

## Dung Beetles (Coleoptera, Scarabaeidae) of Thailand

### Part 1. Genus *Synapsis*

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**Abstract** In the first part of the study on the dung beetles from Thailand, the genus *Synapsis* is dealt with. Three new species are described under the names *S. kiuchii* sp. nov., *S. dickinsoni* sp. nov. and *S. boonlongi* sp. nov. A key to all the *Synapsis* species distributed in Thailand and explanatory photographs are also provided.

### Introduction

Although there are nearly 5,000 described dung beetles belonging to 234 genera of about 12 tribes on the world basis classification (HANSKI & CAMBEFORT, 1991), the dung beetle fauna of Thailand is still very poorly known as compared with other faunas, such as those of Taiwan, Borneo, etc.

One of the authors (K. M.) has contributed much to the survey and identification of the fauna of the dung beetles, Scarabaeidae, Aphodiidae and Trogidae, in North Thailand over the past 10 years, but those of other areas in Thailand are still very little known. The authors have fully realized the necessity of more detailed surveys covering the whole areas of Thailand.

In recent years, Thailand has become much concerned at the loss of biological diversity. Therefore, the Thai Government has set up a programme known as the Biodiversity Research and Training (BRT) to document the biodiversity research and training. Fortunately, the authors have been given a grant from the BRT for conducting a pilot study of the dung beetle fauna of Northeast Thailand and intend to extend this to a full survey of the fauna of Thailand.

This paper is the first contribution of a planned series concerning the Thai dung beetles and deals with the genus *Synapsis* of the tribe Coprini in the family Scarabae-

idae. All the other tribes, genera and species distributed in Thailand will be described by the present authors in forthcoming papers of this series. When this is completed, keys to them will be given in the last part of the series.

The depositories of the holotypes to be designated are the collections of the following museums: DEZ – Insect Museum in the Division of Entomology and Zoology, Department of Agriculture, Ministry of Agriculture and Cooperatives, Bangkok, Thailand; NSMT – National Science Museum (Nat. Hist.), Tokyo, Japan.

### Systematic Position of the Genus *Synapsis*

In his study of the “Fauna of British India, including Ceylon and Burma”, ARROW (1931) placed the genus *Synapsis* BATES in the tribe Coprini of the subfamily Coprinae, which consists of the Scarabaeini, Sysiphini and Coprini. The tribe Coprini *sensu* ARROW included the genera *Synapsis*, *Heliocopris*, *Catharsius*, *Copris*, *Phalops*, *Anoctus*, *Dispysema*, *Caccobius*, *Onthophagus*, *Phacosoma*, *Parachorius*, *Cassolus*, *Liatongus*, *Oniticellus*, *Drepanocerus*, *Onitis* and *Chironitis*.

In his study of the “Coléoptères Scarabéides de l’Indochine”, PAULIAN (1945) regarded this genus as a member of the subfamily Scarabaeinae. His subfamily covered the tribe Coprini *sensu* ARROW.

In his monograph of the Scarabaeidae and Aphodiidae from the Palearctic and Oriental Regions, BALTHASAR (1963) treated this genus as a member of the tribe Coprini in the subfamily Coprinae. The tribe consists of 4 genera: *Synapsis*, *Heliocopris*, *Catharsius* and *Copris*.

Recently, in their studies on the family Scarabaeidae from Borneo, OCHI, KON and KIKUTA (1996) treated this genus as a member of the tribe Coprini in the subfamily Coprinae. The tribe Coprini from this area consists of 4 genera: *Synapsis*, *Catharsius*, *Copris* and *Microcopris*.

### Genus *Synapsis* BATES, 1868

*Synapsis* BATES, 1868, Coleopt. Hefte, **4**: 89. Type species: *Copris brahminus* HOPE.  
*Homalocopris* SOLSKY, 1871, Horae. Soc. ent. ross., **8**: 136.

*General features.* Body rather depressed oval. Head broad, with outer angles strongly produced in front of eyes; clypeus acutely notched at the middle; genae completely fused with clypeus; frons with a median tubercle or an elevation. Antennae short, nine-segmented, with 4th segment a little longer than 3rd, 5th and 6th very short, the last three entirely pubescent.

