

First record of Hagen's batwing
Atrophaneura hageni (Rogenhofer, 1889)
(Lepidoptera Papiolinidae) in southern
Sumatra, Indonesia

By Arum Setiawan

First record of Hagen's batwing *Atrophaneura hageni* (Rogenhofer, 1889) (Lepidoptera: Papiolinidae) in southern Sumatra, Indonesia

DONI SETIAWAN¹, INA APRILIA², MUHAMMAD IQBAL^{3*}, GUNTUR PRAGUSTIANDI²,
ARUM SETIAWAN¹ & INDRA YUSTIAN¹

¹Department of Biology, Faculty of Science, Sriwijaya University, Jalan Raya Palembang-Prabumulih km 32, Indralaya, Sumatera Selatan 30662, Indonesia

²Conservation Biology Program, Faculty of Science, Sriwijaya University, Jalan Padang Selasa 524, Palembang, Sumatera Selatan 30129, Indonesia

³Biology Program, Faculty of Science, Sriwijaya University, Jalan Padang Selasa 524, Palembang, Sumatera Selatan 30129, Indonesia

*Corresponding author: kpbsos26@yahoo.com

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Abstract

Hagen's batwing *Atrophaneura hageni* (Rogenhofer, 1889) (Lepidoptera: Papiolinidae) is endemic to Sumatra and it was previously known only from North Sumatra and West Sumatra provinces. Here we report the first record of this species from South Sumatra. A male individual of *A. hageni* was recorded on 19 April 2018 in the Pagar Alam District, South Sumatra Province, Indonesia. Our record represent the most southern locality in the range of this rare highland species.

Key words: *Atrophaneura hageni*, batwing butterflies, distribution, Rhopalocera.

Introduction

The swallowtail butterflies (Lepidoptera: Papilionidae) is a group with more than 500 species globally (Kirton 2014; Hoskins 2015) that contains many of the largest and most beautiful butterfly species (Hill & Abang 2010). This family is known as swallowtail butterflies because many species have a tail at the hindwing tornus (Holloway *et al.* 2011). There are 24 Papilionidae species listed as precious and protected Indonesian butterflies, and these are the butterflies of highest conservation concern in Indonesia (Peggie 2011).

The genus *Atrophaneura* Reakirt, [1865] contains tailless butterflies somewhat resembling the genus *Troides* Hübner, [1819] at all stages of the life cycle. The larvae have large spiny tubercles, and feed on Aristolochiaceae (known as Birthwort) species. The adults are smaller than those of *Troides* and have shorter wings (Ek-Amnuay 2012). There are up to five *Atrophaneura* species in Sumatra. *Atrophaneura hageni* is a rare endemic butterfly having a range restricted to mountain forest in northern Sumatra (North Sumatra to West Sumatra provinces) (de Niceville & Martin 1896; D'Abbrera 1982; Tsukada & Nishiyama 1982).

This paper report the first record of *A. hageni* in the South Sumatra Province, providing an evidence that the range of this species may be broader than it was expected.

Materials and Methods

A field survey was conducted on 19 April 2018 in Kampung Empat Village (4°02'83"S, 103°08'99"E), Dempo Selatan Subdistrict, Pagar Alam District, South Sumatra Province (Figs. 1-2). This site is situated within the Dempo Mountain Protected Forest Area, in plant cover of height canopy which various plant species are abundant, e.g. *Ficus* spp., *Clibadium surinamensis* L., *Pandanus* sp., *Alsophila junghuhniana* Kunze, *Litsea* sp., *Lithocarpus* sp., *Schinus wallichii* (DC.) Korth., and *Vanda* sp. The area is very close to the Dempo Mountain, bordering with a tea plantation. The altitude is 1,600 m above sea level, an area of lower montane forest in Sumatra (1.200 - 2.100 m) as defined by Whitten *et al.* (2000). On one occasion, our team observed and photographed a large black butterfly perching at *Ficus* sp. and *Alsophila junghuhniana*. Unfortunately, we are unable to collect a specimen due to a large distance and rapid movements of the butterfly. However, it was identified as *A. hageni* based on the combination of specific morphological characters using the series of photographic images (Figs. 3-4).

