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Alburnus baliki, a new species of cyprinid fish from the Manavgat River system, Turkey

Nina G. Bogutskaya*, Fahrettin Kucuk** and Erhan Unlu***

Alburnus baliki, new species, from the Manavgat River basin, South Anatolia, Turkey, is distinguished from its congeners by a suite of characters unique within *Alburnus* including a reduction of scale size, an irregular scale pattern, a lack of pelvic axillary scales, and a low total vertebral number (commonly 19+17-18).

Introduction

Some 23-25 species usually assigned to the genera *Alburnus*, *Chalcalburnus*, *Alburnoides*, *Tropidophoxinellus* and *Leucaspius* form a presumably monophyletic tribe called Alburnini (Bogutskaya, 1990a-b). Uncertainty of definitions of *Alburnus*, *Chalcalburnus* and *Alburnoides* were already discussed (Bianco, 1980; Krupp, 1985) and Coad (1991) suggested that they may be synonyms. Bogutskaya (1997a) synonymized *Alburnus* and *Chalcalburnus* since the distinguishing characters of *Chalcalburnus* according to Berg (1932, 1949) – a partly scaled ventral keel, numerous long gill-rakers and slightly serrated or unserrated pharyngeal teeth – have no diagnostic value, being variably present in *Alburnus* or *Chalcalburnus* species. On the other hand, according to Berg (1949), *Alburnoides* differs from *Alburnus* only in having unserrated pharyngeal teeth.

Bogutskaya (1997a) reviewed the species of the subfamily Leuciscinae of Turkey which includes the following *Alburnus* species (we only

list their range in Turkey): *A. akili* Battalgi, 1942 (Beyşehir Gölü, Central Anatolia), *A. alburnus* (Linnaeus, 1758) (*A. a. alburnus*: Meric River, Parali stream in Sakarya River basin, Western Anatolia from Sapanca in the north to Bafa Gölü in the south; *A. a. hohenackeri*: Kura and Aras basins), *A. caeruleus* Heckel, 1843 (Gaziantep), *A. chalcoides* (Güldenstädt, 1772) (rivers of Black Sea basin from Rezovska in the west to Coruh in the east, lakes of northwestern Anatolia, Büyük Menderes at Aydın), *A. escherichii* Steindachner, 1897 (Sakarya and Kizilirmak Rivers), *A. filippii* Kessler, 1877 (Kura-Aras basin with tributaries from very upper headwaters), *A. heckeli* Battalgi, 1944 (Hazer Gölü in Upper Tigris), ? *A. kotschyi* Steindachner, 1863 (only known from original description, southeastern Turkey, between Alexandretta [Iskenderun] and Antiochia [Antakya]); probably a synonym of *A. caeruleus*), *A. mossulensis* Heckel, 1843 (Tigris – Euphrates basin), *A. nasreddini* Battalgi, 1944 (only known from original description, Eber Gölü in Central Anatolia), *A. orontis* Sauvage, 1882 (Amik Gölü and Orontes

* Zoological Institute, Russian Academy of Sciences, Universitetskaya emb. 1, 199034 St. Petersburg, Russia.

** Faculty of Aquatic Products, Suleyman Demirel University, Egridir Isparta Turkey.

*** Department of Biology, Faculty of Sciences, Dicle University, 21280 Diyarbakir, Turkey.

northeast of Antakya), *A. sellal* Heckel, 1843 (Orontes at Antakia; from Seyhan as *A. s. adanensis* [Battalgazi, 1944]), *A. tarichi* (Pallas, 1811) (Van Gölü). There is no reliable literature data on any *Alburnus* species from the Manavgat River or adjacent areas (Balik, 1988, 1995; Geldiay & Balik, 1996). Kucuk (1997) first collected alburnine specimens in the Manavgat basin and identified them as *Chalcalburnus* sp. This species is described here as *Alburnus baliki*.

Material and methods

Institutional abbreviations: BMNH, Natural History Museum, London; DUM, Zoological Museum of Science and Art Faculty, Dicle University, Diyarbakir; MBL, Museu Bocage, Lisbon; MRSN, Museo Regionale di Scienze Naturali, Torino; NMC, Museum of Nature, Ottawa; NMW, Naturhistorisches Museum, Wien; SMF, Senckenberg Museum, Frankfurt; ZISP, Zoological Institute, Russian Academy of Sciences, St. Petersburg; and ZMH, Zoologisches Museum und Institut Universität Hamburg. C&S indicates specimens cleared and stained with alizarin red S.

