

## *Bidessus instriatus* Zimmermann, 1928 – another junior synonym of widespread *Pseuduvarus vitticollis* (Boheman, 1848), with notes on the distribution in the Oriental Region

(Coleoptera, Dytiscidae)

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*Bidessus instriatus* Zimmermann, 1928, so far known from a single type specimen from West Sumatra, currently classified in the genus *Hydroglyphus* Motschulsky, 1853, is illustrated for the first time. New subjective synonymy is proposed: *Pseuduvarus vitticollis* (Boheman, 1848) = *Bidessus instriatus* Zimmermann, 1928, **syn. nov.** New records of *P. vitticollis* in the Oriental Region are provided from India (Goa, Meghalaya), China (Fujian, Hainan, Hong Kong, Yunnan), Myanmar, Malaysia (Sarawak), Indonesia (Kalimantan, Nias, Siberut), and the Philippines (Mindanao), and the habitat of the species is briefly discussed.

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### Introduction

Alois Zimmermann (1871–1929) was a German coleopterologist and an eminent specialist on taxonomy of adepagous aquatic beetle families. During his career, Zimmermann published 44 taxonomic works; probably the most significant “Monograph of Palearctic Dytiscidae” was presented posthumously, completed and edited by Leopold Gschwendtner (see Daniel 1930, Nilsson & Hájek 2024). Alois Zimmermann described 13 genus level and 155 species level taxa (Nilsson & Hájek 2024). His collection containing more than 30000 specimens was sold to the Zoologische Staatssammlung München in 1938 and became a basis of the systematic collection of water

beetles there. The vast majority of Zimmermann’s taxa were studied and re-evaluated during almost a century of subsequent entomological research, but few remain known only from the original description – this is the case of the enigmatic *Bidessus instriatus*, described based on a single specimen from West Sumatra. In addition to the original description, it was only mentioned by Biström (1988) who transferred the species to the genus *Hydroglyphus* Motschulsky, 1853. However, Biström apparently did not see its type. The aim of this contribution is the illustration of *Bidessus instriatus* type specimen, and clarification of the status of this name – i. e., its synonymy with the widespread Afrotropical-Oriental *Pseuduvarus vitticollis* (Boheman, 1848).

## Material and methods

Exact label data are cited for the type material. Authors' remarks are in square brackets, separate label lines are indicated by a slash (/), separate labels by a double slash (//). The specimens included in this study are deposited in the following collections:

- LHCM Lars Hendrich collection, Munich, Germany (property of NHMW)  
LKC�HMLee Kong Chian Natural History Museum, Singapore (W.S. Kwang)  
NHMW Naturhistorisches Museum Wien, Vienna, Austria (H. Shaverdo)  
NMPC National Museum, Prague, Czech Republic (J. Hájek)  
ZSMG Zoologische Staatssammlung München, Munich, Germany (M. Balke)

## Morphological observations

Specimens were examined using an Olympus SZX12 dissecting scope; measurements were taken with an ocular graticule. Habitus photograph was taken using a Canon EOS 550D digital camera with an attached Canon MP-E65mm f/2.8 1–5 $\times$  macro lens as numerous separate images at different focal planes and afterwards combined using Helicon Focus 8.2.0 software. The male genitalia were studied and illustrated in temporary glycerine mounts using an Olympus BX41 transmitted light microscope with Canon DS126291 camera; they were subsequently washed in distilled water and mounted in DMHF on the same card as the beetle.

## Taxonomy

### *Pseuduvarus vitticollis* (Boheman, 1848)

Figs 1–4

*Hydroporus vitticollis* Boheman, 1848: 256 (Type locality: Caffraria interiore); new combination by Biström (1988: 10).

*Bidessus gentilis* Sharp, 1890: 344 (Type locality: Ceylon, Kitulgalle); synonymy by Nilsson et al. (1995: 363).

*Bidessus octoguttatus* Régimbart, 1895: 94 (Type locality: Ethiopia); synonymy by Omer-Cooper 1965: 119.

