



## A new species of the genus *Symphlebia* Felder, 1874 (Lepidoptera: Erebidae: Arctiinae: Phaegopterina) from Peru

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### Abstract

Adult male and female of a new species of Arctiinae (Lepidoptera: Erebidae) *Symphlebia pipkinsorum* from southeastern Amazonia, Peru, are described, illustrated and compared to the similar species *Symphlebia muscosa* Schaus, 1910.

**Keywords:** amazonia, citizen science, neotropical, tambopata, taxonomy

### 1. Introduction

The Neotropical genus *Symphlebia* was proposed by Felder (1874) <sup>[1]</sup> with *Symphlebia lophocampoides* as type species, which was described with a female specimen from Brazil. Currently, the number of species that comprise the genus is not very clear, the last two catalogs of the Phaegopterina subtribe record 49 (Watson & Goodger 1986) <sup>[2]</sup> and 46 species (Vincent & Laguerre 2014) <sup>[3]</sup>. Recently, *Symphlebia janecheverriae* has been described for Costa Rica (Espinoza *et al.*, 2017) <sup>[4]</sup>.

The genus has a wide geographic distribution with *Symphlebia jalapa* in Mexico, *S. jamaicensis* in the Antilles, *S. nigripunctata* in Brazil. Altitudinally, they occur in low places such as the Amazon as *S. lophocampoides* reaching up to the high parts of the Andean Eastern slope, above 3500 m as *S. tolimensis* and *S. fulminans*. A new species of the genus *Symphlebia* Felder is described. Description of adults of male and female and the characters of the male genitalia, is provided, together with the differences with *Symphlebia muscosa*, a similar species.

### 2. Materials and methods

The description of the new species is the result of daily collections at Refugio Amazonas Lodge (ARA) located at the right bank of the Tambopata River (Madre de Dios, Peru), as part of a Citizen Science program whose direct participants were guests of the Lodge. This project is carried out in mutual collaboration between the Natural History Museum (MUSM) and the company Rainforest Expeditions. A light trap with a mixed light bulb of 250 V was used to capture the specimens.

Specimens from the following collection were examined: Muséum National d'Histoire Naturelle, Paris, France (MNHP), Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Perú (MUSM), United States National Museum, Smithsonian Institution, USA (USNM).

The genitalia of the specimens were dissected and prepared using a KOH solution (10%) in a water bath. For the best observation of the characters, chlorazole black was used as a staining solution (Cannon, 1937, 1941; Carayon 1969) <sup>[5][6][7]</sup>. All the structures were stored in microvials with glycerin with their respective code. The photographs of the

adults were taken with a Nikon D80 camera; Genitalia with a Canon EOS Rebel T6 camera and a Canon MP-E 65mm macro. The terminology used for venation follows Comstock and Needman (1898, 1899) <sup>[8][9]</sup>, Miller (1970) <sup>[10]</sup>, Wootton (1979) <sup>[11]</sup> and Commom (1990) <sup>[12]</sup>; genitalia follows Sibatani, Ogata, Okada and Okagaki (1954) <sup>[13]</sup>, Kuznetsov (1967) <sup>[14]</sup> and Klots (1970) <sup>[15]</sup>.

The specimens have been deposited in the collection of the Entomology Department of the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Perú.

### 3.- Results

#### *Symphlebia pipkinsorum* sp. nov.

(Figs. 1–4, 5–8)

**Diagnosis:** Similar to *S. muscosa*, both with head and thorax green with blackish spots. Forewing green with black spots, these being larger in *S. pipkinsorum*. Abdominal tergum black and uniform in *S. muscosa*. In *S. pipkinsorum* the posterior part of the seventh tergite, yellow. At the genital capsule, *S. pipkinsorum* presents a few spiniform structures on the distal part of the ventral process, abundant at dorsal processes, while *S. muscosa* presents setae only in both processes of the valva.