Comparative material: *Alburnoides bipunctatus*: over 250 specimens (26 C&S) in ZISP, ZMH, NMC, from Volga, Dnieper, Kura-Aras system and rivers in Lenkoran' Province, Western Transcaucasia, Kizilirmak, Danube, Ohrid Lake, Kuban', Tigris, Urmia Lake. *A. oblongus*: BMNH 1975.1.17:249-250 (2); Syr-Darya. – ZISP 30696 (1), 36725 (3); Chirchik, Syr-Darya basin. *A. taeniatatus*: ZISP 25575 (53, 1 C&S); Amu-Darya. *A. akili*: ZMH 1107 (holotype), 1110 (1 paratype), 1116 (6), 2461 (5), 2462 (43, 4 C&S); Beysehir L., Central Turkey. *A. a. alburnus*: ZISP 3931 (5); Volga R. – ZISP 3971 (11), 21610 (11, 4 C&S); Astrakhan' – ZISP 10573 (2); Kama R. – ZISP 41407 (10); Ural R. – ZISP uncat. (6, 6 C&S); Rybinsk reservoir, Volga R. – ZMH 14646 (20); Elbe R. *A. a. hohenackeri*: ZISP 2839 (holotype); Karabakh. – ZISP 9097 (6), 35786 (22); Kura R. – ZISP 9112 (5), 9113 (3), ZISP 14727 (44, 7 C&S), 14728 (9), 15011 (18); Terek R. – ZISP 9132 (5), 9133 (26, 5 C&S), 9148 (6); Lenkoran' – ZISP 14729 (1); Sunzha. – ZISP 15313 (1), 31490 (2); Kuban' R. – ZISP 20865 (2); Baku. – ZISP 24393 (1); Sara Island. *A. atropate-*

nae: BMNH 1905.10.14:58 (1), NMC 118(218) (1), 119 (219) (2), 125(225) (6), 127(227) (6, 1 C&S); Urmia L. *A. belvica*: ZMH 8238 (3); Prespa L. *A. chalcoides*: ZMH 2480 (15), 2481 (27, 3 C&S); Iznik L. – ZMH 3773 (20, 2 C&S), 3896 (4); Bergama. *A. caeruleus*: SMF 100 (4 syntypes); Aleppo. – SMF uncat. (12, 1 C&S); Ra's-al-fin. – ZMH 3604 (1, Gaziantep). *A. doriae*: MRSN 720 (1 syntype), MRSN 9102 (2 syntypes); Shiraz. *A. escherichii*: NMW 88036 (5, 1 C&S); Angora. – ZISP 26624 (3), 26626 (2); Sakarya R. *A. filippii*: ZISP 2914 (2 paralectotypes), 2925 (13 paralectotypes), 2926 (lectotype, 16 paralectotypes), 3930 (4), 5189 (5), 9100 (21, 3 C&S), 9105 (11), 10251 (12, 2 C&S), 10482 (5), 10483 (2), 14721 (5), 14722 (4), 14723 (7), 14724 (1), 14725 (1), 14726 (1), 15012 (1), 20767 (11), 31101 (3), uncat. (3 C&S); Kura-Aras system. *A. heckeli*: ZMH 1109 (1 syntype); Hazer-Gölü, Turkey. *A. mossulensis*: SMF 402 (2 syntypes); Mossul. – SMF 24354 (10); Iraq, W of Basra. – ZISP 3907 (2); W. Armenia. – ZISP 15254 (5, 1 C&S); Euphrates. – ZMH 1143 (2), 7360 (4); Dicle R. – ZMH 4072 (3); Hakkari, Haman-suyu. – ZMH 4342 (2); Tigris-Euphrates delta. – ZMH 4816 (3); Kandili, Karasu). *A. orontis*: SMF 24402 (4), 24404 (7), 24410 (7); Orontes R. *A. qalilus*: SMF 24480 (holotype), 24481 (5 paratypes); Syria, Nahr al-Hawaiz. *A. tarichi*: NMC 82-0382 (4), ZISP 6742 (1), 15249 (9, 2 C&S), ZMH 3564 (14), 7363 (4), uncat. (6, 1 C&S); Lake Van basin. *Alburnus* sp.: NMC 70-170 (10), 79-243 (13); Zayanden R., Esfahan. – NMC 79-244 (3); Shahr-e-Kord. – NMC 79-245 (50, 2 C&S), 79-250 (8); Esfahan. – NMC 79-253 (11, 1 C&S); Qom. *Leucaspius delineatus*: ZISP 2897 (9), 2898 (16, 2 C&S); Volga. – ZISP 30225 (3), 33363 (19, 3 C&S); Dnieper. *Tropidophoxinellus alburnoides*: NMW 49749 (5 syntypes), BML uncat. (18, 3 C&S), ZISP 38328 (4); Guadiana. – BML uncat. (5); Jaraiz, Cáceres. – BML uncat. (14, 3 C&S), Tajo. – BML uncat. (9, 1 C&S); Aguede. – ZMH 7326 (4); Guadajira. *T. spartiaticus*: NMC 77-1720 (4), MBL uncat. (3); Eurotas R. "*Tropidophoxinellus*" *hellenicus*: MBL uncat. (4); Trichonnis L.

All specimens were radiographed. Methods of counting branched fin rays, vertebrae and sensory pores as well as terminology of vertebral regions and subregions follow those given in Bogutskaya (1997b).

