

## Studies on the Asian Staphylininae (Coleoptera, Staphylinidae)

### II. On the Characteristics of the Genus *Philonthus* CURTIS, *sensu stricto*, with a Redescription of *Philonthus* *splendens* (FABRICIUS)

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**Abstract** Characteristics of the staphylinid genus *Philonthus* CURTIS (s. str.) are reviewed, and its type species, *Ph. splendens* (FABRICIUS), is redescribed

The genus *Philonthus* (s. lat.) includes a large number of species, and even now many new species are being reported from all over the world. It is currently classified into several subgenera, and the subgenus *Philonthus* (s. str.) is again split up into many species-groups.

*Philonthus* is the type genus of the tribe Philonthini COIFFAIT and occupies an important position in the subfamily Staphylininae. For revising the phylogeny of the Staphylininae, therefore, it is indispensable to seize the diagnostic characters of the genus *Philonthus* CURTIS.

*Philonthus splendens* (FABRICIUS), the type species of the genus, is rather a peculiar species and seems isolated in the genus. If *Philonthus* is interpreted in a strict sense, systematic status of many species currently regarded as members of *Philonthus* become problematical. It is therefore reasonable first to make a close investigation into the morphological features of *Ph. splendens* (FABRICIUS).

In the second part of this series, I am going to redescribe this species and to make comment on the genus *Philonthus* (s. str.) after comparing some *Philonthus* species with it. The main terminology and the abbreviations used herein are the same as those explained in the first part of this series with some additional ones as follows: sutural space (ss) of elytra = space between suture and parasutural line.

Before going further, I wish to express my hearty thanks to Dr. Ales SMETANA of the Research Branch of Agriculture Canada for giving me an opportunity to examine *Philonthus splendens* (FABRICIUS), and to Dr. Shun-Ichi UENO of the National Science Museum (Nat. Hist.), Tokyo, for his invaluable advice in preparing the manuscript of this paper.

*Philonthus* (s. str.) *splendens* (FABRICIUS)

(Figs. 1–18)

*Staphylinus splendens* FABRICIUS, 1792, Ent. Syst., 1 (1): 523.

*Philonthus* (s. str.) *splendens*: COIFFAIT, 1974, *Nouv. Rev. Ent., Suppl.*, 4 (4): 122–127, 128–130, 266–267.

Other references are omitted.

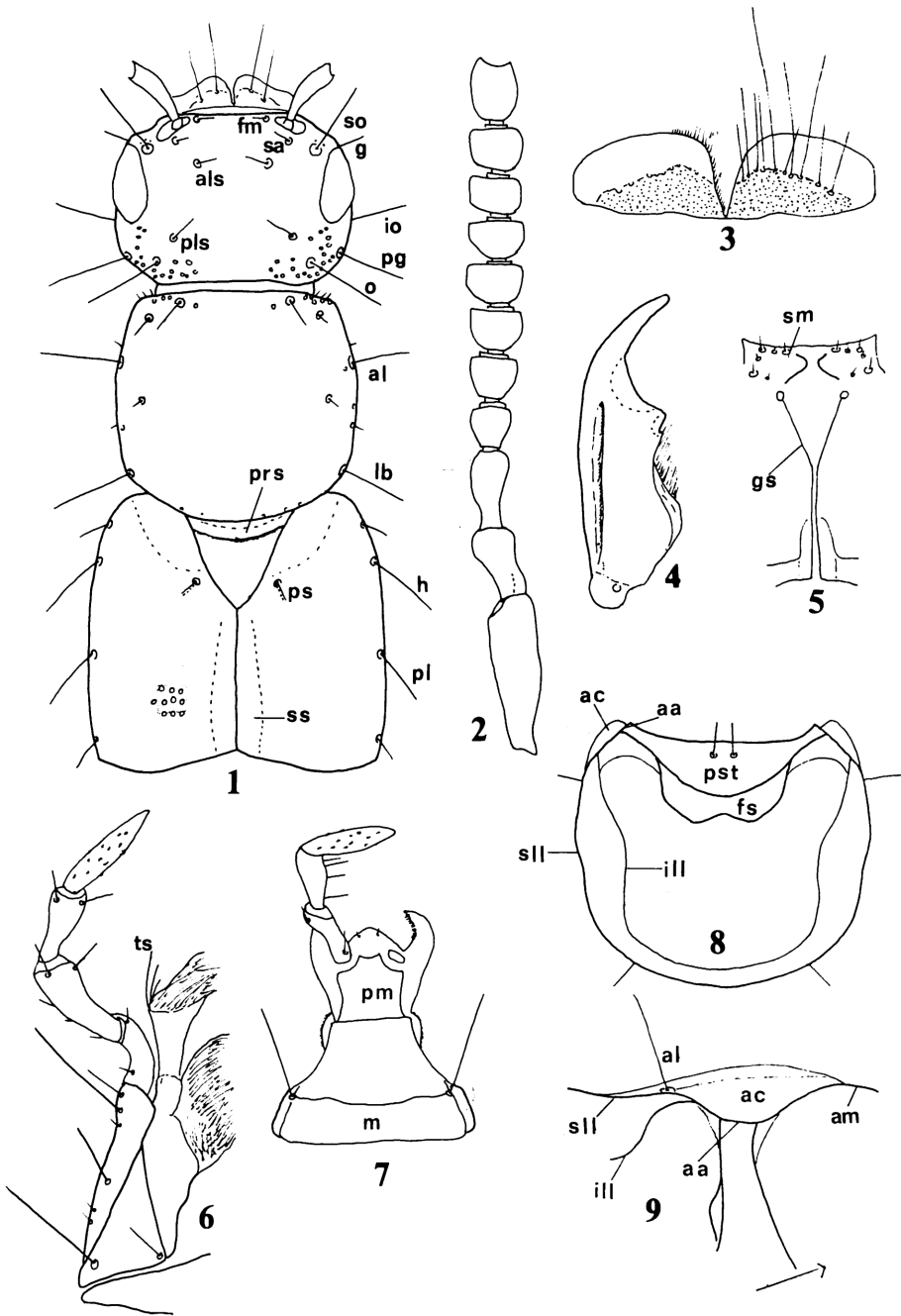
Body robust, thick, subparallel-sided and fairly shiny; colour black, mouth organs dark brown to pitchy, antennae and legs blackish brown, elytra pitchy black with weak aeneous lustre, suture somewhat brownish, abdomen weakly iridescent. Length: 11–14 mm (12.6 mm in the material examined).