*Bidessus ornatipennis* Régimbart, 1900: 372 (Type locality: Madagascar, Diego-Suarez); synonymy by Omer-Cooper 1959: 135.

*Bidessus instriatus* Zimmermann, 1928: 172 (Type locality: Sumatra, Fort de Kock); **syn. nov.**

*Amarodytes* (*Uvarus*) *octoguttatus caligosus* Guignot, 1946: 257 (Type locality: Madagascar, Vatoman-dry); synonymy by Biström (1988: 11).

*Uvarus monticola* Guignot, 1957: 98 (Type locality: La Réunion, Piton des Neiges); synonymy by Biström (1988: 11).

**Type material.** *Bidessus instriatus* (Fig. 1). Holotype  $\delta$  (ZSMG), labelled: “Fort de Kock / Sumatra) 920 M [printed] // 1924 / E. Jacobson [printed] // Type [handwritten, round greenish label] // Samml.A. / Zimmermann [printed] // HOLOTYPE  $\delta$  / BIDE-SUS / instriatus / Zimmermann, 1928 / labelled by J. Hájek et al. 2024 [printed, red label]” (Fig. 4).

**Additional material examined** (Oriental Region only). **CHINA:** Fujian: 1 $\varnothing$ , Wuyishan Mts. NNR, Sangang vill., 27°45.0'N, 117°40.7'E, 720 m, 24.v.–3.vi.2018, J. Hájek, D. Král, J. Růžička & L. Sekerka leg. (NMPC). **Hainan:** 1 specimen, 4 km W Qiongzong, 150 m, 16.i.1996, M.A. Jäch leg. (NHMW). **Hong Kong:** 1 $\varnothing$ , Tai Po Kau, 14.vii.1983, D. Dudgeon leg. (NHMW); 2 specimens, New Territories, Plover Cove Country Park, 1 km E Wu Kau Tang, 60 m, 14.i.1996, M.A. Jäch leg. (NHMW). **Taiwan:** 2 specimens, Taitung Luyeh, 19.x.1994, L.-J. Wang leg. (LHCM). **Yunnan:** 21 specimens, 6 km SW of Tengchong, Rehai hot springs, 24°57.1'N, 98°26.2'E, 1400 m, 5.vi.2007, J. Hájek & J. Růžička leg. (NMPC); 1 $\delta$  2 $\varnothing$ , 3 specimens, Tongbiguan vill., 24°36.7'N, 97°39.4'E, 1340 m, 24.–26.vi.2016, J. Hájek & J. Růžička leg. (NMPC); 1 $\varnothing$ , Zizhi vill., 25°43.7'N, 98°34.1'E, 1995 m, 29.vi.–2.vii.2016, J. Hájek & J. Růžička leg. (NMPC). **INDIA:** Goa: 1 specimen, 20 km SE Savantvadi, 20.ix.1991, R. Schuh leg. (NHMW). **Meghalaya:** 19 specimens, Khasi Hills, Shillong peak, 25°32.8'N, 91°52.5'E, 1850 m, 4.–5.vi.1996, E. Jendek & O. Šauša leg. (NHMW); 2 specimens, Jaintia Hills, Jowai, 25°27'N 92°12'E, 1350 m, 6.–8.vi.1996, E. Jendek & O. Šauša leg. (NHMW). **INDONESIA:** Kalimantan: 2 specimens, West Kalimantan, foot of Gunung Bawang, 0°51.151'N 109°21.564'E, 100 m, 12.iv.2011 (ZSMG); 2 specimens, East Kalimantan, PT Silva Rimba Lestari, camp “Limbang”, 00°07.4'N, 116°18.1'E, 60 m, 3.–4.+6.xii.2011, J. Hájek, J. Schneider & P. Votruba leg. (NMPC). **Nias:** 1 specimen, Lahusa/Gomo, 0–300 m, 9.–11.ii.1990, S. Schödl leg. (NHMW); 3 specimens, 40 km N Telukdalam, 13.ii.1990, M.A. Jäch & S. Schödl leg. (NHMW). **Siberut:** 5 specimens, Muarasiberut, 15.ii.1991, S. Schödl leg. (NHMW). **Sumatra:** 2 specimens, North Sumatra, South Tapanuli, Padangsidempuan-Sipirok, 1000 m, 4.ii.1991, M.A. Jäch leg. (NHMW); 1 $\varnothing$ , Fort de Kock [=West Sumatra, Bukittinggi], 1924, E. Jacobson (ZSMG); 5 specimens, 15 km NE Payakumbuh, NSG Lemba Haru, 11.ii.1991, S. Schödl leg. (NHMW); 1 specimen, West Sumatra, 50 km NW Padang, Sicincin, 13.ii.1991, S. Schödl leg. (NHMW); 1 specimen, West Sumatra, Bungus Beach, 14.ii.1991, S. Schödl leg. (NHMW); 2 specimens, West Sumatra, Panti, 0°20.960'S 100°04.047'E, 260 m, 29.ix.2009, Balke & Amran leg. (ZSMG); 2 specimens, West Sumatra, Padang Solok, Lubuk Kilangan, ox puddle, 0°57.312'S 100°36.589'E, 960 m, 9.ix.2011, Balke leg. (ZSMG). **MALAYSIA:** Pahang/Johor: 66 specimen, Endau Rompin NP, Salendang, 100 m, 28.ii.–12.iii.1995, Strba & Hergovits leg. (NHMW); **Sarawak:** 1 specimen, Kuching env., Bako NP, 21.ii.1993, M.A. Jäch leg. (NHMW); 3 specimens, Kelabit Highlands, 6 km E Bario Pa Ukut,