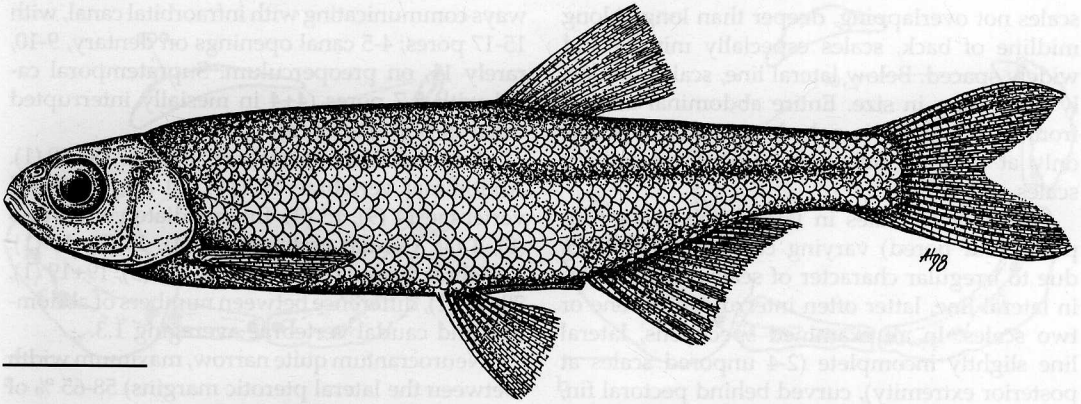


Fig. 1. *Alburnus baliki*, holotype, DUM 63, 60.5 mm SL. Scale bar 10 mm (drawing by A.M. Naseka).

***Alburnus baliki*, new species**
(Fig. 1)

Chalcalburnus sp.: Kucuk, 1997: 63 (Oymapinar and Manavgat reservoirs, Ilica stream, Manavgat River system, Antalya, Turkey).

Holotype. DUM 63, 60.5 mm SL; Turkey: Antalya: Manavgat Reservoir, Manavgat River; 12 June 1996, F. Kucuk.

Paratypes. DUM 64a, 4, 30.4-40.6 mm SL; ZISP 51711, 1, 36.1 mm SL; same data as holotype. – ZISP 51712, 1, 58.2 mm SL; Turkey: Antalya: Oymapinar Reservoir, Manavgat River basin; 12 June 1996, F. Kucuk. – DUM 64b, 2, 41.0-48.1 mm SL; ZMH 9079, 3, 45.2-47.7 mm SL; Turkey: Antalya: Ilica stream, Manavgat River basin; 22 April 1997, F. Kucuk. All of the specimens were radiographed, six superficially stained with alizarin, and one partly dissected.

Diagnosis. *Alburnus baliki* is distinguished from all other species in the genus in having the following unique combination of characters: dorsal fin with 3 simple and 9 branched rays; anal fin with 3 simple and 13-15 branched rays; 47-61 pored lateral line scales; 11-13 gill rakers; 36-37(38) total vertebrae; ventral keel between the pelvic and anal fins completely scaleless, sharp; area in front on the pelvic fin almost scaleless; dorsal and ventral scales reduced in size, not overlapping; all scales weakly calcified with poorly developed radii and focus; no pelvic axillary scales.

Description. Morphometric data are given in Table 1. Body elongate, considerably compressed. Ventral keel between pelvic and anal fin origins completely naked, extremely pronounced. Naked area much wider than in any other *Alburnus* species.

Head quite small, 23-26 % SL. Upper head profile convex, snout rounded, mouth terminal. Uppermost point of cleft on level of middle of eye. Lower jaw-quadrangle junction on vertical through anterior margin of eye or slightly behind. Eye large, diameter greater than snout length, 57-66 % of postorbital length.

Dorsal fin with 3 simple and 9 branched rays; outer margin straight or slightly convex. Dorsal fin origin markedly behind vertical through posterior extremity of pelvic fin base. Anal fin with 3 simple and 13 (3), 14 (4 including holotype), 15 (5) branched rays; outer margin convex but very tip of fin rounded due to elongation of first two branched rays; origin under posterior extremity of dorsal fin base.

Gill rakers elongated, narrow, 11 (4 including holotype), 12 (5), 13 (4) on outer side of first left gill arch. Pharyngeal teeth 2.5-5.2, narrow, hooked, markedly serrated.

Scales extremely thin, weakly calcified, easily lost. Scales on most of body including flank above lateral line without radii; focus weakly marked; circuli slightly visible; 2-4 short radii in posterior field only on scales just below lateral line. Scales arranged more or less regularly only in central parts of flank, but even here individual scales may have clearly different sizes. In general, scale size gradually decreasing dorsally both in front of and behind dorsal fin. On most parts of back,

scales not overlapping, deeper than long. Along midline of back, scales especially minute and widely spaced. Below lateral line, scales similarly decreasing in size. Entire abdominal area in front of pelvic fin is naked, rare minute scales only at pectoral fin origin. No pelvic axillary scales.

Number of scales in lateral line series (unpored and pored) varying considerably, 50-65, due to irregular character of scales. 47-61 scales in lateral line, latter often interrupted on one or two scales. In all examined specimens, lateral line slightly incomplete (2-4 unpored scales at posterior extremity), curved behind pectoral fin, reaching lowermost point above pelvic fin origin, separated from latter by 3-4 small scales, continuing further markedly below middle of flank, parallel to lower profile of body

All cephalic sensory canals complete. Supraorbital canal with 9-10 pores; posterior section straight and sometimes shortened (only one segment on parietal); 3 canal openings in nasal, 6-7 in frontal. Infraorbital canal with 14-17 (commonly 15-16) pores with 4 canal openings on first infraorbital. Preopercular-mandibular canal al-

ways communicating with infraorbital canal, with 15-17 pores; 4-5 canal openings on dentary, 9-10, rarely 11, on preoperculum. Supratemporal canal with 5-7 pores (4+4 in mesially interrupted canal in one specimen).

