

## *Schistura puncticeps*, a new species of loach from Myanmar (Cypriniformes: Nemacheilidae)

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*Schistura puncticeps*, new species, is described from the Nam Paw stream, Shan State, Myanmar. It is distinguished from all other species of *Schistura* by a combination of the following characters: head dorsally and laterally covered by dark brown dots, 5–8 large dark brown blotches along lateral midline of the body; a large head (head length 20.7–24.9 % SL), a short caudal peduncle (caudal peduncle length 12.2–13.4 % SL), a large eye (4.8–6.6 % SL), and no discernable sexual dimorphism.

### Introduction

The loach family Nemacheilidae is one of the most characteristic and widespread elements in the freshwater fauna of Eurasia. The largest of the 46 genera with around 193 species is *Schistura* (Kottelat, 2012), occurring in most flowing waters across South and Southeast Asia from the Helmand drainage in the West to the Yangtze drainage in the East and southwards to Sri Lanka and the Malay Peninsula; with an isolated species, *S. maculiceps*, in the Kapuas drainage in Borneo (Roberts, 1989). Many species of *Schistura* have a small distribution and new species are still described from formerly poorly studied areas (Bohlen & Šlechtová, 2009, 2011, 2013; Lalramliana, 2012; Lokeshwor & Vishwanath, 2012; Ou et al., 2011; Kottelat & Leisher, 2012; Plongsesthee et al., 2011; Zheng et al., 2012). A recent collection in Myanmar revealed a species of *Schistura* that could not be assigned to any described species and is described in the present study.

### Material and methods

Specimens of the new species were either fixed in 4 % formaldehyde and later transferred into 70 % ethanol for storage or fixed and stored in 96 % ethanol. All measurements and counts follow Kottelat (1990). Measurements were made point-to-point with dial callipers to the nearest 0.1 mm. Collection abbreviations: CMK, Collection of Maurice Kottelat, Cornol; IAPG, Institute of Animal Physiology and Genetics, Laboratory of Fish Genetics, Liběchov; ZRC, Zoological Reference Collection, Raffles Museum of Biodiversity Research, Department of Biological Sciences, National University of Singapore, Singapore.

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**Fig. 1.** *Schistura puncticeps*, ZRC 53783, paratype, 55.2 mm SL; Myanmar: Shan State: mouth of Nam Paw, shortly after capture.

*Schistura puncticeps*, new species  
(Figs. 1–2, 4)

**Holotype.** ZRC 53782, 56.0 mm SL; Myanmar: Shan state: stream Nam Paw west of Hsipaw city; 22°37'40" N 97°18'17" E; J. Bohlen, 13 Nov 2011.

**Paratypes.** ZRC 53783, 17, 33.7–56.6 mm SL; CMK 23278, 5, 38.4–51.3 mm SL; IAPG A5836–5840, 5, 33.8–43.2 mm SL; same data as holotype.

**Diagnosis.** *Schistura puncticeps* is distinguished from all other species of *Schistura* by a combination of the following characters: head dorsally and laterally covered by dark brown dots; 5–8 large brown blotches along lateral midline of the body; a large head (head length 20.7–24.9 % SL); a short caudal peduncle (caudal peduncle length 12.2–13.4 % SL); a large eye (4.8–6.6 % SL); and no discernable sexual dimorphism.

**Description.** See Figures 1, 2, and 4 for general appearance and Table 1 for morphometric data of holotype and 20 paratypes. A medium sized (up to 56.6 mm SL) nemacheilid loach with moderately elongated body. Body anteriorly slightly compressed, caudal peduncle compressed. Maximum body depth between pectoral-fin base and dorsal-fin origin. Head depressed. Snout round in lateral view, slightly squarish in dorsal view. A rim across head just before nares and two slight humps between nares. Width of head increasing from level of mouth backwards to anterior part of opercle, from that point onwards head and body regularly narrowing until caudal-fin origin. Depth of caudal peduncle 1.0–1.1 times in its length. Axillary pelvic lobe present and free. A very low adipose crest on dorsal midline of

caudal peduncle between caudal-fin base and half distance between bases of dorsal fin and caudal fin. Very low and short adipose crest on ventral midline of caudal peduncle directly in front of caudal-fin base. Largest known size 56.6 mm SL.

