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Cover: Long-tailed Shrike *Lanius schach* resting on a dry branch after courtship. Digital illustration on Procreate. © Aakanksha Komanduri.



Rediscovery of the endemic and threatened Jewel Damselfly *Rhinocypha togeanensis* van Tol & Günther, 2018 (Insecta: Odonata: Chlorocyphidae) in Indonesia, with notes on its habitat loss and the urgent need for conservation action

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Abstract: *Rhinocypha togeanensis* van Tol & Günther, 2018 (Insecta: Odonata: Chlorocyphidae) is a damselfly species endemic to Batudaka Island, Togeian Archipelago, Indonesia. Since its discovery over 25 years ago, no further records of its presence have been made. This study documents its rediscovery, current distribution, and the state of the habitat of *R. togeanensis* in Sungai Tanimpo. Surveys were conducted at 12 sites, and several environmental parameters were recorded at each locality. A total of 18 individuals were observed along its type locality, Sungai Tanimpo, where the habitat comprised primary forest along the riverbank. Numerous perches were available, such as foliage and small twigs. This species prefers the stream's upper reaches in the forested area with lower air temperatures and good illumination. Since no individuals were found at the exact type locality of this species, the preliminary impression was that *R. togeanensis* has experienced habitat reduction due to deforestation and other human activity, suggesting that urgent conservation measures are needed to preserve this endangered species. According to current knowledge, it is one of the endangered damselfly species in the world.

Keywords: Conservation, diversity, deforestation, endemic fauna, freshwater habitat, habitat protection, Indonesia, Sulawesi, Togeian Islands, Wallacea.

Abstrak: *Rhinocypha togeanensis* van Tol & Günther, 2018 (Odonata: Zygoptera: Chlorocyphidae) merupakan capung endemik yang tersebar hanya di Pulau Batudaka, Kepulauan Togeian. Selama lebih dari 25 tahun setelah ditemukan pertama kali pada 1994 dan 1999, belum pernah ada laporan terbaru terkait status populasi dan distribusinya. Penelitian ini bertujuan untuk melaporkan penemuan kembali, distribusi dan kondisi habitat *R. togeanensis* di Sungai Tanimpo. Survei dilakukan pada 12 titik menggunakan jaring serangga. Pengambilan data lingkungan dilakukan meliputi suhu, kelembapan dan intensitas cahaya serta kondisi habitat. Total sebanyak 18 individu ditemukan di Sungai Tanimpo dengan mikrohabitat berupa vegetasi alami dan ranting serta batang kayu di sepanjang aliran sungai. Spesies ini hanya ditemukan di wilayah mendekati bagian hulu sungai dengan tutupan hutan yang baik serta suhu yang lebih rendah. Kami tidak menemukan *R. togeanensis* di type locality nya sehingga mengindikasikan adanya penurunan kualitas habitat akibat aktivitas manusia dan deforestasi sehingga perlu adanya upaya konservasi untuk menyelamatkan spesies ini. Oleh karenanya, spesies ini menjadi salah satu spesies capung paling terancam di dunia.

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MASYARAKAT
ZOOLOGI
WALLACEA



صندوق محمد بن زايد
للمحافظة على الكائنات الحية
The Mohamed bin Zayed SPECIES CONSERVATION FUND

INTRODUCTION

Odonata (dragonflies and damselflies) are well-known for their significance in ecosystem assessment and environmental monitoring. Certain groups of damselflies, especially members of the family Chlorocyphidae, are good bioindicators as they are very sensitive to landscape change, especially the loss of vegetation cover along the riverbank (Da Silva Junior et al. 2023). Many Indonesian chlorocyphids are at a high risk of extinction due to extensive human activities, including the expansion of land given over to agriculture, especially in the small islands where the damselflies rely on undisturbed, clear running water and other pristine microhabitats (Harahap & Shahroni 2024). Several smaller islands in Indonesia host a high percentage of endemic species (Lupiyaningdyah 2020; Dow et al. 2024), but at the same time, species diversity in these islands usually suffers disproportionately from anthropogenic pressures (Clausnitzer et al. 2009; Cleary et al. 2025). The study of Odonata in Indonesia has mainly focused on their taxonomy and systematics, while their ecology, behaviour, and other conservation-related studies are limited, especially in Sulawesi (Dow et al. 2024). One of the essential topics suggested by these researchers was broadly assessing population status and mapping the distribution of dragonflies in Indonesia that could be used as a template for conservation action and management planning (Lupiyaningdyah 2020). Sulawesi is a unique island, with remarkable biodiversity patterns owing to its composite geological history, and it is widely recognised as a diversity hotspot for Odonata (van Tol 1987).

