

DISTRIBUTION NOTES

Range extensions and new departmental records for amphibians in Nicaragua

Nicaragua is located in the southern portion of Mesoamerica, and after Mexico is the second largest country in this area. Nevertheless, it is the third least herpetologically-diverse country in this megadiverse region, after Belize and El Salvador, and the least diverse of those that share Pacific and Atlantic (Caribbean) oceanic boundaries (Wilson and Johnson, 2010). Despite the interesting zoogeographic position of the country, compared with neighboring countries Nicaragua historically has received limited attention from herpetologists. During the last decade and a half, however, increased research in Nicaragua has resulted in the description of several new species of amphibians and reptiles, as well as in the addition of species to the country's list. Still, an inventory of the herpetofauna of Nicaragua is far from complete, and with advances in herpetological research several species recorded in adjacent Costa Rica and Honduras, in addition to undescribed endemic species, are expected to be found in the country (Sunyer and Köhler, 2010). From a herpetological perspective most of the 17 departments in Nicaragua remain understudied, and their habitats are under extreme pressure from uncontrolled deforestation, including in national protected areas.

As a result of recent field surveys, herein we report several range extensions and new departmental records for amphibian species in Nicaragua. We also provide a few natural history comments, and place each of the mentioned localities (Fig. 1) within the nine forest formations identified for the country based on the life zone concept proposed by Holdridge (1967) and used by Sunyer and Köhler (2010), as follows: Lowland Moist Forest (Aguazarca, Kahkabila, Muelle de los Bueyes, Moss, Wisconsin, Papaturro, Río Frío, Finca Santa Elena, Santo Domingo, and portions of Cerro Musún below 600 m a.s.l.); Lowland Dry Forest (Finca de Escameca Grande, Morgan's Rock, Finca Concepción de María, Chinandega, and portions of Volcán Momotombo and Volcán Mombacho below 600 m a.s.l.); Premontane Wet Forest (portions of Cerro Musún ranging from 600 to 1,200 m a.s.l.); Premontane Moist Forest (portions of Volcán Mombacho, Cerro Datanlí-El Diablo, and Cerro Kilambé ranging from 600 to 1,200 m a.s.l.); and Lower Montane Moist Forest (portions of Miraflores, Cerro Datanlí-El Diablo, and Cerro Kilambé above 1,200 m a.s.l.). El Abuelo corresponds to a transitional area between Lowland Moist and Dry forests. Lost Canyon corresponds to a transitional area between Lowland Dry and Arid forests. In addition, Kahkabila, Papaturro, El Abuelo, and lowlands located on the southern slope of Volcán Mombacho are immersed or surrounded by wetlands.

We handled all animals according to the approved IACUC standards and protocols (IACUC #16–13). We include photographs for all records that lack voucher specimens; the photographs are vouchered at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC). Acronyms for museum collections follow those of Sabaj-Pérez (2013). Collecting and exportation permits were authorized by the MARENA (Ministerio del Ambiente y los Recursos Naturales), Managua,

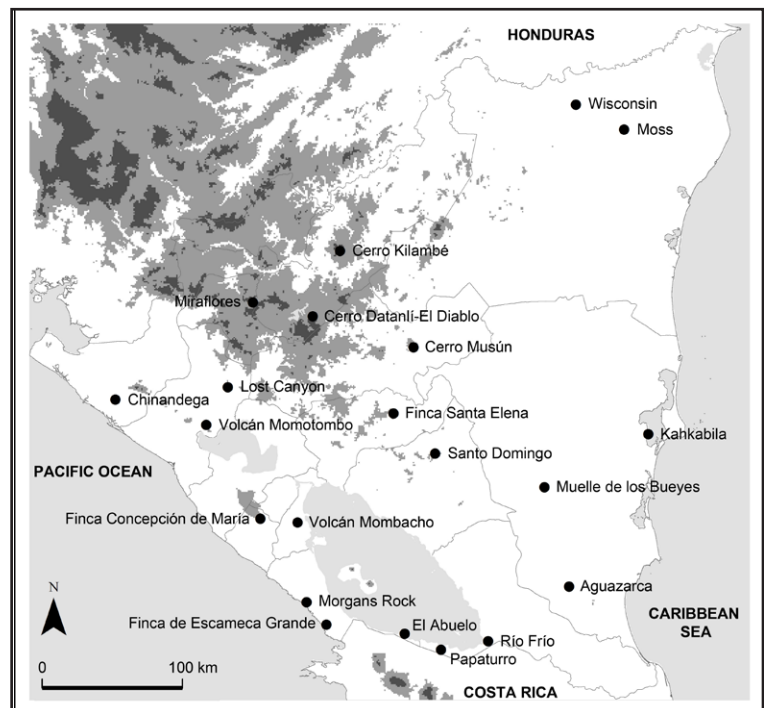


Fig. 1. Map of Nicaragua showing the collecting localities mentioned in the text. Water surfaces = pale gray; areas 600–1,200 m in elevation = gray; and areas above 1,200 m in elevation = dark gray.

Nicaragua. We thank Andreas Hertz, Armando Gómez, Darwin E. Manzanarez, Iris Garbayo, Jenny A. Gubler, John G. Phillips, Kirsten E. Nicholson, Luis Arauz, Luis Gutiérrez-López, Marlon Chávez, Maynor A. Fernández, and Sebastian Lotzkat for field assistance, Sean M. Rovito for molecular corroboration of one species, Justin Touchon for the loan of a photograph, Carl Franklin for providing museum voucher numbers for photographs, and Louis W. Porras for helpful suggestions that substantially improved the manuscript. JS was partially supported by the DAAD (Deutscher Akademischer Austausch Dienst), Germany. DMGU was supported by the Facultad de Ciencias, Universidad de Los Andes, Bogotá, Colombia, and the Wilhelm-Peters-Fond of the Deutsche Gesellschaft fuer Herpetologie und Terrarienkunde, Germany.

