

SUMMARY

In present study, the fresh water fishes were collected from the riverine system of study area (Map, page No. 9) especially from following two districts;

1. DHULE DISTRICT

Dhule district, formerly known as West Khandesh, belongs to Northern Maharashtra region; lies between 20.38⁰ to 21.61⁰ North latitude and 73.50⁰ to 75.11⁰ East longitudes in upper Tapi basin and on the North west side of Maharashtra. The district is surrounded by Madhya Pradesh on the North, Nandurbar district and Gujarat State on the West, Nasik district on the South and Jalgaon district toward the East. It occupies an area of approximately 8063 square kilometers. There are nine important rivers flowing in the district. The largest river in length is Panzara. It is life line of Dhule district and one of the tributaries of interstate river Tapi that flows eastwards in to the Arabial sea. The river Panzara harbors rich fish fauna. Barring the relatively small area of Narmada drainage of the North part, the rest of the district is comparatively drained by the Tapi and its tributaries. The river Tapi is Major River flowing through district while other rivers are Panzara, Burai, Gomai, Amravati, Aner, Bori, Kan and Jamkhedi etc.

Collecting Stations

A total seven collecting station was made from where 127 fish sample were collected. Help was obtained from local fisherman. The collecting stations with river and number of sample collected are shown in parenthesis, these include;

1. Pimpalner- Panzara and Jamkhedi river (26)
2. Sakri- Kan river (33)
3. Dhule- Panzara-Kan river (19)
4. Kusumba- Panzara river (8)
5. Shirpur- Tapi and Aner river (25)
6. Shindkheda- Tapi and Amaravati river (8) and
7. Nizampur- Burai river (8).

2. NANDURBAR DISTRICT

Nandurbar district lays northwest corner (Khandesh region) of Maharashtra. It is having strong mythological background. In Ramayana, Mahabharat, Sadashkumar Charitras the Region was known as “Krushik”. After that in Yadava’s region it was known as ‘Sevundesh’ after the kind Devunchandra. There is a mention of various regions in Bhishma Parva of Mahabharat i.e. Gomta, Mandka, Khana, Vidarbha and Rupvahika. As per western Historian the ‘Khanda’ represented Khandadesh means reach area. Being on straight on same line to Dwarka Nandurbar is also called Nandnagari in reminiscence of Lord Krishna. Nandurbar district is a tribal district. The Nandurbar district was one of the taluka falling under the jurisdiction of Dhule district. However, with effect from 1st july 1998 the Nandurbar was separated from Dhule district and it came into existence as new district. Nandurbar district has six tahsils viz., Akrani (Dhadgaon), akkalkuwa, Taloda, Shahada, Nandurbar and Navapur. It belongs to Nasik Division of Maharashtra State situated between 73.31⁰ and 74.32⁰ East longitudes and 21.03⁰ and 22.00⁰ North latitude. The district is surrounded by Madhya Pradesh State on the North, Dhule district on the East, Gujarat State in the West and Nasik district on the South. The principal river in the district is Tapi river, which flows through Shahada and Nandurbar block.

Collection Stations

A total nine collection centers were made from where fishes were purchased from local fishermen. The inventory reports from these centers of total 83 specimens of 32 species of fishes have been collected. The collection stations with river and number of sample collected are shown in parenthesis, these include;

1. Nndurbar – Shivan river (5)
2. Shahada - Gomai river (8)
3. Prakasha - Tapi river (6)
4. Navapur - Rangavali river (7)
5. Visarwadi - Local stream (4)
6. Sarangkheda - Tapi river (11)
7. Taloda - Tapi river (16)
8. Khapar - Daheli + Tapi river (17) and
9. Dhadgaon - Unai river (9)

Tapi River

The River Tapti flows from the East to the West and is second largest inter-state rivers, spread across the areas of Maharashtra, Madhya Pradesh and Gujarat. It originates from Mahadeva Mountain at Baitul (Dist-Nemad, M.P.) Its basin is located at 21⁰- 48 North latitude and 78⁰-15 East longitude. The basin of Tapi is surrounded by Saputara mountain range in the North, Ajanta and Satmala mountain range in the South and Mahadeva mountain range in the East. It meets the Arabic Ocean in the West. The river surrounded from three sides, flows through Madyapradesh (282 K.M.), Maharashtra (228 K.M.) and Gujarat with its estuaries (262 K.M.). Its total catchment area is around 65145 sq. Kms, out of which 80% lies in the Maharashtra region.

Objective of study

- To report the freshwater fish diversity from Dhule district (West Khandesh) of Maharashtra State.
- To analyze the present status and categories of riverine fishes from this region.
- To initiate and encourage the conservation movement among fisherman.
- To popularize importance of fish as a cheapest source of animal protein.

