

Range extension of the endemic Sumatran admiral *Vanessa samani* (Hagen, 1895) (Lepidoptera: Nymphalidae) in Sumatra, Indonesia

MUHAMMAD IQBAL^{1,*}, PAVEL KIRILLOV², PORMANSYAH³, DONI SETIAWAN⁴, GUNTUR PRAGUSTIANDI², ARUM SETIAWAN⁴, INDRA YUSTIAN³

¹Biology Program, Faculty of Science, Sriwijaya University, Jalan Padang Selasa 524, Palembang, Sumatera Selatan 30129, Indonesia

²Brookes Moscow International school, Lazorevyy pr., 7, Moscow, Russia

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

⁴Department of Biology, Faculty of Science, Sriwijaya University, Jalan Raya Palembang-Prabumulih km 32, Indralaya, Sumatera Selatan 30662, Indonesia

Corresponding author: kpbsos26@yahoo.com

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ABSTRACT

Sumatran Admiral *Vanessa samani* (Hagen, 1895) (Lepidoptera: Nymphalidae) is a butterfly endemic to Sumatra, and can only be found in the Karo Highlands (North Sumatra) and Kerinci Mountain (southwestern Sumatra). In this paper, we report two additional records of *V. samani* from the Aceh Province in northern Sumatra, and the Jambul Highlands of South Sumatra. These records significantly extend the range of distribution of this rare Sumatran highland species. We also report three plants presumed to be the host plants of *V. samani* in Sumatra: *Boehmeria* sp., *Smilax* sp. (*Smilax leucophylla*) and *Anaphalis* sp. (*Anaphalis longifolia*).

ABSTRAK

Kupu-kupu Laksamana Sumatera *Vanessa samani* (Hagen, 1895) (Lepidoptera: Nymphalidae) merupakan kupu-kupu endemik yang hanya terdapat di Sumatera, dan hanya diketahui dari Dataran Tinggi Karo (Sumatera Utara) dan Gunung Kerinci (Sumatera bagian barat daya). Dalam paper ini, kami melaporkan dua catatan tambahan *V. samani* dari Provinsi Aceh di Sumatera bagian utara, dan dari Dataran Tinggi Jambul di Provinsi Sumatera Selatan. Catatan-catatan ini menambah kisaran distribusi spesies endemik dan langka dataran tinggi Sumatera ini. Selain itu, kami mencatat tiga tanaman yang diduga sebagai tanaman inang jenis ini, yaitu *Boehmeria* sp., *Smilax* sp. (*Smilax leucophylla*) dan *Anaphalis* sp. (*Anaphalis longifolia*).

Keywords: brush-footed butterfly, restricted range species, Sumatra, *Vanessa samani*

INTRODUCTION

The brush-footed butterflies (Lepidoptera: Nymphalidae) are the biggest group of butterflies, containing 7,000 species in about 16 subfamilies, with many of them considered as distinct families (Holloway et al, 2001). Majority of the species in this family are large, showy and often multicoloured, although two of the subfamilies feature brownish or drab-coloured butterflies (Khoon, 2010). The single characteristic that unites members of this group is the non-functional forelegs for walking in both sexes. With their forelegs reduced to brush-like stumps, this group becomes popularly known as brush-foots (Hoskins, 2015).

Vanessa is a genus under subfamily Nymphalinae (Scoble, 1992; Holloway et al, 2001), and there are currently 22 species within the genus *Vanessa* (Wahlberg & Rubinoff, 2011). Sumatran admiral *Vanessa samani* (Hagen, 1895) is the only species of genus *Vanessa* occurring in Sumatra, and this species is restricted to the highland zones of Karo and Kerinci mountains of the island (D'Abrera, 1982; Tsukada et al, 1985;

Vane-Wright & Hughes, 2007).

Vanessa samani is a species restricted to the high altitudinal zones of Sumatra. It can be found in mountainous regions above 1,000 m altitude in the Karo Highlands (3° N) in the Province of North Sumatra; and has a range that extends southward to the Kerinci Mountain (0° S) in the Jambi Province of southwest Sumatra, at an altitude around 1,500 m (D'Abrera, 1982; Tsukada et al, 1985; Vane-Wright & Hughes, 2007). A male individual from North Sumatra (location details unknown) once received an offer online and sold the butterfly for as much as €40 (Theinsectcollector, 2020). *Vanessa samani*'s findings have also been reported from Aceh Province as specimen code NW80-15 taken in July 1997, but no detailed information on the location is given. (Wahlberg & Rubinoff, 2011; NSG, 2020). Another specimen with specimen ID JM00005 (GenBank accession number DQ028753 and DQ385863) was reported from Sumatra without further details (Otaki et al, 2006a, 2006b; Wahlberg & Rubinoff, 2011).

In this paper, we report two observations of *V. samani*. Their occurrences significantly extend the range of their distribution in Sumatra.

