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Summary : This is a report on the fishes in the Mornos river, namely: Salmo trutta macrostigma, Barbus meridionalis peloponnesius, Barbus capito albanicus, and Leuciscus cephalus albus. The systematic position of Barbus meridionalis peloponnesius, as well as the relation between subspecies Barbus capito albanicus (Mornos r.) and Barbus capito graecus (Spercheios r.) is. discussed.

The Mornos river is the easternmost river to the south of the western part of Greece. It is fed by the waters of the basin formed by Mts Vardousia, Oete, and Giona, and further reinforced by waters of other sources, among which the most important is by Kallion village, and flows into the Corinth gulf, very close to Navpaktos.

This is a report on the fish fauna of the above mentioned river, which has never been studied previously. It shows an opportune interest in view of the imminent construction of a dam there, and of an artificial lake for supplying water to Athens, a fact that, in our opinion, will be the cause of considerable changes in the conditions prevailing in the river. The report is based on samples that are kept in the Zoology Laboratory of the University of Thessaloniki.* Sampling points appear on the following map (Fig. 1).

Investigation has established the Mornos river as the habitar of: *Salmo trutta macrostigma*, *Barbus capito albanicus*, *Barbus meridionalis peloponnesius*, and *Leuciscus cephalus albus*.

* A. Stephanidis and P. Economidis collection.

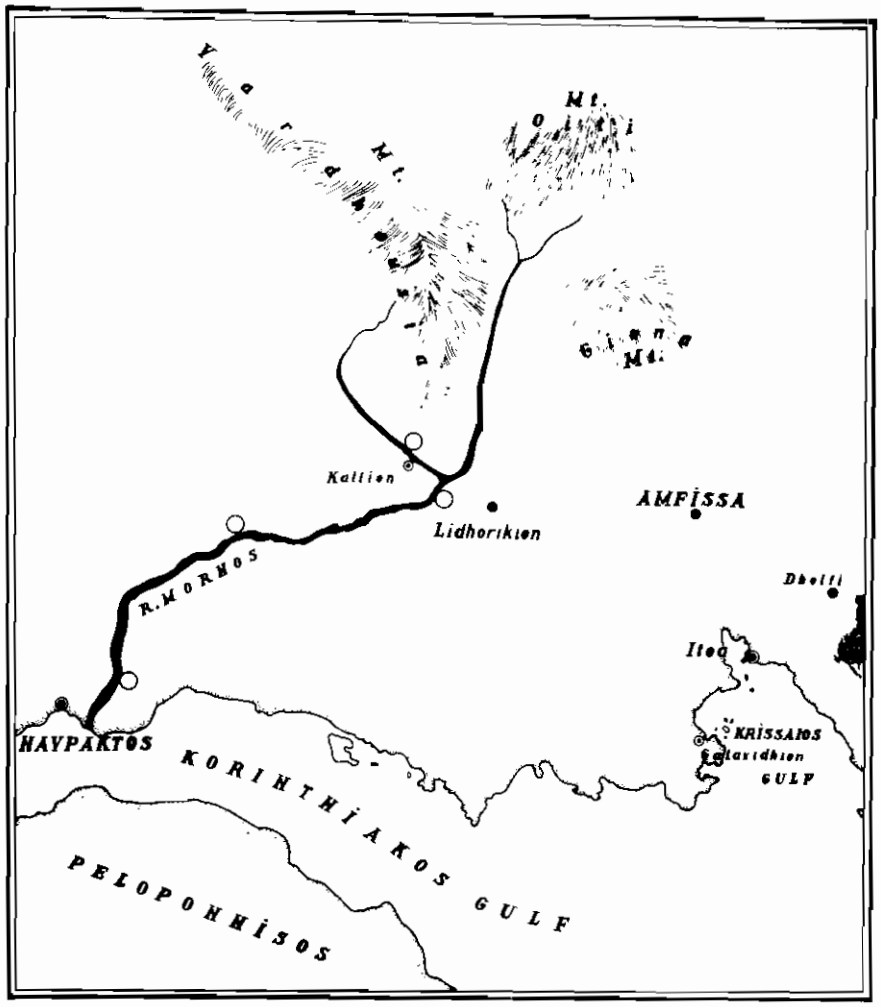

Fig. 1. Sampling points on the Mornos river

Salmo trutta macrostigma (DUMERIL, 1858), «Pestropha»

Salmo macrostigma PANAGIOTOPOULOS, 1916, Report about Hydrobiological Station p. 576 (Torrents of Evrytania). ATHANASSOPOULOS, 1917, Bull. Stat. Hydrobiol. Marine Grèce, fasc. I, p. 25 (Torrents d' Evrytanie).

