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## Additions to the knowledge of South Indian Scaphisomatini (Coleoptera: Staphylinidae: Scaphidiinae)

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**Abstract:** A study of a collection of South Indian Scaphidiinae yielded six new species and several interesting records. The following species are described: *Scaphisoma boukali* sp. nov., *S. divali* sp. nov., *S. holi* sp. nov., *S. kejvali* sp. nov., *S. onam* sp. nov. and *S. pooram* sp. nov. *Scaphobaeocera stipes* Löbl, 1971 is reported from India for the first time. An updated key to identification of South Indian species of *Scaphisoma* is provided.

**Keywords:** Shining fungus beetles - taxonomy - distribution - Karnataka - Kerala - Tamil Nadu.

### INTRODUCTION

Scaphidiinae is a clade of mycophagous and myxomycetophagous beetles distributed in the tropics, subtropics, and temperate zones (e.g., Newton, 1991). Most occur in areas that hold incalculable numbers of undescribed species (IL, personal observation). As far as the Indian fauna is concerned, overviews of Scaphidiinae have been given only for the southern states (Löbl, 1979), and for some of the northern Sub-Himalayan and Himalayan states (Löbl, 1984, 1986a, b, 1990). The review of the South Indian scaphidiines (Löbl, 1979) provides information on 46 species of ten genera. Subsequently, only five additional South Indian species have been described or reported from the area (Löbl, 1982, 2003; Löbl & Tang, 2013; Löbl *et al.*, 2020), although one of them, *Pseudobironium fasciatum* Löbl, 1982, was already mentioned by Löbl (1979) as *Pseudobironium* sp. Notable is that only a single species, *Scaphidium andrewesi* (Achard, 1922), has been recorded from the state of Karnataka (Löbl, 1979) and three species, *Scaphisoma nigrofasciatum* Pic, 1915, *S. perbrincki* Löbl, 1971 and *Bironium sumatranum* (Achard, 1920), from Goa (Löbl, 2018; Löbl *et al.*, 2020). Thus, 52 species of scaphidiines are currently known to occur in South India while the group is as good as unknown from the areas north of the states of Tamil Nadu and Kerala.

A recent study of a collection of Scaphisomatini from South India yielded the surprising discovery of six species

of *Scaphisoma* Leach, 1815 that are new to science. It also included the first specimen of *Scaphobaeocera stipes* Löbl, 1971 found in India, along with supplemental distribution data. The results of the study incited to provide an updated key to the South Indian species of the highly diverse genus *Scaphisoma* Leach, 1815.

### MATERIAL AND METHODS

The material studied is deposited in the following collections:

MHNG Muséum d'histoire naturelle de Genève, Switzerland

NHML Natural History Museum, London, UK

NMPC National Museum, Prague, Czech Republic

The specimens studied have been collected by sieving forest floor debris. The label data of the primary types are reproduced verbatim. The body length is measured from the anterior pronotal margin to the posterior inner angles of elytra. The widths are measured at the widest points of the respective body parts. The length/width ratios of antennomeres are measured on slide-mounted antennae at the same magnification (200 times). The length/width of the mesepimera refer to their exposed part. Statements about metaventral punctation do not refer to punctures margining submesocoxal lines and statements about abdominal microsculpture do not refer to intersegmental membranes. The sides of the aedeagi

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refer to their morphological sides with the ostium situated dorsally, while it is in resting position rotated 90°. The dissected body parts are embedded in Euparal and fixed on a separate card on the same pin as the respective specimen. Primary references are given for all taxa dealt with in the present paper; for other Scaphidiinae taxa only mentioned, and for the distribution of taxa, see Löbl (2018).

## TAXONOMY

*Scaphisoma* Leach, 1815 is with over 800 species the most species-rich genus of the Scaphidiinae and has nearly world-wide distribution (Löbl, 2018). It is

characterized by short antennomeres III, the pronotal and elytral pubescence strongly reduced, the basal angles of the pronotum extended, the hypomera oblique, the metacoxae distant, the profemora with ctenidium, and the ventrite I with submetacoxal lines, in combination. The keys in Löbl (1979, 1992) provide criteria to distinguish *Scaphisoma* from other Scaphidiinae genera occurring in India. As only some species possess conspicuous external characters, their identification is often difficult without use of the primary male genital characters. The Bold System (Ratnasingham & Hebert, 2007) provides data on only 14 species (accessed on March 25, 2023), all European and North American, and is thus useless as an identification tool for the subfamily.

### Key to the South Indian species of *Scaphisoma*

- |    |   |                            |
|----|---|----------------------------|
| 1  | Elytra with basal striae .....  | 2                          |
| -  | Elytra lacking basal striae .....   | 8                          |
| 2  | Pronotum and most of elytra dark reddish-brown to black, elytra lighter near apical margins .....   | 3                          |
| -  | Elytra with conspicuous bicour pattern .....  | 5                          |
| 3  | Antennomeres IV and III together shorter than antennomere V. Parameral process absent or prominent ventrally, uncurved, parameres lacking membranous lobes .....  | 4                          |
| -  | Antennomeres IV and III together longer than antennomere V. Ventrite I lacking microsculpture. Parameral process strongly prominent and incurved, parameres each with inner membranous lobe .....                                 | <i>S. besucheti</i> Löbl   |
| 4  | Exposed tergites and ventrites with punctulate microsculpture (absent at lateral areas of ventrite I). Aedeagus asymmetrical, tip of median lobe oblique (Figs 14-16) .....   | <i>S. holi</i> sp. nov.    |
| -  | Exposed tergites and ventrites with strigulate microsculpture absent from lateral areas of ventrite I. Aedeagus symmetrical, tip of median lobe incurved and hook-like (Figs 12, 13) .....  | <i>S. divali</i> sp. nov.  |
| 5  | Antennomeres III and IV equal in length. Elytron with large oblique ochraceous spot covering most of disc, surrounded by narrow blackish areas (Fig. 6) .....   | <i>S. onam</i> sp. nov.    |
| -  | Antennomere IV longer than III. Elytral colour different .....  | 6                          |
| 6  | Antennomere V shorter than IV. Elytron yellowish on prevailing surface, with blackish pattern .....   | 7                          |
| -  | Antennomere V longer than antennomere IV. Elytron blackish on prevailing surface, with reddish basal and subapical bands (Fig. 8) .....   | <i>S. pooram</i> sp. nov.  |
| 7  | Elytron blackish on inner two thirds of disc and on narrow bands along basal margin and suture (Fig. 5) .....   | <i>S. nilgiriense</i> Löbl |
| -  | Elytron nearly entirely yellowish, narrowly darkened along suture, basal and lateral margins, and with small spot posterior of mid-length (Fig. 1) .....  | <i>S. binotatum</i> Achard |
| 8  | Abdomen with strigulate microsculpture .....  | 9                          |
| -  | Abdomen with punctulate microsculpture, or lacking microsculpture .....   | 17                         |
| 9  | Elytron unicolor or nearly unicolor, often lighter along apical margin or on apical third .....   | 10                         |
| -  | Elytron with distinctive bicourous pattern, not considering lighter apex .....  | 13                         |
| 10 | Metaventrite with submesocoxal areas longer than submetacoxal areas of ventrite I. Body length 1.4 to 1.6 mm. Apical process of median lobe sinuate in lateral view, with minute subapical denticles visible in dorsal view ..... | <i>S. mussardi</i> Löbl    |
| -  | Metaventrite with submesocoxal areas as long as or shorter than submetacoxal areas of ventrite I. Body length 1.2 to 1.45 mm. Apical process of median lobe arcuate in lateral view, lacking subapical denticles .....            | 12                         |
| 12 | Apical tenth of elytron light. Lateral parts of metaventrite with punctation much finer than punctation on apicomedian part of metaventrite. Apical process of median lobe lacking dorsal valve .....                             | <i>B. bayau</i> Löbl       |
| -  | Apical third of elytron distinctly lighter than basal third of elytron. Metaventrite entirely very finely punctate. Apical process of median lobe with dorsal valve (Figs 17, 18) .....   | <i>S. kejvali</i> sp. nov. |
| 13 | Pronotum uniformly dark brown to black, elytron mostly dark, with light subhumeral spot and light apex (Figs 3, 9) .....  | 14                         |
| -  | Pronotum uniformly ochraceous, or ochraceous with dark admesal bands, elytron ochraceous with dark pattern .....  | 15                         |

