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Before it is too late: description of a new genus and species of butterfly from a highly threatened Brazilian biome

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ABSTRACT

A new genus, *Nhambikuara* Freitas, Barbosa & Zacca **gen. nov.**, and species, *Nhambikuara cerradensis* Freitas, Barbosa & Zacca **sp. nov.**, of the highly diverse Neotropical butterfly subtribe Euptychiina are described. *Nhambikuara cerradensis* **sp. nov.** is the type species for the genus, and *Euptychia mima* Butler, 1867 is also transferred to the new genus, as *Nhambikuara mima* (Butler, 1867) **comb. nov.**, from the genus *Zischkaia* Forster, 1964. The taxonomy, phylogenetic relationships, geographic distribution and natural history of species of the genus are also discussed.

http://zoobank.org/urn:lsid:zoobank.org:pub:41AD7568-3490-4F63-A019-32D5592A8C44

Introduction

Originally covering more than 2 million km^2, the cerrado (a Brazilian tropical savanna, see Goodland, 1971) is the second largest Brazilian biome, after Amazonia (Klink and Machado, 2005). About 15 years ago, Cavalcanti and Joly (2002) called attention to the fact that the conservation of the cerrado biome has been neglected, providing a list of priority areas for conservation together with recommendations for conservation strategies. However, very few of their recommendations have since been adopted, and accelerating destruction and conversion of the natural habitats into an agricultural landscape has resulted in the complete loss of almost half of the original cerrado vegetation, with only ca. of 20% of the remaining vegetation considered as undisturbed (Strassburg et al., 2017). This rampant process of destruction is putting at risk an exceptional number of species that are endemic to this important biodiversity hotspot (Myers et al., 2000).

As mentioned above, the cerrado savannas are extremely high in species richness and endemism of several groups of plants and animals (Oliveira and Marquis, 2002). For Lepidoptera, in particular, and considering also subspecific taxa, some groups present levels of endemism as high as 40% or more, such as Ithomiini (Nymphalidae), myrmecophilous Riodinidae and Troidini swallowtails (Papilionidae) (Brown and Gifford, 2002). Additionally, Brown and Gifford (2002) predicted that some groups, such as grass feeding Satyrinae (Nymphalidae) and Hesperiinae (Hesperiidae), should also show higher levels of endemism with additional taxonomic studies.

Notwithstanding the high levels of habitat degradation, several new endemic species of Satyrinae butterflies have been discovered in the cerrado in recent years, and while some of them have been described (Freitas, 2004; Freitas et al., 2010, 2015; Zacca et al., 2014; Barbosa et al., 2015; Kaminski et al., 2015), several are awaiting formal description. Among these, our research showed that a very distinctive undescribed species of Euptychiina (Nymphalidae: Satyrinae) could not be adequately accommodated in any described genus.

In the present paper a new genus, *Nhambikuara* Freitas, Barbosa & Zacca **gen. nov.**, is therefore described to house this new species endemic to the cerrado savannas, *Nhambikuara cerradensis* **sp. nov.** Freitas, Barbosa & Zacca. In addition, we transfer *Euptychia mima* Butler, 1867 from *Zischkaia* Forster, 1964, into *Nhambikuara* (**comb. nov.**).

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Material and methods

Material examined

A total of 150 specimens of *Nhambikuara cerradensis* **sp. nov.** and *Nhambikuara mima* **comb. nov.** were examined in the following institutions: **CLEIC** – Coleção do Laboratório de Ecologia e Interações de Insetos da Caatinga, Universidade Federal de Campina Grande, Patos, Paraíba, Brazil; **DD** – Diego Dolibaina collection, Curitiba, Paraná, Brazil; **DZUP** – Entomological Collection Padre Jesus Santiago Moure, Universidade Federal do Paraná, Curitiba, Paraná, Brazil; **MGCL** – McGuire Center for Lepidoptera, Florida Museum of Natural History, University of Florida, Gainesville, Florida, USA; **MNHU** – Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung an de Humboldt Universität, Berlin, Germany; **MUSM** – Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru; **MZFS** – Entomological Collection Prof. Johann Becker, Universidade Estadual de Feira de Santana, Feira de Santana, Bahia, Brazil; **USNM** – National Museum of Natural History, Smithsonian Institution, Washington, DC, USA; **ZUEC** – Museu de Zoologia da Universidade Estadual de Campinas, Unicamp, Campinas, São Paulo, Brazil; **ZUEC-AVLF** – André V. L. Freitas Collection, Universidade Estadual de Campinas, Campinas, São Paulo, Brazil. Some strongly damaged specimens of *N. cerradensis* **sp. nov.** were not designated as paratypes and listed in the "Additional material examined" section.

Morphological study

The specimens studied had their abdomen detached and soaked in a heated test tube with 10% potassium hydroxide solution (KOH) for about 5 min in bain marie before dissection of the genitalia. Dissected specimens are marked with an asterisk (*) after the voucher number in the examined material section. The genitalia images were obtained in two different equipment, Leica LAS 3D view with the aid of a video camera Leica DFC 500 attached to a stereoscopic microscope Leica MZ16 using the software LAS montage version 4.7 and a Zeiss Discovery.V20 Stereomicroscope. Male and female genitalia terminologies are indicated in Fig. 2.

Wings were measured with a ruler and measures were taken from the insertion to the apex in the forewing and from the insertion to the tornus region in the hindwing. Nomenclature of venation used herein follows Comstock & Needham (1898–99) and Comstock (1918), and for broad regions of the wing we follow Neild (1996). The following abbreviations were used throughout the text: FW – forewing; HW – hindwing; DW – dorsal wings; VW – ventral wings; DFW – dorsal forewing; VFW – ventral forewing; DHW – dorsal hindwing; VHW – ventral hindwing. The geographical distribution of the species is based on label data and literature records. The taxonomic classification follows Lamas (2004) modified after Peña et al. (2006, 2010) and Wahlberg et al. (2009).

DNA sampling and analysis

Total DNA was extracted from two legs of adults using the DNeasy Blood & Tissue Kit protocol (QIAGEN, Düsseldorf, Germany). DNA was stored in TE buffer at −20 °C. The mitochondrial gene cytochrome c oxidase I (COI – 1498 bp) and the nuclear genes GAPDH (691 bp) and RpS5 (610 bp) for all specimens were amplified, purified and sequenced using standard techniques (see Barbosa et al., 2015; Silva-Brandão et al., 2005; Wahlberg and Wheat, 2008) and deposited at GenBank (Benson et al., 2013) (see Table 1 for account numbers). All sequences were analyzed with the program FinchTV v. 1.4.0 (Geospiza, PerkinElmer Inc., Waltham, MA), and posteriorly aligned manually with sequences obtained previously and available on GenBank by using BioEdit v.7.2.4 (Hall, 2013). The final matrix comprised 30 specimens from species of eight genera (including eight specimens from the new genus *Nhambikuara* **gen. nov.** – see Table 1 for the sequence codes). The phylogenetic relationships of the new species were estimated using a maximum likelihood (ML) analysis. Analyses were run using RAxML (Stamatakis et al., 2008) with 1000 rapid bootstrap replicates on the CIPRES portal (Miller et al., 2010). The data were modeled according to the GTR + CAT model.

Genetic distances among the species of *Nhambikuara* **gen. nov.** and species of its sister-clade (Tables 2 and 3) were determined using the program MEGA v. 6.0 (Tamura et al., 2013) under Kimura-2-parameters (K2P) model of nucleotide substitution (Kimura, 1980).

Adult ecology

Adult ecology was studied through trap studies (see Freitas et al., 2014) in three sites in Minas Gerais State, and one in São Paulo State, Southeastern Brazil: 1) Área de Proteção Especial Manancial Cercadinho, Belo Horizonte, Minas Gerais, 900–1000 m, 19°58′S, 43°54′W, Oct/2006–Sep/2007 (see details in Silva et al., 2012); 2) Área de Proteção Ambiental Morro da Pedreira, Santana do Riacho, Minas Gerais, 900 m, 19°21′S, 43°36′W, Oct/2011–Jul/2013 (MVB, unpublished); 3) Parque Municipal das Mangabeiras, Belo Horizonte, Minas Gerais, 1100 m, 19°56′S, 43°54′W, Jan–Dec/2014 (ARMS, unpublished); 4) Cerrado da Graúna, Itirapina, São Paulo, 800 m, 22°15′S, 47°47′W, Nov/2009–Oct/2010 (AVLF, unpublished). Traps were hung 1.5 m above the ground and a standard mixture of mashed banana with sugar cane juice, fermented for at least 48 h, was used as attractant. The bait was placed inside the traps in plastic pots with a perforated cover. The traps were checked every 24 h, and the baits were replaced at each visit. All butterflies were collected.