1000 m, 27.ii.1993, M.A. Jäch leg. (NHMW). **MYANMAR: Shan State:** 1♀, N Aungban, halfway between Pindaya and Ye'ngan, 20°58.271' N 96°32.488' E, 1241 m, stream, 10.vi.2004, H. Shaverdo leg. (NHMW); 1♀, NE Mintaingbin Forest Camp, 20°55.640' N 96°33.634' E, 1290 m, puddles, 14.–20.vi.2004, H. Shaverdo leg. (NHMW); 1♀, SE Mintaingbin Forest Camp, 20°55.097' N 96°33.805' E, 1274 m, puddles, 17.vi.2004, H. Shaverdo leg. (NHMW); 1♂, same data, but 16.vi.2004 (NHMW). **NEPAL:** 1 specimen, Thak Khola Area, Jharkot env., 4000–4300 m, H. Franz leg. (NHMW); 1 specimen, N Kathmandu, Lamosangu, 5.ii.1980, M.A. Jäch leg. (NHMW); 2 specimens, Pokhara Valley, Phewa Lake, 21.ii.1980, M.A. Jäch leg. (NHMW); 3 specimens, Hetauda env., 19.ii.1981, M.A. Jäch leg. (NHMW); 5 specimens, 30 km NW of Pokhara, Birethanti, 1100 m, 4.v.1984, G. Wewalka leg. (NMPC); 4 specimens, Kavrepalanchok Distr., Dolalghat, Cha Khola, 7.xi.1993, Moog et al. leg. (NHMW). **PHILIPPINES: Luzon:** 2 specimens, Laguna Prov., Lucban, Luisiana, 24.xi.1992, M.A. Jäch leg. (NHMW). **Mindanao:** 1♂, 4 specimens, Misamis Oriental, 2.5 km SW of Civoleg, 0.5 km S of Haze Kaffe, 8°42.0' N, 125°00.9' E, 1210 m, 30.v.2022, J. Hájek, L. Sekerka & D. Vondráček leg. (NMPC). **SINGAPORE:** 3 specimens, Sembawang Senoko, grassland on eastern side of Sembawang, 10.i.1992, C.M. Yang & K.L. Yeo leg. (LKC-NHM); 19 specimens, Bukit Timah Nature Reserve, swampy meadow near fishpond, 9.iv.1997, M. Balke, L. Hendrich & H.K. Lua leg. (LHCM, LKC-NHM, ZSMG). **SRI LANKA:** 1 specimen, Colombo env., 11.xi.1980, M.A. Jäch leg. (NHMW); 1 specimen, Beragala, 26.xi.1980, M.A. Jäch leg. (NHMW); 1 specimen, Kitulgala, env., xii.1980, M.A. Jäch leg. (NHMW); 1 specimen, Ratnapura env., 4.i.1981, M.A. Jäch leg. (NHMW).

