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Authors: Eduardo Carneiro, Diego Rodrigo Dolibaina, Olaf Hermann Hendrik Mielke, and Mirna Martins Casagrande

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THESPIEUS MAACKI SP. NOV. (LEPIDOPTERA: HESPERIIDAE, HESPERIINI): A NEW SKIPPER FROM SOUTHERN BRAZILIAN PÁRAMOS

EDUARDO CARNEIRO*, DIEGO RODRIGO DOLIBAINA, OLAF HERMANN HENDRIK MIELKE AND MIRNA MARTINS CASAGRANDE
Laboratório de Estudos de Lepidoptera Neotropical, Departamento de Zoologia, Universidade Federal do Paraná, P.O. Box 19.020, 81.531-980, Curitiba, Paraná, Brazil

*Corresponding author; E-mail: carneiroeduardo@hotmail.com

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ABSTRACT

A new species of *Thespieus* Godman, 1900 (Hesperiidae, Hesperiini), *Thespieus maacki* sp. nov., is described from high altitude grasslands on Araçatuba Mountain peak, Tijucas do Sul, Paraná, Brazil. Similar habitats surrounding the type locality were also sampled, but this species was never recorded elsewhere. The most similar species *Thespieus caraca* Evans, 1955 is also illustrated and compared, in order to provide clear diagnostic characters for species identification.

Key Words: restricted distribution, butterfly, new species, grassland habitats

MATERIAL AND METHODS

During 2 collection trips to Araçatuba Mountain, Tijucas do Sul, Paraná, Brazil (S 25° 54' 07" W 48° 59' 39"), 19 specimens of an undescribed *Thespieus* species were collected visiting some blooming Asteraceae on mountain top around 1600-1670 m asl. The specimens were prepared and dissected by standard methods. Illustrations were drawn from the new species and compared to the most similar species in the genus: *Thespieus caraca* Evans, 1955, from Caraça, Minas Gerais, Brazil. The description is based on males and the different characters for females are given at the end of each described structure. Dissected specimens are assigned with “*” in type material. All
material is deposited in the Coleção Entomológica Pe. Jesus Santiago Moure, Curitiba, Paraná, Brazil (DZUP). Supplementary material for this article in Florida Entomologist 97(4) (2014) is online at http://purl.fcla.edu/fcla/entomologist/browse.

**THESPIEUS MAACKI** CARNEIRO, DOLIBAINA, MIELKE & CASAGRANDE SP. NOV. (Figs. 1-4, 9, 11)

*Thespieus* sp.; Carneiro; Mielke; Casagrande & Fiedler 2014. Neotrop. Entomol. 43, Electr. Supl. Mat.: 7.

**Diagnosis**

The color pattern of both the forewing and the hind wing on the ventral surface is markedly covered by bright yellow spots, a feature lacking in any other *Thespieus* except *T. caraca* Evans, 1955, which is the most similar species to *T. maacki*. The following characters distinguish these 2 species: 1) female antennal club is ventrally black on its distal half in *T. maacki* while whitish in *T. caraca*; 2) dorsal forewing triangular spot in CuA<sub>2</sub>-2A is ochreous in males of *T. maacki* while larger and yellowish in *T. caraca*; 3) ventral forewing submarginal bright yellow band from apex, wide, continuous, extending to M<sub>3</sub> and fusing with M<sub>1</sub>-M<sub>3</sub> submarginal hyaline spots in *T. maacki* while narrow, somewhat discontinuous, extending to M<sub>1</sub> and never fusing with M<sub>1</sub>-M<sub>3</sub> submarginal hyaline spots in *T. caraca*; 4) ventral hind wing with a thin whitish line in M<sub>3</sub> in *T. maacki* while absent in *T. caraca*; 5) ventral hind wing postdiscal yellow opaque spot in Rs-M<sub>1</sub> larger in both sexes in *T. maacki* while small in both sexes in *T. caraca*; 6) ventral hind wing postdiscal whitish spot in CuA<sub>2</sub>-2A not divided in *T. maacki* while crossed by a thin rufous line in *T. caraca*; 7) fenestra narrower with an anterior prolongation in *T. maacki* while broader in *T. caraca*; 8) uncus shorter in *T. maacki* than in *T. caraca*; 9) harpe distally broader and dorsally pointed in *T. maacki* while narrower and dorsally rounded in *T. caraca*; 10) fulitura inferior narrower in *T. maacki* than in *T. caraca*; 11) aedeagus shorter in *T. maacki* than in *T. caraca*, with the opening of the ejaculatory bulb shorter and distally inserted in *T. maacki* while longer and proximally inserted in *T. caraca*, and distal ventral margin of aedeagus rounded in *T. maacki* while with a central lobular projection in *T. caraca*; 12) sterigma slightly broader and shorter in *T. maacki*, with a truncated apex.

