

Volker Assing †, Michael Schülke & Jiří Kolibáč

**A glimpse at hyperdiversity:
A revision of the Oriental, Palaeartic, and New
Guinean fauna of *Palaminus* (Coleoptera:
Staphylinidae: Paederinae: Pinophilini)**



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A glimpse at hyperdiversity: A revision of the Oriental, Palaearctic, and New Guinean fauna of *Palaminus* (Coleoptera: Staphylinidae: Paederinae: Pinophilini)

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Volker Assing died suddenly and unexpectedly on 23 September, 2022. He was the most eminent specialist for Palaearctic and Oriental Paederinae who published numerous revisions of Palaearctic and Oriental genera such as *Achenium* Leach, *Lathrobium* Gravenhorst, *Lithocharis* Dejean, *Lobrathium* Mulsant & Rey, *Medon* Stephens, *Orsunius* Assing, *Rugilus* Leach, *Sunius* Stephens, *Trisunius* Assing, and most recently a large monograph on the subtribe Pinophilina Nordmann.

Among the manuscripts that Volker left unfinished was a forthcoming revision of the taxonomically difficult and species-rich genus *Palaminus*. This comprehensive monograph was to be a follow-up to the “*Monograph of the Palearctic, Oriental and New Guinea Pinophilina (Coleoptera: Staphylinidae, Paederinae)*” published by the Moravian Museum in 2022 and edited by Jiří Kolibáč. Volker already worked on this second book during the preparation of the latter publication for print. In the summer of 2022, Jiří had received a preliminary draft of the text and Volker started working on the photographs of the beetles – the publication of the book was originally planned for 2023. This work should not have been in vain. After Volker’s unexpected death, the work was fortunately continued by another rove-beetle specialist Michael Schülke, who revised and completed the text, added all general chapters and supplemented the taxonomic section with 12 more new species not yet treated. Finally, Jiří undertook the processing of all of the approximately 2500 raw images of morphological structures and adult beetles, completed plates of illustrations, made editorial arrangement and the prepared the book for printing.

All previously described species, which were examined and treated in the present book (with the exception of *Palaminus philippinus* Bernhauer), as well as the species newly described and denoted as “Assing, sp. nov.”, were exclusively revised, described and illustrated by Volker Assing. The descriptions and illustrations of 13 further species (twelve of them denoted as “Schülke, sp. nov.”), the description and illustration of the male of *P. philippinus*, the chapters Introduction and the Catalogue of the *Palaminus* species, the sections on morphology, biology and zoogeography, the arrangement of the species into particular sections as well as maps of species distribution are the work of Michael Schülke.

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The genus *Palaminus* Erichson, 1839, part of the paederine subtribe Procirrina, is widely distributed in tropical and subtropical forests around the world and represented by 309 valid species and two subspecies. The majority of the species was described from the Neotropical and Nearctic Regions (141 species), and the Afrotropical Region including Madagascar and neighbouring islands (117 species). The Palearctic, Oriental, and New Guinean fauna of the genus *Palaminus* was previously represented by only 36 species, while 14 species are known from Australia and the Pacific Islands. The genus had never been the subject of a comprehensive revision and only two of the species from the study region (*P. rufulus* Coiffait, 1978 and *P. elmebalanasae* Rougemont, 2017) were described using male sexual characters. In order to assess the taxonomy and diversity of *Palaminus* in the study region, the accessible type material of previously described species, as well as numerous additional specimens, were examined. As a result of the present study, the genus is now represented in the Palearctic and Oriental regions, including New Guinea, by as many as 367 species. All the species are (re-)described and illustrated. With few exceptions (records without specific localities), the distributions of all the species in the study region are mapped.

