



TAXONOMIC REASSESSMENT OF TWO INDIAN SHIELDTAIL SNAKES IN THE *UROPELTIS CEYLANICUS* SPECIES GROUP (REPTILIA: UROPELTIDAE)

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Abstract: *Uropeltis* is the most speciose of all shieldtail snake (uropeltid) genera, particularly in India, and has been bedeviled by a complex and intricate taxonomic history, with several weakly established synonyms and widely disjunct geographic ranges. Our present work on two Indian *Uropeltis* species revealed greater species diversity than what is currently recognised. We elevate *Uropeltis arcticeps madurensis* to species level, and revive *Silybura shortii* (in the combination *Uropeltis shortii*) from the subjective synonymy of *U. ceylanicus*. We provide differential diagnoses, descriptions of examined material and comparisons with similar species based on an examination of voucher specimens as well as fresh, uncollected topotypes documented in the field.

Keywords: India, *Silybura madurensis*, shieldtail, *S. shortii*, subspecies, synonym, taxonomy.

Abbreviations: BMNH—The Natural History Museum, London, United Kingdom; CSPT—Chennai Snake Park Trust, Chennai, India; CES—Centre for Ecological Sciences, Indian Institute of Sciences, Bangalore, India; MAD—Madras Government Museum, Chennai, India; MHNP—Museum of Natural History Paris, France; ZSI/SRC—Zoological Survey of India, Southern Regional Centre, Chennai, India.

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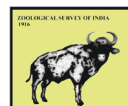
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Author Contribution: SRG studied both the species dealt with; RA and MER provided data on one snake species. SRG led the writing, in consultation with RA and MER who perused and approved the final text.

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INTRODUCTION

The shieldtail snakes of the family Uropeltidae Müller, 1832, are small to medium-sized, fossorial, primarily wet hill forest-dwelling, ovoviviparous snakes endemic to peninsular India and the adjacent island of Sri Lanka (Smith 1943; Murthy 1981, 1982; Daniel 2002; Das 2002). Currently, the following eight genera—*Rhinophis* Hemprich, 1820, *Uropeltis* Cuvier, 1829, *Pseudotyphlops* Schlegel, 1839, *Plectrurus* Duméril, 1851, *Melanophidium* Günther, 1864, *Platyplectrurus* Günther, 1868, *Teretrurus* Beddome, 1868 and *Brachyophidium* Wall, 1921 are considered valid (Smith 1943 [part]; McDiarmid et al. 1999). Among these, *Pseudotyphlops* is endemic to Sri Lanka; *Rhinophis* and *Uropeltis* occur both in Western Ghats and Sri Lanka while all the other genera are endemic to the Western Ghats of India (Smith 1943; Rajendran 1985; McDiarmid et al. 1999; Whitaker & Captain 2004). Many uropeltid species were described in India during its colonial rule in the 19th century and the presence of several weakly established subjective synonyms further complicates the systematics of this group as a whole (Gower et al. 2008).

The genus *Uropeltis* Cuvier, 1829 currently comprises 26 valid species and is reported to have a tricky and complicated taxonomy, badly needing a revision, which is exemplified by its type species *U. ceylanicus* Cuvier, 1829 (see Gower et al. 2008). We refer to Smith's (1943) "group II" (after Gower et al. 2008) containing *U. ceylanicus*, *U. bicatenatus* (Günther, 1864), *U. arcticeps* *arcticeps* (Günther, 1875), *U. arcticeps madurensis* (Beddome, 1878), *U. macrolepis macrolepis* (Peters, 1861), *U. macrolepis mahabaleshwariensis* Chari, 1955, *U. rubromaculatus* (Beddome, 1867), *U. rubrolineatus* (Günther, 1875), *U. broughami* (Beddome, 1878), *U. phipsonii* (Mason, 1888) and *U. myhendrae* (Beddome, 1886) as the *Uropeltis ceylanicus* species group. In this paper, two species in this group, *Silybura shorttii* Beddome, 1863 and *S. madurensis* Beddome, 1878 that were subsequent to their original description as distinct species, considered either as a synonym or a subspecies of congeneric species, are taxonomically reassessed and elevated to species rank based on examination of preserved specimens and fresh, topotypic uncollected specimens sighted in the field that revealed diagnostic differences that were, in part, not considered by earlier workers.

