

SIX NEW SPECIES IN THE "FOLIORUM GROUP" OF *THEOPE*
(Lepidoptera: Riodinidae)

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Abstract: Six new species in the "*foliorum* Bates, 1868, group" of *Theope* Doubleday, 1847, are described from Panamá, French Guiana, Ecuador, Peru and Brazil as a prelude to a revision of the genus.

Key-words: Nymphidiini, *Theope amicitiae* sp. nov., *Theope batesi* sp. nov., *Theope busbyi* sp. nov., *Theope pakitza* sp. nov., *Theope sticheli* sp. nov., *Theope wallacei* sp. nov.

Introduction

The genus *Theope* Doubleday, 1847, is significantly more speciose than previously thought (SEITZ, 1920; STICHEL, 1930), as evidenced by the spate of recent descriptions in the genus (GALLARD & BREVIGNON, 1989; D'ABRERA, 1994; WILLMOTT & HALL, 1994; HALL & WILLMOTT, 1996; GALLARD, 1996; DEVRIES & HALL, 1996; HALL & AUSTIN, 1997). The purpose of this paper, as a prelude to a full revision of the genus *Theope*, is to describe six species in the "*foliorum* Bates, 1868, group", whose members are typically small, with grey-brown ventral surfaces and submarginal ventral spotting, and often look very much alike, invariably being confused in museum collections. This group is defined by the following male genitalic synapomorphies: a long upper arm to the valvae and an incomplete vinculum that extends from the lower anterior edge of the tegumen to the top of the valvae.

The species described herein originate from several European and North American museums and private collections. One of these, collected during biodiversity inventories of Parque Nacional del Manu in south-east Peru (see LAMAS *et al.*, 1991; ROBBINS *et al.*, 1996), is co-authored with D. J. HARVEY; another, collected during a long term survey of the riodinids of French Guiana (see BREVIGNON & GALLARD, 1997a,b, 1998a,b), is described with J.-Y. Gallard and C. Brévignon. I largely follow HEPPNER & LAMAS (1982) in using the following museum acronyms throughout the text:

AME - Allyn Museum of Entomology, Sarasota, Florida, USA
AMNH - American Museum of Natural History, New York, USA
FSCA - Florida State Collection of Arthropods, Gainesville, Florida, USA
MNHN - Muséum National d'Histoire Naturelle, Paris, France
MNMSM - Museo Nacional Mayor de San Marcos, Lima, Peru
USNM - United States National Museum, Smithsonian, Washington, USA
ZMHU - Zoologische Museum Humboldt Universität, Berlin, Germany

Theope wallacei Hall, sp. nov. (Figs. 1a-d; 7)

Description: Male: forewing length 16mm. Wing shape elongate; forewing pointed, hindwing rounded. *Dorsal surface:* forewing ground colour black; elongate semicircle of blue in basal portion of wing occupies approximately basal four-fifths of cells above and below vein 1A+2A, basal two-thirds of cell Cu₂, basal third of cell Cu₁ and entire discal cell, with a few blue scales distal of cell end; fringe brown. Hindwing ground colour blue, paler at anal margin; broad black borders at costal and distal margins, broader at costal margin and tornus, two faint black spots in submargin of cell 1A+2A, one in submargin of cells Cu₂ to M₂; fringe brown. *Ventral surface:* ground colour of both wings pale grey, subtle yellow tinge along base of forewing costa; thin brown line extends around very outer margin of both wings; two black spots in submargin of cell 1A+2A, one in submargin of cells Cu₂ to M₁ on both wings, those on hindwing more prominent, especially in tornal region. Labial palpi yellow, second segment elongate. Eyes pale brown and bare, yellow scaling at margins. Frons orange-brown. Antennal segments brown with basal white scaling that is most prominent on ventral surface; tubular clubs brown, tips orange-brown. Dorsal surface of thorax and abdomen dark