In the present publication, 335 species are described for the first time: *Palaminus abnormalis* Assing, sp. nov. (Indonesia: New Guinea); *P. abruptus* Assing, sp. nov. (Malaysia: Sabah); *P. abstersus* Assing, sp. nov. (Malaysia: Singapore); *P. accinctus* Assing, sp. nov. (Indonesia: Sumatra; Malaysia); *P. acifer* Assing, sp. nov. (Malaysia: Sabah); *P. aculeatissimus* Assing, sp. nov. (Malaysia); *P. aculeatus* Assing, sp. nov. (Indonesia: Sumatra); *P. aculus* Assing, sp. nov. (Brunei; Malaysia: Sarawak); *P. acutissimus* Assing, sp. nov. (Brunei); *P. adclinis* Assing, sp. nov. (Malaysia: Sabah); *P. adesus* Assing, sp. nov. (Malaysia: Sabah); *P. adhaerescens* Assing, sp. nov. (Thailand); *P. aequalis* Assing, sp. nov. (Malaysia: Sabah, Sarawak); *P. aequicurvus* Assing, sp. nov. (Indonesia: Java); *P. ambangus* Assing, sp. nov. (Indonesia: Sulawesi); *P. ambonicus* Assing, sp. nov. (Indonesia: Ambon); *P. amplexans* Assing, sp. nov. (Indonesia: New Guinea); *P. ampliatus* Assing, sp. nov. (Bhutan); *P. amputatus* Assing, sp. nov. (Vietnam); *P. ancoratus* Assing, sp. nov. (Malaysia: Sabah); *P. ancorifer* Assing, sp. nov. (Malaysia: Sabah); *P. anguineus* Assing, sp. nov. (Indonesia: Java); *P. anguinus* Assing, sp. nov. (Malaysia); *P. angulatus* Assing, sp. nov. (Indonesia: Kalimantan); *P. angulistylus* Assing, sp. nov. (Malaysia: Sabah); *P. angustior* Assing, sp. nov. (India: Kerala); *P. aperiens* Assing, sp. nov. (China: Yunnan); *P. appendiculatus* Assing, sp. nov. (Indonesia: Sulawesi); *P. applodens* Assing, sp. nov. (Indonesia: New Guinea); *P. appulsus* Assing, sp. nov. (Indonesia: Sumatra); *P. arctipennis* Assing, sp. nov. (Taiwan); *P. arcuatus* Assing, sp. nov. (Malaysia: Sarawak); *P. armiger* Assing, sp. nov. (China: Yunnan); *P. arrosus* Assing, sp. nov. (Malaysia: Sabah, Sarawak); *P. artexcisus* Assing, sp. nov. (Indonesia: Sulawesi); *P. ascians* Assing, sp. nov. (Malaysia: Sabah); *P. asciatus* Assing, sp. nov. (Taiwan); *P. assingi* Schülke, sp. nov. (Philippines: Luzon); *P. atrisuturalis* Assing, sp. nov. (Indonesia: New Guinea); *P. atrofemoralis* Assing, sp. nov. (Indonesia: New Guinea); *P. atroflavus* Assing, sp. nov. (Indonesia: Sumatra); *P. bacriofer* Assing, sp. nov. (Indonesia: New Guinea); *P. bacriotus* Assing, sp. nov. (Indonesia: New Guinea); *P. baiulus* Assing, sp. nov. (Indonesia: Sulawesi); *P. basalis* Assing, sp. nov. (Malaysia: Sabah); *P. basangularis* Assing, sp. nov. (Indonesia: New Guinea); *P. betzi* Assing, sp. nov. (Thailand); *P. biacifer* Assing, sp. nov. (Philippines: Palawan); *P. biacutus* Assing, sp. nov. (Taiwan); *P. bibaculatus* Assing, sp. nov. (Malaysia: Sabah); *P. bibio* Assing, sp. nov. (Malaysia); *P. bicavatus* Assing, sp. nov. (Philippines: Luzon); *P. biclinatus* Assing, sp. nov. (Indonesia: Sumatra); *P. bicrenatus* Assing, sp. nov. (Malaysia: Sabah); *P. bicultellatus* Assing, sp. nov. 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(China: Sichuan); *P. biunguis* Assing, sp. nov. (India: Meghalaya); *P. brevisetosus* Assing, sp. nov. (China: Yunnan); *P. brevissimus* Assing, sp. nov. (Malaysia); *P. buccatus* Assing, sp. nov. (Indonesia: New Guinea); *P. bulbosus* Assing, sp. nov. (Malaysia: Sabah); *P. calcarifer* Assing, sp. nov. (Indonesia: New Guinea); *P. camaratus* Assing, sp. nov. (Nepal); *P. cariniventris* Assing, sp. nov. (China: Yunnan); *P. carinulatus* Assing, sp. nov. (Vietnam); *P. cavatus* Assing, sp. nov. (Indonesia: Java); *P. cervinus* Assing, sp. nov. (Nepal); *P. circinatus* Assing, sp. nov. (China: Zhejiang); *P. circumplicans* Assing, sp. nov. (Indonesia: Sulawesi); *P. clivicarinatus* Assing, sp. nov. (Indonesia: Sulawesi); *P. cochleatus* Assing, sp. nov. (India: Karnataka); *P. coextensus* Assing, sp. nov. (Brunei; Indonesia: Sumatra; Malaysia: Sarawak); *P. commarcens* Assing, sp. nov. (Taiwan); *P. compactus* Assing, sp. nov. (China: Yunnan); *P. complicatus* Assing, sp. nov. 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(Indonesia: Sulawesi); *P. quadrisetosus* Assing, sp. nov. (Philippines: Palawan); *P. quinquetosus* Assing, sp. nov. (Malaysia: Sabah); *P. quotidianus* Assing, sp. nov. (Malaysia: Sabah); *P. radens* Assing, sp. nov. (Laos); *P. radifer* Assing, sp. nov. (Vietnam); *P. radulatus* Assing, sp. nov. (Indonesia: New Guinea); *P. radulifer* Assing, sp. nov. (Indonesia: New Guinea); *P. raduliformis* Assing, sp. nov. (Indonesia: New Guinea); *P. ramifer* Assing, sp. nov. (Malaysia: Sabah); *P. ramosus* Assing, sp. nov. (Malaysia: Sabah); *P. rectus* Assing, sp. nov. (Myanmar); *P. remifer* Assing, sp. nov. (Vietnam); *P. restinctus* Assing, sp. nov. (Vietnam); *P. ricatus* Assing, sp. nov. (Indonesia: New Guinea); *P. riedeli* Assing, sp. nov. (Indonesia: New Guinea); *P. rostratus* Assing, sp. nov. (China: Zhejiang); *P. ruptus* Assing, sp. nov. (China: Jiangxi); *P. rutriformis* Assing, sp. nov. (China: Yunnan); *P. scabens* Assing, sp. nov. (Thailand); *P. scalpens* Assing, sp. nov. (Malaysia: Sabah); *P. scindens* Assing, sp. nov. (Malaysia: Sabah); *P. scissus* Assing, sp. nov. (Malaysia: Sarawak); *P. secans* Assing, sp. nov. (Indonesia: Sulawesi); *P.*