MATERIALS AND METHODS

This study is based on examination of five preserved specimens as well as four wild, live, uncollected individuals, all from the type locality of the taxa discussed. Morphological details were noted using magnifying hand lenses. Measurements were taken using vernier calipers (least count 0.1mm) and in the case of snout-vent length, by a standard measuring tape (least count 1mm). Where necessary, mean and standard deviation are given in brackets alongside ranges of numerical values. Morphological character definitions and terminology follow Smith (1943), except for counting ventral scales for which we follow Gower & Ablett (2006), who included mental, postmental and prementals in ventral counts. Unequal symmetric scalation values are given in right, left order. Comparison is based on examination of 24 preserved specimens (see Appendix) and original description papers and subsequent taxonomic treatises (see literature cited). Although the type specimens housed in European museums could not be accessed by us due to logistic constraints, our identifications of the mostly topotypic, non-types examined here were carefully cross-checked with the recently published type-redescriptions of *U. ceylanicus* group (except *U. myhendrae*) by Gower et al. (2008). Specific epithets used here follow Smith's (1943) justified emendations, consequent upon his generic transfer to *Uropeltis*.

TAXONOMY

Uropeltis shorttii (Beddome, 1863) comb. nov.

Silybura shorttii Beddome, 1863a (correct original spelling)

Silybura shorttii – Beddome, 1863b (incorrect subsequent spelling)

Silybura shorttii – Günther, 1864: 191; Theobald, 1868: 43

Silybura shorttii – Theobald, 1876: 134

Silybura nilgherriensis shorttii – Beddome, 1886: 15

Silybura brevis – Boulenger, 1890: 269 in part; Boulenger, 1893: 158 in part

Uropeltis ceylanicus – Smith, 1943: 80 in part

U[ropeltis]. ceylanicus shorttii – Murthy, 1990: 15

Taxonomic history

Cuvier (1829) first described *Uropeltis ceylanicus* from "Ceylan" (now Sri Lanka) but the type locality was subsequently considered erroneous, and the species

is now considered endemic to India (Smith 1943). This species has several very weakly characterised subjective synonyms originating from places far and wide in peninsular India (see Beddome 1886; Boulenger 1890, 1893; Smith 1943; Gower et al. 2008). Günther (1862) described *Silybura brevis* from Anamallays, Western Ghats. Soon, this was followed by Beddome's (1863) series of new species descriptions including *S. shorttii* from Shevaroy Hills in the Eastern Ghats, *S. nilgherriensis* from Nilgiris in the Western Ghats and *S. nilgherriensis* var. *annulata* from Wynaad, also in the Western Ghats. Lastly, Günther, (1864) described *S. bicatenata* from Deccan. Gower et al. (2008) recently revived *U. bicatenata* (*sic*) from the synonymy of *U. ceylanicus*, thus demonstrating the potential existence of several other valid species hidden as synonyms within *U. ceylanicus*. *Silybura shorttii* was described by Beddome (1863) as a distinct species from the Shevaroy Hills in the Eastern Ghats based on syntypes BMNH 1946.1.15.91-94 (formerly 74.4.29.737-739) and MHNP 95.100 (McDiarmid et al. 1999). *Silybura shorttii* was considered as a subspecies of Günther's *S. brevis* by Beddome (1886) who also relegated several other uropeltid species to subspecific status. Boulenger (1890; 1893) further relegated the status of *S. shorttii* by listing it as a synonym of *S. brevis*. This view was followed by Smith (1943), except that he rightly recognized the priority of Cuvier's (1829) *U. ceylanicus* instead of erroneously perpetuating usage of Günther's (1862) *S. brevis*. Murthy (1990) first allocated *Silybura shorttii*, as '*shorttii*' (*sic*) to *Uropeltis*, as a subspecies of *U. ceylanicus* (see chresonymy above).

Etymology

The specific epithet *shorttii* is a patronym, honouring its collector Dr. John Shortt, a medical physician with the then Madras Army (Playne et al. 1915), who donated the type specimens to Col. R.H. Beddome (see Beddome 1863a).

