

The genus *Spermophagus* in Vietnam: biological data and description
of three new species
(Coleoptera: Chrysomelidae: Bruchinae: Amblycerini)

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ABSTRACT. In his 1991 revision of the genus, BOROWIEC mentioned nine Vietnamese species of *Spermophagus*. No addition to his list has been made since. Convolvulaceae and Malvaceae seed samples collected in the southern part of the country yielded seven *Spermophagus* species. Among these, three are new to science (*S. cornutus*, *S. insularis* and *S. voarum*). One further species (*S. titivilitius* BOH.) has never been reported from Vietnam. The number of Vietnamese *Spermophagus* species now amounts to 13, and the larval food plants of nine of them are identified.

Key words: entomology, taxonomy, Coleoptera, Bruchinae, new species, Convolvulaceae, Malvaceae, *Ipomoea*, *Merremia*, *Urena*.

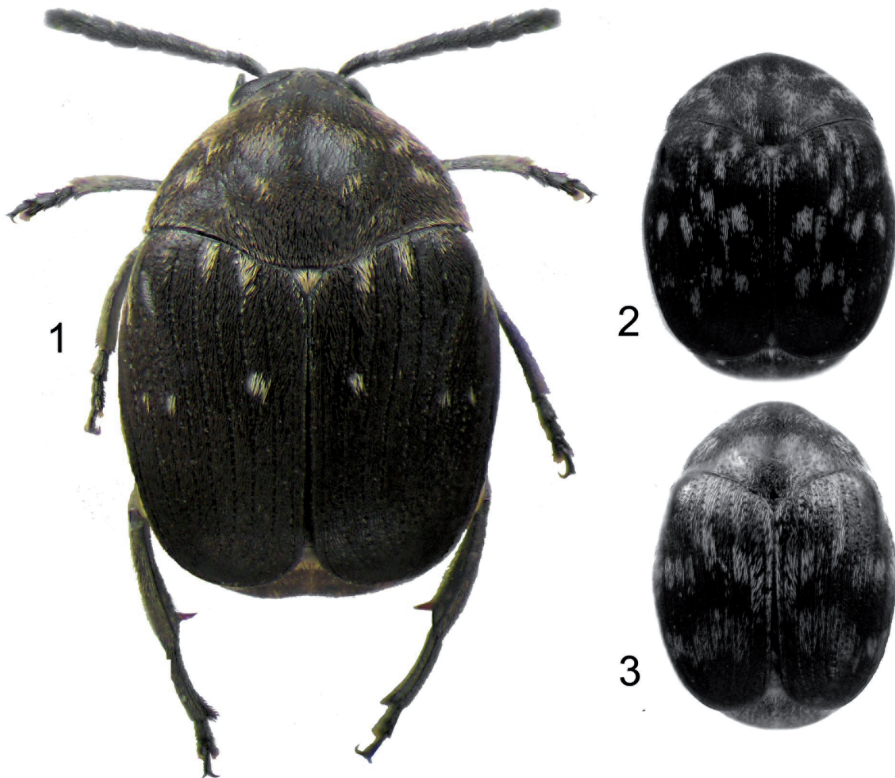
INTRODUCTION

The genus *Spermophagus* is limited to the Old World. BOROWIEC's (1991) major revision included 90 species (plus 11 *incertae sedis*), 43 of them from the Ethiopian region, 31 from tropical Asia, 13 from the West Palaearctic region, and only three from the East Palaearctic region. Since then, 21 species have been described, 11 of them from the Oriental region (ANTON 1993, 1996, 1999a, b, 2000, BOROWIEC 1995) and 10 (ZAMPETTI 1992, BOROWIEC 1994, WENDT 1995) from the Ethiopian region.

BOROWIEC (1991) reported nine species of *Spermophagus* from Vietnam: *S. abdominalis* (F.), *S. aeneipennis* PIC, *S. drak* BOROWIEC, *S. ligatus* CHEVROLAT, *S. mannarenis* DECELLE, *S. negligens* PIC, *S. niger* MOTSCHULSKY, *S. perpastus* LEA (= *pfaffenbergeri* BOROWIEC), *S. variolosopunctatus* GYLLENHAL, and *S. vietnamensis* BOROWIEC. The seed beetle fauna of the country seems rather poor when compared with that of neighbouring

countries such as Laos or Thailand. Also, the biology of most of these species remains unknown; the mere identification of larval host plants is often lacking.