separatus Assing, sp. nov. (Vietnam); *P. serapicus* Assing, sp. nov. (Malaysia: Sarawak); *P. serratus* Assing, sp. nov. (Brunei); *P. setifer* Assing, sp. nov. (Indonesia: Kalimantan); *P. sexsetosus* Assing, sp. nov. (Malaysia: Sabah); *P. shavrini* Assing, sp. nov. (Philippines: Mindanao); *P. simillimus* Assing, sp. nov. (Indonesia: Sumatra); *P. spathulatus* Assing, sp. nov. (Malaysia: Sabah); *P. stimulans* Assing, sp. nov. (Brunei); *P. subvexus* Assing, sp. nov. (China: Guizhou); *P. suens* Assing, sp. nov. (Taiwan); *P. sulcatus* Assing, sp. nov. (Philippines: Mindanao); *P. superans* Assing, sp. nov. (Philippines: Mindanao); *P. symmetricus* Schülke, sp. nov. (Philippines: Mindoro); *P. tabidus* Assing, sp. nov. (Indonesia: New Guinea); *P. tambusisicus* Assing, sp. nov. (Indonesia: Sulawesi); *P. tenens* Assing, sp. nov. (Brunei); *P. tensus* Assing, sp. nov. (Malaysia: Sabah); *P. tenuipennis* Assing, sp. nov. (Indonesia: New Guinea); *P. timoricus* Assing, sp. nov. (Indonesia: West Timor); *P. tractus* Assing, sp. nov. (Taiwan); *P. transversus* Assing, sp. nov. (China: Hunan); *P. triangularis* Assing, sp. nov. (Thailand); *P. triarcuatus* Assing, sp. nov. (China: Yunnan); *P. triastatus* Assing, sp. nov. (Indonesia: New Guinea); *P. tricuspidatus* Assing, sp. nov. (India: Meghalaya); *P. tridentatus* Assing, sp. nov. (Indonesia: Sumatra); *P. trifurcatus* Assing, sp. nov. (Indonesia: Sumatra); *P. tripilosus* Assing, sp. nov. (Indonesia: Sulawesi); *P. trisetosus* Assing, sp. nov. (India: Assam, Meghalaya); *P. trisinuatus* Assing, sp. nov. (India: West Bengal; Nepal); *P. trispinosus* Assing, sp. nov. (Malaysia: Sabah); *P. trullifer* Assing, sp. nov. (Papua New Guinea); *P. tuberculatus* Assing, sp. nov. (China: Guizhou); *P. uncifer* Assing, sp. nov. (Philippines: Mindanao); *P. undulatus* Assing, sp. nov. (Indonesia: Sulawesi); *P. unguicus* Assing, sp. nov. (China: Yunnan); *P. unimaculatus* Assing, sp. nov. (Philippines: Mindanao); *P. varicans* Assing, sp. nov. (Malaysia); *P. varicoloratus* Assing, sp. nov. (Philippines: Mindanao); *P. velatus* Assing, sp. nov. (Malaysia: Sabah); *P. vermiculus* Assing, sp. nov. (China: Guizhou); *P. vermifer* Assing, sp. nov. (China: Hubei); *P. verminatus* Assing, sp. nov. (China: Guizhou, Sichuan); *P. vexillifer* Assing, sp. nov. (Malaysia); *P. vincens* Assing, sp. nov. (India: Meghalaya); *P. virgatus* Assing, sp. nov. (Malaysia); *P. virilis* Assing, sp. nov. (Thailand); *P. vittosus* Assing, sp. nov. (Papua New Guinea); *P. vitreus* Assing, sp. nov. (Papua New Guinea); *P. volsellatus* Assing, sp. nov. (Malaysia: Sabah); *P. weigeli* Assing, sp. nov. (China: Hunan; Vietnam).