Sulawesi hosts a moderately high diversity of the suborder Zygoptera with 59 species (Dow et al. 2024), including 50 species in the northern arm (Van Tol 1987). Three genera of Chlorocyphidae are endemic to Sulawesi: *Disparocypha* Ris, 1916 (Günther 2020), *Sclerocypha* Fraser, 1949 (Günther 2019), and *Watuwila* van Tol, 1998 (van Tol 1998). In addition, two widespread genera are also represented on Sulawesi: *Libellago* Selys, 1840 and *Rhinocypha* Rambur, 1842. Van Tol & Günther (2018) published a revision of the genus *Rhinocypha* on Sulawesi and adjacent islands and reported eight species from the island, several closely related. Five of the species were new to science, including *Rhinocypha togeanensis* from Togeian Island in Sulawesi.

Rhinocypha togeanensis van Tol & Günther, 2018 was first collected in 1994 and 1999 by the last author (AG). This species was found only in one locality, Sungai Tanimpo, South of Wakai Village, Batudaka Island.

During the first fieldwork in 1994, AG and F. Randow found about 80 individuals on 13–14 August 1994 along the stream between the (former) beginning of the undisturbed rainforest and the waterfall. Above the waterfall, the population density increased further. In August 1999, the lower reaches of the stream had already been significantly disturbed by deforestation. Below the waterfall, only eight males could be observed. Above the waterfall, in the section up to a narrow gorge, about 25 individuals were encountered.

In the following two decades, no further records of this species were reported. Günther (2008) noted the importance of clear streams in healthy forests for successful reproduction in most *Rhinocypha*. Anthropogenic activities in smaller islands like Batudaka result in particularly serious habitat loss to agriculture (van Tol & Günther 2018; Jati et al. 2024); modification of river flow for recreational purposes poses another serious threat. A survey of population size and distribution is needed since the habitat condition has evidently changed a lot since the original 1994 observations. This study provided a record of the rediscovery of *Rhinocypha togeanensis*, and its current distribution around its type locality in Sungai Tanimpo, Batudaka Island. In addition, the present study also provides the current condition of the habitat of *R. togeanensis* in Sungai Tanimpo along with the profound changes that have occurred to natural habitats in Batudaka Island, Togeian Archipelago, in the last ca. 30 years.

MATERIALS AND METHODS

Study site

Several field investigations were conducted in Sungai Tanimpo ['sungai' (Indonesian: river/stream)] in the south of Wakai Village, located in Batudaka Island (244 km²), one of the islands in the Togeian Archipelago (Figure 1), Tojo Una-Una Regency, Central Sulawesi Province. This archipelago lies in Gorontalo Bay and is separated from the main island by a deep-water strait (200–4,000 m), suggesting that these islands were never connected to the Sulawesi main island, even with significant sea level fluctuations that occurred during the past million years (Nugraha & Hall 2018). Geologically, Batudaka Island was formed during the Pliocene to Pleistocene, and is dominated by limestone and interbedded sediments, a formation known as Celebes Molasse (Cottam et al. 2011). The island of Batudaka is dominated by lowland tropical rainforest and mangroves. Well before modern times, some parts near the coastal area were