Dorsal fin with 4 simple and 8½ branched rays. Distal margin of dorsal fin straight or very slightly convex. Anal fin with 3 simple and 5½ branched rays, not reaching caudal-fin base. Caudal fin with 9+8 branched rays (9+9 in one paratype), deeply emarginated, lobes rounded or slightly pointed. Pelvic fin with 8 rays; origin under last unbranched or first branched dorsal-fin ray; reaching distinctly beyond half of distance to anal-fin origin; usually just reaching anus, which is about one eye diameter in front of anal fin. Pectoral fin with 11 rays, reaching ⅓ of distance between bases of pectoral and pelvic fins.

No scales on body in front of dorsal-fin; few scales on flank below dorsal-fin base, arranged mainly along lateral line; body completely covered by scales (including belly) behind dorsal-fin base. Lateral line complete, reaching to base of caudal fin, with 69–83 pores. Cephalic lateral line system with 6 supraorbital, 4+11 infraorbital, 10 preoperculo-mandibular and 3 supratemporal pores. Lips and barbels covered with unculi.

Anterior nostril pierced in front side of a flap-like tube, with a low anterior rim. Eyes relatively large (3.5–4.8 times in head length), directed upwards and sideways, eye diameter 1.0–1.6 times in interorbital width. Interorbital distance increasing with body size, while relative size of eye slightly decreasing. Head length 4.0–4.8 times in standard length. Mouth gape about 2–2.5 times wider than long (Fig. 3). Processus dentiformis wide, low, broadly rounded. Slight notch in



Fig. 2. *Schistura puncticeps*, Myanmar: Shan state: mouth of Nam Paw, a, b, ZRC 53782, holotype, 56.0 mm SL.

lower jaw. Lips thick; upper lip with a well-marked median incision and no furrows. Lower lip with a broad median interruption, no furrows, but few small folds towards the corners of the mouth. Inner rostral barbel reaching or nearly reaching corner of mouth, outer one reaching behind base of maxillary barbel, maxillary barbel reaching or nearly reaching vertical through posterior rim of eye.

**Sexual dimorphism.** Not discernible.

**Colouration.** Ground colour in freshly preserved specimens light beige, darkest on back, intermediate on sides, lightest on belly. Head, except ventral surface, with regularly distributed dark brown spots, occasionally joining to form small vermiform pattern. Size of dots usually larger than nasal opening but smaller than pupil. The number, size and density of dots are variable, no two specimens with same pattern. A short vertical thin dark brown bar of various length, thickness and shape present on opercle of most specimens. A very faint dark grey stripe from eye towards snout, not reaching snout; its thickness less than thickness of maxillary barbel at base; located in a deeper layer of the skin than other

head pigmentation. No dark brown stripe from eye to opercle as present in many other species of nemacheilid loaches.

Body with 5–9, most frequently 7 or 8 (5 and 8 out of 18 specimens, respectively) dark brown blotches along lateral midline, most commonly rounded, regularly dorsoventrally extended to form elliptical or barred shapes. If bars on anterior part of body before origin of dorsal fin, always extending dorsally, occasionally reaching dorsal



Fig. 3. *Schistura puncticeps*, ZRC 53782, 56.0 mm SL; ventral view of oral region. Scale bar 1 mm.

