Squalius platyceps, a new species of fish (Actinopterygii: Cyprinidae) from the Skadar Lake basin

Squalius platyceps, новый вид рыб (Actinopterygii: Cyprinidae) из бассейна Скадарского озера

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Squalius platyceps, new species, is described from the Drin River drainage including the Skadar Lake and its tributaries. The new taxon is distinguished from other species of the genus *Squalius* in the eastern Adriatic Sea basin by a combination of the following character states: body depth 24–29% SL; head length 25–30% SL; a wide head (head width 52–59% HL, and interorbital width 37–42% HL); a moderately pointed conical snout; a subterminal mouth, with a projecting upper lip; a straight mouth cleft; lower jaw length (38–43% HL) about equal to caudal peduncle depth and only slightly larger than interorbital width; 43–47 (commonly 44–45) total lateral line scales; commonly 8½ branched anal fin rays; anal fin margin straight (in specimens up to about 180 mm SL) or convex; commonly 43 total vertebrae (24+19 or 25+18); a row of dense black pigment dots along the outer margin of scales on back and flanks forming a regular reticulate pattern, and intense black pigmentation on pectoral, pelvic, anal and caudal fins.

Описан новый вид *Squalius platyceps* из бассейна реки Дрин, включая Скадарское озеро с притоками. Новый таксон отличается от других видов рода *Squalius* в бассейне восточной части Адриатического моря сочетанием следующих признаков: максимальная высота тела 24–29% SL; длина головы 25–30% SL; широкая голова (ширина головы 52–59% HL, межглазничное расстояние 37–42% HL); умеренно коническое рыло; полунижний рот с выдающейся верхней челюстью, прямая ротовая щель; длина нижней челюсти (38–43% HL) примерно равная высоте хвостового стебля и только немного превосходящая межглазничное расстояние; 43–47 (обычно 44–45) чешуй боковой линии; обычно 8½ ветвистых лучей анального плавника; прямой (у экземпляров менее 180 мм SL) или слегка закруглённый край анального плавника; общее число позвонков обычно 43 (24+19 или 25+18); имеется черная пигментация чешуй, образующая регулярную сеточку, а грудной, брюшной, анальный и хвостовой плавники интенсивно пигментированы (у взрослых экземпляров полностью черные).

Key words: Adriatic Sea basin, Drin River drainage, Skadar Lake, freshwater fishes, taxonomy, morphology, Cyprinidae, *Squalius,* new species

Ключевые слова: бассейн Адриатического моря, река Дрин, Скадарское озеро, пресноводные рыбы, таксономия, морфология, Cyprinidae, *Squalius,* новый вид

INTRODUCTION

Species of the genus *Squalius* are distributed in river drainages along the entire Adriatic Sea coast. Kottelat & Freyhof (2007) summarised data known up to that time and a new species from the Istra Peninsula has been described (Bogutskaya & Zupančič, 2010) since then. Reviewing data from the literature, the following information is available on *Squalius* distribution along the eastern Adriatic coast from north to south.

Squalius squalus (Bonaparte, 1837) occurs from Isonzo [Soca] down to Mirna (north-western Istra Peninsula) excluding Dragonja River (Kottelat & Freyhof, 2007; Bogutskaya & Zupančič, 2010). According to Kottelat & Freyhof (2007), the range of *S. squalus* covers an area from the southernmost Italy (Ofanto drainage) to Skadar and Ohrid lakes inclusively (Kottelat & Freyhof, 2007: text on page 274) though they exclude the Neretva and the Drin [Drini, Drim] drainages, and the Skadar [Skadarsko Jezero, Skutari, Shkodër] and Ohrid [Ohrit] lakes which belong to the Drin drainage (Kottelat & Freyhof, 2007: map on page 274).

The known range of *S. janae* Bogutskaya & Zupančič, 2010 includes Dragonja River (type locality), draining to the west of the Istra Peninsula, Pazinčica River that used to flow westwards, but at present terminates in a cave at the town of Pazin, and Boljunšćica River, that used to flow southwards but now ends in canals in an area that was formerly Čepić Lake (Bogutskaya & Zupančič, 2010; Zupančič et al., 2010). We do not have material from River Raša that is adjacent to the Boljunšćica and is now connected by canals to the latter. Therefore, we cannot express an opinion on the identity of the native Raša chub.

The Rječina River, flowing into the Adriatic Sea at Rijeka, is the closest to the Istra Peninsula in the east. No chubs (*Squalius*) are known from this river (Šprem, 2006). The Dubračina, a small, now endorheic river system, is inhabited by a chub (Zupančič's observations) of unknown identity. There are no published data on any chub occurring in Ričina, flowing into the Adriatic at Novi Vinodolski. There are no native *Squalius* species in endorheic drainages of the Lika region (Lika-Jadova, Ričica, Otuča) that lie southward from the Velika Kapela and Mala Kapela mountains down to Gračac. *Squalius cephalus* (Linnaeus, 1758) from Danube was introduced into the Lika River (specimens in PZC).

