Herpetologica, 72(2), 2016, 148–156

A New Species of *Bachia* Gray 1845 (Squamata: Gymnophthalmidae) from the Eastern Guiana Shield

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Abstract: A new species of *Bachia* of the *B. heteropa* group is described from the Parque Nacional Montanhas do Tumucumaque in northeastern Amazonia, Amapá State, Brazil. The new species morphologically resembles *B. heteropa* and *B. guianensis*. Nonetheless, the absence of interparietal and prefrontal scales, and the number of supraciliary scales, can distinguish the new species from its close relatives. This description increases the species diversity of the *B. heteropa* group after a number of decades of stasis in the taxonomy of this group in Amazonia. In addition, we present an updated key to the groups of *Bachia*, including the species and subspecies of the *B. heteropa* group.

Key words: Amazon Forest; *Bachia heteropa* group; Brazil; Lizards; Taxonomy; Tumucumaque

Species within the *Bachia heteropa* group are distributed in southern Central America (Costa Rica and Panamá), northern South America (Colombia, Venezuela, and Guyana), and in some islands of the Lesser Antilles (Grenada, Grenadines, Trinidad, and Tobago; Dixon 1973; Hoogmoed and Dixon 1977; McDiarmid and DeWeese 1977; Malhotra and Thorpe 1999). The two first described species of this group were originally placed in other genera, with Wiegmann (1856) describing *Chalcides heteropus* from La Guaira, Venezuela, and Cope (1862) nominating *Brachypus pallidiceps* from Río Truando, Colombia. Garman (1892) subsequently transferred *C. heteropus* to the genus *Bachia* Gray (1845), and *B. pallidiceps* was reclassified in *Scolecosaurus* by Dunn (1940), and then *Bachia* by Vanzolini (1961). Hoogmoed and Dixon (1977) described the third species of this group, *Bachia guianensis*, from Bolívar state, in Venezuela. Currently, the *B. heteropa* group includes three species—*B. guianensis*, *B. heteropa*, and *B. pallidiceps*—and five subspecies—*B. h. heteropa* (Wiegmann 1856), *B. h. alleni* (Barbour 1914), *B. h. lineata* Boulenger 1903, *B. h. marcelae* Donoso-Barros and Garrido 1964, and *B. h. trinitatis* Barbour 1914.

Dixon (1973) defined the arrangement of the *Bachia* groups as recognized today. Recent studies in molecular phylogeny have nevertheless revealed that the *B. heteropa* group, like other *Bachia* species groups, might not represent a natural arrangement, with species belonging to the same group being nested within different clades (Kohlsdorf and Wagner 2006; Galis et al. 2010; Kohlsdorf et al. 2010). The topologies provided by these studies are contradictory, however, and because further studies will be required to provide a more definitive position, we have adopted Dixon's (1973) arrangement of the *B. heteropa* group for the present study.

During a review of the specimens collected by J. Lima in Amapá State, Brazil, deposited in the Amapá State Institute for Science and Technology, Instituto de Pesquisas Científicas e Tecnológicas do Estado do Amapá (IEPA), MAR-J identified 12 specimens of *Bachia*. Eleven of these specimens were identified as *B. flavescens*, although the 12th specimen was differentiated from the others on account of its hexagonal and imbricated dorsal scales, distinct from the quadrangular dorsal scales found in *B. flavescens*. This specimen was collected in the extreme northwestern portion of Amapá, during an expedition to the Montanhas do Tumucumaque National Park, which is one of the most remote regions of Brazilian Amazonia. Based on the series of specimens examined and systematic comparisons with other species, we recognize this specimen of *Bachia* as a representative of a distinct new species, which is described here.

Material and Methods

Morphology

Measurements were taken with digital calipers (±0.1 mm); scale counts and other morphological characters were observed using a stereomicroscope. The measurements were as follows: snout–vent length (SVL), from the border of cloaca to the tip of snout; axilla–groin length, from the anterior margin of the hindlimb to the posterior margin of the forelimb; head depth at the highest point dorsi–ventrally; head width at the widest point; head length from the anterior margin of tympanic aperture to the tip of snout; forelimb length; hindlimb length; tail length, in intact tails.

We followed the nomenclature of the scales described by Dixon (1973) and Hoogmoed and Dixon (1977). The meristic characters were as follows: dorsal scales, counted from the parietals posteriorly to the insertion of hindlimbs; ventrals, counted between the interbrachial and preanal shields; chin shields; gulars, counted between the interbrachial and mental plates; caudals, counted both middorsally and midventrally; scale rows around the midbody; scale rows around the tail, immediately posterior to the cloaca; temporal, scales along each oblique series of temporals; supraoculars; suboculars; preoculars; postoculars; supraciliaries; supralabials; infralabials; preanal shields; femoral and preanal pores. The number of digits on each of the four limbs was also counted.

For comparison, we examined specimens held by the herpetological collections of a number of research institutions in Brazil and the United States (see Appendix; museum acronyms follow Sabaj-Perez [2014]). In Brazil, the collections were the Goeldi Museum (MPEG) in Belém, the

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Zoology Museum of the University of São Paulo (MZUSP), the National Museum (MNRJ) in Rio de Janeiro, University of Brasília (CHUNB), National Amazon Research Institute (INPA) in Manaus, Faculdades Integradas Tapajós (LPHA) in Santarém, and IEPA in Macapá. The American institutions were the American Museum of Natural History (AMNH), the Museum of Comparative Zoology (MCZ), and the National Museum of Natural History (USNM). This analysis was supplemented with data from the literature (Cope 1862, 1868; Barbour 1914; Burt and Burt 1931; Vanzolini 1961; Dixon 1973; Hoogmoed and Dixon 1977; McDiarmid and DeWeese 1977; Ávila-Pires 1995; Kizirian and McDiarmid 1998; Teixeira et al. 2013a, b).