Results

Taxonomy

Nhambikuara **Freitas, Barbosa & Zacca, gen. nov.**

Euptychia mima Butler, 1867: 500 [no illustration].

Zischkaia Forster, 1964 [in part.]

Zischkaia mima; Lamas 2004: 223. – Brévignon & Benmesbah, 2012: 46.

Yphthimoides sp.1; Silva et al., 2012: 295

Satyrinae sp.1; Freire Júnior & Diniz, 2015: 1214

Type-species: *Nhambikuara cerradensis* Freitas, Barbosa & Zacca, **sp. nov.**

Diagnosis. *Nhambikuara* **gen. nov.** differs from all other genera of Euptychiina by the following combination of characters: 1) VW with submedian, median, submarginal and marginal lines, 2) VHW with six ocelli between Rs and 2A, with variable number (1 or 2) of pupils; 3) appendices angulares reduced; 4) anterior projection of saccus developed; 5) apex of valva serrated; 6) aedeagus with paired cornutal patches; 7) female genitalia with lamella antevaginalis and postvaginalis fused forming a sclerotized sterigma; 8) ductus bursae with sclerotized plates variable in shape. Species of *Nhambikuara* are easily distinguished from *Zischkaia* species by the absence of androconial patches on dorsal wing surfaces in males, absence of the dorsal projection of tegumen in male genitalia and female genitalia with sterigma.

Etymology. The generic name is derived from that of the Nhambikuara, an ethnic group of Brazilian Native Americans inhabiting the cerrado and Amazon biomes (see Setz, 1983 for a detailed study of the Nhambikuaras). It should be treated as a noun in the nominative singular, be the gender of the noun masculine or feminine.

Table 1
Species of Euptychiina with code, sampling site data and GenBank accession numbers for sequenced genes. Species of *Nhambikuara* **gen. nov.** are in bold.

Species name	Code	Locality	COI	GAPDH	RpS5
Oressinoma sorata	CP06-89	Peru, Pasco, Oxapampa	GQ357209	GQ357440	GQ357570
Yphthimoides eriphule	YPH-0063	Brazil, São Paulo, Santa Rita do Passa Quatro	MF489977	MF489997	MF490010
Yphthimoides mimula	YPH-0348	Brazil, Paraná, Foz do Iguaçú	MF489981	MF490001	MF490014
Yphthimoides maepius	YPH-0466	Colombia, Amazonas, Leticia	MF489982	MF490002	MF490015
Yphthimoides affinis	YPH-0082	Brazil, São Paulo, Luís Antônio, Reserva Jataí	MF489978	MF489998	MF490011
Paryphthimoides sp.	YPH-0544	Brazil, Amazonas, Manaus	MF489983	MF490003	MF490016
Paryphthimoides sp.	NW167-6	Brazil, Mato Grosso do Sul, Três Lagoas	MF489989	MF490008	MF490022
Paryphthimoides sp.	YPH-0336	Brazil, Goiás, Pirenópolis	MF489980	MF490000	MF490013
Paryphthimoides sp.	YPH-0267	Brazil, Minas Gerais, Santana do Riacho	MF489979	MF489999	MF490012
Erichthodes julia	CP04-65	Peru, Junín, Quebrada Siete Jeringas	GU205834	GU205946	GU206006
Erichthodes antonina	YPH-0325	Brazil, Alagoas, Serra Grande	KU340864	KU340913	KU340946
Erichthodes antonina	CP02-24	Peru, Madre de Díos, Albergue Posada Amazonas	DQ338792	GQ357429	GQ357558
Neonympha areolatus	CP22-03	USA	GU205856	GU205967	GU206028
Pareuptychia binocula	CP02-42	Peru, Madre de Díos, Albergue Posada Amazonas	GU205858	GU205969	GU206030
Pareuptychia ocirrhoe	NW126-6	Brazil, São Paulo, Atibaia	GU205859	GU205970	GU206031
Splendeuptychia toynei	LEP-10657	Ecuador, Zamora-Chinchipe, La Libertad, km 11.5 Los Encuentros-Zarza	MF489990	–	MF490023
Splendeuptychia furina	CP02-39	Peru, Madre de Díos, Albergue Posada Amazonas	GU205868	GU205982	GU206043
Splendeuptychia doxes	NW126-8	Brazil, São Paulo, Atibaia	GU205867	GU205981	GU206042
Splendeuptychia doxes	BC-DZWillmott-092	Brazil, Paraná, Campo Mourão, Parque Estadual Lago Azul	MF489991	–	MF490024
Splendeuptychia doxes	YPH-0172	Brazil, São Paulo, Jundiaí, Serra do Japi	KR349478	KR349474	–
Splendeuptychia doxes	MGCL-LOAN-386	Brazil, São Paulo, Jundiaí, Serra do Japi	MF489992	–	–
Splendeuptychia latia	MGCL-LOAN-500	Brazil, Bahia, Una, Reserva Biológica de Una	MF489996	–	–
Nhambikuara mima	**MGCL-LOAN-550**	**Brazil, Rondônia, Porto Velho**	**MF489994**	**MF490009**	**MF490025**
Nhambikuara mima	**MGCL-LOAN-175**	**Brazil, Alagoas, Ibateguara**	**MF489993**	–	–
Nhambikuara cerradensis	**MGCL-LOAN-134**	**Brazil, São Paulo, Itirapina**	**MF489995**	–	–
Nhambikuara cerradensis	**YPH-0572**	**Brazil, Minas Gerais, Santana do Riacho**	**MF489984**	**MF490004**	**MF490017**
Nhambikuara cerradensis	**YPH-0573**	**Brazil, Minas Gerais, Santana do Riacho**	**MF489985**	**MF490005**	**MF490018**
Nhambikuara cerradensis	**YPH-0574**	**Brazil, Minas Gerais, Santana do Riacho**	**MF489986**	**MF490006**	**MF490019**
Nhambikuara cerradensis	**YPH-0575**	**Brazil, Mato Grosso do Sul, Aquidauana**	**MF489987**	–	**MF490020**
Nhambikuara cerradensis	**YPH-0576**	**Brazil, Mato Grosso do Sul, Aquidauana**	**MF489988**	**MF490007**	**MF490021**

***Nhambikuara cerradensis* Freitas, Barbosa & Zacca, sp. nov.** (Figs. 1, 2, 5, 6)

Yphthimoides sp.1; Silva et al., 2012: 295

Satyrinae sp.1; Freire Júnior & Diniz, 2015: 1214

Type material. Holotype male deposited at ZUEC (Figs. 1A, 1B) with the following labels (separated by transverse bars): /Holotypus/Serra do Cipó, Santana do Riacho, Minas Gerais, Brasil, 08.III.2009, Kaminski L. A. *leg.*/ZUEC LEP 10071/*Nhambikuara cerradensis* Freitas, Barbosa & Zacca det. 2018/

Allotype female deposited at ZUEC (Figs. 1C, 1D) with the following labels (separated by transverse bars): /Allotypus/Serra do Cipó, Santana do Riacho, Minas Gerais, Brasil, 11.III.2009, Kaminski L. A. *leg.*/ZUEC LEP 10073/*Nhambikuara cerradensis* Freitas, Barbosa & Zacca det. 2018/

Diagnosis. This species is characterized by the following combination of characters: 1) absence of ocelli in DW, 2) ochre wavy submedian, median, submarginal and marginal lines in VHW, 3) six small bipupilated ocelli in VHW between Rs and 2A, 4) valva with subtriangular developed costae and apex strongly serrated, 5) aedeagus with elongated paired cornutal patches and anterior region strongly curved upwards, 6) sterigma strongly sclerotized and developed, almost three times longer than wider, 7) ductus