midline and fused with counterpart on other side of body (Fig. 4a), most often observed if first blotch extended. If bars present on posterior part of body, usually extending ventrally, rarely dorsally, reaching ventrally nearly to ventral midline (in two specimens bar fused with counterpart on other side of body; e.g. bar above base of anal fin in Fig. 4b). Size and shape of dark brown blotches and bars variable, no two specimens with same pattern. Back with 6–8 (modally 7, 11 out of 18 specimens) dark brown saddles of variable shape, wider than interspaces, reaching ventrally close to or to level of dorsal rim of lateral blotches. Occasionally saddles and lateral blotches fused, sometimes forming together a solid band reaching from one lateral midline across dorsum to opposite lateral midline, most often observed in first saddle and first lateral blotches. A dark brown stripe with chevron pattern along lateral midline, in some specimens very faint; usually best visible on posterior half of body. Black bar at base of caudal fin thin, usually reaching across base of all branched caudal-fin rays plus 1–2 unbranched fin rays ventrally and 2–3 unbranched fin rays dorsally, but never reaching dorsal or ventral midline; usually interrupted or very weak and thin at level of lateral midline, regularly interrupted elsewhere.

Usually 2, rarely 3 dark brown to grey blotches at base of dorsal fin, continuous with adjacent saddles. One or two rows of black spots on last unbranched and all branched dorsal-fin rays, interradial membrane hyaline. One to three rows of black spots on all principle caudal-fin rays, interradial membrane hyaline. Other fins without pigmentation.

**Distribution and habitat.** *Schistura puncticeps* is presently known only from the type locality, the mouth of Nam Paw at its confluence with Myitnge River, a left tributary of Irrawaddy River. The mouth of Nam Paw is about 50 m wide and at the time of sampling a gravel band crossed by the Nam Paw in several branches, forming pools, riffles, gravel beds, sandbars, channels etc. The water was less than 1 m deep, clear and flow speed ranged from slow to very fast. Within the Nam Paw stream the species seems to be restricted to the lowest stretch, since it was not found in several upstream locations. Most likely, it occurs in the main course of the Myitnge River, where sampling was not possible.

**Etymology.** From Latin *punctum* (dot) and *ceps* (derivation of *caput*, head); an allusion to the prominent spots on the head. A noun in apposition.

**Remarks.** Using the identification key of genera in the most comprehensive study about Indochinese nemacheilid loaches (Kottelat 1990), *S. puncticeps* is identified as a member of the genus *Schistura* because of its nearly smooth lips with median interruption in the lower lip not accompanied by triangular pads, strongly arched mouth with processus dentiformis and notched lower jaw, posterior position of anus shortly before anal-fin origin and close position of nares. If compared to the species described in Kottelat (1990), *S. puncticeps* is identified as *S. spilota* due to the complete lateral line, lack of a sexual dimorphism and pigmentation pattern. *Schistura puncticeps* differs from *S. spilota* by having a larger head (head length 4.0–4.5 times in SL vs. 4.5–5.2 times), a shorter caudal peduncle (12.2–13.4 vs. 14.4–17.7 % SL), the black bar at base of caudal fin stretching with interruptions across the base of all principal fin rays (vs. reaching from lower principal simple ray to about  $\frac{3}{4}$  of depth of caudal peduncle), and by having 10 (vs. 9) pores in the pre-operculo-mandibular canal of the cephalic lateral line system. *Schistura puncticeps* is further distinguished from all species of *Schistura* discussed by Kottelat (1990) by its pigmentation pattern consisting of a speckled head without further pigmentation elements and 5–8 large dark brown blotches along lateral midline of the body.

The most prominent character of *S. puncticeps* is its dark brown dotted head. A similarly dotted head can be found in *S. maculiceps* from Borneo, *S. callichroma* from Yunnan, *S. prashadi* from northeast India, *S. ephelis* from Laos as well as in some specimens of *S. vinciguerrae*, *S. nicolsi* and *S. waltoni* from Thailand and Myanmar (Roberts, 1989; Kottelat, 1990, 1998, 2001; Menon, 1987). *Schistura puncticeps* differs from *S. maculiceps* by its large eye (4.8–6.6 % SL vs. 3.5–3.9 % SL), having scales present only in the posterior half of the body (vs. present at least along whole lateral midline), an oval posterior nostril (vs. narrowing to a slit posteriorly), a rim before nares and two humps between nares (vs. dorsal surface of head relatively flat) and having midlaterally predominantly blotches (vs. bands). It differs from *S. cal-*