brown, ventral surface pale grey. Forelegs yellow; femur of mid and hindlegs whitish yellow, remainder yellow. *Genitalia* (Fig. 7): lower posterior angle of uncus triangular, lower posterior angle of remainder downwardly pointed; falci small and compact; vinculum incomplete, extending from anterior edge of tegumen to top of valvae; valvae with basal lateral bulge and long, broad upper arm that is bluntly pointed, has a small basal hump, and a very slight projection at middle of distal edge; aedeagus sigmoidal in ventral view, heavily sclerotised portion ends broadly and slightly downturned at lower edge, large semi-sclerotised posterior portion has numerous lateral crease lines basally and distally, where there are more heavily sclerotised ridges, five internal cornuti; sclerotised block at base of pedicel, remainder very weakly sclerotised; vestigial "V"-shaped portion of last sternite supports base of aedeagus, attached to valvae by membranous tissue.

Female: differs from male in the following ways: forewing length 14.5mm. Forewing less pointed. *Dorsal surface*: ground colour of both wings dark brown; postdiscal blue scaling on forewing more extensive, especially in cell M_3 ; blue extends further towards distal margin on hindwing, veins towards distal margin outlined in pale brown, black submarginal spots more prominent.

Types: Holotype ♂: Panama.- Canal zone, Piña, 200m, 21 Apr 1970 (H. L. King); in the FSCA. Allotype ♀: Panama.- Canal Zone, same locality data as HT, 1 May 1970 (H. L. King); in the FSCA. Paratypes: Panama.- same locality data as HT, 1 ♂: 11 Oct 1970; 1 ♀: 1 May 1970; 2 ♀ ♀: 10 May 1970; 1 ♀: 3 Aug 1971 (all H. L. King); all in the FSCA. Same locality data as HT, 1 ♂: 9 Mar 1973; 1 ♂: Mar 1970. Gatun, 1 ♂: 27 Apr 1973; 1 ♂: 20 Apr 1970; 2 ♀ ♀: 6 Apr 1971; 1 ♀: 18 Apr 1971 (all G. B. Small); all in the USNM. Paraiso, 1 ♀: 4 Feb 1911 (A. Busck); in the USNM. Gamboa, 1 ♀: 1 Feb 1969 (H. L. King); in the FSCA.

Etymology: This species is named for Alfred Russell WALLACE, intrepid explorer and naturalist *extraordinaire*. Best known for his travels in the Oriente and publication of the *The Malay Archipelago* (1869), he also spent four years collecting butterflies, birds and fish on the Amazon, Negro and Uaupés rivers of Brazil between 1848 and 1852, and were it not for the tragic sinking of his ship the *Helen* on his return journey, he would undoubtedly have brought home a wealth of natural history treasures from the Neotropical realm.

Diagnosis: *Theope wallacei* sp. nov. superficially most closely resembles *Theope methemona* Bates, 1868, with which it shares a very similar wing shape and wing pattern. *T. wallacei* differs on the dorsal surface by never having pale brown postdiscal scaling on the forewing (this is not discernible on the type of *T. methemona*) and by having more extensive blue colouration on both wings but with none in cell R_s of the hindwing; on the ventral surface, the black submarginal spots are rounded instead of elongate, rarely have paler encircling colouration and are larger on the hindwing. Other superficially similar species include *Theope lycaenina* Bates, 1868, and *Theope sticheli* sp. nov. (described below) but the wing shape of both is more rounded and the pattern of dorsal blue is different.

In fact, the male genitalia of *T. wallacei* are so distinct from those of any of the aforementioned taxa as to place the species in a separate subgroup. Instead of having a long, evenly narrow aedeagus, *T. wallacei* has an aedeagus with a large, semi-sclerotised, sculptured "basket shaped" posterior portion and peg-like internal cornuti, and a hump at the base of the upper valve arm; *Theope foliorum* Bates, 1868, and *Theope pakitza* sp. nov. (described below) are the only other species to share both these characters. *T. wallacei* differs from *T. pakitza* by lacking white rays on the dorsal hindwing, by having a larger semicircle of blue on the dorsal forewing, black costal and distal (typically) margins and a blue instead of white anal margin on the dorsal hindwing, typically a slightly darker ventral ground color (this is much darker in sympatric Amazonian specimens), prominent black submarginal spots on both ventral wing surfaces and at least three internal aedeagal cornuti in the male genitalia instead of one. *T. foliorum* is typically a smaller species with paler dorsal blue colouration that is

