

Infirm effect of phylogeny on morphometric features in a cryptic *Gobio* species complex

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Supplementary material

TABLE S1 The measured basic Hydrophisico-chemical variables of the samled sites

Site code	T (°C)	pH	O₂ cc. (mg/l)	Conductivity (μS/cm)	TDS (ppm)
Pop1	15.7	7.45	12.4	256	131
Pop2	12.4	7.48	10.9	895	448
Pop3	9.3	7.33	11.2	203	108
Pop4	15.9	7.94	9.6	772	392
Pop5	14.6	8.23	12.2	806	401

TABLE S2 Name and codes of the measured morphometric variables. Start- and endpoints of measured distances presented on Fig. 1D. Variable selection was made by the F-ratios (as the quotient of the among and within sum of squares). The selected 22 variables (where $F > 2.6$) marked with an asterisk (*)

Nº	Name of variable	Code	Start-point	End-point	Among group sum of squares	Within group sum of squares	F-ratio
1.	Standard length	SL	1	2	-	-	-
2.	Fork length	Var02	1	3	2.05	1.37	1.50
3.	Predorsal length	Var03*	1	4	17.64	1.9	9.282
4.	Preanal length	Var04	1	5	0.6	0.74	0.808
5.	Prepelvic distance	Var05*	1	6	4.81	1.63	2.953
6.	Prepectoral distance	Var06	1	7	1.44	1.99	0.724
7.	Distance between the tip of snouth and ventral end of opercle	Var07*	1	8	6.39	0.74	8.595
8.	Mouth size	Var08*	1	9	5.48	1.06	5.170
9.	Head length	Var09	1	10	0.52	0.37	1.391
10.	Distance between the tip of snout and occiput	Var10*	1	11	5.07	0.54	9.317
11.	Preorbital distance	Var11*	1	12	3.93	0.73	5.382
12.	Horizontal eye diameter	Var12	12	13	0.67	0.33	2.052
13.	Postorbital distance	Var13	13	10	0.02	0.17	0.131
14.	Vertical eye diameter	Var14*	14	15	1.52	0.26	5.752
15.	Distance between the anterior eye margin and the ventral end of opercle	Var15	8	12	0.37	0.14	2.598
16.	Distance between ventral end of opercle and the origin of first dorsal fin ray	Var16*	8	4	0.8	0.29	2.814
17.	Length of first dorsal fin ray	Var17*	4	16	15.01	1.06	14.23
18.	Distance between the origin of dorsal fin and the upper lobe origin of caudal fin	Var18*	4	17	7.17	1.06	6.764
19.	Distance between the origin of dorsal fin and the lower lobe origin of caudal fin	Var19	4	18	1.79	1.23	1.454
20.	Distance between the origin of dorsal fin and origin of anal fin	Var20*	4	5	3.91	1.14	3.419
21.	Distance between the occiput and the origin of dorsal fin	Var21*	4	11	3.28	0.86	3.818
22.	Distance between the origin of dorsal fin and origin of pectoral fin	Var22*	4	7	9.62	0.8	11.98
23.	Maximum body depth	Var23*	4	19	19.47	0.8	24.34
24.	Distance between the origin of dorsal fin and origin of pelvic fin	Var24*	4	6	13.91	0.96	14.54
25.	Length of pelvic fin	Var25*	6	20	6.88	0.8	8.563
26.	Distance between the occiput and the origin of pelvic fin	Var26	6	11	1.6	1.4	1.149
27.	Distance between the ventral end of opercle and the origin of pelvic fin	Var27*	6	8	6.58	1.71	3.842
28.	Distance between the origin of anal fin and the upper lobe origin of caudal fin	Var28*	5	17	7.5	2.07	3.625
29.	Length of anal fin	Var29*	5	21	19.37	1.34	14.48
30.	Length of caudal peduncle	Var30*	5	18	3.9	1.27	3.062
31.	Length of lower lobe of caudal fin	Var31	18	22	3.65	1.9	1.922
32.	Height of caudal peduncle	Var32	17	18	2.01	1.57	1.279
33.	Length of upper lobe of caudal fin	Var33*	17	23	2.08	0.22	9.268

34. Length of pectoral fin	Var34*	7	24	4.8	1.56	3.077
35. Length of dorsal fin base	Var35	4	25	4.53	2.95	1.537

TABLE S3 Pairwise group differences by the results of the conducted CVA analyses. squared Mahalanobis distances (upper left) and Pairwise Hotelling's p values (downer right) Significant p values (where $p < 0.05$) are highlighted in red. GMS: geometric morphometry of body, GMS: geometric morphometry of scales, DBM: distance based method. Gsp1: *Gobio* "sp1", Gobt: *Gobio obtusirostris*, South: „Southern haplogroup”