Order Caudata

Family Plethodontidae

Bolitoglossa striatula (Noble, 1918). GRANADA: Southern slope of Volcán Mombacho (11.77161°N, 85.96110°W, WGS84); elev. 66 m; 7 January 2011. José G. Martínez-Fonseca and Milton Salazar-Saavedra. We encountered an individual on a palm leaf. GRANADA: southern slope of Volcán Mombacho (11.77113°N, 85.95906°W, WGS84); elev. 59 m; 31 May 2012. José G. Martínez-Fonseca and Milton Salazar-Saavedra. We found another individual (UTADC-8196; Fig. 2A) under a fallen log. These salamanders represent a new departmental record, with their closest localities in the departments Chontales and Rivas (Noble, 1918; Villa, 1972).

Oedipina koehleri Sunyer, Townsend, Wake, Travers, Gonzalez, Obando, and Quintana, 2011. JINOTEGA: Reserva Natural Cerro Datanlí-El Diablo, El Gobiado (13.15784°N, 85.87355°W, WGS84); elev. 1,275 m; 3 October 2011. Javier Sunyer, José G. Martínez-Fonseca, and Maynor A. Fernández. Sean M. Rovito identified the specimen (MVZ 269556; Fig. 2B) through a molecular analysis. We found the salamander at night in a coffee plantation, under a fallen log. For this endemic species, the specimen represents (1) an elevational record, exceeding the previously-known elevational range by 330 m, (2) the northwesternmost record, (3) the fourth known locality, and (4) a new departmental record, with the closest locality in the department of Matagalpa (Sunyer et al., 2011).

Order Anura

Family Bufonidae

Incilius melanochlorus (Cope, 1877). RIVAS: Reserva Silvestre Privada El Abuelo (11.12556°N, 85.28386°W, WGS84); elev. 51 m; 7 June 2013. José G. Martínez-Fonseca and Milton Salazar-Saavedra. We came across a single individual (UTADC-8197; Fig. 2C) of this species at night in a rocky area, which represents (1) the northwesternmost distributional record for the species, (2) the third known locality in Nicaragua, and (3) a new departmental record, with the closest locality in the department of Río San Juan (Köhler et al., 2004; Sunyer et al., 2009).

Rhaebo haematiticus Cope, 1862. CHONTALES: Santo Domingo, Reserva Silvestre Privada Las Brumas (12.28°N, 85.09°W, WGS84); elev. 562 m; 20 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. UTADC-8198; Fig. 2D. We found two individuals on the ground at night in a disturbed patch of forest, which represent a new departmental record; the closest localities are in the departments Matagalpa (see below) and Atlántico Sur (Brattstrom and Howell, 1954; Köhler, 2001). MATAGALPA: Reserva Natural Cerro Musún, La Canoga (12.95874°N, 85.22723°W, WGS84); elev. 628 m; 8 July 2006. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. We found a single specimen (SMF 87964, Fig. 2E) of this bufonid at night, between flat rocks on the shore of a permanent stream. It represents the westernmost recorded locality in Nicaragua, and a new departmental record with the closest localities in departments of Chontales (see above), Atlántico Norte, and Jinotega (Noble, 1918; Köhler, 2001; King et al., 2007).

Family Centrolenidae

Cochranella granulosa (Taylor, 1949). CHONTALES: Santo Domingo, Reserva Silvestre Privada Las Brumas (12.28°N, 85.09°W, WGS84); elev. 562 m; 21 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. UTADC-8199; Fig. 2F. We found two individuals calling and guarding egg masses at night, at ca. 3 m above the ground on a tree above a permanent stream, in a disturbed patch of forest. CHONTALES: Santo Domingo, B2GOLD mining concession (12.25878°N, 85.07110°W, WGS84); elev. 482 m; 20 April 2013. Milton Salazar-Saavedra and Luis Arauz. UTADC-8200; Fig. 2G. We discovered an additional five individuals calling at night while perched > 5 m above the ground on trees above a small stream, in a patch of disturbed forest. Collectively, these individuals represent a new departmental record, with their closest locality in the department of Matagalpa (Villa, 1972; Köhler, 2001).

Hyalinobatrachium fleischmanni (Boettger, 1893). CHONTALES: Santo Domingo, Reserva Silvestre Privada Las Brumas (12.28°N, 85.09°W, WGS84); elev. 562 m; 20 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. UTADC-8201; Fig. 2H. We observed three of these centrolenids calling and in amplexus at night, at a height of ca. 3–7 m above the ground in trees above a permanent stream in a disturbed patch of forest. CHONTALES: Santo Domingo, B2GOLD mining concession (12.25122°N, 85.06617°W, WGS84); elev. 455 m; 8 November 2012. Milton Salazar-Saavedra and Luis Arauz. UTADC-8202; Fig. 3A. We found 16 individuals calling and in amplexus at night, at a height > 5 m above the ground on trees above a small stream in a disturbed patch of forest. These frogs represent a new departmental record, with the closest locality in the department of Boaco (Villa, 1972). JINOTEGA: Reserva Natural Cerro Datanli-El Diablo, La Esmeralda (13.08550°N, 85.86508°W, WGS84); elev. 1,157 m; 3 August 2005. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. We collected a single specimen (SMF 84919) calling at night (2115 h) while perched ca. 1.7 m above the ground on herbaceous vegetation along the shore of a permanent and relatively large stream. JINOTEGA: Reserva Natural Cerro Kilambé (13.57767°N, 85.69914°W, WGS84); elev. 1,303–1,356 m; 13 August 2005. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. We captured four specimens (SMF 84920, 98534–36) calling at night (2030–0030 h) while on herbaceous vegetation or perched on trees at a height of 1–10 m above the ground, on the shore of a permanent stream. These specimens represent a new departmental record, with the closest localities in the departments of Atlántico Norte and Matagalpa (Mayorga, 1967; Köhler, 2001).