Distribution

Distributional records of the species of the *Bachia heteropa* group were obtained from the specimens examined (Appendix), the literature (Dixon 1973; Hoogmoed and Dixon 1977; McDiarmid and DeWeese 1977; Medina-Rangel and Calderón 2013; López-Perilla et al. 2014), and online databases (GBIF 2015). The distribution map was created using ArcGIS (v10.1, ESRI, Redlands, CA).

Species Description

Bachia ***remota*** sp. nov.
(Figs. 1–3; Table 1)

Bachia gr. *heteropa;* Lima (2008:42)

Holotype.—IEPA 777 (Figs. 1–3), an adult female, collected on 20 January 2005 by J. Lima, Parque Nacional Montanhas do Tumucumaque (2°11′36″N, 54°35′15″W; datum = WGS84), Laranjal do Jari municipality, State of Amapá, Brazil. The park is located on the Brazilian border with French Guiana and Suriname. Field number TQ 372.

Diagnosis.—*Bachia remota* is a member of the *heteropa* group with hexagonal, smooth, imbricate dorsal, and rectangular, juxtaposed ventral and lateral scales. The new species is distinguished from all other species in the *heteropa* group by the following combinations of characters: (1) four clawed digits on all limbs; (2) prefrontals absent; (3) interparietal absent; (4) two supraciliary scales; (5) large size (86.8 mm SVL); and, (6) background coloration homogeneous brown on all surfaces of body and tail.

Comparisons with other species.—*Bachia remota* differs from all species of the *B. bresslaui* group (*B. bresslaui* (Amaral 1935); *B. cacerensis* Castrillon and Strüssmann 1998; *B. didactyla* Freitas, Strüssmann, Carvalho, Kawashita-Ribeiro and Mott 2011; *B. geralista* Teixeira, Sousa-Recoder, Camacho, Sena, Navas and Rodrigues 2013a; *B. micromela* Rodrigues, Pavan and Curcio 2007; *B. oxyrhina* Rodrigues, Camacho, Sales-Nunes, Sousa-Recoder, Teixeira, Valdujo, Ghellere, Mott and Nogueira 2008; *B. panoplia* Thomas 1965; *B. psamophila* Rodrigues, Pavan and Curcio 2007; *B. pyburni* Kizirian and McDiarmid 1998; and *B. scolecoides* Vanzolini 1961) by having hexagonal, smooth, imbricate dorsal, and rectangular, juxtaposed lateral scales (vs. keeled dorsal, and hexagonal lateral scales in all other species). Differs from the *B. dorbignyi* group (*B. dorbignyi* (Duméril and Bibron 1839); *B. barbouri* Burt and Burt 1931; *B. bicolor* (Cope 1896); *B. huallagana* Dixon 1973; *B. intermedia* Noble 1921; *B. peruana* (Werner 1901); *B. scaea*

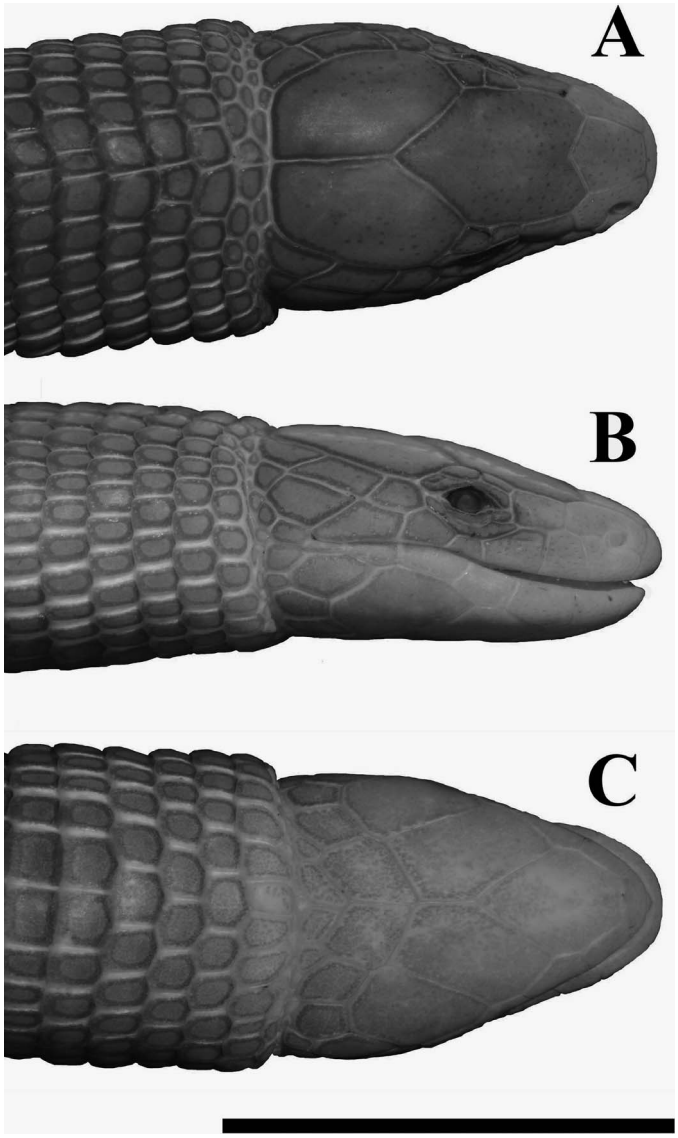

Fig. 1.—Dorsal (A), lateral (B), and ventral (C) views of the head of the holotype of *Bachia remota* sp. nov. (IEPA 777). Bar represents 10 mm.

Teixeira, Dal Vechio, Sales-Nunes, Mollo-Neto, Moreira-Lobo, Storti, Junqueira-Gaiga, Freire-Dias and Rodrigues 2013b; *B. talpa* Ruthven 1925; and *B. trisanale* (Cope 1868) by having rectangular, juxtaposed lateral scales, four clawed digits on each limb, and supraoculars present (vs. hexagonal lateral scales, three digits on each limb, and supraoculars absent in all other species). Differs from *B. flavescens* (Bonnaterre 1789) by having hexagonal, imbricate dorsal (vs. quadrangular dorsal scales).

