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ANALYSIS OF *TRIPLOPHYSA YASINENSIS* COMPLEX (PISCES : NEMACHEILIDAE)

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Abstract: *Triplophysa yasinensis* (Alcock, 1898), *T. choprai* (Hora, 1934) and *T. kashmirensis* (Hora, 1934) are closely related and show similarities in various characters. Hence, *T. yasinensis* and *T. kashmirensis* were treated as the same species. Similarly, *T. yasinensis* and *T. choprai* were merged together. However, on the basis of the statistical analysis significant differences were discovered in the three species. So these three are treated as valid species.

Key words: Taxonomy, fish classification.

INTRODUCTION

The fishes of the genus *Triplophysa* are distributed in the High Asian Ichthyogeographical Region. Among these, *Triplophysa yasinensis* (Alcock, 1898), *T. choprai* (Hora, 1934) and *T. kashmirensis* (Hora, 1934) are very closely related. On the basis of their close similarity Menon (1987) merged *T. kashmirensis* into the synonymy of *T. yasinensis*, while Mirza and Alam (1994) merged *T. choprai* into the synonymy of *T. yasinensis*. On detailed statistical analysis, it was found that the three species, although showing similarity in some characters, are nevertheless distinct in many aspects. So it seems desirable to treat them as three valid species.

MATERIALS AND METHODS

Fishes for this study were collected from different parts of Pakistan and Azad Kashmir: *T. choprai* (n=10) from Chitral, Swat and Dir (Fig.1); *T. yasinensis* (n=10) from the river Hunza near Gulmit (Fig.2) and *T. kashmirensis* (n=7) from the river Neelum near Keran, Neelum Valley, Azad Kashmir (Fig.3).

Total length, standard length, head and snout lengths, body and head height; predorsal, prepelvic and preanal distances; lengths of dorsal, pectoral, pelvic, anal and caudal fins; diameter of eye and interorbital distance; base of dorsal, pectoral and pelvic

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fins; length of maxillary, inner and outer rostral barbels and caudal peduncle; and maximum and least height of caudal peduncle were taken into account. Menon (1987) was followed for measurements and meristic trait count.

Data was subjected to statistical analysis to evaluate the level of differences (Steel and Torrie, 1981) for each parameter separately.

RESULTS

Base of dorsal fin, lengths of inner rostral barbels and caudal peduncle were found to be similar (non-significantly different) in the three species, whereas length of dorsal, pectoral and pelvic fins, total, standard, head and snout lengths, head and body height; predorsal, prepelvic, preanal and interorbital distances; diameter of eye; lengths of anal and caudal fins, maxillary and outer rostral barbels, base of pectoral and pelvic fins and maximum and minimum height of caudal peduncle were found to be significantly different ($P<0.001$; Table 1).

DISCUSSION

Triplophysa yasinensis complex of species are composed of *T. yasinensis* (Alcock, 1898), *T. choprai* (Hora, 1934) and *T. kashmirenois* (Hora, 1934). These three species are very closely related and show overlapping of many characters. The similarity between *T. yasinensis* and *T. kashmiransis* was noted by Menon (1987). So he treated these two species as one. *T. yasinensis* and *T. choprai* also show similarities in many characters and hence were treated as the same species by Mirza and Alam (1994).

In the present study the different characters were subjected to statistical analysis. It was found that the three species differ significantly in such characters like: total length, standard length, head length, head height, body height, predorsal distance, prepelvic distance, preanal distance, diameter of eye, interorbital distance, snout length, length of dorsal fin, length of pectoral fin, length of pelvic fin, length of anal fin, length of caudal fin, base of pectoral fin, base of pelvic fin, length of outer rostral barbels, length of maxillary barbels, maximum height of caudal peduncle, least height of caudal peduncle.

So it seems desirable to treat these three species as valid. Among these, *T. yasinensis* is distributed in the upper parts of the Indus from Skardu to Tarbela and its tributaries like Gilgit, Hunza etc; *T. choprai* is restricted to the upper parts of the rivers Chitral, Panjkora and Swat, while *T. kashmirensis* is primairly distributed in Kashmir and Jammu (rivers Jhelum, Neelum and Poonch etc.). Menon's (1987) record of *T. yasinensis* from the river Tawi near Chineni is most probably, based on *T. kashmirensis*.

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Table 1: Comparison of different characters of the three species

Characters	*T.yasinensis* (n = 10)	*T. choprai* (n = 10)	*T. kashmirensis* (n = 7)	LSD at P 0.05
Total length	12.41±0.29	10.99±0.55	13.44±0.42	1.29
Standard length	10.46±0.26	9.26±0.48	11.31±0.37	1.13
Head length	2.13±0.04	1.96±0.08	2.48±0.11	0.23
Head height	1.12±0.02	1.05±0.06	1.34±0.05	0.14
Body height	1.37±0.06	1.21±0.07	1.74±0.08	0.21
Predorsal distance	5.22±0.12	4.58±0.23	5.73±0.20	0.55
Prepelvic distance	5.25±0.12	4.54±0.20	5.93±0.17	0.47
Preanal distance	7.07±0.16	6.24±0.30	7.78±0.23	0.84
Diameter of eye	0.2±0.00	0.26±0.02	0.3±0.00	0.03
Interorbital distance	0.5±0.01	0.41±0.02	0.67±0.04	0.13
Snout length	1.01±0.02	0.87±0.12	1.18±0.05	0.27
Length of dorsal fin	1.94±0.05	1.84±0.08	2.2±0.09	0.23
Length of pectoral fin	1.96±0.04	1.82±0.1	2.16±0.08	0.23
Length of pelvic fin	1.66±0.04	1.58±0.08	1.93±0.09	0.22
Length of anal fin	1.66±0.04	1.58±0.08	1.91±0.08	0.20
Length of caudal fin	1.95±0.05	1.75±0.08	2.13±0.07	0.20
Base of dorsal fin	1.48±0.06	1.39±0.07	1.57±0.05	N.S.
Base of pectoral fin	0.5±0.02	0.88±0.14	0.59±0.03	0.28
Base of pelvic fin	0.4±0.00	0.37±0.03	0.5±0.02	0.06
Length of inner rostral barbels	0.47±0.02	0.39±0.02	0.34±0.03	N.S.
Length of outer rostral barbels	0.71±0.08	0.58±0.02	0.79±0.04	0.09
Length of maxillary barbels	0.7±0.21	0.51±0.23	0.86±0.02	0.06
Length of caudal peduncle	2.7±0.08	2.36±0.12	2.63±0.10	N.S.
Maximum height of caudal peduncle	0.69±0.02	0.64±0.03	0.93±0.03	0.08
Least height of caudal peduncle	0.5±0.01	0.41±0.02	0.68±0.02	0.05

N.S.: Non-significane
LSD: Least significant difference

Fig. 1: *Triplophysa choprai* from Kalam (Swat), **1" length = 5.7 cm**

Fig. 2: *Triplophysa yasinensis* from Hunza, **1" length = 6.1 cm**

Fig. 3: *Triplophysa kashmirensis* from Keran and river Neelum, **1" length = 5.4 cm**

of *Triplophysa* from Northern Areas, Chitral, Swat, Dir and Azad Kashmir on which this study is mostly based.

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