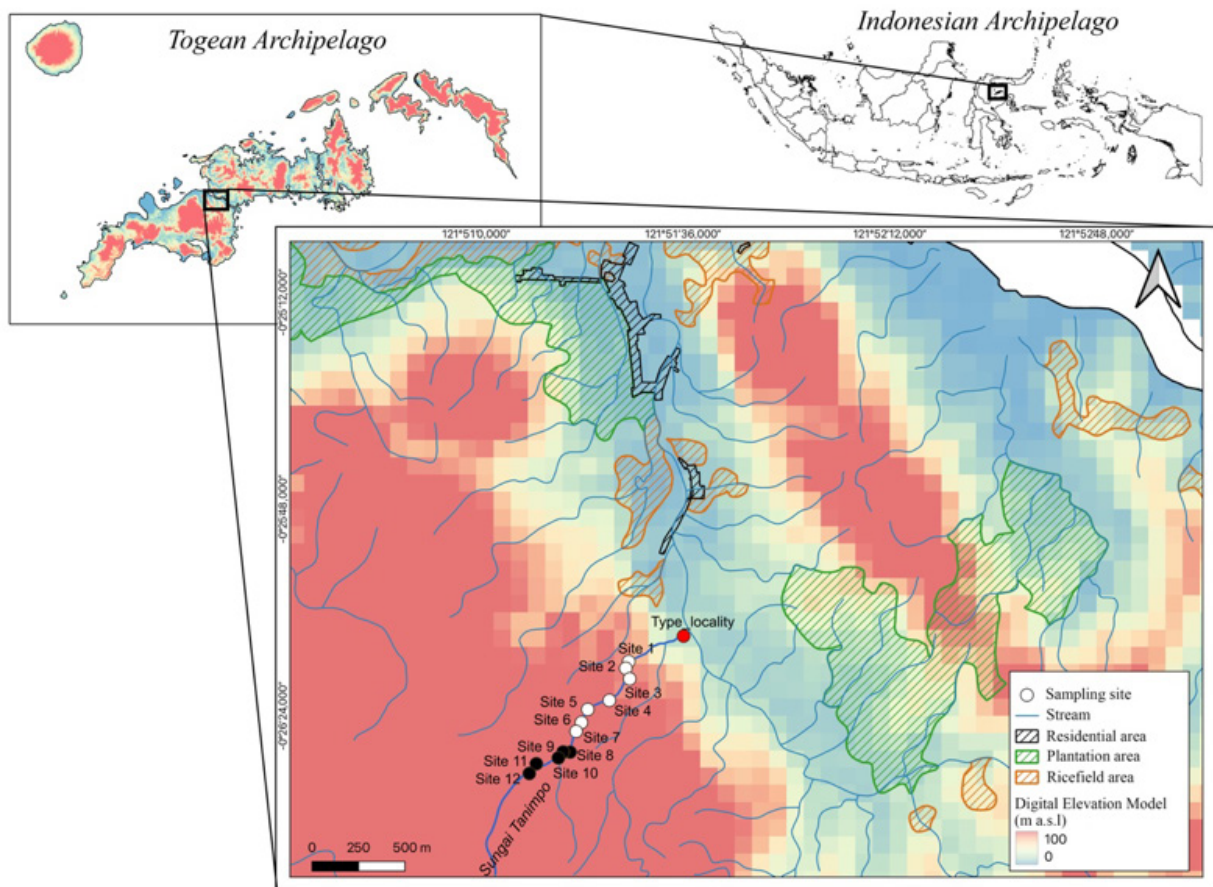


Figure 1. The map of the study site shows the land-use surrounding Sungai Tanimpo, the habitat of *Rhynocypha togeanensis* in Batudaka Island, Togeian Archipelago. Red circle: type locality in 1994 and 1999; white circle: *R. togeanensis* absent; black circle: *R. togeanensis* present.

converted into agricultural plantations, including clove and coconut, which are typical crops suitable for an area with low precipitation (monthly precipitation 203–445 mm in 2022) (Jati et al. 2024).