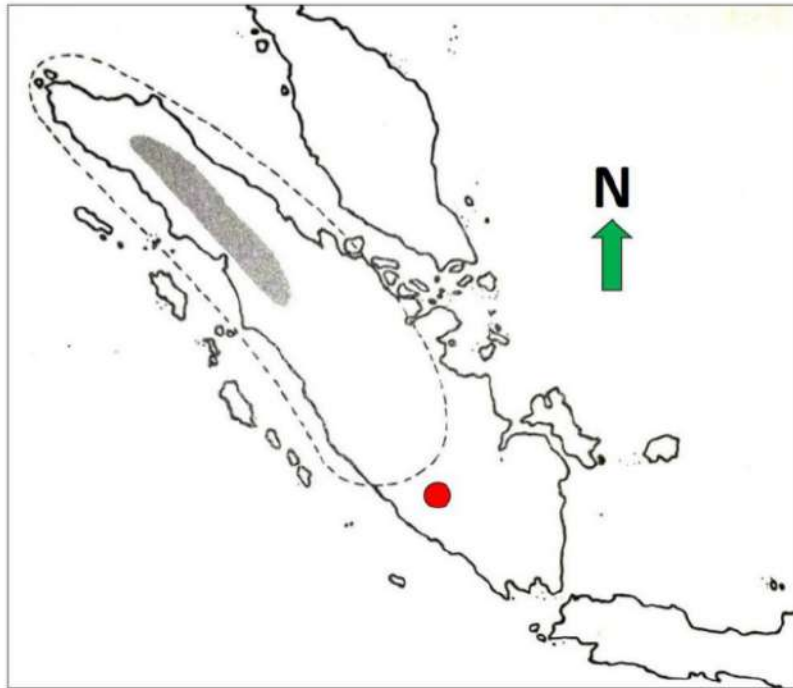


Figure 1. Distribution of *A. hageni* (map modified after Tsukada & Nishiyama 1982). Gray filling and area contoured by a dashed line indicate the range of *A. hageni*, and red circle indicates our new record in the Pagar Alam District, South Sumatra Province, Indonesia.

Results and Discussion

The butterfly was identified as a member of the genus *Atrophaneura* by its large-medium size, white dorsal side of the head, entirely black body, black forewing with whitish shadow on venations, black hindwing with a white large spot in the post discal and submarginal area, and with four series of black spots (Fig. 3-4). These patterns are constant for the *Atrophaneura priapus* group. In Sumatra, there are three species of white headed *Atrophaneura*, that is: *A. hageni*, *A. priapus* (Boisduval, 1836), and *A. sycorax* (Grose-Smith, 1885) (D'Abbrera 1982; Tsukada & Nishiyama 1982).



Figure 2. Habitat of *A. hageni* in the Pagar Alam District, South Sumatra Province, Indonesia (Photo: Doni Setiawan).

The white headed *Atrophaneura* individual found in the Pagar Alam District was identified as *A. hageni* by its specific characters compared to *A. priapus* and *A. sycorax*. The butterfly differs from *Atrophaneura sycorax* by an entirely black dorsal surface of the abdomen and from *A. sycorax* by having a more than apical half of the body yellowish-white. The butterfly is very similar to *Atrophaneura priapus* by sharing white head and specific wing patterns. However, the latter species has more elongate hindwing, a white spot marking in hindwing extending between radius and discocellulars zone, and a smaller series of black spots within the white area in the hindwing (D'Abrera 1982; Tsukada & Nishiyama 1982; Harada *et al.* 2012). The butterfly from Pagar Alam District, South Sumatra differs from a set of characters listed above by its distinct white color in the head area, a more rounded hindwing, a white spot marking in hindwing absent or not extends to the area between radius and discocellulars zone, and by a larger series of black spots within the white area in the hindwing. Based on the specific characters listed above and appropriate guides (D'Abrera 1982; Tsukada & Nishiyama 1982; Harada *et al.* 2012), the butterfly found in the Pagar Alam district was identified as a male of *A. hageni*. The male was considered rarely seen than female (de Niceville & Martin 1896).