Total number of vertebrae 36 (3), 37 (8), 38 (1). Abdominal vertebrae 19 (11), 20 (1). Predorsal vertebrae 14 (9), 15 (3). Intermediate vertebrae 3 (8), 4 (4). Caudal vertebrae 17 (4), 18 (7), 19 (1). Vertebral formula 19+18 (7), 19+17 (3), 19+19 (1), 20+17 (1), difference between numbers of abdominal and caudal vertebrae averaging 1.3.

Neurocranium quite narrow, maximum width (between the lateral pterotic margins) 58-65 % of cranial roof length. Depth of neurocranium at lowermost point of parasphenoid exceeding (markedly in larger specimens) depth in occipital region. Bones of ethmoid region relatively small. Width of supraethmoid only 20-22 % of maximum cranial width. Preethmoid entirely ossified. Vomer short, head and handle not clearly separated. Orbit extremely large: very narrow interorbital part of parasphenoid considerably convex, almost round, interorbital septa of orbitosphenoid extremely deep, depth about $\frac{2}{3}$ of

Table 1. Morphometric data of holotype (DUM 63) and paratypes of *Alburnus baliki*.

	DUM 63	ZISP 51712	DUM 64b		ZMH 9079		
SL (mm)	60.5	58.2	48.1	41.0	47.7	46.2	45.2
Percents of standard length							
Head length	23.8	23.7	22.9	24.3	25.0	26.2	25.7
Maximum body depth	22.8	22.6	25.2	25.9	23.1	24.7	24.8
Minimum body depth	8.4	8.6	8.9	8.8	8.6	9.5	9.9
Predorsal distance	57.2	58.4	55.5	56.6	58.1	54.3	55.3
Postdorsal distance	33.1	34.4	33.1	31.7	30.2	30.7	31.6
Caudal peduncle length	16.0	16.3	16.2	15.6	17.0	15.7	15.5
Dorsal fin length	12.9	12.2	14.8	12.7	13.4	14.7	14.2
Dorsal fin depth	21.7	21.3	22.7	21.7	22.0	23.2	22.8
Anal fin length	19.2	18.6	18.7	19.3	16.8	19.5	20.1
Anal fin depth	16.2	17.2	17.9	17.3	17.8	19.0	17.7
Pectoral fin length	19.2	19.9	20.2	18.9	18.9	21.0	20.8
Pelvic fin length	16.4	17.9	18.7	17.3	17.6	18.4	18.1
P-V distance	26.8	23.2	24.7	26.6	23.1	23.6	24.6
V-A distance	18.5	21.0	21.2	19.5	19.5	17.7	19.5
Percents of head length							
Snout length	26.4	29.2	27.3	26.0	23.4	24.8	25.9
Eye diameter	30.6	30.0	28.2	28.0	29.0	29.8	27.6
Postorbital distance	46.5	45.8	50.0	47.0	47.6	45.5	44.8
Head depth at nape	72.9	76.4	83.6	73.0	74.2	73.6	77.6
Head width at nape	48.6	49.3	50.1	46.0	48.4	48.8	48.6
Interorbital distance	28.5	31.3	30.9	30.0	31.7	28.1	32.8
Lower jaw length	39.6	40.3	39.1	38.0	43.5	36.4	37.9

