

# Meristic and Morphometric Characteristics of Spirlin, *Alburnoides bipunctatus* Bloch 1782 (Actinopterygii: Cyprinidae) of the Letca Area – Someș River

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## Abstract

Spirlin (*Alburnoides bipunctatus*) is an important element of the trophic chain of aquatic ecosystems in Romania's hilly areas. To assess the conservation status of this species, 21 specimens were taken from the Letca area, Sălaj County. The specimens caught were weighed and analysed from the meristic (8 determinations) and morphometric (36 determinations) points of view. The obtained results reflect the homogeneity of the fish population in terms of morphology (their coefficients of variation showing lower values). This study will continue in the future with the analyses of the spiralin populations from several sectors of the Someș River and its tributaries.

**Keywords:** *Alburnoides bipunctatus*, morphometry, phenotypic characterisation

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## INTRODUCTION

The Someș River is one of the largest water basins in North-Western Transylvania, with two springs in the mountain area (in the Apuseni and Rodnei mountains). It reaches the Western plains, passing through all types of relief. For these reasons, the Someș River has a highly diversified ichthyofauna (Telcean and Cupșa, 2009). A representative fish species from the lower course of the Someș River is spiralin (*Alburnoides bipunctatus*). Spirlin does not have economic importance, but it is a good indicator of the biodiversity of the waters in which it lives (Bănărescu, 1964).

## AIMS AND OBJECTIVES

In our study we carried out a morphometric and meristic analysis of spiralin from the Letca area (the middle course of the Someș River). Our data are compared with results of other studies. Thus, for spiralin, we can determine the variability of the

body conformation depending on the area where it lives.

## MATERIALS AND METHODS

Spirlin specimens were collected by angling, during August-September 2014. All specimens were preserved in formalin 10% till they were analysed in the laboratories of the University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca. For somatic measurements AmScope ToupView 3.7 software was used. Morphometrically, 16 phenotypic characters were studied, and meristically, 8 characters. The obtained data were statistically interpreted using GraphPad Prism 6.07.

## RESULTS AND DISCUSSION

21 specimens of spiralin were caught from the Someș River (Letca area, Sălaj County). Regarding the body weight (BW) and total length (TL),