**Description**

**Head:** vertex mostly ochreous brown, with a line of whitish scales close to the eyes, interrupted by the dark brown posterior chaetosema; eyes black; anterior chaetosema ochreous; antenna about 60% of the costa length, dorsally black; club anteriorly and ventrally white in males and black in females; nudum 15; labial palp dorsally ochreous, ventrally white; third segment short, cylindrical, mostly hidden by apical scales of second segment. Female as male.

**Thorax:** dorsally dark brown, with long ochreous to rufous scales; ventrally densely covered by long ochreous scales, latero-posterior margin dark brown to rufous; metatibia doubly spined with 2 pairs of spurs, metatibia spined with one pair of spurs.

**Dorsal forewing:** males 14.5-15.5mm (*n* = 10) (holotype: 15.5mm); females 16.5-18mm (*n* = 9) (alotype: 16.5mm); triangular; costal margin straight, slightly convex near the base and the

Figs. 1-8. *Thespieus maacki* sp. nov. HOLOTYPE male (dorsal, Fig. 1, ventral, Fig. 2) and ALOTYPE female (dorsal, Fig. 3, ventral, Fig. 4) and *Thespieus caraca* Evans, 1955 male (dorsal, Fig. 5, ventral, Fig. 6) and female (dorsal, Fig. 7, ventral, Fig. 8). These figures are shown in color in a supplementary document online as Suppl. Figs. 1-8 in Florida Entomologist 97(4) (December 2014) at http://purl.fcla.edu/fcla/entomologist/browse.
apex; apex rounded; outer margin convex from apex to M, then straight; tornus rounded, obtuse; inner margin straight. Ground color dark brown with long ochreous scales near the base of the wing and along the CuA and 2A, never exceeding distally the discal cell; ochreous spots on costal area from base to Sc end, around CuA, origin (triangular shaped), and one triangular in CuA,2A, and in posterior half of CuA,2A; 9 yellowish hyaline spots, 2 fused inside the discal cell (slightly separated in some specimens), 3 subapical in R,2M, somewhat aligned with each other and towards the anal margin, distally produced in R-R, (opaque in some specimens), 2 reduced submarginal spots in M,2M, (in M,·M, reduced or absent in some males); and 2 discal developed spots in M,·CuA, the first one smaller and distally produced than the last one; stigma black, bipartite and elongated, from origin CuA, to CuA, and from CuA, to 2A; fringe uniformly dark brown. Female as in male except for: the reduced ochreous spots, posterior half of CuA,2A rectangular; all hyaline spots lighter than in males, the subapical spot in R,·R, hyaline and the submarginal spots M,·M, developed, fringe whitish at the center of the spaces M,·CuA, to CuA,·2A.

**Dorsal hind wing:** costal margin convex; apex rounded, with a small indentation at the end of Rs; outer margin convex from apex to CuA, with an indentation in CuA,2A and from 2A to tornus produced; tornus rounded; anal margin slightly convex. Ground color dark brown with long ochreous scales from base to discal cell end, and in anal area; one thin and poorly defined ochreous spot on dcm (absent in some of the males); one discal ochreous opaque spot in Rs-M, (absent in part of the males), and 4 discal yellowish hyaline spots in M,·CuA, with the spots M,·M, and M,·M, fused, subquadrate, distally projected, but never touching the subtriangular the spot in M,·CuA,; fringe ochreous to brown. Female as in male except for the constant presence of the discal spot Rs-M,; fringe dark brown, whitish at the center of the spaces CuA,·CuA, and CuA,·2A.

