | Solapur          |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 02                 | 02                  | 4.44                      | 0.44                       | 0.0019    |           |         |                  |                  |
| Oct.15| Cestode         | 45                 | 07                  | 05                        | 04                         | 11.11     | 0.088     | 0.009   |                  | Osmanabad        |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 03                 | 03                  | 6.66                      | 0.066                      | 0.004     |           |         |                  |                  |
| Nov.15| Cestode         | 50                 | 25                  | 22                        | 20                         | 44        | 0.90      | 0.4     | 0.176            | Yermala           |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 03                 | 02                  | 66.6                      | 0.04                       | 0.002     |           |         |                  |                  |
| Des.15| Cestode         | 55                 | 20                  | 16                        | 05                         | 29.0      | 0.312     | 0.09    | 0.0026           | Ujani            |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 04                 | 02                  | 7.27                      | 0.036                      | 0.0026    |           |         |                  |                  |
| Jan.16| Cestode         | 40                 | 24                  | 20                        | 04                         | 50        | 0.2       | 0.1     | 0.05             | Kallamb          |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 04                 | 02                  | 10                        | 0.05                       | 0.005     |           |         |                  |                  |
| Feb.16| Cestode         | 37                 | 30                  | 20                        | 15                         | 54.05     | 0.75      | 0.4    | 0.219            | Barshi           |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 10                 | 10                  | 27.02                     | 0.27                       | 0.07      |           |         |                  |                  |
| Mar.16| Cestode         | 55                 | 45                  | 40                        | 20                         | 72.72     | 0.5       | 0.36   | 0.26             | Osmanabad        |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 05                 | 08                  | 9.09                      | 1.6                        | 0.14      | 0.013     |         |                  |                  |
| Apr.16| Cestode         | 60                 | 55                  | 50                        | 30                         | 83.3      | 0.6       | 0.05   | 0.416            | Solapur          |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 05                 | 09                  | 8.33                      | 1.8                        | 0.15      | 0.0125    |         |                  |                  |
| May 16| Cestode         | 65                 | 60                  | 55                        | 25                         | 8.46      | 0.45      | 0.38   | 0.325            | Ujani            |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 05                 | 06                  | 7.69                      | 1.2                        | 0.092     | 0.007     |         |                  |                  |
| Jun.16| Cestode         | 70                 | 46                  | 26                        | 10                         | 37.1      | 0.38      | 0.14  | 0.053            | Barshi           |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 20                 | 03                  | 28.57                     | 0.15                       | 0.042     | 0.012     |         |                  |                  |
| July 16| Cestode        | 50                 | 20                  | 12                        | 05                         | 24        | 0.41      | 0.1    | 0.024            | Osmanabad        |
|       | Trematod        | 00                 | 00                  | 00                        | 00                         | 00        | 00        | 00      |                  |                  |
|       | Nematode        | 08                 | 04                  | 16                        | 05                         | 0.08      | 0.0128    |         |                  |                  |
**Result and Discussion:**
The analysis of data shows that the occurrence of helminth parasites variable according to seasons.

The high incidences, intensity, density and index of infection of all the helminth parasites occurred in summer season followed by winter season where as lower infections in mansoon season. The intensity varies greatly with respect to helminth parasites and host species, host size and feeding habitats, season and locality.

Rodhe, 1993 explained the temperature control parasitization. He explained the infections are more in warm seas than old ones. JadHAV (1976, 2005 and 2006) explained the development of parasites should be needed high temperature, low rainfall and sufficient moisture. Hence the high prevalence occurs in summer followed by other season.
Conclusion:
After the analysis of data the present study can be concluded that the high infections of helminth parasite (incidences, intensity, density and index of infection) are occurred in summer season followed by winter where as low in mansoon season. This type of results indicated that environmental factors and feeding habitat are influencing the seasonality of parasitic infection either directly or indirectly.

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