Considering the species of the *Bachia heteropa* group (Table 1), *B. remota* can be distinguished from *B. heteropa* (Wiegmann 1856) and *B. pallidiceps* (Cope 1862) by the absence of interparietal scale, and having 56 dorsal scales (vs. presence of interparietal, and 38–49 dorsal scales in *B. heteropa,* 43–48 in *B. pallidiceps*), and from *B. guianensis* Hoogmoed and Dixon 1977 and *B. pallidiceps* by the absence of prefrontal scales. *Bachia remota* can also be distinguished from *B. guianensis* by having two supraciliary scales and a homogeneous brown body (vs. three supraci-

Fig. 2.—Dorsal (A) and ventral (B) views of the holotype of *Bachia remota* sp. nov. (IEPA 777). Bar represents 10 mm.

liaries, and dorsal surface of body and tail with four longitudinal series of white spots). The new species can be distinguished from other species occurring in Amazonia (Table 2).

Description of the holotype.—Body elongate, rounded snout, tail longer than body. Rostral trapezoidal, contacting first supralabial, nasal, and frontonasal. Viewed dorsally, the rostral is about three times wide as high. Frontonasal trapezoidal, as wide as long, wider posteriorly, contacting rostral, nasal, and frontal. Prefrontals absent. Frontal octagonal, very large, longer than wide, with anterior margin in contact with frontonasal and nasals; lateral margins straight, in contact with loreal, and supraoculars; posteriorly angulose, broadly contacting parietals. Frontal length and width is about twice that of the frontonasal. Frontoparietals absent. Interparietal absent. Parietals very large, longer than wide, as long as frontal, and narrower than frontal, roughly pentagonal; their anterior margin deeply indented and in broad contact with frontal, contacting narrowly the second supraocular and the second supraciliary; lateral margins contacting the postocular and two temporal; posterior margins straight, in contact with dorsals. Two supraoculars, the first about two times longer than wide, contacting frontal, loreal, first superciliary, and second supraocular. Second supraocular largest, about two times wider than first, contacting frontal, first supraocular, first and second superciliaries, and parietal. Two superciliaries, both with about the same length; first wider in its anterior margin, and in contact with loreal, first and second supraoculars, and second superciliar; second wider in its posterior margin, and in contact with first superciliar, second supraocular, parietal, and first temporal. One small preocular, curved, in contact with first superciliar, loreal, and first subocular. Two suboculars; first longer, about five times longer than wide, contacting loreal, preocular, and third, fourth, and fifth supralabials; second smaller, about two times longer than wide, contacting fifth supralabial and first temporal. Postocular absent. Eyelid present with an undivided semitransparent disc. Nasal large, about three times longer than high. Nostril in the middle of lower margin of nasal. Loreal rectangular, in contact with nasal, frontal, first supraocular, first superciliary, preocular, first subocular, and second and third supralabials. Six supralabials, third, fourth, and fifth under the orbital region; second the tallest (dorsi-ventrally), fourth the smallest, and sixth the largest (in scale area). Contact of supralabials with parietal absent. Five relatively large temporals, in two oblique rows, upper row with three (in contact with parietal) and lower row with two scales. First temporal in broad contact with parietal and sixth supralabial. Ear opening absent. All head scales smooth and juxtaposed.

Mental trapezoidal, about twice wider than long. Postmental heptagonal, as wide as long. Two pairs of chin shields, first pair in medial contact, second widely separated; both in contact with infralabials. Three pairs of symmetric flat and diagonally disposed elongate pregulars. Five infralabials; first, second, and third about the same size; fourth longer than wide; fifth the smallest. Gulars smooth, imbricate, rounded posteriorly, in eight transversal rows, increasing gradually in size toward interbrachial region. Interbrachial region with four scales, the central ones largest, twice longer than wide. Lateral scales of neck rectangular, smooth, imbricate, slightly rounded posteriorly, and longer than wide, disposed in regular transverse rows and becoming gradually similar to adjacent dorsal or ventral scales. Collar fold absent.

Dorsal scales smooth, hexagonal, imbricate, and disposed in regular transversal rows; wider in occipital region, becoming progressively narrower and more elongate. Fifty-four transverse rows between parietals and the level of hindlimbs. Lateral scales about the same size as dorsals but rectangular; those closer to ventrals slightly wider. A distinctive area with granular scales surrounds the area of arm insertion and the posterior part of leg insertion. Twenty-eight scales around midbody. Ventral scales smooth, laterally juxtaposed, longitudinally imbricate, almost squared just after the interbrachial row, becoming gradually longer than wide; 40 transverse rows between interbrachials and preanals. Four scales in preanal plate; one anterior and one posterior about the same size and form (with diverging lateral margins); two large laterals rhomboidal scales, separated by anterior and posterior ones. Preanal and femoral pores absent.

Limbs reduced. Forelimbs and hindlimbs covered by five smooth, imbricate scales. Four clawed digits on each of the four limbs (Fig. 3). Scales of tail similar to dorsals, smooth, hexagonal, imbricate, and disposed in regular 107 transversal rows. Twenty-six scales around the tail base.

Measurements of the holotype (mm).—SVL = 86.76; axilla–groin length = 63.20; head depth = 4.40; head width = 5.96; head length = 9.00; forelimb length = 5.26; hindlimb length = 6.11; tail length = 130.28 (60% SVL).

Coloration in preservative.—Background dorsal, lateral, and ventral surfaces of body and tail homogeneous brown. Ventral surface of head light brown to cream, immaculate.