Squalius zrmanjae Karaman, 1928 inhabits River Zrmanja, and this species together with *S. illyricus* Heckel & Kner, 1858 and *Squalius* sp. also occurs in the Krka River drainage. The identity of a *Squalius* from Krka needs further investigation as well as the identity of *S. squalus*-like chubs from drainages down to the Neretva inclusively. Historically (e.g. Heckel & Kner, 1857; Berg, 1932; Taler, 1953; Vuković & Ivanović, 1971), they were commonly identified as *S. cephalus albus* (Bonaparte, 1838). It is worth mentioning that a *S. squalus*-like chub is absent from the Cetina drainage (e.g. Bianco & Knežević, 1987; Bogutskaya & Zupančič, 1999), which is inhabited by *S. illyricus*. A chub of unknown identity, *Squalius* sp. 4 (Zupančič, 2008), is reported from Cetina. In Neretva, *Squalius* sp. occurs together with *S. svallize* Heckel & Kner, 1858, although the drainage is quite complex and the exact pattern of distribution needs further study.

A chub inhabiting the Drin drainage (including Skadar and Ohrid lakes) was commonly identified as *Squalius albus* (e.g. Heckel & Kner, 1858; Steindachner, 1882) or *Leuciscus cephalus albus* (e.g. Berg, 1932; Taler, 1953; Drecun, 1954, 1957, 1962, 1985; Ivanović, 1962; Sket, 1967; Sekulović & Ivanović, 1969; Ivanović & Sekulović 1971; Vuković & Ivanović, 1971; Knežević, 1981; Stanković-Trivunać, 1981; Šorić, 1984, 1990; Drecun et al., 1985; Marić, 1995; Marić & Krivokapić, 1997). Some authors did not recognize subspecies within *Leuciscus cephalus* (now in *Squalius*) (e. g. Kottelat, 1997; Bogutskaya & Zupančič,

1999) so that the Skadar chub's identity was *L. cephalus*. Šorić (2007) gave the status of a distinct species to *L. cephalus albus* of the earlier authors though he provided no data to support his opinion that the material from the Beli Drim [White Drin] River examined by him is identical to the chub *S. albus* from the Trasimeno Lake in Italy. As discussed above, Kottelat & Freyhof (2007), although including the Ohrid and Skadar basins into the range of *S. squalus,* were uncertain about the range of the species, and earlier, Freyhof et al. (2005: 353) identified a chub from the Skadar Lake as *S. pamvoticus* (Stephanidis, 1939).

Karaman (1924, 1928) assigned the chub from the Neretva and Krka rivers and Skadar, Ohrid and Janina [Pamvotis] lakes to *S. cephalus cavedanus*, but described a new variety, *S. cephalus cavedanus* v. *prespensis,* from Prespa Lake, which is now considered to be a distinct species, with its name available from Fowler (1977) (Kottelat & Freyhof, 2007). Prespa Lake has a subterranaean connection with Ohrid Lake, and while many geographers do not include it into the Drin drainage, others do. Dhora (2009a, 2009b) lists *S. cephalus*, *S. prespensis* and *Squalius* sp. Aoos from Albania, folowing Kottelat & Freyhof (2007) who distinguish a distinct but undescribed species, *Squalius* sp. Aoos. These authors give the range of this species as rivers flowing into the Adriatic Sea southward from the Drin (Mat [Mati], Ishem, Erzen, Shkumbin, Seman) drainage down to the Vjosa (Aoos in Greece) drainage inclusively (Kottelat & Freyhof, 2007: text on page 278), although the drawn range (Kottelat & Freyhof, 2007: map on page 279) covers only the Vjosa (Aoos) drainage. Further south along the Adriatic and Ionian coasts, are distributed *S. pamvoticus* (Stephanidis, 1939) (in Kalamas, Acheron, Loúros and Arachthos drainages, and Lake Pamvotis) and *S. peloponensis* (Valenciennes, 1844) (in Peloponnese, except for Evrotas and Lake Stymphalia) (Kottelat & Freyhof, 2007).

Thus, the identity of the chub from the Drin drainage, including Skadar Lake, is not well defined in the literature. We supposed that it is a distinct species from *S. squalus, S. prespensis, Squalius* sp. from the Aoos and other species of the genus and made a morphological comparison presented below. We found no available name for the Skadar chub in the literature, and therefore, the Drin-Skadar chub is described here as a new species.