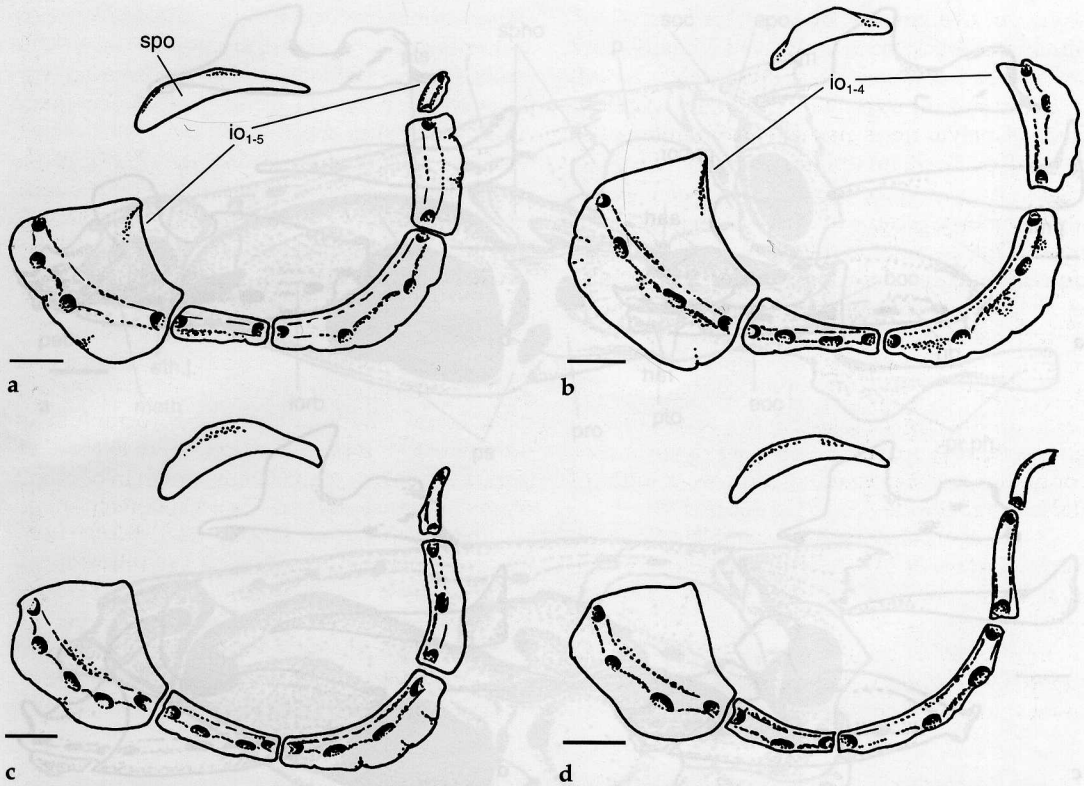


Fig. 2. Circumorbitals of: **a**, *Tropidophoxinellus alburnoides*, BML uncat., Tajo basin, 77.5 mm SL; **b**, *Leucaspius delineatus*, ZISP 31166, Severnaya Dvina R., 73.0 mm SL; **c**, *Alburnus alburnus hohenackeri*, ZISP 14727, Terek R., 82.5 mm SL; **d**, *A. baliki*, paratype, ZISP 51712, 58.2 mm SL. Abbreviations: **io**, infraorbitals; **spo**, supraorbital. Scale bars 1 mm.

depth of entire orbitosphenoid, orbital incisure of frontal shallow but long. Central portion of parasphenoid projected downward, bearing a shallow but sharp, well-pronounced ventral keel. Parasphenoidal lateral ascending processes high and narrow, forming anterior border of rather extensive carotid foramen. Lateral sphenotic process narrow, markedly hooked, laterally projected. Sphenotic contributing to cranial roof separating frontal and pterotic.

Infraorbitals (Fig. 2d) narrow, second sometimes fragmented into two, fourth not wider or even narrower than third. Fifth sometimes absent; when present, tube-like, with almost entirely reduced lamellate portion.

Lower jaw (Fig. 3d) comparatively deep. Coronoid process curved backwards, with more or less rounded top attenuated anteriorly; anguloarticular relatively deep, joining posteriormost margin of process.

Ascending branch of cleithrum narrow, with posteroventral corner attenuated posteriorly as a triangular process. Postcleithrum very short. Coracoid comparatively deep, with a rounded ventral margin.

Coloration. Alcohol preserved specimens light silvery, almost white ventrally. A well-pronounced, narrow, straight dark stripe. Smaller specimens with relatively wider and darker stripe. Fins pale.

Distribution and habitat. *Alburnus baliki* is only known from the Manavgat River basin. The Manavgat originates in the Taurus mountains about 1000-1200 masl and drains to the Mediterranean, entering it in Antalya Bay. The Oymapinar and Manavgat dams were constructed on this river. Besides a single sample from the Ilica stream, all specimens were collected in the