Table 2
Pairwise genetic distances among species of *Nhambikuara* and *Splendeuptychia*. Species of *Nhambikuara* **gen. nov.** are in bold.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. *Nhambikuara mima* MGCL-LOAN-175														
2. *Nhambikuara mima* MGCL-LOAN-550	1.2													
3. *Nhambikuara cerradensis* YPH-0572	4.6	5.4												
4. *Nhambikuara cerradensis* YPH-0573	4.6	5.4	0.0											
5. *Nhambikuara cerradensis* YPH-0574	4.6	5.4	0.0	0.0										
6. *Nhambikuara cerradensis* YPH-0575	4.6	5.0	1.2	1.2	1.2									
7. *Nhambikuara cerradensis* YPH-0576	4.6	5.0	1.2	1.2	1.2	0.0								
8. *Nhambikuara cerradensis* MGCL-LOAN-134	4.6	5.0	1.2	1.2	1.2	0.0	0.0							
9. *Splendeuptychia furina* CP02-39	5.6	6.0	5.6	5.6	5.6	5.2	5.2	5.2						
10. *Splendeuptychia toynei* LEP-10657	6.7	6.7	6.1	6.1	6.1	6.1	6.1	6.1	4.2					
11. *Splendeuptychia doxes* MGCL-LOAN-386	5.4	6.3	5.8	5.8	5.8	6.7	6.7	6.7	5.0	5.0				
12. *Splendeuptychia doxes* BC-DZWill-092	5.2	6.1	5.6	5.6	5.6	6.5	6.5	6.5	4.8	4.8	0.2			
13. *Splendeuptychia doxes* NW126-8	5.4	6.3	5.8	5.8	5.8	6.7	6.7	6.7	5.0	5.0	0.4	0.2		
14. *Splendeuptychia doxes* YPH-0172	5.2	6.1	5.6	5.6	5.6	6.5	6.5	6.5	4.8	4.8	0.2	0.0	0.2	
15. *Splendeuptychia latia* MGCL-LOAN-500	5.6	6.0	6.7	6.7	6.7	5.8	5.8	5.8	4.4	5.0	2.0	1.8	2.0	1.8

Table 3
Mean genetic distances among species of *Nhambikuara* and *Splendeuptychia*. Species of *Nhambikuara* **gen. nov.** are in bold.

	1	2	3	4	5
1. *Nhambikuara mima*					
2. *Nhambikuara cerradensis*	4.9				
3. *Splendeuptychia furina*	5.8	5.4			
4. *Splendeuptychia toynei*	6.7	6.1	4.2		
5. *Splendeuptychia doxes*	5.7	6.1	4.9	4.9	
6. *Splendeuptychia latia*	5.8	6.2	4.4	5.0	1.9

bursae membranous with a half-ring sclerotized plate and, 8) corpus bursae with dorsal paired signa. DNA sequence data suggest that its sister species is *Nhambikuara mima* **comb. nov.**, and the differences between these two species are discussed further below, under the account for *N. mima*.

Description. *Head*: dark brown, frons with mixed creamy and light brown scales; eyes chestnut brown, with sparsely localized bristles; post-genal area creamy mixed with light brown scales; labial palpus curved upwards, dorsally short, creamy mixed with brown scales, laterally short, creamy scales, ventrally elongated with creamy mixed with light brown scales at first and second segment, short scales at third segment; antennae brown with apex dark brown, laterally with white scales in each side of the base of the flagellomeres. *Thorax*: dorsally brown, ventrally covered in long mixed creamy and brown scales; legs mixed with creamy and light brown scales. *Wings*: males FW: 17–19 mm ($n = 7$), HW: 14–15 mm ($n = 5$) (Holotype: FW: 19 mm; HW: 14 mm), females FW: 19–21 mm ($n = 8$), HW: 15–16 mm ($n = 6$) (Allotype: FW: 20 mm; HW: 15 mm). DFW: ground color brown, submarginal and marginal lines dark brown, marginal region light brown. DHW: similar to DFW. VFW: ground color light brown, four parallels brown ochre lines, submedian and median lines crossing from Radius to 1A + 2A, and submarginal and marginal lines crossing from R_4 to inner margin; two small ocelli in M_1-M_2 and M_2-M_3 in submarginal

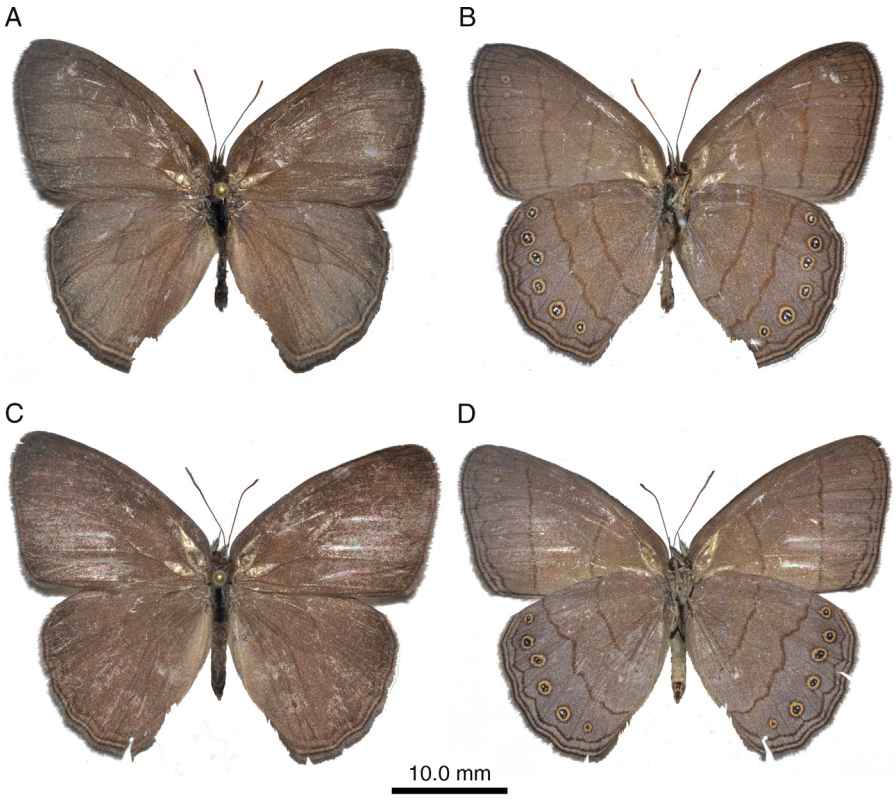

Fig. 1. *Nhambikuara cerradensis* **gen.** et **sp. nov**. A – holotype male, dorsal; B – holotype male, ventral; C – allotype female, dorsal; D – allotype female, ventral.

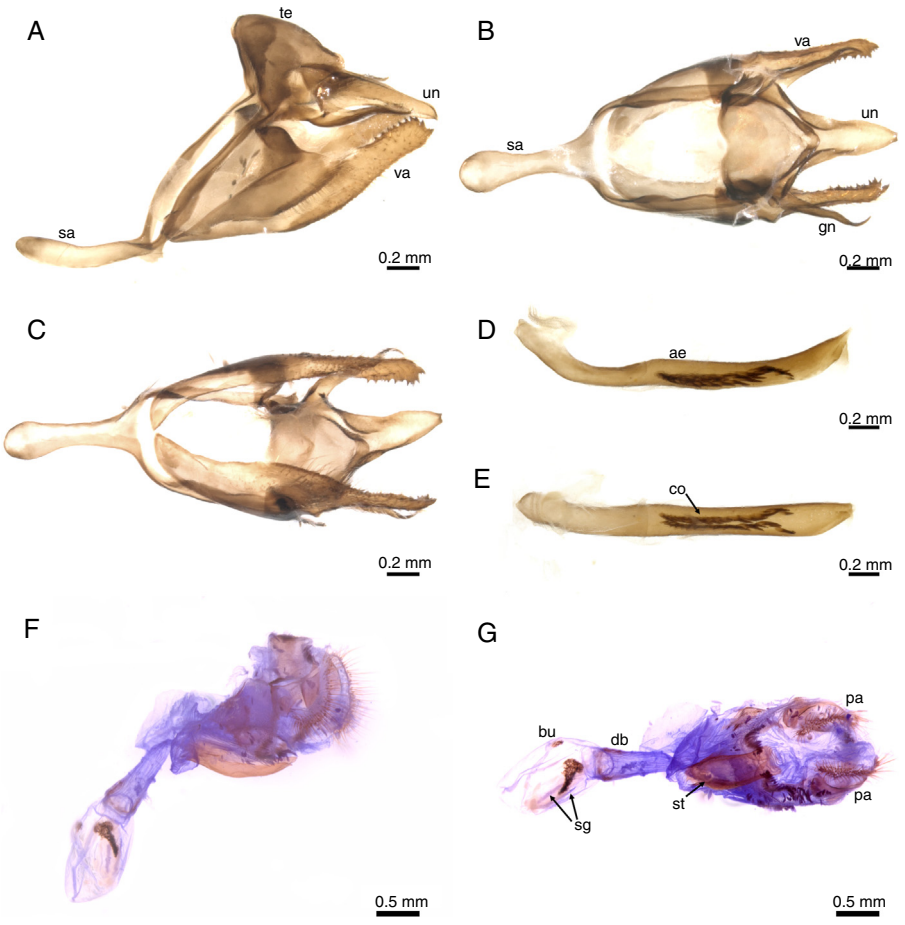

Fig. 2. *Nhambikuara cerradensis* **gen. et sp. nov.**, male (YPH-0574) and female (DZ 33.900) genitalia. A – male lateral; B – male dorsal; C – male ventral; D – male aedeagus, lateral; E – male aedeagus, dorsal; F – female lateral; G – female ventral. *Abbreviations*: sa – saccus; te – tegumen; un – uncus; va – valva; gn – gnathos; ae – aedeagus; co – cornuti; bu – bursae coppulatrix; db – ductus bursae; pa – papilla anallis; st – sterigma; sg – signa.

region. VHW: ground color light brown, four parallels brown ochre lines crossing from costal margin to inner margin, median and submarginal lines irregular fused to each other at tornal area, a series of six ocelli at submarginal region in Rs-M_1, M_1-M_2, M_2-M_3, M_3-Cu_1, Cu_1-Cu_2, Cu_2-1A + 2A, ocelli Rs-M_1 and Cu_2-1A + 2A with only a silvery pupil, ocelli M_1-M_2 to CuA_1-CuA_2 bipupilated. *Abdomen*: dorsally brown, ventrally with mixed creamy and brown scales.