much reduced on the forewing and less prominent ventral submarginal black spots that are largely restricted to the hindwing; the male genitalia of *T. foliorum* differ most noticeably by having a much longer, heavily setose upper arm to the valvae, with a very large basal hump, a dorso-ventrally elongate basal portion to the valvae, and a more internally torsional posterior portion to the aedeagus which has a narrower semi-sclerotized portion, typically with two small spines towards the tip.

Discussion: The majority of *T. wallacei* specimens originate from Panamá but there are others, listed below, from the Amazon region, that I regard as belonging to this species but do not include as paratypes because of the extent of geographic variation expressed in the wing pattern and male genitalia:

French Guiana - Cayenne; 1 ♂ in the USNM, 1 ♀ in the BMNH.

Ecuador - 1 ♀: Morona-Santiago Prov., Río Morona, San José de Morona, 300m, 29 Sept 1996 (K. R. Willmott); in the coll. of J. P. W. Hall & K. R. Willmott, Gainesville, Florida, USA.

Peru - Madre de Dios, Parque Nacional del Manu, Pakitza, 1 ♂: 11°53' S 70°58' W, 400m, 12 Oct 1990; 1 ♂: 11°55'48" S 70°15'18" W, 340m, 6 Oct 1991 (both R.K. Robbins); both in the USNM.

The specimens from French Guiana exhibit the same wing pattern as those from Panamá but the aedeagus of the male genitalia contains eight internal cornuti instead of the three to five found in two dissected Panamanian specimens. Specimens from the west Amazon have a darker grey ventral ground color and thus paler colouration is apparent encircling the submarginal black spots, which are barely discernible on the forewing. Both of the Peruvian males are also considerably smaller than average; they both have five internal aedeagal cornuti.

The Ecuadorian specimen of *T. wallacei* was found feeding at low weedy flowers at the edge of secondary forest at 15:00 hrs.

***Theope pakitza* Hall & Harvey, sp. nov. (Figs. 2a,b; 8)**

Description: Male: forewing length 15.5mm. Wing shape elongate; forewing slightly pointed at apex, hindwing slightly pointed at tornus. *Dorsal surface:* forewing ground colour black; elongate semicircle of blue in anal portion of wing occupies approximately basal four-fifths of cells above and below vein 1A+2A, basal half of cell Cu₂, basal third of cell Cu₁ and entire discal cell, with a few blue scales distal of cell end; fringe brown. Hindwing ground colour blue, white at anal margin; dark brown in distal half of cell Rs and distal third of cell M₁, very thin dark brown line around remaining distal margin, two faint black spots in submargin of cell 1A+2A, one in submargin of cells Cu₂ to M₂, long streaks of white scaling in middle of cells 1A+2A and Cu₂ and at base of cells Cu₁ to M₂; fringe brown. *Ventral surface:* ground colour of both wings dirty white, subtle yellow tinge along base of forewing costa; thin brown line extends around very outer margin of both wings; faint, tiny black speck in submargin of cells 1A+2A and Cu₂ on hindwing. Labial palpi dirty white, some yellow scaling towards tips, second segment elongate. Eyes pale brown and bare, white scaling at margins. Frons brown. Antennal segments brown with basal white scaling that is most prominent on ventral surface; tubular clubs brown, tips orange-brown. Dorsal surface of thorax and abdomen dark brown, ventral surface white. Forelegs have mixture of yellow and white setae; femur of mid and hindlegs white, remainder pale yellow. *Genitalia* (Fig. 8): lower posterior angle of uncus triangular, lower posterior angle of remainder downwardly pointed; falci small and compact; vinculum incomplete, extending from anterior edge of tegumen to top of valvae; valvae with basal lateral bulge and long, broad upper arm that is upturned towards roundly pointed tip, has a small basal hump, and a very slight projection at middle of distal edge; aedeagus sigmoidal in ventral view, heavily sclerotised portion ends broadly and slightly downturned at lower edge, large semi-sclerotised posterior portion has numerous lateral crease lines basally and distally, where there are more heavily sclerotised ridges, a single internal cornutus; sclerotised block at base of pedicel, remainder very weakly

sclerotised; vestigial "V"-shaped portion of last sternite supports base of aedeagus, attached to valvae by membranous tissue.