- 14 Body ca. 1.40 to 1.55 mm long. Apical process of median lobe trifold, internal sac with mesal row of scale-like structures ..... *S. tetrastictum* Champion
- Body 1.02-1.16 mm long. Apical process of median lobe not trifold, internal sac lacking scale-like structures (Figs 10, 11) ..... *S. boukali* sp. nov.
- 15 Pronotum uniformly light, ochraceous (Fig. 2). Elytron lacking clearly delimited dark bands or spots, sutural stria conspicuously oblique near base. Dorsal side of basal bulb expanded apicad and overlapping apical process of median lobe ..... *S. binhanum* (Pic)
- Pronotum ochraceous, usually with two dark admesal bands. Elytron with clearly delimited dark colour pattern, sutural stria hardly curved near base. Dorsal side of basal bulb not expanded apicad and not overlapping apical process of median lobe ..... 16
- 16 Elytron narrowly darkened along basal, sutural, and lateral margins, and with narrow dark band anterior of apical third and joining dark adsutural and lateral areas (Fig. 4) ..... *S. nigrofasciatum* Pic
- Elytron with dark adsutural area expanded anterior to form triangular pattern, dark lateral band expanded anterior apical fourth mesally to form spot not joining dark adsutural area (Fig. 7) ..... *S. pictum* Motschulsky
- 17 Metaventricle with large submesocoxal areas longer than intervals between them and apical metaventral margin. Body 0.95-1.15 mm long. Aedeagus symmetrical, with apical process of median lobe in lateral view much narrower than parameres ..... *S. perbrincki* Löbl
- Metaventricle with submesocoxal areas as long as or shorter than intervals between them and apical metaventral margin. Body 1.30 to 1.80 mm long. .... 18
- 18 Metaventricle with antecoxal puncture rows. Aedeagus symmetrical, with trifold apical process, internal sac lacking flagellum ..... 19
- Metaventricle lacking antecoxal puncture rows. Aedeagus asymmetrical, apical process not trifold, internal sac with flagellum ..... 20
- 19 Body dark brown or blackish. Punctures on elytral disc clearly delimited. Parameres lacking mesal lobes, internal sac lacking sclerotized pieces ..... *S. kali* Löbl
- Body light brown. Punctures on elytral disc poorly delimited. Parameres with mesal lobes, internal sac with pair of sclerotized pieces ..... *S. aurum* Löbl
- 20 Apicomedian area of metaventricle and basomedian area of ventrite I with punctation much coarser than that on lateral areas of metaventricle and ventrite I, pubescent in males ..... 21
- Metaventricle and ventrite I nearly evenly very finely punctate or with few coarser punctures, in males lacking conspicuous pubescence ..... *S. skanda* Löbl
- 21 Aedeagus with parameres gradually narrowing in lateral view, apical process of median lobe widest posterior of mid-length, parameral process curved, hook-like ..... *S. maindroni* Achard
- Aedeagus with parameres abruptly narrowed posterior mid-length in lateral view, median lobe widest posterior of mid-length, apical process of median lobe gradually narrowing in lateral view, parameral process oblique ..... *S. swapna* Löbl

### Descriptions of new species

#### *Scaphisoma boukali* Löbl, sp. nov.

Figs 3, 10, 11

**Holotype:** MHNG, male; INDIA: Kerala Cardamom Hills, 300 m 27-29.12.93, ca 50 km NW Pathanamthitta, 77°05'E 9°25'N, Boukal & Kejval.

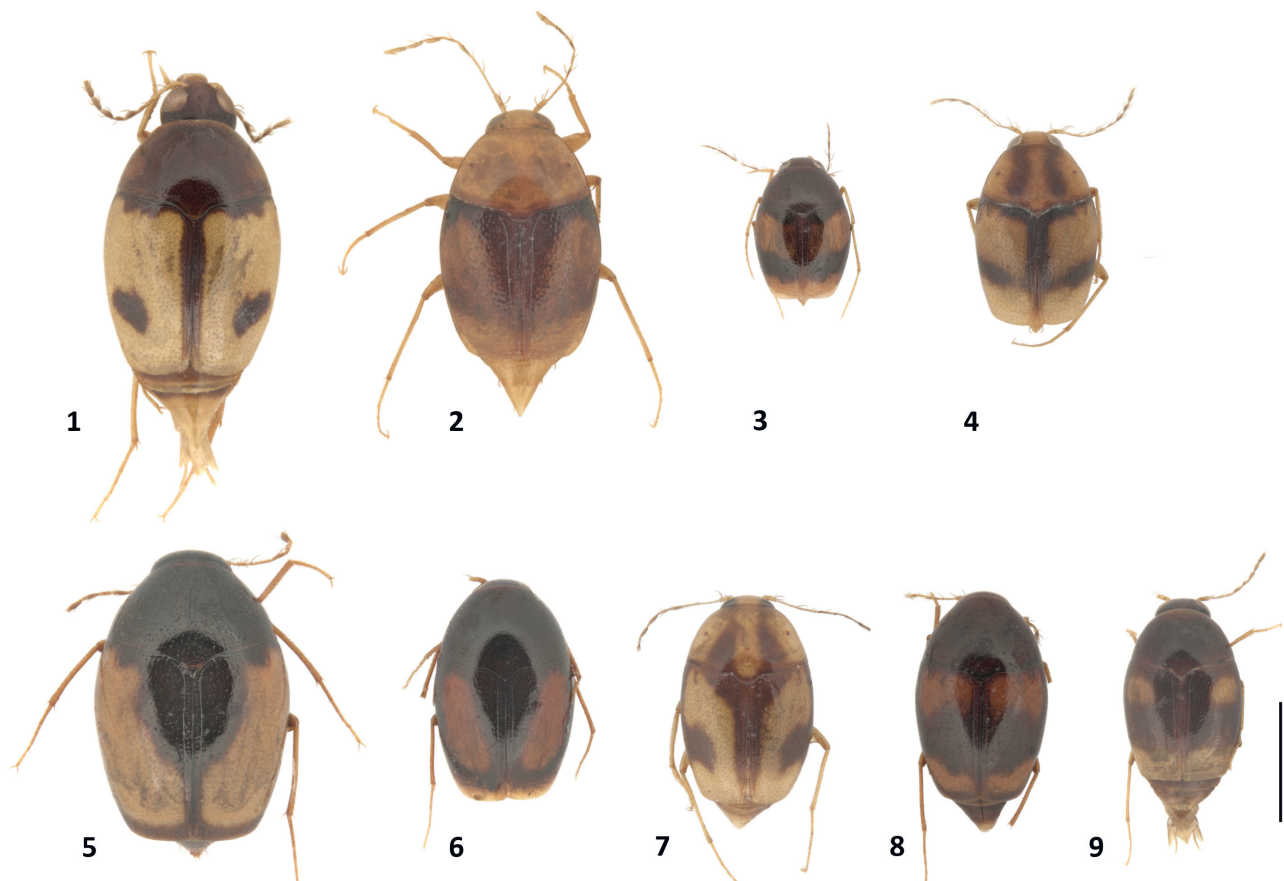
**Paratypes:** MHNG, 6 males, 7 females; with same data as holotype. – 5 males, 3 females, Kerala, Cardamom Hills, 15 km SW Munnar, Kallar Valley, 1000 m, 6-18. XII.1993, D. Boukal & Z. Kejval.

