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Three new species of *Alburnoides* (Teleostei: Cyprinidae) from Euphrates River, Eastern Anatolia, Turkey

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Abstract

Three new species of *Alburnoides*, *Alburnoides emineae* sp. n., *Alburnoides velioglui* sp. n., *Alburnoides recepi* sp. n., are described from the Euphrates River drainages (Persian Gulf basin) in eastern Anatolia, Turkey. *Alburnoides emineae*, from Beyazsu Stream (south-eastern Euphrates River drainage), is distinguished from all species of *Alburnoides* in Turkey and adjacent regions by a combination of the following characters (none unique to the species): a well developed ventral keel between pelvic and anal fins, commonly scaleless or very rarely 1–2 scales covering the anterior portion of the keel; a deep body (depth at dorsal-fin origin 31–36% SL); 37–43 + 1–2 lateral-line scales, 13½–15½ branched anal-fin rays; number of total vertebrae 41–42, modally 41, comprising 20–21 abdominal and 20–21 caudal vertebrae. *Alburnoides velioglui*, from Sırlı, Karasu, Divriği and Sultansuyu streams (northern and northeastern Euphrates River drainages), is distinguished by a poorly developed ventral keel, completely scaled; a moderately deep body (depth at dorsal-fin origin 24–29% SL); 45–53 + 1–2 lateral-line scales, 11½–13½ branched anal-fin rays; number of total vertebrae 41–42, modally 42, comprising 20–22 abdominal and 20–21 caudal vertebrae. *Alburnoides recepi*, from Merzimen Stream (southern Euphrates River drainage), is distinguished by a well developed ventral keel, completely scaleless; a deep body (depth at dorsal-fin origin 29–34% SL); 47–56 + 2–3 lateral-line scales; 13½–16½ branched anal-fin rays; number of total vertebrae 38–40, comprising 19–21 abdominal and 18–20 caudal vertebrae.

Key words: Anatolia, Cyprinidae, taxonomy, *Alburnoides*, new species

Introduction

The spiralin, *Alburnoides bipunctatus* (Bloch, 1782), is a cyprinid that has long been considered a species complex. It is distributed from France east to Afghanistan. It does not occur south of the Alps and Pyrenees except in Genova (Italy), or in Scandinavia, but is present in nearly all the rivers draining to Black and Azov seas, in upper Volga and Kura drainage in Caspian Sea basin. It is also found in western Greece and Albania (Kottelat & Freyhof, 2007). As presently conceived, *A. bipunctatus* lives in Turkey throughout the whole Marmara basin, and in the Aegean region to the Büyük Menderes drainage. It is not found in the Mediterranean region of Turkey, but is in the Euphrates and Tigris drainages (Kuru 1975; Erk'akan 1983; Kutrup 1994; Turan 2003; Kuru 2004; Geldiay & Balık 2009; our data). In previous publications, a number of subspecies or local forms within *A. bipunctatus* were given. All of them are treated as *A. bipunctatus* below.

The species-level taxonomy of the members of the genus remain to be settled. Banarescu (1964) recognized *A. bipunctatus rossicus natio kubanicus* Berg, 1932 [Kuban River, Azov Sea basin] as a valid species. Later, Kottelat and Freyhof (2007) treated *A. bipunctatus ohridanus* Karaman, 1928 [Lake Ohrid, Adriatic Sea basin] and *A. bipunctatus* var. *prespensis* Karaman, 1924 [Lake Prespa] as species. Bogutskaya and Coad (2009) re-described *A. bipunctatus rossicus* Berg, 1924 [Dnieper River, Black Sea basin; Volga River, Caspian Sea basin], *A. bipunctatus fasciatus* Nordmann, 1840 [rivers of the western Transcaucasia, Black Sea basin], *A. maculatus* Kessler, 1859

in *A. eichwaldii*; 19–22, mean 20.4 in *A. fasciatus*). It further differs from *A. eichwaldii* by having more branched anal-fin rays ($13\frac{1}{2}$ – $16\frac{1}{2}$, mean 14.2, vs. $11\frac{1}{2}$ – $14\frac{1}{2}$, mean 12.4).