Male genitalia (Figs. 2A–2E). Tegumen dorsally flattened, anterior margin concave at median region; gnathos 2/3 the length of uncus, sinuous and curved upwards; uncus straight, apex curved downwards, basal third as long as the median region; appendices angulares reduced; anterior projection of saccus almost two times longer than valva; fultura superior absent; fultura inferior sclerotized in U-shape; valva with a developed costae, dorso-apical region serrated, basal region narrow; aedeagus with anterior region strongly curved upwards, posterior region about 1 ½ length of anterior region, elongated paired cornutal patches.

Female genitalia (Figs 2F, 2G). 8th tergite half-sclerotized, not fused with the lateral expansions of lamella antevaginalis, spiracle absent; papilla analis developed, sub-squared, basal half strongly sclerotized, setae sparsely distributed at distal region, apophysis posterior reduced; lamella antevaginalis fused to lamella postvaginalis forming the sterigma which is strongly sclerotized and developed, almost three times longer than wider; ductus bursae membranous, as long as corpus bursae, sclerotized half-ring between ductus bursae and corpus bursae, paired signa dorsally.

Variation (Figs 1E, 1F). Seasonal variation seems to occur in this species, as has also been reported for many other species of Euptychiina from the Brazilian savanna (Freitas, 2007; Freitas et al., 2010; Siewert et al., 2013; Zacca et al., 2014). During the rainy season (October to March), the wing ventral ocelli are developed, filling in most of the intervenal spaces on the VHW, whereas these ocelli become strongly reduced in the dry season (April to September).

Distribution (Fig. 6). This species is mostly associated to open vegetation, especially the Brazilian cerrado (States of Maranhão, Ceará, Bahia, Goiás, Distrito Federal, Mato Grosso, Mato Grosso do Sul, Minas Gerais and São Paulo), a biome that presents a high richness of endemic species (Ratter et al., 1997; Brown and Gifford, 2002).

Natural history. This species is restricted to open savannic vegetations in the cerrado biome, montane rocky fields (known locally as "*campos rupestres*"), flying both in open vegetation and at the edges of the riparian forests along small streams. In the region of Belo Horizonte, Minas Gerais, 46 out of the 48 sampled individuals were captured in the cerrado area, and only two in the adjacent riparian forest. In a cerrado area in Brasília (central Brazil), 72 out of the 104 sampled individuals were captured in the cerrado area and 32 in the adjacent riparian forest (Freire Júnior, 2015). Adults have a low flight, usually not flying more than 1.5 m above the ground. The species is usually localized and although it has been throughout the year, typically no more than 10 individuals are seen in a single day. However, the species was found to be common in some sites, such as Santana do Riacho, Minas Gerais, where from 30 to nearly 60 individuals were captured with bait traps in single

months (MVB, unpublished; see also Freire Júnior, 2015 and Freire Júnior and Diniz, 2015). Males and females were observed feeding on animal feces and other decaying material and were easily attracted to traps baited with fermented fruits (AVLF, MVB and ARMS, pers. obs., Silva et al., 2012). The sex ratio was close to 1:1 in two bait trap studies, with females being more common in both studies: 1) in Santana do Riacho, a total of 81 females and 64 males were captured ($x^2 = 1.99$, $P = 0.18$, DF = 1); 2) in Itirapina, a total of 10 females and four males were captured ($x^2 = 2.57$, $P = 0.11$, DF = 1). Individuals were more active during the morning, and no territorial behavior has been reported (AVLF pers. obs.).

Etymology. The name of this species is formed by adding the suffix -ensis to the toponym "cerrado" to form an adjective which means "from the cerrado", alluding to its strong association with the savannic Brazilian cerrado biome. As mentioned before, the cerrado is one of the most threatened phytophysiognomies in Brazil (Strassburg et al., 2017), suffering from high anthropic conversion rates every year, mostly to give place to extensive soybean and sugarcane plantations.