**Diagnosis:** Small species with black pronotum and usually bicolorous elytra (Fig. 3); antennomere III much shorter than antennomere IV; elytra lacking basal striae, hypomeron and mesanepisternum smooth, mesoventrite punctate, mesepimeron long, metaventricle lacking microsculpture, with punctation conspicuously

dense on apicomedian area, submesocoxal lines convex, antecoxal puncture rows absent; ventrite I with submetacoxal areas about half as long as shortest interval between its margin and apical margin of ventrite, aedeagus symmetrical, apical process moderately long, gradually narrowing apicad, with rather acute tip, dorsal valve weakly sclerotized and split, basal bulb oval, lacking prominent articular process, parameres narrowed posterior of mid-length, straight; internal sac with dense rows of long spines, and fine duct visible in lateral view.

**Etymology:** Eponymous. The species is named in honour of one of its collectors, David S. Boukal of České Budějovice, Czech Republic.

**Description:** Length 1.02-1.16 mm, width 0.67-0.71 mm. Head, pronotum and elytra along basal margins black (Fig. 3). Elytron usually also dark brown



Figs 1-9. *Scaphisoma* spp., habitus, scale = 1 mm. (1) *S. binotatum* Achard. (2) *S. binhanum* (Pic). (3) *S. boukali* sp. nov. (4) *S. nigrofasciatum* Pic. (5) *S. nilgiriense* Löbl. (6) *S. onam* sp. nov. (7) *S. pictum* Motschulsky. (8) *S. pooram* sp. nov. (9) *S. tetrastictum* Champion.

to black along suture, along lateral margin, and on narrow transverse band posteriad of elytral mid-length, prevailing elytral surface light, ochraceous or yellowish. Transverse dark band absent from some specimens, or replaced by spot. Venter of thorax reddish-brown to blackish. Abdomen and appendages yellowish. Length/width ratios of antennomeres as: III 12/6: IV 19/5: V 30/6: VI 28/6: VII 43/8: VIII 30/6: IX 45/9: X 43/10: XI 52/10. Pronotum and elytra lacking microsculpture. Pronotum with lateral margins arcuate; lateral margin stria visible in dorsal view, punctate; discal punctation very fine, visible at 40 times magnification, dense near basal margin, becoming sparse anteriorly. Minute tip of scutellum exposed. Elytron moderately narrowing apicad, with lateral margin arcuate, lateral margin stria exposed, punctate; apical margin weakly rounded, without distinct crenulation; inner apical angle situated posteriad of level of outer angle; sutural margin not raised; sutural striae moderately deep, converging apicad, starting near pronotal lobe, not extending laterally; adsutural area flat, ca. 0.06 mm wide shortly posteriad of scutellar tip, with single puncture row; discal punctation sparse and very fine near base,

dense and rather coarse on prevailing surface, with puncture intervals mostly about two to four times as large as puncture diameters. Hind wings fully developed. Hypomeron and mesanepisternum smooth. Mesoventrite punctate. Mesepimeron about 5 times as long as wide and twice as long as interval between its tip and mesocoxa. Metaventrite lacking microsculpture, convex in middle, lacking impressions, with punctation on apicomedian area fine and conspicuously dense, distinct at 20 times magnification, becoming sparse and very fine anteriorly and laterally; antecoxal puncture rows absent; submesocoxal areas ca. 0.04 mm long, about as long as third of shortest interval between its margin and metacoxa; submesocoxal lines subtriangular, appearing impunctate. Metanepisternum lacking microsculpture, convex, narrowing anteriorly, suture impressed, oblique, slightly rounded at posterior angle. Tibiae straight. Exposed tergites and ventrites with strigulate microsculpture absent from lateral areas of ventrite I. Mesal area of ventrite I densely and finely punctate, punctures near intercoxal process in part about as large as puncture intervals, punctation on lateral areas of ventrite I sparse and extremely fine; submetacoxal areas



0.05 mm long, about half as long as shortest interval between its margin and apical margin of ventrite; submetacoxal lines convex, finely punctate.

**Male.** Protarsomeres I to III widened, with tenent setae, protarsomere I narrower than apex of protibia. Mesotarsomeres I to III not widened. Aedeagus (Figs 10, 11) 0.34-0.37 mm long.

**Comments:** The aedeagal characters suggest relationship of *S. boukali* with *S. pseudorufum* Löbl, 1986, a species widely distributed in Southeast Asia, and *S. napu* Löbl, 1983 from Sulawesi. The new species may be easily distinguished from them by its colour pattern. It differs also from *S. pseudorufum* by the much smaller body, the elongate antennomere IV and the aedeagus with the internal sac bearing long, spine like structures. *Scaphisoma napu* has elytra with shortened sutural striae and much coarser punctation, the metaventrite with antecoxal puncture rows and two apicomedian impressions, the internal sac with short denticles, and the apical margin of the male ventrite V tridentate, as that of the New Guinean *S. tridentatum* Löbl, 1975 and *S. beccarii* Löbl, 1975.

**Distribution:** India: Kerala.

***Scaphisoma divali* Löbl, sp. nov.**

Figs 12, 13

**Holotype:** MHNG, male; INDIA Kerala Vattiar Cardamom Hills 1000 m 10 km SW Munnar 5-17.XII.1993, 77°01'E 100°02'N, Boukal & Kejval.

**Paratypes:** MHNG, 2 males, 1 female; with same data as holotype. – 1 male, Kerala, Cardamom Hills, 15 km SW Munnar, Kallar Valley, 1000 m, 6-18.XII.1993, D. Boukal & Z. Kejval.