*Male.* Head (Fig. 1) transversely oblong, considerably convex above, about four-fifths as long as wide, subparallel-sided, front margin and sides nearly straight, hind margin feebly emarginate in the middle, and hind angles angulately rounded; upper surface scattered very sparsely with weak unhaired micropunctures throughout, microsculpture barely perceptible as fine striation except for vertex, coarse setiferous punctures except primary ones (which bear macrosetae and large setae) not dense, markedly localized on supraorbital space and latero-occipital corners (postgenae bearing primary punctures only); front marginal, supra-antennal and genal macrosetae mal-developed, thin and short, supraorbital macroseta rather distant from eye and placed before the level of anterior large seta, which lies just inside each imaginary longitudinal line traced on antennal insertion and rather nearer to each other than to each lateral margin of head, posterior large seta located at the level of infraorbital macroseta and much nearer to lateral margin of head than to each other. Eyes moderate in size, not prominent and slightly shorter than postgena (6.5: 7.0). Antennae (Fig. 2) rather thick, subclavate, thickest at 7th and 8th segments, hardly reaching the middle of pronotum; basal 3 segments polished, these and 11th segment more or less longer than wide, 4th slightly and the following 6 segments much wider than long, 6th to 10th segments slightly asymmetrical, 11th subovate, each segment with the following relative length: 25.0–12.0–13.0–7.5–7.5–7.5–7.0–7.0–7.0–11.0.

Labrum (Fig. 3) rather long, bilobed with a very deep notch, which reaches base, each lobe about 1.7 times as wide as long, weakly convex and bearing about 10 long setae and fringed with fine and short pubescence of various length in the inner half of front margin, and two of the long setae much longer than the others. Mandibles (Figs. 4) not elongate, nearly as long as head, thick and stout, rather acute at the tips, gently arcuate, left mandible with a molar tooth at the middle, the tooth bidenticulate at the tip; prostheca unilobed and thickly pubescent. Maxillary palpi (Fig. 6) robust and not elongate; 1st segment very short, feebly geniculate, with 1 or 2 short fine setae; 2nd fairly thickened distad, long, gently incurved, with some fine setae at base and lateral sides, and also with a few and a little longer setae at apex; 3rd straight, fairly thickened apicad, half as long as and slightly thinner than 2nd, with a few short

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Figs. 1–9. *Philonthus splendens* (FABRICIUS), ♂. — 1, Fore body with original setae (als = anterior large seta; pls = posterior large seta); 2, antenna; 3, labrum (large setae are removed in the left half and fine setae are removed in the right half); 4, left mandible; 5, gular plate (sm = submentum); 6, right maxilla; 7, labium; 8, prothorax in ventral view; 9, same, latero-ventral view.

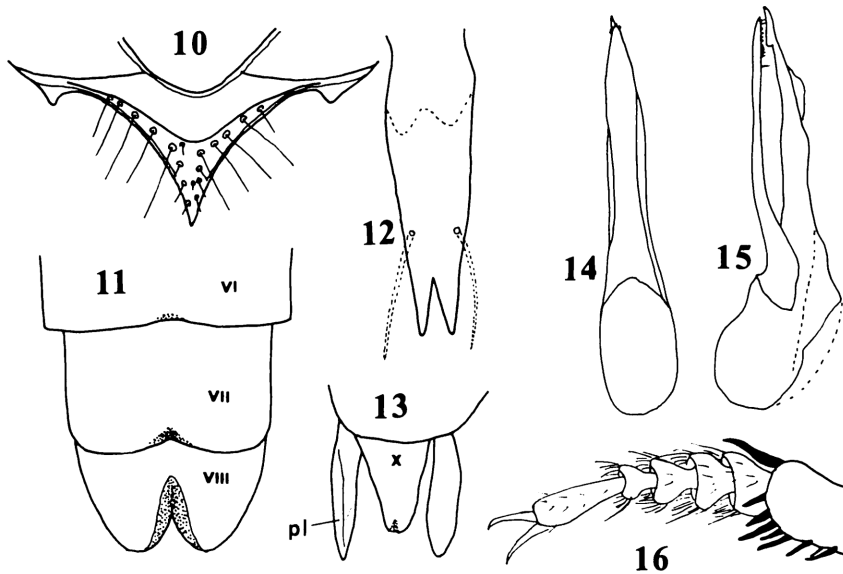


setae at apex; 4th subfusiform, blunt at tip, a little more than 4 times as long as wide, nearly as long as 2nd, a little thinner than 3rd, unhaired but minutely and very sparsely tuberculate. Galea (Fig. 6) thickened distad, densely pubescent on distal lobe, with proximal sclerite subtrapezoidal, bearing 2 strong terminal setae; lacinia (Fig. 6) wide, densely pubescent, with fine suberect setae at base. Labial palpi (Fig. 7) stout and fairly long; 1st segment considerably thickened apicad, distinctly longer than wide, with a fine, not long seta at both base and apex; 2nd slightly longer than and nearly as thick as 1st, but more strongly thickened in apical half, bearing 2 fine setae at base and a few ones at apical portion; 3rd subfusiform, nearly 4 times as long as wide, slightly slenderer and longer than 2nd, blunt at tip, somewhat oppressed, unhaired but with very sparse and minute tubercles as in 4th segment of maxillary palpus. Ligula (Fig. 7) wide, fairly long, rounded at apex, with a pair of very fine short hairs. Paraglossae (Fig. 7) moderate in length and width, porrect forwards and densely pubescent inside. Prementum (Fig. 7) subpentagonal, impressed medially in the front portion. Mentum (Fig. 7) short, very transverse, narrowly reflexed at sides, well sclerotized, feebly emarginate at well-defined front margin, with a single thick and long seta at each front corner. Gular sutures (Fig. 5) distinct, fine and shallow, straightly convergent behind in anterior halves, then much narrowed and parallel to each other towards neck constriction.

Pronotum (Figs. 1, 8–9) subquadrate, slightly wider than long (23.0: 21.5), widest at anterior third, a little narrower and longer than elytra (23: 27 and 21.5: 20.0), front margin nearly straight in middle, oblique and feebly emarginate laterally, apical corner rounded at the marginal line and divided by a very loose fold into the upper (generally called disc) and the under sides (apical corner *sensu* HAYASHI, 1993), sides subparallel to each other in the middle, slightly convergent in front and behind, base gently rounded, with hind angles obtuse but rounded at the tips; disc not convex, rather coarsely and irregularly punctured on front and hind angles, median series of large seta formed by only a single seta near front margin, but lateral series includes 2 setae, surface without microsculpture but very minutely, shallowly and sparsely punctured; chaetotaxy consisting of 2 pairs of well developed macrosetae, antero-lateral seta lying far behind apical angle, with its socket just contiguous to superior lateral line, latero-basal one at hind angle; superior lateral line gently incurved antero-inferiorly from anterior fourth and then hidden (in dorsal view) by apical corner and united with inferior lateral line far behind apical angle, the united line extending forwards and continuous to front margin; pronotal epipleuron almost evenly facing downwards, somewhat undulate and almost invisible in lateral view. Prepimera absent.