Paratypes. BRAZIL – *Maranhão*: **Feira Nova** – 26 km East, Fazenda Forquilha dos Brejos, 1 male, 13-16-IV-2011, Mielke & Casagrande *leg*., DZ 32.041 (DZUP); **Imperatriz** – 1 male, 9-VII-1974, Exc. Depto Zool., DZ 31.804 (DZUP). *Ceará*: **Viçosa do Ceará** – 3 km W, 750 m, 1 male, 28.V.2013, Dolibaina & Pessoa *leg*., DD 226* (DD). *Bahia*: **Catolés** – Abaíra, Chapada Diamantina, 1 male, 1.XI.2013, S. M. Kerpel & A. F. Junior *leg*., CLEIIC802 (CLEIC), 1 female, 2.XI.2013, S. M. Kerpel & A. F. Junior *leg*., CLEIIC803 (CLEIC), 1 male, 3.XI.2013, S. M. Kerpel & A. F. Junior *leg*., CLEIIC804 (CLEIC), 1 male, 31.X.2013, S. M. Kerpel & A. F. Junior *leg*., CLEIIC805 (CLEIC); **Morro do Chapéu** – Capão do Pinho, 1 male, 1 female, 22.VI.2009, T. Zacca leg., MZUEFS#5.0060, MZUEFS#5.0059 (MZFS); **Pindobaçu** – Cachoeira da Fumaça, 10°28′43″S 40°12′27.6″W, 1 male, XII.2009, T. Zacca leg., MZUEFS#46.805 (MZFS); **Senhor do Bonfim** – Serra da Maravilha, 1 male, 1 female, 20.VII.2009, T. Zacca leg., MZUEFS#45220, MZUEFS#45179 (MZFS). *Distrito Federal:* **Brasília** – 1000 m, 1 male, 8.IX.1969, H. Ebert *leg*., DZ 35.043 (DZUP), 4 females, 14.V.1969, ex-coll. H. Ebert, DZ 34.963, DZ 34.983, DZ 35.213, DZ 35.273 (DZUP), Parque do Gama, 1000 m, 1 male and 2 females, 17-VI-1972, Mielke & Brown *leg*., DZ 33.899*, DZ 35.113, DZ 35.073 (DZUP), 1 male, 4 females, 17.V.1969, ZUEC-LEP 10285, ZUEC-LEP 10286, ZUEC-LEP 10287, ZUEC-LEP 10288, ZUEC-LEP 10289 (ZUEC), 1 male, 20.VI.1972, K. S. Brown *leg*., ZUEC-LEP 10297 (ZUEC), Fazenda Água Limpa, 1 female, 11.VII.1976, K. S. Brown *leg*., ZUEC-LEP 10266 (ZUEC), Brasília Country Club, 1200 m, 1 female, 17.VI.1972, Mielke & Brown *leg*., DZ 35.173 (DZUP), 2 females, 19.VI.1972, DZ 35.183, DZ 35.193 (DZUP), 2 females, 18.VI.1972, K. S. Brown *leg*. ZUEC-LEP 10267, ZUEC-LEP 10269 (ZUEC); **Planaltina** – 15°35′S 47°42′W, 1000 m, 1 male, 4.XII.1982, Mielke & Becker *leg*., DZ 35.153 (DZUP). *Goiás*: 2 males, 31.VIII.1969, ex-coll. H. Ebert, DZ 34.953, DZ 35.243 (DZUP); **Goiânia** – 2 males and 1 female, 17.XII.1968, K. S. Brown *leg*., ZUEC-LEP 10282, ZUEC-LEP 10283, ZUEC-LEP 10284 (ZUEC); **Rio Quente** – Pousada do Rio Quente, 2 males, 12.II.1979, A. Raw *leg*., DZ 35.023, DZ 35.163 (DZUP); **Iporá** – 1 male, 21.VI.1972, K. S. Brown *leg*., ZUEC-LEP 10299 (ZUEC). *Mato Grosso*: **Diamantino** – Rio Arinos, Fazenda Diamantino, 300–400 m, 1 male (no abdome), 5.V.1986, H. & H. D. Ebert *leg*., DZ 35.103 (DZUP), 1 female, 26.VIII.1978, Mielke & Furtado *leg*., DZ 35.013 (DZUP), 1 female, 5-IX-1996, E. Furtado *leg*., DZ 33.900* (DZUP), 1 male, 7-IX-1978, Mielke & Furtado *leg*., DZ 31.884 (DZUP); **São Vicente –** São José da Serra, 700 m, 1 male, 24.VI.1972, Mielke & Brown *leg*., DZ 35.093 (DZUP), 1 female, 24.VI.1972, K. S. Brown *leg*., ZUEC-LEP 10295 (ZUEC). *Mato Grosso do Sul*: **Aquidauana** – 20°25′59.23″S–55°39′30.28″W, 2 females, no date, (DNA Vouchers YPH-0575, YPH-0576), J. Lener *leg*., ZUEC-LEP 10013, ZUEC-LEP 10014 (ZUEC). *Minas Gerais*: **Belo Horizonte** – 4 males, 5 females, Área de Proteção Especial Manancial Cercadinho, 2007, 19°58′18.4″S 43°54′30″W, Silva A.R.M. *leg*., ZUEC-LEP 10076, ZUEC-LEP 10078, ZUEC-LEP 10080, ZUEC-LEP 10084, ZUEC-LEP 10077, ZUEC-LEP 10079, ZUEC-LEP 10080, ZUEC-LEP 10081, ZUEC-LEP 10082 (ZUEC); **Letícia** – Córrego leitão, 19°06′38″S 44°32′14″W, 1 male, 15.VI.1972, K. S. Brown *leg*., ZUEC-LEP 10296 (ZUEC); **Paracatu** – 1 female, 13.V.1969, K. S. Brown *leg*., ZUEC-LEP 10274 (ZUEC), 1 male, 16.V.1969, ex-coll. H. Ebert, DZ 35.003 (DZUP); **Buritis** – 1 female and 1 (no abdomen), 23.XII.1968, ex-coll. H. Ebert, DZ 34.993, DZ 35.233 (DZUP), 8 males and 4 females, 23.XII.1968, K. S. Brown *leg*., ZUEC-LEP 10268, ZUEC-LEP 10270, ZUEC-LEP 10271, ZUEC-LEP 10272, ZUEC-LEP 10273, ZUEC-LEP 10275, ZUEC-LEP 10276, ZUEC-LEP 10277, ZUEC-LEP10278, ZUEC-LEP 10279, ZUEC-LEP 10280, ZUEC-LEP 10281 (ZUEC), 1 male, 6.XI.1976, D. Gifford *leg*., DZ 35.033 (DZUP); **São Gonçalo do Rio Preto** – Parque Estadual do Rio Preto, 811 m, 1 male, 26.III.2015, I. Saraiva et al. *leg*. (ZUEC), 1 male, 27.V.2015 (PUC-MG), 1 male, 16.VII.2015 (ZUEC), 808 m, 2 males, 29.V.2015, I. Saraiva et al. *leg*. (PUC-MG), 899 m, 4 males, 16.VII.2015 (PUC-MG), 2 males, 18.VII.2015 (PUC-MG), 766 m, 3 males, 2 females, 19.VII.2015 (PUC-MG), 2 males, 19.IX.2015 (PUC-MG), 1 male, 20.IX.2015 (PUC-MG), 1 male, 28.V.2015 (PUC-MG), 1 male, 25.IX.2015 (PUC-MG), 1 male, 2 females, 23.II.2016 (PUC-MG), 1 male, 26.III.2016 (PUC-MG), 1 female, 19.IX.2016 (PUC-MG), 2 females, 25.XI.2016 (PUC-MG), 787 m, 1 male, 26.III.2016, I. Saraiva et al. *leg*. ZUEC-LEP 10016 (ZUEC), 899 m, 1 female, 16.VII.2015, I. Saraiva et al. *leg*. ZUEC-LEP 10017 (ZUEC), 801 m, 1 female, 28.VII.2016, Geanne leg., ZUEC-LEP 10571 (ZUEC), 904 m, 1 female, 29.VII.2016, Geanne leg., ZUEC-LEP 10572 (ZUEC), 914 m, 1 male, 27.VII.2016, Geanne leg., ZUEC-LEP 10573 (ZUEC), 752 m, 1 female, 27.VII.2016, Geanne leg., ZUEC-LEP 10574 (ZUEC), 882 m, 1 female, 27.VII.2016, Geanne leg., ZUEC-LEP 10575 (ZUEC); **São João del Rei** – Rio das Mortes, 800–1000 m, 1 (no abdomen), 16.IV.1955, H. Ebert *leg*., DZ 35.203 (DZUP); **Santana do Riacho** – Serra do Cipó, 1100 m, 1 male, 1 female, 7–10.V.2002, A. V. L. Freitas *leg*. (ZUEC-AVLF), APA Morro da Pedreira, 1 female, 14.IV.2012, 1 female, 24.X.2012, 1 male, 15.IV.2012, (DNA vouchers YPH-0572, YPH-0573, YPH-0574), M. Beirão *leg*., ZUEC-LEP 10010, ZUEC-LEP 10011*, ZUEC-LEP 10012* (ZUEC), 1 male, 08.III.2009, 1 male, 11.III.2009, Kaminski L.A. *leg*., ZUEC-LEP 10072, ZUEC-LEP 10074 (ZUEC); **Santa Barbara** – Serra do Caraça, 1300–1500 m, 1 male, 1–5-II-1985, Mielke & Casagrande *leg*., DZ 31806 (DZUP); **Lagoa Santa:** Serra do Cipó, 1000–1300 m, 1 female, 30-I-1985, Mielke & Casagrande *leg*., DZ 31.848 (DZUP); **Cardeal Mota** – Serra do Cipó, 19°21′S 43°36′W, 1 male, 07-XII-2005, Oliveira L. B. *leg*., ZUEC-LEP 10298 (ZUEC). *São Paulo*: **Campo Alegre** – Brotas, 750 m, 2 males, 1.V.1966, H. Ebert *leg*., DZ 35.223, DZ 35.263, 1 male, 21.V.1967, DZ 34.973 (DZUP); **Santa Rita do Passa Quatro** – Gleba Pé do Gigante, Parque Estadual da Vassununga, 21°37′36.52″S 47°37′34.57″W, 1 male, 1–3.V.2003, A.V.L. Freitas *leg*. (ZUEC-AVLF), 1 female, 1–3.V.2003, A.V.L. Freitas *leg*. (ZUEC), 1 female, IV.2003, A. V. L. Freitas *leg*., ZUEC-LEP 10265 (ZUEC), 1 female, IV.2003, (DNA Voucher YPH-0065), A.V.L. Freitas *leg*., ZUEC-LEP 10015 (ZUEC); **Itirapina** – Cerrado da Graúna, 1 female, 13.VIII.2010, D.G.M. Silva leg., (DNA voucher MGCL-LOAN-150) (ZUEC), 1 male, 31.VIII.2010, D.G.M. Silva leg., (DNA voucher MGCL-LOAN-134) (ZUEC).

Additional examined material. *Minas Gerais*: **Santana do Riacho** – Serra do Cipó, 1 female, 11.III.2009, Kaminski L.A. *leg*., ZUEC-LEP 10075 (ZUEC); **Belo Horizonte** – Área de Proteção Especial Manancial Cercadinho, 19°58′18.4″S 43°54′30″W, 2007, 1 male, 8 females, Silva A.R.M. *leg*., ZUEC-LEP 10087, ZUEC-LEP 10083, ZUEC-LEP 10085, ZUEC-LEP 10086, ZUEC-LEP 10088, ZUEC-LEP 10089, ZUEC-LEP 10090, ZUEC-LEP 10091, ZUEC-LEP 10092 (ZUEC).

***Nhambikuara mima* (Butler, 1867) comb. nov.** (Figs. 3–6)

Euptychia mima Butler, 1867: 500 [no illustration].

Zischkaia mima; Lamas 2004: 223. – Brévignon & Benmesbah, 2012: 46.