**Ventral forewing:** ground color dark brown, rufous brown from apex to discal cell end, and CuA, spots as in dorsal surface, except by the spot in CuA,2A, which is whitish, and a submarginal wide, bright yellowish and contiguous band from apex to M, fused with the 2 submarginal hyaline spots in M,·M,; costal area from base to Sc end yellowish; fringe dark rufous brown, whitish at the center of the space CuA,·2A. Female as in male except for the reduced yellow markings; presence of a thin, whitish cream spot in in anterior half of CuA,2A, distally inclined and surrounding distally the whitish cream spot in posterior half of CuA,2A; fringe with short rufous brown scales, dark brown at the end of the veins, whitish at the apex and at the center of the spaces R, to 2A.

**Ventral hind wing:** ground color dark brown, rufous brown from costal margin to anterior half of CuA,2A and from 3A to anal margin; a basal large bright yellow spot from the base of the wing to the first third of costa; 2 discal large bright yellow spots from costal margin to Rs, covered by rufous brown scales at the center; discal cell crossed longitudinally by a white stripe that covers dcm and dci, then a thin line extending on M, finishing at discal yellowish hyaline spot on M,·M,; a bright yellow line from origin of Rs, covering dcs, crossing vertically the discal cell, and extending to 2A (variable among individuals); 6 discal spots from Rs to 2A, all bright yellow except by the whitish spot in CuA,2A, hyaline from M, to CuA, the spots in M,·M, and M,·M, fused; submarginal bright yellow band from Rs to CuA, with the proximal margin irregular and distal margin...
covered by rufous scales; fringe dark brown, whitish at the apex, and from CuA2 to the tornus. Female as in male.

Abdomen: dorsally dark brown with ochreous scales, ventrally ochreous. Female as in male except for the whitish ventral abdomen, with a central thin dark brown poorly defined line.

Male genitalia (Fig. 9): tegumen dorsally broad and laterally narrow, distally tapered; fenestra lostangular, with an anterior thin extension; ventral arms of tegumen and dorsal arms of saccus fused and thin; ventral arms of tegumen strongly inclined distally; anterior projection of saccus as long as tegumen + uncus and narrow; uncus divided, thin and short, arms short, thin and parallel to each other; gnathos divided, formed by 2 parallel bars, comma-shaped in lateral view with a median membranous area between the 2 sclerotized plates; valva with an external membranous area at the middle; costa absent; harpe broad, distally projected and rounded and, dorsally pointed; ampulla short, rounded, produced to harpe’s anterior margin, with a rounded external tip; fultura inferior U-shaped; aedeagus longer than valva, thin, coecum short, rounded, slightly right turned, insertion opening of ejaculatory bulb ovoid, undeveloped, distal end triangular, with 2 lateral spines, center of the distal margin rounded, distal opening dorsal, and anteriorly prolonged; cornuti present as 4 small spines.

Female genitalia (Fig. 11): lamella antevaginalis absent; lamella postvaginalis T-shaped with lateral arms truncated, posterior margin with a wide median depression with semicircular patch of small bristles; inferior portion strongly constricted at the middle; ostium bursae wide, and free; bursa copulatrix less than 3 times the sterigma length; ductus bursae broad, cylindrical and sclerotized, shorter than corpus bursae; corpus bursae posteriorly jagged, anteriorly ovoid, without signa.

Type Material

HOLOTYPE male with the following labels: / HOLOTYPE/ Thespieus maacki sp. nov. (Fig. 11) and Thespieus caraca Evans, 1955 (Fig. 12). Left to right: ventral view of sterigma and bursae copulatrix; lateral view of the papilla anal and Tergum VIII. Arrow indicates diagnostic characters cited in the text.

Distribution

The species is known to occur only at the peak of Araçatuba Mountain, Tijucas do Sul, Paraná, Brazil, where high altitude grasslands (páramos) are present. The same mountain was sampled along 2 years but specimens were recorded only in February. Other mountains in the region were also explored in the same month, but this species was never recorded elsewhere.