Teratohyla pulverata (Peters, 1873). BOACO: Camoapa, Finca Santa Elena (12.53579°N, 85.35665°W, WGS84); elev. 530 m; 16 September 2009. Javier Sunyer and Lenin A. Obando. We found a single member of this species (MHUL 164, Fig. 3B) at night, while calling from vegetation ca. 1 m above a permanent stream. The specimen represents a new departmental record, with the closest locality in the department of Matagalpa (Köhler, 2001).

Family Craugastoridae

Pristimantis cerasinus (Cope, 1875). MATAGALPA: Reserva Natural Cerro Musún, La Canoga (12.95874°N, 85.22723°W, WGS84); elev. 628 m; 8 July 2006. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. We collected one specimen (SMF 87821) at night on vegetation 1 m above the ground, which represents a new departmental record; the closest locality is in department of Atlántico Norte (Köhler, 2001).

Pristimantis ridens (Cope, 1866). CHONTALES: Santo Domingo, Reserva Silvestre Privada Las Brumas (12.28°N, 85.09°W, WGS84); elev. 562 m; 20 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. We found one individual (UTADC-8203; Fig. 3C) at night on vegetation ca. 1 m above the ground, in a disturbed patch of forest. CHONTALES: Santo Domingo, B2GOLD mining concession (12.25823°N, 85.07630°W, WGS84); elev. 531 m; 8 November 2012. Milton Salazar-Saavedra and Luis Arauz. (UTADC-8204; Fig. 3D). We found two individuals at night, calling from vegetation near a small stream in a disturbed patch of forest. They represent a new departmental record, with the closest localities in the departments of Atlántico Sur and Río San Juan (Noble, 1918; Köhler, 2001).

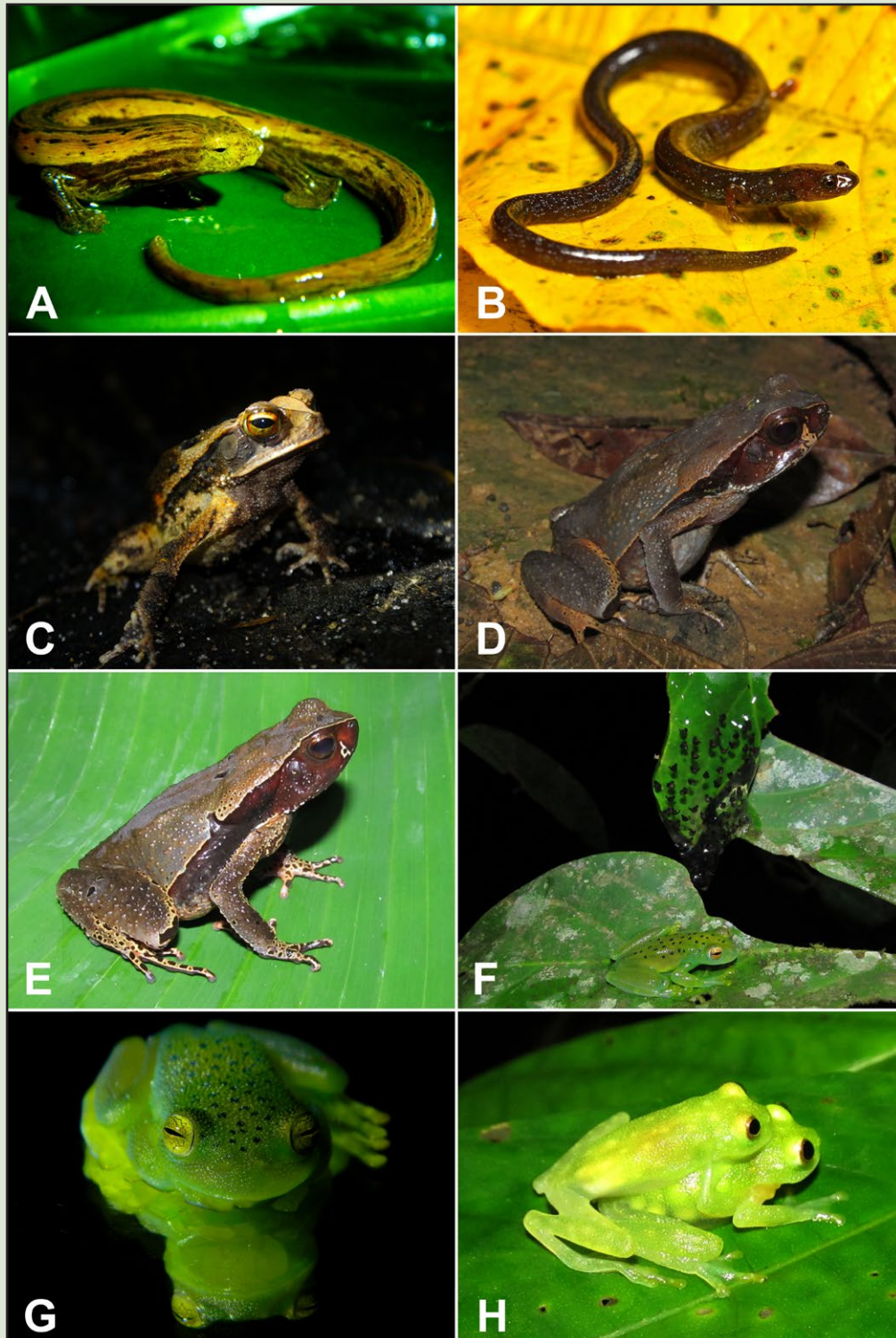


Fig. 2. (A) *Bolitoglossa striatula* from the department of Granada; (B) *Oedipina koehleri* from the department of Jinotega; (C) *Incilius melanochlorus* from the department of Rivas; (D) *Rhaebo haematiticus* from the department of Chontales; (E) *R. haematiticus* from the department of Matagalpa; (F and G) *Cochranella granulosa* from the department of Chontales; and (H) *Hyalinobatrachium fleischmanni* from the department of Chontales.