On the spelling of *Silybura shorttii*

The article Beddome (1863a) titled "Further notes upon the snakes of the Madras Presidency; with descriptions of new species" was published on 1 January 1863 in *Madras Quarterly Journal of Medical Science*, containing the original description of *Silybura shorttii* wherein the specimen collector was mentioned as Dr. Shortt. The article Beddome (1863b) titled "Descriptions of new species of the family Uropeltidae from southern India, with notes on other little-known species" was published on 9 June 1863 in *Proceedings of the Zoological*

Society of London. This latter paper contains an account on *Silybura shorttii* wherein the specimen collector was miswritten as Dr. Short. *Silybura shorttii* Beddome, 1863a dated 1 January is obviously a precursor to *Silybura shorttii* as mentioned in Beddome (1863b) dated 9 June, in keeping with Article 23 of the *Code* (ICZN 1999)—the Principle of Priority. But the spelling *shortii* has been perpetuated in the literature (see chresonymy above). Thus, *Silybura shorttii* Beddome, 1863 is the correct original spelling *sensu* Article 32 of the *Code* (ICZN 1999) and *Silybura shortti* used by Beddome, 1863b is an incorrect subsequent spelling.

Material examined (n=4, adults) (Image 1)

CSPT/S-80 (n=2, both adult males); ZSI/SRC/VRS 258 (n=2, subadults, a male and a female); coll. from Yercaud, Shevaroy Hills - a part of the Eastern Ghats, in Salem District of Tamil Nadu State, India.

Diagnosis

Uropeltis shorttii is diagnosed by the following combination of characters: tail shield with clearly defined, thickened, circumscribed disc; part of rostral visible from above not distinctly longer than its distance from frontal; rostral not fully separating nasals, shorter than rostral scale; dorsum dark blackish-brown with distinct yellow crossbars or annuli all over the body; ventrals 141–156 (148.5±10.06); venter with alternate rhomboidal large yellow and black spots or blotches, the two colours of equal intensities.

Description and variation (measurements in mm)

Snout-vent length 218.0–340.0 (279.0±86.2); tail length 13.0–17.0 (15.0±2.8); head length 7.9–12.0 (9.9±2.8); head width 4.9–8.5 (6.7±2.5); head depth 4.6–8.0 (6.3±2.0); body width 6.5–10.5 (8.5±2.8); eye-diameter 1.2–1.7 (1.4±0.2); eye-lip distance 0.9–1.1 (1.0±0.1); eye-nostril distance 2.0–2.9 (2.4±0.6); eye-rostrum distance 3.6–4.5 (4.0±0.6); interocular distance 3.3–4.3 (3.8±0.7); internarial distance 1.9–3.0 (2.4±0.7); snout-parietal distance 8.4–10.7 (9.5±1.6); posterior end of rostral to posterior end of parietal distance 6.9–8.9 (7.9±1.4); tail shield length 12.2–18.4 (15.3±4.3); tail shield width 5.7–11.4 (8.5±4.0); tail shield depth 6.2–9.3 (7.7±2.1); parietal scale length 2.9–4.7 (3.8±1.2); parietal scale width 2.1–3.8 (2.9±1.2); frontal scale length 2.7–3.4 (3.0±0.4); frontal scale width 2.8–3.1 (2.9±0.2); ocular scale length 1.9–3.0 (2.4±0.7); prefrontal scale length 1.5–2.7 (2.1±0.8); midbody ventral scale width 5.0–5.4 (5.2±0.2); midbody basal coastal scale width 2.3–2.7 (2.5±0.2).



Image 1. Entire and profile close-ups of *Uropeltis shortii* CSPT/S-80 (Photos by S.R.Ganesh). Bottom—live uncollected toptypic specimen (Photo by Eric Ramanujam)

Scalation

Rostral visible from above, smaller than nasal, not completely separating nasals; nasals in contact with one another posteriorly, prefrontals not in contact with rostral, subequal in size to nasal and ocular scales; nasals pierced by nostril, divided by rostral anteriorly but in contact with each other posteriorly; prefrontals somewhat larger than nasals and oculars, subequal to frontal; frontal longer than broad, distinctly smaller

than parietal; parietals large, largest of all head scales; supralabials 4,4 (left, right), 1st and 2nd ones small, 3rd below eye, 4th the largest; infralabials 3,3 (left, right), elongate; mental scale small, subequal to 1st infralabial, but as wide as long; body scales imbricate, cycloid; dorsally around body in 19 (one head length after neck): 17 (at midbody): 17–15 (one head length before vent) rows; ventrals 141–156 (148.5±10.6), angulate laterally; anals 2, left overlapping right, each larger than a body

scale; subcaudals 10–12 pairs +1 terminal scale; tail shield distinctly truncate above, mildly concave, circumscribed and ridged; covered with 30–31 (30.5 ± 0.7), bi- and tricarinate thickened scales; 10 scales across the length and 4–5 (4.5 ± 0.6) across the width of the tail shield.