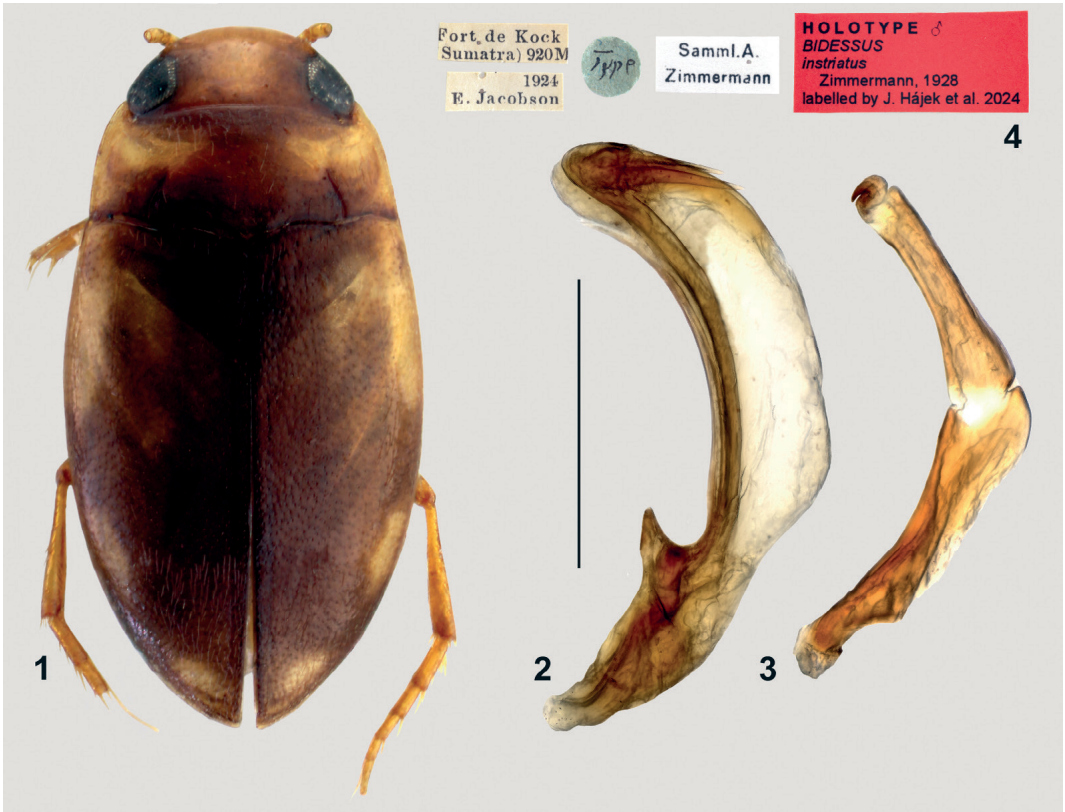
**Notes to classification.** The genus *Pseudouarus* was proposed by Biström (1988) for South African *Hydroporus vitticollis* Boheman, 1848, classified until then in the genus *Uvarus* Guignot, 1939. In the same work, Biström synonymised another four African *Uvarus* taxa with *P. vitticollis*, keeping *Pseudouarus* as monotypic African genus. Subsequently, Bilardo & Rocchi (2002) described second species from Gabon, and Ranarilalaitiana et al. (2022) pointed out that *Pseudouarus* on Madagascar represents a complex of species. In the Oriental Region, *Pseudouarus* was mentioned for the first time by Nilsson et al. (1995), who added the synonymy of *P. vitticollis* with *Bidessus gentilis* described from Sri Lanka, and recorded the species from Taiwan.