Salmo trutta macrostigma STEPHANIDIS, 1971, Biol. Gallo-Hellenica 3, p. 166 (Peloponnèse).

Material: 4 specimen of a total length 185 - 221 mm.

Diagnosis: D. 3 - 5/8 - 10, A. 3 - 4/7 - 8, C. 19, p. 1/12, V. 2/8, L. l 23 - 24/111 - 117/ 24-28, Branchial spines 18 - 20, Vertebrae 58, Vomerine teeth in zig - zag series 15, Caec. pyloric 30.

The measurements and colouration of a male specimen of a total length 221 mm are as follows:

Standard length	180.0 mm	D1 base length	29.4 mm
Body greatest depth	51.7 »	Anal height	31.2 »
Body least depth	21.0 »	Anal base length	15.2 »
Caudal peduncle length	27.1 »	Pectoral length	36.6 »
Head length	48.6 »	Ventral length	29.2 »
Eye diameter	10.7 »	Distance P - V	57.0 »
Preorbital space	13.8 »	Distance V - A	41.2 »
		Ventral origin to	
Interorbital space	15.4 »	snout origin	102.0 »
		Anal origin to	
Predorsal space	88.7 »	snout origin	142.0 »
D1 height	36.0 »		

Colouration: Dorsal region light ash-coloured. Ventral region silver coloured, yellowish. Head ash-coloured with very small dark spots. Dorsal fin ash-coloured. Pectoral and ventral fins yellowish orange. Anal fin as pectoral and ventral fins but more orange. Second dorsal fin ash-coloured with upper edge orange. Caudal fin ash-yellow. Head with 8 dark brown spots (4 on the branchial cover and 4 between it and the head). Body with scattered bright orange, and a few dark coloured spots. First dorsal fin with orange spots, some of them with very small dark spots. The spots in first dorsal fin are generally thicker than in the body. The rest of the fins spotless.

Distribution: It is encountered in the upper part of the Mornos river and the Velouhi rivulet, by Kallion village. Panagiotopoulos (1916) and Athanassopoulos (1917) report the same form to have been found in Evrytania, and Stephanidis (1971) in West Peloponnesus.

Barbus meridionalis peloponnesius (C. et V., 1842), «Chamosourtis».

Barbus meridionalis meridionalis Koller, 1927, Zool. Anz. 70, p. 267 (Aspropotamos). Stephanidis, 1939b, Fresh waters fish of western Greece, p. 18 (Epirus, Etolie).

Barbus meridionalis peloponnesius ALMACA, 1969, Bull. Mus. Hist. nat. Paris 40, p. 1134 (Peloponnèse, type of Museum of Paris). STEPHANIDIS, 1971, Biolog. Gall. Hellen. 3, p. 169 (rivers of western Peloponnisous).

Barbus peloponnesius KARAMAN, 1971, Mitt. Hamb. Zool. Mus. Inst. 67, p. 212 (Peloponnèse).

Material: 25 specimen of a total length 120-185 mm.

Diagnosis: D. 3/8, A. 3/5, C. 19, P. 1/15-18, V. 2/8, L. l 9-11/47-52 (53)/5-7, Pharyngeal teeth 2.3.5-5.3.2, Branchial spines 21-26, Vertebrae 40-42.

Measurements taken from 25 specimen appear in table No I.

Distribution: This subspecies will be mainly found in the middle and upper part of the Mornos river.

Table I

Proportional measurements of Barbus meridionalis peloponnesius from Mornos river.

Characters	n	M±m	σ	Range
a. In % of the Standard length				
Body greatest depth	25	23.34±0.26	1.31	21.73-26.55
Caudal peduncle length	25	18.22±0.24	1.21	16.45-20.97
Head length	25	24.90±0.21	1.04	23.08-26.50
Dorsal height	25	18.11±0.24	1.19	16.08-20.00
Dorsal base length	25	12.58±0.23	1.13	11.10-16.52
Anal height	25	21.44±0.32	1.58	15.94-23.45
Anal hasc length	25	7.67±0.18	0.87	6.13- 9.87
Pectoral length	25	19.97±0.20	1.03	18.12-21.62
Ventral length	25	16.35±0.15	0.76	15.07-18.08
Distauce P-V	25	29.45±0.30	1.49	26.95-31.97
Distance V-A	25	23.57±0.30	1.50	21.25-26.11
Snout origin to ventral origin	10	54.64±0.33	1.03	53.64-56.61
Snout origin to anal origin	10	78.43±0.49	1.53	76.87-81.10
b. In % of the greatest body heigth. Body least depth	25	46.71±0.54	2.65	42.42-51.85
c. In % of the caudal peduncle length. Body least depth	25	60.09±1.23	6.14	50.00-74.85
d. In % of the head length				
Eye diameter	25	17.38±0.41	2.04	13.33-20.83
Preorbital space	25	43.03±1.29	6.45	34.38-54.67
Interorbital space	25	33.24±0.57	2.85	28.33-38.06
Barbel length (first pair)	10	26.00±0.72	2.26	23.33-29.97
Barbel length (second pair)	10	34.89±1.06	3.34	29.33-41.30