Classification of fishes

In the present investigation of fish collected from both districts i.e. district Dhule and Nandurbar, mainly from river Tapi and its tributaries viz., Panzara, Kan, Burai, Shivan, Gomai, Rangavali, Arunavati, Daheli and Unai by making 16 collection stations centers at various places of both districts. I found total 53 species (35genera) belongs to 8 different orders and 15 families. The details of fish classification with their orders, families and species are as follows;

I) Order – Beloniformes

Family- Belonidae (Fresh water Gars)

Species – *1. *Xenentodon cancila* (Hamilton)

II) Order – Clupeiformes

Family – Clupeidae (Herrings, Sardines, shads)

Species - *2. *Tenualosa ilisha* (Hamilton)

III) Order - Cypriniformes

i. Family- Balitoridae (Loaches)

- Species
3. *Acanthocobitis botea* (Ham-Buch)
 - *4. *Acanthocobitis mooreh* (Sykes)
 5. *Oreonectus evezardi* (Day)
 - *6. *Schistura denisoni* (Day)

ii. Family- Cyprinidae (Carps, Minnows)

- Species:
- *7. *Amblypharyngodon mola* (Hamilton)
 8. *Barilius bendelisis* (Hamilton)
 - *9. *Cirrihinus reba* (Hamilton)
 10. *Crossocheilus latius* (Hamilton)
 - *11. *Cyprinus carpio* (Linnaeus)
 12. *Danio aequipinnatus* (Mc Clelland)
 13. *Garra mullya* (Sykes)
 - *14. *Hypophthalmichthys nobilis* (Richardson)
 15. *Labeo boggut* (Sykes)
 - *16. *Labeo calbasu* (Hamilton)
 - *17. *Labeo rohita* (Hamilton)
 18. *Lepidocephalichthys guntea* (Ham Buch)
 19. *Lepidocephalichthys thermalis* (Valencinnes)
 20. *Osteobrama cotio cotio* (Ham-Buch)
 - *21. *Osteobrama vigorsii* (Sykes)
 - *22. *Puntius amphibious* (Val)
 23. *Puntius conchoni* (Ham-Buch)

24. *Puntius sarana sarana* (Ham – Buch)
25. *Puntius sophore* (Ham-Buch)
26. *Puntius ticto* (Ham-Buch)
27. *Rasbora daniconius* (Hamilton-Buchanan)
- *28. *Salmostoma bacaila* (Hamilton)
- *29. *Salmostoma balookee* (Sykes)
30. *Salmostoma clupiodes* (Day)
31. *Salmostoma Phulo phulo* (Ham Buch)
32. *Tor khudree* (Sykes)

IV) Order – Cyprinodontiformes

Family- Aplocheilidae (Riverlines)

- Species - *33. *Aplocheilus panchax* (Hamilton)

V) Order – Osteoglossiformes

Family- Notopteridae (Featherbacks)

- Species 34 *Notopterus notopterus* (Pallas)

VI) Order – Perciformes

i. Family- Ambassidae or Chandidae (Glass fishes)

- Species 35. *Chanda nama* (Hamilton-Buchanan)
36. *Parambassis lala* (Hamilton-Buchanan)
- *37. *Parambassis ranga* (Hamilton-Buchanan)

ii. Family – Channidae (Murrels)

- Species *38. *Channa gachua* (Hamilton).
39. *Channa marulius* (Ham-Buch)

40. *Channa orientalis* (Bloch & Schneides).

*41. *Channa punctata* (Bloch)

iii. Family – Cichlide (Cichlids)

Species 42. *Oreochromis mossambicus* (Peters)

iv. Family- Gobidae (Gobies)

Species 43. *Glossogobius giuris* (Ham – Buch)

VII) Order – Siluriformes

i. Family- Bagridae (Bagrid Catfishes)

Species *44. *Aorichthys aor* (Hamilton).

*45. *Mystus cavasius* (Hamilto)

46. *Mystus bleekeri* (Day).

47. *Rita pavimentata* (Val)

ii. Family- Clariidae (Air breathing Catfishes)

Species 48. *Heteropneustes fossilis* (Bloch)

iii. Family- Schilbidae (Schilbid Catfishes)

Species 49. *Clupisoma garua* (Hamilton)

iv. Family- Silirudae (Sheat fishes)

Species 50. *Ompok bimaculatus* (Bloch)

VIII) Order – Synbranchiformes

Family- Matacembelidae (Spiny eels)

Species *51. *Macrogathus panicalus* (Hamilton)

*52. *Mastacembelus armatus* (Laceped)

53. *Mastacembelu pancalus* (Ham-Buch).