*lichroma* by an elongated body (body depth 16.4–20.2 % SL vs. >22 % SL) and having dorsal saddles (vs. dorsum covered by small dots). *Schistura puncticeps* differs from *S. prashadi* by the lack of sexual dimorphism (vs. present), having regular dorsal saddles (vs. irregularly shaped spots), 5–9 lateral blotches (vs. 11–12), and no furrows in upper lip (vs. with numerous shallow furrows) and from *S. vinciguerrae*, *S. nicolsi* and *S. waltoni* by its pigmentation pattern (5–9 mid-lateral blotches and 6–8 dorsal saddles vs. 8–16 bars). *Schistura puncticeps* differs from *S. ephelis* by having the black bar at base of caudal fin interrupted (vs. complete), by a hyaline caudal fin (vs. red), and having a median incision in the upper lip (vs. no incision).

Blotches along the lateral midline are found in at least 6 species of *Schistura*, namely *S. corica*, *S. defectiva*, *S. geisleri*, *S. isostigma*, *S. kloetzi* and *S. spilota*. The blotches along the lateral midline in *S. laterimaculata* could be an artefact resulting from fixation of specimens already dead (M. Ko-

ttelat, pers. comm.); the species is tentatively synonymised with *S. nicolsi* (Kottelat, 2012). *Schistura puncticeps* differs from *S. corica*, *S. geisleri* and *S. isostigma* by the lack of sexual dimorphism (vs. males with suborbital flap), a higher caudal peduncle (caudal peduncle depth 11.5–13.7 % SL vs. 8.0–11.6 % SL in *S. corica*, 8.7–13.9 % SL in *S. geisleri* and 8.3–8.6 % SL in *S. isostigma*) and a larger body (maximum size 56.4 mm SL vs. 45.0 mm in *S. corica*, 31.8 mm in *S. geisleri* and 25.8 mm in *S. isostigma*). *Schistura puncticeps* further differs from *S. isostigma* and *S. geisleri* by having a nearly complete black bar at base of caudal fin (vs. reduced to 1–2 small spots). It further differs from *S. corica* by having 9+8 branched caudal-fin rays (vs. 8+7). *Schistura puncticeps* differs from *S. defectiva* by having a slight notch in lower jaw (vs. absence), sides of head spotted (vs. not spotted), and a deeper body (body depth 16.4–20.2 % SL vs. 14.3–15.8 % SL) and from *S. kloetzi* by having 9+8 branched caudal-fin rays (vs. 8+8) and the absence of a

**Table 1.** Morphometric data of holotype and 20 paratypes of *Schistura puncticeps*.

	holotype	range	mean	S.D.
SL (mm)	56.0	37.9–56.4		
<b>In percents of SL</b>				
Total length	124.3	121.2–129.3	124.6	1.6
Dorsal head length	22.7	20.7–24.9	22.4	1.1
Lateral head length	26.8	24.5–28.1	26.3	0.9
Predorsal length	52.5	50.3–54.2	52.8	1.1
Pre-pelvic length	52.3	51.4–53.8	52.5	0.7
Pre-anus length	71.1	69.1–73.6	71.6	1.4
Preanal length	77.9	76.0–79.9	77.5	1.1
Head depth at eye	12.1	11.0–13.7	12.4	0.6
Head depth at nape	13.6	13.1–16.0	14.5	0.7
Body depth	15.5	16.4–20.2	17.8	1.0
Depth of caudal peduncle	11.8	11.5–13.7	12.8	0.6
Length of caudal peduncle	11.8	12.2–14.9	13.4	0.6
Snout length	10.5	9.0–10.9	9.9	0.5
Head width at nares	11.3	9.5–12.2	10.6	0.6
Maximum head width	16.6	13.6–19.0	17.3	0.7
Body width at dorsal-fin origin	12.0	12.6–15.5	13.6	0.7
Body width at anal-fin origin	6.4	6.9–8.8	7.7	0.4
Eye diameter	4.8	4.8–6.6	5.7	0.5
Interorbital width	7.0	6.0–8.1	7.1	0.6
Height of dorsal fin	13.6	13.2–17.6	15.9	1.2
Length of upper caudal-fin lobe	22.1	21.0–25.9	23.1	1.0
Length of median caudal-fin ray	18.2	17.7–21.5	19.1	1.0
Length of lower caudal-fin lobe	22.9	22.0–25.1	23.5	0.9
Depth of anal fin	17.9	15.9–18.8	17.8	0.8
Length of pelvic fin	18.8	17.4–19.3	18.4	0.5
Length of pectoral fin	22.0	20.0–23.0	21.6	0.9



