



## Research Note

# Current status of Gangetic tengra from the middle stretch of the Ganga river, India

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## ABSTRACT

Freshwater fishing is a major source of income and protein for the riverine populations of most tropical and subtropical regions. During present investigation a total of 1006 specimens of *Sperata aor* and 966 specimens of *S. seenghala* were collected from the middle stretch of the Ganga river at Prayagraj, Uttar Pradesh. Size range of fishes varied from 12.2 to 136.4 cm and 11.8 to 129.7 cm for *S. aor* and *S. seenghala*, respectively in during the months from September 2015 to August 2017. The 80.1-90.0 cm size group fishes of *S. aor* was shared (16.10%) while 70.1 to 80.0 cm size group of *S. seenghala* was shared (19.77%) in exploited stock. Middle size group was maximum exploited compared to lower and higher size group of both species. The exploitation pattern was not systematic for heavy recruitment. The result also indicated that the fishing activities should be prohibited during the breeding season of these fishes.

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## INTRODUCTION

The Gangetic Tengra, *Sperata aor* and *S. seenghala*, the two commonest species abound in the Ganga river system with commercially exploited fish species (Gupta 2015, Khan *et al.* 2016, Dwivedi *et al.* 2016a) and hardly prefer riverine habitat. Both species have a high range of tolerance for temperature and salinity (Chondar 1999). Both constitutes the major component of the fishery in the middle and lower stretches of the river (Talwar and Jhingran 1991, Tripathi *et al.* 2017), also from sizeable fishery in the Yamuna river (Saigal 1982, Mayank and Dwivedi 2015a) and all the major river systems in India (Ramakrishniah 1992). These are a popular food fish due to its good taste and high nutritional value. Though almost the year round is the fishing season for *S. aor* and *S. seenghala* but the peak period of fishing in the Gangetic system is March to June and again September to February. Day fishing during winter and night fishing during summer months are done in the Ganga and Yamuna river. Both form a sizeable fishery of Hirakund, Rihand, Gandhisagar, Govindsagar and other big reservoirs and wetlands of India (Rahman *et al.* 2005, Alam *et al.* 2016, Priyanka *et al.* 2018). *S. aor* and *S. seenghala* may be 6 feet or 1828 mm long (Day 1878, Misra 1959). *S. aor* is more abundant than *S. seenghala* in the nature. Its natural distribution is in the freshwater of India, Pakistan,

Nepal, Bangladesh and Burma (Chondar 1999, Afsarullah *et al.* 2015). *S. aor* and *S. seenghala* is a bottom and column feeder and adults are piscivorous. At Kanpur, *S. seenghala* (15.76%) was dominated compared to *C. garua* (14.67%) and *E. vacha* (13.95%) through number (Dwivedi *et al.* 2016a). The objective of the present study was to give size composition and current status of the *S. aor* and *S. seenghala* from the Ganga river at Prayagraj section

## MATERIALS AND METHODS

### Climate

The climate of this region is marked by mild cold during winters and intensive heat during summers. The monsoon season is July to September. Sometimes winter rainfall is also recorded.

### Sampling

The Ganga river is a mainstay for natural stock of fresh water fishes, India. *S. aor* and *S. seenghala* was collected using a variety of methods including drag netting (mahajal,

chaundi, darwari), cast netting, gill netting and hook and line. The 1006 and 966 fish samples of *S. aor* and *S. seenghala* were collected, respectively at random during the months September 2015 to August 2017 from the Teliarganj fish market, Prayagraj, India. This market represents the fishes of middle stretch of the Ganga river at Prayagraj. Sizes of fishes were measured by simple measuring scale. Total length (TL) of fish was measured from tip of the snout to the largest rays of caudal fin. Collected data were classified at 10 cm intervals and size composition varied from 192 to 136 cm size groups. The number of samples calculated according to size group then converted into percentage.

## RESULTS AND DISCUSSION

Size composition of *S. aor* and *S. seenghala* varied from 12.2 to 136.4 cm and 11.8 to 129.7 cm size group, respectively from the middle stretch of the Ganga river at Prayagraj. In case of *S. aor*, the maximum exploitation was observed in 80.1-90.0 cm (16.10%) size groups while minimum exploitation was recorded with 0.50% in 130.1-140.0 cm size group (Fig. 1). The exploitation was observed 2.48% in 10.1-20.0 cm, 3.68% in 20.1-30.0 cm, 5.27% in 30.1-40.0 cm, 4.45% in 40.1-50.0 cm, 12.52% in 50.1-60.0 cm, 13.72% in 60.1-70.0 cm and 15.21% in 70.1-80.0 cm size groups. Overall, middle size group contributed maximum exploitation (57.55%) compared to higher size group (22.57%) and lower size group (19.88%).