Except for a few doubtful records, all known host plants of world *Spermophagus* belong to only two botanic families, namely Convolvulaceae and Malvaceae (BOROWIEC 1991). During several visits in the Southern part of the country, we gathered a number of fruit and seed samples of these two families. Areas visited were the HoChiMinh, TayNinh, DongNai, LamDong and KhanhHoa Provinces; PhuQuoc Island, in the gulf of Thailand, was also explored. Techniques used for the collection of samples and rearing were similar to those described earlier (DELOBEL 2003). We report here on seven *Spermophagus* species that were reared from field-collected seeds, three of which are new to science. Convolvulaceae were identified using the Flora of RHUI-CHENG & STAPLES (1995), and Malvaceae using that of PHAM-HOANG HÔ (2002). In a few instances, data are incomplete because the host plant could not be properly identified (this usually happens when the plant has dried up and leaves or flowers are unavailable). After the emergence of adults, part of the specimens was stored in 95% ethanol for further DNA analysis.



1-3. Habitus of male *Spermophagus*: 1 – *S. cornutus*, 2 – *S. insularis*, 3 – *S. voarum*

REVIEW OF SPECIES

***S. abdominalis* (F.)**

KINGSOLVER & BOROWIEC (1988) and BOROWIEC (1991) synonymized not less than 21 tropical Asian and African species under *abdominalis*. The colour of Vietnamese specimens belonging to this highly polymorphic species ranges from entirely red, with only head and posterior tibiae and tarsi black, to entirely black, except for red apical abdominal sternites.

TayNinh Province: TrangBang, April 2005; BinhDuong Province: LaiThieu, January 2007, reared from *Ipomoea* sp. and *Xenostegia tridentata* (Convolvulaceae) seeds; DongNai Province: VinhAn, February 2007, reared from *Merremia hederacea* (Convolvulaceae) seeds; KhanhHoa Province: NhaTrang, February 2007, reared from *Ipomoea pes-tigridis* and *Xenostegia tridentata* seeds. There are reports of this species on several other host plants (BOROWIEC 1991): *Ipomoea hederacea*, *I. purpurea*, *I. quamoclit*, *I. reptans* (a synonym of *I. aquatica* according to ITIS, 2007), as well as a few unidentified hosts or plants that cannot be considered as larval hosts. The exact identity of another reported host, *Calystegia dahurica*, remains doubtful.

***Spermophagus cornutus* n. sp.**

TYPE MATERIAL

Holotype, Male, "Vietnam, Ile de PhuQuoc, DuongDong, 12 février 2007, ex graines de *Merremia umbell. orientalis*, H. & A. Delobel coll.", genitalia dissected (slide 01307), MNHN. Paratypes: 4 males and 9 females, same data as holotype, one female dissected (slide 03207), MNHN.

DESCRIPTION

Length: 2.4-2.8 mm, width: 1.6-1.9 mm. Body short ellipsoid. Integument black, only hind tibial spines reddish. Vestiture moderately dense, denser on pronotum and pygidium, dark brown, yellowish-grey and whitish. Largely yellowish grey on anterior pronotum margin, especially laterally, four large and irregular spots in the middle, two spots basally on disc, and two oblique lines laterally. Scutellum white. Elytra dark brown, with small conspicuous white spots at base and before middle of interstriae 3 and 5, and at middle of interstriae 7 and 9; base of interstriae 10 to 12 yellowish-grey (Fig. 1). Pygidium base with a band of long yellow pubescence, rest with mixture of yellow and grey setae.

Male. Head short, clypeo-labral area concave, eyes emarginate to less than 2/3 length. Frons = 0.3 to 0.4 width of eye, without distinct medial keel. Antennae moderately long, extending beyond humeral callus. Segment 3 about twice longer than 2, segments 6-10 about 1.2 times longer than wide.

