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**First record of *Agalychnis callidryas* Cope, 1862 (Anura:
Phyllomedusidae) for the extreme northwest from
Nicaragua.**

Ricardo Soza



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Foto de Portada: *Agalychnis callidryas* from Volcán Casitas, Chichigalpa. (Photo: Ricardo Soza).

First record of *Agalychnis callidryas* Cope, 1862 (Anura: Phyllomedusidae) for the extreme northwest from Nicaragua.

Ricardo Soza¹

RESUMEN

Se presenta un nuevo registro para la Rana de Ojos Rojos (*Agalychnis callidryas*) en Nicaragua, el nuevo registro es para el extremo noroeste de Nicaragua, a 105 km de su registro más cercano (El Crucero, Managua), también se presenta una distribución actualizada de esta especie en Nicaragua.

Palabras clave: *Agalychnis callidryas*, distribución, nuevo registro, Chinandega, Nicaragua.

ABSTRACT

A new record is presented for the Red-eyed Frog (*Agalychnis callidryas*) in Nicaragua, the new record is for the extreme northwest from Nicaragua, at 105 km from its closest record (El Crucero, Managua), an updated distribution of this species is also presented in Nicaragua.

Key words: *Agalychnis callidryas*, distribution, new record, Chinandega, Nicaragua.

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INTRODUCTION

In Nicaragua there are 76 species of Amphibians (Class Amphibia), grouped into three orders and 14 families (Sunyer, 2014; McCranie, 2017; Villa, 2015). Phyllomedusidae is a small group in the herpetofauna of Nicaragua, this family includes two genera and three species: *Agalychnis callidryas*, *Agalychnis saltator* and *Cruziohyla sylviae* (Sunyer, 2014; Gray, 2018).