In case of *S. seenghala*, the maximum exploitation was observed in 70.1-80.0 cm (19.77%) size groups while minimum exploitation was recorded with 0.83% in 120.1-130.0 cm size group (Fig. 3). The exploitation was recorded 2.17% in 10.1-20.0 cm, 4.76% in 20.1-30.0 cm, 6.52% in 30.1-40.0 cm, 9.21% in 40.1-50.0 cm, 12.11% in 50.1-60.0 cm and 14.80% in 60.1-70.0 cm size groups. Overall, middle size group contributed maximum exploitation (57.55%) compared to lower size group (22.66%) and higher size group (16.56%) (Fig. 2). In general, middle size groups of any commercially exploited fish species have more attractive to fishers and consumers (Imran *et al.* 2015, Mayank and Dwivedi 2015b).

The results also indicated that the exploitation was not systematic in middle size group to higher size group. If higher size group exploitation is not systematic then it is an alarming sign for future population of *S. aor* and *S. seenghala* because higher size group of fishes more experienced for heavy recruitment and healthy spawning. In collective, middle size group of fishes in case of riverine/natural stocks are more exploited than other size groups (Nikolskii 1980, Pathak *et al.* 2015, Tripathi *et al.* 2015).

The current water quality and water discharge of the Ganga river supports to the hardy fishes (example *Cyprinus carpio*, *Oreochromis niloticus*, *S. aor*, *S. seenghala* and other catfishes). Tiwari *et al.* (2016, 2017) and Dwivedi *et al.* (2018a) also reported similar findings from the Ganga river. The catfishes are the backbone of the Ganga river fishery (Mayank and Dwivedi 2015b). The water discharge of the river also interferes in the production of the culture pond of the surrounding river bank (Jha *et al.* 2015, Dwivedi *et al.* 2018b). Exploitation is an economic activity governed by social needs and pressures (Dwivedi *et al.* 2014, Mayank and Dwivedi 2016b). The water pollution, over exploitation and targeted fishing is the biggest problem

of riverine fishery (Kumar *et al.*, 2013, Jatan *et al.* 2014, Tiwari *et al.* 2016, Dwivedi *et al.* 2017, Muthmainnah and Gaffar 2017, Mayank *et al.* 2018).

## CONCLUSION

It may be concluded that the exploitation of *S. aor* and *S. seenghala* were not systematic in middle size group to higher size group. The present size of both fishes was declined compared to earlier study. Both species was also struggle to *Cyprinus carpio* and *Oreochromis niloticus* for space and food in the Ganga river at Prayagraj, Uttar Pradesh.

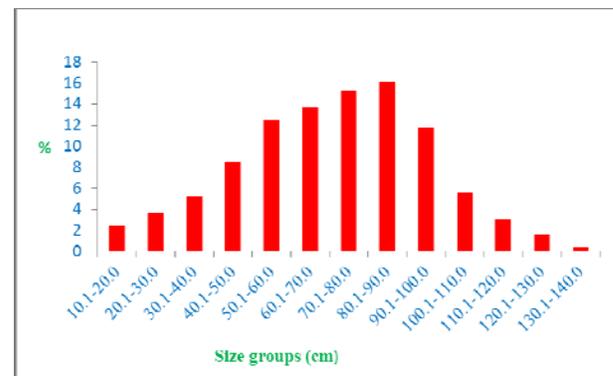


Fig. 1: Size composition of *S. aor* from the Ganga river at Prayagraj

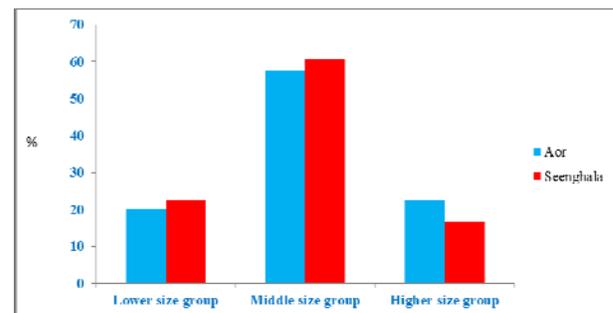


Fig. 2: Exploitation pattern of *S. aor* and *S. seenghala* from the Ganga river at Prayagraj

