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Zelenkaesalus subgen.n. for three Southeast Asian species of *Echinoaesalus* ZELENKA, including *E. javanus* sp.n. (Coleoptera: Lucanidae: Aesalinae)

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Abstract

Aesaline stag beetles of the genus *Echinoaesalus* ZELENKA, 1993 (Coleoptera: Lucanidae) were hitherto recorded from Peninsular Malaysia/Thailand, Borneo, Sumatra, and Sulawesi. In this paper a new species from Java, *Echinoaesalus javanus*, is described and illustrated. It is closely related with two named Southeast Asian species with deep metapectoral and abdominal grooves accommodating the middle and hind legs. A new subgenus, *Zelenkaesalus* (type-species *Aesalus timidus* KRIKKEN, 1975), is established for these three species. The broader taxonomic and biogeographic context of the Aesalini is briefly discussed.

Key words: Coleoptera, Lucanidae, Aesalini, *Echinoaesalus*, *Zelenkaesalus*, new subgenus, key, species list, new species, Southeast Asia.

Introduction

During the past few decades two new genera and several new species of tropical Aesalini have been proposed, following their initial discovery in both Southeast Asia and South America in the early seventies. The subfamily Aesalinae apparently comprises odd, ancient lineages within the Lucanidae (HOSOYA & ARAYA 2005, NIKOLAJEV 1993), and the tribe Aesalini was for a long time thought to have a monogeneric Palearctic-Mesoamerican distribution. The first aesaline from the Oriental tropics was described from North Sumatra by KRIKKEN (1975), who already emphasized its differences from the "normal" species of *Aesalus* FABRICIUS, 1801 then known. At present the total number of species known from the area between Thailand and Sulawesi, meanwhile all referred to *Echinoaesalus* ZELENKA, 1993, has risen to nine (see check list below), including records from most major islands, except Java. There are no records from the Philippines and the area east of Sulawesi. Further new Aesalini from mainland Eurasia have been placed in *Aesalus* (see, for instance, BARTOLOZZI 1991, ARAYA et al. 1998, ARAYA & YOSHITOMI 2003), and more aesaline novelties are anticipated.

Recently, after having been beyond reach for two decades, a small, diverse lot of Asian aesalines came back to Leiden, including a specimen from West Java collected there about 75 years ago – to my knowledge the first aesaline to be recorded from the island. This specimen, from the well-known volcano Tangkubanperahu, north of the city of Bandung, certainly represents a new species of the group characterized by deep, sharply defined ventral sulci, which includes two more Sundaland species, *Echinoaesalus timidus* (KRIKKEN, 1975) and *E. sabahensis* ZELENKA, 1994. The metapectoral and abdominal sulci, apparently adapted to receive and protect the meso- and metatibiae and tarsi, evidently constitute a synapomorphy, and, consequently, a new subgenus is proposed for this conspicuous set of three species. In this paper the new subgenus is briefly characterized, the three included species are keyed, and the new species from Java is described; the genus is also briefly characterized. For more synoptic work on Southeast Asian

Aesalini, see the key to *Echinoaesalus* species by ZELENKA (1994), plus the extensive information in ARAYA et al. (1993, 1994, 2004).

Biological information on these Sundaland aesalines is scanty: some were found in decaying wood infected by a brown rot fungus, in both lowland and upland forest environments; several specimens came to light (some have lepidopterous scales on them, apparently coming from light trap samples, UV light has been mentioned). Although *Echinoaesalus* were reared to the adult stage from larvae taken in the field (ARAYA et al. 1993, ARAYA 2004), the larvae themselves are not yet formally described. Certain species have, in addition to the sulci mentioned, deep pits in their metaventrite, which may, leg protection aside, function as mycangia (or acarodomatia – minute mites were noticed). The shape of the body, and the way in which the head and the various appendages can be securely fitted and fastened, make a protective impression – apparently required in a hostile microhabitat. The head can be rigidly retracted against the robust prosternal apophysis.