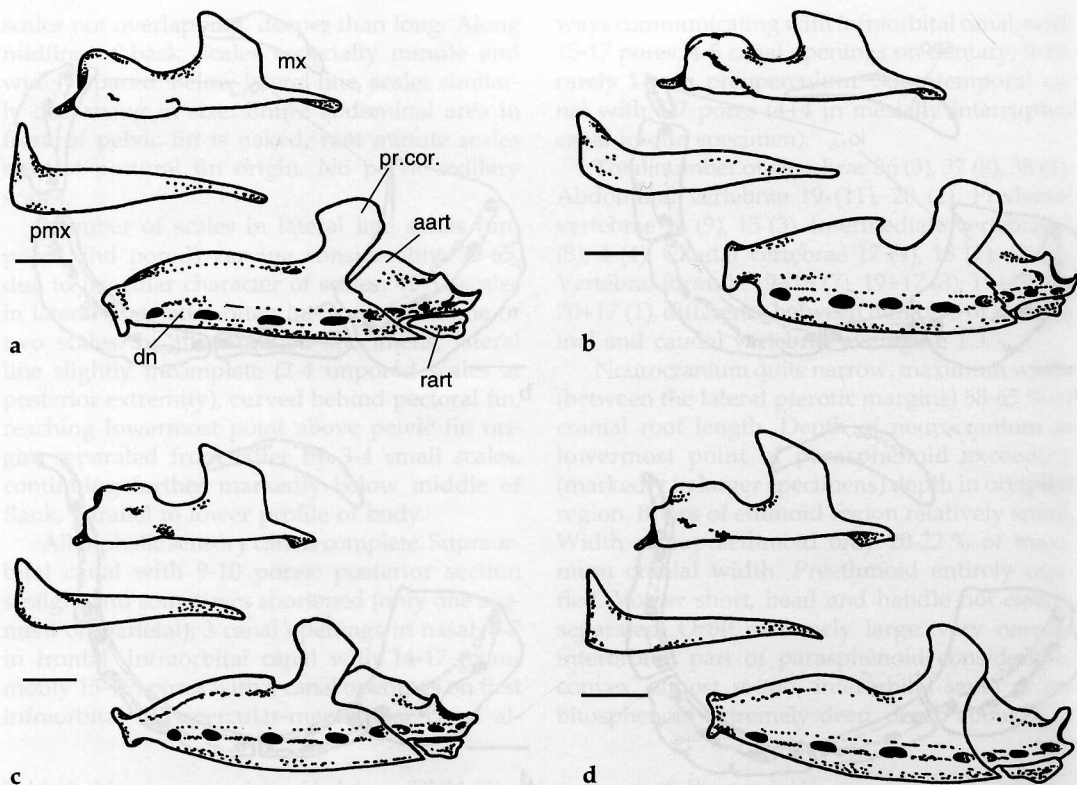


Fig. 3. Bones of jaws of: **a**, *Tropidophoxinellus alburnoides*, BML uncat., Tajo basin, 77.5 mm SL; **b**, *Leucaspis delineatus*, ZISP 31166, Severnaya Dvina R., 73.0 mm SL; **c**, *Alburnus alburnus hohenackeri*, ZISP 14727, Terek R., 82.5 mm SL; **d**, *A. baliki*, paratype, ZISP 51712, 58.2 mm SL. Abbreviations: **aart**, anguloarticular; **dn**, dentary; **mx**, maxilla; **pmx**, premaxilla; **pr.cor.**, coronoid process; **rart**, retroarticular. Scale bars 1 mm.

Manavgat and the Oymapinar reservoirs. *Alburnus baliki* forms schools along the banks just under the water surface in clean, slow flowing water. The aquatic vegetation is very dense at these places. In June, the temperature was 15–17°, dissolved O₂ 9 mg·l⁻¹, pH 6.5, and conductivity 120 umh·cm⁻¹. Fish species living at the same localities are: *Anguilla anguilla*, *Cyprinus carpio*, *Carasius auratus*, *Capoeta capoeta angorea*, *Pseudophoxinus antalyae*, *Gambusia affinis*.

Etymology. The species is named for Suleyman Balik, who contributed to our knowledge of the fishes of West Anatolia and the Mediterranean Region of Turkey

Discussion. The new species shares with the tribe Alburnini all its diagnostic characters (Bogutskaya, 1990a-b; Bogutskaya & Collares-Pereira,

1997): 1) orbital region of neurocranium deeper than occipital region (34–40 and 32–39 % of neurocranial base length respectively, vs. 30–32 and 36–38 respectively, the hypothesized ancestral condition); 2) high interorbital septum (depth $\frac{1}{2}$ – $\frac{2}{3}$ of orbitosphenoid depth, vs. about $\frac{1}{3}$ or less in most Leuciscinae); 3) anterior orbital foramen and posterior orbital-hypophyseal foramen very large (for comparison with other leuciscine genera see, e.g., Bogutskaya, 1990a-b, 1992, 1994; Bogutskaya & Collares-Pereira, 1997); 4) interorbital portion of parasphenoid downwardly curved (Fig. 4) (vs. straight in most other Leuciscinae); 5) sphenotic often contributing to cranial roof (Fig. 4a,c) (a rare feature in other groups; besides Alburnini, present in *Leuciscus torgalensis* Coelho, Bogutskaya, Rodrigues & Collares-Pereira, 1998 and some *Pseudophoxinus* species); 6) straightened anterior section of infraorbital