Pronotum short, with a supplementary lateral carina on each side, uniting in front and behind with outer marginal carina, and enclosing a lenticular space; front angle mostly bearing two or three teeth, hind angle obtuse or almost rounded. Scutellum absent.

Elytra ten-striate, though the 7th striae are often unclear, with rather straight or

rounded sides, sharp lateral carinae, and broad epipleura.

Metasternum long, the hinder part a little produced in the middle, with a rather deep depression, the sides divided transversely by a raised and rather irregularly curved line, extending from end of middle coxal cavity to outer margin.

Legs fairly long but not very slender; mesocoxae widely separated and parallel; protibia with three strong teeth, the terminal one long and blunt; meso- and metatibiae slender at bases, gradually dilated apicad, with digitate apices; protarsi rather short and stout, meso- and metatarsi with diminishing triangular segments, moderately long and not very broad.

*Notes.* Remarkable characteristics distinguishing this genus from species of the other genera in the tribe Coprini are the body not so strongly convex, with pronotum bearing two strong lateral carinae joining in front and behind, protibia with three lateral teeth, meso- and metatibiae without distinct transverse carina on the outer side, etc.

It is very interesting that some species of this genus possess haired hollows near the front angles of the prosternum (Fig. 8), or on the mesepimera (Fig. 9). In some species, the 2nd elytral intervals possess vague swellings near the base. These characters furnish the best diagnoses for identifying the species.

The species of the genus *Synapsis* do not show prominent sexual dimorphism, though we can barely recognize it by the shortened abdominal segments in the male.

*Distribution.* Oriental and Palearctic Regions.

### Description of the New Species

#### *Synapsis kiuchii* sp. nov.

(Figs. 2, 7, 12 & 13)

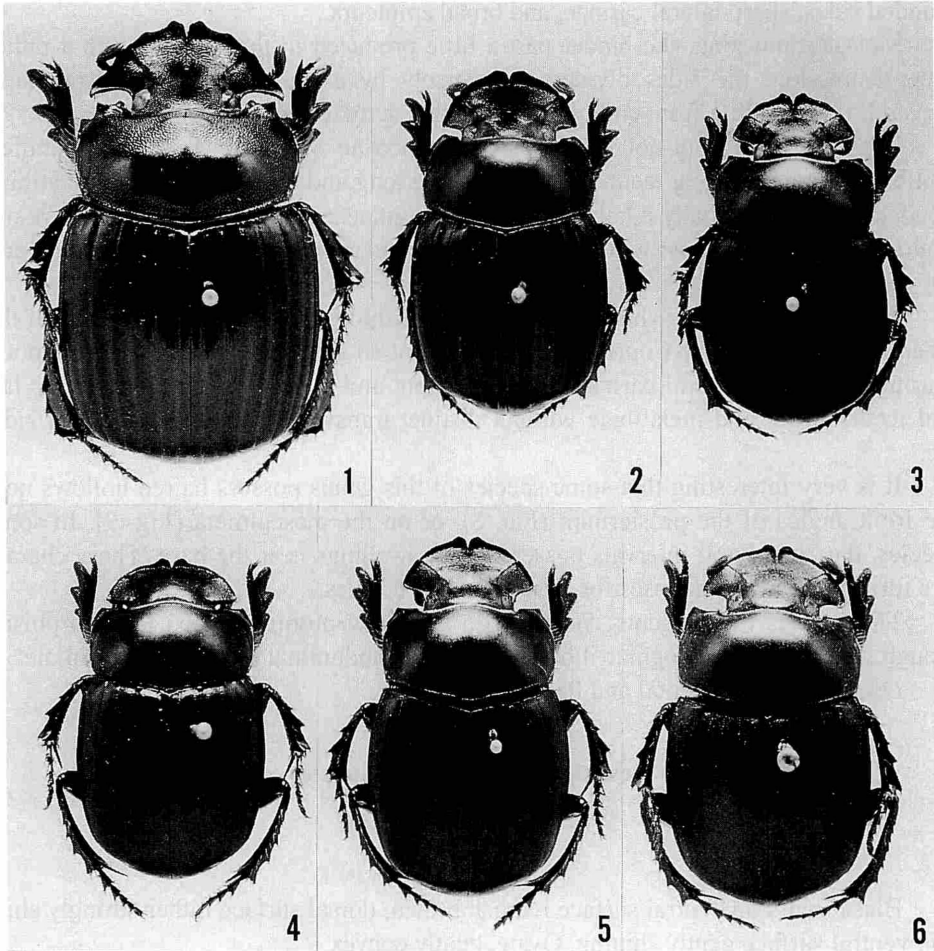
Black, hairs on ventral surface reddish brown; dorsal surface rather strongly shining, ventral surface gently shining. Ovate, gently convex.