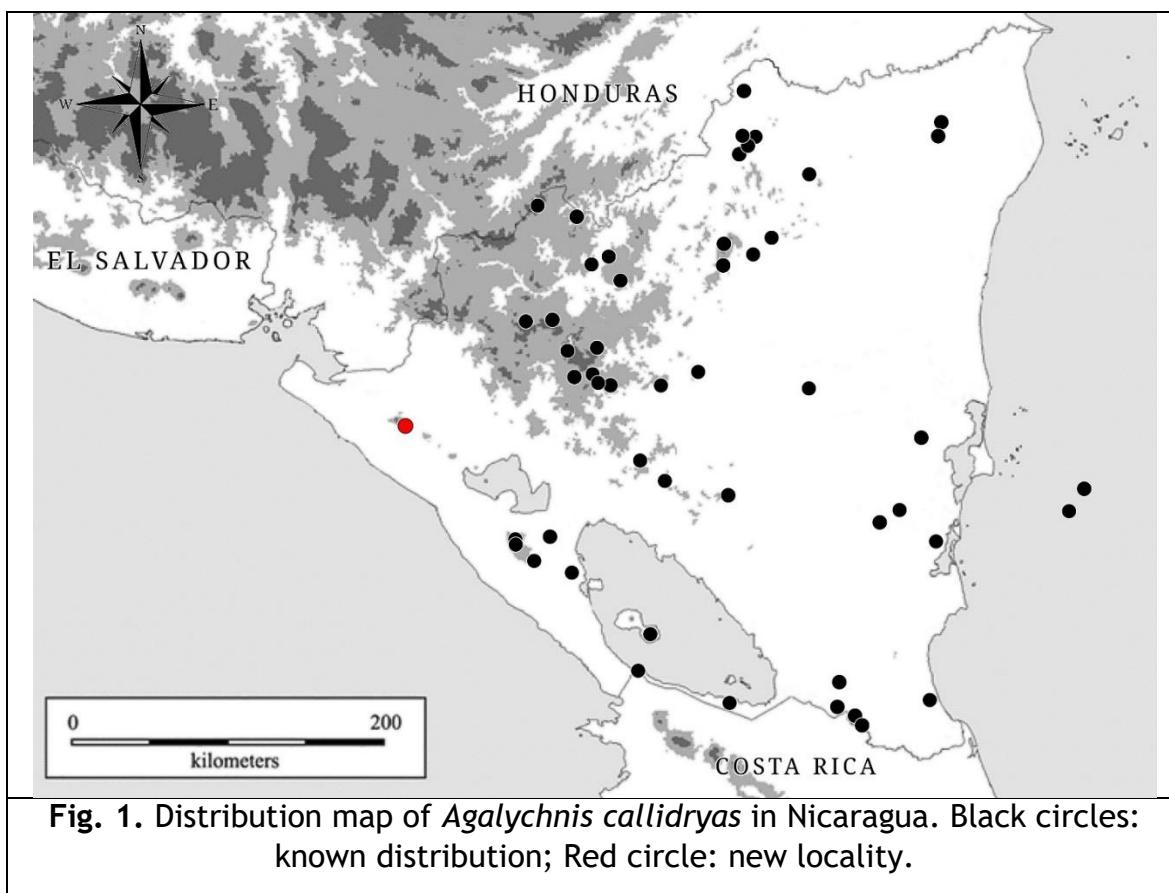
Phyllomedusidae is a family of anurans commonly known as monkey frogs, this family contains 65 species and eight genera (*Agalychnis*, *Callimedusa*, *Cruziohyla*, *Hylomantis*, *Phasmahyla*, *Phrynomedusa*, *Phyllomedusa* and *Pithecopus*), they are distributed from tropical Mexico to Argentina (Duellman *et al.*, 2016). Phyllomedusidae was originally described by Günther (1858), this group was considered a subfamily of the family Hylidae (Savage, 2002; Miranda-Ribeiro, 1926), results of genetic and morphological studies of Bossuyt & Roelants (2009) and Duellman *et al.* (2016) raise this taxon to “Family”. This family differs from the others by the following characteristics, based on Duellman *et al.* (2016): (1) Iris vertically elliptical; (2) arciferal pectoral girdle, eight procoelous presacral vertebrae; (3) separate calcaneum and astragalus; (4) intercalary cartilages between terminal and penultimate phalanges; (5) claw-shaped terminal phalanges; (6) SVL from 45-119 mm; (7) Chromosome complement $2n=26$.

Agalychnis callidryas (red-eyed frog) is distributed by Atlantic lowlands of Veracruz and Oaxaca, Mexico to the southeast in the Caribbean lowlands of Central America, to central Panama; through the Pacific lowlands of southern Costa Rica and eastern Panama, up to Chocó, Colombia, from sea level to 1325 m altitude (Köhler, 2011). In Nicaragua, *Agalychnis callidryas* is distributed in the Caribbean slope, center and in some volcanoes of the Pacific slope of Nicaragua, from 10 to 1470 m elevation. It has been found in the departments of Atlántico Norte, Atlántico Sur, Boaco, Carazo, Chontales, Estelí, Granada, Jinotega, Managua, Masaya, Matagalpa, Nueva Segovia, Rio San Juan and Rivas (Köhler, 2001; Sunyer *et al.*, 2014; García-Roa *et al.*, 2014) in low and humid regions and cloud forests.

Specimens and localities of *Agalychnis callidryas* reported from Nicaragua.

Locations and specimens of *Agalychnis callidryas* according to: Köhler, 2001; Sunyer *et al.*, 2014; García-Roa *et al.*, 2014; Villa, 1972a; Villa, 1972b; Sunyer *et al.*, 2009; Duellman, 1970; Barbour & Loveridge, 1929; Mayorga, 1967; Barquero *et al.*, 2010; Gómez *et al.*, 2011; King *et al.*, 2007; Savage & Heyer, 1967; Vences & Schmitt, 1991; Hofmann *et al.*, 2016; Martínez-Fonseca *et al.*, 2019 and Sunyer, 2009. Other specimens and museum numbers, extracted from: VertNet (2016).