The distribution of the species *Barbus meridionalis* — represented by various subspecies, which have not been studied in detail yet — in Greek waters is as follows: Aspropotamos (Acheloos) system (KOLLER 1927, STEPHANIDIS 1939b), Epirus (Aoos, Vikos, Thyamis), Evenos (STEPHANIDIS, 1939b), W. Peloponnesus (*Barbus meridionalis peloponnesius*) (STEPHANIDIS, 1971), Macedonia (Lake Begoritis, Aliakmon) (*Barbus meridionalis petenyi*) (STEPHANIDIS, 1950).

Discussion: KARAMAN (1971) has recently stated that the *Barbus* with the last ossified dorsal ray without teeth belong to two separate species (*Barbus meridionalis and Barbus peloponnesius*) and not to one, as it has been until now believed. The characteristics upon which the differentiation has been based are, in our opinion, insufficient. KARAMAN does not seem to have examined samples from Peloponnesus. STEPHANIDIS (1971) reports extensive variety in the form and the length of the head and the snout, as well as in the length of the barbels and the fins of *Barbus meridionalis peloponnesius* that exceeds sometimes the corresponding figures of *Barbus meridionalis meridionalis*. In view of which, we consider quite premature this differentiation in two separate species, before a thorough investigation of a large number of specimen has taken place.

Barbus capito albanicus STEINDACHNER, 1895, «Moustakato»

Barbus albanicus STEINDACHNER, 1895, Denkschr. Akad. Wiss. Wien 63 p. 182 (Janina see, Louros Flusse). KOLLER, 1926, SB. Akad. Wiss. Wien, 135 p. 180 (Janina see). STEPHANIDIS, 1939b, Fresh water fish of western Greece, p. 13 (rivers and lakes of western Greece), 1971, Biol. Gallo - Hellen. 3, p. 167 (river Peneus of Peloponnissous).

Barbus albanicus albanicus KOLLER, 1927, Zool. Anz. 70. p. 267 (Aspropotamos).

Barbus capito albanicus KARAMAN, 1971, Mitt. Hamburg. Zool. Mus. Inst. 67 p. 212 (NW Griechenland).

Material: 12 specimen of a total length 133 - 230 mm.

Diagnosis: D. 4/8, A. 3/5, C. 19, P. 1/17 - 18, V. 2/8, L. l. 11/52 - 57/6 - 7, Pharyngeal teeth 2.3.5 - 5.3.2, Branchial spines 32 - 35, Vertebrae 43 - 44.

Measurements, effected on 12 specimen, appear in table II.

Distribution: It occurs in the middle and the lower part of the

Table II Proportional measurements of Barbus capito albanicus from Mornos river and Barbus capito graecus from Spercheios river

