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

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Received 24 December 2019 | Accepted by V. Pešić: 7 February 2020 | Published online 13 February 2020.

**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.

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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’Abrera 1982; Tsukada & Nishiyama 1982).
This paper reports 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., *Clidadium surinamensis* L., *Pandanus* sp., *Alsophila junghuhniana* Kunze, *Litsea* sp., *Lithocarpus* sp., *Schima 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](image-url)  
**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’Abrera 1982; Tsukada & Nishiyama 1982).
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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Country - Montenegro

Subject Area and Category - Agricultural and Biological Sciences
- Animal Science and Zoology
- Ecology, Evolution, Behavior and Systematics
- Insect Science
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Publisher - Journals

ISSN - 23370173, 23369744

Coverage - 2014-2020

Scope - Ecologica Montenegrina (ISSN 2336-9744 (online) | ISSN 2337-0173 (print)) is peer-reviewed journal in which scientifc articles and reports are quickly published. The papers are in the elds of taxonomy, biogeography and ecology (for example: new taxa for science, taxonomic revision, and/or fundamental ecology and biogeography papers). Open access publishing option is strongly encouraged for authors with research grants and other funds. For those without grants/funds, all accepted manuscripts will be published but access is secured for subscribers only.

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ISSN: 2336-9744
Ecologica Montenegrina

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By Arum Setiawan
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Received 24 December 2019 | Accepted by Y. Petic 7 February 2020 | Published online 13 February 2020.

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- a. Nama Jurnal : Ecologica Montenegrina
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- **Kecukupan & Kemutahiran Data & Metodologi:**
  - Data-data hasil penelitian sudah baik dan didukung peta lokasi sampling dan gambar yang ditampilkan menarik. Data didapatkan dengan menggunakan metode yang sudah standard.

- **Kelengkapan Unsur & Kualitas Penerbit:**
  - Penerbit Center for Biodiversity of Montenegro berkualitas baik, tidak termasuk predatory publisher, dan jurnal masuk di Q2.
Surabaya, 15 Mei 2020

Penilai I

Prof. Hery Purnobasuki, M.Si., Ph.D.
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Unit Kerja : Jurusan Biologi FST Unair
Bidang Ilmu : Biologi
Jabatan/Pangkat : Guru Besar/ Pembina Utama Madya
FORMAT PENILAIAN (VALIDASI & PEER REVIEW)
LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH

Jurnal Artikel Ilmiah : First record of Hagen's batwing Atrophaneura hageni (Rogenhofer, 1889) (Lepidoptera: Papilionidae) in southern Sumatra, Indonesia
Penulis Artikel Ilmiah : Arum Setiawan
Identitas Jurnal Artikel Ilmiah
a. Nama Jurnal : Ecologica Montenegrina
c. Edisi (bulan/tahun) : Februari 2020
d. Penerbit : Center for Biodiversity of Montenegro
e. Jumlah Halaman : 5

I. Hasil Penilaian Validasi :

<table>
<thead>
<tr>
<th>No.</th>
<th>ASPEK</th>
<th>URAIAN/KOMENTAR PENILAIAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Indikasi Plagiasi</td>
<td>2 %</td>
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<tr>
<td>2.</td>
<td>Linearitas</td>
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</table>

II. Hasil Penilaian Peer Review :

<table>
<thead>
<tr>
<th>Komponen Yang Dinilai</th>
<th>Nilai Maksimal Jurnal Ilmiah (isikan di kolom yang sesuai)</th>
<th>Nilai Akhir Yang Diperoleh</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>International Bereputasi (Maks 40)</td>
<td>Internasional (Maks 20)</td>
</tr>
<tr>
<td>Kelengkapan dan Kesesuaian unsur isi jurnal (10%)</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nasional Terakreditasi S1, S2 Maks 25</td>
<td>Nasional Terakreditasi S3, S4 Maks 20</td>
</tr>
<tr>
<td>Ruang lingkup dan kedalaman pembahasan (30%)</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Nasional tidak Terakreditasi i (maks 10)</td>
<td></td>
</tr>
<tr>
<td>Kecukupan dan Kemutakhiran data/informasi dan metodologi (30%)</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Kelengkapan unsur dan kualitas penerbit (30%)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Total = (100%)</td>
<td>40</td>
<td>36</td>
</tr>
</tbody>
</table>

Kontribusi Pengusul (Penulis Pertama /Anggota Utama)
Journal of Ecologica Montenegrina Vol. 28(1) 2020. SJR 0,37; IF 0,79. Penulis ke 5 dari 6 penulis. Nilai maksimal 90%. Nilai pengusul = (0,4 x 0,9 x 40)/5 = 2,88

KOMENTAR/ULASAN PEER REVIEW

- Kelengkapan dan Kesesuaian Unsur: Format kurang lengkap.
- Kecukupan & Kemutakhiran Data & Metodologi: Kesimpulan kurang jelas dan tidak sambung dengan latar belakang. Similarity hanya 2% artinya tidak ada plagiasi.
- Kelengkapan Unsur & Kualitas Penerbit: Penerbit sangat baik.

Yogyakarta, 5 Juni 2020

[Signature]

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