Colouration in life

Dorsum dark coffee brown with distinct bright yellow cross bars formed by series of yellow blotches across consecutive scales in dorsal scale rows; 34–47 (41 ± 7.0) such cross bars present on body and tail; venter largely yellowish with dark brown spots and blotches, the dark spots restricted mostly to either side where ventral scales contact the outermost coastal scale rows; a pair of thick yellow stripes anteriorly along the neck and forebody on scale rows 3–5, the stripes extending to the level of the 36th–48th (42 ± 8.4) ventral scale; the stripe passing through lower half of supralabials, below the ocular scale and upper half of infralabials; eye pale whitish-grey; inside of mouth pale pink; tongue of same colour, its tips lighter.

Colouration in preservative

Similar to in-life colouration, except that the bright yellow is faded to pale cream colour.

Comparisons and differential diagnosis

Uropeltis shorttii is herein compared with all the 26 currently recognized congeners from both India and Sri Lanka. By having a thickened, circumscribed, mildly concave tail shield *U. shorttii* differs from the following 16 species: *U. ellioti*, *U. nitidus*, *U. ocellatus*, *U. dindigalensis*, *U. beddomii*, *U. macrorhynchus*, *U. woodmasoni*, *U. broughami*, *U. maculatus*, *U. petersi*, *U. liura*, *U. pulneyensis*, *U. smithi* from Western Ghats and *U. melanogaster*, *U. phillipsi*, *U. ruhunae* from Sri Lanka. Further, *U. shorttii* also differs from the remaining congeners (after Gower et al. 2008) with a thickened, circumscribed, caudal shield categorized under Smith's (1943) Group II A & B as follows (only opposing suite of character states of the congeners listed): *U. macrolepis macrolepis* found in northern Western Ghats: 15 midbody scale rows; ventral scales 127–140 (133.5 ± 8.9); dorsum blackish-brown with yellow broken spots forming zig-zag crossbars or annuli; *U. macrolepis mahabaleshwariensis* found in northern Western Ghats: 15 midbody scale rows; ventral scales 120–130 (125 ± 4.8); a pair of distinct, thick, yellowish-orange paravertebral stripes extending across most of the body except near neck, where there are two large orange spots; *U. ceylanicus* s. auct. here restricted to Western Ghats: dorsal body

colouration uniform without distinct yellow crossbars; ventral scales 119–146 (132.5 ± 19.0); *U. arcticeps* s. str. here restricted to Tirunelveli hills (see below): dorsally unpatterned, without distinct yellow crossbars; ventral scales 127–128; *U. madurensis* here restricted to High Wavys, Varushanad and Periyar hills (see below): dorsum uniform, without distinct yellow annuli; scales with distinct yellowish-rim over the body; venter with large orange and black blotched pattern; *U. bicatenatus* found in northern Western Ghats: no yellowish scalloping chain-like pattern across both sides of the body; *U. phipsonii* found in northern Western Ghats: a pair of yellowish lateral streaks, one each, along both sides of the body; part of rostral visible from above distinctly longer than its distance from the frontal; *U. myhendrae* found in Tirunelveli, Ashambu and Travancore hills: part of rostral visible from above distinctly longer than its distance from frontal; *U. broughami* found in Nilgiri, Palni and Sirumalai hills: 19 midbody scale rows; rostral scale strongly developed and ridged with a dorsal keel; ventral scales 181–230 (205.2 ± 34.6).