**Fig. 4.** *Schistura puncticeps*, Myanmar: Shan state: mouth of Nam Paw, paratypes; **a**, 56.3 mm SL; **b**, 55.6 mm SL; **c**, 53.0 mm SL; **d**, 52.6 mm SL.

pronounced black bar reaching all around caudal peduncle between bases of anal fin and caudal fin (vs. present). The difference between *S. puncticeps* and *S. spilota* is discussed above.

**Comparative material.** *Schistura corica*: IAPG A3436, 3438, 2, 22.7–24.8 mm SL; Nepal: Mechi: Mechi river. – IAPG A325–326, 364, 3, 31.2–41.1 mm SL; ornamental fish trade. *S. defectiva*: IAPG A7455–7468, 14, 23.2–46.8 mm SL; Laos: Luang Prabang province: Nam Khan. – IAPG A7482–7484, 2, 36.0–36.5 mm SL; Laos: Luang



Fig. 4. (continued); e, 52.0 mm SL; f, 50.1 mm SL; g, 45.7 mm SL and h, 34.0 mm SL.

Prabang province: Houay Tat. *S. ephelis*: CMK 21072, 1, 30.8 mm SL; Laos: Vientiane: Nam Xong. *S. geisleri*: IAPG A1237–1269, 33, 16.8–24.7 mm SL; Thailand: Chiang Mai: Mae Nam Taeng. *S. isostigma*: IAPG A1307, 1, 18.6 mm SL; Laos: Khammouan province: Xe Bangfai. *S. nicholsi*: IAPG A6996–6997, 2, 31.7–40.4 mm SL; Thailand: Loei province: Pak Chom. – IAPG A 7073–

7075, 3, 37.9–47.9 mm SL; Thailand: Chiang Rai province: Nam Mae Lao. *S. spilota*: IAPG A6858, 1, 46.9 mm SL; Thailand: Chiang Mai province: Doi Inthanon. *S. vinciguerra*: IAPG 5693–5736, 44, 28.1–58.4 mm SL; Myanmar: Magway Division: Nam Man. – IAPG 5800–5810, 11, 41.8–56.3 mm SL; Myanmar: Rakhine state: small stream draining to Panthein River. *S. waltoni*: IAPG A

7076–7083, 8, 34.8–58.9 mm SL; Thailand: Chiang Mai province: Doi Inthanon. – IAPG A 7084–7088, 5, 46.4–63.6 mm SL; Thailand: Chiang Mai province: Doi Chiang Dao. – IAPG A 7127–7131, 5, 38.6–66.6 mm SL; Thailand: Chiang Mai province: Mae Taeng.

Comparative data of *S. callichroma*, *S. kloetzliae*, *S. maculiceps* and *S. prashadi* taken from Kottelat (1990, 2000), Roberts (1989) and Zhu & Wang (1985).