*** All are newly reported species from study area.**

NUTRITIONAL VALUE OF FISHES

Fishes are used by human beings in different forms from time immemorial. Millions of human beings suffer due to hunger and malnutrition, and fishes form a rich source of food and provide good staple food to tide over the nutritional need of man. Most of the captured fishes are utilized as food. While others are distasteful and considered unsuitable for human consumption. Similarly, the material discarded during fish processing also become a waste. Such fishes and discarded material become an important source of raw materials to fish by-product industries and are used to produce several useful by-products. The per capita consumption of fish has been 3.2 kg on an average up to 1992 as against estimated requirement of 11.0 kg. Pisciculture has the potentiality of popularity due to its on-the-spot food characteristic, balanced nutrients and above all affordable prices (Vidya and Rao, 2004).

Fish is rightly considered as the “**Poor man’s diet**”. It costs much less in comparison to its food value. It is an almost zero-carbohydrate food, good for diabetics and other such patients. Fish is a rich source of protein, vitamins and minerals with approximate composition as crude protein (14.2-22.8 %), fat (0.6-2.4%) and energy (76-161 Kcal) per 100 g (Pandey and Shukla, 2010). A special feature of fish flesh is content of vitamin B₁₂ which is almost absent in plant food and also good source of calcium and vitamin-A. Fish also contains poly unsaturated fatty acids which are known to provide protection against cardio vascular diseases. Fish proteins comprise all the ten essential amino acids in desirable strength for human consumption. Further, unsaturated fatty acids belonging to limolinic acid series present in fish flesh and fish oils are considered to be essential for the prevention of coronary heart disease (shukla and Pandey, 1984). In present study, various fresh water fish species captured from different riverine system of Dhule and Nandurbar districts were analyzed for estimation of total proteins (Lowry et al, 1951), total lipids (Bligh and Dyer, 1959)and moisture contents (Anonymous, 1996) .

RESULTS AND DISCUSSION

Life process in a living organism is sustained by a chemical process derived from food for growth, maintenance and reproduction. Fishes are rich in proteins, fats and vitamins. The fats provide energy and produces body fats, whereas proteins provide energy and material for growth and repair and sometimes the formation of fats.

In present nutritional analysis i.e. total proteins, total lipid and moisture content of fresh water fishes were estimated immediately on same day of collection. The results are;

- 1. Total proteins (%):** The amount of protein in freshwater fishes is ranges from 15 to 20 g /100 g. In some species, the amounts of protein were found to be more than this range, these includes; *A. botia* (21.70), *A. mooreh* (21.00), *C. gachua* (21.00), *C. marulius* (20.70), *C. orientalis* (20.60), *C. punctata* (20.50), *M. armatus* (20.00), *S. denisoni* (22.00), *T. ilisha* (21.80) and *X. cancila* (21.00). The highest amount of protein is reported from *Schistura denisoni* i.e. 22.00 g/100 g tissues. Whereas the lowest amount is found in *Parambassis ranga* i.e. 12.80 g/ 100 g tissue.
- 2.** The amount of lipid in freshwater fishes is ranges between 1.0 to 3.0 g/ 100 g tissues. In present study 15 fish species collected from study area of both districts possess appreciable amount of lipid e.g. species like *A. botia* (6.7), *A. mooreh* (7.2), *C. gachua* (5.5), *C. marulius* (5.0), *C. orientalis* (4.8), *C. punctata* (6.8), *M. panicalus* (6.8), *M. armatus* (8.0), *M. pancalas* (7.0), *S. denisoni* (8.0), *T. ilisha* (10.5) and *X. cancila* (9.0). The higher amount of lipid was reported in *T. ilisha* while lowest level i. e. 1.20 g was found in two fish species e.g. *A. panchax* and *O. bimaculatus*.
- 3. Water content (%):** Percentage of water content in the fishes is entirely depends on total fat content. From the collected species, higher amount of water content i.e. more than 80 % were seen in 15 fish species. Least water percentage was reported from species like *C. gachua* (69), *M. panicalas* (69), *T. ilisha* (67.7) and *X. cancila* (67). Remaining species ranges from 70 to 80 % water content.

HEMATOLOGICAL VALUES AND ENDOPARASITE STUDY

As per plan of work I am unable to find out hematological parameters such as Total RBC count, Total WBC count, ESR, Hb percentage, MCH, PCV and MCHV etc mentioned in the plan of work. In present piece of MRP, the fishes collected from various collection stations are actually dead fishes purchased from local fisherman. Though they doesn't have sufficient blood for hematological study. Like that for endoparasite study, the fishes are so small in size. Therefore, I was unable to report endoparasite from these fishes.