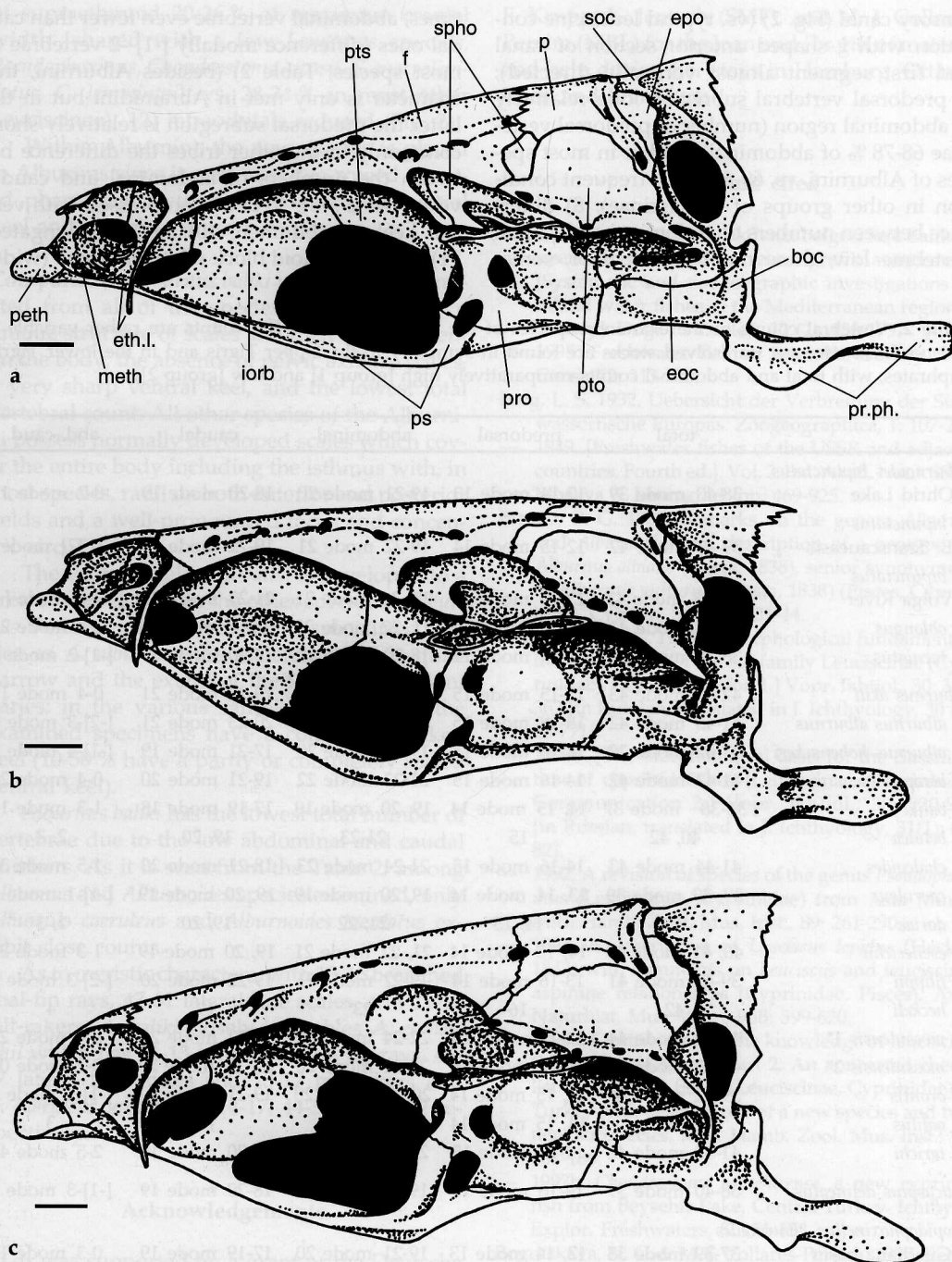


Fig. 4. Lateral view of the neurocranium of: **a**, *Tropidophoxinellus alburnoides*, BML uncat., Tajo basin, 77.5 mm SL; **b**, *Leucaspis delineatus*, ZISP 31166, Severnaya Dvina R., 73.0 mm SL; **c**, *Alburnus alburnus hohenackeri*, ZISP 14727, Terek R., 82.5 mm SL. Abbreviations: **boc**, basioccipital; **eoc**, exoccipital; **epo**, epiotic; **eth.l.**, lateral ethmoid; **f**, frontal; **iorb**, interorbital septum of orbitosphenoid; **meth**, mesethmoid; **p**, parietal; **peth**, preethmoid; **pr.ph.**, pharyngeal process; **pro**, prootic; **ps**, parasphenoid; **pto**, pterotic; **pts**, pterosphenoid; **soc**, supraoccipital; **spho**, sphenotic. Scale bars 1 mm.

sensory canal (Fig. 2) (vs. typical leuciscine condition with L-shaped anterior section of canal and first segment almost vertically directed); 7) predorsal vertebral subregion long relatively to abdominal region (number of predorsal vertebrae 68-78 % of abdominal number in most species of Alburnini, vs. 60-66, most frequent condition in other groups of Leuciscinae); 8) difference between numbers of abdominal and caudal vertebrae low, these numbers equal or, some-

times, abdominal vertebrae even fewer than caudal ones (difference modally [-1] -2 vertebrae in most species; Table 2) (besides Alburnini, this character is only met in Abramidini but in the latter the predorsal subregion is relatively short; commonly in the other tribes the difference between the numbers of abdominal and caudal vertebrae is 3-6); 9) body compressed with ventral keel on abdomen; 10) anal fin elongated; 11) cranial ethmoid block relatively small (width

Table 2. Vertebral counts of the examined species of the tribe Alburnini. (The counts are rather variable in *A. mossulensis*: two yet unresolved stocks are found in sympatry in the Upper Tigris and in the lower Tigris-Euphrates, with total and abdominal counts comparatively high [group 1] and low [group 2]).