There is some debate about the taxonomy, phylogeny and morphology of the Aesalinae (HOWDEN & LAWRENCE 1974, ARAYA et al. 1998, HOLLOWAY 1998, etc.). In the present context this would amount to questions about the interrelations of the various groups of species within the Aesalini, or, in other words, the cladogram and consequent ranking of the relevant genus-group taxa (*Aesalus*, *Echinoaesalus*, the new subgenus diagnosed below, and the South American *Lucanobium* HOWDEN & LAWRENCE, 1974). The separation of Himalayan and Far East *Aesalus* from Southeast Asian *Echinoaesalus*, for instance, has been a moot point – and indeed their relationships could be paraphyletic. I recognize an operational genus *Echinoaesalus*, distinguishing two subgenera, and three groups of species within the nominate subgenus (see list below). Whatever the final outcome of this discussion, the three species in the new subgenus are united by at least one unique, very distinct, apparently autapomorphous attribute: their ventral sulci.

A few years ago a review of the Aesalini was published (ARAYA 2004, largely in Japanese), containing, inter alia, pictures, a list of species, and a phylogeographic map; in the same paper *Echinoaesalus* is accepted, following previous reluctance. The same author also suggests an apparently unpublished occurrence of Aesalini in Central Africa. The direct relationship between *Echinoaesalus* and the South American *Lucanobium* suggested by ARAYA (2004) seems, at first sight, far-fetched, but the distribution of the tapirs and many other groups of organisms shows that trans-tropical-Pacific vicariance exists, and may be coupled with a choice of events varying from trans-Atlantic (e.g., Tethyan) to trans-Pacific (e.g., Beringian) dispersal, depending on available phylogenetic and/or fossil dating evidence. Note that there are no recent records of Aesalini known from America North of Mexico; they appear widespread in the Far East lowlands and uplands, but in the area from Europe to the Himalayas they occur only in montane (or at least temperate) situations.

All in all, if the interpretation of the fossil aesaline *Cretaesalus* NIKOLAJEV, 1993 still stands, then a Laurasia-Tethys Cretaceous origin of the Aesalini, followed by differentiation into the present-day tropics, may be postulated.

Because more aesaline novelties are anticipated, it seems wise to postpone a cladistic analysis.

Technical notes

First some remarks on the (dorsal) vestiture of Aesalini are in order. In some *Echinoaesalus* species and in *Lucanobium* this is complex, including (straight or curled) setae, stiff (isodiametric, claviform, squamiform) bristles, and star- or plume-like sets of microsetae (very fine hairs, expanding into a tomentous tapestry), in colour varying from white through brown to

black. The bristles may be more or less concentrated, forming clumps. This vestiture may easily be rubbed off. The tomentum may be flocky, difficult to distinguish from any extraneous matter, frequently giving these aesalines a scruffy appearance.

The term pectus (pectoral) designates the combined ventral side of the thorax (may have prefixes, like pro-, meso-, meta-); these terms, and conventional ones like metaventrite and abdominal sternites, are used for the sake of practical continuity, not implying any broader morphological homologies.

I have refrained from dissecting (and sexing) certain specimens, in view of their uniqueness and extreme fragility. Following the precautionary principle, it seems better to save the anatomical parts for a future, minimally invasive comparative study. In *Echinoaesalus* sexual dimorphism is limited.

Note that some of the body elements figured in this paper are slightly tilted, and that they could not all be photographed in exactly the same position.

In addition to the new Javan *Echinoaesalus*, I studied six other Southeast Asian species of *Echinoaesalus*, plus *Aesalus* from Japan, the Himalayas, and Europe. The species here figured as *E.* (*Echinoaesalus*) sp. (deposited in the Vienna Natural History Museum) is a presumably undescribed taxon from Sabah.

Measurements in mm, instead of scale lines with the Figs. 1–2, 4–5, 7–8:

E. timidus: maximum width of pronotum 2.3, maximum width of elytra combined 2.7.
E. sabahensis: maximum width of pronotum 2.4, maximum width of elytra combined 2.6.
E. javanus: as in holotype description.