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Family Eleutherodactylidae

Diasporus diastema (Cope, 1875). CHONTALES: Santo Domingo, Reserva Silvestre Privada Las Brumas (12.28°N, 85.09°W, WGS84); elev. 562 m; 20 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. UTADC-8205; Fig. 3E. We observed two individuals at night, calling from trees at a height of ca. 2 m above the ground in a disturbed patch of forest. They represent a new departmental record, with the closest localities in the departments of Atlántico Sur and Matagalpa (Noble, 1918; Gaige et al., 1937; Köhler, 2001).

Family Hylidae

Agalychnis callidryas (Cope, 1862). CARAZO: Reserva Silvestre Privada Finca Concepción de María (11.86207°N, 86.20999°W, WGS84); elev. 132 m; 24 May 2012. Milton Salazar-Saavedra. We encountered one individual (UTADC-8206; Fig. 3F) at night, perched on a palm leaf in a coffee plantation; it represents a new departmental record, with the closest localities in the departments of Granada, Managua, and Masaya (Köhler, 2001; Savage and Heyer, 1967). CHONTALES: Santo Domingo, Reserva Silvestre Privada Las Brumas (12.28°N, 85.09°W, WGS84); elev. 562 m; 21 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. UTADC-8207; Fig. 3G. We found several dozen of these hylids at night in back of the reserve's building, calling from trees at heights up to 4 m above the ground. They represent a new departmental record, with the closest localities in the departments of Atlántico Sur and Boaco (Noble, 1918; Köhler, 2001; Savage and Heyer, 1967). ESTELÍ: Reserva Natural Miraflores (13.24722°N, 86.25750°W, WGS84); elev. 1,325 m; 5 June 2005. Javier Sunyer and Darwin E. Manzanarez. We collected a single specimen (SMF 84941) at 1900 h, about 1 m above the ground on herbaceous vegetation along a permanent lagoon. It represents a new departmental record, with the closest locality in the department of Jinotega (Savage and Heyer, 1967; Köhler, 2001).

Dendropsophus ebraccatus (Cope, 1874). ATLÁNTICO NORTE: Río Wawa, Moss (14.35449°N, 83.87750°W, WGS84); elev. 30 m; 11 October 2007. Javier Sunyer and Darwin E. Manzanarez. We captured three of these frogs (SMF 87971–72, 98453) at night, while in amplexus and calling from banana plants that emerged from a seasonal pond in a pasture. ATLÁNTICO SUR: Laguna de Perlas, Kahkabila (12.40339°N, 83.72230°W, WGS84); elev. 5 m; 26 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. UTADC-8208; Fig. 3H. We spotted five individuals at about 2100 h, calling from herbaceous vegetation that emerged from a large permanent pond. ATLÁNTICO SUR: Muelle de los Bueyes (12.06289°N, 84.38754°W, WGS84); elev. 286 m; 12 December 2013. José G. Martínez-Fonseca, Marlon Chávez, and Luis Gutiérrez-López. UTADC-8209; Fig. 4A. We found three members of this species at night in a seasonal pond. BOACO: Camoapa, Finca Santa Elena (12.53579°N, 85.35665°W, WGS84); elev. 530 m; 18 September 2009. Javier Sunyer and Lenin A. Obando. UTADC-8210; Fig. 4B. We saw six individuals at night, calling from herbaceous vegetation that emerged from a seasonal pond in a cattle field. CHONTALES: Santo Domingo, B2GOLD mining concession (12.26092°N, 85.06662°W, WGS84); elev. 640 m; 21 July 2012. Milton Salazar-Saavedra and Luis Arauz. UTADC-8211; Fig. 4C. We found 15 individuals at night, while in amplexus and calling from herbaceous vegetation on the shore of a large deep pond. JINOTEGA: Reserva Natural Cerro Datanlí-El Diablo, El Volcán (13.13108°N, 85.84258°W, WGS84); elev. 998 m; 1 August 2005. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. We collected five specimens (SMF 84890, 98454–57, Fig. 4D) at 2130 h, calling from herbaceous vegetation that emerged from a pond adjacent to a small permanent lagoon. JINOTEGA: Reserva Natural Cerro Datanlí-El Diablo, La Esmeralda (13.08411°N, 85.87319°W, WGS84); elev. 1,147 m; 2 August 2005. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. SMF 84891, 98458. We found two of these hylid frogs at 2000 h, calling from herbaceous vegetation that emerged from a pond adjacent to a small permanent lagoon. JINOTEGA: Reserva Natural Cerro Kilambé, La Escuelita (13.61834°N, 85.72208°W, WGS84); elev. 1,012 m; 15 August 2005. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. We came across three specimens (SMF 84892–93, 98459) at 2200 h, calling from herbaceous vegetation that emerged from a pond adjacent to a small permanent lagoon. In total, we report new departmental records for Atlántico Norte, Boaco, Chontales, and Jinotega, as well as for the mainland of Atlántico Sur. Previously, this species was poorly known in Nicaragua, reported only from the departments of Atlántico Sur (where its distribution was restricted to the Corn Islands), Matagalpa, and Río San Juan (Duellman, 1970; Villa, 1972; Köhler, 2001; Sunyer et al., 2009).