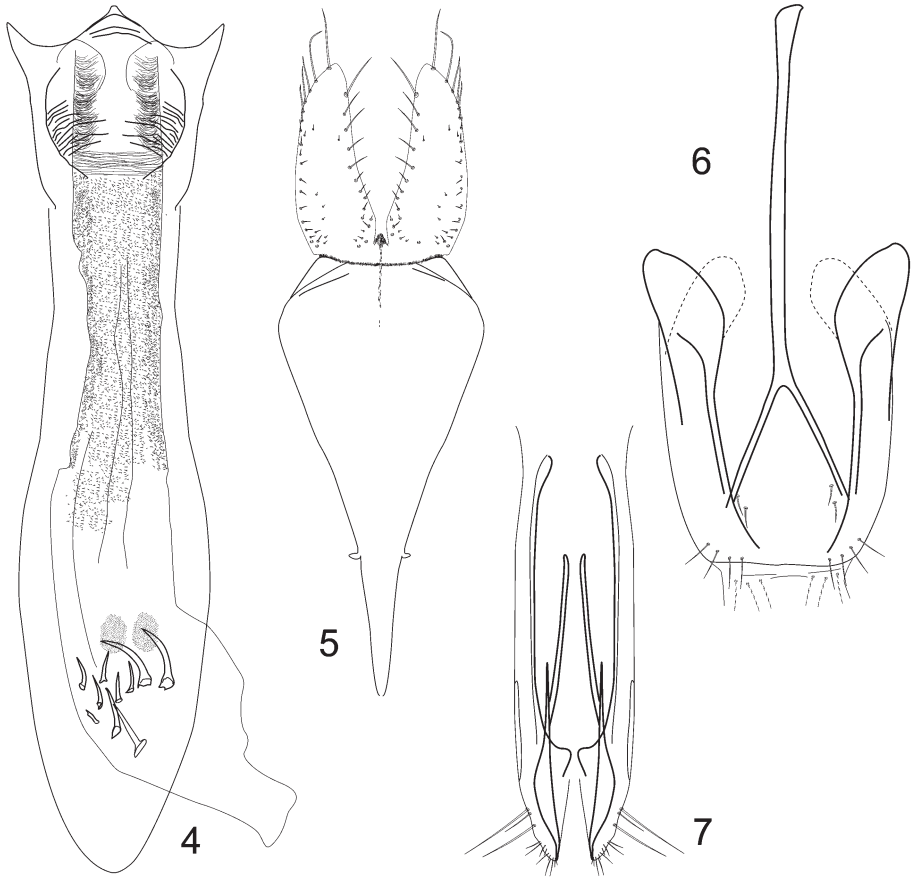
Pronotum anteriorly semicircular when seen perpendicular to base, wide (W/L = 1.6); with large ocellate punctures, almost contiguous on sides, smaller on disc. Pronotal margin in lateral view feebly convex.

Elytra slightly shorter than wide together; their intervals finely punctate, with irregular rows of large punctures. Pygidium 1.2 times wider than long, posteriorly strongly convex, densely punctate, with large punctures almost touching each other, less so anteriorly.

Legs. Hind tibia with dorsolateral carina complete, lateral carina complete, not serrate. Hind tibial spines straight, sharp, subequal in length. First segment of hind tarsi with apical spine almost as long as second segment.

Abdomen with apical margin of fifth ventrite strongly concave, length at middle about half maximum length.

Genitalia. Median lobe (Fig. 4) rather stout, ventral valve with lateral expansions, apically pointed, dorsal valve rounded; internal sac in valve area with two longitudinal strands of thin needles, then lined with numerous minute spines; apical part with two elongate, hooked spines, and 8 smaller, straight ones; with a pair of faintly granulated



4-7. *Spermophagus cornutus* genitalia, ventral view: 4 – median lobe, 5 – lateral lobes of tegmen, 6 – ovipositor, segment VIII, 7 – ovipositor, segment IX

sclerites. Tegmen wide, strongly convex, parameres short and wide, their margins with numerous sensory setae (Fig. 5).

Female. Similar to male, but apical margin of fifth ventrite hardly concave, pygidium subvertical, almost flat. Genitalia: anterior branches of spiculum gastrale (Fig. 6) particularly thin and long, segment IX (Fig. 7) elongated, parallel-sided, of a simplified type, without pecten or pubescent suture.

AFFINITIES

The shape of the ventral valve in male genitalia shows some similarity with *S. radjasthanicus* ANTON (ANTON 1993) from India, but parameres are of a very different type, and internal sac lacks spines. In fact *S. cornutus* seems more closely related with *S. kannegieteri* PIC from Indonesia, which possesses a similar tegmen, and a wide (though unarmed) ventral valve. Moreover, the ovipositor of *S. kannegieteri* is of a strongly modified and simplified type, much as in *S. cornutus*. The apical part of the internal sac is however completely devoid of spines in *S. kannegieteri*.