MATERIAL AND METHODS

Measurements were done point to point to the nearest 0.1 mm and follow those used by Bogutskaya & Zupančič (1999, 2010). The standard length (SL) is measured from the tip of the snout to the end of the hypural complex. The length of the caudal peduncle is measured from behind the base of the last anal fin ray to the end of the hypural complex, at mid-height of caudal-fin base. Head length (HL) and interorbital width were measured including the skin fold. Postdorsal length is measured from the dorsal fin insertion to the end of the hypural complex. Two more characters were added from Doadrio et al. (2007) and Kottelat & Freyhof (2007): 1) a point, where the dorso-hypural distance (taken from the origin of the dorsal fin to the end of the hypural complex) falls when this distance is transposed forward from the origin of the dorsal fin; 2) a distance between the first and the last anal fin branched rays (when the fin is stretched out) relative to the caudal peduncle depth. The last two branched rays articulated on a single pterygiophore in dorsal and anal fins are noted as "1½". Total lateral line scales count includes all pored scales, from the first one just behind the posttemporal bone to the posteriormost one located on the bases of the caudal fin rays. Osteological characters are examined from radiographs, cleared-and-stained and dried preparations.

Abbreviations used: NMW, Naturhistorisches Museum, Wien; SMNH, Slovenian

Museum of Natural History; PZC, Collection of P. Zupančič, Dolsko (Slovenia); ZIN [also ZISP elsewhere in literature], Zoological Institute, Russian Academy of Sciences, St. Petersburg; ZMH, Zoologisches Museum und Institut, Universität Hamburg.

RESULTS

Squalius platyceps sp. nov.
(Figs 1–5)

Holotype (Fig. 1). SMNH 208, 237.8 mm SL; **Montenegro**: Skadar Lake at Vranjina (*ca.* 42°17´N 19°08´E); coll. Zupančič (from fishermen), 28 June 2007.

Paratypes. NMW 48993, 5, 83.8–298 mm SL; Priszren [Prizren; town, upper Drin in Kosovo; *ca.* 42°27´N 19°16´E], 1894, Steindachner don. – NMW 48998, 2, 295.4, 298.8 mm SL; Priszren; 1894, Steindachner coll. & don. – PZC 216, 4, 82.5–118.7 mm SL; **Montenegro**: River Morača, tributary of Skadar Lake, at Golubovci (ca. 42°15´N 19°06´E); coll. Zupančič & Freyhof, 14 May 2003. – PZC 226, 8, 83.2–120.2 mm SL; **Montenegro**: Sitnica River at Podgorica (ca. 42°27´N 19°16´E); coll. Zupančič & Freyhof, 14 May 2003. – PZC 229, 2, 121.7, 142.5 mm SL; **Montenegro**: River Oraoštica, tributary of Skadar Lake, at Virpazar, (ca. 42°15´N 19°06´E); coll. Zupančič & Freyhof, May 2003. – PZC 481, 8, 210–275 mm SL; same data as holotype. – ZIN 54921, 4, 51.2–133.6 mm SL; **Montenegro**: Sitnica River at Podgorica (ca. 42°27´N 19°16´E); coll. Zupančič & Freyhof, 14 May 2003.

Additional material. **Albania** and **Montenegro**: NMW 48989, 2, Scutari [Skadar Lake]; NMW 48992, 2, Rieka [Crnojevića Rijeka], Skutari; NMW 49001, 3, Priszren; NMW 49156, 2, Scutari; NMW 49159, 7, Scutari; NMW 49155, 3, Skutari; NMW 49157, 4, Scutari; NMW 90569, 1, Zrinos [Drin]; ZMH 15039, 1, Rieka, Skutari.

Diagnosis. The species is distinguished from other species of the genus *Squalius* in the Adriatic basin by a combination of the following character states: body depth 24–29% SL; head length, 25–30% SL, commonly exceeding the body depth; a wide head: head width 52–59% head length and maximum cranial width 79–93% cranial roof length, and interorbital width 37–42% head length; upper head surface considerably flattened in larger individuals; a moderately pointed conical snout; a subterminal mouth, with a projecting (considerably projecting in most specimens of larger size) upper lip; a straight mouth cleft; lower jaw length, 38–43% head length, exceeding the operculum depth and being about equal to caudal peduncle depth and only slightly larger than interorbital width; a small eye in specimens over 180 mm SL, its diameter 14–18% head length; 43–47 (commonly 44–45) total lateral line scales; commonly 8½ branched anal fin rays; anal fin margin straight (in specimens up to about 180 mm SL) or convex; commonly 43 total vertebrae (24+19 or 25+18); dark colouration with grey tones and a row of dense black pigment dots along the outer margin of scales on back and flanks forming a regular reticulate pattern, and intense black pigmentation on pectoral, pelvic, anal and caudal fins.