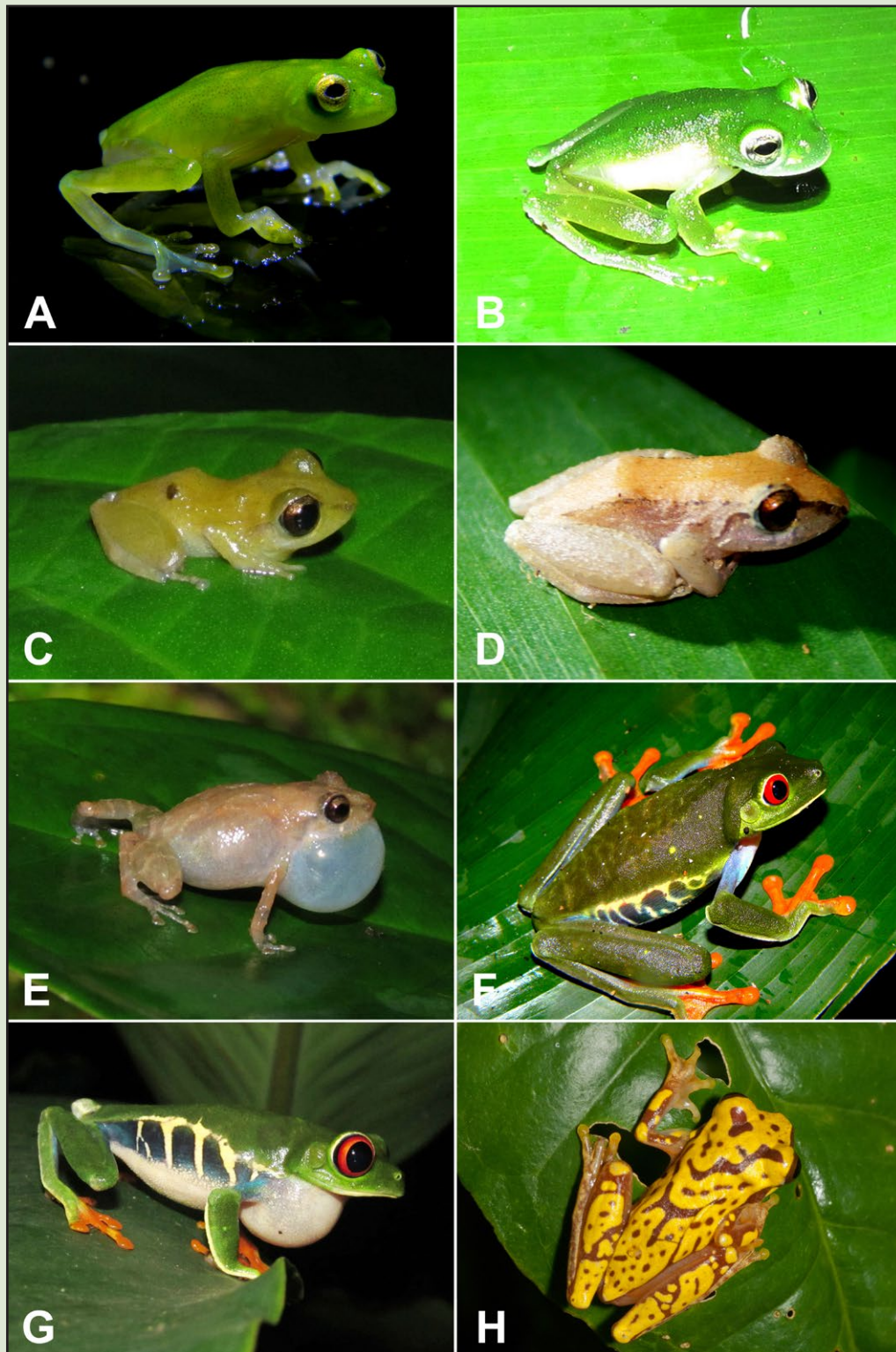


Fig. 3. (A) *Hyalinobatrachium fleischmanni* from the department of Chontales; (B) *Teratohyla pulverata* from the department of Boaco; (C and D) *Pristimantis ridens* from the department of Chontales; (E) *Diasporus diastema* from the department of Chontales; (F) *Agalychnis callidryas* from the department of Carazo; (G) *A. callidryas* from the department of Chontales; and (H) *Dendropsophus ebraccatus* from the department of Atlántico Sur.

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Scinax boulengeri (Cope, 1887). BOACO: Camoapa, Finca Santa Elena (12.53579°N, 85.35665°W, WGS84); elev. 530 m; 17 September 2009. Javier Sunyer and Lenin A. Obando. We obtained one frog (MHUL 165) at night, calling from a leaf ca. 1 m above a permanent stream. The specimen represents the northwesternmost record in Nicaragua, as well as a new departmental record with the closest localities in the departments of Atlántico Sur and Chontales (Noble, 1918; Gaige et al., 1937; Duellman, 1970; Villa, 1972; Köhler, 2001). RIVAS: Reserva Silvestre Privada El Abuelo (11.11216°N, 85.26927°W, WGS84); elev. 39 m; 28 October 2012. José G. Martínez-Fonseca, Luis Gutiérrez-López, and Milton Salazar-Saavedra. We found one individual (UTA-8212; Fig. 4E) at night, on a bush ca. 90 cm above the ground in a disturbed patch of forest close to Lago de Nicaragua. This voucher represents the westernmost locality in the country for the species and a new departmental record, with the closest locality in the department of Río San Juan (Noble, 1918; Villa, 1972).

***Scinax staufferi* (Cope, 1865). LEÓN: El Jicaral, San Juan de Dios, Lost Canyon Nature Reserve (12.70403°N, 86.41782°W, WGS84); elev. 142 m; 28 May 2007. Javier Sunyer and Lenin A. Obando. We encountered three specimens (SMF 87287–88, 98685, Fig. 4F) at night, calling from herbaceous vegetation that emerged from a seasonal pond adjacent to a permanent stream. They represent a new departmental record, with the closest localities in the departments of Chinandega, Estelí, and Managua (Mayorga, 1967; Köhler, 2001).**

Smilisca phaeota (Cope, 1862). BOACO: Camoapa, Finca Santa Elena (12.53579°N, 85.35665°W, WGS84); elev. 530 m; 16 September 2009. Javier Sunyer and Lenin A. Obando. MHUL 166. We happened upon three frogs calling in a chorus at night while floating in a small artificial pool; they represent a new departmental record, with the closest localities in the departments of Chontales and Matagalpa (Villa, 1972; Köhler, 2001).