Head rather wide, moderately punctate, the punctures varying to rugosities in middle part; clypeus cleft at the middle of front margin, produced and almost vertically reflexed above on each side of the cleavage; frons with a tubercle at the middle; genae somewhat granulate in inner portions, acutely angulate at outer angles, with hind edges weakly emarginate; vertex very slightly depressed.

Pronotum transverse, micro-aciculate, minutely punctate; front angles obtusely angulate, with front edges very feebly sinuous; hind angles almost rounded; base widely triangularly produced.

Elytra finely striate, punctures in the striae almost invisible; intervals micro-aciculate, weakly convex, 1st ones more noticeably so than the others; sides gently declined to lateral margins, which are evenly produced laterad.

Pygidium feebly convex, somewhat coriaceous, rather frequently scattered with punctures. Metasternum alutaceous, minutely and shallowly punctate in anterior por-

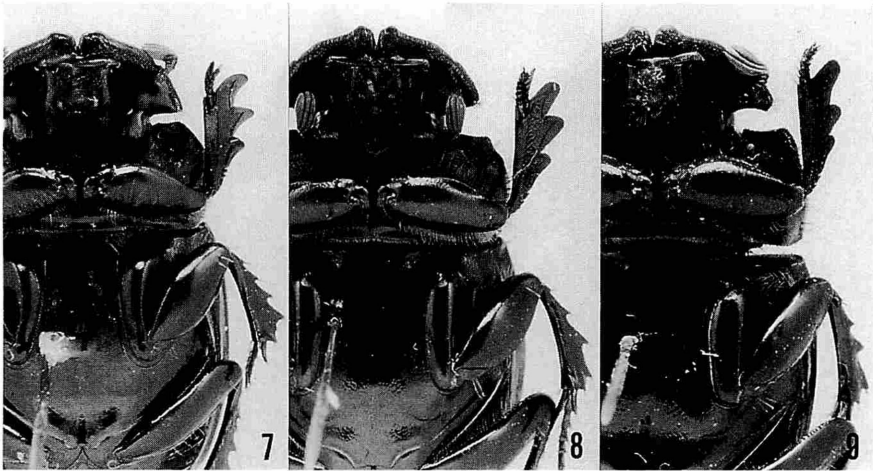


Figs. 1–6. Habitus of *Synapsis* spp. — 1, *S. tridens* SHARP, ♂; 2, *S. kiuchii* sp. nov., holotype ♂; 3, *S. birmanicus* GILLET, ♂; 4, *S. ochii* MASUMOTO, holotype ♂; 5, *S. dickinsoni* sp. nov., holotype ♂; 6, *S. boonlongi* sp. nov., holotype ♂.

tion, micro-aciculate in middle, with a short longitudinal impression and a transverse depression in posterior part. Anterior margins of 2nd to 5th abdominal sternites ridged on each side. Metafemur without spine at posterior edge.

Body length: 23–25 mm.