	Barbus capito albanicus				*Barbus capito graecus*			
Characters	n	M ± m	σ	Range	n	M ± m	σ	Range
a. *In % of the Standard length*								
Body greatest depth	12	24.83 ± 0.46	1.57	22.06 — 27.10	13	25.53 ± 0.34	1.22	23.23 — 27.11
Caudal peduncle length	12	17.29 ± 0.48	1.67	14.34 — 19.79	15	16.27 ± 0.27	1.04	14.37 — 18.45
Head length	12	26.92 ± 0.34	1.18	25.67 — 29.17	15	26.03 ± 0.27	1.04	24.41 — 27.69
Dorsal height	12	18.53 ± 0.33	1.13	16.58 — 20.22	15	19.18 ± 0.27	1.04	17.68 — 21.07
Dorsal base length	12	12.86 ± 0.26	0.88	11.03 — 14.17	15	13.76 ± 0.13	0.49	13.11 — 14.60
Anal height	12	17.98 ± 0.35	1.19	15.51 — 20.14	15	18.15 ± 0.19	0.74	17.07 — 19.75
Anal base length	12	7.29 ± 0.11	0.38	6.54 — 8.02	15	7.55 ± 0.10	0.39	6.63 — 8.14
Pectoral length	12	19.62 ± 0.25	0.88	17.97 — 21.52	15	20.29 ± 0.23	0.89	18.52 — 21.40
Ventral length	12	17.36 ± 0.15	0.51	16.55 — 17.93	15	17.61 ± 0.25	0.95	15.44 — 19.17
Distance P - V	12	27.95 ± 0.44	1.51	26.25 — 31.33	14	28.30 ± 0.23	0.87	26.56 — 29.58
Distance V - A	12	23.59 ± 0.52	1.80	21.09 — 26.22	14	25.09 ± 0.36	1.36	22.63 — 27.50
Snout origin to ventral origin	4	55.78 ± 0.73	1.46	53.77 — 57.31	14	54.30 ± 0.39	1.47	52.30 — 56.88
Snout origin to anal origin	4	79.51 ± 0.52	1.03	78.53 — 80.48	14	78.66 ± 0.36	1.32	76.83 — 81.69
b. *In % of the greatest body heigth.* Body least depth	12	44.66 ± 0.53	1.84	41.38 — 47.73	13	45.54 ± 0.59	2.12	40.43 — 48.97
c. *In % of the caudal peduncle length.* Body least depth	12	64.83 ± 2.64	9.16	55.77 — 82.95	13	71.17 ± 1.58	5.71	62.32 — 81.32
d. *In % of the head length*								
Eye diameter	12	18.23 ± 0.43	1.49	14.18 — 20.00	15	19.96 ± 0.66	2.56	15.73 — 25.55
Preorbital space	12	36.89 ± 1.43	4.96	31.25 — 44.59	15	39.77 ± 0.87	3.35	28.34 — 43.33
Interorbital space	12	34.08 ± 0.85	2.95	30.56 — 41.08	15	33.93 ± 0.30	1.14	32.05 — 35.71
Barbel length (first pair)	12	28.04 ± 0.97	3.34	20.93 — 33.10	15	28.47 ± 0.82	3.17	24.00 — 33.23
Barbel length (second pair)	12	34.85 ± 1.15	3.99	25.58 — 38.89	15	37.71 ± 0.58	2.26	29.95 — 36.76
Scales of the lateral line	12	54.42 ± 0.42	1.45	52 — 57	15	45.20 ± 0.28	1.08	43 — 47

Mornos river. The distribution of this subspecies, which is endemic in Greek waters, has been established throughout the west of Greece from the Thyamis (Kalamas) river up to and the Mornos river, as well as in the Penios river of Peloponnesus (STEINDACHNER 1895, KOLLER 1927, STEPHANIDIS 1939 b, 1971). Its presence in the east of the Mornos has not been established.

Discussion: It is a well known fact that south Greece is the habitat of the two related species, *Barbus albanicus and Barbus graecus* (STEINDACHNER 1895, BERG 1932, LADIGES and VOGT 1965, LADIGES 1967) which KARAMAN (1971) has recently ventured to consider as one subspecies (*Barbus capito albanicus*). An examination of samples from the Mornos and the Spercheios River has shown that there are differences between the populations of these two river systems, which fully justify the view that the fishes in question belong to two separate subspecies — *Barbus capito albanicus* in the Mornos, and *Barbus capito graecus* in the Spercheios. This assertion is based on the following observations (see table II).

The scales on the lateral line of *Barbus capito albanicus* are 52 - 57 ($M \pm m = 54.42 \pm 0.42$) compared to the 43 - 47 ($M \pm m = 45.20 \pm 0.28$) of *Barbus capito graccus*. The diameter of the eye in % of the head length of *Barbus capito albanicus* is between 14.18 and 20.00 ($M \pm m = 18.23 \pm 0.43$) compared to the 15.73 to 25.55 ($M \pm m = 19.96 \pm 0.66$) of *Barbus capito graecus*. The free edge of the dorsal fin of *Barbus capito graecus* is usually curved in contrast with that of *Barbus capito albanicus* which is straight, and the last ray is more ossified.

Furthermore, the distribution of *Barbus capito graecus* is different from that of *Barbus capito albanicus*, with a partially overlapping zone in Aetoloakarnania. The latter is distributed all over the west part of Greece, up to the Mornos, and the west of Peloponnesus (Pineos r.), while the presence of *Barbus capito graecus* has been established to occur in Aetoloakarnania (STEINDACHNER 1895, KOLLER 1926, 1927) and in Atticoboeotia and the Spercheios river (STEPHANIDIS, 1939a).

In view of the above and until a more detailed study of the population of such fishes in Greek waters has been effected, we consider expedient that *Barbus capito albanicus* and *Barbus capito graecus* should be considered as two separate subspecies.

