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Synopsis of the genus *Hemicryphalus* SCHEDL with descriptions of four new species from Borneo (Coleoptera: Scolytidae)

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Abstract

Four species of *Hemicryphalus* SCHEDL from Borneo are described and named; *kinabaluensis* sp.n., *minutus* sp.n., *podocarpi* sp.n. and *squamosus* sp.n. Notes on the gallery patterns of *H. minutus* sp.n. are included. Each species is illustrated. A key to the seven known species is included.

Key words: *Hemicryphalus*, Borneo, Scolytidae, taxonomy.

The present contribution is part of a larger study which will eventually result in a monographic treatment of the Scolytidae of Malaysia. The four new species described herein were all collected in the vicinity of Mt. Kinabalu, Sabah. Rather than just describe and name them, it was decided to briefly review the entire genus as presently understood.

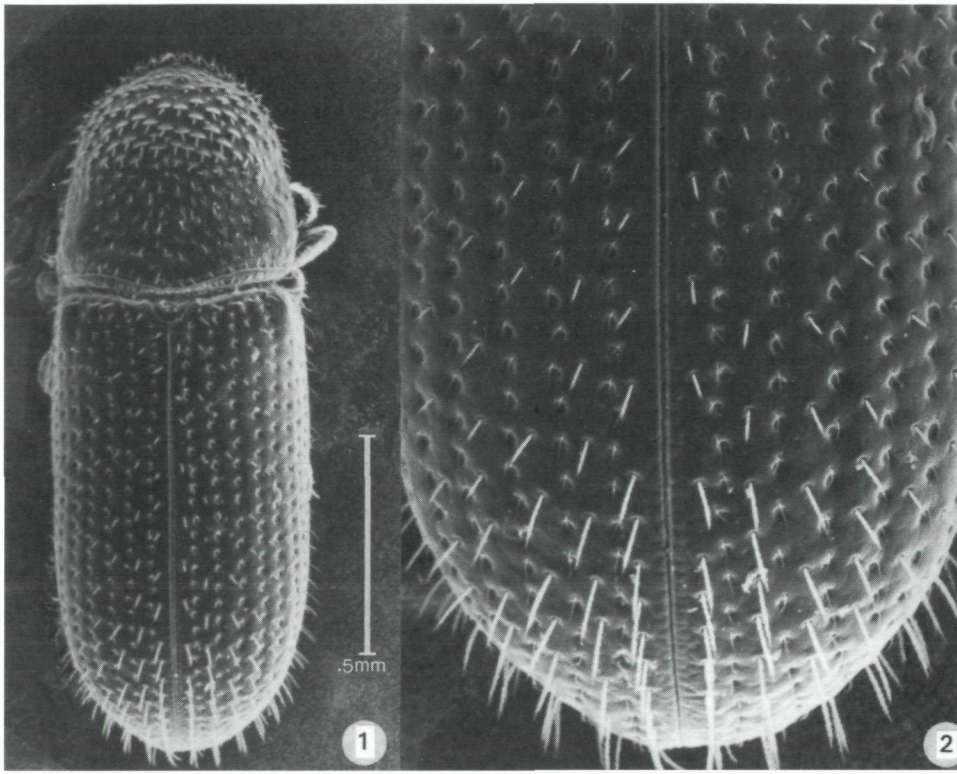
Hemicryphalus was described by SCHEDL (1963: 264) when he recognized that *Eidophelus argutus* WOOD from the Mariana Islands was not congeneric with *E. imitans* EICHHOFF, the type species of *Eidophelus* EICHHOFF. Two additional species of *Eidophelus* from Micronesia were described by WOOD (1960); both were also placed in *Hemicryphalus* by SCHEDL (1963). BEAVER (1987) placed *Eidophelus samoanus* SCHEDL in *Hemicryphalus* but changed this placement in 1990 (BEAVER & MADDISON 1990) . The type was examined by Wood and the species is placed in *Eidophelus* in the forthcoming catalog of the world Scolytidae and Platypodidae (WOOD & BRIGHT, in preparation). I prefer to leave it in *Eidophelus* until a more complete study of related genera is available. With the addition of the four species named herein, the genus now contains seven species.

Hemicryphalus is in the tribe Cryphalini and may be distinguished from related genera by the weakly to strongly procurved sutures on the antennal club, by the prominently elevated pronotal summit, by the distinctly concave posterior portion of the pronotum, by the sparse elytral vestiture which is mostly confined to the declivital area and by the fine raised line on the lateral and basal margins of the pronotum. The sexes cannot be easily distinguished externally.