Holotype: ♂, Doi Angkhang, Fang Dist., Chiang Mai Prov., N. Thailand, 23–VI–1992, Y. MANIT leg. (NSMT). Paratypes: 1 ex., Maesa Vill., Chiang Mai Prov., 14–IX–1988, K. MASUMOTO leg. (DEZ); 4 exs., Measa Vill., Chiang Mai Prov., 4–VII–1988, K. MASUMOTO leg.; 4 exs., Maesa Vill., Chiang Mai Prov., 14–VIII–1994, K. MASUMOTO leg.; 1 ex., Maesa Vill., Chiang Mai Prov., 30–VIII–1987, Y. MANIT leg.; 1 ex.,



Figs. 7–9. Ventral surfaces of *Synapsis* spp. — 7, *S. kiuchii* sp. nov., lacking haired hollows near the front angle of prosternum and mesepimeron; 8, *S. dickinsoni* sp. nov., bearing a haired hollow near the front angle of prosternum; 9, *S. boonlongi* sp. nov., bearing a haired hollow on mesepimeron.

Phrao Dist., Chiang Mai Prov., 1~10-VI-1987, Y. MANIT leg.

*Notes.* This new species resembles *S. simplex* SHARP, 1875, from Laos, in lacking haired hollows near the front angles of the prosternum or on the mesepimera, but can be distinguished from the latter by the body more rounded, with head more acutely angular laterad, pronotum with lateral margins not notched at apical 1/3, and front angles less remarkably produced.

*Synapsis dickinsoni* sp. nov.

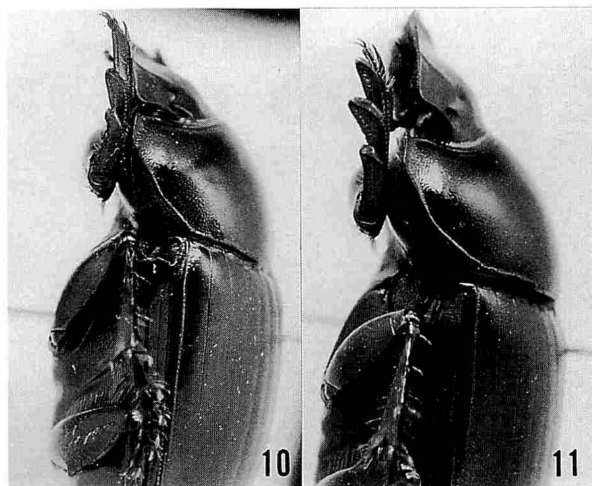
(Figs. 5, 8, 11, 18 & 19)

This new species closely resembles *Synapsis ochii* MASUMOTO, 1996 (Figs. 4, 10, 16 & 17), but can be distinguished from the latter by the following characteristics:

Black, hairs on ventral surface reddish brown; each surface gently shining. Ovate, gently convex.

Head slightly narrower, rugulose in anterior part, closely and more clearly punctate in middle; clypeus slightly more produced anteriorly, cleft at the middle of front margin; frons gently raised in middle; genae granulate, more strongly sinuous before eyes; vertex weakly, somewhat transversely depressed.

Pronotum convex, somewhat transversely micro-aciculate, minutely punctate; sides gently inclined, with area between two lateral ridges not becoming narrower basad; front angles subrectangular and very weakly reflexed upwards, with feebly emarginate front edges and weakly sinuous outer (side) edges; hind angles modified, the corner of upper margin being faintly impressed from oblique dorsal side, thus, the



Figs. 10–11. Lateral view of fore body of *Synapsis* spp. — 10, *S. ochii* MASUMOTO; 11, *S. dickinsoni* sp. nov. (showing an impression at the hind angle of upper margin of pronotum).

upper margin is somewhat rounded and the lower margin angulate in dorsal view; apex more produced in middle; base very widely triangularly produced.