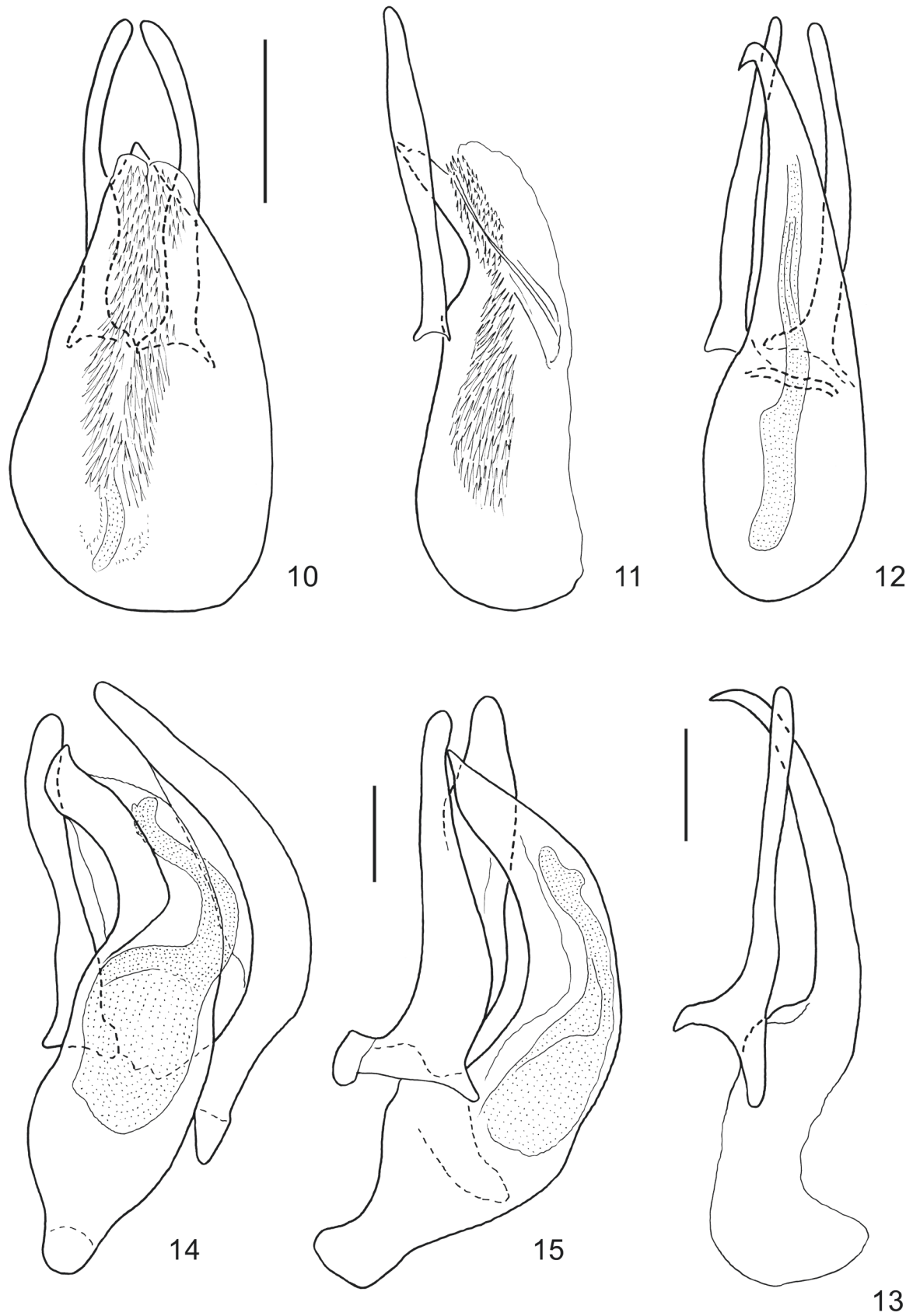
**Diagnosis:** Rather large species with dark reddish-brown to blackish body, elytra along apices lighter; antennomere III much shorter than antennomere IV, elytra with sutural striae extending along base to form basal striae, hypomeron and mesanepisternum smooth, mesoventrite punctate, mesepimeron long, metaventrite lacking microsculpture, with punctation coarse and dense on apical half of median area, submesocoxal lines convex, antecoxal puncture rows absent, abdomen with strigulate microsculpture, ventrite I with submetacoxal areas somewhat shorter than half of shortest interval between its margin and apical margin of ventrite, aedeagus symmetrical, apical process long, gradually narrowing apicad, with tip acute and hook-like, dorsal valve membranose, unsplit, basal bulb oval, lacking prominent articular process, parameres narrow and nearly straight, internal sac with weakly sclerotized rod, lacking spines or denticle-like structures.

**Etymology:** The species epithet is the name of the Indian festival of lights.

**Description:** Length 1.90-2.0 mm, width 1.33-1.44 mm. Head and most of body very dark reddish-brown to blackish, elytra along apices and apex of abdomen lighter; appendages reddish-brown or ochraceous. Length/width ratios of antennomeres: III 13/9: IV 23/8: V 40/8: VI 50/10: VII 52/17: VIII 45/11: IX 52/16: X 51/16: XI 60/17. Pronotum and elytra lacking microsculpture. Pronotum with lateral margins arcuate; lateral margin stria visible in dorsal view, punctate; discal punctation dense and rather coarse, hardly visible at 16 times magnification. Tip of scutellum exposed. Elytron weakly narrowing apicad, with lateral margin arcuate, lateral margin stria exposed, punctate; apical margin slightly rounded, with distinct crenulation; inner apical angle situated at level of outer angle; sutural margin not raised; sutural stria deep, slightly converging apicad, curved at pronotal lobe and extending laterad to form basal stria which reaches outer half of basal width of elytron; adsutural area flat, ca. 0.06 mm wide shortly posteriad of scutellar tip, with single puncture row; discal punctation consisting of clearly delimited punctures, near base about as fine as pronotal punctation, coarser on prevailing surface, with puncture intervals mostly about 1.5 to two times as large as puncture diameters. Hind wings fully developed. Hypomeron and mesanepisternum smooth. Mesoventrite impunctate. Mesepimeron 2.5 times as long as wide and as long as interval between its tip and mesocoxa. Metaventrite lacking microsculpture, slightly convex in middle, lacking impressions, with punctation coarse and dense on apical half of median area, punctures clearly delimited, visible at 16 times magnification, laterad becoming gradually sparser and finer; antecoxal puncture rows absent; submesocoxal areas about 0.09 mm long, about as long as half of shortest interval between its margin and metacoxa; submesocoxal lines convex, impunctate. Metanepisternum lacking distinct microsculpture, somewhat convex, narrowing anteriorly, suture impressed, oblique, slightly rounded at angles. Protibiae straight, mesotibiae and metatibiae slightly curved. Exposed tergites and ventrites with strigulate microsculpture absent from basolateral parts of ventrite I. Punctation rather coarse on most of basal half of ventrite I, becoming very fine apicad and laterad. Ventrite I with submetacoxal areas 0.09-0.10 mm long, somewhat shorter than half of shortest interval between its margin and apical margin of ventrite; submetacoxal lines convex, finely punctate. Following ventrites very finely punctate.

**Male.** Protarsomeres I to III hardly widened. Aedeagus (Figs 12, 13) 0.51-0.53 mm long.

**Comments:** The aedeagal characters of this species resemble those of *S. penangense* Löbl, 1986, *S. oppositum* Löbl, 1999, and *S. weigeli* Löbl, 2019. These species share a narrow, gradually narrowing



Figs 10-15. *Scaphisoma* spp., genital characters, scales = 0.1 mm. (10) *S. boukali* sp. nov., aedeagus in dorsal view. (11) ditto, lateral view. (12) *S. divali* sp. nov., aedeagus in dorsal view. (13) ditto, lateral view. (14) *S. holi* sp. nov., aedeagus in dorsal view. (15) ditto, lateral view.

median lobe curved and acute at apex and lack prominent parameral tubercles. In addition, they have narrow, unlobed parameres and a simple internal sac. *Scaphisoma penangense* from Western Malaysia may be readily distinguished by the light body colour and the colour pattern of the elytra, the antennomere V as long as the antennomeres III and IV combined and only somewhat shorter than the antennomere VI, the much shorter submesocoxal and submetacoxal areas, and the very finely punctate ventrite I. *Scaphisoma oppositum* from Yunnan has the body black, the abdominal microsculpture punctulate, the submetacoxal lines coarsely punctate, and the antennomere VI about as long the antennomeres II to V combined. *Scaphisoma weigeli*, also from Yunnan and with black body, differs by the straight tibiae and the ventrite I very finely punctate.

**Distribution:** India: Kerala.

*Scaphisoma holi* Löbl, sp. nov.