Description: Frons flat to weakly concave, sometimes with fine setae in female; antennal funicle 4-segmented, club round to broadly oval with two distinct, weakly to strongly procurved sutures. Pronotum asperate on anterior slope; anterior margin serrate; summit distinctly elevated; posterior area behind summit transversely concave; lateral and basal margins with a fine raised line. Elytra elongate; striae punctured in regular rows; vestiture sparse, usually confined to declivital area. Fore tibia broadened distally, with a distinct terminal spine, lateral margin of tibia with four socketed teeth. Tarsal segments with long setae on ventral surface. Length 1.1 - 1.8 mm.

Type species: *Eidophelus argutus* WOOD, original designation. Type species examined.

The holotype and most of the paratypes of the species described below are temporarily in the collection of the author (DEBC). Some paratypes are in the Canadian National Collection, Ottawa, Ontario (CNC), the Natural History Museum, London (NHML), the United States National Museum of Natural History, Washington D.C. (USNM) and the Forest Research Center, Sandakan, Sabah, Malaysia (FRCM).



Figs. 1, 2. *H. kinabaluensis*: 1, habitus; 2, posterior half of elytra.

I would like to thank my technician, Mr. Robert Skidmore, for taking the photos used herein. The manuscript was typed by Eileen Muir-Fahola, Barbara Hilliker and Gilberte Cloutier and reviewed by Drs. A. Smetana and Y. Bousquet, all from my research center.

Key to species of *Hemicryphalus*

1 Sutures on antennal club weakly procurved; interstrial setae on declivity narrowly scale-like, flattened only at tip; Pacific Islands 2

- Sutures on antennal club strongly procurved; interstrial setae on declivity hair-like or distinctly scale-like; Borneo 4

2 Pronotum dull; posterior area finely rugose-reticulate with a few minute granules; elytral surface more coarsely sculptured, interstriae irregular; 1.4 mm ..... *incomptus* (WOOD)

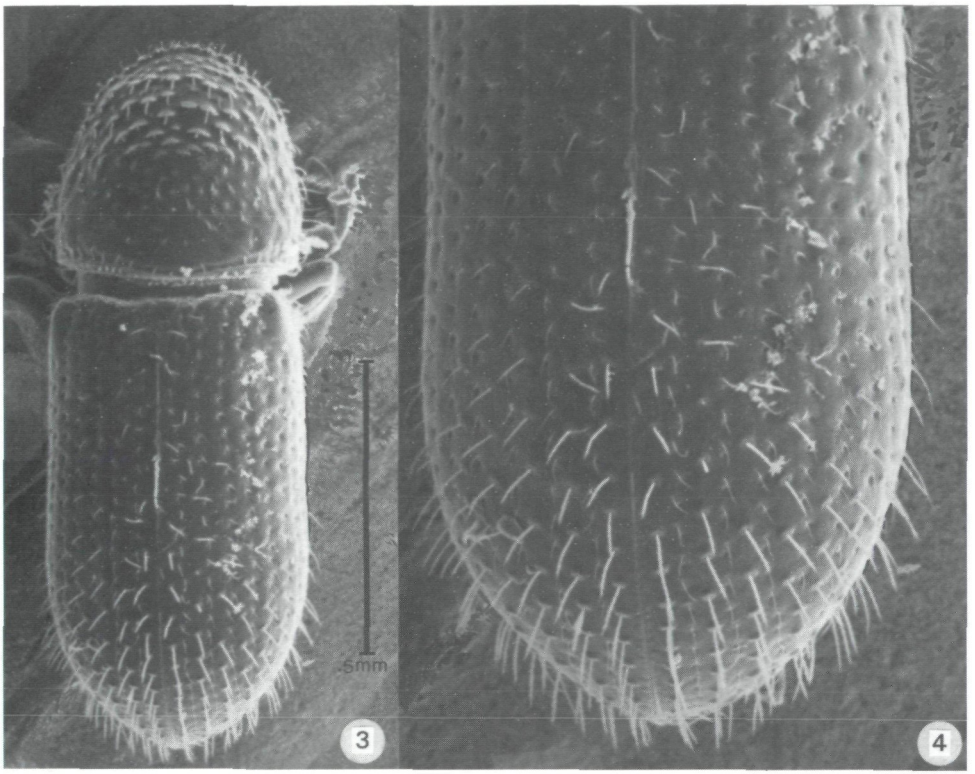
- Pronotum shining, posterior area finely reticulate, deeply, closely punctured; elytral surface finely sculptured, interstriae smooth 3