Description. See Table for morphometric data of holotype, 26 paratypes and 3 additional specimens. The body is elongate, moderately compressed. The body depth at the dorsal fin origin is 25–29% SL in specimens less than 180 mm SL and 24–26% SL in specimens over 190 mm SL. The larger specimens are more elongated and less compressed when compared to the smaller specimens in our samples. There is a marked discontinuity between the dorsal profile of the head and body, and the dorsal hump just behind the head is pronounced, especially in larger specimens (Figs 1–5).

The head is not long, its length 25–30% SL, is commonly greater than body depth, and the head length demonstrates some negative correlation with fish size (Table). Head length exceeds caudal peduncle depth by a factor of 2.3–2.8. The head is conical in lateral view, not deep, its depth at the nape 59–67% HL. The head is wide, and its whole upper surface is markedly flattened, especially in larger specimens. Maximum head width varies from 52 to 59% HL. Maximum width of the neurocranium (between the lateral margins of the pterotics) is 79–93% of cranial roof length (the cra-

Table. Standard length and proportional measurements of *Squalius platyceps* **sp. nov.** and *S. prespensis*. Characters, diagnostic for the the two species, are in boldface.

	Holotype SMNH 208		*S. platyceps* **sp. nov.** NMW 48993, 49159, PZC 216, 226, 229, ZIN 54921; n=20			*S. platyceps* **sp. nov.** NMW 48993, SMNH 208, PZC 481; n=10			*S. prespensis* NMW 49198, PZC 228, 478; n=10		
			min	Max	Mean	Min	Max	Mean	min	max	Mean
SL	237.8 mm	mm	103.5	177.5	137.6	199.2	298.0	253.42	107.6	190.4	149.52
Body depth at dorsal fin origin	59.8 mm	% SL	25.2	29.0	26.77	24.0	26.1	24.93	24.5	26.6	25.70
Caudal peduncle depth	27.9 mm	% SL	10.4	12.2	11.35	11.0	12.1	11.58	11.1	12.6	11.63
		% caudal peduncle length	53.1	68.3	60.18	51.2	62.5	58.28	56.3	68.7	60.15
Predorsal length	127.1 mm	% SL	54.2	58.3	56.96	53.4	56.7	55.07	55.5	58.7	56.96
Postdorsal length	85.4 mm	% SL	32.0	36.3	34.44	34.4	37.7	36.19	33.9	35.1	34.65
Preanal length	154.5 mm	% SL	70.0	76.8	73.95	65.0	78.5	72.99	73.2	73.8	73.52
Pectoral – pelvic-fin origin length	68.2 mm	% SL	24.9	31.4	27.03	24.0	29.7	26.88	25.3	26.7	26.01
Pelvic – anal fin origin length	54.9 mm	% SL	19.6	22.6	21.30	21.8	26.0	23.20	21.1	22.2	21.54
Caudal peduncle length	45.4 mm	% SL	16.8	21.0	18.93	18.8	21.9	19.93	18.3	20.6	19.39
Dorsal fin base length	18.8 mm	% SL	9.7	12.0	10.87	7.9	11.6	10.41	11.1	11.7	11.44
Dorsal fin depth	33.8 mm	% SL	14.8	18.6	16.26	14.2	17.1	15.61	14.9	17.7	16.17
Anal fin base length	25.7 mm	% SL	9.4	11.6	10.39	9.1	10.8	9.78	9.2	10.3	9.87
Anal fin depth	29.0 mm	% SL	12.0	14.8	13.44	11.6	13.3	12.42	11.9	14.5	13.05
Pectoral fin length	40.8 mm	% SL	16.1	20.1	17.90	15.6	19.1	17.30	17.3	19.1	17.88
Pelvic fin length	34.7 mm	% SL	13.8	15.9	15.05	13.4	16.7	15.06	14.1	16.0	14.71
Head length	64.4 mm	% SL	27.0	30.4	28.69	24.8	28.7	26.57	28.5	31.2	29.57
		% body depth	97.6	129.0	111.87	107.7	119.5	110.65	113.3	118.7	115.09
Head depth at nape	40.0 mm	% SL	17.1	19.2	17.99	16.3	18.2	17.29	16.4	19.3	17.96