ETYMOLOGY

The species name refers to the shape of the ventral valve.

HOST PLANTS

Material from Phu Quoc was reared from ripe fruits of *Merremia umbellata orientalis* (H. HALLIER) (Convolvulaceae).

DISTRIBUTION

Vietnam (PhuQuoc Island).

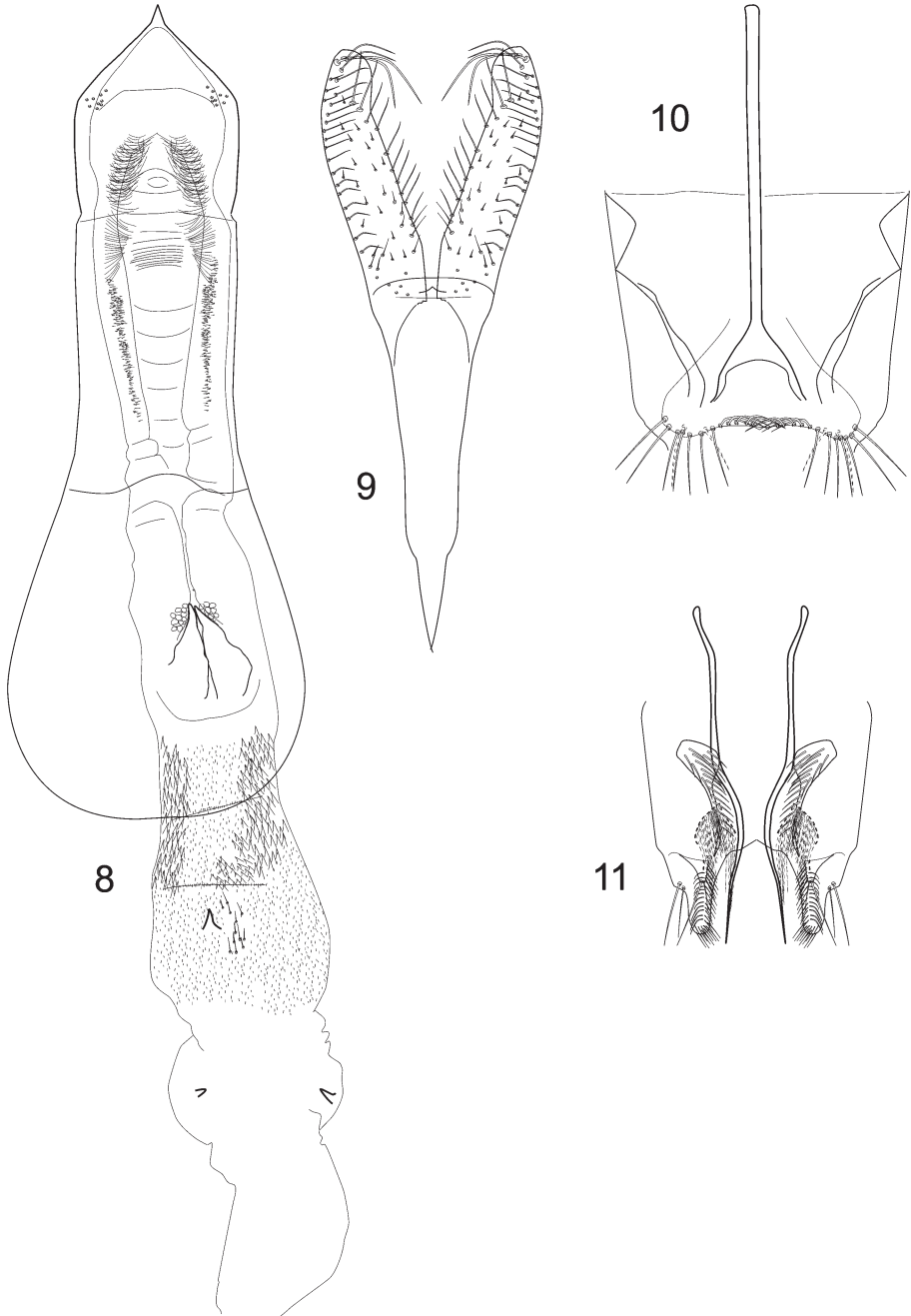
Spermophagus insularis n. sp.

