

Short Communication

Pakistan J. Zool., vol. 39(6), pp. 413-414, 2007.

0030-9923/2007/0006-0413 \$ 8.00/0
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MORPHOMETRIC AND MERISTIC STUDIES OF BIGHEAD CARP, *ARISTICHTHYS NOBILIS* (RICHARDSON) INTRODUCED IN PAKISTAN FOR AQUACULTURE

Abstract. Thirty specimens of bighead carp, *Aristichthys nobilis*, of varying sizes were collected from ponds and reservoir of National Agricultural Research Center to study different morphometric measurements and meristic counts. Morphometric characters were similar as described earlier but showed a gradual increase with increase in body length. All the meristic characters remained constant with increasing body length except lateral line scales (102-114), which showed slight variations. On the basis of morphometric and meristic observations, the fish was recognized as pure breed of *Aristichthys nobilis* which was introduced in the country.

Key words: Bighead carp, *Aristichthys nobilis*, meristic counts, morphometry.

Bighead carp (*Aristichthys nobilis*) is recognized throughout the world, primarily because of its versatility in aquaculture operations (Opuszynski, *Aquaculture*, **25**: 223-233, 1981). Bighead carp has been introduced in Pakistan for possible enhancement of number of species in polyculture system from China (FAO, Aquaculture Department in China. Fisheries Technical Paper, 426. 104pp, 2004) in late 80s by Punjab Fisheries Department. The fish was bred by Punjab Fisheries Department at its hatcheries. This species is closely related to *Hypophthalmichthys molitrix* (Silver carp). The two species, *A. nobilis* and *H. molitrix*, share several unique characteristics and sometime referred in the same genus *Hypophthalmichthys* (Howe, *Fisher. Res.*, **56**: 1-7, 2002). Due to similarities there is a chance of hybridization between bighead and silver carp as described by Kohinoora *et al.* (*Aquaculture*, **247**: 267-273, 2005).

Since no information is available on the meristic and morphometric characteristics of bighead carp (*A. nobilis*) under the changed conditions of Pakistan, this study was designed with the objectives to study the morphometric characters and meristic counts of bighead carp and exclude the possibility of hybridization with silver carp and identified as pure breed of bighead carp and to observe variations (if there is any) in morphometric and meristic characteristics.

Materials and methods

Thirty specimen of bighead carp (ranged between 11.1-60.2 cm total body lengths) were collected from fish ponds and reservoir of Aquaculture and Fisheries Program (AFP), NARC, Islamabad. Fish was first procured from Fish Seed Hatchery, Mianchannu, Government of Punjab in 2003 and multiplied at AFP, NARC, Islamabad. Fish were collected with the help of cast net (mesh size 2.5 cm) and drag net (mesh size 10 cm). Based on their total body length, fishes were divided in three groups each of ten fishes; Group A, 11.1-12.2 cm; Group B, 34.1-35.5 cm; C, 58.6-60.2 cm.

Morphometric and meristic studies of bighead carp were performed according to Talwar and Jhingran (*Inland fishes of India and adjacent countries*, vol. 2, Oxford and IBH Publishing Co. Pvt. LTD. New Delhi, 1991).

Results and discussion

Morphometric characteristics of bighead carp (Table I) were found similar as described by Talwar and Jhingran (*Inland fishes of India and adjacent countries*, vol. 2, Oxford and IBH Publishing Co. Pvt. LTD, New Delhi, 1991). The morphometric characters showed a gradual increase with increase in body length and showed an isometric growth pattern. These findings were in agreement with those of Jennings (*U.S. Fish. Wildl. Serv. Biol. Rep.*, **88**: 1-47, 1988).

Meristic counts of bighead carp are given in Table II. All the meristic counts remained constant with increasing body length except lateral line

scales, which showed some variation. Lateral line scales ranged between 102-114 in our study as compared to Talwar and Jhingran (*Inland fishes of*

Table I.- Morphometric measurements (cm) of *Aristichthys nobilis*.

	Morphometric characters		
	Group I	Group II	Group III
Weight of fish	14.2	419.3	262.4
Total length	11.8	34.8	59.8
Standard length	9.4	28.1	49.2
Fork length	10.3	30.2	52.8
Body length	8.4	25.9	44.3
Greatest depth	2.8	7.9	15.3
Greatest breadth	1.4	3.7	7.2
Pre orbital length of head	0.8	2.3	4.1
Post orbital length of head	1.4	5.4	8.0
Diameter of eye	0.4	1.3	1.5
Inter orbital distance	1.5	4.0	7.9
Inter nostril distance	0.7	2.4	4.3
Head length	3.0	9.4	15.0
Head depth	2.2	6.6	10.9
Length of caudal peduncle	1.1	3.0	9.0
Depth of caudal peduncle	1.1	3.4	6.1
Length of upper jaw	1.0	3.0	4.7
Length of lower jaw	1.0	3.3	5.1
Length of dorsal fin	1.8	4.9	8.8
Length of pectoral fin and	1.5	6.4	9.8
Length of pelvic fin	1.6	5.3	7.5

India and adjacent countries, vol. 2, Oxford and IBH Publishing Co. Pvt. LTD, New Delhi, 1991) and Kolar *et al.* (Asian carp of the genus *Hypophthalmichthys* (Pisces, Cyprinidae) A biological synopsis and environmental risk assessment. Report to U.S. Fish and Wildlife

Service per Interagency Agreement 94400, 30-128, 2005) who reported lateral line scales in bighead carp 115 and 98-100, respectively. The difference in meristic characters of bighead carp between regions may be resulted from differences in genotype or environmental factors Weatherley and Gill (*The biology of fish growth*, Academic Press, London, 443 pp, 1987). On the basis of morphometric and meristic observations, the fish was recognized as pure breed of *Aristichthys nobilis* which was introduced in the country.

Table II.- Meristic counts of *Aristichthys nobilis* (number).

	Morphometric characters		
	Group I	Group II	Group III
Dorsal fin ray	ii-8	ii-8	ii-8
Pectoral fin ray	i-17	i-17	i-17
Pelvic fin ray	i-8	i-8	i-8
Anal fin ray	ii-12	ii-12	ii-12
Caudal fin ray	v-17-7	v-17-7	v-17-7
Lateral line scales	113	114	102
Scales above lateral line	20	20	20
Scales below lateral line	28	28	28

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(Received 12 June 2006, revised 3 September 2007)