Figs 14-16

**Holotype:** MHNG, male; INDIA: Kerala Palni Hills, 10 km E Munnar, top station / 1900 m, 22-26.V.1994 77°15'E, 10°08'N Z. Kejval leg.

**Paratypes:** MHNG, 2 males; Kerala, 15 km SW Munnar, Kallar Valley, 1000 m, 6-18.XII.1993, D. Boukal & Z. Kejval leg.

**Diagnosis:** Rather large species with blackish body, elytra lighter at apices; antennomere IV moderately longer than antennomere III, elytra with sutural striae extending along base to form basal striae not joining lateral striae, hypomeron and mesanepisternum smooth, mesoventrite impunctate, mesepimeron long, metaventrite lacking microsculpture, with very fine and sparse punctation, submesocoxal lines convex, antecoxal puncture rows absent, abdomen with punctulate microsculpture, ventrite I with submetacoxal areas about as long as third of shortest interval between its margin and apical margin of ventrite, aedeagus asymmetrical, apical process long, sinuate, with acute tip, dorsal valve split, basal bulb narrowed proximally, with prominent articular process, parameres rather wide, and curved, internal sac broad basally, incurved in apical half, strongly sclerotized, lacking spines or denticle-like structures.

**Etymology:** The species epithet is a name of one of the Indian festivals.

**Description:** Length 1.75-1.86 mm, width 1.16-1.28 mm. Head and most of body blackish, elytra becoming somewhat lighter near apical margins, mesosternum and abdomen dark reddish-brown, femora and tibiae light reddish-brown, tarsi and antennomeres I to VI yellowish, following antennomeres brown. Length/width ratios of antennomeres: III 14/9: IV

18/8: V 42/8: VI 39/10: VII 45/20: VIII 33/12: IX 43/20: X 45/18: XI 50/22. Pronotum and elytra lacking microsculpture. Pronotum with lateral margins arcuate; lateral margin striae concealed in dorsal view, impunctate; discal punctation dense and rather fine, visible at 20 times magnification. Tip of scutellum exposed. Elytron weakly narrowing apicad, with arcuate lateral margin, lateral margin stria concealed, impunctate; apical margin truncate, with distinct crenulation; inner apical angle situated at level of outer angle; sutural margin not raised; sutural striae deep, slightly converging apicad, curved at pronotal lobe and extending laterally to form basal stria which reaches outer half of elytral basal width; adsutural area flat, ca. 0.06 mm wide shortly posterior of scutellar tip, with single puncture row; prevailing discal punctation sparse and about as fine as pronotal punctation, consisting of clearly delimited punctures, with puncture intervals about 3 to 4 times as large as puncture diameters, apical fifth of elytra with punctation coarser and denser, with puncture intervals in part about as large as puncture diameters. Hind wings fully developed. Hypomera smooth. Mesoventrite impunctate. Mesepimeron 3 times as long as wide and as long as interval between its tip and mesocoxa. Metaventrite lacking microsculpture, nearly flat in middle, lacking impressions, with punctation very fine and sparse on entire surface; antecoxal puncture rows absent; submesocoxal areas ca. 0.04 mm long, about as long as seventh of shortest interval between its margin and metacoxa; submesocoxal lines convex, punctate. Metanepisternum lacking microsculpture, flat, narrowing anteriorly, suture impressed, oblique, slightly rounded at posterior angle. Protibiae straight, mesotibiae and metatibiae slightly curved. Exposed tergites and ventrites with punctulate microsculpture absent from lateral areas of ventrite I, sparsely and very finely punctate. Ventrite I with submetacoxal areas 0.07 mm long, about as long as third of shortest interval between its margin and apical margin of ventrite; submetacoxal lines convex, finely punctate.

**Male.** Protarsomeres I to III distinctly widened, with tenet setae; protarsomere I narrower than apex of protibia. Mesotarsomeres I to III hardly widened. Ventrite VI with triangular, 0.06 mm long lobe. Aedeagus (Figs 14-16) 0.50-0.62 mm long.

**Comments:** The aedeagal characters suggest relationship of *S. holi* with *S. mirandum* Löbl, 1990 from Thailand. The new species may be easily distinguished by the median lobe narrowed proximally and incurved apicad, the internal sac with an incurved rod expanded in proximal section, and the right paramere not notably narrower than the left paramere. The species differs from *S. mirandum* notably by the dark body colour and the elytra with basal striae not joining the lateral striae.

**Distribution:** India, Kerala.



***Scaphisoma kejvali* Löbl, sp. nov.**

Figs 17, 18

**Holotype:** MHNG, male; INDIA Kerala Vattiar Cardamom Hills 1000 m 10 km SW Munnar 5-17. XII.1993, 77°01'E 100°02'N, Boukal & Kejval.

**Diagnosis:** Rather small species with ochraceous body, elytra lighter apicad; antennomere IV much longer than antennomere III, elytra with sutural striae not extending along base, hypomeron and mesanepisternum smooth, mesoventrite impunctate, mesepimeron long, metaventrite lacking microsculpture, with very fine and sparse punctation, submesocoxal lines convex, antecoxal puncture rows absent, abdomen with strigulate microsculpture, ventrite I with submetacoxal areas about half as long as shortest interval between its margin and apical margin of ventrite, aedeagus symmetrical, apical process rather short, inflexed with concave ventral side, acute at tip, with sclerotized dorsal valve incurved at tip, basal bulb large, oval, without prominent articular process, parameres rather wide, curved, lobed near base, internal sac bulbous basally, narrowed and tubular in middle section, widened apicad, with very small denticle-like structures becoming larger and scale-like in widened apical section.

**Etymology:** Eponymous. The species is named in honour of one of its collectors, the coleopterist Zbyněk Kejval of Domažlice, Czech Republic.

**Description:** Length 1.45 mm, width 1.0 mm. Head and body ochraceous, elytra becoming lighter apicad, abdomen lighter than thorax, femora about as pronotum, tibiae, tarsi and antennae yellowish. Length/width ratios of antennomeres: III 11/8: IV 23/5: V 36/7: VI 30/7: VII 37/9: VIII 32/9: IX 42/11: X 35/11: XI 55/12. Pronotum and elytra lacking microsculpture. Pronotum with lateral margins arcuate; lateral margin stria visible in dorsal view, impunctate; discal punctation sparse and very fine, hardly visible at 50 times magnification. Tip of scutellum exposed. Elytron weakly narrowing apicad, with lateral margin arcuate, lateral margin stria exposed, punctate; apical margin weakly rounded, with distinct crenulation; inner apical angle situated posteriorly of level of outer angle; sutural margin not raised; sutural striae moderately deep, slightly converging apicad, starting near pronotal lobe, not extending laterally; adsutural area flat, ca. 0.06 mm wide shortly posteriorly of scutellar tip, with single puncture row; punctation sparse and fine near base, dense and rather coarse on prevailing surface, with puncture intervals mostly about 2 to 4 times as large as puncture diameters. Hind wing fully developed. Hypomera and mesanepisterna smooth. Mesoventrite impunctate. Mesepimeron 4 times as long as wide and about 1.5 times as long as interval between its tip and mesocoxa. Metaventrite lacking microsculpture, convex in middle, lacking impressions,

with punctation very fine and sparse, hardly visible at 100 times magnification; antecoxal puncture rows absent; submesocoxal areas ca. 0.06 mm long, about as long as half of shortest interval between its margin and metacoxa; submesocoxal lines subtriangular, appearing impunctate. Metanepisternum lacking microsculpture, convex, narrowing anteriorly, suture impressed, oblique, slightly rounded at angles. Tibiae straight. Exposed tergites and ventrites with strigulate microsculpture absent from lateral parts of ventrite I, very finely punctate. Ventrite I with punctation hardly visible on lateral areas; submetacoxal areas 0.06 mm long, approximately as half of shortest interval between its margin and apical margin of ventrite; submetacoxal lines convex, very finely punctate.