Survey of *Rhynocypha togeanensis*

The second author (DD) conducted the preliminary survey at the type locality on 12 October 2023, followed by the first author (MA). The survey on the population and distribution of *R. togeanensis* was conducted on 15–16 November and 17–20 December, 2024, in Sungai Tanimpo, starting from the lower reaches at an altitude of 78 m in the agricultural area up to 153 m in the forested area. Since this river is vital for the local community in Wakai Village, the upper reaches were used as a source of drinking water. Thus, Sungai Tanimpo has an important role in sustaining the local environment. This stream flows from a hilly area with dense tropical forest vegetation to a coastal area in Wakai before emptying into Gorontalo Bay, forming a transitional ecosystem supporting freshwater species.

In its upper reaches, Sungai Tanimpo is characterised by a fast-flowing shallow stream, with several small waterfalls, cascades, and pools along the stream. The stream bottom is composed mainly of gravel and rocks.

Individuals of *R. togeanensis* were identified by ‘catch and release’ method (Balzan 2012; Fernandez 2024) and one individual collected in their habitat along the Sungai Tanimpo using an aerial net. We searched for this damselfly in 12 sites, including its type locality in Air Terjun Tanimpo [‘air terjun’ (Indonesian: waterfall)] (van Tol & Günther 2018). The individuals collected were directly identified in the field based on key identification provided by van Tol & Günther (2018). The photographs of *R. togeanensis* were made using a Canon EOS 200D camera with a 70–300 mm lens. Only one individual was preserved for further detailed examination using a stereomicroscope. The environmental parameters, including air temperature (°C), relative humidity (%) and light intensity (lux), were measured using a digital thermohygrometer. The coordinates of each site were recorded using a global positioning system (GPS) Garmin

GPSmap 78s. The distribution map of *R. togeanensis* was made using QGIS 3.36 Maidenhead (QGIS.org 2026).

RESULTS

This study rediscovered *Rhinocypha togeanensis* in its natural habitat after the last record in 1999 (more than two decades ago) (Image 1). Specimens were found at localities somewhat contracted more upstream from the location where *R. togeanensis* was found for the first time in Air Terjun Wakai (van Tol & Gunther 2018) (Figure 1). During the survey, no individual was observed in the type locality (red circle in Figure 1), but they were present approximately 2 km, far more inland in the remaining pristine forest. The stream section where this species was observed was located beyond a narrow gorge with dense forest cover and less anthropogenic activity.

In this study, since the focus was on rediscovery and updating the current population of *R. togeanensis*, only one specimen was collected. In fact, only one individual (male) was preserved for morphological examination under a stereomicroscope to avoid population depletion of this endangered species. The species identification was verified directly by the last author (AG), who collected this species in 1994 and 1999. Based on one male, the specimen agreed well with the original description of *R. togeanensis* by van Tol & Günther (2018), especially in black colour of head, without any blue markings; black mandible; thorax with velvet black colour, pronotum black; abdomen with black dorsum and blue markings on the lateral part, S9 and anal appendages black; wings with dark brownish black, anterior part of wings dark brown, wings with blue metallic colour (Image 2).

The specimens have no well-defined blue annulae thus differing from *R. virgulata* (van Tol & Günther 2018).

A total of 12 sites in Sungai Tanimpo, Batudaka Island, were surveyed. *R. togeanensis* was recorded at only five sites, all of which were located in primary forest and relatively far from the residential and agricultural area. Around 18 individuals were recorded in the stream located beyond a narrow gorge rarely visited by humans. In this study, the sex of *R. togeanensis* were not recorded, hence, the functional sex ratio cannot be stated (Table 1).

In the lower reaches, near the residential and agricultural area (sites 1–7), not a single individual of *R. togeanensis* was observed but they appeared in forested area hiding in the narrow gorge (high approximately 5 m) (Image 3A). Beyond the narrow gorge, the area became a well-preserved primary forest with little human activity (Image 3B,C). Areas favoured by *R. togeanensis* in this area tended to support vegetation located approximately 0.6 m above the water surface and twigs along the riverbank. When disturbed, the damselflies occasionally moved to the higher part of the tree branches. It was primarily found on riverbanks exposed to direct sunlight (Table 1).