Etymology.—The specific epithet is derived from the Latin adjective *remotus* and refers to the geographical remoteness and isolation of the region (Montanhas do

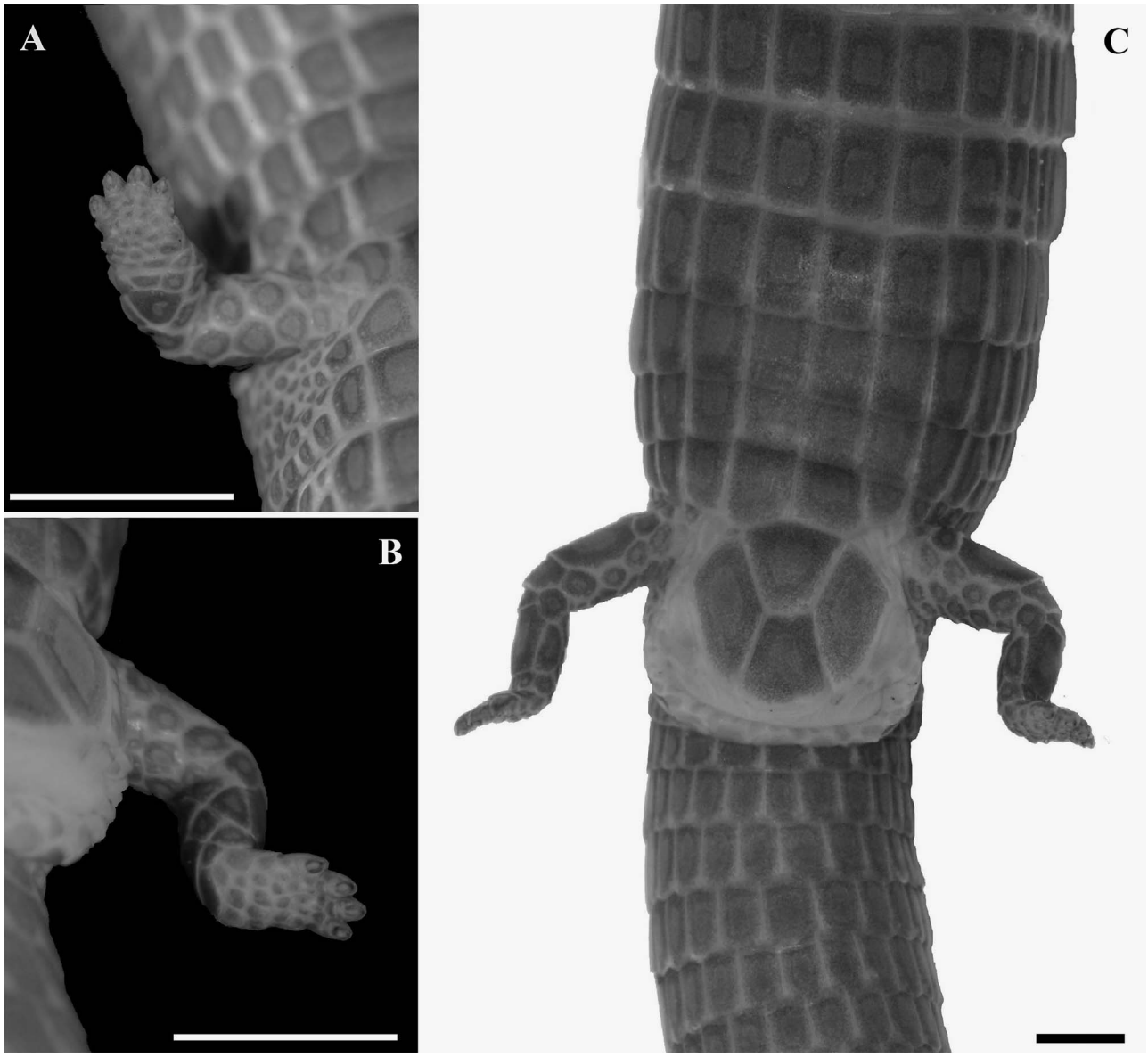

FIG. 3.—Ventral views of forelimb (A), hindlimb (B), and preanal plate (C) of the holotype of *Bachia remota* (IEPA 777). Bar represents 2 mm.

Tumucumaque National Park) where the specimen was collected.

Distribution and habitat.—*Bachia remota* is known only from the type-locality (~300 m elevation) situated in the northwest portion of the Montanhas do Tumucumaque National Park in the State of Amapá, northeastern Brazilian Amazonia (Fig. 4). Tumucumaque, which means "the rock on top of the mountain" in the language of the local Apalai and Wayana indigenous peoples, is a region characterized by its many granite outcrops (inselbergs) rising above the forest

TABLE 1.—Summary of diagnostic traits among species of the *Bachia heteropa* group. Data for *B. guianensis* taken from Hoogmoed and Dixon (1977), for *B. pallidiceps* from Dixon (1973) and McDiarmid and DeWeese (1977), and for *B. heteropa* from Dixon (1973) and examined specimens (n = 89; see Appendix). SVL, snout–vent length.

Trait	*Bachia remota* sp. nov.	*B. guianensis*	*B. heteropa*	*B. pallidiceps*
Supraocular scales (each side)	2	2	2 or 3	2
Supraciliary scales (each side)	2	3	2 or 3	2
Prefrontal scales	Absent	Present	Variable	Present
Interparietal scales	Absent	Absent	Present	Present
Transverse rows of dorsal scales	56	50	38–49	43–48
SVL (maximum)	86.7 mm	63 mm	64 mm	73 mm
Color pattern (dorsal of body and tail)	Homogeneous brown	Brown with four longitudinal series of white spots	Brown with three dark longitudinal stripes, alternating with four wider, lighter stripes	Homogeneous brown; brown with black median stripe, bordered by a golden tan to yellowish line

TABLE 2.—Summary of diagnostic traits among species of *Bachia* with occurrence in Amazonia, based on examined specimens (*B. flavescens*, *n* = 249; *B. panoplia*, *n* = 70; *B. pyburni*, *n* = 5; *B. dorbignyi*, *n* = 37; *B. peruana*, *n* = 18; see Appendix) and data from the literature (Cope 1868; Vanzolini 1961; Dixon 1973; Ávila-Pires 1995; Kizirian and McDiarmid 1998; Teixeira et al. 2013a, b). SVL = snout–vent length, X = presence.