Distribution and field observations

Uropeltis shorttii in as far as is known, is restricted to Shevaroy Hills (11°N & 78°E; 350–1600 m), a part of southern Eastern Ghats located in Salem District of Tamil Nadu. Shevaroy Hills that is largely cultivated with coffee and silver oak today, has some remnant patches of tropical evergreen cloud forests and has been reported to harbor wet-forest taxa (e.g., the endemic Yercaud Day Gecko *Cnemaspis yercaudensis* Das & Bauer, 2002), even though set amidst the drier, rocky, Eastern Ghats hill range. Although Smith (1943) reported the Shevaroy Hills in the distribution of his *U. ceylanicus*, it was inclusive of *U. shorttii*, which as currently understood is allopatric with respect to the Western Ghats species *U. ceylanicus* s. auct. (also see Gower et al. 2008). The live specimen was encountered on the way to Kiliyur Falls, a seasonal waterfall surrounded by silver oak and coffee plantations and smaller patches of evergreen forests in Yercaud (1550m) at the summit of Shevaroy Hills. The only syntopic congener occurring with *U. shorttii* is *U. ellioti*, an apparently widespread species belonging to a different species group (see Smith 1943). We doubt the identity of the species mentioned as '*S. shortii*' by Beddome (1886) from Anamalais and based on our field observations including part of the data presented herein, we do not expect *U. shorttii* and *U. ceylanicus* to co-occur either in the Western or the Eastern Ghats.

Uropeltis madurensis* (Beddome, 1878) comb. nov.Silybura madurensis* Beddome, 1878: 802*Silybura nilgherriensis arcticeps* – Beddome, 1886:16
in part*Silybura madurensis* – Boulenger, 1890: 267, 1893:
156*Uropeltis arcticeps madurensis* – Smith, 1943: 81 in
part; Whitaker & Captain, 2004: 71; Chandramouli &
Ganesh, 2010: 79*Uropeltis arcticeps* (non *Silybura arcticeps* Günther,
1875) – Hutton & David, 2009: 310**Taxonomic history**

Beddome (1878) described *Silybura madurensis* based on syntypes BMNH 1946.1.16.38-39 (formerly 82.1.12.11-12) (McDiarmid et al. 1999) collected from High Wavy Mountains, Madura[i] District, [Tamilnadu State] elevation 5500 feet, southern India. Beddome (1886) relegated *S. madurensis* to the synonymy of another congener *S. arcticeps* Günther, 1875. Again, *S. arcticeps* was considered as a 'variety' of *S. nilgherriensis* Beddome, 1863. Beddome (1886) did this rather reluctantly, as evidenced by his reporting of two distinct, non-overlapping ventral scale count ranges "127-128" for *arcticeps* and "146-157" for *madurensis*. Some subsequent workers on Indian snakes (Boulenger 1890, 1893) continued to recognise *madurensis* as a valid species. However, Smith (1943) again followed Beddome (1886) and listed *S. madurensis* as a synonym of *S. arcticeps* along with another 'variety' *S. nilgherriensis* var. *picta* Beddome, 1886 originating from Peermade, Travancore. The status of *picta* was not discussed by Smith (1943), for reasons not made clear, but it is worth mentioning here that Boulenger (1890, 1893) listed var. *picta* as a synonym of *U. madurensis* and not of *U. arcticeps*. Murthy (1990) and Whitaker & Captain (2004) have regarded *U. madurensis* as a subspecies of *U. arcticeps*, and their nomenclatural usages have been—*Uropeltis arcticeps arcticeps* (Günther, 1875) and *U. a. madurensis* (Beddome, 1878).

Etymology

Although not mentioned in the original description, the specific epithet *madurensis* is a toponym, named after its "type locality" sensu lato 'Madura' (= Madurai District, Tamilnadu State), southern India.

Material examined (Image 2)

CSPT/S-6 an adult female from (the greater) Madurai District, Tamil Nadu, southern India; formalin-preserved;

collector and date unknown. Four more uncollected topotypic specimens documented in the field by the first author in High Wavy Mountains, Tamil Nadu, southern India.

Diagnosis

Uropeltis madurensis can be diagnosed by the following combination of characters: tail shield with clearly defined, thickened, circumscribed disc; part of rostral visible from above not distinctly longer than its distance from frontal; rostral not fully separating nasals; dorsum uniform brown, each scale with a well-defined lighter golden yellowish outline; ventrals 144–157; venter with alternate rhomboidal large brown and orange spots or blotches, the two colours of equal intensities.