The distribution of *R. togeanensis* is associated with small, swift-running streams in the upper reaches (> 100 m). The environmental parameters in Sungai Tanimpo, where *R. togeanensis* was found, included lower air temperature 26.7–26.8°C (sites 8–12) and higher relative humidity > 96%, i.e., characteristics of a closed canopy of the primary forest. The light intensity ranged from 694–8117 lux. The stream in the habitat of *R. togeanensis* was approximately 3 m wide with a rocky and gravel bottom and shallow riffles (Image 3C). In this part, there are some cascades or pools with a rocky

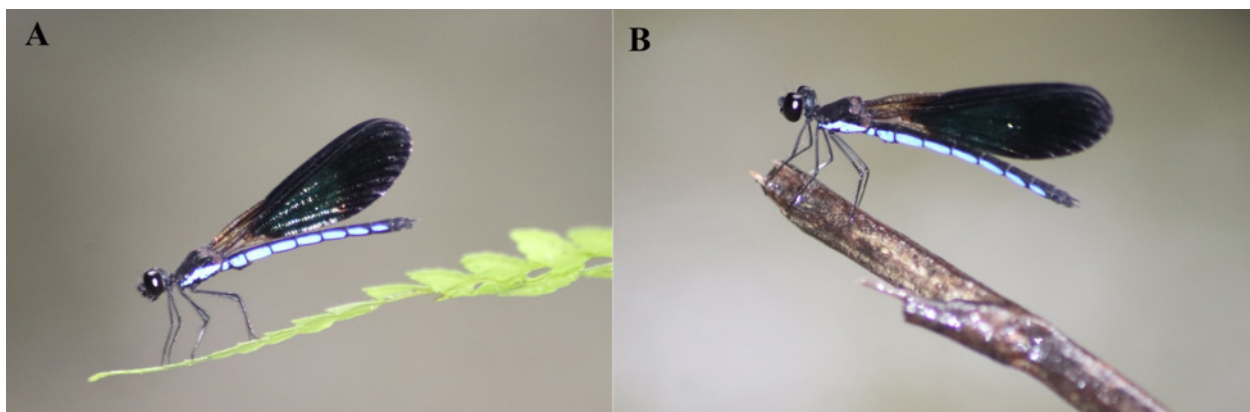


Image 1. *Rhinocypha togeanensis* at Sungai Tanimpo showing preferred perches: A—on leaves | B—on branch. © Muhammad Amiruddin.

Table 1. Environmental variables, elevation and population abundance recorded in 12 sampling sites during this study.

Sampling site	Temperature (°C)	Relative humidity (%)	Light intensity (Lux)		Elevation (m)	Number of individuals
			min.	max.		
Site 1	32.2	89.6	217	254	78	0
Site 2	32.4	74.1	155	164	82	0
Site 3	28.5	84.6	632	986	85	0
Site 4	31	84.4	4307	4735	87	0
Site 5	32.3	78.7	869	1305	91	0
Site 6	29.3	92.4	1688	2317	98	0
Site 7	30.1	80.3	718	842	113	0
Site 8	26.8	96	1007	1407	136	4
Site 9	26.7	96.4	1022	1421	139	3
Site 10	26.7	97.2	900	1185	146	4
Site 11	26.8	97.5	694	916	151	3
Site 12	26.8	98.3	4137	8117	153	4
Total						18



Image 2. A male of *Rhinocypha togeanensis* van Tol & Gunther, 2018 from Sungai Tanimpo, Batudaka Island, Togeian Islands. © Muhammad Amiruddin.

bottom. The surrounding vegetation was dominated by primary forest.

DISCUSSION

This study confirmed that *Rhinocypha togeanensis* still occurs in its habitat in Sungai Tanimpo, although there is a significant contraction in occupied habitat to the undisturbed forested area upstream. After more than two decades, although there has been extensive development in human settlement and expansion of agriculture, this study is the first survey to rediscover this endemic damselfly in its wild habitat (Image 1).