TYPE MATERIAL

Holotype, Male, "Vietnam, Ile de PhuQuoc, DuongDong, 12 février 2007, ex graines de *Merremia umbell. orientalis*, H. & A. Delobel coll.", genitalia dissected (slide 01407), MNHN. Paratypes: 2 males and 8 females, same data as holotype, one female dissected (slide 03107), MNHN.

DESCRIPTION

Length: 2.2-2.3 mm, width: 1.8 mm. Body short ellipsoid, almost circular. Integument black, only hind tibial spines reddish brown. Vestiture moderately dense, dark brown and whitish. A few white setae thinly scattered on anterior pronotum margin, four spots at anterior third, two on disc, surrounded by a large V-shaped line, and sides also white. Elytra with numerous, small, white spots: three spots in intervals 3, 5, 7, and two elongated and fainter spots in intervals 2, 4, 6; scutellum and scattered setae along suture, white; posterior fourth of elytra entirely dark (Fig. 2). Pygidium with mixed



8-11. *Spermophagus insularis* genitalia, ventral view: 8 – median lobe, 9 – lateral lobes of tegmen, 10 – ovipositor, segment VIII, 11 – ovipositor, segment IX

grey and white pubescence (white more abundant posteriorly), with three triangular basal spots and sometimes a transverse band of lighter hair.

Male. Head short, eyes emarginate to $2/3$ length. Face = 0.6 to 0.7 width of eye, not concave, with distinct medial elevation, densely and irregularly punctated. Clypeolabrum convex or flat. Antennae cylindrical, extending beyond humeral callus, with segment 2 small, 3 and 4 slightly longer, square, following segments of increasing length.

Pronotum transverse ($L/l = 0.57$), doubly punctured. Large punctures disposed on whole pronotal disc, punctures larger and denser on sides. Pronotal margin in lateral view feebly convex.

Elytra together slightly wider than long ($L/l = 0.94$). Elytral intervals finely punctate, with irregular rows of larger punctures. Pygidium very convex in posterior $1/4$ th, densely punctate, large punctures almost touching each other.

Legs. Hind tibia with dorsolateral carina complete, and lateral carina not serrate. Hind tibial spines straight, sharp, anterior 1.3 times longer than posterior. First segment of hind tarsi with apical spine measuring about $2/3$ of second segment.

Abdomen with posterior margin of last ventrite strongly emarginate.

Genitalia. Ventral lobe short, ventral valve large, pentagonal, apex acute, dorsal valve slightly smaller than ventral, with rounded apex (Fig. 8). Anterior third of internal sac with two longitudinal, lateral bands of fine, dense needles, in the middle with a pair of elongated, triangular plates ending in two spines surrounded by a patch of partly sclerotized squamae followed by one small cone-like sclerite, and at the end with two pin-like sclerites. Between large plates and pin-like sclerites numerous very small spines, two patches of small hyaline denticles, and a few setae around cone-like sclerite. Lateral lobes parallel-sided, moderately long, only slightly narrowed apically, with apex rounded. Margins of lobes with several, long, dense hair, surface of lobe with several shorter hairs (Fig. 9). Basal plate with dense ctenoid plates.

Female. Similar to male, except last ventrite feebly emarginate, pygidium more regularly convex, antennae very slightly shorter, with segments 5-10 square. Genitalia: ovipositor short, spiculum gastrale long (Fig. 10), segment IX short and wide, with oblique pubescent suture distinct in both internal and external part of lobe, without circular pigmentation, pecten with enlarged base fused with lateral sclerotisation of lobe, apical lobe tapered, ending in a cylindrical apex. Longitudinal apodemes of sternite IX extending posteriorly beyond gonopode apices (Fig. 11).

AFFINITIES

S. insularis belongs to the *S. johnsoni* species group (BOROWIEC 1991). Elytral pattern is quite similar with that of *S. johnsoni* BOROWIEC from Burma, but pronotum pattern is different. It differs also in the shape and size of sclerites in the internal sac, shape of tegmen and the presence of squamose plates. Differs from *S. samuelsoni* BOROWIEC from Thailand and Malaysia in the shape of ventral and dorsal valves, the number and shape of sclerites in the internal sac. The ovipositor of this species is quite similar with that found in *S. negligens* females, possibly indicating that the *S. negligens* and *S. johnsoni* groups are closely related.