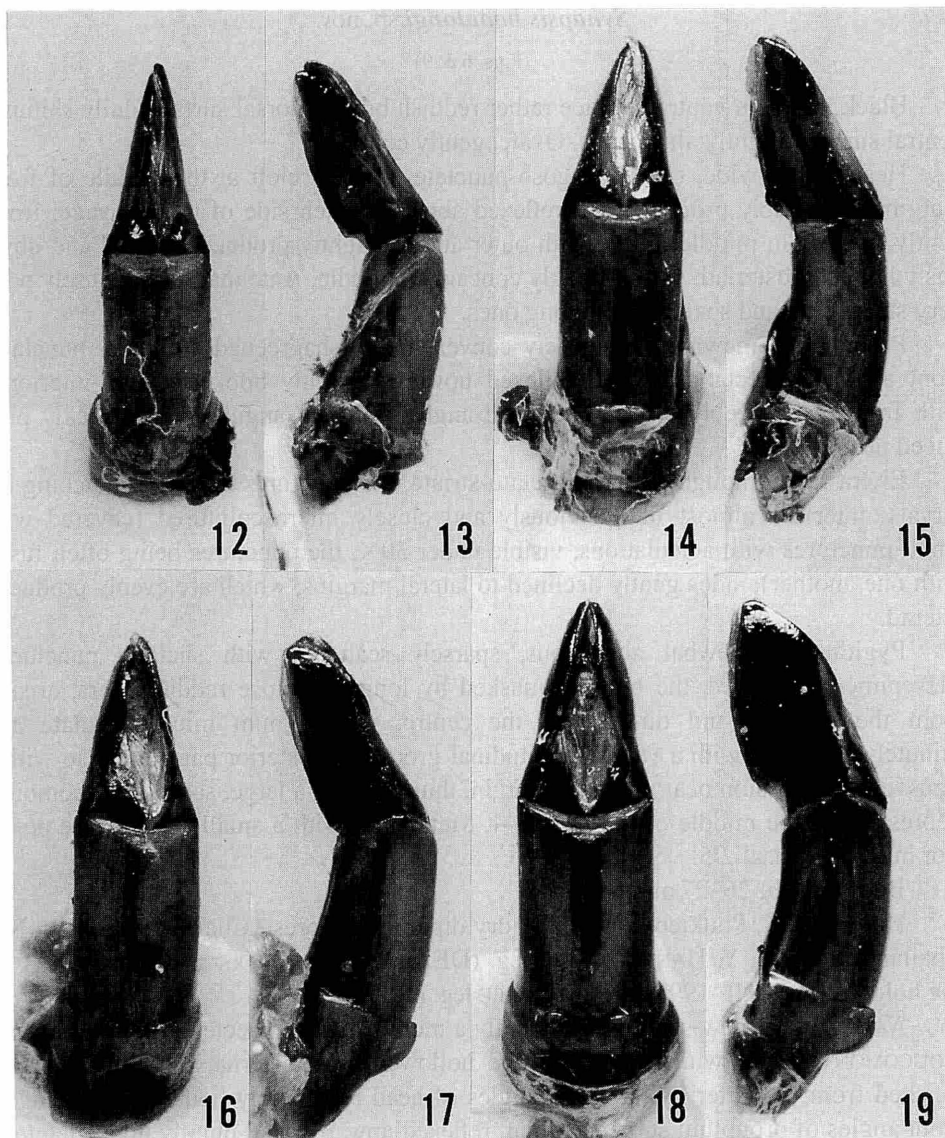
Elytra finely striate, punctures in the striae slightly finer; intervals less coarsely microsculptured, very slightly convex, 2nd interval with a vague swelling near base.

Pygidium wider though less produced apicad and less noticeably convex, microshagreened and scattered with minute granules. Front angles of prosternum with haired hollows. Metasternum with a longitudinal impression and a transverse depression, which are obviously shallower than in *S. ochii*. Metafemur with a spine before the middle on posterior edge; metatrochanter with bristles on posterior edge. Male genitalia larger and stouter.

Body length: 26–28.5 mm.

Holotype: ♂, Phukieo, 1,000 m alt., evergreen forest, Chaityaphum Prov., NE. Thailand, 10–VII–1998, C. DICKINSON leg. (DEZ). Paratypes: 1 ex., same data as for the holotype; 10 exs., same locality and collector as for the holotype, 29–V–1998; 4 exs., same locality and collector as for the holotype, 26–VI–1998; 1 ex., Phukieo, 800 m alt., pine–dipterocarp, 31–X–1998, C. DICKINSON leg.; 3 exs., same locality and collector, 25–V–1998; 1 ex., same locality and collector as for the holotype, 16–X–1998, 1 ex., 11–IX–1998, 2 exs., 18–XII–1998; 1 ex., Phukieo, 9–VI–1998, S. PIMPASALEE leg.; 2 exs., Ban Phrom Song, 800 m alt., evergreen forest, Chaityaphum Prov., 2–XII–1998, K. MASUMOTO leg. (NSMT).