3 Strial punctures large, deeply impressed; interstriae impunctate; 1.4 mm ..... *argutus* (WOOD)

- Strial punctures smaller, shallowly impressed; interstriae minutely, closely, irregularly punctured; 1.1 mm ..... *atomus* (WOOD)

4 Declivital interstriae with median row of fine, hairlike setae 5

- Declivital interstriae with median row of narrow to broad scales 6



Figs. 3, 4. *H. minutus*: 3, habitus; 4, posterior half of elytra.

5 Declivital interstriae with a small granule at base of each seta; 1.1-1.3 mm; in *Podocarpus* sp. .... *minutus* n. sp.

- Declivital interstriae smooth, without granules; 1.5-1.8 mm ..... *kinabaluensis* n. sp.

6 Vestiture on elytra extending from base to apex; declivital scales narrowly flattened; 1.5-1.6 mm; in *Podocarpus* sp. ..... *podocarpi* n. sp.

- Vestiture on elytra confined to posterior third; declivital scales broadly flattened; 1.4-1.6 mm; in *Rhododendron* sp. ..... *squamosus* n. sp.

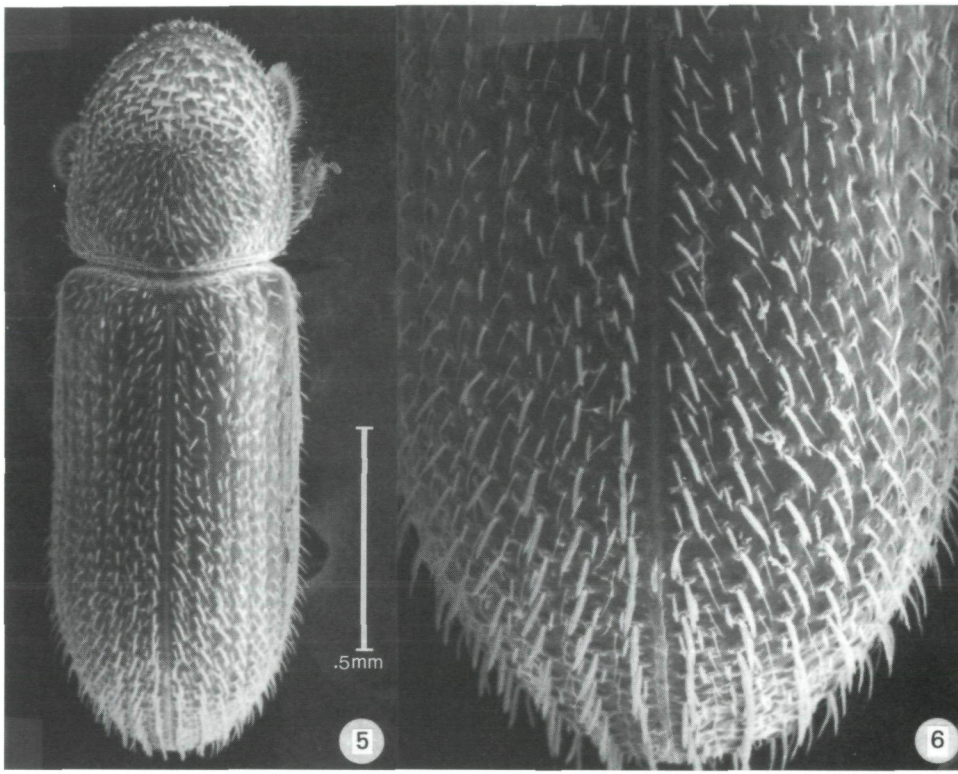
Hemicryphalus incomptus (WOOD)

Eidophelus incomptus WOOD 1960, p. 32 (Holotype ♀, Field Museum, Chicago, Illinois, USA).
Hemicryphalus incomptus: SCHEDL 1963, p. 264.

This species is known from only two specimens. Adults are similar to those of *H. argutus* but differ by the less conspicuous vestiture on the female frons, by the dull rugose-reticulate pronotum and by the more coarsely sculptured elytral surface. Adults also differ from those of *H. atomus* by the lack of granules on the declivital interstriae. This species is known only from Iwo Jima, Volcano Islands. The holotype has been examined.