Trait	*Bachia heteropa* group *Bachia remota* sp. nov.	*B. flavescens* group *B. flavescens*	*B. bresslaui* group *B. panoplia*	*B. pyburni*	*B. scolecoides*	*B. dorbignyi* group *B. dorbignyi*	*B. huallagana*	*B. peruana*	*B. scaea*	*B. trisanale*
Frontonasal scales	Present	Present	Present	Present	Present	Present	Present	Present	Present	Absent
Prefrontal scales	Absent	Absent	Present	Present	Present	Absent	Absent	Absent	Absent	Absent
Interparietal scales	Absent	Variable	Present	Present	Present	Absent	Absent	Absent	Absent	Absent
Supraocular scales (each side)	2	1 or 2	3	2	2	Absent	Absent	Absent	Absent	Absent
Supraciliary scales (each side)	2	2 or 3	3 or 4	3	3	2 or 3	2	2	2	2
Supralabial scales	6	5 or 6	6	7	8	6	5	5	6	5
Infralabial scales	5	4 or 5	6 or 7	6 or 7	7	5	4	5	5	4
Transverse rows of dorsal scales	56	46–52	48–54	52	?	47–55	47–54	53–57	51–54	47–55
Clawed fingers	4	Variable	4	4	4	3	3	3	3 digits without claws	3
SVL (maximum, in mm)	86.7	80	82	80	78	80	73	107	69	79
Hexagonal, smooth, imbricate dorsal scales	X					X	X	X	X	X
Quadrangular, smooth dorsal scales		X								
Hexagonal-lanceolate, keeled dorsal scales			X	X	X					
Rectangular, juxtaposed lateral scales	X	X				X	X	X	X	X
Hexagonal lateral scales			X	X	X					

(Fig. 5). The Mapaoni River is the main watercourse in the region. The type-locality is ~800 km southeast of the nearest recorded locality for a species of the *B. heteropa* group (Fig. 4).

The specimen of *B. remota* was encountered in the leaf litter of a dense terra firme forest scattered with rocky outcrops and boulders (Fig. 5). This is "typical forest of the southern Guiana Shield" (Bernard 2008:80,81), with a predominance of Leguminosae and Burseraceae. A more detailed description of the vegetation in the northwestern Montanhas do Tumucumaque National Park is found in Bernard (2008).

Discussion

In his seminal work on the lizards of the genus *Bachia*, Dixon (1973) commented that some species groups, including the *Bachia heteropa* group, require further investigation. The group currently includes species that once belonged to four distinct genera (*Chalcides*, *Brachypus*, *Scolecosaurus*, and *Bachia*), and five subspecies that were previously considered to be valid species: *Bachia h. heteropa* (Wiegmann 1856), *B. h. alleni* (Barbour 1914), *B. h. lineata* Boulenger 1903, *B. h. marcelae* Donoso-Barros and Garrido 1964, and *B. h. trinitatis* Barbour 1914. Recent molecular phylogenetic studies suggest that this species group is paraphyletic, although there is no consensus arrangement (Kohlsdorf and Wagner 2006; Galis et al. 2010; Kohlsdorf et al. 2010). Even so, the presence of hexagonal, imbricate dorsal scales and rectangular, juxtaposed ventral and lateral scales, together with the geographical distribution of *Bachia remota*, indicate that the new species is related to *B. heteropa*. Despite the considerable variation found among the species of this group, mainly among the *B. heteropa* subspecies, the diagnostic features of *B. remota* provide conclusive support for the new species. This new addition to the genus ends a long stasis in the taxonomy of the *B. heteropa* group, which had gone nearly four decades since the last description of a new species (Hoogmoed and Dixon 1977).

Relative to other species of terrestrial lizards, those in the genus *Bachia* are among the least commonly captured during field sampling, mainly because of their semifossorial and fossorial habits. The low sampling rate limits the collection of data on the natural history and reproductive behavior of the different species (Freitas et al. 2011), and this lack of basic information on their biology is an obstacle to a better understanding of the evolution of morphological traits within the genus, and in particular, the reduction of the limbs (Kohlsdorf et al. 2010). Only a few individuals are available in collections, so there is scant material for taxonomic review or the interpretation of species distributions and the biogeography of the group. This situation is even more critical for remote and understudied areas such as Amazonia. The discovery of *B. remota* reinforces the conclusion that the diversity of the genus is underestimated in this region.

Although lizard diversity in the Amazon region is among the largest in the world (Rodrigues 2005), the