Scutellum (Fig. 1) subtriangular, finely and sparsely asperate-punctate, with recumbent fine and short pubescence, covered with transverse, fine and linear microsculpture; prescutum well developed.

Elytra (Fig. 1) subquadrate, slightly widened behind, a little wider than long (27.0: 20.0, but nearly equal in width to the maximum length), each disc flattened but feebly convex in sutural space, which is coarsely, sparsely and obliquely strigous; sides feebly



Figs. 10–16. *Philonthus splendens* (FABRICIUS), ♂. — 10, Mesosternum; 11, 6th to 8th abdominal sternites of male; 12, 9th abdominal sternite with paired pores; 13, 9th (pleurite) and 10th tergites; 14, male genitalia in ventral view; 15, same, right lateral view; 16, fore tarsus.

arcuate, apices shallowly emarginate, latero-apical angles obtusely rounded; surface somewhat undulate, without distinct microsculpture but faintly and vaguely scratched here and there, not finely, rather sparsely and shallowly punctured, with suberect, rather long and stout brownish pubescence; chaetotaxy probably composed of 3 pairs of macrosetae, parascutellar macroseta just beside the middle of scutellum (the setae are unfortunately lost in the specimen examined, so that grade of their development cannot be ascertained), humeral and postero-lateral ones well-developed, single large seta present at each shoulder and latero-apical angle.

Prosternum (Fig. 8) smoothly and highly convex in middle, without fossae and median ridge, paired setae rather thick and short; lateral border short and completely united with pronotal discal margin at the apical angle. Furcasternum (Fig. 8) short and even, without median ridge.

Mesosternum (Fig. 10) rather flattened, transversely and remarkably bounded at about the middle; surface smooth before the bound but coarsely and roughly punctate, with several long setae behind it; mesosternal process narrow, acute at tip, feebly convex and not margined by a ridge in the apical portion; intersternal piece deeply sunk. Mesocoxae contiguous to each other.

Abdomen feebly dilated in middle, finely and rather sparsely punctate, with recumbent, long and dark setae, the punctures on each segment a little denser at base; 3rd

tergite impunctate and slightly depressed at base; 6th sternite (Fig. 11) faintly emarginate at the middle of apical margin; 7th sternite (Fig. 11) widely and shallowly emarginate at apex and shallowly depressed in the middle of apex; 8th sternite (Fig. 11) triangularly, deeply and clearly excavated from the middle to apex, sharply and deeply incised medially; 10th tergite (Fig. 13) subtruncate at apex but with a small notch at the middle; 9th sternite (Fig. 12) narrow, gently narrowed behind, deeply and triangularly excised at apex (in the specimen examined, paired large erect setae are unfortunately lost but paired pores are recognizable); pleurites (Fig. 13) thick, wide and foliaceous in lateral view.

Legs thick, stout and rather short; procoxae not spinous; protibiae fairly clavate and bearing numerous remarkable spines; basal 4 tarsal segment (Fig. 16) short, subtrapezoidal, rather narrow, much narrower than apex of protibia and with dense stiff pubescence on the planters; empodial setae imperceptible.

Male genitalia (Figs. 14–15) elongate and symmetrical; penis feebly dilated at base, rather straightly narrowed towards subacute tip, feebly sinuate in lateral view and with a small hook before the tip on the ventral side; parameres unilobed, thin, elongate, reaching near apex of penis, somewhat emarginate at sides, abruptly narrowed in apical portion towards acute tip, inner side bearing 6 pairs of black sensory tubercles and 2 pairs of fine short pubescence both before and behind the tubercles.

*Material examined.* ♂, Tubney, Berks, England, 17–IV–1948.

#### Previous Arrangement of the Genus *Philonthus* and its Allies

BERNHAEUER and SCHUBERT (1914) collected past literature and arranged the genera of the *Philonthus* group from the Palearctic and Oriental Regions in a phylogenetic order as follows:— *Neobisnius* GANGLBAUER (syn. *Bisnius* C. G. THOMSON, *Erichsonius* FAUVEL [*ex parte*], *Actobius* FAUVEL [*ex parte*]); *Actobius* FAUVEL (syn. *Remus* C. G. THOMSON, *Erichsonius* FAUVEL [*ex parte*]); *Philonthus* CURTIS (subgenn. *Gabrius* STEPHENS, *Gefyrobis* C. G. THOMSON, *Rabigus* MULSANT et REY, *Philonthus* s. str. [syn. *Bisnius* STEPHENS]); *Cafius* STEPHENS (subgenn. *Bryonomus* CASEY, *Cafius* s. str., *Remus* HOLME [syn. *Pseudidus* MULSANT et REY]); *Hesperus* FAUVEL; *Belonuchus* NORDMANN (syn. *Trapeziderus* MOTSCHULSKY).

SCHERPELTZ (1933) gave the following additional arrangement to the *Philonthus* group:— *Jurecekiø* RAMBOUSEK (separated from *Philonthus*); *Hesperus* FAUVEL (subgen. *Hesperotropis* GRIDELLI); *Stevensia* CAMERON; *Tolmerinus* BERNHAUER.

BLACKWELDER (1952) added the following treatment to the *Philonthus* group:— *Erichsonius* FAUVEL (syn. *Actobius* FAUVEL); *Philonthus* CURTIS (subgenn. *Bisnius* CURTIS [syn. *Gefyrobis* C. G. THOMSON], *Jurecekiø* RAMBOUSEK, *Onychophilonthus* NERESHEIMER et WAGNER); *Cafius* CURTIS (subgenn. *Remus* HOLME [syn. *Menapius* HOLME], *Euremus* BIERIG, *Pseudoremus* KOCH, *Ifacus* BLACKWELDER [syn. *Philonthopsis* KOCH]).