Hemicryphalus argutus (WOOD)

Eidophelus argutus WOOD 1960, p. 33 (Holotype ♀, Field Museum, Chicago, Illinois, USA).
Hemicryphalus argutus: SCHEDL 1963, p. 264.



Figs. 5, 6. *H. podocarpi*: 5, habitus; 6, posterior half of elytra.

Eleven specimens of this species are known. Adults may be distinguished by the abundant setae on the female frons, by the absence of tubercules or granules on the declivital interstriae and by the large, deeply impressed strial punctures. This species is known only from Saipan, South Mariana Islands. The holotype has been examined.

Hemicryphalus atomus (WOOD)

Eidophelus atomus WOOD 1960, p. 34 (Holotype ♂, U.S. National Museum of Natural History, Washington, D.C.).
Hemicryphalus atomus: SCHEDL 1963, p. 264.

This species is known only from the holotype. The species closely resembles *H. argutus* but differs by the smaller size, by the smaller, less deeply impressed strial punctures, by the presence of numerous, minute interstrial punctures and by the presence of large granules on the declivital interstriae. This species is known only from Yap, Western Caroline Islands. The holotype has been examined.

Hemicryphalus kinabaluensis sp. n.
(Figs. 1, 2)

Length 1.5-1.8 mm, about 2.7 times longer than wide. Frons weakly convex, narrowly transversely impressed just above epistoma, with a small, distinct, circular, impressed point at midpoint just above epistomal margin; surface dull, densely, finely, minutely reticulate; vestiture

absent except for scattered, yellowish setae along epistomal margin. Antennal club oval, 1.3 times longer than wide; sutures 1 and 2 strongly arcuate. Pronotum as long as wide; sides nearly straight, weakly converging on basal half; anteroir margin narrowly rounded, with about 8 rather large serrations; anterior slope steep, with large, scattered asperities; surface dull, minutely reticulate; vestiture inconspicuous, consisting of short, erect, fine setae arising from base of each asperity; posteroir area densely reticulate, with scattered shining granules; basal margin slightly elevated, bisinuate. Elytra 1.7 times longer than wide; sides parallel on basal four-fifths, apex broadly rounded; strial punctures large, close, deeply impressed; interstriae as wide as striae, surface moderately shining. Declivity evenly convex; striae and interstriae as on disc, except each interstria with a median row of erect, yellowish, hair-like setae, each seta slightly longer than distance between rows, each strial puncture also with a very small, very fine, barely discernable (96X) hair-like setae as long as diameter of puncture.

Type material: Holotype, sex unknown, Borneo, Sabah, Mount Kinabalu National Park, New Hut, 3343 m, ex trunk of large fallen tree, 4.V.1987 (D.E. Bright) (DEBC). Paratypes, 34, same data as holotype (CNC, DEBC, FRCM, NHML, USNM).

Adults of this species are very similar to those of *H. minutus* described below but *H. minutus* is a much smaller beetle. In addition, the antennal club of *H. minutus* is larger, the strial punctures are smaller and each seta on the elytral declivity bears a small granule at its base.

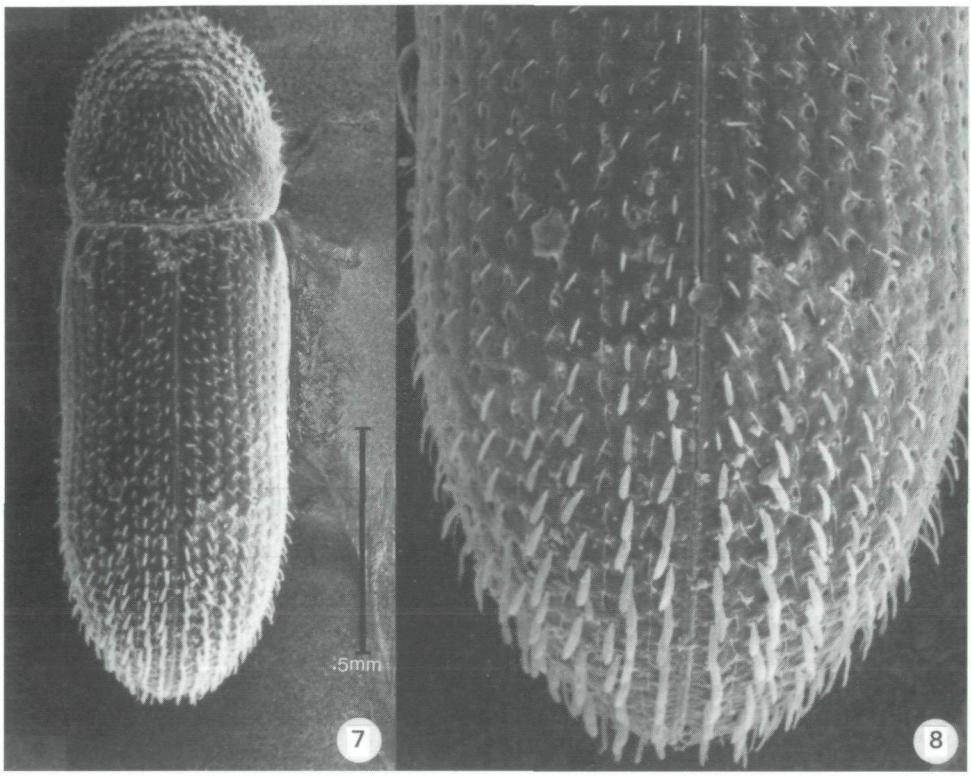
Hemicryphalus minutus sp. n.
(Figs. 3, 4)