Description of preserved specimen (measurements in mm)

Snout-vent length 320.0; tail length 10.3; head length 10.0; head width 9.05; head depth 5.5; body width 10.5; eye-diameter 1.9; eye-lip distance 1.1; eye-nostril distance 2.9; eye-rostrum distance 4.0; interocular distance 4.7; internarial distance 3.5; snout-parietal distance 10.7; posterior end of rostral to posterior end of parietal distance 8.9; tail shield length 13.4; tail shield width 7.8; tail shield depth 8.7; parietal scale length 4.1; parietal scale width 3.8; frontal scale length 4.0; frontal scale width 3.1; ocular scale length 3.0; prefrontal scale length 3.0; midbody ventral scale width 5.4; midbody basal coastal scale width 2.7.

Scalation

Rostral visible from above, not fully separating nasals; portion of rostral visible from above less than distance from frontal; nasals pierced by nostril, divided by rostral anteriorly but in contact with each other posteriorly; prefrontals slightly larger than nasals / oculars, subequal to frontal; frontal longer than broad, distinctly smaller than parietal; parietals large, largest of all head scales; a small rhomboid accessory scale just behind parietal; supralabials 4,4, 1st and 2nd ones small, 3rd below eye, 4th the largest; infralabials 3,3, elongate, 1st pair slightly curved anteriorly; mental scale small, subequal to 1st infralabial, but as wide as long; dorsal scales in 17 (one head length after neck): 17 (at midbody): 15 (one head length before vent) rows; ventrals 144, angulate laterally; anals 2, right overlapping left, each larger than a body scale; subcaudals 7 pairs + 1 terminal scale; tail shield distinctly truncate above, ridged and slightly concave; covered with 30, bi- and tri-carinate thickened scales; 7



Image 2. Entire and profiles close-ups of *Uropeltis madurensis* CSPT/S-6. Bottom—live uncollected totypic specimen (All photos by S.R. Ganesh).

scales across the length and 4–5 across the width of the disc.

Colouration in preservative

Overall dorsal body colour pale brownish-grey, with contrastingly coloured pale whitish scale border around all dorsal scales; neck with two parallel, longitudinal pale stripes one on each side, that converge towards the mental; each stripe extends dorsally to the supralabials and two to three outermost scalerows, posteriorly to the

first lateral blotch present on the neck; eye pale white; inside of mouth pale rose to grey deeper inside; venter brownish-grey with 32, paired, off-white blotches, each blotch two to three scales large; blotches either alternate or rarely conjoin to form cross bars; subcaudals deep brown enclosed by two parallel stripes laterally, joined together anteriorly by a cross bar at the anal scale; tail shield dorsally with dark brown swatches on a pale whitish background.

Colouration in life based on topotypes sighted in the field (n=4)

Dorsum rich brown; each scale with a yellowish-orange outline; venter heavily blotched with alternate large spots of orange and dark brown, the two colours being more or less equal in proportions; a pair of thick, orange stripes extending from last supralabial scale to the anterior 1/3rd of the body, across the first blotch near the neck; anal and subcaudal scales orange with smaller blackish-brown spots.

Distribution and field observations

Uropeltis madurensis is now considered endemic to HighWavys-Varushanad-Periyar hill complex. This region is located between the Palnis to the north and the Srivilliputhur Hills to the south (Hutton & David 2009). The first author studied *U. madurensis* in cloud forest-plantation matrix in High Wavys between December 2007 and January 2008, in the post-monsoon season. Four adults were sighted on a high elevation mountainous plateau ca. 1300–1600 m. The first snake was sighted dormant under a small rock in a streamside rainforest tract near Cloud Land Estate. The second one was actively moving about on forest floor near tea estates in Upper Manalar on a rainy day. The third one was a road-kill sighted amidst coffee plantations in Manalar/Sand River Cottage. The fourth one was found resting under a small cement slab near an estate bungalow in Eravangalar. Important characters of these specimens include mildly concave, thickened, circumscribed tail shield, 17 midbody scalerows, dorsal body with contrasting yellow-orange outline and 148–157 ventrals. Syntopic congeners include *Uropeltis* cf. *dindigalensis* (see Chandramouli & Ganesh 2010), *U. liura* (see Smith 1943) and *U. ceylanicus*, *U. ellioti*, *U. pulneyensis*, *U. rubromaculatus* and *U. woodmasoni* (after Hutton & David 2009). All syntopic congeners except *U. ceylanicus* and *U. rubromaculatus* belong to different species groups (Smith 1943).