Echinoaesalus ZELENKA, 1993

BRIEF DIAGNOSIS: Body relatively short, semioval, strongly convex, ratio length/width approximately 1.5–1.7. Eye-canthus well developed, tip rounded, not completely dividing eyes. Elytral epipleuron broad in front, with variably developed depressions, accommodating meso- and metatibial "knee", very narrow along abdomen. Propectus laterally concave. Protibia with hook-shaped, sharp apico-external denticles and up to three finer proximal denticles (may be worn off), lacking proximal serration; terminal spur fine, with tarsal base fitting between upper and lower lobe forming apico-internal cavity. Meso- and metatibiae with few fine external spines, lacking strong elevations. Cephalic plate more or less transversely elliptic, at most slightly angular anteromedially (one species with single, isolated denticle), surface flat or nearly so. Pilosity abundant, diverse according to species, on dorsum at least consisting of more or less erect, simple or scale-like bristles. At most minor sexual differences in shape of mandibles. Prosternum with robust intercoxal, anteriorly broadened apophysis. Antenna 10-segmented, with 3-segmented, entirely pubescent club; scapus long, unmodified, segment 3 slender. Abdominal venter with five visible flat sternites.

TYPE-SPECIES: *Echinoaesalus jaechi* ZELENKA, 1993, by original designation.

SUBGENERA: Two subgenera are recognized here, distinguished primarily by presence and absence of ventral sulci (Figs. 12, 17). Some authors (for instance, KRAJCIK 2001) treat *Echinoaesalus* as subgenus of *Aesalus* (see also Introduction).

DISTRIBUTION: As conceived here restricted to Southeast Asia, 10 species known, from both lowland and upland forest.

SPECIES-LEVEL DIVERSITY:

Characters serving to distinguish the species include:

1) Head shape (length/width ratio, anterior margin, any projections, eye-canthi)
2) Mandibular shape (outline, protrusions, cavities, punctures, slightly different between sexes)
3) Shape of labrum (outline)
4) Shape of mentum (outline, impression(s), callosities, ridges)
5) Pronotal shape (dorsal outline, outline in profile)
6) Elytral shape (dorsal and ventral outline, relative length, outline in profile, umbones, epipleuron)
7) Dorsal vestiture (distribution and colour of bristles, scales, plumes/tomentum, bristle clustering)
8) Dorsal microsculpture (nature and arrangement of punctation, associated pilosity)
9) Prosternal intercoxal apophysis (shape details)
10) Metaventral shape (any cavities, disc deplanation, other details)
11) Lateral metapectoral sulcus (presence, shape details)
12) Lateral abdominal sulcus (presence, shape details)
13) Protibial shape (external dentation, width/length proportion)
14) Meso- and metatibial shape (external spines, apex)
15) Profemoral shape (details of margins)
16) Genitalia details (male, female)
17) Size (body length in mm)

Check list of *Echinoaesalus* species occurring between peninsular Thailand and Sulawesi

For guidance some group characters added, between parentheses. There are no other Aesalinae known from the region.

subgenus ***Echinoaesalus*** (no ventral sulci)

E. hidakai group (bristle clumps present)
- *E. hidakai* (ARAYA et al., 1993, *Aesalus*) – Malay Peninsula
- *E. schuhi* ZELENKA, 1994 – Malay Peninsula

E. matsuii group (bristles scattered, metaventrite with anterolateral cavity on either side)
- *E. barriesi* ZELENKA, 1993 – Sumatra
- *E. dharma* (ARAYA et al., 1994, *Aesalus*) – Peninsular Thailand
- *E. matsuii* (ARAYA, 1993, *Aesalus*) – Malay Peninsula
- *E. yongi* (ARAYA, 1993, *Aesalus*) – Malay Peninsula, Borneo (ARAYA & HAMID 1996)

E. jaechi group (bristles on elytra serially arranged)
- *E. jaechi* ZELENKA, 1993 – Sulawesi

subgenus ***Zelenkaesalus*** (with sharply defined ventral sulci)
- *E. javanus* sp.n. – Java
- *E. sabahensis* ZELENKA, 1994 – Borneo
- *E. timidus* (KRIKKEN, 1975, *Aesalus*) – Sumatra, Malay Peninsula, Peninsular Thailand, Borneo (ARAYA & OCHI 1992, ARAYA et al. 1993)

***Zelenkaesalus* subg.n.**

BRIEF DIAGNOSIS: Metapectoral sides (metaventral-metepisternal-epipleural surface) shaped as deep, sharply defined longitudinal sulcus. Abdominal sternites (1–3) on either side with narrow, sharply defined sublongitudinal sulcus. Short body, with dorsum strongly, somewhat unevenly convex, top of elytra jointly more or less hunched; ventral outline somewhat waisted due to slightly sinuous elytral edges. Dorsal side with erect, scattered bristles; pronotum and elytra with sets of subsymmetrically placed, dense clumps of bristles (resulting in scruffy general

appearance). Metaventral surface at most with furrow, anterolaterally along mesocoxae (no deep cavities away from mesocoxae). Anterior border of clypeus evenly, widely arcuate, unmodified. Compare Figs. 12, 17.