		% HL	58.8	67.1	62.78	58.6	66.4	62.73	57.5	64.0	60.71
Head depth through eye	28.1 mm	% HL	40.9	48.6	45.03	42.2	47.0	44.60	40.6	43.3	41.49
Maximum head width	**38.1 mm**	**% HL**	**51.8**	**57.0**	**54.44**	**53.5**	**59.2**	**55.10**	**48.4**	**52.9**	**50.97**
Maximum cranial width	**27.0 mm**	**% cranial roof length**	**79.3**	**85.6**	**83.95**	**85.2**	**93.0**	**89.73**	**69.8**	**77.4**	**73.54**
Supraethmoid width	**11.9 mm**	**% cranial roof length**	**30.4**	**38.6**	**36.76**	**33.7**	**42.3**	**37.06**	**22.4**	**29.9**	**26.55**
Interorbital width	**25.3 mm**	**% HL**	**36.6**	**41.1**	**38.25**	**36.7**	**42.2**	**39.22**	**34.7**	**36.8**	**35.83**
Snout length	18.8 mm	% HL	26.9	31.8	29.38	29.0	32.1	30.11	30.8	31.8	31.29
Eye horizontal diameter	10.7 mm	% HL	18.1	21.7	19.89	14.1	17.6	16.06	15.5	20.0	17.28
		% interorbital width	45.9	58.6	53.55	38.5	45.8	41.04	42.3	54.6	48.23
Postorbital distance	36.8 mm	% HL	50.2	56.1	54.01	55.0	58.5	56.49	53.5	58.0	55.98
Upper jaw length	20.5 mm	% HL	30.4	33.7	31.97	30.3	34.6	32.15	30.2	32.7	31.49
Lower jaw length	25.8 mm	% SL	10.2	12.9	11.56	10.7	11.8	11.02	11.4	11.8	11.54
		% HL	37.8	42.7	40.29	38.9	41.8	39.98	37.6	40.6	39.05
		% depth of operculum	100.7	116.3	109.14	101.9	117.9	107.38	104.8	111.6	108.60
Depth of operculum	24.1 mm	% HL	34.5	39.0	36.94	33.4	39.3	37.31	34.8	36.5	35.95
Ratios											
Snout length/eye diameter	1.8		1.3	1.7	1.48	1.7	2.1	1.88	1.6	2.0	1.83
Head depth at nape/eye diameter	3.7		2.7	3.7	3.17	3.5	4.4	3.92	3.2	3.9	3.53
Head length/caudal peduncle depth	2.3		2.3	2.8	2.53	2.3	2.5	2.38	2.4	2.6	2.55
Caudal peduncle length/caudal peduncle depth	1.6		1.5	1.9	1.67	1.6	2.0	1.72	1.5	1.8	1.67
Lower jaw/caudal peduncle depth	0.9		0.8	1.2	1.02	0.9	1.0	0.95	0.9	1.1	0.99

nium is especially wide in larger specimens, 85–93%), and width of the supraethmoid is 30–42% of cranial roof length. The dorsal head surface is flat so that the upper head profile is almost straight, especially in larger specimens; the snout is slightly pointed. The mouth cleft is straight; it is slightly curved only in smaller individuals (up to about 140 mm SL). The mouth is subterminal or almost terminal though never clearly terminal for the uppermost point of the mouth cleft is always slightly to markedly below the level of the middle of the eye: from the lower margin of the pupil to the lower margin of the eye (Figs 1–5). The lower jaw-quadrate junction is on the vertical through the anterior margin of the pupil or behind it, often through the middle of the eye. There is no marked chin formed by the lower jaws symphysis, and the upper jaw often includes the tip of the lower jaw. The upper jaw projects beyond the lower jaw (Fig. 5), although this feature is variable to some extent. The lower jaw length is 38–43% HL and shows no correlation with fish size in our material. The lower jaw length always slightly exceeds the operculum depth (being 101–118% of the latter) and is about equal to caudal peduncle depth (the ratio is 0.9–1.0 in large-size specimens). The lower jaw length is only sligthly less than and sometimes equal to the interorbital width which is 37–42% HL. The eye diameter is negatively correlated with fish size: it is 18–22% HL (46–59% of interorbital width) in specimens of less than 190 mm SL and 14–18% HL (39–46% of interorbital width) in specimens over 190 mm SL.

The dorsal fin has 3 simple and 8½ branched rays in all specimens. Its outer margin is straight, slightly convex in its lower part in a few specimens. The dorsal fin is located at or slightly behind the end of the pelvic-fin base. The dorso-hypural distance falls at the anterior eye margin in larger specimens (including the holotype) and posterior to the eye in some smaller specimens. The dorsal fin is not high, its depth being 14–17% SL. The anal fin has 3 simple and commonly 8½ branched rays (9½ branched rays were found in 1 paratype only). The anal fin outer margin is straight in specimens up to 160–180 mm SL (Fig. 2) and convex in larger specimens (Figs 1, 3, 4). The distance between the first and the last anal fin branched rays when the fin is streched out is markedly greater than the caudal peduncle depth. Caudal fin is moderately forked, its lobes rounded.