*Notes.* This new species is a member of the species-group of *S. birmanicus* GILLET, 1907 (Figs. 3, 14 & 15) in having the haired hollows near the front angles of prosternum. The nearest species except *S. ochii* might be *S. yama* GILLET, 1911, originally described from Vietnam and Laos, but can be distinguished from the latter by the



Figs. 12–19. Male genitalia of *Synapsis* spp. — 12–13, *S. kiuchii* sp. nov., dorsal view (12), and lateral view (13); 14–15, *S. birmanicus* GILLET, dorsal view (14), and lateral view (15); 16–17, *S. ochii* MASUMOTO, dorsal view (16), and lateral view (17); 18–19, *S. dickinsoni* sp. nov., dorsal view (18), and lateral view (19).

head with lateral angles less acutely produced, and the pronotum with more rounded sides and impressed hind angles.

*Synopsis boonlongi* sp. nov.

(Figs. 6 &amp; 9)

Black, hairs on ventral surface rather reddish brown; dorsal surface dully shining, ventral surface slightly alutaceous. Ovate, gently convex.

Head rather wide, closely rugoso-punctate; clypeus cleft at the middle of front margin, remarkably produced and reflexed above on each side of the cleavage; frons gently swollen in middle; genae with outer angles slightly produced laterad and obviously hooked posteriad; vertex weakly concave in middle. Antennal clubs densely with very short hairs and sparsely with long ones.

Pronotum somewhat transversely convex, micro-shagreened, minutely punctate; front angles subrectangular and reflexed upwards, bluntly hooked antero-interiorly, with front edges feebly emarginate; hind angles obtusely angular; base weakly produced posteriad.

Elytra finely though clearly punctato-striate, the punctures small but notching intervals; intervals almost flat, obviously and closely microsculptured (covered with small punctures with aciculations, visible under 30×, the punctures being often fused with one another); sides gently declined to lateral margins, which are evenly produced laterad.

Pygidium somewhat alutaceous, sparsely scattered with shallow punctures. Mesepimera hollowed, the hollows masked by long and close reddish hairs, arising from the margins and directed to the centre; metasternum micro-aciculate and minutely punctate, with a vague longitudinal groove in posterior part, and also with a transverse depression near posterior margin, thus forming a large, somewhat rhombical depression in the middle of posterior 1/4. Metafemur with a small spine at the posterior margin at basal 2/5.

Body length: 26–27 mm.

Holotype: ♂, Phukieo, 800 m alt., dry dipterocarp forest, Chaiyaphum Prov., NE. Thailand, II–1998, Y. HANBOONSONG leg. (DEZ). Paratype: 1 ex., same locality as for the holotype, 12–VII–1998, S. PIMPASALEE leg. (NSMT).

*Notes.* This new species is evidently a member of the species-group of *S. ovalis* BOUCOMONT, 1916, which possesses the hollowed mesepisterna, but can be distinguished from the latter by the outer angles of head remarkably hooked posteriad, the front angles of pronotum subrectangular, reflexed upwards, and bluntly hooked antero-interiad, and the front edges feebly sinuate. Beside the above two species, *S. gilleti* ARROW, 1931, from Bengal is also a member of this species-group.

**Key to the Species of the Genus *Synopsis* from Thailand**

- 1 (4) Front angles of prothorax or mesepimera without haired hollows; frons with a tubercle at the middle.
- 2 (3) Lateral angles of head produced into very slender acuminate processes; pro-