In addition, *Palaminus* specimens from the Pacific islands of New Caledonia, Vanuatu, Fiji, Guam and Samoa are revised, seven species are described for the first time: *Palaminus caledonicus* Assing, sp. nov. (New Caledonia); *P. falcarius* Assing, sp. nov. (New Caledonia); *P. lifouensis* Schülke, sp. nov. (New Caledonia); *P. pertortus* Assing, sp. nov. (New Caledonia); *P. unicolor* Schülke, sp. nov. (New Caledonia); *P. unciformis* Schülke, sp. nov. (New Caledonia), and *P. velifer* Schülke, sp. nov. (New Caledonia).

Two names are revalidated: *Palaminus obliteratedus* Cameron, 1952 (previously a synonym of *P. bivittatus* Cameron, 1943); *P. hebridensis* Cameron, 1934 (previously a subspecies of *P. australiae* Fauvel, 1878).

Four species-group synonymies are proposed: *Palaminus truncatus* Fauvel, 1903 = *P. nilgiriensis* Cameron, 1931, syn. nov.; *P. lumiventris* Herman, 2003 = *P. elemabalasanae* Rougemont, 2017, syn. nov.; *P. parvus* Cameron, 1918 = *P. sumbaensis* Scheerpeltz, 1957, syn. nov.; *P. buehleri* Scheerpeltz, 1957 = *P. sutteri* Scheerpeltz, 1957, syn. nov.

Palaminus pennifer Fauvel, 1904, described from Madagascar, Java and the Philippines, is excluded from the fauna of the Palaearctic and Oriental regions.

Lectotypes are designated for *Palaminus ceylanensis* Kraatz, 1859; *P. simoni* Fauvel, 1904; *P. andrewesi* Cameron, 1931; *P. nigropiceus* Cameron, 1931; *P. truncatus* Fauvel, 1903; *P. nilgiriensis* Cameron, 1931; *P. morosus* Cameron, 1924; *P. indicus* Kraatz, 1859; *P. bryanti* Cameron, 1920; *P. parvus* Cameron, 1918; *P. varipennis* Cameron, 1952; *P. hebridensis* Cameron, 1934; *P. evansi* Bernhauer, 1926; and *P. minutissimus* Bernhauer, 1942.

Eleven of the described species were represented only by females (*P. monticola* Cameron 1931, *P. birmanus* Cameron, 1931, *P. flavoguttatus* Cameron, 1941, *P. borneensis* Cameron, 1928, *P. germanus* Cameron, 1928, *P. kokodanus* Cameron, 1937, *P. bivittatus* Cameron, 1943, *P. obliteratedus* Cameron, 1952, *P. papuanus* Cameron, 1937, *P. difficilis* Cameron, 1927, and *P. swezeyi* Bernhauer, 1942), in one species, *P. formosae* Cameron, 1949, male type material was not accessible. In all these cases, males would be required for an unambiguous characterisation of the species. Also, numerous examined undescribed species are represented only by females and consequently not named. This and the general rarity of records suggest that a substantial number of species remains to be discovered and described in the future.

A comprehensive catalogue of the species of *Palaminus* of the Palaearctic and Oriental regions, Wallacea and some Pacific Islands is provided.

Keywords. Coleoptera, Staphylinidae, Paederinae, Procirrina, taxonomy, new species, revalidations, new synonymies, lectotype designations, new records, Palaearctic region, Oriental region, New Guinea, New Caledonia, Vanuatu, Fiji, Samoa, Guam, distribution maps.



**A glimpse at hyperdiversity: A revision of the Oriental, Palearctic,
and New Guinean fauna of *Palaminus* (Coleoptera: Staphylinidae: Paederinae: Pinophilini)**

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