ETYMOLOGY

The species name refers to the Vietnamese island of PhuQuoc, in the Gulf of Thailand.

HOST PLANT

Material from PhuQuoc wa reared from ripe fruits of *Merremia umbellata orientalis* (H. HALLIER) (Convolvulaceae).

DISTRIBUTION

Vietnam (PhuQuoc Island)

***Spermophagus negligens* PIC**

TayNinh Province: TrangBang, Decembre 2005, reared from *Urena lobata* (Malvaceae) seeds (first record of host plant); HoChiMinh Province: NhaBé, January 2006; LamDong Province: Dalat, February 2002; PhuAn, Avril 2006, reared from *Urena lobata* seeds.

***Spermophagus perpastus* LEA**

Spermophagus pfaffenbergeri BOROWIEC, 1986: 786.

Spermophagus perpastus LEA : ANTON, 1999a.

BinhDuong Province: LaiThieu, January 2007, reared from *Ipomoea pes-tigridis* (Convolvulaceae) seeds, host previously recorded in India (BOROWIEC 1991).

***Spermophagus titivilitius* BOHEMAN**

HoChiMinh Province: Saigon, February 2002; BinhKhanh, January 2006, reared from *Ipomoea aquatica* (water spinach, “rau muống”) seeds. This species, erroneously described from Mexico, was reported from Pondicherry in India (DECILLE 1983, KING-SOLVER & BOROWIEC 1988). New report for Vietnam, first record of host plant.

***Spermophagus voarum* n. sp.**

TYPE MATERIAL

Holotype, Male, “Vietnam, région LamDong, PhuAn, rte Pougour, 2 février 2007, ex *Urena lobata*, H. & A. Delobel coll.”, genitalia dissected (slide 01807), MNHN. Paratypes: 3 males and 1 female, same data as holotype, female dissected (slide 03307), MNHN.

DESCRIPTION

Length: 2.3-2.4mm, width: 1.6mm.

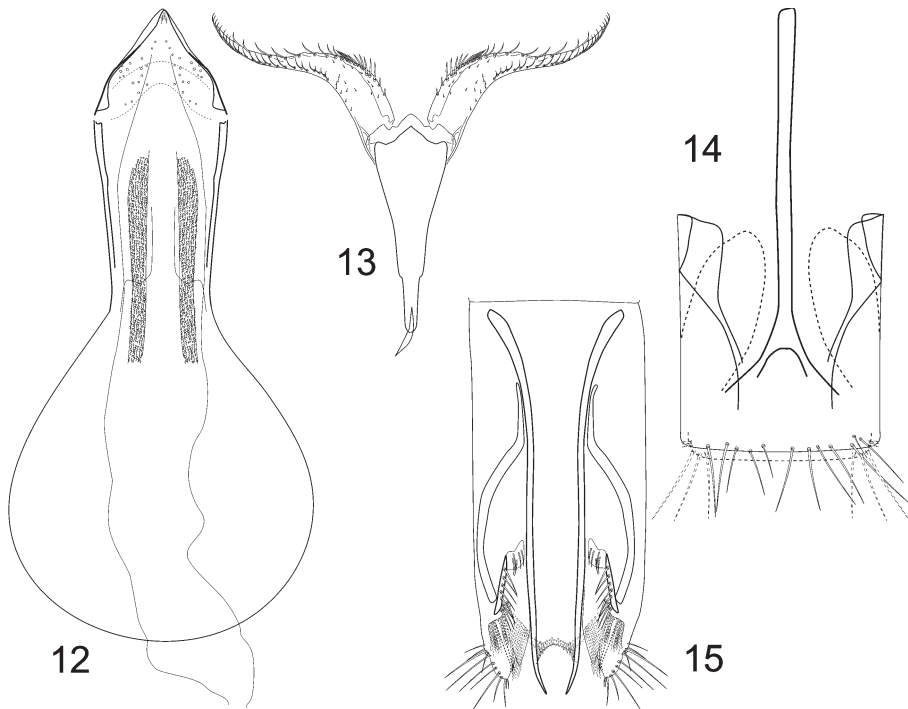
Black, only hind tibial spines reddish. Body short ellipsoid. Vestiture moderately dense and long, brown and golden grey. Anterior third of pronotum greyish, with two dark spots, then 4 elongated spots on disc, sometimes fused; sides of pronotum and scutellum yellowish (Fig. 3). First interstria yellowish, base of elytra with scattered yellowish setae, more abundant on interstriae 3, 5, 7; two transverse irregular bands of yellowish setae at basal third of elytra and at apical fourth, the latter less conspicuous. Central fourth or third of second interstria yellowish. On pygidium dense and long golden setation, except darker crescent.