Smilisca sordida (Peters, 1863). MATAGALPA: Reserva Natural Cerro Musún, Palán, Bilampí (13.02572°N, 85.23908°W, WGS84); elev. 458 m; 16 July 2006. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. We found a single frog (SMF 86777) at night in the back of a ranch, on vegetation growing in a flooded pasture with scattered bushes nearby. It represents a new departmental record, with the closest localities in the departments of Atlántico Sur and Jinotega (Duellman, 1970; Travers et al., 2011).

Tlalocohyla loquax (Gaige and Stuart, 1934). ATLÁNTICO NORTE: Wisconsin (14.51403°N, 84.18591°W, WGS84); elev. 76 m; 19 June 2010. Javier Sunyer, Kirsten E. Nicholson, Jenny A. Gubler, John G. Phillips, and Lenin A. Obando. We captured one specimen (MHUL 167) at night, on a bush above a seasonal roadside pond. It represents the northeasternmost record in Nicaragua, and a new departmental record with the closest localities in the departments of Jinotega, Matagalpa, Boaco, and Atlántico Sur, where its distribution is restricted to the Corn Islands (Duellman, 1970; Köhler, 2001).

Trachycephalus typhonius (Linnaeus, 1758). CARAZO: Reserva Silvestre Privada Finca Concepción de María (11.86064°N, 86.20946°W, WGS84); elev. 132 m; 24 May 2012. Milton Salazar-Saavedra. We found one individual (UTADC-8213; Fig. 4G) in a coffee plantation, perched on a palm leaf at night. This voucher represents a new departmental record, with the closest localities in the departments of Granada and Managua (Villa, 1972; Köhler, 2001). LEÓN: Reserva Natural Complejo Volcánico Momotombo (12.46240°N, 86.55661°W, WGS84); elev. 108 m; 15 October 2010. José G. Martínez-Fonseca and Milton Salazar-Saavedra. We encountered a single individual (UTADC-8214; Fig. 4H) at night, ca. 1.3 m above the ground on a small tree. It represents a new departmental record, with the closest localities in the departments of Chinandega and Managua (Duellman, 1970; Villa, 1972; Köhler, 2001). RÍO SAN JUAN: Refugio de Vida Silvestre Los Guatuzos, Río Frío, Estación Fundeverde (11.07694°N, 84.74881°W, WGS84); elev. 45 m; 4 June 2006. Javier Sunyer, Darwin E. Manzanarez, Andreas Hertz, and Sebastian Lotzkat. We secured one specimen (SMF 87944) at night, on herbaceous vegetation in swampy area along Senda Peter. RÍO SAN JUAN: Refugio de Vida Silvestre Los Guatuzos, Río Frío, Estación Fundeverde (11.07869°N, 84.75145°W, WGS84); elev. 37 m; 28 April 2010. José G. Martínez-Fonseca and Luis Gutiérrez-López. We observed one frog (UTADC-8215; Fig. 5A) at night while it was raining, perched on the wall of a house located near a seasonal pond. RÍO SAN JUAN: Refugio de Vida Silvestre Los Guatuzos, Papaturro (11.02278°N, 85.05139°W, WGS84); elev. 40 m; 20 July 2007. Javier Sunyer, Iris Garbayo, and Armando Gómez. We collected