The abbreviations of the museums or collections are the following ones: AMNH: American Museum of Natural History; CRB: Collection of Refugio Bartola; FMNH: Field Museum of Natural History; FU: Florida Museum of Natural History; JS: Collection of Javier Sunyer; JV: Collection of Jaime Villa; KU: University of Kansas, Museum of Natural History; LACM: Natural History Museum of Los Angeles; MCZ: Museum of Comparative Zoology; MPM: Milwaukee Public Museum; MVZ: The Museum of Vertebrate Zoology; MZUT: Museo di Zoologia. Instituto di Anatomia Comparata Università di Torino; OMNH: Osaka Museum of Natural History; SMF: Senckenberg Forschungsinstitut und Naturmuseum; UMMZ: University of Michigan, Museum of Zoology; UPRM: Universidad de Puerto Rico; USNM: National Museum of Natural History; UTA: University of Texas at Arlington; UTADC: University of Texas at Arlington Collection of Vertebrates, Digital Collection



Agalychnis callidryas (Cope, 1862:14). NICARAGUA: not specify locality: USNM 14186; FHMN 51584; USNM 13737 (holotype: *Agalychnis helena* Cope, 1885[1884]); “Nicaragua”: LACM 1224; Atlántico Norte: Siuna ($13^{\circ}44'18.91''N$, $84^{\circ}47'05.66''W$), 185 m; Intersection road Puerto Cabezas-Waspám with road to Moss ($14^{\circ}26'06.50''N$, $83^{\circ}52'24.92''W$), 100 m: SMF 88020; Finca URACCAN ($13^{\circ}43'44.1''N$, $84^{\circ}53'14.5''W$), 145 m: SMF 84944; Moss, along Río Wawa ($14^{\circ}21'16.19''N$, $83^{\circ}52'38.99''W$), 30 m: SMF 88019; Rancho Alegre