From 1953 to 1973, several important papers were published on the *Philonthus* group by TOTTENHAM, COIFFAIT and SMETANA. Then, COIFFAIT (1974) made a comprehensive survey of previous studies on the group and published the result in a monograph of the Staphylinidae of the West Palearctic Region. His arrangement is as follows:— *Palaeophilonthus* COIFFAIT; *Erichsonius* FAUVEL (subgenn. *Erichsonius* s. str., *Parerichsonius* COIFFAIT); *Gabrius* CURTIS; *Paragabrius* COIFFAIT (subgenn. *Paragabrius* s. str., *Metagabrius* COIFFAIT); *Rabigus* MULSANT et REY; *Gabronthus* TOTTENHAM; *Philonthus* CURTIS (subgenn. *Gefyrobius* C. G. THOMSON, *Onychophilonthus* NERESHEIMER et WAGNER, *Kenonthus* COIFFAIT, *Trionthus* COIFFAIT, *Philonthus* s. str.); *Spatulonthus* TOTTENHAM; *Jureckia* RAMBOUSEK; *Hesperus* FAUVEL; *Neobisnius* GANGLBAUER; *Remus* HOLME; *Cafius* STEPHENS (subgenn. *Euremus* BIERIG, *Pseudoremus* KOCH, *Suborthidus* COIFFAIT).

COIFFAIT's arrangement given above is supported by most researchers of the Staphylinidae.

#### Notes on Some *Philonthus* Species

For correct recognition of the genus *Philonthus* CURTIS (s. str.), it is very useful to know different characteristics in some corresponding organs between *Philonthus splendens* and some other *Philonthus*-species. The following reference species except *Ph. tarsalis* are currently placed in the subgenus *Philonthus* s. str. (after COIFFAIT, 1974, SHIBATA, 1983, and SMETANA, 1983).

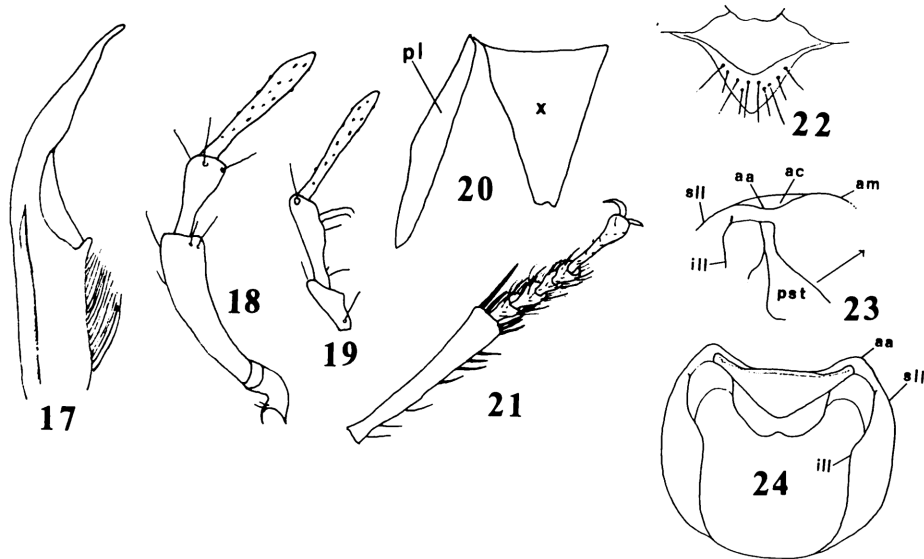
#### *Philonthus cyanipennis* (FABRICIUS)

(Figs. 17–23)

Mandibles elongate, much longer than head (11 : 7), left mandible (Fig. 17) with a simple slender tooth, the right one bidentate; palpi (Fig. 18–19) very long and slender, 4th segment of maxillary palpus more than 7 times as long as wide. Of pronotum (Figs. 23–24), inferior lateral line terminated before reaching superior lateral line and prosternal lateral borders, and never united with the latter line, so that the superior lateral line only extends forwards and shifts to anterior margin. Prosternum (Fig. 24) bearing a pair of well-developed long setae, lateral borders far separated from pronotal discal margins and never united with the latter; mesosternum (Fig. 22) flattened before and behind the bound, with its process wide. Pleurites (Fig. 20) elongate, subfusiform. Male protarsomeres (Fig. 21) not dilated, narrow; protibiae (Fig. 21) elongate, with many long spines.

*Specimen examined.* ♂, Mt. Kohjin, Nara, Japan, 11–V–1981, M. YAMAMOTO leg.

*Notes.* The present species is one of the most widespread species in the Palearctic Region, always regarded as a member of *Philonthus* (s. str.), and placed in the *intermedius* group (COIFFAIT, 1974, the largest species-group of *Philonthus* s. str.), though markedly different from *Ph. splendens* in the limbic conformation of the pronotum.



Figs. 17–24 (22–24: after HAYASHI, 1993). *Philonthus cyanipennis* (FABRICIUS), ♂. — 17, Left mandible; 18, right maxillary palpus; 19, right labial palpus; 20, 9th (pleurite) and 10th tergites; 21, right protibia and protarsus; 22, mesosternum; 23, prothorax in latero-ventral view; 24, same, ventral view.