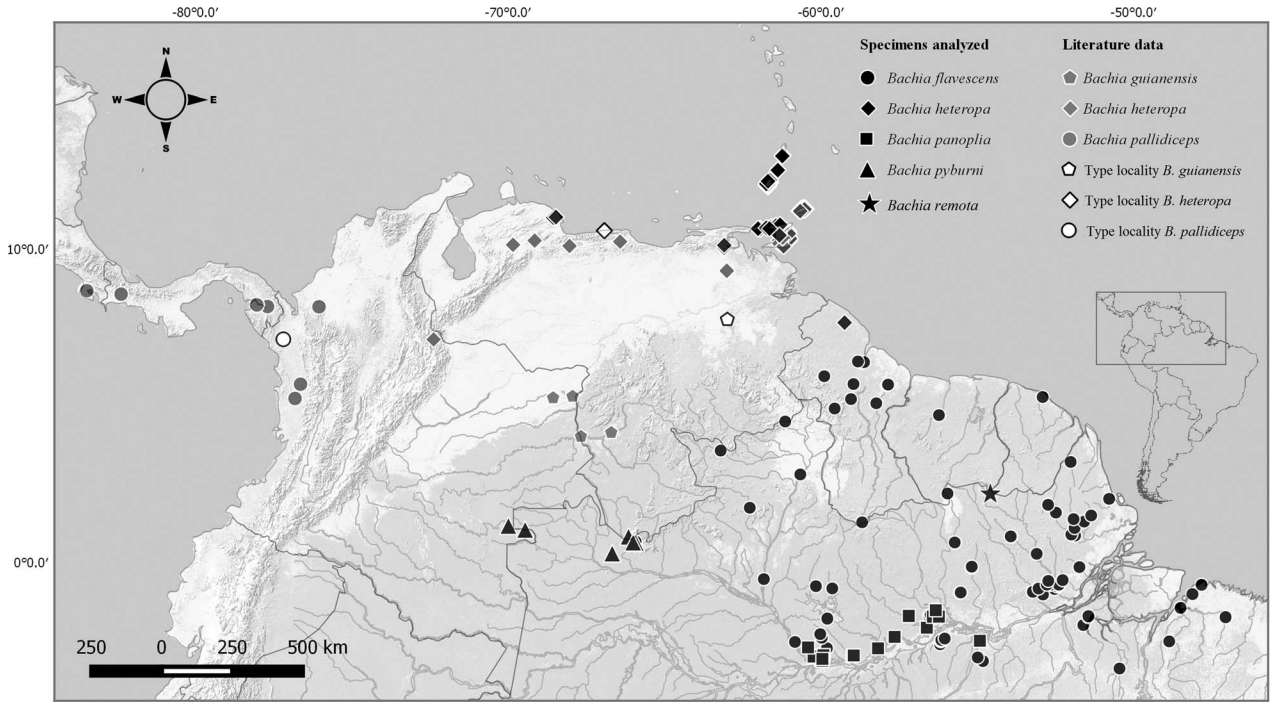

FIG. 4.—Distributional records of *Bachia* species of *B. heteropa* group in northern South America, southern Central America, and Lesser Antilles. Records of other *Bachia* species with distribution in the Guiana Shield are also included. Examined specimens are represented by black symbols, literature records by gray symbols, and the type localities of species of *B. heteropa* group by white symbols.

Wallacean shortfall (gaps in our knowledge of the distribution of organisms; Lomolino 2004) is still considerable. The new species described for the *B. heteropa* group was discovered in northeastern Brazilian Amazonia as a consequence of a rapid assessment of the Montanhas do Tumucumaque National Park (MTNP). Located in the Brazilian state of Amapá, and bordering French Guiana and Suriname, the MTNP covers 3,867,000 ha (the world's largest protected area of tropical forest) and ensures full protection of an important part of the Guiana Shield (Bernard and Funi 2008). The interior of the park is virtually uninhabited, and access is limited. As a consequence, the MTNP represents one of the few forested regions in Brazilian Amazonia still unaltered by humans (Bernard and

FIG. 5.—Habitat and microhabitat of *Bachia remota* sp. nov., at Parque Nacional Montanhas do Tumucumaque: (A) aerial view of the northwestern portion of the park, with the inselbergs emerging from the dense forest; and (B) detail of the location where the specimen was found (in the leaf litter among the rocks).

Funi 2008), and the new species is protected by the remoteness of the area of its known occurrence.

Key to the Groups of *Bachia*, Including the Species and Subspecies of the *B. heteropa* Group

This key is adapted from Dixon (1973) and does not reflect the phylogenetic relationships of the species.

1. Narrow, hexagonal dorsal scales 2
   Rectangular, smooth dorsal scales ..... *Bachia flavescens*
2. Smooth dorsal scales 3
   Keeled dorsal scales ..... *Bachia bresslaui* group
3. Hexagonal lateral scales; supraoculars absent ..... *Bachia dorbigyi* group
   Rectangular lateral scales; supraoculars present ..... *Bachia heteropa* group (4)
4. Interparietal scale present; <50 scales along a middorsal line (from nape to posterior margin of hindlimbs) 5
   Interparietal scale absent; >50 scales along a middorsal line 10
5. Two or three supraoculars and superciliaries; dorsal with three long-itudinal dark lines alternating with four wider, light interspace stripes 6
   Two supraoculars and superciliaries; dorsal with a black median stripe, bordered by a golden tan to yellowish line ..... *Bachia pallidiceps*
6. Prefrontals present; four toes on hindlimb 7
   Prefrontals absent; three or fewer toes on hindlimb 8
7. Prefrontals not in medial contact ..... *Bachia heteropa trinitatis*
   Prefrontals in medial contact ..... *Bachia heteropa alleni*
8. Hindlimb with two distinct toes 9
   Hindlimb with three distinct toes ..... *Bachia h. heteropa*
9. Seven rows of scales in front of pectoral shields ..... *Bachia heteropa lineata*
   Five rows of scales in front of pectoral shields ..... *Bachia heteropa marcelae*
10. Prefrontal scales present; three superciliary scales ..... *Bachia guianensis*
    Prefrontal scales absent; two superciliary scales ..... *Bachia remota* sp. nov.

Acknowledgments.—We are grateful to Conservação Internacional do Brasil, Instituto Chico Mendes de Conservação da Biodiversidade, Secretaria Estadual do Meio Ambiente, Corpo de Bombeiros, Cruz Vermelha do Brasil, and Exército Brasileiro for logistic support and funding. Thanks also to Projeto Corredor da Biodiversidade do Amapá and Instituto de Pesquisas Científicas e Tecnológicas do Estado do Amapá. We also thank D. Frost, D. Kizirian, J. Losos, R. Heyer, K. Tighe, H. Zaher, C. Castro-Mello, G. Colli, R. Vogt, T. Ávila-Pires, H. Chalkides, J. Lima, and R. Fernandes for access to specimens; and A. Dourado and A. Maciel for help with photographs. We thank A. Fouquet, S. Ferrari, the Editor, and two anonymous referees for feedback on earlier drafts of this manuscript. This work was supported in part by MCT/CNPQ/CT-INFRA/GEOMA (No. 61/2009). MAR-J thanks Conselho Nacional de Desenvolvimento Científico e Tecnológico/CNPq for a doctoral scholarship.

Resumo: Uma nova espécie de *Bachia* do grupo *heteropa* é descrita para o Parque Nacional Montanhas do Tumucumaque, nordeste da Amazônia, estado do Amapá, Brasil. A nova espécie assemelha-se morfologicamente a *B. heteropa* e *B. guianensis*. Contudo, a ausência das escamas pré-frontais e interparietal e o número de escamas supraciliares permitem a distinção da nova espécie das espécies mais próximas. Esta descrição aumenta a diversidade de espécies do grupo *B. heteropa* após várias décadas de estagnação na taxonomia deste grupo na Amazônia. Nós apresentamos também uma chave atualizada para os grupos de *Bachia,* incluindo as espécies e subespécies do grupo *B. heteropa*.