($13^{\circ}39'47.5''N$, $85^{\circ}01'38.9''W$), 285-315 m: JS 033, JS 064, SMF 84942-43; Reserva de Biosfera Bosawas, Urus Was ($14^{\circ}17.773'N$, $84^{\circ}55.111'W$), 220 m: N 344, N 357; Masawas, Rio Huaspuc: AMNH 58432; Reserva de Biosfera Bosawas, Laka Papan ($14.369467^{\circ}N$, $84.906983^{\circ}W$), 220 m: UF 156088; Atlántico Sur: 4.5 km NW Rama: MPM 12900-04; 2.5 mi NW Rama: TCWC 55557-60; Rio Escondido, 50 mi from Bluefields: UMMZ 19907, UMMZ 20699; Bluefields, 10 m: FMNH 60885; El Recreo, S side Rio Mico, 25 m: KU 112740; Little Corn Island: MCZ 14849- 50; Great Corn Island: JV 69075; Cukra: AMNH 7360; Rio Grande: AMNH 2636; Boaco: 14 km N and 13 km E Boaco, 360 m: KU 112741; 30 km E Boaco: KU 173658; Carazo: Diriamba; Reserva Silvestre Privada Finca Concepción de María ($11.86207^{\circ}N$, $86.20999^{\circ}W$), 132 m: UTADC 8206; Reserva Silvestre Privada Finca Concepción de María, Municipio de Dolores ($11.86160^{\circ}N$, $86.21200^{\circ}W$), 600 m; Chinandega: southern slope of the Volcán Casitas ($12.66969^{\circ}N$, $86.96924^{\circ}W$), near the community of Pikin Guerrero (=Versalles), Chichigalpa, 654 m (new record); Chontales: Santo Domingo, Reserva Silvestre Privada Las Brumas ($12.28^{\circ}N$, $85.09^{\circ}W$), 562 m: UTADC 8207; Estelí: Reserva Natural Miraflores ($13^{\circ}14'50''N$, $86^{\circ}15'27''W$), 1325 m: SMF 84941; Granada: Reserva Natural Volcán Mombacho ($10^{\circ}50.02'N$, $85^{\circ}58.75'W$), 1150 m: SMF 78145-51; Jinotega: Reserva Natural Cerro Datanlí-El Diablo, El Gobiado ($13^{\circ}10'23.0''N$, $85^{\circ}51'24.6''W$), 1230 m: SMF 84947, MVZ 263741; Reserva Natural Cerro Datanlí-El Diablo, La Esmeralda ($13^{\circ}05'02.8''N$, $85^{\circ}52'23.5''W$), 1150 m: JS 236, SMF 84948; Reserva Natural Cerro Kilambé ($13^{\circ}35'07.7''N$, $85^{\circ}42'17.1''W$), 1010 m: SMF 84949; Reserva Natural Cerro Kilambé, Caballo Blanco ($13^{\circ}35'22.3''N$, $85^{\circ}44'34.3''W$), 1045 m: SMF 84946; Reserva Natural Cerro Kilambé, El Diamante ($13^{\circ}36'51.3''N$, $85^{\circ}44'20.2''W$), 1090 m: JS 111, SMF 84945; Reserva de Biosfera Bosawas, Aran Dak ($14^{\circ}31.03'N$, $84^{\circ}59.86'W$), 150 m: N 445, SMF 88022, SMF 88037; Reserva de Biosfera Bosawas, between Raití and Aran Dak, 165 m: SMF 88028; Reserva de Biosfera Bosawas, Kulum Kitang ($14^{\circ}19.8'N$, $84^{\circ}56.2'W$), 180 m: SMF 88029; Reserva de Biosfera Bosawas, Siwi Was ($14^{\circ}23.266'N$, $84^{\circ}58.795'W$), 180 m: SMF 88023, SMF 88025; Reserva de Biosfera Bosawas, Tuburus, 190m: SMF 88026; Parque Nacional Cerro Saslaya ($13^{\circ}40.12'N$, $85^{\circ}0.79'W$), 188 m: SMF 78976; Finca Berlín ($13^{\circ}32.26'N$, $85^{\circ}41.50'W$), 1015 m: SMF 78973-75; Jinotega, 1050 m: FMNH 51584, KU 173657; Reserva Silvestre Privada El Jaguar ($13^{\circ}14'15.9''N$, $86^{\circ}03'22''W$), 1250 m; Reserva de Biosfera Bosawas, Limi Tingni ($14.578017^{\circ}N$, $84.994283^{\circ}W$), 139 m: UF 156089; Municipio de Wiwilí ($13.62375^{\circ}N$, $85.798633^{\circ}W$), 353 m: UF 156087; Managua: Lago de Managua: MZUT an893; Casa Colorada, Las Nubes, 960 m: KU 173660-725, KU 173656; Hacienda El Castillo, Sierras de Managua: UPRM 2057-59, UPRM 2061-62, MCZ 56302; Masaya: Casa Colorada, 22 km S Managua, 850 m: KU 84943, KU 85371-75; Matagalpa: Reserva Natural Cerro Musún, Fundenic ($12^{\circ}57'18.8''N$, $85^{\circ}13'51.2''W$), 630 m: JS 727, SMF 88018; Selva Negra ($12^{\circ}59.96'N$, $85^{\circ}54.55'W$), 1260-1340 m: SMF 77878, SMF 78143-44; Selva Negra, El Mirador ($13.00000^{\circ}N$, $85.91666^{\circ}W$), 1260-1340 m: FU 156375; Finca Tepeyac, 10.5 km N, 9 km E Matagalpa, 960 m: KU 85376- 84, KU 87703; Hacienda La Cumplida, 750 m: KU 63938-39, KU 64067, KU 68166, KU 68527; Hacienda San Pablo, Matagalpa: UPRM 2189-91; Matagalpa: UMMZ 118666, UMMZ 118413, UMMZ 116475-77; UTA 51784, UTA 173657; Municipio de Matiguás ($12.833333^{\circ}N$, $85.466667^{\circ}W$), 300 m; Nueva