The number of gill rakers (in total on the outer side of the first left gill arch) is 9 in the holotype; 8(1), 9(3) or 10(6) in paratypes. Pharyngeal teeth (examined in 3 paratypes) 2.5–5.2, hooked, serrated. The lateral line is complete with commonly 1, none or 2, rarely 3, unpored scales at the posterior end of the lateral series. The number of total lateral line scales is 44 in holotype; 43(4), 44(19), 45(15), 46(4) or 47(1) in paratypes and 12 additional specimens. A long pelvic axillary scale is present.

General topography of cephalic sensory canals is typical of the *S. cephalus* species group, as described by Bogutskaya & Zupančič (1999). Supraorbital canal has 11–13(14) pores; the posterior section of the canal is elongated, downwardly bent passing close to the supratemporal canal, and usually having two canal segments on the parietal. There are 4–6 canal openings on the nasal and (6)7–9 on the frontal. Infraorbital canal has 21–25 pores with 6–8 canal openings on the 1st infraorbital. Preopercular-mandibular canal has 15–20 pores. There are 6–8 canal openings on the dentary. Supratemporal canal has 7–11 pores.

The total vertebrae, including four Weberian vertebrae and the last complex centrum, are 43 in holotype and in five paratypes. The number of abdominal vertebrae (including intermediate ones; precaudal vertebrae auctorum) is 25 in holotype, 24(3) or 25(2) in paratypes. The number of predorsal vertebrae (anterior to the first dorsal pterygiophore) is 15 in all specimens. Intermediate vertebrae are 5(4) or 6(2). The number of caudal vertebrae is 18 in the holotype, 18(2) or 19(3) in paratypes. The

Figs 1–5. *Squalius platyceps* **sp. nov.**: **1**, holotype, SMNH 206, 237.8 mm SL, Skadar Lake at Vranjica; **2**, paratype, ZIN 54921, 133.6 mm SL, Sitnica River at Podgorica; **3**, paratype, NMW 48998, 298.8 mm SL, upper Drin at Prizren; **4**, live specimen, about 350 mm SL, Skadar Lake.

Fig. 5–7. Three *Squalius* species: **5**, Head of *Squalius platyceps* **sp. nov.**, paratype, PZC 229, 142.5 mm SL; Oraoštica River at Virpazar; **6**, *Squalius* cf. *platyceps*, NMW 49159, 176 mm SL, Ohrid; **7**, *Squalius prespensis,* PZC 478, 147.2 mm SL, Prespa Lake at Kalamas.

vertebral formulae are 25+18 (in holotype and 2 paratypes) or 24+19 (in 3 paratypes).

Colouration. In formalin fixed, ethanol stored specimens the head and body are grayish, in some specimens brownish, dark on the back and light on the ventral surface. There is a distinct black band along the gill opening and the cleithrum margin down to the pectoral fin base. The flanks have a conspicuous regular black reticulated pattern formed from pigment dots located along scale outer margins and on scale pockets (well seen in freshly-preserved specimens, Figs 2, 5). There are no concentrations of pigment forming spots. All fins are pigmented; black pigments dots are located mostly along rays but also on membranes, especially on the posterior half of the caudal fin and on the anal fin (except for the last few rays) where the pigment forms either a big dark blotch (Fig. 2) or a wide marginal band (Fig. 1), or the entire anal fin is black. In live specimens, pigment pattern is the same but the overall colouration is grayish (Fig. 4) rather than brownish with some bronze tones on the head. Dorsal, caudal and pectoral fins are blackish, pelvic and anal fins black in larger specimens; no orange or red pigment has been foud in the specimens examined by us, including freshly caught ones.

Adult spawning males have nuptial tubercles located on upper head surface, on the side of the head behind the eye, and along the margin of dorsal scales (Fig. 5).

Distribution. *Squalius platyceps* **sp. nov.** is known from the Drin drainage, including Skadar Lake basin, in Montenegro and Albania. It occurs in both lake and rivers of the basin, for example, Sasko Lake, rivers Radika, Beli Drin and its tributaries, Morača (middle and lower reaches) and tributaries Oraoštica, Kiri, Zeta (middle and lower reaches) (e.g. Oliva, 1961; Ivanović & Sekulović, 1971; Šorić, 1981, 1990; Marić, 1995; Rakaj, 1995; Dhora, 2009b; this study).

Our study of three specimens from Ohrid Lake suggests that the Ohrid chub (Fig. 6) may be conspecific with *S. platyceps*, having a similar distribution pattern to that of clade C of *Barbus rebeli* Köller, 1926 occurring in Ohrid, Skadar and Drin with tributaries (Marková et al., 2010); however, this issue needs further study.