Leuciscus cephalus albus BONAPARTE, 1838, «Dromitsa».

Leuciscus cephalus albus STEINDACHNER, 1895, Denksch. Akad. Wiss.

Wien, 63 p. 184 (Janina See). OLIVA, 1965, Bonn. Zool. Beitz. p. 309 (Korfu). ALMAÇA, 1969, Bull. Mus. Hist. nat. Paris, 40, p. 1127 (Peloponnèse type of *Leuciscus peloponensis* of Museum of Paris).

Leuciscus peloponensis STEPHANIDIS, 1939b, Fresh water fish of western Greece p. 28 (Epirus, Etolia, island Kerkyra).

Leuciscus cabeda var. pamvoticus STEPHANIDIS, 1939b, Fresh water fish of western Greece p. 30 (lake of Janina).

Leuciscus cephalus peloponensis STEPHANIDIS, 1971, Biol. Gallo - Hellen., 3 p. 191 (Peloponnissous).

Material: 20 specimen of a total length 134 - 206 mm.

Diagnosis: D. 3/8, A. 3/8 - 9, C. 19, P. 1/15 - 17, V. 2/8, L. l, 8/42 - 44/3 - 4, Pharyngeal teeth 2.5 - 5.2, Branchial spines 19 - 21, Vertebrae 42 - 43.

Measurements, effected on 20 specimen, appear in table No. III.

Table III

Proportional measurements of Leuciscus cephalus albus from Mornos river

Characters	n	M±m	σ	Range
a. *In % of the Standard length*				
Body greatest depth	20	25.11±0.32	1.43	22.77-28.07
Caudal peduncle length	20	20.09±0.22	0.96	18.67-22.27
Head length	20	24.32±0.24	1.07	20.98-25.61
Dorsal height	20	17.65±0.28	1.26	15.63-19.91
Dorsal base length	20	11.11±0.12	0.54	10.16-12.20
Anal height	20	14.74±0.28	1.27	12.79-16.36
Anal base length	20	10.46±0.21	0.92	9.08-12.86
Pectoral length	15	18.09±0.17	0.66	17.20-19.82
Ventral length	15	15.15±0.15	0.56	14.40-16.40
Distance P-V	20	26.63±0.24	1.08	24.29-28.46
Distance V-A	20	21.99±0.25	1.25	20.00-24.41
Snout origin to ventral origin	15	50.79±0.33	1.26	48.55-52.99
Snout origin to anal origin	15	71.58±0.43	1.66	69.09-74.62
b. *In % of the greatest body heigth.* Body least depth	20	44.11±0.53	2.38	39.06-48.64
c. *In % of the caudal peduncle length.* Body least depth	20	55.11±0.79	3.52	48.39-64.71
d. *In % of the head length*				
Eye diameter	20	22.40±0.37	1.63	19.89-25.00
Preorbital space	20	34.65±0.98	4.27	26.32-45.33
Interorbital space	20	39.52±0.73	3.20	35.53-51.00

Distribution: It occurs throughout the Mornos river, particularly in the middle and lower parts of it. It has also been found in Peloponnesus (STEPHANIDIS, 1971), in the Acheloos river (STEPHANIDIS, 1939), in Epirus (Lake of Joannina) (STEIDACHNER 1895, STEPHANIDIS 1939), and Corfu (STEPHANIDIS 1939, OLIVA 1965).

Remarks: The measurements effected on the samples from the Mornos river correspond with those of Peloponnesus (STEPHANIDIS, 1971).

Η ΙΧΘΥΟΠΑΝΙΣ ΤΟΥ ΠΟΤΑΜΟΥ ΜΟΡΝΟΥ

Ὑπὸ

ΜΑΡΙΟΥ ΚΑΤΤΟΥΛΑ

(Ἐργαστήριον Ζωολογίας Πανεπιστημίου Θεσσαλονίκης)

ΠΕΡΙΛΗΨΙΣ

Ἐξετάζονται τὰ εἴδη τῶν ἰχθύων τοῦ ποταμοῦ Μόρνου. Ταῦτα εἶναι τά: Salmo trutta macrostigma, Barbus meridionalis peloponnesius, Barbus capito albanicus καὶ Leuciscus cephalus albus. Συζητεῖται ἡ συστηματικὴ θέσις τοῦ Barbus meridionalis peloponnesius ὡς ἐπίσης καὶ ἡ σχέσις μεταξὺ τῶν ὑποειδῶν Barbus capito albanicus (Μόρνος) καὶ Barbus capito graecus (Σπερχειὸς) (πίναξ II).

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