**Tab. 1.** The body measurements of spiralin (*Alburnoides bipunctatus*) - mean values and variability (n=21)

Morphometric characteristics	Abbreviation	UM	X ± s <sub>x</sub>	Min	Max	V%	s
Body weight	BW	g	12.10 ± 0.489	6.00	28.00	40.41	4.888
Total length	TL	cm	10.81 ± 0.122	86.88	139.83	11.29	1.220
Standard length	SL	cm	8.95 ± 0.101	71.57	115.41	11.30	1.012
Maximum height	H	cm	2.23 ± 0.033	17.02	30.81	14.64	0.326
Minimum height	mH	cm	0.85 ± 0.011	6.61	11.10	12.69	0.108
Body width	BD	cm	1.05 ± 0.145	8.38	14.77	13.84	1.454
Great perimeter	GP	cm	5.50 ± 0.068	4.00	7.20	12.40	0.682
Small perimeter	SP	cm	1.92 ± 0.033	1.20	2.80	17.39	0.335
Caudal peduncle length	CPL	cm	1.59 ± 0.02	13.15	22.17	12.32	0.196
Head length	HL	cm	2.04 ± 0.198	17.21	24.75	9.72	1.977
Head height	HH	cm	1.74 ± 0.02	14.26	23.37	11.47	0.199
Eye diameter	ED	mm	6.40 ± 0.006	4.95	7.59	9.72	0.062
Interorbital width	IOW	mm	6.17 ± 0.082	4.62	7.82	13.31	0.821
Snout length	SNL	mm	15.26 ± 0.156	12.44	19.14	10.19	1.555
Nostrils width	NW	mm	2.89 ± 0.05	2.22	4.06	17.38	0.502
Commissures width	CW	mm	5.46 ± 0.07	4.40	7.28	12.82	0.700
Upper jaw length	UJL	mm	6.32 ± 0.099	4.48	8.04	15.64	0.989
Lower jaw length	LJL	mm	6.00 ± 0.079	4.81	7.75	13.13	0.788
Pre-dorsal length	PDL	cm	4.70 ± 0.055	37.82	61.04	11.69	0.550
Post-dorsal length	PODL	cm	4.05 ± 0.046	32.17	50.85	11.40	0.462
Pre-pectoral length	PPL	cm	2.15 ± 0.239	17.99	27.19	11.09	2.386
Post-pectoral length	POPL	cm	6.66 ± 0.823	51.71	87.78	12.35	8.227
Pre-ventral length	PVL	cm	4.21 ± 0.48	34.08	53.91	11.42	4.804
Post-ventral length	POVL	cm	4.73 ± 0.603	37.45	63.58	12.74	6.027
Pre-anal length	PAL	cm	5.79 ± 0.736	45.57	77.74	12.70	7.357
Post-anal length	POAL	cm	3.07 ± 0.318	25.80	38.43	10.34	3.176
Pectoral-anal fin distance	PAFD	cm	3.58 ± 0.509	27.52	49.56	14.23	5.094
Pectoral-caudal fin distance	PCFD	cm	6.73 ± 0.806	54.78	88.73	11.98	8.056
Pectoral-dorsal fin distance	PDFD	cm	3.05 ± 0.421	23.89	42.21	13.78	4.208
Pectoral-ventral fin distance	PVFD	cm	1.33 ± 0.183	10.36	17.95	13.74	1.826
Dorsal-ventral fin distance	DVFD	cm	2.21 ± 0.313	17.18	30.21	14.16	3.133
Dorsal-anal fin distance	DAFD	cm	2.28 ± 0.309	18.27	31.31	13.56	3.091
Dorsal-caudal fin distance	DCFD	cm	3.83 ± 0.484	30.09	50.55	12.64	4.843
Ventral-anal fin distance	VAFD	cm	1.37 ± 0.197	10.47	18.46	14.41	1.971
Ventral-caudal fin distance	VCFD	cm	4.59 ± 0.544	36.95	60.75	11.85	5.444
Anal-caudal fin distance	ACFD	cm	3.32 ± 0.383	26.77	43.84	11.54	3.828

Note: X-mean; s<sub>x</sub>-standard error; V%-coefficient of variation; s-standard deviation

the average value of these two characteristics was 12.10 ± 0.489 g., and 10.81 ± 0.122 cm., respectively. Results were also obtained for other somatic measurements such as: standard length (SL = 8.95 ± 0.101 cm), head length (HL = 2.04 ± 0.198 cm), maximum height (H = 2.23 ± 0.033 cm),

minimum height (mH = 0.85 ± 0.011 cm), body width (BD = 1.05 ± 0.145 cm), great perimeter (GP = 5.50 ± 0.068 cm), small perimeter (SP = 1.92 ± 0.033 cm), head height (HH = 1.74 ± 0.02 cm), caudal peduncle length (CPL = 1.59 ± 0.02 cm), pre-dorsal length (PDL = 4.70 ± 0.055 cm), post-

dorsal length (PODL=  $4.05 \pm 0.046$  cm) and eye diameter (ED =  $6.40 \pm 0.006$  mm). At the head level the following measurements were made: interorbital width (IW =  $6.17 \pm 0.082$  mm), snout length (SNL =  $15.26 \pm 0.156$  mm), nostrils width (NW =  $2.89 \pm 0.05$  mm), commissures width (CW =  $5.46 \pm 0.07$  mm), upper jaw length (UJL =  $6.32 \pm 0.099$  mm) and lower jaw length (LJL =  $6.00 \pm 0.079$  mm). Other measurements (PDL, PODL, PPL, POPL, etc.), which are presented in table 1, were also performed on the fish body.

In terms of meristic determinations, we obtained the following formula (dichotomous key) for spirlin:

$$41(42 - 43) \frac{(8) 9 (10)}{4} (44 - 45)46$$

D I8 – PI(11)12(13-14) – VI(7)8 – AI13(14-15) – C I(15)17I

## CONCLUSION

Based on the results, we can classify the spirlin population from the Letca area in the ichthyological classes from the literature. Spirlin body shape is directly influenced by the natural productivity of the catchment. This study will continue to evaluate the spirlin population from the other rivers in morphometric terms.

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