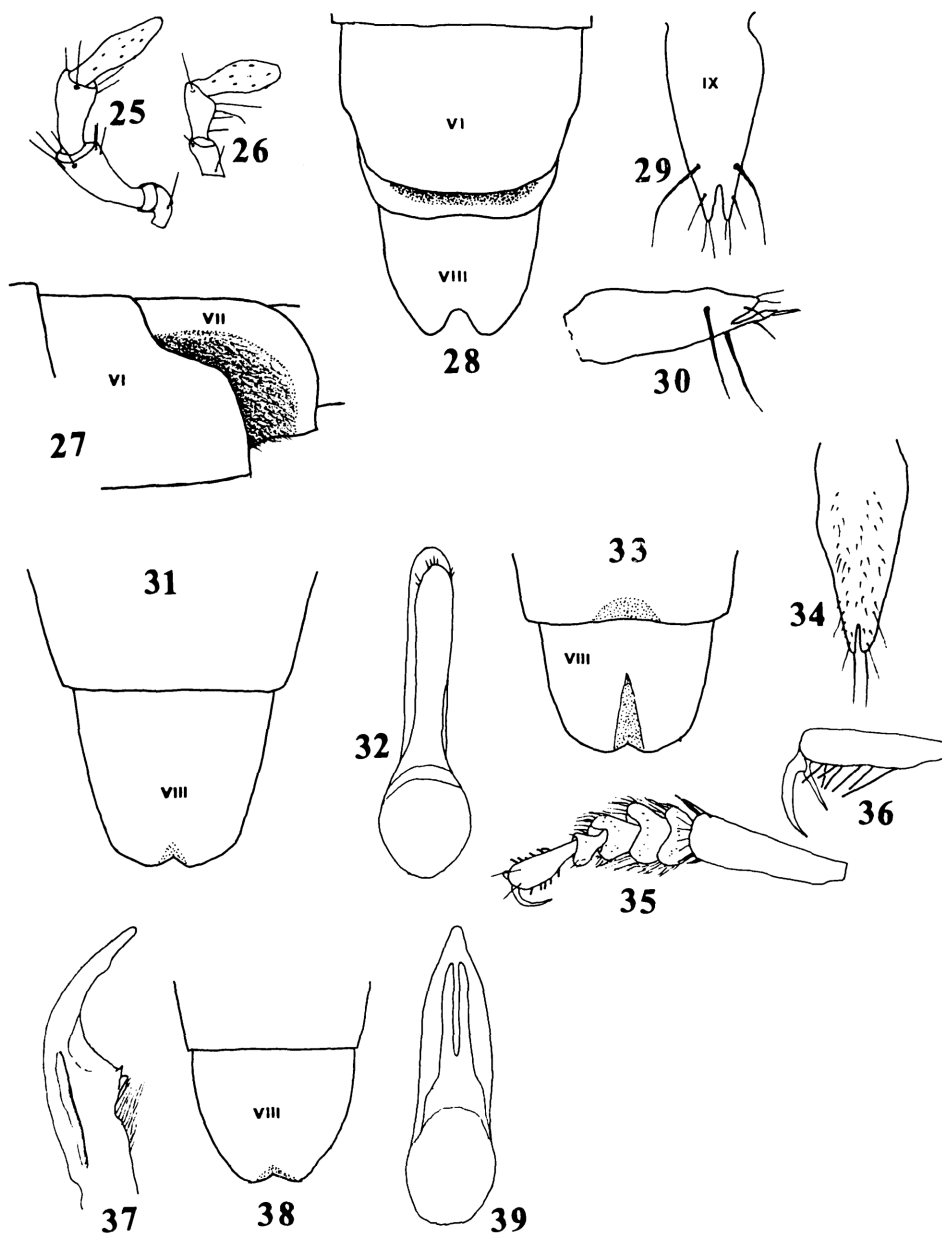
### *Philonthus rotundicollis* MÉNÉTRIÈS

(Figs. 25–30)

Palpi (Figs. 25–26) thick and relatively short; 4th segment of maxillary palpus rather thick and short, only slightly longer than 3 times the width; 3rd segment of labial palpus thick, rather strongly tumid at apical third, somewhat thicker than 4th segment of maxillary palpus, fully as thick as 2nd and 3 times as long as wide. Genal macrosetae much reduced, very fine and short. Limbic conformation of pronotum similar to that in *Ph. cyanipennis*. Male secondary sexual features remarkable: 6th abdominal sternite (Figs. 27–28) widely protrudent behind and concealing most parts of 7th sternite (Fig. 27–28), the concealed area shallowly depressed, strongly shagreened and densely granulo-punctate, with dense long suberect pubescence; apices of 6th and 7th sternites each nearly straight; 8th sternite (Fig. 28) rather deeply, widely and roundly emarginate at apex but not depressed nor flattened before the emargination; 9th sternite (Figs. 29–30) bearing a pair of large erect setae as in *Ph. splendens* (FABRICIUS).

*Specimens examined.* ♂ and 20 exs., Masagosawa (alt. 1,800 m) and Tsurugisawa (2,500 m), Mt. Tsurugi, Toyama, 14, 15, 17, 18 and 20–VII–1962, Y. HAYASHI leg.; 3 exs., Mt. Dainichi (alt. 2,500 m), Toyama, 6–VII–1964, Y. HAYASHI leg. and 27–VII–1964, J. KAMEI leg.; 2 exs., Sennin Taira (alt. 2,100 m), Toyama, 15–VIII–1961, J.





Figs. 25-39. *Philonthus rotundicollis* MÉNÉTRIÈS, ♂ (25-30); *Ph. addendus* SHARP, ♂ (31-32); *Ph. (Onychophilonthus) tarsalis* SMETANA, ♂ (33-36); *Ph. rectangularus* SHARP, ♂ (37-39). — 25, Right maxillary palpus; 26, right labial palpus; 27, 6th and 7th abdominal sternites in lateral view; 28, 7th to 8th sternites, ventral view; 29, 9th abdominal sternite in ventral view; 30, same, oblique view; 31, 7th and 8th abdominal sternites; 32, male genitalia in ventral view; 33, 7th and 8th abdominal sternites; 34, 9th abdominal sternite in ventral view; 35, left protibia and protarsus; 36, 5th segment of protarsus in lateral view; 37, left mandible; 38, 7th and 8th abdominal sternites; 39, male genitalia in ventral view.

KAMEI leg.; 2 exs., Goshikigahara (alt. 2,500 m), Toyama, 2-VIII-1964, J. KAMEI leg.; 2 exs., Taneike (alt. 2,500 m), Mt. Jiigatake, Toyama, 27-VII-1962, Y. HAYASHI leg.; 2 exs., Mizuyajiri and Ohanamatsubara (alt. 2,300 m), Mt. Hakusan, 22-VII-1962, S. TAKABA leg.; 1 ex., Mt. Kisokomagatake (alt. 2,100 m, near Isetaki), Nagano, 24-VIII-1962, Y. HAYASHI leg.; 2 exs., Mt. Houou (alt. 2,800 m), Yamanashi, 21-V-1990, K. HOSODA leg.; 1 ex., Yamada Spa, Hokkaido, 14-VII-1966, J. KAMEI leg. (All the localities are in Japan, so that this species is newly recorded from Japan).

*Notes.* This is one of the most widely distributed species in the Palearctic Region and has been regarded as a member of the *intermedius* group of *Philonthus* (s. str.). It has peculiar secondary sexual features in the male.

#### *Philonthus addendus* SHARP

(Figs. 31-32)

Limbic conformation of pronotum and structure of mesosternum rather similar to those of *Ph. cyanipennis*. Procoxae bearing numerous thin and short spines. Male 7th abdominal sternite (Fig. 31) not modified, and 8th (Fig. 31) narrowly and shallowly emarginate at apex and subtriangularly flattened before the emargination. Male genitalia (Fig. 32) nearly spatulate in both penis and parameres as in the genus *Spatulonthus* though symmetrical.

*Specimens examined.* ♂, Aizankei, Hokkaido, Japan, 24-VIII-1964, C. YAMANO leg.; ♀, Tokugô, Kamikôchi, Nagano, Japan, 1-VIII-1966, T. ITO leg.