TYPE-SPECIES: *Aesalus timidus* KRIKKEN, 1975.

DISTRIBUTION: Sundaland, three species known from upland forest sites.

DERIVATIO NOMINIS: Subgenus named after the author of the genus *Echinoaesalus*, Wilhelm Zelenka (Vienna, Austria). See his picture in JÄCH et al. (2007). Gender masculine.

Key to species of *Zelenkaesalus*

1 Mentum with complete (variably deep) arcuate groove, in front. Elytra with scattered tomentoid pilosity, no whitish bands. 2

– Mentum with short (comma-shaped) pit-like groove on either side of mentum (not in front). Elytra with longitudinal bands of whitish tomentoid pilosity. With black and pale brown bristle clumps on pronotum and elytra. ..... *timidus*

2. Metaventrite and abdominal sternites shining. Pronotum and elytra lacking black bristle clumps. Protibia slender. Anterolateral corner of metaventrite shallowly impressed along mesocoxae. Anterolateral edge of mentum rounded. ..... *javanus*

– Metaventrite and abdominal sternites matt. Pronotum and elytra with black and pale brown bristle-clumps. Protibia robust. Anterolateral corner of metaventrite with deep furrow along mesocoxae. Anterolateral edge of mentum distinctly angular. ..... *sabahensis*

Echinoaesalus (*Zelenkaesalus*) *javanus* sp.n.

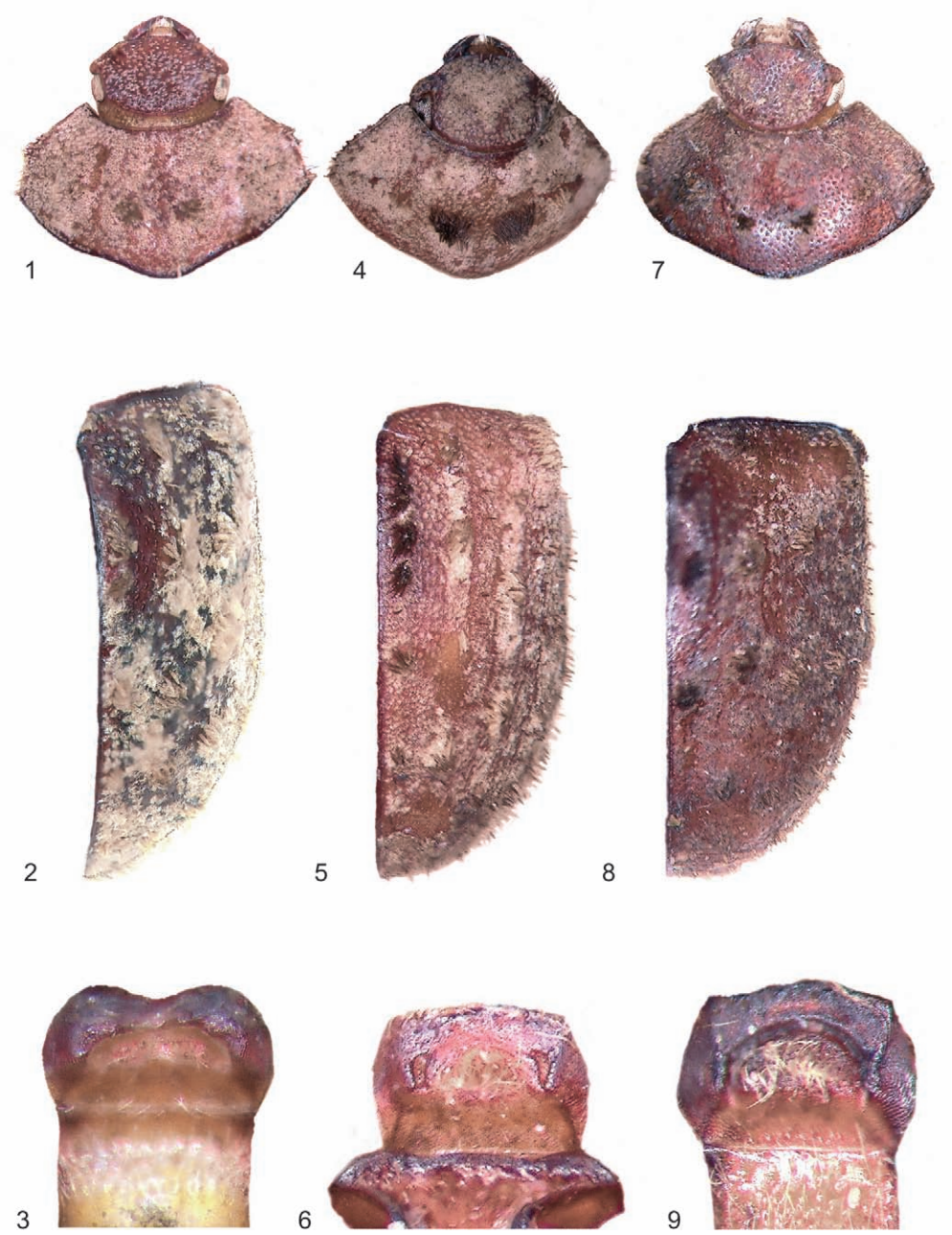
(Figs. 1–3, 10–15)