Etymology. The species' name is derived from *platy-* (Greek πλατύς, πλατυ-), flat or broad, and *ceps* (Latin), head. It is a noun in apposition.

Comparative remarks. The new species belongs to the *Squalius cephalus* group defined on morphological characters (Bogutskaya & Zupančič, 2010) which differs from the rest of the genus in having, inter alia, a higher number of sensory canal pores; a dorsally flattened, wide head, its upper profile straight; a pointed or only slightly rounded snout; and extensive 4th and 5th infraorbitals. Among the *S. cephalus* species group, the new species is similar to *S. cephalus* (most of Europe north from the Pyrenees, the Alps, the Dinarides, and the Caucasus) by having commonly 8½ branched anal fin rays, but differs from the latter by having black pigmentation on the pelvic and anal fins (vs. intense red or orange). From *S. janae* (Istra Peninsula), *S. squalus* (the Apennine Peninsula, Isonzo and rivers of the north-western Istra Peninsula), and *Squalius* sp. from the Neretva drainage *S. platyceps* **sp. nov.** can be distinguished in having commonly 8½ branched anal fin rays (vs. 9½). It is further different from *S. squalus* by its straight mouth cleft (vs. slightly curved), the upper jaw projecting forward relative to the lower jaw (vs. commonly not projecting; Bogutskaya & Zupančič, 2010: Figs 4b, 5, 7), and a pronounced hump just behind the head in adults (vs. absent or slight). The new species further differs from *S. janae* (a detailed description can be found in Bogutskaya & Zupančič, 2010 and Zupančič et al., 2010) in having, inter alia, the head length about equal to the caudal peduncle depth, commonly shorter than the former in larger specimens (vs. commonly markedly longer), a wider head (maximum width of the neurocranium 79–93% of cranial roof length vs. 71–79%), commonly 44 total vertebrae (vs. 43), intense black colouration of pelvic, anal

and caudal fins (vs. yellowish with relatively slight black pigmentation).

Squalius platyceps **sp. nov.** and *S. prespensis* share such character states as a relatively elongated head, a shallow body, a commonly well-pronounced hump behind the head and a straight mouth cleft in larger adults, commonly 8½ branched anal fin rays, a straight margin of the anal fin in smaller specimens (less than about 160–180 mm SL) and commonly convex in larger ones, many proportional measurements (Table), and are similar in colouration (Fig. 7). However, *S. platyceps* is different in having a wider head, head width 52–59% HL (vs. 48–53% HL), cranium width 79–93% cranial roof length (vs. 70–77%), supraethmoid width 30–42% cranial roof length (vs. 22–30%), interorbital width 37–42% HL (vs. 35–37%), and a subterminal mouth with a projecting upper lip (vs. a usualy terminal mouth with a non-projecting upper lip, Fig. 7).

Taxonomic status of chubs from Mati to Aoos drainages (Albania and Greece) is under investigation (Kottelat & Freyhof, 2007). The features that distinguish *S. platyceps* **sp. nov.** from *Squalius* sp. Aoos (Kottelat & Freyhof, 2007: 278) are a larger size attained in *S. platyceps* – up to 400 mm (vs. 140 mm SL) and the distance between tips of first and last branched anal rays (when the fin is stretched out) greater than the caudal peduncle depth (vs. less). When compared to *S. pamvoticus,* a species distributed further southwards in western Greece, *S. platyceps* **sp. nov.** differs in having a wider head, the head width 52–59% HL (vs. 50–54%), larger scales, 43–47, commonly 44, in total lateral line (vs. 45–49, commonly 45–46), and usually 8½ branched anal fin rays (vs. often 9½).