Since the survey only successfully recorded 18

individuals in Sungai Tanimpo, it is assumed that *Rhinocypha togeanensis* might now have a small population size and a very small area of occurrence, making it vulnerable to extinction. In 1994, over 80 individuals were observed in the area below the waterfall, where the species was no longer present in the current survey. And above the waterfall, the species was even more common. By 1999, the population size in the lower reaches of the stream had already decreased considerably due to the loss of suitable habitats (A. Günther, pers. obs. 24–28 August 1999). It cannot be ruled out that lower numbers in the upper part could be a sampling artefact (different time/season, etc.), or it might be that the loss of the healthy downstream population might be adversely affecting the upstream population as well.

Rhinocypha togeanensis was listed as ‘Endangered’ with IUCN Red List criteria B1ab(ii,iii) without any available data on population status (Dow 2021). This study contributes to the preliminary update on the population of this endangered and endemic damselfly in Togeian Islands. It is strongly suggested that the threatened status of this species should be elevated to Critically Endangered (CR) to gather more conservation actions for this species in the future. Current data suggest that this is one of the most threatened damselfly species in the world.

The habitat of *R. togeanensis* in Sungai Tanimpo is now highly disturbed, especially in the lower reaches of the stream. According to the observations, deforestation and disturbance of the surrounding forests and the



Image 3. Habitat of *Rhinocypha togeanensis* in Sungai Tanimpo. A—a narrow gorge in front of the forested area where this species was found | B&C—primary forest around the gorge with cascades and streamflow showing natural vegetation along the riverbank.

introduction of sand and soil into the stream represent the greatest threats to the survival of the species. No individuals of *R. togeanensis* were found near human settlements or agricultural areas (cacao plantation) up to Air Terjun Tanimpo, where this species was previously found. The habitat seems to have now been reduced to the upper part of the stream in forested areas. In some situations, damselflies (Zygoptera) have been reported to have a different community structure according to land change, thus sensitive to disturbance (Monteiro-Júnior et al. 2014). Since the natural flow of Sungai Tanimpo relies on the forested area upstream, deforestation or land use surrounding Sungai Tanimpo could affect that annual flow and water turbidity and cause problems to aquatic organisms that depend on a healthy stream. In addition, Sungai Tanimpo has also now become popular for recreational activities, especially at the waterfall. It is likely that in the future, the habitat of *R. togeanensis* inside the narrow gorge will also become a recreational site. To date, human activity in this area has only been for the regional drinking water supply (PDAM), affected by installing a long pipe from this area to the human

settlement.

This study highlights the conservation priority of *Rhinocypha togeanensis*, an endemic and Endangered damselfly. Conservation issues in the Togeian Islands have been known for several endemic large vertebrates, such as *Babyrousa togeanensis* (Jati et al. 2024) and *Tarsius niemitzi* (Supriatna et al. 2020), including the adverse effects of deforestation for small-scale agriculture and human settlement. Aquatic invertebrates, such as dragonflies and damselflies, are not only found in streams during their larval stage (Monteiro-Júnior et al. 2014), but also in the riparian vegetation and perhaps the subcanopy as adults (de Oliveira-Junior et al. 2017). Many chlorocyphids might ascend to the subcanopy to forage, where they tend to disappear for a day, then return to the breeding site, and there is some evidence that this time is spent feeding, as some species, for example, *Libellago* spp., will travel quite long distances (1–2 km) to forage (Albert G. Orr pers. communication). The presence of human activities for recreation in the stream or waterfall could alter the structure of the habitat, such as the removal of logs, driftwood, and

branches lying in the stream that become a vital site for mating and oviposition (Günther 2008; van Tol & Günther, 2018).

Possible conservation measures for *R. togeanensis* include restoring gallery forests along the stream's lower reaches and preventing runoff from agricultural land. Community outreach programs and education for visitors and the local community will be important steps in providing adequate information regarding this species and its habitat. In addition, searching for other permanently flowing streams hosting the species is needed. The high endemism of damselflies in Sulawesi should be an incentive for extraordinary conservation efforts to ensure their long-term existence in Sulawesi.