**Male (Fig. 1-2):** Forewing span: 18 mm - 20 mm (n = 34).

**Head:** Green with the lower half of the frontoclypeus brown. Labial palpi brown and recurved upwards with a certain bluish hue. Antennae brown, except for the scape, which is yellow; bipectinated, with rami large from almost the first segments and almost the width of the axis of the antenna; increasing slightly in size towards the middle of the antenna; decreasing in size towards the distal part. The fifth distal part of the antenna, white.

**Thorax:** Patagia green, with black spots all over the edge, except in the posterior one. Tegula green with black spots on the internal margin. Mesoscutum, metascutum, mesoscutellum and metascutellum green; two spots on the mesoscutum. Pleura yellowish with tympanic organ at the katapisternum. First pair of legs brown, coxae with yellow spots. Second and third pair brown, coxae yellowish.

**Forewing (dorsal):** Green with a black spot at the base of the wing. A series of antemedial irregular black spots extend from the costal margin to 1A + 2A. A semicircular black spot at the end of the discal cell that reaches the costal margin; with a green internal area. A row of elongated postmedial spots, extending from the costal margin to the tornus; each spot wider towards the mesal part. Small spot towards the apex. A series of small spots, close to the termen and between the veins which are from R<sub>4</sub>-R<sub>5</sub> to Cu<sub>1</sub>-CuP.

**Forewing (ventral):** Same traits as the dorsal side.

**Hindwing (dorsal):** Base of wing and posterior margin blackish. A narrow black spot from the apex to the tornus, broken by yellowish veins. A black spot at the end of the discal cell and at the posterior margin.

**Hindwing (ventral):** Same traits as the dorsal side, except for an elongated black spot at the costal cell and a black line at the costal margin, from the ectal half to the apex.

**Abdomen:** Tergum black with the posterior part of the seventh and eighth tergites yellow. Yellow spots on the sides of the tergites 2-6. Sternum yellowish.

**Male genitalia (Figs 5-7) (Genitalia # JGA-974):** Tegumen weakly sclerotized, with the free space left by the anterior margin, acuminate; wide towards the anterior part, narrowing down towards the posterior part; posterior margin straight. Joining of the tegumen and uncus sclerotized. Uncus sclerotized and spatulate; slightly wider in the proximal two thirds, with setae present; in side view, the central part double the width as the base; distal end sclerotized and in the form of a hook. Valvae elongated and somewhat curved. Ventral process membranous, almost diaphanous, elongated and ovoid, with numerous spiniform structures at the distal end; dorsal process sclerotized, recurved, and with numerous spiniform structures in its dorsal margin; In ventral view, the proximal half of parallel sides, separating in a V shape, with setae in its margins; Saccus developed. Juxta elongated and rectangular, with small spicules. Aedeagus elongated and sclerotized, smaller than the genital capsule. Caecum penis elongated. Vesica small, conformed by several short and membranous extensions.

**Female (Figs 3-4):** Forewing span: 22 mm - 23 mm (n = 3). With the same traits as the males except for the following: a little larger; rami of the antennae smaller, dorsal side of the hindwings black, with some yellow at the last part of the veins; ventral side of hindwings blackish, with part of the discal cell and the veins yellowish.

**Type material:** Holotype male (Figs. 1-2), Perú, Madre de Dios, Río Alto Madre de Dios, ca. Atalaya, 12°53'S, 71°22'W, 587 m, 20.ii.2007, P. Centeno (MV Light trap, 10:00 - 11:00 pm).

**Paratypes:** 36 males and 3 females: Loreto. 1 ♂, Qda. Rumiyacu, Campamento Dorado 5, 01°48'09"S, 75°29'14"W, 230 m, 23.ii.2008, W. Yawuarcani. Pasco. 1 ♂, P.N. Yanachaga-Chemillén, Estación Biológica Paujil, 10°19'24.8"S, 75°15'50.0"W, 373 m, 14.ix.2007, J. Grados