TYPE-MATERIAL: **Holotype** female, label data: "Java: Preanger: G. Tangkoeban Prahoe, 4000-5000 ft, xi/1933, F.C. Drescher" (deposited in the National Museum of Natural History, Leiden, ex coll. De Gunst/Krikken). Holotype label added.

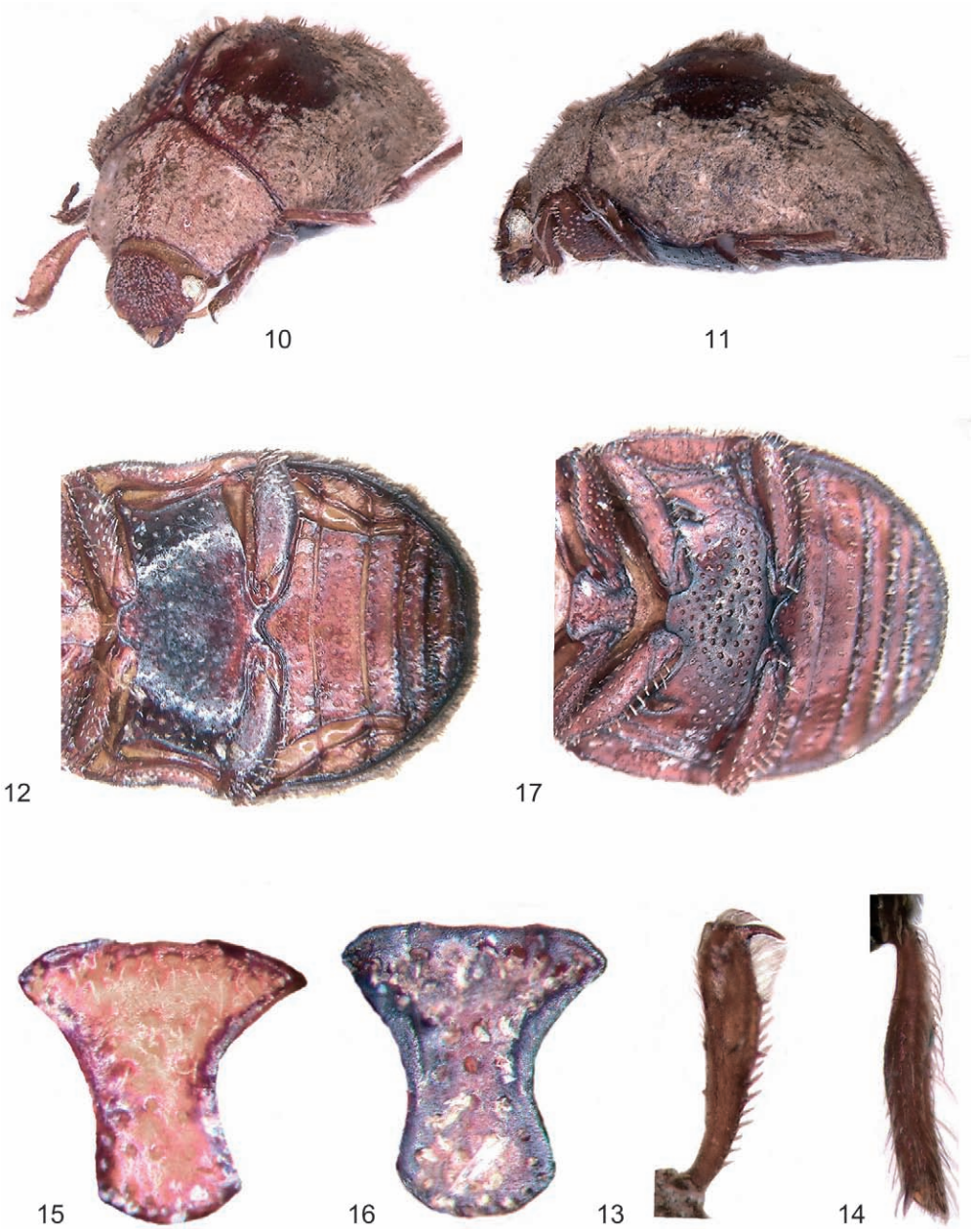
DESCRIPTION (holotype): Body length ca 4.5 mm (head slightly declined). Derm generally reddish-brown, dorsal side covered with seta-bearing punctures; many punctures with pale-brown bristle and/or and whitish tomentoid hairs, elytral sides flocky; subsymmetrically distributed concentrations of more or less erect scale-like bristles on pronotum and elytra. Ventral side with numerous punctures, many with bristle.