The type specimen of *Bidessus instriatus* shares all diagnostic characters of the genus *Pseudouarus* as determined by Biström (1988): (1) body shape oblong oval; (2) anterior margin of clypeus not bordered; (3) head without transverse occipital line; (4) pronotum with a pair of basal plicae, elytron without basal plica; (5) elytron without sutural stria (stria

indicated apically in some specimens); (6) elytral epipleuron without transverse carina at humeral angle; and (7) paramere three-segmented. We had no possibility to compare *Bidessus instriatus* with the type of *P. vitticollis*. However, the shape of the male genitalia of *B. instriatus* (Figs 2–3) matches perfectly to the drawings for *P. vitticollis* as illustrated by Biström (1988: fig. 5), including long spines on protrusible apical part of the median lobe. Therefore, we consider *Bidessus instriatus* **syn. nov.** as a junior subjective synonym of *Pseudouarus vitticollis* (Boheman, 1848).

**Collecting circumstances.** The habitat of *Pseudouarus vitticollis* is, at least in the Oriental Region, insufficiently known. The only ecological data are available for findings in Singapore: Hendrich et al. (2004) considered *P. vitticollis* as a lentic species living in very shallow water at the edge of small, exposed, and well-vegetated pools and puddles, always close to forested areas. The occurrence of *P. vitticollis* ranges usually from sea level up to 2000 m a.s.l., although a single specimen from Nepal (Thak Khola Area, see Material examined) was, according to label data, collected in the altitude 4000 m a.s.l. The specimens from Hong Kong were found in a spring-fed marsh, and the specimen from Hainan in a fish pond (Jäch & Ji 1998); the specimens from Yunnan (Rehai) were collected in exposed small pools with clayey bottom above rice fields; the specimens from West Sumatra were collected from sun exposed ox puddles; the specimens from East Kalimantan were found in open shallow oligotrophic wetland on sandy bottom; and the specimens from Mindanao were found in exposed small puddles without any vegetation on a clearing in secondary forest. The species is also a good flyer – in Fujian and at some places in Yunnan (Tongbiguan, Zizhi), it was collected in a light trap placed at the margin of a village, close to the river.

**Distribution.** Whole sub-Saharan Africa, the Mascarenes and Madagascar (Biström 1988); Morocco (Pederzani 2007). In the Oriental Region, it was known under the name *Uvarus gentilis* from Pakistan, Nepal, India, Sri Lanka and Malaysia (Vazirani 1977, Brancucci 1980); Nilsson et al. (1995) added Taiwan, Hendrich et al. (2004) published records from Singapore, and Freitag et al. (2016) mentioned Luzon in the Philippines. Here we add new records from India (Goa, Meghalaya), China (Fujian, Hainan, Hong Kong, Yunnan), Myanmar, Malaysia (Sarawak), Indonesia (Kalimantan, Nias, Siberut), and the Philippines (Mindanao), documenting a continuous area of distribution covering subtropics and tropics of the Oriental Region.



**Figs 1–4.** *Bidessus instriatum*, male holotype. **1.** dorsal habitus (body length=1.9 mm); **2.** median lobe in lateral view; **3.** paramere; **4.** labels. Scale bar: 0.2 mm (Figs 2–3).