Method	GMB					GMS					DBM							
Phylogenetic		G. sp1	G. obt	South			G. sp1	G. obt	South			G. sp1	G. obt	South				
	G. sp1	-	9.539	13.936		G. sp1	-	1.879	1.743		G. sp1	-	8.876	9.995				
	G. obt	0.0000	-	3.350		G. obt	0.0087	-	1.016		G. obt	0.0000	-	2.287				
	South	0.0000	0.0657	-		South	0.0643	0.6804	-		South	0.0000	0.4803	-				
Population		Pop1	Pop2	Pop3	Pop4	Pop5		Pop1	Pop2	Pop3	Pop4	Pop5		Pop1	Pop2	Pop3	Pop4	Pop5
	Pop1	-	10.361	10.049	19.776	18.221	Pop1	-	2.355	6.434	2.754	2.208	Pop1	-	9.101	7.644	18.870	12.861
	Pop2	0.1344	-	14.681	22.988	21.994	Pop2	1.0000	-	2.251	3.160	2.789	Pop2	0.2550	-	13.173	23.396	15.191
	Pop3	0.1093	0.0114	-	14.712	12.813	Pop3	0.0053	1.0000	-	3.347	3.587	Pop3	0.4212	0.0227	-	11.229	6.472
	Pop4	0.0015	0.0005	0.0067	-	5.078	Pop4	0.6827	0.3807	0.2377	-	2.548	Pop4	0.0020	0.0004	0.0388	-	7.130
	Pop5	0.0003	0.0000	0.0026	0.8004	-	Pop5	0.9552	0.3556	0.0722	0.4488	-	Pop5	0.0044	0.0012	0.2518	0.1480	-
Sex		Male	Female					Male	Female					Male	Female			
	Male	-	4.1000				Male	-	0.746				Male	-	1.3776			
	Female	0.0000	-				Female	0.0877	-				Female	0.0763	-			

TABLE S4 Number and percentage of correctly classified cases. GMS: geometric morphometry of body, GMS: geometric morphometry of scales, DBM: distance based method. The numbers and percentage of correctly classified cases (ccc) using a certain grouping and a certain methodology is indicated by bold letter type

Method	GMB					GMS					DBM										
Phylogenetic	G. sp1	G. obt.	South	Total		G. sp1	G. obt.	South	Total		G. sp1	G. obt.	South	Total							
	G. sp1	37	1	0	38	G. sp1	23	8	7	38	G. sp1	34	3	1	38						
	G. obt	2	27	8	37	G. obt	7	20	10	37	G. obt	5	21	11	37						
	South	0	5	22	27	South	4	5	18	27	South	1	5	21	27						
	Total	39	33	30	102	Total	34	33	35	102	Total	40	29	33	102						
			ccc	84%					ccc	60%					ccc	75%					
Population	Pop1	Pop2	Pop3	Pop4	Pop5	Total	Pop1	Pop2	Pop3	Pop4	Pop5	Total	Pop1	Pop2	Pop3	Pop4	Pop5	Total			
	Pop1	15	2	1	0	1	19	Pop1	12	1	1	2	3	19	Pop1	15	2	1	0	1	19
	Pop2	0	19	0	0	0	19	Pop2	1	11	2	3	2	19	Pop2	1	17	0	0	1	19
	Pop3	0	0	20	0	0	20	Pop3	3	2	12	1	2	20	Pop3	3	2	13	1	1	20
	Pop4	0	0	0	17	3	20	Pop4	3	2	1	14	0	20	Pop4	0	1	1	17	1	20
	Pop5	0	1	3	1	19	24	Pop5	1	3	2	3	15	24	Pop5	1	0	3	3	17	24
	Total	15	22	24	18	23	102	Total	20	19	18	23	22	102	Total	20	22	18	21	21	102
					ccc	88%					ccc	63%					ccc	77%			
Sex	Male	Female	Total				Male	Female	Total			Male	Female	Total							
	Male	46	9	55			Male	33	22		55		Male	43	12		55				
	Female	7	40	47			Female	14	33		47		Female	13	34		47				
	Total	53	49	102			Total	47	55		102		Total	56	46		102				
		ccc	84%					ccc	65%					ccc	75%						