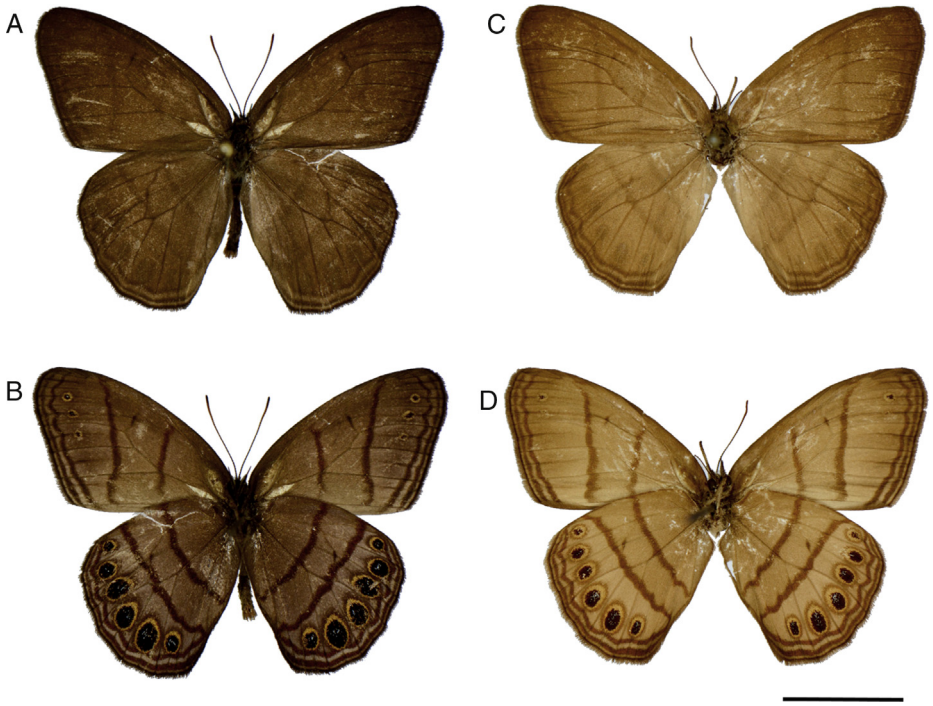

Fig. 3. *Nhambikuara mima* **comb. nov.** A – male, dorsal (DZ 35.877); B – male, ventral; C – female, dorsal (DZ 34.823); D – female, ventral.

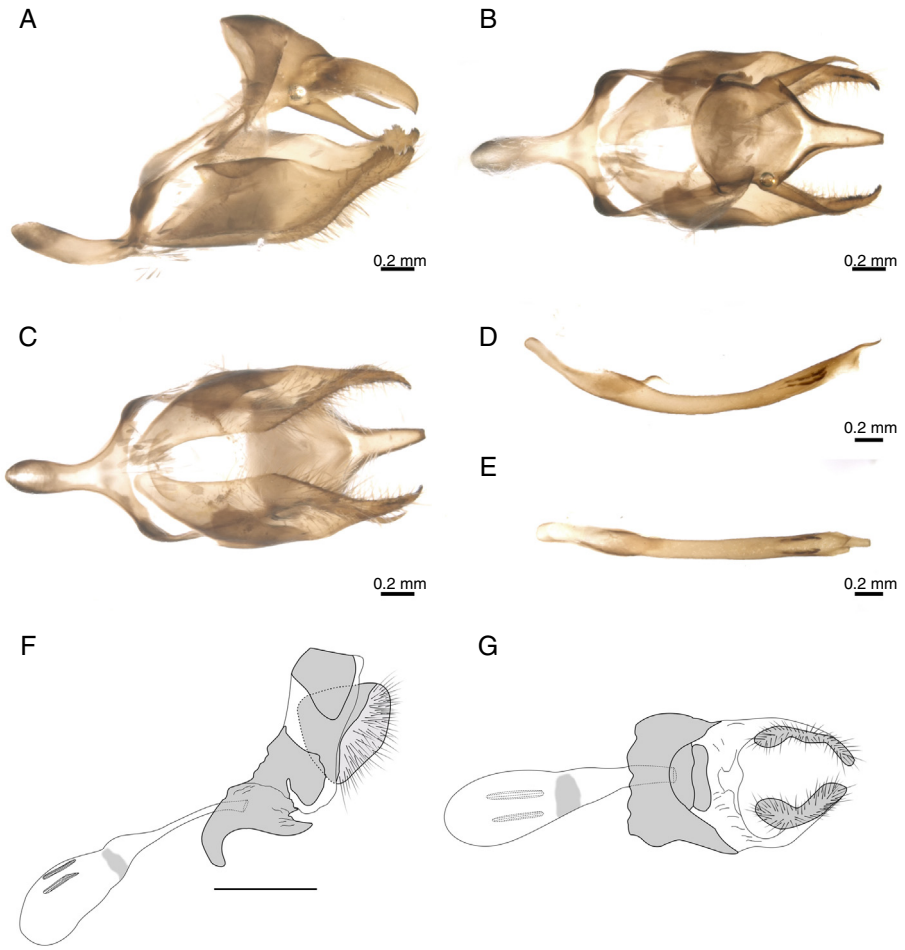

Fig. 4. *Nhambikuara mima* **comb. nov.**, male (MGCL-LOAN-175) and female genitalia (FLMNH-MGCL-278955). A – lateral; B – dorsal; C – ventral; D – aedeagus, lateral; E – aedeagus, dorsal; F – female lateral; G – female ventral.

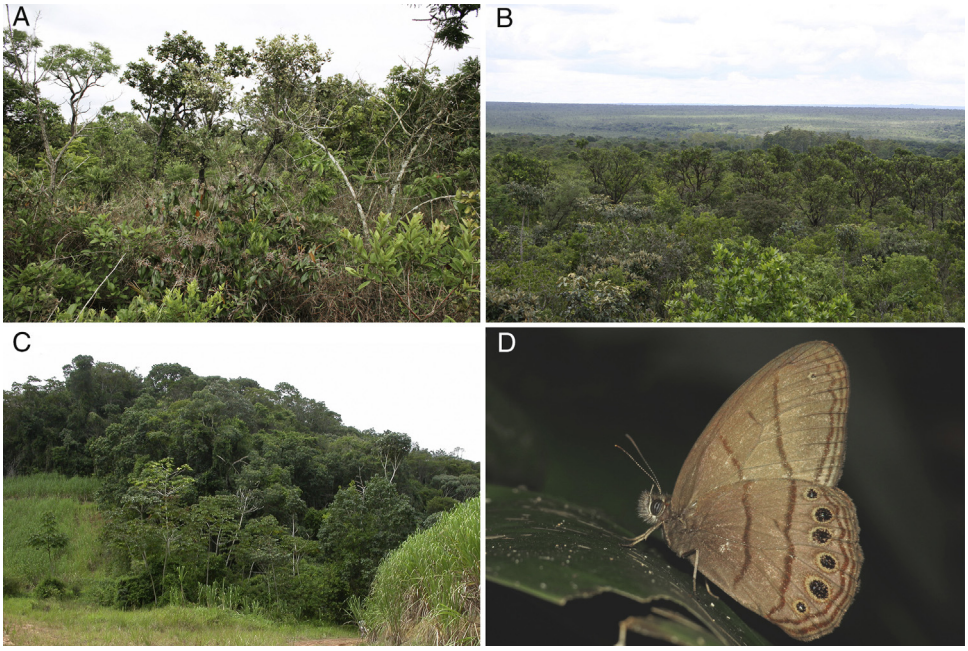

Fig. 5. Natural habitats of *Nhambikuara cerradensis* **gen.** et **sp. nov.** in the *Cerrado*: A – Itirapina, São Paulo; B – Brasília, Distrito Federal and *Nhambikuara mima* **comb. nov.**: C – Sirinhaém, Pernambuco; D – an individual in its natural habitat in Guiana, Surama, north Rupununi (Photo: David Geale).