Comparisons and differential diagnosis

Uropeltis madurensis is herein compared with all the 26 currently recognized congeneric taxa from both India and Sri Lanka. By having a thickened, circumscribed, concave tail shield *U. madurensis* instantly differs from the following 16 species: *U. ellioti*, *U. nitidus*, *U. ocellatus*, *U. dindigalensis*, *U. beddomii*, *U. macrorhynchus*, *U. woodmasoni*, *U. broughami*, *U. maculatus*, *U. petersi*, *U. liura*, *U. pulneyensis*, *U. smithi* from Western Ghats and *U. melanogaster*, *U. phillipsi*, *U. ruhunae* from Sri Lanka. Further, *U. madurensis* also differs from the

remaining congeners (after Gower et al. 2008; Whitaker & Captain 2004) with a thickened, circumscribed, caudal shield categorized under Smith's (1943) Group II A & B as follows (only opposing suite of character states listed): *U. macrolepis macrolepis* found in northern Western Ghats: 15 midbody scale rows; ventral scales 127–140 (133.5±8.9); dorsum blackish-brown with yellow broken spots forming zig-zag crossbars or annuli; *U. macrolepis mahabaleshwarensis* found in northern Western Ghats: 15 midbody scale rows; ventral scales 120–130 (125±4.8); a pair of distinct, thick, yellowish-orange paravertebral stripes extending across most of the body except near neck, where there are two large orange spots; *U. ceylanicus* s. *auct.* here restricted to Western Ghats: dorsal scales lacking a clearly defined yellowish border; ventral scales 119–146 (132.5±19.0); *U. arcticeps* s. *str.* here restricted to Tirunelveli hills: dorsal scales lacking a clearly defined yellow scale border; ventral scales 127–128; *U. shorttii* here restricted to Shevaroy, Eastern Ghats: dorsal body with distinct yellowish annuli or crossbars, each body scale without yellowish-orange border or rim; distribution Eastern Ghats; *U. bicatenatus* found in northern Western Ghats: no yellowish scalloping chain-like pattern across both sides of the body; *U. phipsonii* found in northern Western Ghats: a pair of yellowish lateral streaks along both sides of the body; part of rostral visible from above distinctly longer than its distance from the frontal; *U. myhendrae* found in Tirunelveli, Ashambu and Travancore hills: dorsum with brownish-black body, each scale with yellowish posterior border forming more or less complete band or annuli; part of rostral visible from above distinctly longer than its distance from frontal; *U. broughami* found in Nilgiris, Palni and Sirumalai hills: 19 midbody scale rows; rostral scale strongly developed and ridged with a dorsal keel; dorsum brown with distinct small, yellow-black-edged transverse ocelli; ventral scales 181–230 (205.5±34.5).

DISCUSSION

Uropeltis ceylanicus, as treated here in a partially conservative approach, still contains three junior subjective synonyms—*brevis* Günther, 1862 from Anamallays; *nilgherriensis* Beddome, 1863 from Nilgiris and *nilgherriensis* var. *annulata* Beddome, 1863 from Wynaad, all in the Western Ghats. We repeat the statement of Gower et al. (2008) that full re-evaluation of the taxonomy of *U. ceylanicus* is beyond the scope of the present study, pending new range-wide fieldwork and collections. But this in no way hinders our hypothesis



Image 3. Map of southern India showing the general relief features and the type localities of *Uropeltis shorttii* (Shevaroy) and *U. madurensis* (High Wavys)

that the Eastern Ghats endemic *U. shorttii* is specifically distinct from the Western Ghats endemic *U. ceylanicus* which is also reflected in their extensive morphological differences. Indeed *U. ceylanicus* is so far unknown from the Eastern Ghats except for the implied record of the type locality of *U. shorttii*, which, from now on, is no more *U. ceylanicus*.