*Notes.* This species is also widely distributed in the Palearctic Region, and always regarded as a member of the *intermedius* group of *Philonthus* (s. str.), though somewhat different in the male secondary sexual and the male genitalic features.

#### *Philonthus (Onychophilonthus) tarsalis* SMETANA

(Figs. 33-36)

Similar to *Ph. cyanipennis* in limbic conformation of pronotum. Male 8th sternite (Fig. 33) narrowly, shallowly and subtriangularly emarginate at apex and with median glabrous space long, smooth and triangular; male 9th sternite (Fig. 34) less deeply notched at apex, without paired large setae and pores. Male protarsus (Figs. 35-36) strongly dilated in the basal 3 segments, which are a little wider than the apex of protibia. The 5th male protarsomere (Fig. 36) conspicuously and numerously spinous beneath.

*Specimen examined.* ♂, Gozaishi Spa, Yamanashi, Japan, 5-VI-1991, K. HOSODA leg. (new record from Japan).

*Notes.* This is one of the *Onychophilonthus* species distributed in Japan and Continental Asia, and bears peculiar structure on the underside of the 5th protarsal segment in both sexes.

*Philonthus rectangulus* SHARP

(Figs. 37–39)

Mandibles (Fig. 37) vertically bidentate. Underside of head triangularly and shallowly depressed just before neck constriction. On elytra, only humeral and parascutellar macrosetae well developed. A pair of large setae on prosternum well developed. Mesosternum without developed setae, its process not narrow, and feebly convex. Male 7th abdominal sternite not modified; 8th (Fig. 38) widely and shallowly emarginate at apex, and narrowly smooth before the emargination; male 9th sternite without paired large setae and pores as in *Ph. tarsalis*. Pleurites rather slender as in *Ph. cyanipennis*. Male genitalia (Fig. 39) with parameres bilobed in apical half.

*Specimen examined.* ♂, Kumabashiri, Ishikawa, Japan, 24–IV–1961, Y. HAYASHI leg.

*Notes.* The present species is a representative of the *rectangulus* group (*sensu* COIFFAIT, 1974) widely distributed in the Holarctic Region, and has bilobed parameres in the male. This species has been regarded as a member of *Philonthus* (s. str.).

*Philonthus lewisius* SHARP

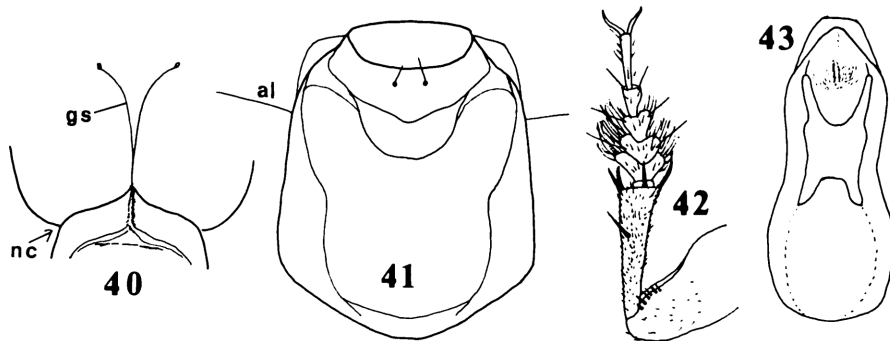
(Figs. 40–43)

Gular plate (Fig. 40) extremely narrow in posterior half. Pronotal latero-basal macroseta rather mal-developed and its socket barely perceptible. Lateral border of prosternum (Fig. 41) long and in the front half only united with discal margin of pronotum at the front angle. Postero-lateral macrosetae of elytra reduced, almost imperceptible as in *Ph. rectangulus*. Male 7th, 8th and 9th sternites formed as in *Ph. rectangulus*. Pleurites rather slender as in *Ph. rectangulus*. Penis (Fig. 43) very thick, cupuliform and blunt at the tip; parameres markedly bilobed apicad. Protibiae (Fig. 42) very sparsely spinous, only with a few spines except for the apices; male protarsi (Fig. 42) strongly dilated in basal 3 segments, which are a little wider than the apex of tibia, and in the female, they are weakly dilated.

*Specimen examined.* ♂, Riv. Yodo, Osaka, Japan, 15–III–1958, T. ITO leg.

*Notes.* The present species was placed by SCHEERPELTZ (1933) in the subgenus *Gefyrobius* C. G. THOMSON, then regarded as a synonym of *Ph. aeneipennis* BOHEMAN (BERNHAEUER & SCHUBERT, 1914). BLACKWELDER (1952) regarded *Gefyrobius* as a synonym of *Bisnius* CURTIS. ADACHI (1957) followed BLACKWELDER and arranged *Ph. aeneipennis* in the subgenus *Bisnius*. SMETANA (1958) pointed out that *Gefyrobius* was not a synonym of *Bisnius*, and regarded *Ph. cephalotes* (GRAVENHORST), the type species of *Bisnius* CURTIS, as a member of *Philonthus* in a strict sense. Accordingly, *Ph. aeneipennis* automatically became a member of the subgenus *Philonthus* (s. str.).

*Philonthus lewisius* was considered to be a synonym of *Ph. aeneipennis*. CAMERON (1932) put the former in a synonym of the latter, but in 1949 he treated it as a good species without comment. SAWADA (1960) suggested existence of some problems be-



Figs. 40–43. *Philonthus lewisius* SHARP, ♂. — 40, Head in ventral view (nc=neck constriction); 41, prothorax in ventral view; 42, right fore leg; 43, male genitalia in ventral view.

tween the two species. I myself agree with CAMERON's 1949 view. This species seems to be a member of the *aeneipennis* group due to the similarity in general appearance and male genitalia. *Philonthus aeneipennis* is widely distributed in the southern areas of Asia including Japan.

#### *Philonthus prolatus* SHARP

Head multi-punctate except for frons and vertexal area. The 4th segment of maxillary palpus twice as long as the 3rd. Basal 3 visible tergites deeply impressed at each base. Male 9th abdominal sternite without paired large setae. Penis spatulate in ventral view.

*Specimens examined.* ♂, Mt. Taradake, Nagasaki, Japan, 3–V–1987, T. ITO leg.

*Notes.* This species was placed by SCHEERPELTZ (1933) in *Gabrius* STEPHENS. ADACHI (1957) and SHIBATA (1983) followed his view. SMETANA (1983) considered that *Ph. prolatus* was not a *Gabrius* species. HAYASHI (1993) followed SMETANA's opinion.