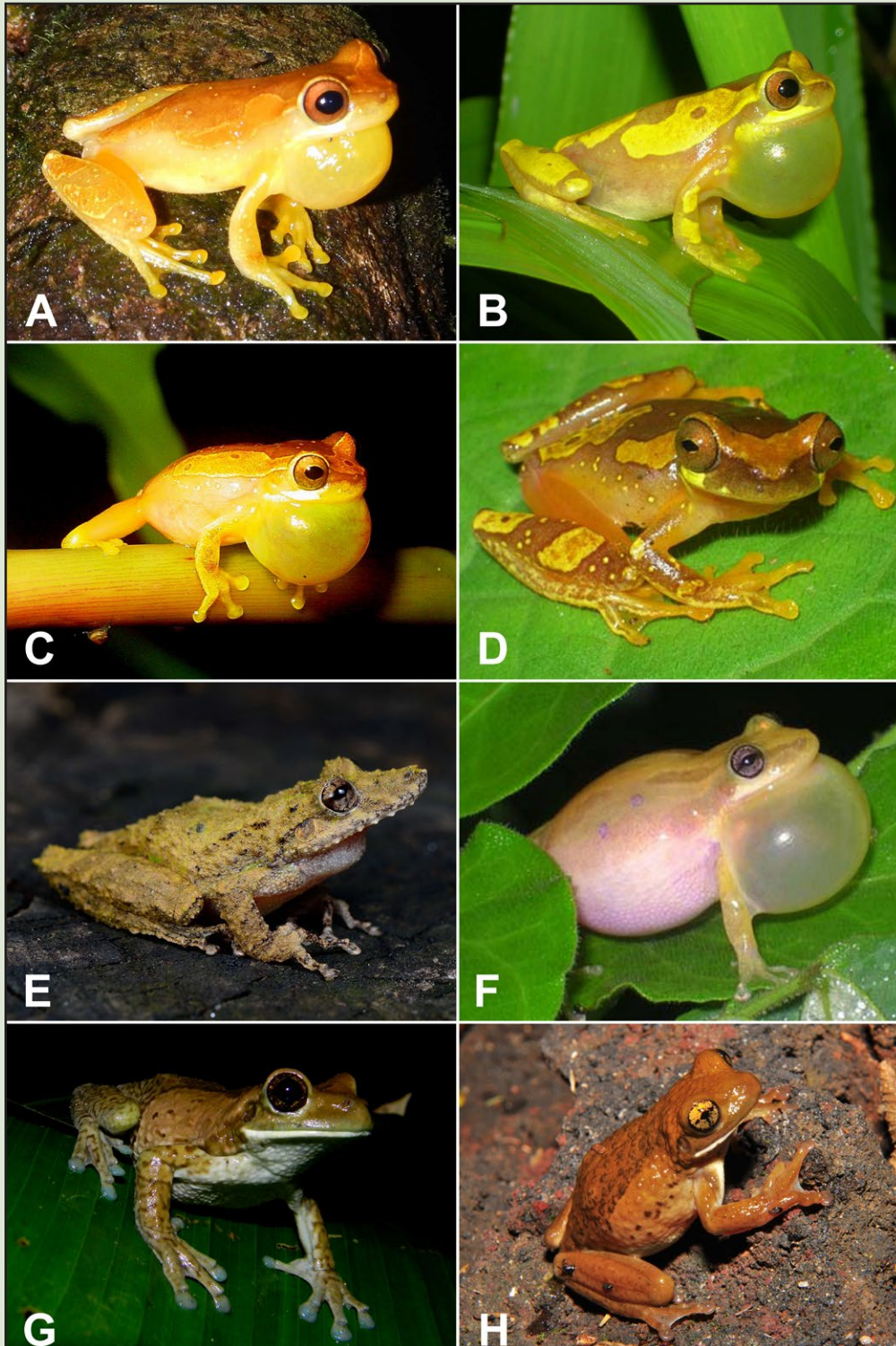


Fig. 4. (A) *Dendropsophus ebraccatus* from the department of Atlántico Sur; (B) *D. ebraccatus* from the department of Boaco; and (C) *D. ebraccatus* from the department of Chontales; (D) *D. ebraccatus* from the department of Jinotega; (E) *Scinax boulengeri* from the department of Rivas; (F) *Scinax staufferi* from the department of León; (G) *Trachycephalus typhonius* from the department of Carazo; and (H) *T. typhonius* from the department of León.

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four specimens (SMF 87942–43, 98732–33; Fig. 5B) at night in the town of Papaturro, perched on small trees above a swampy area adjacent to Río Papaturro. They represent a new departmental record, with the closest locality in adjacent Costa Rica (Duellman, 1970). RIVAS: Morgan's Rock (11.32692°N, 85.91389°W, WGS84); elev. 37 m; 10 September 2006. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. SMF 87941, 98731. We found two frogs (SMF 87941, 98731) at night while it was raining. We encountered SMF 87941 on the ground next to a small seasonal pond, and SMF 98731 calling from the branch of a nearby tree at ca. 12 m above the ground. RIVAS: Finca de Escameca Grande (11.18284°N, 85.78684°W, WGS84); elev. 28 m; 13 December 2011. José G. Martínez-Fonseca and Marlon Chávez. We found one individual (UTADC-8216; Fig. 5C) at night on a small tree at ca. 4.5 m above the ground and ca. 5 m away from a seasonal stream, which was dry at the time. This voucher represents a new departmental record, with the closest localities in the departments of Río San Juan (see above) and Granada (Köhler, 2001).

Family Leptodactylidae

Engystomops pustulosus (Cope, 1864). GRANADA: Reserva Natural Volcán Mombacho (11.83831°N, 85.99277°W, WGS84); elev. 739 m; 19 May 2010. Javier Sunyer, Kirsten E. Nicholson, Jenny A. Gubler, John G. Phillips, and Lenin A. Obando. MHUL 168. We found five of these anurans calling at night while floating in artificial pools used for harvesting coffee. They represent a new departmental record, with the closest localities in the departments of Carazo, Managua, and Rivas (Mayorga, 1967; Köhler, 2001).

Leptodactylus fragilis (Brocchi, 1877). ATLÁNTICO SUR: Laguna de Perlas, Kahkabila (12.40339°N, 83.72230°W, WGS84); elev. 5 m; 25 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. We discovered one frog (MHUL 169) on the ground at night, near a large permanent pond in the town of Kahkabila. This specimen represents a new departmental record, with the closest localities in the departments of Atlántico Norte, Boaco (see below), Chontales, and Río San Juan (Köhler, 2001; Heyer et al., 2006; Sunyer et al., 2009). BOACO: Camoapa, Finca Santa Elena (12.53579°N, 85.35665°W, WGS84); elev. 530 m; 17 September 2009. Javier Sunyer and Lenin A. Obando. We encountered a single frog (MHUL 170) at night, calling from a small hole in the ground in a cattle field. It represents a new departmental record, with the closest localities in the departments of Granada and Chontales (Köhler, 2001; Heyer et al., 2006).

Leptodactylus savagei Heyer, 2005. CHONTALES: Santo Domingo, Reserva Silvestre Privada Las Brumas (12.28°N, 85.09°W, WGS84); elev. 562 m; 22 July 2012. Javier Sunyer and Diana M. Galindo-Urbe. We came across one individual (UTADC-8217; Fig. 5D) of this large leptodactylid at night, on the ground in a disturbed patch of forest. It represents a new departmental record, with the closest localities in the departments of Boaco and Atlántico Sur (Noble, 1918; Gaige et al., 1937; Brattstrom and Howell, 1954; Villa, 1972; Köhler, 2001; Heyer, 2005). RIVAS: Reserva Silvestre Privada El Abuelo (11.11216°N, 85.26927°W, WGS84); elev. 39 m; 30 August 2011. José G. Martínez-Fonseca and Luis Gutiérrez-López. UTADC-8218; Fig. 5E. We found five individuals at 2210 h in holes in the ground on the shore of Lago de Nicaragua, close to a small permanent stream. They represent the westernmost record for this species in Nicaragua and a new departmental record, with the closest locality in the department of Río San Juan (Villa, 1972; Köhler, 2001; Sunyer et al., 2009).

Family Microhylidae

Hypopachus pictiventris (Cope, 1886). ATLÁNTICO SUR: Aguazarca (11.42720°N, 84.23068°W, WGS84); elev. 97 m; 16 April 2014. José G. Martínez-Fonseca, Luis Gutiérrez-López, and Lenin A. Obando. We observed one frog (UTADC-8218; Fig. 5F) at 1940 h, in leaf litter in a small patch of forest surrounded by cattle fields. Although this frog does not constitute a new record for the department nor a range extension, it closes a wide gap in the distribution of this rare species in southern Nicaragua and represents the third known locality for the country (Köhler, 2001).