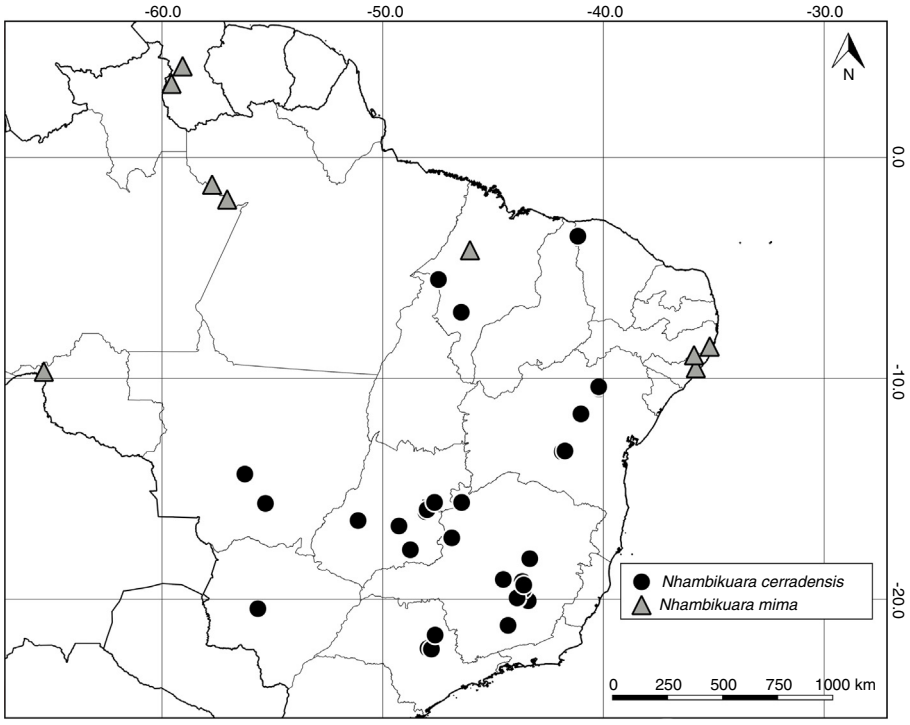

Fig. 6. Map showing the geographical distribution of *Nhambikuara cerradensis* **gen.** et **sp. nov.** (black circle) and *Nhambikuara mima* **comb. nov.** (black triangle).

Diagnosis. *Nhambikuara mima* **comb. nov.** (Fig. 3) differs from *Nhambikuara cerradensis* **sp. nov.** by the slightly more elongated ocelli in the VHW, wider lines on the VW, the male genitalia with a truncated uncus, about the same length as the gnathos, the apex of the valva with a developed dorsal serrated projection, the aedeagus with short paired cornuti, the female genitalia with a rectangular lamella antevaginalis, which is ventrally concave at median region in apical portion, the corpus bursae with a sclerotized half-ring at close to ductus region, and latero-ventrally short, paired signa.

Taxonomic comments. *Euptychia mima* Butler, 1867 was described based on an unstated number of specimens from Tapajós, Pará, Brazil. One of them is designated herein as the lectotype of *Euptychia mima* to fix the identity of the name; this specimen has the following labels: /Type H.T./Euptychia mima Butler. Monog[raph]/B.M.TYPE No Rh 3250 Euptychia mima ♂ But'l[er]./Type of Species/Tapajos, Amazonas, H.W. Bates./Goldman-Salvin Coll. 1904 – 1. Euptychia mima, Butl[er]./mima/; and two other labels will be added later: /Lectotypus/Lectotypus Euptychia mima Butler, 1867. A.V.L. Freitas, E.P.

Barbosa, T. Zacca, det. 2018/. Deposited at NHMUK. The last two labels will be sent to the curator later.

Butler (1867) treated this species in "Division VI" of *Euptychia*, characterized by the absence of ocelli on both DW and VFW, and six black and ovoid ocelli with silvery pupils in VHW. In this division were also included *Euptychia saundersii* Butler, 1867, *Euptychia fumata* Butler, 1867, *Euptychia pacarus* Butler, 1867 and *Euptychia insignis* Butler, 1867, species currently placed in *Zischkaia* Forster, 1964. When describing *Zischkaia*, Forster (1964) did not include *E. mima*, *E. pacarus* or *E. insignis*, but only *E. fumata* and *E. saundersii*. The current taxonomic classification for *Zischkaia* is that of Lamas (2004), who partially followed Butler's arrangement (except by treating *E. insignis* within an *Incertae sedis* group), but also included *E. mima* in the genus. An ongoing revision of *Zischkaia* (Nakahara et al., *in prep*.) shows that *E. mima* is not closely related to other *Zischkaia*, based on morphological and molecular evidence, reinforcing its removal from that genus.

Variation. Sexual dimorphism is not well marked, but, like virtually all euptychines, females are typically larger and paler than males and have more rounded wings. Intraspecific variation is also low, being restricted to the size of VHW ocelli and the irregularity of the VHW median line.

Male genitalia (Fig. 4). Tegumen dorsally flattened, anterior margin concave at median region; gnathos about the same length of uncus and curved upwards; uncus broad and straight, apex curved downwards, basal third wide; appendices angulares reduced; anterior projection of saccus 1/3 length of valva; fultura superior absent; fultura inferior sclerotized in U-shape; valva with a developed costae, dorso-apical region serrated with a small dorsal projection; aedeagus with anterior region curved upwards, posterior region about 2 times longer than anterior region, short paired cornutal patches.

Female genitalia. 8th tergite sclerotized, not fused with the lateral expansions of lamella antevaginalis, spiracle absent; papilla analis developed, sub-squared, basal half strongly sclerotized, setae sparsely at distal region, apophysis posterior absent; lamella antevaginalis fused to lamella postvaginalis forming the squared sterigma which is strongly sclerotized and developed; ductus bursae totally membranous, as long as corpus bursae, weakly sclerotized half-ring between ductus bursae and corpus bursae, paired signa dorsally.

Distribution (Fig. 6). *Nhambikuara mima* **comb. nov.** is present in the humid forests both in the Amazon region (including records from French Guiana – Brévignon and Benmesbah, 2012) and in northeastern Brazil (Alagoas and Pernambuco).

Examined material. 9 males and 7 females (4 specimens dissected). VENEZUELA – *Bolívar:* **Canaima**, [6°14′23″N,62°51′8″W], 1 female, 10 Aug 1973, FLMNH-MGCL-278955* (MGCL). GUYANA – **Takutu-Upper Essequibo**: Kanuku Mts., Nappi Creek, 500–1000 m, 03°20.7′N 59°34.2′W, 1 female, 21.I–10.III.1999, Fratello S., Hanner R., Hendricks S. & Williams R. *leg.* (USNM), 1500–2700 m, 03°18.8′N 59°33.9′W, 1 female, 21.II–10.III.1999 (DNA voucher LEP-18705), Fratello S., Hanner R., Hendricks S. & Williams R. *leg.* (USNM). SURINAM – *Brokopondo*: **Bronsweg**, 2 males, 8 Mar 1971, FLMNH-MGCL-278952, FLMNH-MGCL-278953, (MGCL). FRENCH GUIANA – *St-Laurent du Maroni:* **Maroni River**, 1 male, FLMNH-MGCL-278954 (MGCL). BRAZIL – *Amazonas*: **Nhamundá** – Rio Nhamundá, Cuipiranga, 1°53′58″S 57°02′59″W, 1 male, 20–22.V.2008, Mielke & Casagrande *leg*., DZ 35.877 (DZUP). *Pará:* **Faro** – Co[mpanhia]mi[neradora]sa[ntarém], 1 male, 24.VII.1973, K. S. Brown *leg*., ZUEC-LEP 10264 (ZUEC). *Rondônia*: **Porto Velho** – Abunã, U[sina] H[idr]E[létrica] Jirau, 250 m, 1 female, 15.IX.2012, (DNA voucher MGCL-LOAN-550*), A.V.L. Freitas *leg*., ZUEC-LEP 10107 (ZUEC). *Maranhão*: **Santa Luzia** – Santa Luzia-Açailândia, Fazenda Terrasse road, km 108, 1 male, 3.VIII.1974, Mielke *leg*., DZ 35.878 (DZUP). *Pernambuco*: **Sirinhaém** – Matas da Usina Trapiche, 1 male, 14.VIII.2006, B-834/TPICH, (DNA voucher MGCL-LOAN-406), A.V.L. Freitas leg. (ZUEC-AVLF). *Alagoas*: **Rio Largo** – Utinga, 1 female, 16.VI.1949, ex-coll. A. Cardoso, DZ 34.823* (DZUP); **Ibateguara** – Serra Grande, 1 male, 16.XI.2012 (DNA voucher MGCL-LOAN-175*), D.H.A. Melo leg., ZUEC-LEP 10106 (ZUEC). PERU – *Huánuco:* **Cordillera del Sira**, [9°25′S,74°45′W], 800 m, 2 females, Sep 1987–Aug 1988, Exp. Universidad Vienna, MUSM-LEP-105652, MUSM-LEP-105653 (MUSM).

BOLIVIA – *La Paz:* **Zongo** [16°7′S,68°2′W], 1 male, Garlepp *leg.* (MNHU).