METHODS

Information on the first extension range of *V. samani* was from the Aceh Province, observed and shared in iNaturalist (2020) by the second author on 25 June 2016 in Kedah Village (03°58'38.84"N, 97°14'51.60"E), Gayo Highlands, Blang Jerango District, Gayo Lues District (Figure. 1). The second *V. samani* was observed and photographed on the flower of *Austroepatorium inulifolium* on 18 August 2018 in Talang Pisang Village of Jambul Highlands (04°04'45"S, 103°20'48"E), Jarai Subdistrict, Lahat District, South Sumatra Province (Figure. 2). The Kedah Village of Gayo Highlands is approximately 1.300 m, and the Jambul Highlands is almost 1.500 m

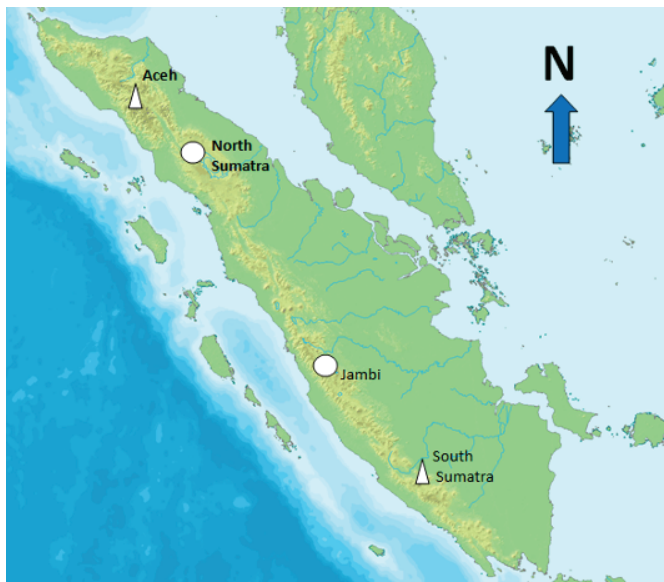


Figure 1. Recent distributions of *V. samani* in Sumatra. White triangle indicates new additional records from Gayo Highlands (Aceh Province) and Jambul Highlands (South Sumatra Province); and white circle indicates historical records before 2016.

above sea level. Whitten et al (2000) defined these altitude zones (1.200 to 2.100 m) as lower montane forest of Sumatra. Unfortunately, the specimens were not collected due to a lack of preservation materials and permit restrictions during field work visitations. However, through the use of a series of photographic images, these butterflies were identified at species level based on a combination of specific morphological characteristics (Figure 3 & Figure 4). In both cases, the photographic observations were time stamped and geotagged.



Figure 2. Habitat of *V. samani* in Talang Pisang Village, Jambul Highlands, South Sumatra Province, Indonesia (Photo: Guntur Pragustiandi).



Figure 3. The male *V. samani* found on 25 June 2016 in Kedah Village, Gayo Highlands, Aceh Province, Indonesia: A. Upperside, and; B. Underside (Photo: Pavel Kirillov).



Figure 4. The male *V. samani* perched on the flower of *Austroepatorium inulifolium* on 18 August 2018, Talang Pisang Village, Jambul Highlands, South Sumatra Province, Indonesia: A. Upperside, and; B. Underside (Photo: Pormansyah).

RESULTS AND DISCUSSION

The two specimens found in Gayo and Jambu Highlands were identified as members of the genus *Vanessa* by its medium size and characteristic dark, reddish-orange, and white markings. The black forewing with reddish-orange patches forms a post-discal band; orange and white spots (?) were found at the apical and subapical; and the dorsal side of the hindwing is reddish-orange with a series of black submarginal spots (Figure 3 [A] & Figure 4 [A]). The colour pattern of the underside of the forewing is similar to the dorsal side but has a pale creamy-orange apex; the underside of the

hindwing has a blotched appearance with many shades and patterns of light to dark brown and grey (Figure 3 [B] & Figure 4 [B]). Based on the specific features above and references made to the major guides (D'Abrera, 1982; Tsukada et al, 1985; Iqbal et al, 2021), the specimens found in the Gayo and Jambul Highlands were identified as the male of *V. samani*, an endemic Sumatran nymphalid. The sexes are similar on both sides of the wings (D'Abrera, 1985), but Tsukada et al. (1985) described the female as lacking black spots on the forewing cell.

Information on the spatial distribution of butterflies in many major islands of Indonesia (particularly Sumatra) remains relatively limited (Aprilia et al, 2020). Compared to Lepidoptera in lowland forests, the butterflies of lower mountain forests are studied less frequently. Recent surveys indicated that lower mountain forests of southern Sumatra could support a greater butterfly diversity than expected (Iqbal et al, 2020; Setiawan et al, 2020). Further field surveys are needed to document Lepidoptera diversity of lower mountain forests of Sumatra, as well as to support conservation effort to protect the forests as Lepidoptera habitats. With its distribution range restricted to the highland zones of Sumatra, combined with rare sightings in the field, we propose the global status of *V. samani* as to at least be "Vulnerable".

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