REFERENCES

- Balzan, M.V. (2012). Associations of dragonflies (Odonata) to habitat variables within the Maltese Islands: A spatiotemporal approach. *Journal of Insect Science* 12(87): 1–18. <https://doi.org/10.1673/031.012.8701>
- Clausnitzer, V., V.J. Kalkman, M. Ram, B. Collen, J.E.M. Baillie, M. Bedjanič, W.R.T. Darwall, K-B.B. Dijkstra, R. Dow, & J. Hawking (2009). Odonata enter the biodiversity crisis debate: the first global assessment of an insect group. *Biological Conservation* 142(8): 1864–1869. <https://doi.org/10.1016/j.biocon.2009.03.028>
- Cleary, D.F.R., A.M. Bijlmer, D. Wielakker & N.J. de Voogd (2025). Damselflies and dragonflies in distress: the impact of forest fires and logging on odonate assemblages. *Ecological Indicators* 173: 113382. <https://doi.org/10.1016/j.ecolind.2025.113382>
- Cottam, M.A., R. Hall, M. Forster & M.K. Boudagher-Fadel (2011). Basement character and basin formation in Gorontalo Bay, Sulawesi, Indonesia: New observations from the Togian Islands. In: Hall, R., M.A. Cottam & M. E.J. Wilson (eds.). *The SE Asian Gateway: History and Tectonics of Australia-Asia Collision*. The Geological Society, London, 381 pp. <https://doi.org/10.1144/SP355.9>
- Da Silva Jr, W.F., L.B. Calvão, F.G. Carvalho, E.F. Medina-Espinoza & L.S. Brasil (2023). Use of the Zygoptera/Anisoptera Ratio (Insecta: Odonata) for habitat alteration assessment in Cerrado Streams. *International Journal of Odonatology* 26: 124–131. <https://doi.org/10.48156/1388.2023.1917214>
- de Oliveira-Junior, J.M.B., P. De Marco, K. Dias-Silva, R.P. Leitão, C.G. Leal, P.S. Pompeu, T.A. Gardner, R.M. Hughes & L. Juen (2017). Effects of human disturbance and riparian conditions on Odonata (Insecta) assemblages in eastern Amazon basin streams. *Limnologia* 66: 31–39. <https://doi.org/10.1016/j.limno.2017.04.007>
- Dow, R., C. Choong, J. Grinang, P. Lupiyaningdyah, R. Ngiam & V. Kalkman (2024). Checklist of the Odonata (Insecta) of Sundaland and Wallacea (Malaysia, Singapore, Brunei, Indonesia and Timor Leste). *Zootaxa* 5460 (1): 1–122. <https://doi.org/10.11646/zootaxa.5460.1.1>
- Dow, R.A. (2021). *Rhinocypha togeanensis*. The IUCN Red List of Threatened Species 2021: e.T173698901A173756660. <https://doi.org/10.2305/IUCN.UK.2021-3.RLTS.T173698901A173756660.en>. Downloaded on 26.vii.2025.
- Fernandez, N.R. (2024). A straightforward protocol to sample morphological traits of dragonflies and damselflies in the field. *Ecology and Evolution* 14(6): e11604. <https://doi.org/10.1002/ece3.11604>
- Günther, A. (2008). Vergleichende Untersuchungen zum Reproduktionsverhalten südostasiatischer Chlorocyphidae und Calopterygidae (Odonata: Zygoptera). PhD Thesis, Fakultät für Chemie und Physik der Technischen Universität Bergakademie Freiberg genehmigte 208 pp.
- Günther, A. (2019). Reproductive behaviour of Chlorocyphidae. Part 1. Genus *Sclerocypha* Fraser, 1949 (Odonata). *Odonatologica* 48 (3/4): 285–304. <https://doi.org/10.5281/zenodo.3539742>
- Günther, A. (2020). Reproductive behaviour of Chlorocyphidae. Part 2. Genus *Disparocypha* Ris, 1916 (Odonata). *Odonatologica* 49 (1/2): 85–106. <https://doi.org/10.5281/zenodo.3823333>
- Harahap, R.R., A.M. Shahroni (2024). Record of two Endemic Damselflies from Obi Island, Moluccas, Indonesia with habitat description. *Treubia* 51(2): 169–174. <https://doi.org/10.14203/treubia.v51i2.4773>