Length 1.1-1.3 mm, about 2.6 times longer than wide. Frons weakly, evenly convex, narrowly transversely impressed above epistoma, with a very small, very weakly impressed, shining impression at midpoint just above epistomal margin; surface dull, densely, finely minutely reticulate; vestiture absent except for scattered yellowish setae along epistomal margin. Antennal club oval, 1.5 times longer than wide; sutures 1 and 2 strongly arcuate. Pronotum as long as wide; sides weakly arcuate from base to before middle; anterior margin broadly rounded, with about 10 small serrations; anterior slope steep, with moderate-sized distinct asperities; surface dull, minutely reticulate, vestiture inconspicuous, consisting of short, erect, fine setae arising from base of each asperity; posterior area densely, minutely reticulate, with scattered, small, shining granules; basal margin slightly elevated, bisinuate. Elytra as described for *H. kinabaluensis* except strial punctures slightly smaller and declivital interstriae each with a distinct median row of small granules in addition to interstrial setae.

Type material: Holotype, sex unknown, Borneo, Sabah, Mount Kinabalu National Park, Pinosuk Plateau, 1800 m, ex small branch of *Podocarpus* sp., 5.VIII.1988 (D.E. Bright) (DEBC). Paratypes, 32, same data as holotype (CNC, DEBC, FRCM, NHML, USNM).

Adults of this species closely resemble those of *H. kinabaluensis* described above. The two may be distinguished by the characters summarized in the comments under *H. kinabaluensis*.

The specimens in the type series were collected in association with *H. podocarpi*, described below, from a small dying branch about 3 cm in diameter. The galleries of *H. minutus* were entirely in the sapwood and deeply engraved the wood; those of *H. podocarpi* were entirely in the inner bark and did not touch the sapwood, therefore the gallery pattern of *H. podocarpi* could not be determined. The adults of *H. minutus* were just beginning to construct galleries so the complete system could not be seen. The galleries that were present consisted of a central nuptial chamber with from one to three galleries extending from the central chamber. In several nearly complete systems, a few egg niches could be seen, with several faint galleries, evidently made by young larvae, extending from some of the egg niches. A "star-shaped" gallery system is evidently characteristic of *H. minutus*.



Figs. 7, 8. *H. squamosus*: 7, habitus; 8, posterior half of elytra.

Hemicryphalus podocarpi sp. n.
(Figs. 5, 6)

Length 1.5-1.6 mm, about 2.8 times longer than wide. Frons very weakly flattened below level of eyes, more strongly impressed just above epistoma, with a very small, very shallowly impressed puncture at midpoint, often with a weakly elevated, longitudinal carina extending from median puncture to epistomal margin; surface dull, densely minutely reticulate; vestiture consisting of numerous, inconspicuous, erect, yellowish setae scattered over surface. Antennal club large, 1.5-1.6 times longer than wide; sutures 1 and 2 strongly arcuate. Pronotum 1.1 times longer than wide; sides weakly arcuate; anterior margin broadly rounded, weakly extended, with 6-8 large serrations; anterior slope steep, with large, erect, scattered asperities; surface dull, minutely reticulate; vestiture inconspicuous, consisting of very fine scattered setae; posterior area densely reiculate-granulate, granules abundant, shining; basal margin slightly elevated, bisinuate. Elytra 2.0 times longer than wide; sides parallel on basal four-fifths, apex broadly rounded; strial punctures rather large, weakly impressed, each with a distinct seta longer than diameter of puncture; interstriae as wide as striae, with surface weakly shining, each discal interstria with a median row of fine, erect setae, these extending from base to apex, becoming scalelike at beginning of declivity. Declivity evenly convex; striae and interstriae essentially as on disc except interstrial setae distinctly scale-like, each scale about as long as distance between rows; strial setae longer, more conspicuous, with smaller, scale-like setae scattered along interstriae, especially on lower half of declivity.