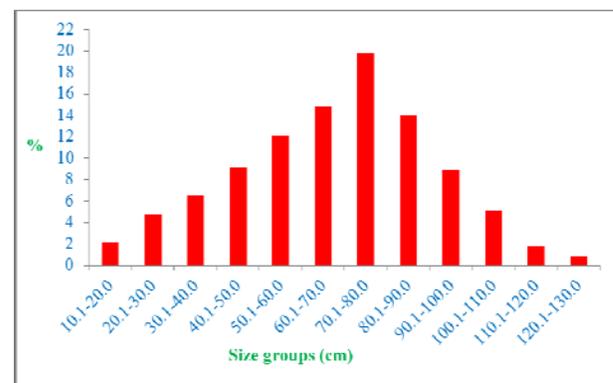


Fig. 3: Size composition of *S. seenghala* from the Ganga river at Prayagraj

## REFERENCE

Afsarullah, Z. Akhtar, S. Shams, Z. Masood, Musarrat-ul-Ain, R. Yasmeeen, H. U. Rehman, A. Ullah, S. Saddozai

- and W. M. Achakzai 2015. Length-Weight relationship of the Singara fish (*Sperata seenghala*) in Baran dam of district Bannu, Khyber Pakhtunkhwa (KPK), Pakistan. *World Journal of Fish and Marine Sciences*, 7(1): 52-54.
- Alam, S. M. D., Md. H. Karim, A. Chakraborty, R. Amin and S. Hasan 2016. Nutritional characterization of the long-whiskered catfish *Sperata aor*: A commercially important freshwater fish of Bangladesh. *International Journal of Food Science and Nutrition Engineering*, 6(1): 1-8. DOI: 10.5923/j.food.20160601.01
- Chondar, S.L. 1999. Biology of Finfish and Shellfish. India: SCSC Publishers. pp. 514.
- Day, F. 1878. The fishes of India being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma and Ceylon. London: William Dowson and Sons. p. 778.
- Dwivedi, A.C., A. S. Mishra, P. Mayank and A. Tiwari 2016a. Persistence and structure of the fish assemblage from the Ganga river (Kanpur to Varanasi section), India. *Journal of Geography and Natural Disasters*, 6: 159. Doi: 10.4172/2167-0587.1000159.
- Dwivedi, A.C., A. Tiwari and P. Mayank 2018a. Environmental pollution supports to constancy and invader potential of *Cyprinus carpio* and *Oreochromis niloticus* from the Ganga river, India. *International Journal of Poultry and Fisheries Sciences*, 2(1): 1-7.
- Dwivedi, A.C., D. N. Jha, R. S. Shrivastava, B. K. Das, P. Mayank M. Kumar and A. Tiwari 2018b. Status of water resources and fish farming in Allahabad district, India. *Journal of Fisheries and Livestock Production*, 6(2): 274. Doi: 10.4172/2332-2608.1000274.
- Dwivedi, A.C., Dharm Nath Jha and Priyanka Mayank 2014. Food security, livelihood and non-native fish species: status, trends and future Perspectives. *Journal of the Kalash Science*, 2(3) (Special Volume): 41-46.
- Dwivedi, A.C., Priyanka Mayank and R. K. Pathak 2016b. Size composition and exploitation structure of Indian major carp, *Cirrhinus mrigala* (Hamilton, 1822) from the Ganga river, India. *Journal of Fisheries and Life Science*, 1(1): 30-32.
- Dwivedi, A.C., Priyanka Mayank, Sarita Tripathi and Ashish Tiwari 2017. Biodiversity: the non-natives species versus the natives species and ecosystem functioning. *Journal of Biodiversity, Bioprospecting and Development*, 4(1): DOI: 10.4172/2376-0214.1000164.
- Gupta, S. 2015. A Review on *Sperata aor* (Hamilton, 1822), a popular food fish of Indian subcontinent. *Sains Malaysiana*, 44(9): 1217-1222
- Imran, S., Sasya Thakur, D. N. Jha and A. C. Dwivedi 2015. Size composition and exploitation pattern of *Labeo calbasu* (Hamilton 1822) from the lower stretch of the Yamuna river. *Asian Journal of Bio Science*, 10(2): 162-164. DOI: 10.15740/HAS/AJBS/10.2/171-173.
- Jatan, I., H.O. Barot, and I.A. Fahabi 2014. Cross-examination on taxonomic status, economic importance, geographical distribution, present status and prevailing threats of fish varieties, Himalayan and Indo Burma biodiversity hotspots zones of North East India, *Afr. J. Fish. Sci.*, 2(6): 107-127.
- Jha, D.N., K. D. Joshi, A. C. Dwivedi, P. Mayank, M. Kumar and A. Tiwari 2015. Assessment of fish production potential of Chitrakoot district, Uttar Pradesh. *Journal of the Kalash Science*, 3(3, Special Volume): 7-10.
- Khan, M. A., A. Nazir, and S. Khan 2016. Assessment of growth zones on whole and thin-sectioned otoliths in *Sperata aor* (Bagridae) inhabiting the river Ganga, India. *Journal of Ichthyology*, 56(2): 242-246.
- Kumar J, Pandey A.K., Dwivedi A.C., Naik A.S. K., Mahesh V. and Benakappa S. 2013. Ichthyofaunal diversity of Faizabad district (Uttar Pradesh), India. *Journal of Experimental Zoology, India*, 16: 149-154.
- Mayank P. and A. C. Dwivedi 2016. Stock assessment and population structure of alien fish species, *Oreochromis niloticus* (Linnaeus) from the lower stretch of the Yamuna river, India. *Journal of the Experimental Zoology, India*, 19(1): 163-167.
- Mayank, P. and A. C. Dwivedi 2015b. River health and commercially important catfishes from the Yamuna river, India. *Journal of the Kalash Science*, 3(3, Special Volume): 23-26.
- Mayank, P. and A.C. Dwivedi 2015a. Biology of *Cirrhinus mrigala* and *Oreochromis niloticus*. LAP LAMBERT Academic Publishing GmbH & Co. KG, Dudweiler Landstr. 99, 66123 Saarbrücken, Germany, Pp. 188.
- Mayank, P., A. C. Dwivedi and R. K. Pathak 2018. Age, growth and age pyramid of exotic fish species *Oreochromis niloticus* (Linnaeus 1758) from the lower stretch of the Yamuna river, India. *National Academy Science Letter*, doi.org/10.1007/s-40009-018-0673-7.
- Misra, K.S. 1959. An aid to the identification of the common commercial fishes of India and Pakistan. *Records of the Indian Museum* 57: 156-157.
- Muthmainnah, D. and A. K. Gaffar 2017. Fish and fisheries in flood plain swamp in middle part of Musi river. *Indonesian J. Environ. Manag. Sustainability*, 1(1): 1-5.
- Nikolskii, G.V. (1980). Theory of fish population dynamics as the biological background for rational exploitation and management of fishery resources. Bishen Singh Mahendra Pal Singh Dehra Dun (India) and Otto Koeltz Science Publishers Koenigstein, W. Germany, pp. 1-323.
- Pathak, R.K., A. Gopesh and A.C. Dwivedi 2015. Invasion potential and biology of *Cyprinus carpio* (Common carp) LAP LAMBERT Academic Publishing GmbH & Co. KG, Dudweiler Landstr. 99, 66123 Saarbrücken. Germany.
- Priyanka, C., G. Tewari and S. S. Hassan 2018. Study on biometric growth parameters in different fish species of family Bagridae from Harike wetland, Punjab, India. *Journal of Entomology and Zoology Studies*, 6(4): 1667-1672.
- Rahman, M.A., K.M.A. Uddin and M. Zaher, 2005. Development of artificial breeding techniques for long-whiskered catfish, *Sperata aor* and giant river catfish, *Sperata seenghala* of Bangladesh. *Bangladesh J. Fish.*, 9(1): 11-12.
- Ramakrishniah, M. 1992. Studies on the breeding and feeding biology of *Mystus aor* (Hamilton) of Nagarjunasagar Reservoir. *Proceedings of the National Academy of Sciences, India* 62 (B) III: 357-364.
- Saigal, B.N. 1982. Biology and fishery of *Mystus (Osteobagrus) aor* (Hamilton) and *Mystus (Osteobagrus) seenghala* (Sykes) with a review of the taxonomic status of the genus *Mystus scopoli*. PhD. Thesis, University of Calcutta, Calcutta, Pp. 389.