With regards to *U. arcticeps* and *U. madurensis*, as stated above, another available name *Silybura nilgherriensis picta* Beddome, 1886 has been associated as a subjective junior synonym of these species (Boulenger 1890, 1893; Smith 1943). Its characters mentioned in the original description (Beddome 1886) including dorsum and venter with orange-yellow and black blotches (vs. uniform brownish-black in *arcticeps*; brown with each scale outlined in yellow in *madurensis*), ventrals 150 that is consistent with *U. madurensis* (vs. 127–128 in *arcticeps*) and distribution: Peermade 1000–1300m (vs. Tirunelveli hills for *arcticeps*; High Wavys for

madurensis) denote that owing to incongruence in both morphology and distribution, it must not be considered as a synonym of either species. We also feel that its ventral count 150 might have prompted Boulenger (1890, 1893) to consider *S.n. picta* as a subjective junior synonym of *U. madurensis*, rather than *U. arcticeps*. As was the case with some other nomina relegated to the synonymy of *U. ceylanicus*, lack of data precludes us from commenting any further on the taxonomic status of *Silybura nilgherriensis* var. *picta*.

Smith (1943) in his accounts of *U. ceylanicus* and *U. arcticeps* had written “with yellowish spots transversely arranged (*shorttii*)” and “ventrals 146–157 (*madurensis*)”. This implicit recognition of names with an express association with consistent features that are diagnosable, serving them to be identified from their nearest related congeners explains how these species got lumped in an over-circumscribed taxon-boundary. This lumping is exemplified by the fact that

Beddome (1886) considered var. *shortii* and *arcticeps* (including *madurensis*) as both belonging to a single species *Silybura nilgherriensis* Beddome, 1863. We are of the opinion that most historical workers apparently felt contended keeping these diagnosable and allopatric (see Image 3) species to a low profile, as 'varieties' or 'subspecies'. In this case, *U. shortii* from Shevaroy Hills in the Eastern Ghats having distinct yellow cross bars (vs. uniform in *U. ceylanicus*) and *U. madurensis* from the High Wavys having considerably high number of ventral scales (vs. lower no. of ventrals in *U. arcticeps*) testifies this. Our present examination of preserved material and wild-caught topotypes revealed subtle differences that disclosed the true taxonomic status of some of the available names. Further specimen examinations and field observations are necessary to reassess the status of other nomina and the true taxonomic diversity of this group.

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Appendix 1. List of preserved voucher specimens studied

- Uropeltis maculatus*: CESS186 from unknown locality; MAD no number from Anamalais.
- Uropeltis rubromaculatus*: MAD no number from Anamalais; CSPT/S-7 from unknown locality; CESS unnumbered, from unknown locality.
- Uropeltis ocellatus*: MAD no number from Perambikulam; more unnumbered specimens from Cochin and Kodaikanal, Palni Hills.
- Uropeltis ellioti*: CESS unnumbered, from unknown locality; CSPT/S-81 from Shevaroy.
- Uropeltis pulneyensis*: MAD 1929 six specimens, collected by E. Barnes, during April–May, from 6000–6800 ft, Kodaikanal, Palni Hills; CSPT/S-4a, 1 e.g., adult from Kodaikanal Hills, Tamil Nadu.
- Uropeltid smithi*: MAD no number from Anamalais.
- Uropeltis dindigalensis*: MAD no number from Sirumalais, Madura District, Tamil Nadu.
- Uropeltis ceylanicus*: MAD no number from Perambikulam; another unnumbered specimen from Cochin; MAD no number from Attikan (Mysore) E. Barne's collection, from ca. 5000 ft, in June 1938; more unnumbered specimens, from Nilgiris, Cochin and Travancore; CESS 092 from unknown locality; CESS unnumbered, from unknown locality.
- Uropeltis liura*: CSPT/S-3, 2 e.g., adults; one present in reserve collection, from Madurai Hills, Tamil Nadu.
- Uropeltis woodmasoni*: CSPT/S-4, 1 e.g., adult, from Anaimalais, Coimbatore District, Tamil Nadu.
- Uropeltis madurensis*: CSPT/S-6, 1 e.g., adult from High Wavys, Theni District, Tamil Nadu.
- Uropeltis petersi*: CSPT/S-7a 1 e.g., adult, from Kodaikanal Hills, Tamil Nadu.
- Uropeltis myhendrae*: CSPT/S-5, 1 e.g., adult from Vannathipparai Rubber Estate, Kanyakumari, Tamil Nadu.