Phylogenetic analyses and genetic distances

The ML analysis using molecular evidence from three genes (Fig. 7) is in agreement with morphological data and supports the close relationship of *Euptychia mima* with the new species here described, *N. cerradensis* **sp. nov.**, and we thus move it into the new genus as *N. mima* **comb. nov.** The ML consensus tree shows that *N. mima* **comb. nov.** is sister to *N. cerradensis* **sp. nov.**, although with low bootstrap value (BS = 66), in the "*Pareuptychia* clade" (*sensu* Peña et al., 2010), and close to a clade containing several species currently placed in *Splendeuptychia*, with high bootstrap value (BS = 100).

Intraspecific genetic distances ranged from 0% to 2.0% and interspecific distances ranged from 4.2% to 6.7% (Fig. 8). The genetic distance between the two individuals of *N. mima* **comb. nov.** was 1.2% and the genetic distances among individuals of *N. cerradensis* **sp. nov.** ranged from 0% to 1.2% (see Table 2). The mean genetic distances among the species analyzed are shown in Table 3.

Discussion

The genus *Nhambikuara* **gen. nov.** contains two species that phenotypically resemble two other genera of Euptychiina, namely *Zischkaia* Forster, 1964 and *Paryphthimoides* Forster, 1964. However, both morphological and molecular evidence confirm that the two species are unrelated to both of the above genera.

Morphologically, species of *Nhambikuara* **gen. nov.** are different from species of *Zischkaia* by the absence of a dorsal and a latero-ventral projection of the tegumen, in addition to the absence of sclerotized plates in the ductus bursae of females. Compared to species of *Paryphthimoides*, species of *Nhambikuara* **gen. nov.** can be differentiated by the truncated uncus, valvae with well-developed costae, and well developed cornuti, in addition to the sterigma in female genitalia. Ongoing taxonomic revisions and phylogenies of *Zischkaia* (Nakahara et al., *in prep*.) and *Paryphthimoides* (Zacca et al., *in prep*.) have also reinforced the results presented herein.

Actually, species of *Nhambikuara* **gen. nov.** are part of the "*Pareuptychia* clade" (*sensu* Peña et al., 2010), and appear to be most closely related to several species of *Splendeuptychia* Forster, 1964 (see Fig. 7). In fact, *Nhambikuara* **gen. nov.** shares several morphological characters with *Splendeuptychia toynei* Willmott & J. Hall, 1995, *Splendeuptychia furina* (Hewitson, 1862), *Splendeuptychia latia* (Butler, 1867) and *Splendeuptychia doxes* (Godart, [1824]), such as the shape of uncus, well-developed anterior projection of saccus, paired and strong sclerotized cornutal patches in aedeagus, female genitalia with sterigma and ductus bursae with sclerotized plates variable in shape, reinforcing the potential close affinities of these taxa.

Based on previous morphological and molecular studies of the Euptychiina (Murray and Prowell, 2005; Peña et al., 2010; Huertas, 2011; Marín et al., 2011, 2017), the genus *Splendeuptychia* has been shown to be polyphyletic, with species spread in at least three different clades. In the present study, the four species above mentioned formed a clade sister to *Nhambikuara* **gen. nov.** (Fig. 7).

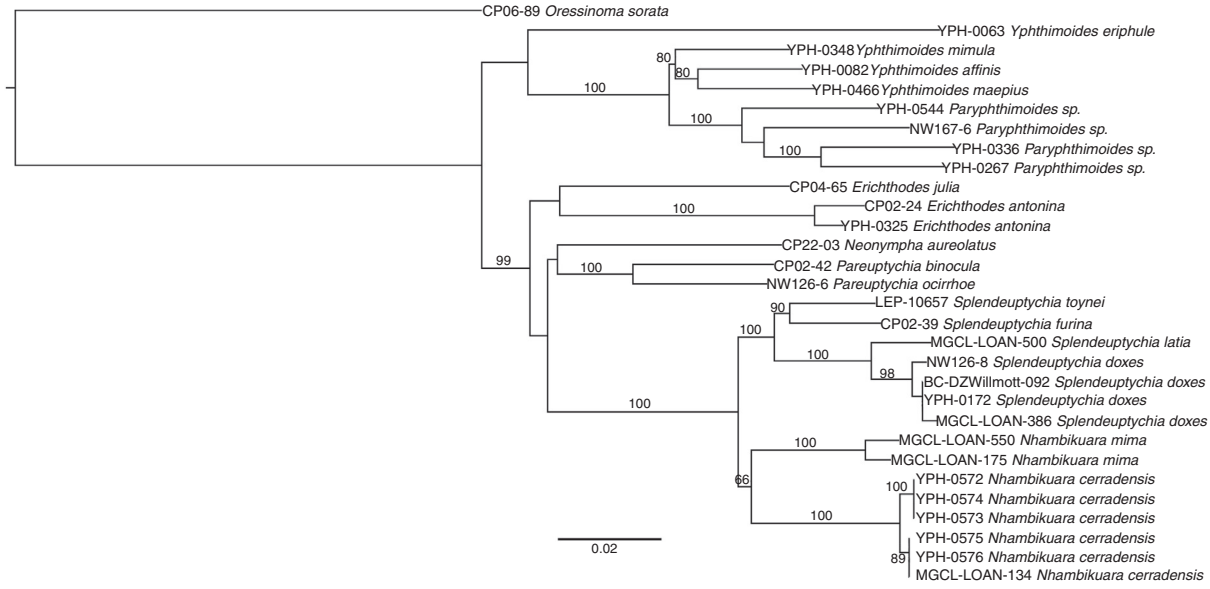

Fig. 7. Maximum likelihood consensus tree showing the phylogenetic relationships among species of *Nhambikuara* **gen. nov.** and exemplar species of *Splendeuptychia*. Numbers above branches are bootstrap values.

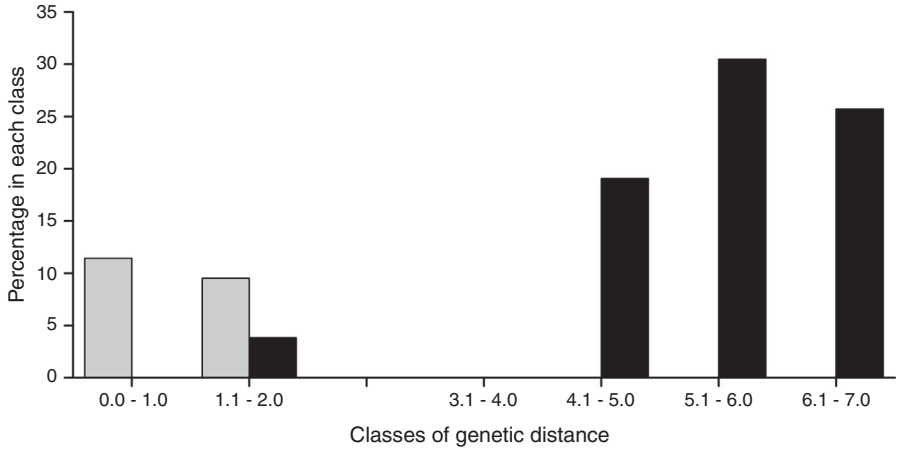

Fig. 8. Frequency distribution of pairwise individual genetic distances within (gray) and between (black) species of *Nhambikuara* **gen. nov.** and *Splendeuptychia* species. The black bar in the class 1.1–2.0 indicates an overlapping of *Splendeuptychia doxes* and *Splendeuptychia latia*.

Other species that are phenotypically similar and that could be part of this clade include *Splendeuptychia junonia* (Butler, 1867), *Splendeuptychia ackeryi* Huertas, Ríos & Le Crom, 2009 and *Splendeuptychia mercedes* Huertas, 2011 (Huertas et al., 2009; Huertas, 2011). More comprehensive morphological and molecular studies are needed to confidently resolve the generic classification of these other potentially closely related species currently treated in *Splendeuptychia*, and ongoing taxonomic revision of the genus *Splendeuptychia* should clarify the taxonomy (Huertas, *in prep.*). Here, we decided to proceed with the description of a new species and genus for a species that is distinctive, widespread, often sampled and whose description could contribute to focusing attention on the need to conserve the poorly studied and threatened Brazilian cerrado habitats. As with several other recent species descriptions in Euptychiina (e.g. Huertas et al., 2016; Zacca et al., 2017; Nakahara et al., 2017), where issues still remain to be resolved in terms of the generic classification, there is a real need for names for distinctive species to facilitate the higher-level phylogenetic research needed to ultimately resolve the subtribe's classification.

The present study is one more example of the complexity faced by researchers working on the taxonomy of Euptychiina. Hopefully, recent collaborative efforts combining several research groups and many subprojects focusing on the systematics of Euptychiina (http://www.flmnh.ufl.edu/museum-voices/euptychiina/) will shed light on the relationships and diversity within this large Neotropical butterfly clade.

Conflicts of interest

The authors declare no conflicts of interest.

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