- notum with tridentate front angles, a prominence at the middle near front margin, a transverse, smooth and shining swelling in posterior half, and also with surface granulate except for the swelling; 30–36 mm; India, Myanmar, N. Thailand, Laos, Vietnam, China (Fig. 1) . . . . . *S. tridens* SHARP.
- 3 (2) Lateral angles of head not slenderly produced but just triangular; pronotum with front angles obtusely angulate, without prominence and swelling, the surface not granulate, but almost smooth and minutely punctate (*S. simplex* group); 24–27 mm; N. Thailand (Fig. 2) . . . . . *S. kiuchii* sp. nov.
- 4 (1) Front angles of prosternum or mesepimera with haired hollows.
- 5 (10) Haired hollows on front angles of prosternum (*S. birmanicus* group); lateral angles of head not hooked; front angles of pronotum not reflexed above.
- 6 (7) Elytra with second interval lacking a vague swelling near base; pronotum with outer margins of front angles noticeably sinuous; 23–27 mm; Myanmar, N. Thailand (Fig. 3) . . . . . *S. birmanicus* GILLET.
- 7 (6) Elytra with second interval bearing a vague swelling near base; pronotum with outer margins of front angles less noticeably sinuous.
- 8 (9) Pronotum with hind angles not impressed from oblique dorsal side but simply obtusely angulate, area between two lateral ridges wider but becoming narrower basad; 22–26 mm; N. Thailand (Fig. 4) . . . . . *S. ochii* MASUMOTO.
- 9 (8) Pronotum with hind angles faintly impressed from oblique dorsal side, thus the upper margin being somewhat rounded and the lower one angulate in dorsal view; area between two lateral ridges narrower but not becoming narrower basad; 26–28.5 mm; NE. Thailand (Fig. 5) . . . . . *S. dickinsoni* sp. nov.
- 10 (5) Haired hollows on mesepimera (*S. ovalis* group); lateral angles of head feebly hooked posteriad; front angles of pronotum weakly reflexed dorsad; 26–27 mm; NE. Thailand (Fig. 6) . . . . . *S. boonlongi* sp. nov.

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## 要 約

Y. HANBOONSONG・益本仁雄：タイ産の食糞コガネムシ類。I. *Synapsis* 属について。—— タイ産の食糞コガネムシ (Scarabaeidae) 研究の第1回として、ダイコクコガネ亜科 (Coprinae) ダイコクコガネ族 (Coprini) の *Synapsis* 属を検討した。その結果、この地域には、*Synapsis tridens* SHARP, *S. birmanicus* GILLET, *S. ochii* MASUMOTO の3種のほかに、新たに3種の分布していることが判明した。それらを、*S. kiuchii* sp. nov., *S. dickinsoni* sp. nov., *S. boonlongi* sp. nov. と命名した。

## References

- BALTHASAR, V., 1963. Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region. **2**. 628 pp., 16 pls. Tschechoslowakischen Akademie der Wissenschaften, Prag.
- BATES, H. W., 1868. Notes on genera and species of Copridae. *Coleopt. Hefte*, **4**: 87–91. Carl Merhoff's Verlag, München.
- BOUCOMONT, A., 1919. Coléoptères coprophages nouveaux d'Asie et de Malaisie. *Annls. Soc. ent. Fr.*, **98**: 307–320.
- GILLET, J. J. E., 1907. Remarques sur quelques Coprides du Museo Civico de Gènes et description d'espèces nouvelles. *Annli. Mus. civ. Genova*, (3), **3**: 587–603.
- HANSKI, I., & Y. CAMBEFORT, 1991. Species richness. In HANSKI, I., & Y. CAMBEFORT (eds.), *Dung Beetle Ecology*, 350–365. Princeton University Press, New Jersey.
- MASUMOTO, K., 1996. Coprophagid-beetles from Northwest Thailand, 10 (Coleoptera, Scarabaeidae). *Ent. Rev. Japan, Osaka*, **50**: 87–94.
- OCHI, T., M. KON & T. KIKUTA, 1996. Studies on the family Scarabaeidae (Coleoptera) from Borneo I. Identification keys to subfamily, tribes and genera. *G. it. Ent.*, **8**: 37–54.
- SHARP, D., 1875. Descriptions of some new genera and species of Scarabaeidae from tropical Asia and Malaysia. *Coleopt. Hefte*, **13**: 33–54. Carl Merhoff's Verlag, München.
- 1881. Note sur l'*Ateuchus tmolus* FISCH. avec description d'une espèce nouvelle du genre *Synapsis*. *Bull. C.-R. Séanc. Soc. ent. Belg.*, **1881**: XCI–XCII.