**Male.** Protarsomeres I to III widened, with tenent setae, protarsomere I narrower than apex of protibia. Mesotarsomeres I to III not widened. Ventrite VI with triangular, 0.05 mm long lobe. Aedeagus (Figs 17, 18) 0.71 mm long.

**Comments:** The aedeagal characters suggest relationships of this new species with *S. flexuosum* Löbl, 1986 and *S. garomontium* Löbl, 1986 from Northeast India, *S. nigrum* Löbl, 1986 from Malaysia, *S. pseudosolutum* Löbl, 2000 from Yunnan, and *S. onerosum* Löbl, 2023 from East Malaysia. The new species may be distinguished from *S. flexuosum* and *S. garomontium* by the dorsal valve of the median lobe triangular, narrower than the ventral branch and bent at tip, the clearly tubular mesal section of the internal sac, and the entire metaventrite very finely punctate and lacking impressions. *Scaphisoma nigrum* is distinguished by its black body, the microsculptured metaventrite and the lobed parameres. The two last characters are shared with *S. pseudosolutum*. *Scaphisoma gentile* Löbl, 1982 from Japan having lobed parameres is likely also related to these species. It is distinguished by its larger body (length 2.0-2.10 mm), the metaventrite with microsculpture, an apicomedian impression and the puncture pattern, and the curved mesotibiae. *Scaphisoma onerosum* has the apical process of the median lobe arcuate and the tip of its dorsal branch incurved.

**Distribution:** Kerala.

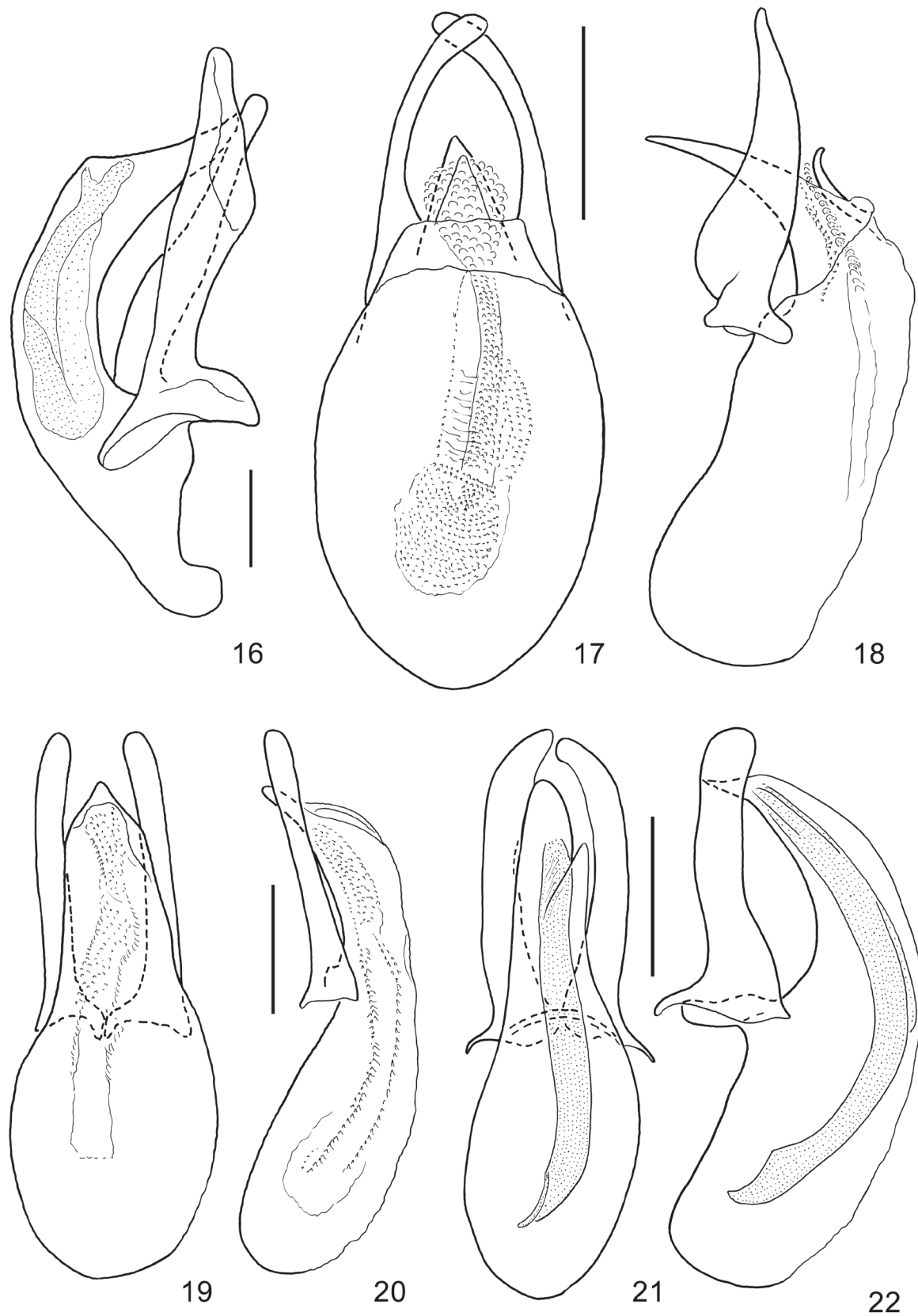
***Scaphisoma onam* Löbl, sp. nov.**

Figs 6, 19, 20

**Holotype:** MHNG, male; INDIA: Kerala Cardamom Hills, 300 m 27-29.12.93, ca 50 km NW Pathanamthitta, 77°05'E 9°25'N, Boukal & Kejval.

**Paratype:** MHNG, female; with same data as holotype.

**Diagnosis:** Rather large species with black pronotum, elytra with large reddish spot surrounded by blackish



Figs 16-22. *Scaphisoma* spp., genital characters. (16) *S. holi* sp. nov., aedeagus in lateral view, scale = 0.1 mm. (17) *S. kejvali* sp. nov. aedeagus in dorsal view, scale = 0.2 mm. (18) ditto, lateral view. (19) *S. onam* sp. nov., aedeagus in dorsal view, scale = 0.1 mm. (20) ditto, lateral view. scale = 0.1 mm. (21) *S. poram* sp. nov., aedeagus in dorsal view, scale = 0.1 mm. (22) ditto, lateral view.

areas (Fig. 6); antennomere III as long as antennomere IV, elytra with sutural striae extending along base to form basal striae, hypomeron and mesanepisternum smooth, mesoventrite impunctate, mesepimeron moderately long, metaventrite lacking microsculpture, with very fine and sparse punctation, submesocoxal lines convex, antecoxal puncture rows absent, abdomen with strigulate microsculpture, ventrite I with submetacoxal areas about half as long as shortest interval between its margin and apical margin of ventrite, aedeagus symmetrical, apical process elongate, slightly inflexed, at tip blunt, with membranose dorsal side, basal bulb oval, without prominent articular process, parameres narrow, nearly straight, unlobed, internal sac tubular, with minute spine-like structures.