Type material: Holotype, sex unknown, Borneo, Sabah, Mount Kinabalu National Park, Pinosuk Plateau, 1800 m, ex small branches of *Podocarpus* sp., 5.VIII.1988 (D.E. Bright) (DEBC). Paratypes, 8, same data as holotype (CNC, FRCM, NHML).

Adults of this species are similar to those of *H. squamosus*, described below, but may be distinguished by the narrower scales on the declivital interstriae and by the more abundant and conspicuous strial setae intermixed with small scales. As noted above, adults of this species occurred together with those of *H. minutus*. Adults of *H. podocarpi* constructed galleries entirely in the inner bark and did not score the sapwood.

Hemicryphalus squamosus sp. n.
(Figs. 7, 8)

Length 1.4-1.6 mm, 2.8 times longer than wide. Frons evenly convex, narrowly transversely impressed above epistoma, impression divided by a small, distinct, longitudinal carina, sometimes with a very small, impressed point just above carina, this often reduced to a simple puncture; surface dull, densely, finely, minutely reticulate; vestiture inconspicuous, consisting of sparse, scattered, hair-like setae, these slightly longer above epistoma. Antennal club oval, 1.45 times longer than wide; sutures 1 and 2 strongly arcuate. Pronotum as long as wide; sides weakly arcuate, strongly converging on anterior half, anterior margin narrowly rounded, appearing slightly extended, with 6 large serrations; anterior slope steep, with numerous, scattered, large asperities, these becoming larger and more acute laterally; surface dull, minutely reticulate; vestiture inconspicuous, consisting of short, erect, fine setae arising from base of each asperity; posterior area densely reticulate, with scattered, small, shining granules; basal margin slightly elevated, bisinuate. Elytra 1.9 times longer than wide; sides parallel on basal four-fifths, apex broadly rounded; strial punctures large, close, moderately impressed; interstriae slightly narrower than striae, surface moderately shining, reticulate. Declivity evenly convex; striae and interstriae essentially as on disc, except each interstria with a median row of erect, flattened scales, each scale about 4.0 timer longer than broad, about as long as distance between rows, strial punctures each with a very fine, recumbent, hair-like seta slightly longer than diameter of puncture.

Type material: Holotype, sex unknown, Borneo, Sabah, Mount Kinabalu National Park, New Hut, 3343 m, ex trunk and large branches of *Rhododendron* sp., 4.V.1987 (D.E. Bright) (DEBC). Paratypes, 15, same data as holotype (CNC, FRCM, NHML, USNM); 1, Borneo, Sabah, Mount Kinabalu National Park, Layang-Layang, 2621 m, ex large fallen tree, 1.V.1987 (D.E. Bright) (DEBC).

Adults of this species resemble those of *H. podocarpi* but differ by the much broader declivital scales and by the sparser and less conspicuous declivital setae. The gallery patterns of this species were not noted.

Notes on distribution and hosts

The distribution of the species in this genus as presently understood presents somewhat of an enigma. The four newly named species occur at middle to high elevations on Mt. Kinabalu while the three previously named species occur on various Pacific islands, presumably at low elevations. Perhaps when more specimens from the area are available, these questions will be resolved. The host plants of the three species from the Pacific islands are unknown. The host plants of the Mt. Kinabalu species are either *Podocarpus* sp. or *Rhododendron* sp. As far as I am aware, these are the first bark beetle records from these two genera of plants.

Zusammenfassung

Vier Arten der Gattung *Hemicryphalus* SCHEDL aus Borneo werden beschrieben: *kinabaluensis*

sp.n., *minutus* sp.n., *podocarpi* sp.n. und *squamosus* sp.n. Das Brutbild von *H. minutus* sp.n. wird kurz beschrieben. Alle Arten sind abgebildet. Eine Bestimmungstabelle für alle 7 bekannten Arten wurde erstellt.

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