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### References

- Bilardo, A. & Rocchi, S. 2002. Haliplidae e Dytiscidae (Coleoptera) del Gabon (Parte quarta). Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano 143: 147–182.
- Biström, O. 1988. Generic review of the Bidessini (Coleoptera, Dytiscidae). Acta Zoologica Fennica 184: 1–41.
- Boheman, C. H. 1848. Insecta Caffraria annis 1838–1845 a J. A. Wahlberg collecta, Pars. I. Fascic. I. Coleoptera. (Carabici, Hydrocanthari, Gyrinii et Staphylinii). viii + 297 pp., Holmiae (Norstedtiana).
- Brancucci, M. 1980. Beitrag zur Kenntnis einiger orientalischer Bidessini (Col. Dytiscidae). Entomologica Basiliensia 5: 166–169.
- Daniel, K. 1930. Alois Zimmermann. Koleopterologische Rundschau 15(5/6)(1929): 240–243.
- Freitag, H., Jäch, M. A. & Wewalka, G. 2016. Diversity of aquatic and riparian Coleoptera of the Philippines: checklist, state of knowledge, priorities for future research and conservation. Aquatic Insects 37: 117–213.
- Guignot, F. 1946. Fascicule 58. Coleoptera Dytiscidae (2e partie). Pp. 215–322 in: Jeannel, R. (ed.). Mission scientifique de l’Omo. Tome VI. Zoologie. Mémoires du Muséum National d’Histoire Naturelle, Nouvelle Série 19(2)(1945).
- 1957. Dytiscides et gyrinides de l’Île de la Réunion. Mémoires de l’Institut Scientifique de Madagascar, Série E 8: 97–101.
- Hendrich, L., Balke, M. & Yang, C. M. 2004. Aquatic Coleoptera of Singapore: species richness, ecology and conservation. The Raffles Bulletin of Zoology 52: 97–145.

- Jäch, M. A. & Ji, L. 1998. China water beetle survey (1995-1998). Pp. 1-23 in: Jäch, M. A. & Ji, L. (eds). Water beetles of China. Vol. II. Vienna (Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein).
- Nilsson, A. N. & Hájek, J. 2024. A world catalogue of the family Dytiscidae, or the diving beetles (Coleoptera, Adephaga). Version 1.I.2024. Distributed as a PDF file via Internet. Available from: <http://www.waterbeetles.eu>
- , Wewalka, G., Wang, L.-J. & Satô, M. 1995. An annotated list of Dytiscidae (Coleoptera) recorded from Taiwan. *Beiträge zur Entomologie* 45: 357-374.
- Omer-Cooper, J. 1959. Dytiscidae from Nyasaland and Southern Rhodesia. V. Hydroporinae, Bidessini. *Journal of the Entomological Society of Southern Africa* 22: 108-137.
- 1965. Chapter 2. Coleoptera: Dytiscidae. A review of the Dytiscidae of southern Africa being the results of the Lund University Expedition 1950-1951, with which are incorporated all other records known to the author. *South African Animal Life* 11: 59-214.
- Pederzani, F. 2007. *Pseuduvarus vitticollis* (Boheman): un emigrante dalla regione Afrotropicale alla regione Palearctica? (*Insecta Coleoptera Dytiscidae*). *Quaderno di Studi e Notizie di Storia Naturale della Romagna* 24: 65-67.
- Ranarilalaitiana, T., Razafindralava, H. A., Granath, G., Bukontaite Malm, R., Rakotonirina, J. C., Razafindranaivo, V., Raveloson Ravaomanarivo, L. H., Johansson, F. & Bergsten, J. 2022. Remaining forests on the Central Highlands of Madagascar – Endemic and endangered aquatic beetle fauna uncovered. *Ecology and Evolution* 12(e9580): 1-26.
- Régimbart, M. 1895. Révision des Dytiscidae et Gyrididae d'Afrique, Madagascar et îles voisines. *Mémoires de la Société Entomologique de Belgique* 4: 1-244.
- 1900. Diagnoses d'espèces nouvelles de Dytiscidae de la région malgache (Col.). *Bulletin de la Société Entomologique de France* 1899: 371-374.
- Sharp, D. 1890. On some aquatic Coleoptera from Ceylon. *The Transactions of the Entomological Society of London* 1890: 339-359.
- Vazirani, T. G. 1977. Catalogue of Oriental Dytiscidae. Records of the zoological survey of India. Miscellaneous Publication Occasional Paper 6 (1976): 1-111.
- Zimmermann A. 1928. Neuer Beitrag zur Kenntnis der Schwimmkäfer. *Wiener Entomologische Zeitung* 44: 165-187.