Abstract

Information of sex ratio is considered vital in the management of the fsheries as it enables to follow the movement of the sexes in relation to the season in life cycle. Present study was undertaken between the months of March 2014 to February 2015 from the middle stretch of the Ganga river, India. 423 fsh specimens were examined of *Cirrhinus mrigala* for determination of sex ratio and sex structure from the Ganga river, India. Male proportion was higher than female in 19.1-25.0, 25.1-31.0, 31.1-37.0, 85.1-91.0 and 91.1-97.0 cm size groups. Proportion of male and female was recorded equal in 79.1-85.0 cm size groups. In the stock, female proportion was higher than male (1:1.05). It is very close to equal proportions of male and female (1:1). It did not differ signifcantly. In the stock, sex structure of male and female was recorded 48.70% and 51.30, respectively.

Keywords: Size composition; Sex ratio; Sex structure; *Cirrhinus mrigala*; Ganga river

Introduction

Riverine sheries are important as it provides nutritional food security and employment for millions of people around the world [1-4]. Fisheries management system is based on the principle of the sustainable use of a renewable living resource. *Cirrhinus mrigala* shares a good production in commercial catches of the rivers Ganga, Yamuna, Brahmaputra, Godavari and other tributaries [5-9] and economically important sh species for the nations i.e. India, Bangladesh, Nepal and Pakistan. Now-a-days *C. mrigala* over exploited in the Ganga river system [3]. e raised shing stress due to greater demand for sh and sh product, followed by indiscriminate shing techniques increased the shing e ort leading to the under/over exploitation, which steadily led to a fall in the catch per unit e ort. With the decreasing natural stocks the shermen had to increase shing e ort for whatever species or size of sh were available to support their livelihoods.

It is a very fast growing and large sized carp species [10,11] and commonly known as Mrigala/Nain. Freshwater rivers, reservoirs, jheels, tanks and beels are the natural habitats of mrigala. It is an excellent species for pond culture in India, Burma, Bangladesh, Nepal and Pakistan [12,13]. *C. mrigala* is a backbone of culture shery practices in in21 (sa. It is annutariesitariesita12 Tw 1.575 -1.83 Td(s anng1121 (sa. -ah37she11 j ofTdhs aw (over exploited82n the [1,6 -1,1nt sIn ed cath)Tjcruitn

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31.1-37.0, 37.1-43.0, 43.1-49.0, 49.1-55.0, 55.1-61.0, 61.1-67.0, 67.1-73.0, 73.1-79.0 85.1-91.0 and 91.1-97.0 cm size groups, respectively. Study also showed that the female shes more active in the Ganga river ecosystem. Proportion of male and female was recorded equal in 79.1-85.0 cm size groups (Table 1). In the stock, female proportion was higher than male (1:1.05). It is very close to equal proportions. It did not di er signi cantly.

e sex structure of male sh was maximum in 91.1-97.0 cm size group (66.67) and minimum in 73.1-79.0 cm size group (42.10%). e sex structure of female sh was maximum in 73.1-79.0 cm size group (57.90%) and minimum in 91.1-97.0 cm size group (33.33%). e sex structure of male and female both was recorded similar in 79.1-85.0 cm size groups (Figure 1). In the stock, sex structure of male was recorded (48.70%) and female (51.30%). It is also good indicator of heavy recruitment in breeding season.

Mayank et al. [23] reported that the female ratio was dominated in *L. calbasu* from the Ghaghra river. e over all sex ratio is close to 1.0:1.0 in many species, but it may be far from this in particular age and size groups, males usually predominating in the younger groups, because they mature earlier but live less long [22,29]. Water ow and depth of rivers are also responsible of changing sex ratio specially in breeding season [30] and over exploitation [31,32]. Higher proportion

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