Atrophaneura hageni is endemic to the high-altitude regions of Sumatra. It was found in mountain jungles above 1,000 m altitude in the Karo Hill (3°N), North Sumatra Province, while its range extends to the Padang District (0°S), West Sumatra Province, in which this species occurred above 1,500 m altitude (Tsukada & Nishiyama 1982). However, it has never been reported from South Sumatra, and it was assumed that in the southern part of the island this species is replaced by *Atrophaneura priapus* (Tsukada & Nishiyama 1982). An old record labelled as Teluk Betung (Lampung Province) in 1928, coastal zone area of southern Sumatra (Creuwels 2020), must be error, because *A. hageni* is high altitude species. The record of *A. hageni* in the Pagar Alam District (4°S) represents the most southern occurrence of this species; approximately 1,000 km south of the Padang District.



Figure 3. Male of *A. hageni* found on 19 April 2018 in the Pagar Alam District, South Sumatra Province, Indonesia (Photo: Doni Setiawan).



Figure 4. The same male of *A. hageni* in flight when approaching by team, Pagar Alam District, South Sumatra Province, Indonesia (Photo: Guntur Pragustiandi).

Additional field surveys and collecting efforts are needed to estimate the status of *A. hageni* at the Pagar Alam District, i.e. if it is a local resident population or a single vagrant individual of this rare taxon. In our opinion, *A. hageni* was not previously recorded from South Sumatra due to the lack of entomological surveys in mountain forests of this area. This species is likely threatened by forest fragmentation and other kinds of anthropogenic impacts. Finally, our record is of importance for future checklists of Papilionidae at regional and global levels (Scriber 1995), particularly as a tropic archipelagic country, Indonesia has high level of endemism in animal distributions, including butterflies (Peggie 2011).

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References

- Creuwels, J. (2020) *Naturalis Biodiversity Center (NL) - Lepidoptera*. Naturalis Biodiversity Center. Occurrence dataset <https://doi.org/10.15468/n4q0sa> accessed via GBIF.org on 2020-02-07. <https://www.gbif.org/occurrence/2443598972>
- D'Abrera, B. (1982) *Butterflies of the Oriental Region, Part I*. Hill House, Victoria, 244 pp.
- Ek-Amnuay, P. (2012) *Butterflies of Thailand*. Baan Lae Suan Amarin Printing and Publishing, Bangkok, 943 pp.
- Harada, M., Teshirogi, M., Ozawa, H. & Yago, M. (2012) *Catalogue of the Suguru Igarashi Insect Collection, The University Museum, The University of Tokyo. Part I. Lepidoptera, Papilionidae*. The University of Tokyo, Tokyo. <http://umdb.um.u-tokyo.ac.jp/DDoubutu/igarashi/en/cabinet2.php?Number=1063&skip=0&max=200> (Accessed on 02.01.2020).
- Hill, D.S. & Abang, F. (2010) *The insects of Borneo (including South-east Asia)*. Universiti Malaysia Sarawak, Sarawak, 435 pp.
- Holloway, J.D., Kibby, G. & Peggie, D. (2001) *The families of Malesian moths and butterflies*. Brill, Leiden, 455 pp.
- Hoskins, A. (2015) *Butterflies of the world*. Reed New Holland Publishers Pty Ltd, London, 312 pp.
- Kirton, L.G. (2014) *A naturalist's guide to the butterflies of Peninsular Malaysia, Singapore and Thailand*. John Beaufoy Publishing, Oxford, 176 pp.
- de Niceville, L. & Martin, L. (1896). A list of the butterflies of Sumatra, with especial reference to the species occurring in the north-east of the Island. *Journal of the Asiatic Society of Bengal [III]*, 64, 357–555.
- Peggie, D. (2011) *Precious and protected Indonesian butterflies*. PT Binamitra Megawarna, Jakarta, 72 pp.
- Scriber, J.M. (1995) Overview of swallowtail butterflies: Taxonomic and distributional latitude. In: Scriber, J.M., Tsubaki, Y. & Lederhouse, R.C. (Eds.), *Swallowtail butterflies: Their ecology and evolutionary biology*. Scientific Publishers, Gainesville, pp. 3–15.
- Tsukada, E. & Nishiyama, Y. (1982) *Butterflies of the South East Asian islands: Volume I Family Papilionidae*. In: Tsukada, E (Ed.), *Butterflies of the South East Asian islands*. Plapac Co., Ltd, Tokyo, pp. 1–457.
- Whiten, T., Damanik, S.J., Anwar, J. & Hisyam, N. (2000) *The ecology of Sumatra*. Periplus, Singapore, 478 pp.

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