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### Literature cited

- Bohlen, J. & V. Šlechtová. 2009. *Schistura udomritthiruji*, a new loach from southern Thailand (Cypriniformes: Nemacheilidae). *Ichthyological Exploration of Freshwaters*, 20: 319–324.
- Bohlen, J. & V. Šlechtová. 2011. A new genus and two new species of loaches (Teleostei: Nemacheilidae) from Myanmar. *Ichthyological Exploration of Freshwaters*, 22: 1–10.
- Bohlen, J. & V. Šlechtová. 2013. Two new species of *Schistura* (Cobitoidea: Nemacheilidae) from Myanmar. *Ichthyological Exploration of Freshwaters*, 24: 21–30.
- Kottelat, M. 1990. Indochinese nemacheilines. A revision of nemacheiline loaches (Pisces: Cypriniformes) of Thailand, Burma, Laos, Cambodia and southern Viet Nam. Pfeil, München, 262 pp.
- 1998. Fishes of the Nam Theun and Xe Bangfai basins, Laos, with diagnoses of twenty-two new species (Teleostei: Cyprinidae, Balitoridae, Cobitidae, Coiidae and Odontobutidae). *Ichthyological Exploration of Freshwaters*, 9: 1–128.
- 2000. Diagnoses of a new genus and 64 new species of fishes from Laos (Teleostei: Cyprinidae, Balitoridae, Bagridae, Syngnathidae, Chaudhuriidae and Tetraodontidae). *Journal of South Asian Natural History*, 5: 37–82.
- 2001. Fishes of Laos. WHT Publications, Colombo, 198 pp.
- 2012. *Conspectus Cobitidum: an inventory of the loaches of the world (Teleostei: Cypriniformes: Cobitoidei)*. *The Raffles Bulletin of Zoology, Supplement*, 26: 1–199.
- Kottelat, M. & C. Leisher. 2012. Fishes from Phuong Hoang cave, northern Vietnam, with description of a new species of loach (Teleostei: Nemacheilidae). *Ichthyological Exploration of Freshwaters*, 23: 237–244.
- Lalramliana. 2012. *Schistura aizawlensis*, a new species of loach from Mizoram, northeastern India (Cypriniformes: Balitoridae). *Ichthyological Exploration of Freshwaters*, 23: 97–104.
- Lokeshwor, Y. & W. Vishwanath. 2012. *Schistura koladyneensis*, a new species of loach from the Koladyne basin, Mizoram, India (Teleostei: Nemacheilidae). *Ichthyological Exploration of Freshwaters*, 23: 139–145.
- Menon, A. G. K. 1987. The fauna of India and the adjacent countries. Pisces Vol. IV. Teleostei, Cobitoidea, Part 1, Homalopteridae. *Zoological Survey of India, Calcutta*, x + 259 pp., 16 pls.
- Ou, C., C. G. Montaña, K. O. Winemiller & K. W. Conway. 2011. *Schistura diminuta*, a new miniature loach from the Mekong River drainage of Cambodia (Teleostei: Nemacheilidae). *Ichthyological Exploration of Freshwaters*, 22: 193–200.
- Plongsesthee, R., L. M. Page & W. Beamish. 2011. *Schistura aurantiaca*, a new species from the Mae Khlong basin, Thailand (Teleostei: Nemacheilidae). *Ichthyological Exploration of Freshwaters*, 22: 169–178.
- Roberts, T. R. 1989. Freshwater fishes of western Borneo (Kalimantan Barat, Indonesia). *Memoirs of the Californian Academy of Sciences*, 14: 1–210.
- Zheng, L.-P., J.-X. Yang & X.-Y. Chen. 2012. *Schistura prolixifasciata*, a new species of loach (Teleostei: Nemacheilidae) from the Salween basin in Yunnan, China. *Ichthyological Exploration of Freshwaters*, 23: 63–67.
- Zhu, S.-Q. & S.-H. Wang. 1985. The noemacheiline fishes from Yunnan province, China. *Acta Zootaxonomica Sinica* 10: 208–220.

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