Alburnoides recepi is distinguished from *A. namaki* by having more branched anal-fin rays ($13\frac{1}{2}$ – $16\frac{1}{2}$, mean 14.2, vs. $11\frac{1}{2}$ – $13\frac{1}{2}$ (14), mean 11.8) and fewer predorsal vertebrae (14–15, mean 14.6, vs. 11–14, mean 12.2). It has a smaller interorbital distance than *A. namaki* (interorbital 3.4–4.1, mean 3.8 times in HL, vs. 2.7–3.3, mean 3.0). It further differs from *A. namaki* by a slightly superior mouth (vs. almost subterminal) and the tip of the mouth cleft between level of middle of pupil and upper margin of pupil (vs. the tip of mouth cleft on the level of lower margin of eye or below). In *A. recepi*, eye diameter is greater than snout length and interorbital distance. In *A. namaki*, eye diameter is greater than snout length but smaller than interorbital distance.

Alburnoides recepi is distinguished from *A. gmelini* by having a longer head (head length 3.5–3.8, mean 3.7 times in SL, vs. 4.0–4.4, mean 4.2), a greater eye (eye diameter 3.1–3.6, mean 3.3 in HL, vs. 3.6–4.3, mean 3.9), a longer snout (snout length 3.4–3.9, mean 3.6 times in HL, vs. 4.1–5.0, mean 4.5) and a smaller interorbital distance (interorbital distance 3.4–4.1, mean 3.8 times in HL, vs. 2.3–3.1, mean 2.7). In *A. recepi*, the mouth is a slightly superior, the tip of the mouth cleft is between level of middle of pupil and upper margin of pupil, and eye diameter is smaller than both snout length and interorbital distance. In *A. gmelini*, the mouth is almost subterminal, the tip of the mouth cleft is on the level below the lower margin of pupil, eye diameter is greater than snout length but smaller than interorbital distance.

Alburnoides recepi is distinguished from *A. manyasensis*, *A. cf. smyrnae* and *A. tzanevi* by a slightly superior mouth (vs. terminal), a well developed ventral keel (vs. partly developed) and the ventral keel completely scaleless (vs. scaled $\frac{1}{3}$ to $\frac{1}{2}$ of its length in *A. manyasensis*, almost scaled in *A. cf. smyrnae*, scaled almost $\frac{1}{2}$ of its length in *A. tzanevi*). *Alburnoides recepi* further differs from *A. manyasensis* by the absence a hump at nape (vs. a markedly hump at nape), having more branched anal-fin rays ($13\frac{1}{2}$ – $16\frac{1}{2}$, mean 14.2, vs. $10\frac{1}{2}$ – $12\frac{1}{2}$, mean 11.5) and more total vertebrae (38–40, mean 39.1, vs. 40–42, mean 40.9). *Alburnoides recepi* is further distinguished from *A. cf. smyrnae* by having more lateral-line scales (49–58, mean 53.1, vs. 42–47, mean 44.3), fewer total vertebrae (38–40, mean 39.1, vs. 41–42, mean 41.3), a smaller interorbital distance (6–8% SL, mean 7.1, vs. 8–10, mean 8.9), a shorter caudal-peduncle (16–21% SL, mean 18.3, vs. 21–26, mean 23.7), shorter caudal-fin (length of upper lobe 20–25% SL, mean 22.6, vs. 28–31, mean 29.1) and a narrower head (head width at posterior margin of eye 11–13% SL, 12.2, vs. 13–15, mean 14). *Alburnoides recepi* is further distinguished from *A. tzanevi* by having more branched anal-fin rays ($13\frac{1}{2}$ – $16\frac{1}{2}$, mean 14.2, vs. $11\frac{1}{2}$ – $12\frac{1}{2}$, mean 11.6), fewer total vertebrae (38–40, mean 39.1, vs. 40–42, mean 41.4), a deeper body (body depth at dorsal-fin origin 29–34% SL, mean 31.1, vs. 24–27, mean 25.4), a greater predorsal length (54–57% SL, mean 55.7, vs. 51–54, mean 53.1) and deeper head (head depth at nape 19–21% SL, mean 20.0, vs. 17–19, mean 18.1).

Comparative material. See Turan *et al.* (2013).

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