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Accepted on 16 December 2015
Associate Editor: Bryan Stuart

Appendix

Specimens Examined

Bachia dorbignyi (Duméril and Bibron 1839).—Brazil: Mato Grosso: INPA 15979, Araputanga; INPA 15980, Indiavaí; MZUSP 81604, 82647, Aripuanã; MZUSP 82421–24, Juruena; MZUSP 97912–21, UHE Guaporé. RONDÔNIA: CHUNB 22328–33, Guajará-Mirim; CHUNB 66674, Porto Velho; MNRJ 1729, Rio Manoel Correa, afluente a nordeste do Rio São Miguel, este afluente do Rio Guaporé; MPEG 20515–16, Parque Estadual Guajará-Mirim. Bolívia: AMNH 22525, Tumupasa; MCZ 20631–32, 29223, Buenavista; MZUSP 2063, Buenavista; USNM 283275, Beni Reserve, Rio Cureraba. Peru: USNM 269007, Puerto Maldonado, ~30 km airline SSW of, Tambopata Reserve.

Bachia flavescens (Bonnaterre 1789).—Brazil: Amapá: CHUNB 11076, Amapá; IEPA (FG 63), Ferreira Gomes; IEPA (JL 43), Igarapé do Braço; IEPA (FL 445, 459), Igarapé Santo Antônio; IEPA (TQ 154), Parque Nacional Montanhas do Tumucumaque, confl. dos Rios Amapari e Anacuí; IEPA (TQ 963–67, 969–71, 1080–81, 1083–87, 1095), Parque Nacional Montanhas do Tumucumaque, Rio Anacuí, margem esquerda do Rio Amapari; IEPA (TQ 420), Parque Nacional Montanhas do Tumucumaque, Rio Anotaie, margem direita do Rio Oiapoque; IEPA (TQ 720), Parque Nacional Montanhas do Tumucumaque, Rio Mutum, margem esquerda do Rio Araguari; IEPA (TQ 280, 342), Parque Nacional Montanhas do Tumucumaque, tríplice fronteira Brasil, Guiana Francesa e Suriname; IEPA (RS 27, 131), RDS Iratapuru; IEPA (LT 8), Resex Cajari; IEPA (TQ 936), Rio Anacuí; MPEG 26556–62, Laranjal do Jari, BR-156; MPEG 26555, N da comunidade de Maracá, BR-156; MPEG 1878, 19672–75, Serra do Navio, Projeto Amapari. Amazonas: INPA 1516, estrada da Vivenda Pontal sítio; INPA 11776, estrada para floresta, PDBFF; INPA 13136, Lago Xadá, margem esquerda do Rio Madeira; INPA 1216, 14860, 17642, 20943–47, 20957, 20959, 21222, 27589–90, Manaus; INPA 29466–67, Mineração Taboca; INPA 12007, Manaus, rodovia BR-174; INPA 18569, Parque Estadual Rio Negro Setor Sul; INPA 12755–62, 15112, 15142, Parque Nacional do Pico da Neblina; INPA 1405, Pitinga; INPA 17751, Reman, Refinaria Isaac Sabbá; INPA 30241–42, Reserva Extrativista do Rio Gregório; INPA 1186, Reserva Florestal Adolpho Ducke; INPA 856, Rio Pitinga, Presidente Figueiredo; INPA 192, UHE Balbina, Rio Uatumã, Igarapé Caititu; MCZ 141798–99, Manaus, confl. of Rio Amazonas with Rio Negro; MPEG 28393, Estação Ecológica de Anavilhanas, Rio Negro, base 2 do Ibama; MPEG 29341–42, Lindóia; MPEG 16781, Manaus; MZUSP 8352, km 50 Estrada Manaus–Itacoatiara; MZUSP 471, 8353, 10912, 26007, 28430, 51642, Manaus; MZUSP 57557, Reserva Ducke; MZUSP 60910–11, Reserva INPA–WWF, km 76 BR-174. Mato Grosso: CHUNB 46999, Alta Floresta; MZUSP 81686, Apiacás. Pará: CHUNB 40057–58, 44810, Novo Progresso; CHUNB 56268–69, Tailândia; INPA 26236–37, 27714–15, Floresta Nacional Trairão; INPA 12005, Treviso; LPHA 5347, Flona Tapajós; MCZ 3782, Curuca; MPEG 22894, 22897, 22899, Almeirim, área 127; MPEG 22889, 22896, Almeirim, área 56; MPEG 22890, Almeirim, área 91; MPEG 22906, Almeirim, Estação; MPEG 22888, 22901–05, 2290709, Almeirim, Pacanari; MPEG 22891–93, 22895, 22898, 22900, Almeirim, Quaruba; MPEG 27469–72, Almeirim, Rebio Maicuru; MPEG 12163–66, Almeirim, Tiriós, Rio Parú de Oeste; MPEG 5173, Belém; MPEG 8492, Capitão Poço; MPEG, 25217–18, Carajás, Mina do Sossego; MPEG 25216, Carajás, Noroeste II; MPEG 16511, 20328, 26858, ECFPn/MPEG, Flona Caxiuanã; MPEG 27583–89, Esec Grão Pará, centro; MPEG 27380, Esec Grão-Pará, Serra do Acaraí; MPEG 27309–14, Esec Grão-Pará, sul; MPEG 21598, 28288–90, Flona Saracá-Taquera; MPEG 27232, Flota Faro; MPEG 27554–56, Flota Paru; MPEG 27240–41, Flota Trombetas; MPEG 29285, Igarapé Xingu, Comunidade Maracanã; MPEG 21871, 25024, 25121, 25385–86, Juruti; MPEG 21969, Parna Amazônia; MPEG 24604–05, Portel, Fazenda Riacho Monte Verde, Precious Woods; MPEG 25757–58, Portel, Flona Caxiuanã, Plot PPBio; MPEG 24359–60, 24763, Porto Trombetas; MPEG 01, Rio Tapajós, Moreira, entre Brasília e Itaituba; MPEG 17609, Santarém, Agropecuária Treviso Ltda; MPEG 19047, Santo Antônio do Tauá, Granja Sonho Azul; MZUSP 72664, Monte Dourado. Rondônia: CHUNB 66103, Porto Velho. Roraima: MNRJ 4438, Boa Vista; MZUSP 49350, Cachoeira do Cujubim, Rio Catrimani; MZUSP 68930, marco de