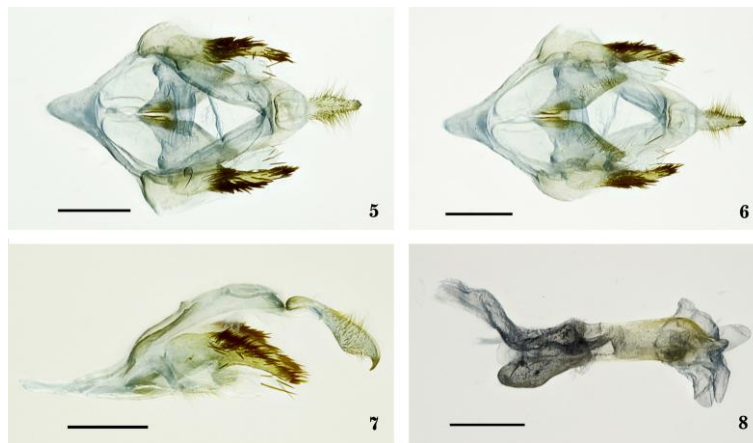
& S. Carbonel; 1 ♂, idem except, 10°19'25"S, 75°15'48.8"W, 375 m, 24.v.2008; 3 ♂, P.N. Yanachaga-Chemillén, Pampa Pescado, confluencia río Danubio y río Pescado, 10°22'35.9"S, 75°14'35.1"W, 407 m, 16.ix.2007, J. Grados & S. Carbonel; 1 ♂, idem except (GENITALIA # 973 - JGA); 2 ♂, P.N. Yanachaga-Chemillén, Pampa Pescado, Laguna Luna llena, 10°22'57.4"S, 75°15'19.8"W, 458 m, 18.ix.2007, J. Grados & S. Carbonel. HUÁNUCO. 1 ♂, Cordillera del Sira, ca. 09°25'S, 74°45'W, 800 m, 18.xii.1987, J. Schwahn. CUSCO. 2 ♂, R.C. Machiguenga, Campamento Mapi OX, 35.5 km O de Nuevo Mundo, 11°31'24"S, 73°28'32"W, 712 m, 13-18.i.2010, J. Grados; 1 ♂, Las Malvinas, Río Urubamba, 11°52'S, 72°56'W, 360 m, 20.ix.1997, J. Grados; 2 ♂, Segakiato, Río Camisea, 11°48'S, 72°52', 330 m, 30.ix.1997, J. Grados; 1 ♂, Campamento Paratori, 12°03'S, 72°58'W, 690 m, 22.x.2002, J. Grados; 1 ♂, idem except, 29.x.2002; 1 ♂, La Convención, Echarate, C.C. Kitaparay, 12°12'12.47"S, 72°49'11.42"W, 474 m, 11.xi.2009, C. Espinoza & E. Rázuri (Light trap); 1 ♂, La Convención, Echarate, C.C. Santa Rosa, 12°34'16.10"S, 72°06'07.56"W, 1249 m, 13.x.2009, C. Carranza & C. Rossi (Light trap); 1 ♂, 1 ♀, Campamento Segakiato, 12°43'S, 73°18'W, 1850 m, 03.xi.2002, J. Grados; 1 ♂, idem except, 02.xi.2002 (GENITALIA # JGA - 236, MUSM); 1 ♂, Campamento Comerciato, 12°47'S, 73°22'W, 1350 m, 25.xi.2002, J. Grados; 1 ♂, Qda. Quitacalzón, 13°01'19"S, 71°29'50"W, 967 m, 14.viii.2012, J. Grados (GENITALIA # JGA - 974, MUSM). MADRE DE DIOS. 2 ♂, Río Los Amigos, CICRA, 12°33'36.3"S, 70°06'17.3"W, 380 m, 09.xii.2005, J. Grados leg. (Introducción al estudio de los artrópodos en el bosque tropical amazónico-CICRA 04-15.xii.2005); 1 ♂, Albergue Pantiacolla ca. Itahuaná, Río Alto Madre de Dios, 12°39'20.5"S, 71°13'54.7"W, 450 m, 30.ix.-03.x.1998, J. Grados; 1 ♀, Albergue Refugio Amazonas, 12°52'30"S, 69°24'35"W, 231 m, 06.x.2016, D. Couceiro leg. (MUSM ARCT-469 JGA COLLECTION)(Voucher DNA Barcoding Arct # 000132 JGA - MUSM ); 1 ♂, idem except, 12.iii.2017 (MUSM ARCT-586 JGA COLLECTION) (Voucher DNA Barcoding Arct # 000249 JGA - MUSM); 1 ♀, idem except, 10.viii.2017 (MUSM ARCT-748 JGA COLLECTION) (Voucher DNA Barcoding Arct # 000411 JGA - MUSM); 1 ♂, idem except, 29.viii.2017 (MUSM ARCT-814 JGA COLLECTION) (Voucher DNA Barcoding Arct # 000477 JGA - MUSM); 1 ♂, Río Alto Madre de Dios, ca. Atalaya, 12°53'S, 71°22'W, 587 m, 03.v.2006, P. Centeno (MV Light trap, 2:00 - 3:00 am); 1 ♂, idem except, 23.vi.2006 (MV Light trap, 00:00 - 1:00 am); 1 ♂, idem except, 27.vi.2006 (MV Light trap, 8:00 - 9:00 pm); 1 ♂, idem except, 16.ii.2007 (MV Light trap, 11:00 - 00:00 am); 1 ♂, idem except, 21.ii.2007 (MV Light trap, 00:00 - 1:00 am). PUNO. 1 ♂, P.N. Bahuaja-Sonene, 4.5 km NO Qda. Aguajal, río Tambopata, 13°23'31.8"S, 69°29'58.7"W, 335 m, 18.ix.2011, J. Grados, E. Rázuri & E. Guillermo; 2 ♂, idem except, 25.ix.2011.