Comparative Material

Squalius cf. *squalus*. KRKA RIVER: PZC 473, 2, 153.5, 218.0 mm SL; **Croatia**: lower River Krka upstream from Skradin, 43°48´N 15°57´E; coll. Zupančič, 13 Oct. 2005. – PZC 474, 3, 152.2–173.5 mm SL; **Croatia**: lower River Krka at Skradinski Buk, 43°48´N 15°57´E; coll. Zupančič, 13 Apr. 2005. – PZC 274, 2, 80.2, 91.9 mm SL; same locality and collector, 26 July 2005. – PZC (1 C&S SL 147.1 mm, lower Krka). – NMW 49183, 1, **Croatia**: Knin [town at Krka R.]), NMW 49203, 1, Knin. NERETVA RIVER: (right-hand tributaries) PZC 414, 3, 90.8-170.5 mm SL; **Bosnia** & **Herzegovina**: River Jasenica at Urbanovo, ca. 43°17´N 17°47´E, coll. Zupančič, 22 Apr. 2004. – PZC 404, 1, 143.0 mm SL; **Bosnia** & **Herzegovina**: River Trebižat at Božak; coll. Zupančič, 5 May 2002; (left hand tributaries): PZC 435, 1, 207 mm SL; **Bosnia** & **Herzegovina**: Bregava River, coll. Zupančič & Freyhof, 12 May 2003. – PZC 263, 7, 76.2–133.5 mm SL; **Bosnia** & **Herzegovina**: eastern Herzegovina, Zalomka River (formerly in Neretva drainage, now isolated) at Fojnica, 43°14´N 18°23´E; coll. Zupančič & Freyhof, 16 May 2003. – PZC 299, 3, 108.2–116.5 mm SL; **Bosnia** & **Herzegovina**: eastern Herzegovina, Zalomka River at Odak [Odžak], 43°14´N 18°11´E; coll. Zupančič, 14 Aug. 2001. – PZC 425, 8, 112.1–205 mm SL; same locality and collector, 16 July 2002. – PZC 434, 3, 133.7–178.0 mm; same data as PZC 263. – PZC 421, 2, 190, 199 mm SL, **Bosnia** & **Herzegovina**: River Trebišnjica near Hutovo, ca. 42°57´N 17°48´E, coll. Zupančič, 12 June 1999. – PZC 426, 4, 218–235 mm SL; same locality and collector as PZC 421, no date. – PZC 477, 4, 156.5–210 mm SL; same locality and collector as PZC 421, 12 June 2008. – PZC (1 C&S 128.5 mm SL, Trebišnjica).

Additional material (x-ray photos and external examination without a morphometric study): NMW 43925, 1, Narenta [Neretva]; NMW 49576a, 2, Trebinje; NMW 49579a, 1, Trebinje; NMW 49580a, 1, Trebinje; NMW 49581a, 1, Trebinje; NMW 49583a, 1, Trebinje; NMW 49585a, 1, Trebinje; NMW 49586a, 1, Trebinje; NMW 49589a, 1, Trebinje; NMW 49598a, 1, Trebinjica [Trebišnjica] at Tschepelitza [Čepelica]; NMW 49601a, 1, Trebinschitza at Bilek; NMW 49603a, 1, Metkovitch [Metković,

town at Neretva River]; NMW 49611, 1, See bei Gradaz [? Gradac at 42°56´N 17°43´E in Bosnia & Herzegovina]; ZMH 15094, 1, Narenta [Neretva]).

Squalius pamvoticus. **Greece**: NMW 9647–67, 20, 130–160 mm SL; Aspropotamos [tributary of the Acheloos River]; 1892, coll. Reiser. – NMW 49110, 4, 141.4–157.6 mm SL; Janina [Pamvotis] Lake; 1892 (Oct. Nov.), Steindachner don. – NMW 49112, 6, 126.9–147.7 mm SL; Janina, 1892 (Oct. Nov.) h, Steidachner don. – NMW 49188, 6, 123.2–141.4 mm SL; Janina; 1892 (Oct. Nov.) b, Steindachner don. – NMW 90638, 2, 70, 120 mm SL; Arahtos [Arakhthos River], 15 Aug. 1990, N. Schulz leg. et don. – ZMH 4459, 2, Loúros River, western Greece.

Squalius peloponensis. **Greece**: NMW 49125, 4, 123.2–141.4 mm SL; Kalavrita, Peloponnes; "1892, Steindachner don., gek. v. Moltz".

Squalius prespensis. NMW 49198, 5, 97.5–164 mm SL; Prespa Lake; "1891 (Nov.)b, Steindachner don.". – PZC 228, 2, 107.6, 151.2 mm SL; **Republic of Macedonia**: Prespa Lake at Stenje, ca. 40°56´N 20°55´E, coll. Zupančič, 29 July 2004. – PZC 478, 1, 190.4 mm SL; **Albania**: Prespa Lake at Kalamas, coll. Zupančič, Aug. 2006. PZC 479, 1, 147.2 mm SL; same locality and collector, 25 June 2007.

Squalius sp. 1. NMW 49195, 3; Ohrid, 1892, Steindachner don.; ZMH 796 (2) Ohrid; ZMH 1463 (7) Ohrid.

Squalius sp. 2. PZC 480, 1, 140.7 mm SL; **Albania**: River Devoll [Devoli, Devol], River Seman drainage; coll. Zupančič, 23 June 2007.

A list of *Squalius* specimens from the Adriatic basin examined earlier can be found in Bogutskaya and Zupančič (1999, 2010). Data for *Squalius* sp. from Aoos River were taken from Kottelat and Freyhof (2007: 278).

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