This species is either closely allied to or belongs to the *nigrita* group (COIFFAIT, 1974) because of resemblance of male genitalia, and has peculiar features in the mouth organs, the basal 3 visible tergites of abdomen and the prothorax.

#### Diagnostic Characters Found in Some Organs of *Philonthus*

In *Philonthus* and its allied groups, phylogenetically important characters seems to appear on the mentum, the prothorax and the male 9th abdominal sternite. It is therefore imperative to examine these organs closely for analysing the phylogeny of *Philonthus* itself and the allied groups, though detailed information is extremely few in previous papers.

In the following lines, some comment will be made on the phylogenetic relationship based on these organs in *Philonthus* itself and its relatives.

1. The mentum bears only a single seta at each anterior corner; the following genera also bear a single seta at each anterior corner of the mentum: *Belonuchus*, *Hesperus*, *Paragabrius*, *Rabigus*, *Neobisnius*, *Spatulonthus* and *Craspedomerus*. On the other hand, the following genera bear at least paired setae at each corner of the mentum (after COIFFAIT, 1974): *Erichsonius*, *Gabronthus*, *Cafius* and *Remus*.

2. In the pronotum, inferior lateral line is distinctly united with superior lateral line far behind the pronotal apical angle; the united line extends forwards, tightly unites with the prosternal lateral border at about the apical angle, and then shifts to the apical margin. At least in the following species, the limbic conformation of pronotum is apparently different from that observed in *Ph. splendens*: *Ph. cyanipennis*, *rotundicollis*, *addendus* and *tarsalis*, in which the inferior lateral line of pronotum ends far behind the apical angle and never unites with the superior lateral line nor with the lateral border of the prosternum.

3. In *Ph. splendens*, the 9th abdominal sternite in the male bears a pair of remarkably developed erect setae arising from large punctures. Similar setae are present in the following species: *Ph. cyanipennis*, *rotundicollis*, *addendus* and *Spatulonthus minutus* (BOHEMAN); but the setae are absent in the following species: *Ph. rectangulus*, *lewisius*, *tarsalis*, *nudus*, *prolatus*, *Belonuchus rufoniger* FAUVEL, *Gabrius ophion* SMETANA, *Rabigus brunnicollis* (HOCHHUTH) and *Craspedomerus bernhaueri* CAMERON.

Reference species examined:—

*Philonthus nudus* SHARP

♂, Maizuru, Kyoto, Japan, 3-V-1986, Y. HAYASHI leg.

*Spatulonthus minutus* (BOHEMAN)

♂, Osaka City, Japan, 12-VII-1958, T. SHIBATA leg.

*Gabrius ophion* SMETANA

♂, Dashiqiau, Yinkou, Lianning, China, 10-VIII-1987, LI Jingke leg.

*Rabigus brunnicollis* (HOCHHUTH)

♂, Numata, Gumma, Japan, 2-IV-1966, T. TAKEI leg.

*Hesperus ornatus* SHARP

♂, Akazai, Hyôgo, Japan, 17-VI-1979, T. ITO leg.

*Belonuchus rufoniger* FAUVEL

♂, Nanshanchi, Taiwan, 17-IX-1970, Y. KIYOYAMA leg.

*Craspedomerus bernhaueri* CAMERON

♂, Ghorapani Pass (alt. 2,835 m), Nepal, 13-V-1983, Y. HAMA leg.

#### Delimitation of the Subgenus *Philonthus* s. str.

(Figs. 1-16)

As a summary of the results given above, the subgenus *Philonthus* should be strictly interpreted as follows:

Type species: *Staphylinus splendens* FABRICIUS.

*Description.* Body elongate, nearly parallel-sided, rather flattened above and

shiny; head and pronotum generally sparsely punctured, elytra and abdomen densely so.

Head suboval to subquadrate, more or less convex above; neck thick and a little wider than a half the width of head. Antennae filiform, moderately long, basal 3 segments polished. Eyes moderately large, generally about as long as postgenae and not so prominent. Chaetotaxy (of macrosetae and large setae) in dorsal view as shown in Fig. 1, front marginal seta, supra-antennal one and genal one mal-developed, large setae usually well developed, consisting of 2 pairs (frontal and occipital) of long setae.

Mandibles thick and stout, subacute at the tips, gently arcuate, about as long as head, left mandible with a molar tooth at the middle, the tooth bidenticulate at the tip; prostheca unilobed and thickly pubescent.

Labrum rather long, bilobed with very deep cleft, which reaches the base; each lobe about 1.7 times as wide as long, weakly convex, bearing about 10 long setae (two of them much longer than the others) a little behind front margin, which is fringed with short pubescence of various length at its inner half.

Galea thickened apicad, densely pubescent on distal lobe and bearing 2 thick and long terminal setae at the apex of subquadrate proximal sclerite; lacinia wide, densely pubescent, with fine suberect setae at base. Maxillary palpi not elongate and rather robust; 1st segment very short, feebly geniculate, with 1 or 2 short fine setae; 2nd moderately thickened apically, long and gently incurved, with some fine setae at base and lateral side, also with a little longer ones at apex; 3rd nearly straight, moderately thickened apically, much shorter and slightly thinner than 2nd, with a few short setae at apex; 4th subfusiform, blunt at tip, about 4 times as long as wide, nearly as long as 2nd, a little thinner than 3rd, glabrous but with several very minute tubercles.

Labial palpi moderately elongate and rather robust; 1st segment long, considerably thickened apicad, distinctly longer than wide, with a fine and not long seta at both base and apex; 2nd slightly longer than and nearly as thick as 1st (though more strongly thickened in apical half), bearing 2 fine setae at base and a few similar ones in apical portion; 3rd subfusiform, about 4 times as long as wide, slightly slenderer and longer than 2nd, blunt at tip, somewhat oppressed, un haired but bearing very sparse and minute tubercles as on 4th segment of maxillary pulpus. Ligula wide, moderately long, rounded at apex, with a pair of very fine short hairs. Paraglossae moderate in length and width, porrect forwards and densely pubescent inside. Prementum sub-pentagonal, impressed medially in the front portion. Mentum short, very transverse, narrowly reflexed at sides, well sclerotized, feebly emarginate at front margin which is well defined with a single long thick seta at each front corner.

Gular sutures distinct, fine and shallow, straightly convergent posteriad in anterior halves, then very narrowly separated and parallel to each other in posterior halves.