Etymology

This species epithet honors Reinhard Maack (1892-1969), a German geologist, known for describing the vegetation of Paraná in detail, and for discovering the highest peak of southern Brazil, Pico do Paraná, along with several surrounding mountains. During his life he was pioneer in urging society to militate against the over exploitation of vegetation and soil. Further, Maack predicted anthropogenic damage to biodiversity damage even before the establishment of the biological conservation sciences.

DISCUSSION

Thespieus is a skipper genus marked by the presence of hyaline spots on forewing and a particularly colored ventral hind wing (Godman & Salvin 1887-
Its species present male genitalia with similar patterns (Evans 1955). Valvae lack projections, uncus bifid, aedeagus long, cylindrical and vesica with several cornuti (see Mielke 1971; Mielke 1993; Mielke & Schroeder 1994). On the wings however, differences are more evident, with species having contrasting ventral hind wing patterns (Warren et al. 2013). In this aspect, *T. maacki* sp. nov. is more similar to *T. caraca* Evans, 1955 (Figs. 5-8, 10, 12), as no other species of *Thespieus* present such bright yellow markings in the spots and submarginal band of the ventral hind wing.

Both of these species are distantly allopatric and have restricted distributions, as is also commonly observed in other species in the genus, e.g. *Thespieus abauna* Zikán, 1938, *T. duidensis* Bell, 1932, *T. fossli* (Draudt, 1923), *T. hieroglyphica* Draudt, 1923, *T. matucanae* Lindsey, 1925, *T. pinda* Evans, 1955 and *T. zikani* Mielke, 1971. It is also common to some species of *Thespieus* to be especially associated with grassland habitats (Mielke et al. 2012; Carneiro et al. 2014) or páramos as the case of *T. maacki* sp. nov. These 2 particular conditions raise the importance of those species to be evaluated in regional threatened lists, as grassland habitats in South America have been greatly replaced by urban areas during recent decades (IUCN 2008). Furthermore, several grassland habitats remain to be explored in the Neotropical region, which might harbor several threatened, although undescribed species. The challenge of entomological researchers resides now in accelerating the description of species that will potentially require special conservation measure, such as *Thespieus maacki* sp. nov.

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**REFERENCES CITED**

Carneiro, E., Mielke, O. H. H., Casagrande, M. M., and Fiedler, K. 2014. Skipper Richness (Hesperiidae) Along Elevational Gradients in Brazilian Atlantic Forest. Neotrop. Entomol. 43: 27-38.

Dolibaïna, D. R., Mielke, O. H. H., and Casagrande, M. M. 2011a. Borboletas (Papilionoidae e Hesperioidae) de Guarapuava e arredores, Paraná, Braxil: Um inventário com base em 63 anos de registros. Biota Neotropica 11: 341-354.

Evans, W. H. 1955. A Catalogue of the American Hesperiidae: Indicating the Classification and Nomenclature Adopted in the British Museum (Natural History). Part IV. Hesperiinae and Megathyminae. British Museum, London.

Godman, F. D. C., and Salvin, O. 1887. Biologia Centrali-Americana. R. H. Porter, London. Available from: http://www.biodiversitylibrary.org/item/14622.

IUCN. 2008. Temperate grasslands of South America. A. Michelson, Hohhot. Available from: http://cmsdata.iucn.org/downloads/pastizales_templados_de_sudamerica.pdf.

Machado, A. M. B., Drummond, G. M., and Paglia, A. P. 2008. Livro vermelho da fauna brasileira ameaçada de extinção. MMA/Fundação Biodiversitas, Brasília.

Mielke, O. H. H., Carneiro, E., and Casagrande, M. M. 2012. Hesperiidae (Lepidoptera, Hesperioidea) from Ponta Grossa, Paraná, Brazil: 70 years of records with special reference to faunal composition of Vila Velha State Park. Rev. Brasileira Entomol. 56: 59-66.

Mikich, S. B., and Bernils, R. S. 2004. Livro Vermelho da Fauna Ameaçada no Estado do Paraná. Instituto Ambiental do Paraná, Curitiba.

Warren, A. D., Davis, K. J., Stangeland, E. M., Pelham, J. P., and Grishin, N. V. 2013. Butterflies of America. Illustrated lists of American butterflies (North and South America) 30-XII-2013. Available from: http://www.butterfliesofamerica.com. Accessed 30-XII-2013.