Clypeal border widely arcuate, slightly marginate. Genal canthus short, tip rounded. Clypeofrontal surface virtually flat, with numerous erect pale brown bristles, most punctures with minute hairs forming tomentoid cover; punctation generally dense, shallow, rather fine. Vertexal ridge transversely, widely arcuate.

Pronotum moderately convex, anterolateral surface slightly deplanate; anterior margin emarginate, subarcuate-concave; anterolateral angle shortly rounded; anterior section of pronotal side virtually straight, curving to shorter, equally straight posterior section; posterolateral angle obtuse; base widely rounded, sinuate, with rounded, slightly expanded basomedian section. Pronotal surface densely annulate-punctate (where visible, for instance on basomedian surface, separated by 1–3 diameters), annuli isodiametric, mostly covered by whitish tomentum; scattered erect pale-brown bristles numerous; disc with paramedian and lateral clumps of more or less erect scale-like pale-brown bristles (total set of four), lateral clump much less densely packed, inconspicuous; midline areas not completely tomentous (type also has abraded surfaces, showing punctural details). Scutellum small, flat, with acute apex, lateral borders curving inward near base.



Figs. 1–9: *Echinoaesalus*. 1–3) *E.* (*Zelenkaesalus*) *javanus* (holotype Java), 4–6) *E.* (*Zelenkaesalus*) *timidus* (holotype Sumatra), 7–9) *E.* (*Zelenkaesalus*) *sabahensis* (male Sabah) – 1, 4, 7) forebody, frontodorsal; 2, 5, 8) elytron, dorsal; 3, 6, 9) mentum and anterior part of gula (Fig. 6 with anterior dilated part of prosternal apophysis, note pair of small pits on mentum).



Figs. 10–17: *Echinoaesalus*. 10–15) *E.* (*Zelenkaesalus*) *javanus* (holotype Java). 16) *E.* (*Zelenkaesalus*) *sabahensis* (paratype female, Sabah), 17) *E.* (*Echinoaesalus*) sp. (from Sabah). – 10) habitus, oblique, 11) lateral view; 12, 17) meso- and metapectus and abdomen, with femora (note prosternal process for orientation, and metaventral cavities in 17), 13) protibia, upper side, 14) metatibia, underside, 15, 16) prosternal apophysis.