**Etymology:** The species epithet is the name of one of the South Indian festivals.

**Description:** Length 1.73 mm, width 1.14-1.18 mm. Head and pronotum black. Elytron black on narrow basal stripe, along lateral margin, on wider adsutural area gradually narrowing apicad and joint by narrow subapical dark band to black lateral area; elytral disc with large, oblique reddish spot, apical margin yellowish (Fig. 6). Venter of thorax and abdomen dark reddish-brown to black, abdominal apex yellowish; femora and tibiae reddish-brown, tarsi and antennae yellowish. Length/width ratios of antennomeres: III 10/10: IV 10/9: V 22/10: VI 45/11: VII 50/18: VIII 42/10: IX 47/14: X 50/13: XI 60/13. Pronotum and elytra lacking microsculpture. Pronotum with lateral margins arcuate; lateral margin stria concealed in dorsal view, impunctate; discal punctation dense and rather coarse, very fine along lateral margins. Tip of scutellum exposed. Elytron weakly narrowing apicad, with lateral margin arcuate, lateral margin striae visible posteriad of mid-length, punctate; apical margin truncate, lacking distinct crenulation; inner apical angle situated at level of outer angle; sutural margin not raised; sutural striae deep, parallel, curved at pronotal lobe and extending laterally to form basal stria which reaches outer half of basal width of elytra; adsutural area flat, ca. 0.05 mm wide shortly posteriad of scutellar tip, with single puncture row; punctation sparse and very fine on anterior half of disc, becoming denser and coarser apicad, puncture intervals in apical half mostly about 2 to 5 times as large as puncture diameters. Hind wing fully developed. Hypomera and mesanepisterna smooth. Mesoventrite very finely punctate. Mesepimeron 3 times as long as wide and as long as interval between its tip and mesocoxa. Metaventrite lacking microsculpture, flattened on apicomedian area, lacking impressions, with punctation very fine and sparse between mesocoxae and on lateral areas, rather conspicuous on most of median area and between mesocoxae and metacoxae; antecoxal puncture rows absent; submesocoxal areas ca. 0.04 mm long,

about as long as fourth of shortest interval between its margin and metacoxa; submesocoxal lines convex, appearing impunctate. Metanepisternum lacking microsculpture, flat, narrowing anteriorly, suture impressed, oblique, slightly rounded at posterior angle. Tibiae straight. Exposed tergites and ventrites with strigulate microsculpture. Ventrite I with punctation rather coarse on median area, very fine and sparse on lateral areas; submetacoxal areas 0.05 mm long, about as long as fourth of shortest interval between its margin and apical margin of ventrite; submetacoxal lines convex, rather coarsely punctate. Following ventrites very finely punctate.

*Male.* Protarsomeres I to III slightly widened, protarsomere I narrower than apex of protibia. Mesotarsomeres I to III not widened. Lobe of ventrite VI triangular, 0.05 mm long. Aedeagus (Figs 19, 20) 0.43 mm long.

**Comments:** The aedeagal characters suggest a relationship with *S. inhospitale* Löbl, 1990, from Himachal Pradesh. The new species may be easily distinguished by the body and aedeagus significantly smaller, the conspicuous colour pattern of the elytra, the abdomen with strigulate microsculpture and the size of the antennomeres, especially by the very short antennomere IV and the antennomere XI nearly 5 times as long as wide.

***Scaphisoma pooram* Löbl, sp. nov.**

Figs 8, 21, 22

**Holotype:** MHNG, male; INDIA, Kerala Cardamom Hills 15 km SW Munnar, Kallar Vall[ey]. 1000 m, 6-18.12.1993 D. Boukal & Z. Kejval.

**Paratypes:** MHNG, 5 males, 5 females; with same data as the holotype.

**Diagnosis:** Rather large species with blackish pronotum, elytra blackish with two lighter transverse bands (Fig. 8); antennomere IV longer than antennomere III, elytra with sutural striae extending along base to form basal striae, hypomeron and mesanepisternum smooth, mesoventrite impunctate, mesepimeron moderately long, metaventrite lacking microsculpture, with very fine and sparse punctation, submesocoxal lines convex, antecoxal puncture rows absent, abdomen lacking microsculpture, ventrite I with submetacoxal areas about as long as third of shortest interval between its margin and apical margin of ventrite, aedeagus symmetrical, apical process elongate, inflexed, with tip acute in lateral view, blunt tip in dorsal view, dorsal valve weakly sclerotized, narrowing apicad, basal bulb elongate-oval, with articular process prominent ventrally, parameres fairly wide, moderately curved, unlobed, internal sac tubular, lacking spine-like or scale-like structures.

**Etymology:** The species epithet is the name of a Hindu festival.

**Description:** Length 1.85-1.93 mm, width 1.20-1.28 mm. Head and pronotum blackish, elytron blackish along suture, lateral margins and on large middle area, very narrowly blackish along basal margin, darkened along apical margin, with large ochraceous subbasal band notched in middle and extending laterally nearly to middle third of elytral length and smaller, yellowish subapical band (Fig. 8). Venter of thorax blackish, abdomen dark brown to rufous with light apex. Femora and tibiae ochraceous, tarsi and antennomeres yellowish. Length/width ratios of antennomeres as: III 15/11: IV 20/6: V 30/8: VI 35/11: VII 18/15: VIII 30/13: IX 38/18: X 37/15: XI 60/15. Pronotum and elytra lacking microsculpture. Pronotum with lateral margins arcuate; lateral margin stria concealed in dorsal view, impunctate; discal punctation sparse and very fine, visible at 20 times magnification. Tip of scutellum exposed. Elytron weakly narrowing apicad, with lateral margin oblique, basal area excepted; lateral margin striae concealed, impunctate; apical margin slightly rounded, with distinct crenulation; inner apical angle situated at level of outer angle; sutural margin raised; sutural striae deep, slightly converging apicad, curved at pronotal lobe and extending laterad to form basal stria reaching outer half of basal width of elytron; adsutural area flat, ca. 0.06 mm wide shortly posterior of scutellar tip, with irregular puncture row; punctation very fine and sparse near base, rather similar to pronotal punctation, becoming denser and coarse apicad, with puncture intervals about 2 to 5 times as large as puncture interval on dark middle area. Hind wing fully developed. Mesoventrite impunctate. Hypomera smooth. Mesoventrite impunctate. Mesepimeron 3 times as long as wide and as long as interval between its tip and mesocoxa. Metaventrite lacking microsculpture, slightly convex in middle, lacking impressions, with punctation very fine and sparse, somewhat denser and less fine on apicomedian area than between mesocoxae and on lateral areas; antecoxal puncture rows absent; submesocoxal areas ca. 0.05 mm long, about as long as fifth to fourth of shortest interval between its margin and metacoxa; submesocoxal lines convex, punctate. Metanepisternum lacking microsculpture, flat, narrowing anteriorly, suture impressed, oblique, slightly rounded at angles. Protibiae straight, mesotibiae and metatibiae hardly curved. Exposed tergites and ventrites lacking microsculpture, sparsely and very finely punctate. Ventricle I with submetacoxal areas 0.07 mm long, about as long as third of shortest interval between its margin and apical margin of ventrite; submetacoxal lines convex, finely punctate.

**Male.** Protarsomeres I to III distinctly widened, with tenet setae; protarsomere I narrower than apex of protibia.

Mesotarsomeres I to III hardly widened. Ventricle VI with triangular, 0.05 mm long lobe. Aedeagus (Figs 21, 22) 0.35-0.38 mm long.