fronteira BV-8; MZUSP 73273, Santa Maria do Boiaçu. French Guiana: AMNH 139912, 139959–61, Paracou, ~15 km by rd. SSE Sinnamary. Guyana: AMNH 137365–69, Kartabo; AMNH 130929, Awhyape Creek, trib. of Cuyuni River, 0.5 mi W of Skull Point Landing; AMNH 21269, Bartica Dist, nr. Kalacoon; AMNH 151916–29, Berbice River Camp, ~18 mi linear SW Kwakwani ~2 mi downriver from Kurudini River confl.; AMNH 140924, 140928, Dubulay Ranch on the Berbice River; AMNH 25084–85, Kamakusa; AMNH 151930–32, Magdalen's Creek Camp, nr. 300 yds NW bank of the Konawaruk River, ~25 mi linear WSW Mabura Hill; AMNH 140923, 140925–27, Warniabo Creek, 4 mi by rd. SW Dubulay ranch house; MCZ 81179, Kaburi; MCZ 21685, Chenapowu River; USNM 85012, Pickersgill, Pomeroon River; USNM 566422, Dubulay Ranch, on the Berbice River; USNM 566423–26, Kwakwani, ~18 mi airline SW of ~2 mi downriver from confl. of Berbice River and Kurudini River, Berbice River camp; USNM 566427, Mabura Hill, ~25 mi airline WSW of Magdalen's Creek camp, ~300 yds NW bank of the Konawaruk River. Suriname: MCZ 149339–40, Raleighvallen-Voltzberg Nature Reservation, W bank Coppename River, Lolapasi side.

Bachia heteropa (Wiegmann 1856).—Grenada: MCZ 79741, Beausejour; MCZ 9005–14, Grand Ebang; MCZ 4513, Grenada; MCZ 7793, 165544–45, St. George; MCZ 79742, Tufton Hall, St. Mark's; MZUSP 11911, Grand Etang. Guyana: MCZ 49062–63, Akvero rest. house, Aruka River, Barama District. Saint Vincent and the Grenadines: MCZ 79735–40, Petite, St. Vincent; MCZ 175138–40, Bequia, Friendship Bay. Trinidad and Tobago: AMNH 138767, Guanta Peninsula; MCZ 79819–21, 0.75 mi. N St. Joseph, Maracas Valley; MCZ 55675, Blanchiseuse; MCZ 8950–59, Caparo; MCZ 39689, Caura Valley; MCZ 160075, Port of Spain, Marakas bay rd. MCZ 22367–68, Port of Spain; MCZ 32521, Mt. Tucuche; MZUSP 6362, Caparo. Venezuela: AMNH 137630–34, Caripito; MCZ 48902–09, El Mene, Acosta District; MCZ 165546–67, Pauji, Acosta District; MCZ 43880, Yacua, Peninsula of Paria; MZUSP 3010–11, 7640–41, Pauji.

Bachia panoplia Thomas 1965.—Brazil: Amazonas: AMNH 64872–76 (Paratypes), 64877 (Holotype), 64878–82, Manaus; INPA 59–60, 241, 1517, 9053, 12612, 14862, 15827, 18736, 20090–91, Manaus; INPA 18570–71, Parque Estadual Rio Negro, Setor Sul; INPA 17724, 17752–56, Reman, Refinaria Isaac Sabbá; INPA 18734–35, Reserva Adolpho Ducke; INPA 8572, Reserva Adolpho Ducke, Igarapé Acará; INPA 16071, Reserva Extrativista Tupé; MPEG 29339, Itacoatiara; MPEG 29338, Lindóia; MPEG 16779–80, Manaus; MPEG 29340, Urucará; MZUSP 60598, Igarapé Tarumazinho, prox. Manaus; MZUSP 10910–11, 26008, 43008, 49285, 51282, 56857, 57329, 57561–62, 57638–39, 57852, 58814, 60597, 73011, Manaus; MZUSP 55706–07, Reserva Ducke. Pará: INPA 10669, Ilha Grande, Alter do Chão; LPHA 2762, 3739, Belterra; MPEG 21600, 22194, 24566, Flona Saracá-Taquera; MPEG 27233, Flota Faro; MPEG 29230, Igarapé Xingu, Comunidade Maracanã; MPEG 24131, Lago do Batata, Porto Trombetas; MPEG 29251, Oriximiná, Lago Sapucuá; MPEG 29648–49, Terra Santa, Igarapé Xingu.

Bachia peruana (Werner 1901).—Brazil: Acre: MPEG 20639, ~5 km N de Porto Walter, Rio Juruá; ZUEC 435–36, 438, Cruzeiro do Sul. Amazonas: INPA 30245–46, Reserva Extrativista do Rio Gregório. Peru: AMNH 56560–63, Chanchamayo; AMNH 56564, Orellano, Rio Ucayali Valley; AMNH 23212, 23414–15, Perene; AMNH 104278, Rio Llullapichis; AMNH 56557–59, 56565, Roaboya, Ucayali River Valley; MZUSP 51640, Rio Santa Rosa entre Pataccocha e San José.

Bachia pyburni Kizirian and McDiarmid 1998.—Brazil: Amazonas: INPA 12753–54, 14866–67, Parque Nacional do Pico da Neblina. Venezuela: USNM 344820, Neblina base camp on left bank of Rio Baria, Rio Mawarinuma.