	total		predorsal		abdominal		caudal		abd.-caud.	
<i>Alburnoides bipunctatus</i>										
Ohrid Lake	38-40	mode 39	12-14	mode 13	19-21	mode 20	18-20	mode 19	0-2	mode 1
<i>A. bipunctatus</i>										
E. Transcaucasia	39-43	mode 42	12-15	mode 14	19-22	mode 21	19-22	mode 21	[-2]-[2]	mode 0
<i>A. bipunctatus</i>										
Volga River	42, 43	mode 43	13-15	mode 14	20, 21	mode 21	21-23	mode 22	[-3]-0	mode [-1]
<i>A. oblongus</i>	40-42	mode 41	14, 15	mode 14	21, 22	mode 22	19, 20	mode 19	1-3	mode 2
<i>A. taeniatus</i>	36-39	mode 38	13-15	mode 14	18-20	mode 19	17-20	mode 19	[-1]-2	mode 1
<i>Alburnus akili</i>	42-45	mode 43	13-15	mode 15	22-24	mode 22	19-22	mode 21	0-4	mode 1
<i>A. alburnus alburnus</i>	41-45	mode 42	15-18	mode 15	20-23	mode 21	20-23	mode 21	[-2]-3	mode 0
<i>A. alburnus hohenackeri</i>	37-42	mode 39	14-16	mode 15	19-22	mode 20	17-21	mode 19	[-1]-4	mode 1
<i>A. atropatense</i>	41-43	mode 42	14-16	mode 15	21-23	mode 22	19-21	mode 20	0-4	mode 2
<i>A. baliki</i>	36-38	mode 37	14, 15	mode 14	19, 20	mode 19	17-19	mode 18	1-3	mode 1
<i>A. belvica</i>	40, 42		15		21-23		19, 20		2, 3	
<i>A. chalcoides</i>	41-44	mode 43	14-16	mode 15	21-24	mode 23	18-21	mode 20	1-5	mode 3
<i>A. caeruleus</i>	39, 39	mode 39	13, 14	mode 14	19, 20	mode 19	19, 20	mode 19	[-1]-1	mode 0
<i>A. doriae</i>	41		14, 15		21, 22		19, 20		1, 3	
<i>A. escherichii</i>	40, 41	mode 40	14, 15	mode 14	21, 22	mode 21	19, 20	mode 19	1-3	mode 2
<i>A. filippii</i>	39-43	mode 41	13-16	mode 14	19-22	mode 21	19-22	mode 20	[-2]-3	mode 0
<i>A. heckeli</i>	42		16		23		19		4	
<i>A. mossulensis</i> 1*	42-45	mode 44	14-17	mode 16	22-24	mode 23	19-22	mode 21	0-4	mode 2
<i>A. mossulensis</i> 2*	40-43	mode 40	15-17	mode 15	20-22	mode 20	20, 21	mode 20	0-2	mode 0
<i>A. orontis</i>	39-42	mode 40	14, 15	mode 14	20, 21	mode 20	19-21	mode 20	[-1]-2	mode 0
<i>A. qalilus</i>	39		14, 15	mode 14	21		18		3	
<i>A. tarichi</i>	41-43	mode 42	14-17	mode 15	22-24	mode 23	18-20	mode 19	2-5	mode 4
<i>Leucaspius delineatus</i>	38-40	mode 39	14-16	mode 15	19-21	mode 20	18-20	mode 19	[-1]-3	mode 1
<i>Tropidophoxinellus alburnoides</i>										
Guadiana basin	37-39	mode 38	13, 14	mode 13	19-21	mode 20	17-19	mode 19	0-3	mode 1
<i>T. spartiaticus</i>	38, 39	mode 38	15, 16	mode 15	21, 22	mode 21	17, 18	mode 17	3-5	mode 3
<i>T. hellenicus</i>	37, 38	mode 37	13, 14	mode 13	20		17, 18	mode 17	2, 3	mode 2

* Vertebral pattern of *A. mossulensis* is rather variable: sympatrically, in the Upper Tigris and in the lower Tigris-Euphrates, specimens with total and abdominal counts comparatively high (group 1) and low (group 2) are found.

of supraethmoid 20-26 % of maximum cranial width [shared with a few *Leuciscus* species, *Pseudophoxinus*, *Chondrostoma arcasii*, *C. macrolepidotus*, *C. lemmingii*], vs. 28-34 % in most other Leuciscinae); 12) infraorbitals reduced (Fig. 2).

Within *Alburnini*, the new species is placed in *Alburnus* since it possesses two-rowed serrated pharyngeal teeth, a well-developed ventral keel and complete sensory canals.

Comparison. *Alburnus baliki* is clearly differentiated from all of the species of *Alburnus* by a unique structure of scales and their arrangement on the body, the absence of pelvic axillary scales, a very sharp ventral keel, and the lowest total vertebral count. All other species of the *Alburnini* possess normally developed scales which cover the entire body including the isthmus with, in most species, radii on both anterior and posterior fields and a well-pronounced focus and concentric circuli.

The ventral keel in *A. baliki* is developed to a greater degree than in the other species of *Alburnus*. For example, even in such a specialized species as *A. alburnus*, the scaleless band is quite narrow and the extent of the keel development varies: in the various samples, 50-90 % of the examined specimens have a completely naked keel (10-50 % have a partly or completely scaled ventral keel).

Alburnus baliki has the lowest total number of vertebrae due to the low abdominal and caudal numbers. As it is seen from the Table 2, among *Alburnus* and *Alburnoides* species examined, only *Alburnus caeruleus* and *Alburnoides taeniatus* exhibit close counts.

As to meristic characters, with 13-15 branched anal-fin rays, 47-61 lateral line scales, and 11-13 gill-rakers, *A. baliki* closely resembles *A. escherichii* which has 11-15 branched anal-fin rays, 46-57 lateral line scales and 13-17 gill-rakers and *A. caeruleus* which has 14-17, 44-56 and 8-12 respectively

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