**Etymology:** pipkinsorum is a noun in plural genitive, dedicated to the Pipkins family for being the first to collect specimens of the new species at the Refugio Amazonas Lodge.

**Geographic distribution:** In the departments of Loreto, Pasco, Huánuco, Cusco, Madre de Dios and Puno.



**Fig 1–4.** *Symplebia pipkinsorum* Grados, **sp. nov.** 1. Holotype male, dorsal. 2. Holotype male, ventral. 3. Paratype female, dorsal (Refugio Amazonas lodge). 4. Paratype female, ventral (Refugio Amazonas Lodge). Scales=5 mm.



**Fig 5–8:** Genitalia of *Symplebia pipkinsorum* Grados, **sp. nov.** Male (Genitalia # JGA–974). 5. Dorsal view. 6. Ventral view. 7. Lateral view. 8. Aedeagus. Scales= 1 mm.

**4. Discussion**

The new species is very similar to *S. muscosa* descrita por Schaus (1910)<sup>[16]</sup>, which can be easily confused by the wing color pattern. The species *S. muscosa* was described from an unspecified number of specimens from Tuis (Costa Rica). The lectotype was designated by Watson (1971)<sup>[17]</sup>.

Both species have a similar disposition pattern of the black spots on the forewings. In *S. pipkinsorum* black spots are wider; the antemedial spot at the posterior margin is not very conspicuous, whereas in *S. muscosa* it is more pronounced; antemedial spots in *S. muscosa* are interrupted, while in *S. pipkinsorum* they have some continuity; finally, in *S. pipkinsorum* the posterior part of the seventh tergite is yellow while in *S. muscosa* it isn't. According to Watson (1971)<sup>[17]</sup>, regarding the genital capsule, processes of the dorsal valvae in *S. muscosa* are elongated, present setae and the vesica of the aedeagus is short with small spicules at the base, while in *S. pipkinsorum* the dorsal processes have a series of very sclerosed spiniform structures and, the aedeagus vesica is membranous with four short extensions. According to the available information, both species are allopatric. *S. muscosa* occurs in Central America (Costa Rica) and *S. pipkinsorum* in South America (French Guiana, Ecuador and Peru). In Peru it occurs in the Amazon, reaching the middle parts of the montane forests of the

Eastern Slope of the Andes (Segakiato camp, Cusco).

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