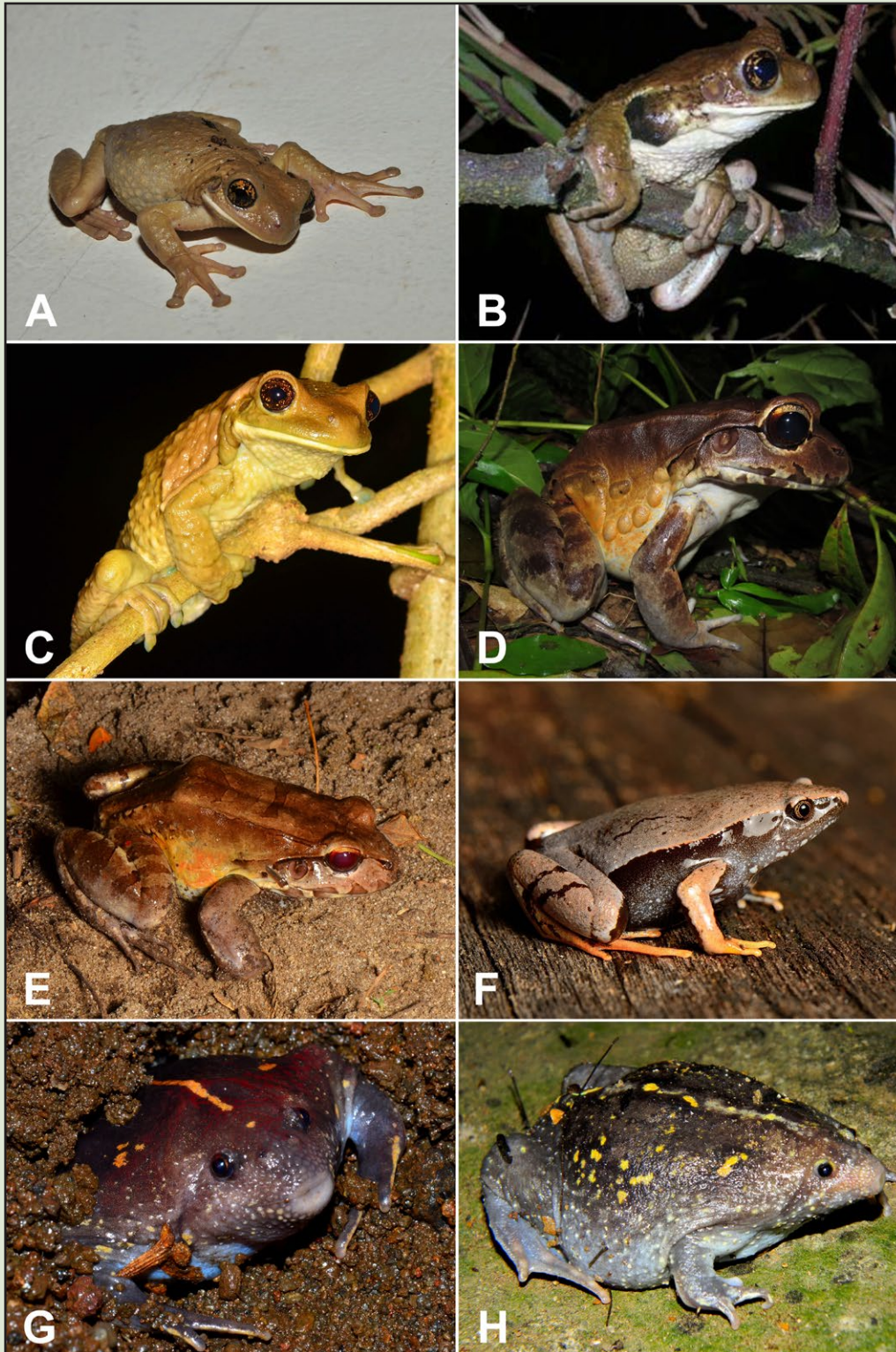


Fig. 5. (A and B) *Trachycephalus typhonius* from the department of Río San Juan; (C) *T. typhonius* from the department of Rivas; (D) *Leptodactylus savagei* from the department of Chontales; (E) *L. savagei* from the department of Rivas; (F); *Hypopachus pictiventris* from the department of Atlántico Sur; (G) *Rhinophrynus dorsalis* from the department of Chinandega; and (H) *R. dorsalis* from the department of Granada.

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Hypopachus variolosus (Cope, 1866). RIVAS: Morgan's Rock (11.32692°N, 85.91389°W, WGS84); elev. 37 m; 11 September 2006. Javier Sunyer, Lenin A. Obando, and Darwin E. Manzanarez. We found two of these microhylids (SMF 88076, 98540) calling at night during heavy rains, while floating in small seasonal ponds. They represent a new departmental record, with the closest localities in the departments of Carazo and Granada (Villa, 1972; Nelson, 1974).

Family Rhinophrynidae

Rhinophrynus dorsalis Duméril and Bibron, 1841. CHINANDEGA: Chinandega, Barrio El Rosario (12.62550°N, 87.13926°W, WGS84); elev. 61 m; 30 August 2014. Milton Salazar-Saavedra. We observed one frog (UTADC 8221; Fig. 5G) in the backyard of a house around midnight, during heavy rain. It represents a new departmental record, with the closest locality in the department of León (Villa, 1984; Sunyer and Köhler, 2007). GRANADA: Southern slope of Volcán Mombacho (11.77114°N, 85.95770°W, WGS84); elev. 62 m; 7 February 2012. José G. Martínez-Fonseca and Milton Salazar-Saavedra. UTADC-8220; Fig. 5H. We saw five individuals at night in a pond surrounded by palm forest. They represent a new departmental record, with the closest locality in the department of León (Villa, 1984; Sunyer and Köhler, 2007).

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