Pronotum subquadrate, front margin and sides usually straight, base more or less arcuate, rather rounded at each angle; chaetotaxy consisting of 2 pairs of macrosetae, which are well developed, antero-lateral seta placed far behind apical angle with

its socket just contiguous to discal margin, latero-basal seta at hind angle; disc bearing 2 series (median and lateral) of large punctures on both sides; superior lateral line gently incurved antero-inferiorly from far behind apical angle, then hidden (in dorsal view) by apical corner and united with inferior lateral line far behind apical angle, the united line extending forwards and continuous to front margin; pronotal epipleuron evenly faced downwards, somewhat undulate and almost invisible in lateral view. Pronotal epimera absent.

Scutellum subtriangular, with well developed prescutum.

Elytra subquadrate, rather flattened, with feebly convex sutural space; lateral margins not edged, hind margin feebly emarginate; chaetotaxy consisting of 3 pairs of macrosetae, parascutellar macroseta placed just beside the middle of scutellum, humeral and postero-lateral ones well developed.

Prosternum strongly convex in middle, without fossae and median ridge, bearing paired, rather thick and short setae; lateral border short, and entirely united with pronotal discal margin at the apical angle. Furcasternum short, even, and not ridged medially.

Mesosternum rather flattened, remarkably and transversely bounded at about the middle, smooth before the bound but roughly punctured behind; its process narrow, acute at the tip and not margined by ridge in apical portion; intersternal piece deeply sunk. Mesocoxae contiguous to each other.

Male 7th and 8th sternites more or less emarginate or notched at the least; 9th sternite bearing a pair of well developed large setae, deeply and triangularly notched at apex; pleurites (male) thick and wide.

Procoxae not spinous; protibiae remarkably spinous; protarsomeres rather short, not dilated, much narrower than apex of protibia, with dense stiff fine hairs; empodial setae imperceptible.

Male genitalia elongate and symmetrical; parameres consolidated in a single lobe and bearing fine dark tubercles on the inner (dorsal) face of apical portion.

*Discussion.* The subgenus *Philonthus* in current sense (*viz. sensu* COIFFAIT) is divided into two groups by difference in the structure of male 9th abdominal sternite; in one group, a pair of large erect setae are present as in *Ph. splendens*, but in the other they are absent. At least the latter group (*e.g., rectangulus, lewisius* and *prolatus* groups) should be excluded from *Philonthus* (s. str.). It is, however, difficult to decide at present to which subgenera the species of the latter group actually belong, because of the lack of knowledge about African and Neotropical species.

The species currently placed in *Philonthus* are considerably variable in limbic conformation of pronotum (also in relation to the prosternum), and it is difficult to apply the pronotal character to reclassification of *Philonthus*. In some species-groups of the second group mentioned above, however, this character seems to be stable according to specified groups.

## 要 約

林 靖彦: アジア産ハネカクシ亜科の研究, II. *Philonthus* 属 (コガシラハネカクシ属) とその属基準種 *Ph. splendens* (FABRICIUS) について. — コガシラハネカクシ類は, 現在の定義においても膨大な数の種を含み, 若干の亜属に分かれている. そのうちでも *Philonthus* 亜属は非常に多くの種群に分けられている (COIFFAIT, 1974). 筆者は, 日本産種を中心に属基準種 *Ph. splendens* との比較検討を行なった結果, *Philonthus* 亜属は雄の第9腹板上に1対の顕著な長刺毛があるかないかで大きく2群に分けられると考えるにいたった. 本属はハネカクシ亜科のうちでももっとも重要な属の一つで, その本態を正しく理解することは, コガシラハネカクシ群の解明のみならず, ハネカクシ亜科全体の系統を考える上でも, きわめて有意義なことと思われる. また, 本属の前胸背板周辺構造は, 全体として見ると変化が多く, 属の特徴として確定しがたいが, 種群によっては安定しているように見受けられるものもあり, 今後の検討課題である.

本報ではコガシラハネカクシ属の基準種の再記載を行い, 基亜属の再記載と若干の考察を試みた.

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### 新 刊 紹 介

土壤動物区系生態地理研究 (Studies on Fauna and Ecogeography of Soil Animal). 李景科 (Li Jingke)・陳鵬 (CHEN Peng) 等著. vii+4+i+265 ページ. 東北师范大学出版社, 長春. 1993 年.

この書物は、主として北東中国の土壤動物に関する従来の知見および近年の調査結果を取りまとめたものである。内容は、まず土壤動物の区系地理と生態地理の2部門に大別されているが、それぞれの部門の記述項目および著者名(括弧内)を示せば次のとおりである。

#### 土壤動物の区系地理

北東中国のハネカクシ類 (李景科); 北東中国のハンミョウ類 (李景科); 中国産ハンミョウ科目録 (李景科); 中国のエンマムシ類 (李景科); 北東中国に分布する鞘翅目の科の分布型 (李景科・陳鵬・張雪萍); 中国におけるセスジハネカクシ科の区系分布 (李景科・張雪萍); 北東中国のオトシブミ類 (李景科・唐永紅); 中国産 *Coptolabrus lafossei* (F.) の分布と3新亜種 (李景科・唐永紅); 北東中国産アラメナガゴミムシ亜属の2種 (李景科・陳鵬); 北東中国のコキノコムシ科と1新記録種 (唐永紅・李景科); 黒龍江省尚志市老爺嶺産土壤甲虫類の分類 (李景科・陳鵬・卜照義・張雪萍); 安徽省の土壤甲虫類 (李景科・王宗英).

#### 土壤動物の生態地理

帽儿山地域における土壤動物群の構造的特徴 (陳鵬・仲伟彦・張雪萍・梁淑英); 帽儿山の落葉松林におけるダニ類 (卜照義・董冬平・文在根); 小興安嶺の泥炭地林における土壤動物群集の構造的特徴 (梁淑英・陳鵬・郎惠卿); 小興安嶺の沼沢地林における土壤動物と微量元素含量 (張桂榮・梁淑英); 馬家沟汚灌区土壤と土壤動物の重金属含量 (華德尊・張雪萍・劉來祥); 吉林省における丘陵と山地の蒙古櫟林落葉層の土壤動物 (殷秀琴・張桂榮・李景科・許静); 長春市南湖公園の土壤昆虫 (蘇志剛); 遼寧營口地区におけるハンミョウの生態的分布 (李景科・陳鵬); 千山自然保護区のおサムシ類 (李景科・梁淑英); 森林群落での異なる遷移の土壤動物 (侯威嶺・張桂榮); 土壤性線虫群集の特徴 (楊發柱・殷秀琴); 土壤性線虫の研究方法 (楊發柱); 主要参考文献.