Elytra strongly convex, combined outline suboval, with joint discal hunch and distinct humeral umbone, apex strongly, evenly declivitous; epipleuron modified: broadly, distinctly concave, in two places, to receive knee regions of middle and hind legs; part of epipleuron along abdomen very narrow; apicosutural area of elytron rectangular. Elytra with general cover of whitish tomentum (locally looking flocky), and with somewhat longitudinal rows of concentrations of yellowish to pale-brown bristles, on what vaguely seem to be odd intervals (analogous to the bands mentioned for *E. timidus* in the key?), all mixed with scattered erect pale-brown bristles; bristle clumps on top of juxtasutural strip densely packed. Much of elytra with dense annulate punctation, some areas (around discal hunch) with hemiannulate (horseshoe-shaped) punctation. Mandibles subsymmetric, laterally angular (dorsal view), mandibular points long, sharp; upper side with pit near base. Labrum yellow, well developed, projecting straight forward. Mentum with dark brown outer circumference, in front separated from flat yellowish inner plate by widely arcuate groove; surface glabrous. Antenna with long, slightly curved, subclavate scapus, noduliform pedicel, long, slender segment 3, very short segments 4–7, and three entirely pubescent club segments.

Intercoxal apophysis of prosternum robust, front end expanded laterad, with acute tips (outline almost anchor-like), surface very slightly concave, with numerous seta-bearing punctures; lateral and anterior sides slightly marginate. Propectoral sides concave. Metepisternum plus adjacent side of metaventrite forming deep, sharply defined lateral longitudinal sulcus. Metaventral disc deplanate, medially very slightly impressed, with dense, fine annulate punctation; lateral slopes with abundant, larger annulate punctures; many punctures with fine seta; metaventral derm generally shiny blackish; margin laterally along mesocoxa with narrow impression; anterior intercoxal lobe truncate, anterolateral angles rounded off; posterior intercoxal lobe delimited by fine transverse, linear impression, apex with round emargination between pair of distinct angles. Abdomen with five visible flat, apparently (partly) fused, shiny sternites, laterally on either side with deep, sharply defined sublongitudinal sulcus from basal side onto sternite 3; sternites 1–3 with numerous large (circular to slightly elliptic) annulate punctures, some bearing fine seta; punctures along anterior and posterior border of sternites 3–5 creating heavily crenulate margins (except on anal edge), on sternite 2 only along posterior border near sulcus; dermal background feebly shagreened; intercoxal apicomedian lobe, formed by sternite 1, rounded.

Protibia broad, with strong, hook-shaped, acuminate apico-external denticle, and two equidistant, inconspicuous, very fine, acute (spiniform) denticles (may be abraded); abundantly setose, upper side smooth, glabrous, distal surface shallowly concave; apex transverse, nearly straight; terminal spur short, slender, on lobe over tarsal cavity. Profemur with underside explanate in front (lined with marginal groove), underside densely, strongly annulate-punctate-setose. Meso- and metatibiae long, slender, slightly sinuate and dilated distad; upper side largely smooth, glabrous; underside with longitudinal rows of setae; mesotibia with longitudinal row of several distinct seta-bearing accrete spines on external surface, ending in acute apico-external hook; metatibia with minute, more or less obsolescent spines on external surface, apex shortly protuberant externally, apical crest of tibiae fringed with bristles, with short, slender terminal spur. Meso- and metafemora slender, underside abundantly, finely annulate-punctate, many punctures with fine seta. Tarsi all relatively short, densely setose, unmodified (partly lost in type).

Measurements in mm. Width of head between tips of eye canthi 1.2, median length clypeal border to vertexal ridge 0.75. Median length (full-face view) of pronotum 1.3, maximum width 2.4. Sutural length of elytra (full-face view, scutellar apex to elytral apex) 3.1, maximum width combined 2.8.

DIAGNOSTIC REMARKS: *E. javanus* is dorsally covered largely by a complex vestiture; it has relatively slender protibiae, and a shiny metaventrite and abdominal venter. Pronotum and elytra

with pale yellow-brown bristle clumps, no black setae or bristles. Although locally abraded, the distribution of the tomentoid vestiture on the elytra is clearly not arranged in bands, as in *timidus*; the abraded surface on the side of the mid-elytral hunch shows the horse-shoe-shaped punctation. The mentum of *E. javanus* is rounded-sinuate in front and has, between the posterior yellowish slope and the heavily sclerotized brown circumference, a shallow, somewhat arcuate furrow; no isolated pits present, surface of mentum glabrous. Profemora explanate in front. Apophysis between procoxae with relatively sharp anterolateral expansions. Anterolateral grooves on metaventrite very shallow, metaventrite lacking deep pits. Eyes distinct in full-face view.