Male. Head short, eyes emarginate to more than 1/2 length. Frons = 0.4 eye width, shining, with irregular punctures, without medial keel. Antennae rather long, extending to basal third of elytra. Segment 3 and 4 subequal, only slightly longer than 2, segments 6-10 about 1.5 times longer than wide.

Pronotum anteriorly semicircular when seen perpendicular to base, transverse ($W/L = 1.5$); with double punctation, ocellate punctures larger and more numerous on sides, where they are separated by more or less their own diameter. Pronotal margin in lateral view almost straight.

Elytra slightly shorter than wide together; their intervals with shallow punctures.

Legs. Hind tibia with faint dorsolateral carina, lateral carina complete, not serrate. Hind tibial spines straight, sharp, anterior 1.1 times longer than posterior. First posterior



12-15. *Spermothagus voarum* genitalia, ventral view: 12 – median lobe, 13 – lateral lobes of tegmen, 14 – ovipositor, segment VIII, 15 – ovipositor, segment IX

tarsal segment with sharp mucro and a small lateral tooth. First segment of hind tarsi with apical spine measuring about half second segment.

Abdomen. Pygidium 1.1 times wider than long posteriorly strongly convex, with apex turned under, with dense ocellate punctation, becoming contiguous towards apex. Ventral side with large shallow punctures and inconspicuous microsculpture.

Genitalia. Apical margin of fifth ventrite strongly concave, length at middle about 2/3 maximum length. Median lobe short, ventral valve triangular, apically pointed, dorsal valve triangular; internal sac in anterior half with two strands of small granules along margin (Fig. 12). Basal plate of tegmen subtriangular, without triangular sclerite at base, apically pointed and carinated. Parameres long, tapered, S-shaped, acute apically. Inner margin of parameres pigmented in basal half, with short and stout sensillae, distal part with 6-7 long curved setae. Outer margin with about four minute setae in basal third and about 25 moderately long sensillae in distal 2/3 (Fig. 13).

Female. Similar to male, but apical margin of fifth ventrite not concave, antennae shorter. Pygidium more regularly convex. Genitalia: ovipositor of the "standard" type; sternite 8 with spiculum gastrale moderately long (Fig. 14). Tergite 9 rather long and narrow, strongly pigmented, with ill-defined circular pigmentation; longitudinal apodemes long, almost straight and parallel except at base, extending beyond apical lobes; pecten with enlarged base; apical lobes rounded; oblique pubescent suture rather long (Fig. 15).

AFFINITIES

S. voarum belongs to the *S. niger* species group. It differs from *S. drak*, *S. similis* ANTON and *S. aeneipennis* PIC by the position and size of granule strands of the internal sac, the absence of triangular sclerite at base of tegminal plate, the shape and setation of parameres. Female ovipositor is also quite distinctive.

ETYMOLOGY

The species is dedicated to the Vo sisters, for their active and very helpful participation in the survey of Vietnamese seed beetles.

HOST PLANT

The typical material was reared from dry capsules of *Urena lobata* GUILL. & PERR. (Malvaceae), which is also the larval host plant of *S. niger* MOTSCHULSKY in India (BOROWIEC 1991) and *S. negligens* in Vietnam.

DISTRIBUTION

Vietnam (LamDong province).

CONCLUSION

We were able to recover only the three commonest of the nine species of *Spermophagus* that were previously reported from Vietnam: *S. abdominalis*, *S. perpastus* and *S. negligens*. But among the seven species listed here, three are new to science.

This seems to indicate that species presently known represent only a small part of the *Spermophagus* fauna existing in Vietnam. It may be assumed that the rich flora of rarely visited parts of the country harbours a large number of unknown species.

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