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- Talwar, P.K. and A.G. Jhingran 1991. *Inland Fishes of India and Adjacent Countries*. 1st Ed. New Delhi, Bombay and Calcutta: Oxford and IBH Publishing Co. Pvt. Ltd. Pp. 1063.
- Tiwari, A., A. C. Dwivedi and Priyank Mayank 2016. Time scale changes in the water quality of the Ganga River, India and estimation of suitability for exotic and hardy fishes. *Hydrology Current Research*, 7(3): 254. doi:10.4172/2157-7587.1000254.
- Tiwari, A., P. Mayank and A. C. Dwivedi 2017. Assessment of human health risk via the consumption of the freshwater fish, *Cyprinus carpio* and *Oreochromis niloticus* from the Ganga River, India. *Bioved* 28(2): 341-349.
- Tripathi, S., A. Gopesh and A. C. Dwivedi 2017. Fish and fisheries in the Ganga river: current assessment of the fish community, threats and restoration. *Journal of Experimental Zoology, India*, 20(2): 907-912.
- Tripathi, S., A. Gopesh, K.D. Joshi and A. C. Dwivedi 2015. Size composition, exploitation pattern, sex ratio and sex structure of *Eutropiichthys vacha* (Hamilton, 1822) from the middle stretch of the river Ganga at Allahabad, India. *In: Advances in biosciences and Technology* edited by K.B. Pandeya, A.S. Mishra R.P. Ojha and A.K. Singh published by NGBU, Allahabad, Pp 116-120.