Echinoaesalus javanus was compared with various other aesalines, including types of the two other species of *Zelenkaesalus* (from the National Museum of Natural History, Leiden and the Vienna Natural History Museum) – see the key above.

DERIVATIO NOMINIS: javanus (adjective, Latin) – pertaining to Java. This species is so far known only from the island of Java.

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References

ARAYA, K. 1993: Two new tropical *Aesalus* (Coleoptera, Lucanidae) from the Malay Peninsula. – Japanese Journal of Entomology 61: 697–710.

ARAYA, K. 2004: [On attractive lucanid beetles of the tribe Aesalini.] – Gekkan-Mushi 402: 18–25. [In Japanese]

ARAYA, K. & HAMID, A.-A. 1996: Discovery of *Aesalus yongi* (Coleoptera, Lucanidae) from Borneo. – Elytra 24: 329–330.

ARAYA, K. & OCHI, T. 1992: A new record of *Aesalus timidus* (Coleoptera, Lucanidae) from the Malay Peninsula. – Elytra 20: 206.

ARAYA, K., TANAKA, M. & BARTOLOZZI, L. 1998: Taxonomic review of the genus *Aesalus* (Coleoptera: Lucanidae) in the Himalayas. – European Journal of Entomology 95: 407–416.

ARAYA, K. & YOSHITOMI, H. 2003: Discovery of the lucanid genus *Aesalus* (Coleoptera) in the Indochina region, with description of a new species. – Special Bulletin of the Japanese Society of Coleopterology 6: 189–199.

ARAYA, K., KON, M. & JOHKI, Y. 1993: A new species of the genus *Aesalus* (Coleoptera, Lucanidae) from the Malay Peninsula. – Elytra 21: 93–107.

ARAYA, K., MATSUI, M., NABHITABHATA, J. & PANHA, S. 1994: A new bristly *Aesalus* from peninsular Thailand (Coleoptera, Lucanidae). – Giornale Italiano di Entomologia 7: 73–77.

BARTOLOZZI, L. 1991: Osservazioni sulle specie paleartiche del genere *Aesalus* Fabricius, 1801 (Coleoptera: Lucanidae). – Opuscula Zoologica Fluminensia 76: 1–8.

HOLLOWAY, B.A. 1998: A re-evaluation of the genera of New Zealand stag beetles (Coleoptera: Lucanidae). – Journal of the Royal Society of New Zealand 28: 641–656.

HOSOYA, T. & ARAYA, K. 2005: Phylogeny of Japanese stag beetles (Coleoptera: Lucanidae) inferred from 16S mtrRNA gene sequences, with reference to the evolution of sexual dimorphism of mandibles. – Zoological Science (Tokyo) 22: 1305–1318.

HOWDEN, H.F. & LAWRENCE, J.F. 1974: The New World Aesalinae, with notes on the North American lucanid subfamilies (Coleoptera, Lucanidae). – Canadian Journal of Zoology 52: 1505–1510.

JÄCH, M.A., SCHÖNMANN, H. & SCHUH, R. 2007: Die "Koleopterologische Rundschau" – ein Relikt im Höhenflug (Geschichte der ältesten entomologischen Fachzeitschrift Österreichs, und Synopsis der koleopterologischen Zeitschriften und Newsletter der Welt). – Entomologia Austriaca 14: 231–271.

KRAJCIK, M. 2001: Lucanidae of the world. Catalogue – Part I. Checklist of the stag beetles of the world. – Most: Krajcik, [4]+108 pp.

KRIKKEN, J. 1975: *Aesalus timidus* sp.nov., a remarkable addition to the Indonesian stag-beetle fauna (Coleoptera, Lucanidae). – Entomologische Berichten (Amsterdam) 35: 49–51.

NIKOLAJEV, G.V. 1993: [The discovery of the pectinicorn beetle (Coleoptera, Lucanidae) from the Upper Cretaceous of Kazakhstan.] – Selevinia 1: 89–92. [In Russian]

ZELENKA, W. 1993: *Echinoaesalus* gen. n. – eine neue Lucaniden Gattung aus Südostasien (Coleoptera: Lucanidae). – Koleopterologische Rundschau 63: 235–237.

ZELENKA, W. 1994: Zwei neue *Echinoaesalus*-Arten aus Südostasien (Coleoptera: Lucanidae). – Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen 46: 56–61.

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