Segovia: Cerro Jesús, Jalapa (13.984° N, 86.190° W), 1080-1470 m; Arenal, 48 km E Jalapa: LACM 74766; Río San Juan: Los Guatuzos, along Río Papaturro (11.0227° N, 85.0513° W), 40 m: SMF 88021, SMF 88024; Refugio Bartola ($10^{\circ}58.37'N$, $84^{\circ}20.35'W$), 30 m: SMF 79780, SMF 82145; CRB 066; Reserva Silvestre Privada El Quebracho ($11^{\circ}09'58''N$, $84^{\circ}24'21''W$), 60 m; Rio Indio (11.0423° N, 83.8792° W), 10 m: MVZ 269142; Rio San Juan: by Isla El Diamante: OMNH 33352; Rivas: Reserva Natural Volcán Maderas, Isla de Ometepe (11.442° N, 85.512° W), 810-1250 m; road between Sapoá and Peñas Blancas: KU 173659.

NEW RECORD

On November 21, 2017, Ricardo Soza collected an adult male *Agalychnis callidryas* (Fig. 2 A) on the southern slope of the Volcán Casitas (12.66969° N, 86.96924° W; WGS 84); 654 m elevation, near the community of Pikin Guerrero (=Versalles), in the Municipio de Chichigalpa, Departamento de Chinandega. The specimen was active at 1930 h. singing near a pool of temporary waters, the amphibian was found 1.86 meters high on a low branch of a tree of Guarumo (*Cecropia peltata*), in the Dry Premontane Forest (Holdridge, 1967), characteristic of that area. The Complejo Volcánico San Cristóbal Casitas is a protected area of 179.64 km^2 under the category of “Natural Reserve” belonging to the Sistema Nacional de Áreas Protegidas (SINAP) of the Republic of Nicaragua. It was established by Decree Law 1320 of the year 1983. This is the first record of this species for the far northeast of Nicaragua. The new record is located to 105 km from its nearest registry in El Crucero, Managua (Köhler, 2001; Sunyer, 2009).

The specimen is a male of medium size SVL 61.3 mm; tympanum distinct; disk on fingers III equal than tympanum; spines nuptial present, have a brown color; subgular sac visible; dorsal surface green color, had light green color on the back, hands and feet red or orange, red eyes with vertical pupil black color, flanks with yellow markings on a bluish background, belly cream. There was the possibility that it was a specimen introduced in that area, so an investigation was conducted in all the nearby communities to determine if the specimen was someone's pet or it was introduced either intently or purposely. The surveys were made but no result was obtained.



Fig. 2. A: *Agalychnis callidryas* from the Volcán Casitas, Chichigalpa (Photo: Ricardo Soza). B: Habitat of *A. callidryas* in the Volcán Casitas. C: Aerial view of the Volcán Casitas (ViaNica.com). D: Mummification of Phyllomedusidae in the Volcán Cosigüina (extracted from Medina & Salazar-Saavedra, 2006).

DISCUSSION

Medina & Salazar-Saavedra (2006) in their monographic thesis conducted a study in the buffer zones of the Volcán Cosigüina, in the Municipio de El Viejo, Chinandega, where they found a mummification of what could be a species of the family Phyllomedusidae (genus *Agalychnis* or *Phyllomedusa* Fig. 2 D). This specimen is located 72 km from the possible population of the Volcán Casitas. Both populations must be severely linked.

Funkhouser (1957) divides the populations of *Agalychnis callidryas* into 2 subspecies, *Agalychnis c. callidryas* (Central America, from Guatemala to Panama), and *Agalychnis c. taylori* (Mexico), both subspecies were rejected by Savage & Heyer (1967).

During the investigation carried out in the Volcán Casitas, only one male specimen was found, which means that it is a sparse population. Future research on the southern slope of the Volcán Casitas, I hope, give better results for a better study of the population of amphibians and reptiles in the Volcán Casitas.

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