**Comments:** The aedeagal characters of this species suggest a relationship with *S. rubripenne* Löbl, 2003 from Nepal. The new species may be easily distinguished by the broad parameres not widened apicad in lateral view. In addition, its aedeagus is significantly smaller and the parameral process of the median lobe is prominent ventrally. This new species differs from *S. rubripenne* notably by the elytra bicolour with basal striae not joining lateral striae, the antennomere IV much longer than the antennomere III, the antennomere XI parallel-sided and 4 times as long as wide, and the metaventrite lacking a median tubercle.

#### New records

##### *Scaphisoma bayau* Löbl, 1979

**Material examined:** MHNG; 1, Kerala, Cardamom Hills, 15 km SW Munnar, Kallar Valley, 1000 m, 6-18.XII.1993, D. Boukal & Z. Kejval leg. – 1, Kerala, Cardamom Hills, 30 km W Peermade, 900 m, 25.XII.1993, D. Boukal & Z. Kejval leg. – 4, Kerala, Cardamom Hills, ca 50 km NW Pathanamthitta, 77°05'E, 9°25'N, 300 m, 27-29.XII.1993, D. Boukal & Z. Kejval leg. – 2, Tamil Nadu, Nilgiri Hills, SE Kotangiri, Kunchappanai, 900 m, 17-28.IX.1993, D. Boukal & Z. Kejval leg.

**Distribution:** India: Kerala, Tamil Nadu.

**Comment:** The species was based on two specimens collected near the Valara Falls, 46 km SW of Munnar.

##### *Scaphisoma besucheti* Löbl, 1971

**Material examined:** MHNG; 1, Kerala, env. Kallar, 30 km NE of Trivandrum, valley of River Kallar, 77°04'E, 8°45'N, ca 300-500 m, 28-30.IV.1999, Z. Kejval & M. Trýzna leg.

**Distribution:** India: Himachal Pradesh, Kerala, Madhya Pradesh, Tamil Nadu, Uttarakhand; Nepal; Sri Lanka.

##### *Scaphisoma kali* Löbl, 1979

**Material examined:** MHNG; 8, Kerala, Cardamom Hills, 15 km SW Munnar, Kallar Valley, 1000 m, 6-18.XII.1993, D. Boukal & Z. Kejval leg.

**Distribution:** India: Kerala, Tamil Nadu.

**Comment:** All new specimens are males.



*Scaphisoma mussardi* Löbl, 1971

**Material examined:** MHNG; 1, Tamil Nadu, Nilgiri Hills, 15 km SE of Kotagiri near Kunchappanai, 76°56'E, 11°22'N, 900 m, 13-20.V.1994, Z. Kejval leg.

**Distribution:** India: Tamil Nadu; Sri Lanka.

*Scaphosoma nigrofasciatum* Pic, 1915

**Material examined:** MHNG; 1, Kerala, Cardamom Hills, ca 50 km NW Pathanamthitta, 77°05'E, 9°25'N, 300 m, 27-29.XII.1993, D. Boukal & Z. Kejval leg. – 1, Kerala, Cardamom Hills, 15 km SW Munnar, Kallar Valley, 1000 m, 6-18.XII.1993, D. Boukal & Z. Kejval leg. – 6, Kerala, Cardamom Hills, 15 km SE Kotagiri, Kunchappanai, 900 m, 17-28.IX.1993, D. Boukal & Z. Kejval leg.

**Distribution:** India: “engalien”, Goa, Himachal Pradesh, Kerala, Tamil Nadu, Uttarakhand; Sri Lanka; Nepal; La Réunion; Mauritius; Seychelles.

**Comment:** The colour of the pronotum is variable. It may be nearly uniformly ochraceous, or with two dark admesal bands (Fig. 4), like that of *S. pictum* Motschulsky, 1863 (Fig. 7).

*Scaphisoma perbrincki* Löbl, 1971

**Material examined:** MHNG; 8, Kerala, Cardamom Hills, ca 50 km NW Pathanamthitta, 77°05'E, 9°25'N, 300 m, 27-29.XII.1993, D. Boukal & Z. Kejval leg.

**Distribution:** India: Kerala, Goa; Sri Lanka.

**Comments:** This species may be distinguished from all South Indian and Sri Lankan congeners by the ventrite I with large submetacoxal areas, longer than the intervals between them and the apical margin of the ventrite.

*Scaphisoma skanda* Löbl, 1979

**Material examined:** MHNG; 11, Kerala, Cardamom Hills, ca 50 km NW Pathanamthitta, 77°05'E, 9°25'N, 300 m, 27-29.XII.1993, D. Boukal & Z. Kejval leg. – 4, Kerala, Cardamom Hills, Vallakadavu, 1000 m, 77°07'E, 9°31'N, 24.XII.1993, D. Boukal & Z. Kejval leg. – MHNG, NHML, NMPC; 49, Kerala, Cardamom Hills, 30 km W Peermade, 900 m, 25.XII.1993, D. Boukal & Z. Kejval leg. – MHNG; 2, Kerala, Cardamom Hills, Pamba env. ca 50 km NW of Pathanamthitta, valley of Pambayiar River, 77°05'E, 9°25'N, ca 300 m, 15-18.V.1999, J. Kejval & M. Trýzna leg. – MHNG; 2, Karnataka, Coorg Distr., NE of Virajpet, 75°50'E, 12°13'N, ca 500 m, 4-8.VI.1999, J. Kejval & M. Trýzna leg.

**Distribution:** India: Kerala, Tamila Nadu, Karnataka.

*Scaphisoma swapna* Löbl, 1979

**Material examined:** MHNG, NHML, NMPC; 136, Tamil Nadu, Nilgiri Hills, SE Kotangiri, Kunchappanai, 900 m, 17-28.IX.1993, D. Boukal & Z. Kejval leg.

**Distribution:** India: Tamila Nadu.

*Scaphisoma tetrastictum* Champion, 1927

**Material examined:** MHNG; 1, Kerala, Cardamom Hills, 10 km SW Munnar, Vattian, 77°01'E, 10°02'N, 1000 m, 5-17.XII.1993, D. Boukal & Z. Kejval leg. – 3, Kerala, Cardamom Hills, 15 km SW Munnar, Kallar Valley, 1000 m, 6-18.XII.1993, D. Boukal & Z. Kejval leg.

**Distribution:** India: Assam, Himachal Pradesh, Kerala, Meghalaya, Tamila Nadu, Uttarakhand; Nepal; China; Myanmar; Sri Lanka; Thailand; Taiwan; Vietnam.

**Comments:** The species may be distinguished from its South Indian congeners by the elytral colour pattern (Fig. 9), although rather variable, in combination with the small body size.

*Scaphobaeocera* Csiki, 1909

This genus is with over 120 species mainly distributed in the tropics and subtropics of the Old World and of Australia, only a few species occur in Far East Russia, Japan, and North China. Members of the genus have elongated antennomeres III, extending to the basal angles of the pronotum, oblique hypomera, approximate metacoxae, and lack submetacoxal lines. Most have elytra iridescent and with parasutural striae. Five species have been reported from South India (Löbl, 1979), the following is now added.

*Scaphobaeocera stipes* Löbl, 1971

**Material examined:** MHNG, male; Kerala, Cardamom Hills, ca 50 km NW Pathanamthitta, 77°05'E, 9°25'N, 300 m, 27-29.XII.1993, D. Boukal & Z. Kejval leg.

**Distribution:** India: Kerala; Sri Lanka.

**Comments:** This species resembles *S. soror* Löbl, 1979 and *S. difficilis* Löbl, 1979, described from South India. It may be distinguished by the aedeagal characters, notably by the prominent parameral process and the unconvoluted flagellum of the internal sac.

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