Female: unknown.

Types: Holotype ♂: Peru - Madre de Dios, Parque Nacional del Manu, Pakitza, 12°07' S 70°58' W, 400m, 23 Sept 1989 (R. K. Robbins); to be deposited in the MNMSM.

Etymology: This species is named after its place of origin, Pakitza, a field station in the Peruvian Parque Nacional del Manu where large numbers of man hours have been spent in elucidating the taxonomic composition of the butterfly fauna (LAMAS *et al.*, 1991; ROBBINS *et al.*, 1996).

Diagnosis: As discussed in the diagnosis for the previous species, the presence of a large, semi-sclerotised, sculptured "basket shaped" posterior portion to the aedeagus of the male genitalia places *Theope pakitza* sp. nov. in a subgroup of the "foliorum group" that includes *Theope wallacei* sp. nov. (described above) and *Theope foliorum*. The latter has a more compact and pointed wing shape, a darker ventral ground colour, prominent black submarginal spots on both hindwing surfaces and greyish-blue dorsal colouration that is not as extensive in the costal area of the hindwing or the discal area of the forewing. Based on male genitalia and wing pattern, *T. pakitza* appears to be most closely related to *T. wallacei* from which it is separated in the diagnosis for that species.

Discussion: *T. pakitza* is thus far represented only by the holotype from south-east Peru but it should be looked for in the entire west Amazon region. All three species in this subgroup occur sympatrically at the type locality.

Theope amicitiae Hall, Gallard & Brévignon, sp. nov. (Figs. 3a,b; 9)

Description: Male: forewing length 9mm. Forewing costal margin slightly convex, distal margin nearly straight; hindwing rounded. *Dorsal surface:* forewing entirely brown; fringe brown. Hindwing ground colour brown; pale chalk blue restricted to tornal portion of wing, at anal margin, in distal two-thirds of cell 1A+2A, in cell Cu₂ and basal half of cell Cu₁, leaving thin brown line at margin; two small, dark brown spots in submargin of cell 1A+2A, one in cells Cu₂ and Cu₁; fringe white. *Ventral surface:* forewing ground colour greyish-white; two small, black spots at submargin of cell 1A+2A, one in cells Cu₂ to M₁, all surrounded by square of paler grey. Hindwing ground colour greyish-white; two small, black spots at submargin of cell 1A+2A, one in cells Cu₂-M₁, all surrounded by square of paler grey. Labial palpi grey, second segment elongate. Eyes bare and brown, grey scaling at margins. Frons brown edged with grey. Antennal segments brown with tiny amounts of basal white scaling; clubs brown, tips orange-brown. Thorax and abdomen dorsal surface dark brown, ventral surface greyish-white. All legs grey-brown. *Genitalia* (Fig. 9): lower posterior angle of uncus pointed, remaining portion rounded; falci small and compact; vinculum incomplete, extending from anterior edge of tegumen to top of valvae; valvae with basal lateral bulge, long, bluntly pointed upper arm and small projection at middle of distal edge; aedeagus relatively long and pointed, sigmoidal in ventral view, contains numerous very small sclerotised spines that form broad strip in middle, tapering towards tip; vestigial "V"-shaped portion of last sternite supports base of aedeagus, attached to valvae by membranous tissue.

Female: unknown.

Types: Holotype ♂: French Guiana - Cayenne, Galion, Roura, 5 Aug 1989 (J.-Y. Gallard) (# 181); to be deposited in the MNHN.

Paratypes: French Guiana - 1 ♂: same locality data as HT, 2 Apr 1989 (J.-Y. Gallard); to be deposited in the FSCA.