- Jati, A.S., B.W. Broto, G.F. Dri, K. Latifiana, S. Fraver, I.S. Rejeki, B. Bustang & A. Mortelliti (2024). Conserving large mammals on small islands: A case study on one of the world's most understudied pigs, the Togeian islands babirusa. *Biodiversity and Conservation* 33: 1207–1223. <https://doi.org/10.1007/s10531-024-02800-5>
- Lupiyaningdyah, P. (2020). The past, present and future of dragonfly research in Indonesia. *BIO Web of Conferences* 19(1): 00024. <https://doi.org/10.1051/bioconf/20201900024>
- Monteiro-Júnior, C.S., L. Juen & N. Hamada (2014). Effects of urbanization on stream habitats and associated adult dragonfly and damselfly communities in central Brazilian Amazonia. *Landscape and Urban Planning* 127: 28–40. <https://doi.org/10.1016/j.landurbplan.2014.03.006>
- Nugraha, A.M. & R. Hall (2018). Late Cenozoic palaeogeography of Sulawesi, Indonesia. *Palaeogeography, Palaeoclimatology, Palaeoecology* 490: 191–209. <https://doi.org/10.1016/j.palaeo.2017.10.033>
- QGIS.org (2026). QGIS Geographic Information System. QGIS Association. <http://www.qgis.org>. Downloaded on 15.v.2025.
- Ris, F. (1916). Zwei Notizen über Calopterygiden (Odonata) vom Malaiischen Archipel. *Entomologische Mitteilungen* 5: 30–3318.
- Supriatna, J., M. Shekelle, H.A.H. Fuad, N.L. Winarni, A.A. Dwiyahreni, M. Farid, S. Mariati, C. Margules, B. Prakoso & Z. Zakaria (2020). Deforestation on the Indonesian island of Sulawesi and the loss of primate habitat. *Global Ecology and Conservation* 24: e01205. <https://doi.org/10.1016/j.gecco.2020.e01205>
- van Tol, J. & A. Günther (2018). The Odonata of Sulawesi and adjacent islands. Part 8. Revision of the genus *Rhinocypha* Rambur, 1842 (Chlorocyphidae). *Odonatologica* 47(3/4): 299–386. <https://doi.org/10.5281/zenodo.1481114>
- van Tol, J. (1987). The Odonata of Sulawesi (Celebes), Indonesia an introduction. *Odonatologica* 3: 147–155.
- van Tol, J. (1998). The Odonata of Sulawesi and adjacent islands. Part 4. A new genus and species of Chlorocyphidae from south-eastern Sulawesi. *Zoologische Verhandlungen* 323: 441–448.
- van Tol, J. (2007). The Odonata of Sulawesi and adjacent islands. Part 6. Revision of the genus *Drepanosticta* Laidlaw (Zygoptera: Platystictidae). *Odonatologica* 36(2): 171–189.

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First record of leucism in Rock Hyrax *Procapra capensis* from Ibbex Reserve Protected Area, Saudi Arabia

– Zaffar R. Mir, Naif Alajmi, Ali Alahmari, Ahmad Alobaid, Khalid Almaliki, Farah Niaz, Naif Alqahtani & Ahmed Boug, Pp. 28719–28723

First national record of Yellow Owl Butterfly *Neorina hilda* Westwood, 1851 (Lepidoptera: Nymphalidae: Satyrinae) for Nepal

– Nishan Limbu, Pp. 28724–28728

Notes

First record of Wall's Krait *Bungarus walli* Wall, 1907 (Reptilia: Squamata: Elapidae) from Assam, and diagnostic keys to the kraits of India

– Bijay Basfore, Abhi Medhi, Nazrul Islam, Rathin Barman, Madhurima Das, Anjana Singha Naorem & Jayaditya Purkayastha, Pp. 28729–28733

Eastern range extension of the band-winged grasshopper *Pusana rugulosa* (Uvarov, 1921) (Insecta: Orthoptera: Acrididae) in India

– Amlanjyoti Gautam, Rajnish Ranjan & Jennifer Lyngdoh, Pp. 28734–28738

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