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A new species of Microteiid Lizard (Gymnophthalmidae, Cercosaurini, *Selvasaura*) from a remote area in the Peruvian Andes

Germán Chávez[1,2], Luis A. García-Ayachi[1,2], Alessandro Catenazzi[1,2,3]

1 *Instituto Peruano de Herpetología (IPH), Augusto Salazar Bondy 136, Urb. Higuereta, Surco, Lima, Peru*
2 *Centro de Ornitologia y Biodiversidad (CORBIDI), Lima, Peru*
3 *Department of Biological Sciences, Florida International University, Miami, FL, USA*

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Corresponding author: Germán Chávez (vampflack@yahoo.com)

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Abstract

We describe a new species of *Selvasaura* lizard from the western slopes of the eastern Andes of central Peru. Among other characters, the new species differs from congeners in having keeled dorsal scales and more transverse rows of scales on dorsum. We present a phylogeny as additional evidence supporting delimitation of the new species.

Key Words

New species, eastern Andes, central Peru, phylogeny

Introduction

Since the beginning of this century, molecular phylogenetic studies have brought some light into the taxonomy of the neotropical gymnophthalmid lizards of the subfamily Cercosaurinae (Pellegrino et al. 2001; Doan 2003; Doan and Castoe 2005; Goicoechea et al. 2012, 2013; Torres-Carvajal et al. 2016; Sánchez-Pacheco et al. 2017, 2018; Kok et al. 2018; Moravec et al. 2018; Fang et al. 2020; Vásquez-Restrepo et al. 2020; Rojas-Runjaic et al. 2021). These authors uncovered new relationships between species and revised gymnophthalmid taxonomy by describing new species and genera, and by assigning named species into new clades (Doan and Castoe 2005; Goicoechea et al. 2012; Torres-Carvajal et al. 2016; Kok et al. 2018; Moravec et al. 2018; Sánchez-Pacheco et al. 2018; Lehr et al. 2019; Fang et al. 2020; Lehr et al. 2020; Vásquez-Restrepo et al. 2020; Rojas-Runjaic et al. 2021). *Selvasaura* is one of the recently named genera (Moravec et al. 2018) and contains three species: *S. almendarizae* Torres-Carvajal, Parra, Sales-Nunes & Koch, 2021, *S. brava* Moravec, Šmid, Štundl & Lehr, 2018 and *S. evasa* Echevarría, Venegas, García-Ayachi & Nunes, 2021. All of them are reported to be diurnal, and total or partially arboreal (Moravec et al. 2018; Echevarría et al. 2021; Torres-Carvajal et al. 2021). Yet, molecular phylogenetic analyses suggest that *Selvasaura* contains at least one more unnamed species to be described (Torres-Carvajal et al. 2016; Moravec et al. 2018; Echevarría et al. 2021; Torres-Carvajal et al. 2021). Certainly, Torres-Carvajal et al. (2021) identified a population from southeastern Ecuador as an undescribed lineage.

However, more unnamed species of *Selvasaura* may occur than those previously reported. The western side of the eastern Andes in northern Peru have been poorly explored. Thus, explorers of these mountains often discover new species and report new distribution records (Venegas et al. 2013; Beraún et al. 2014; Twomey et al. 2014; Echevarría et al. 2015; Torres-Carvajal et al 2015; Cusi et al. 2017; Echevarría et al. 2021; Venegas et al. 2021). New species discoveries are more likely at specific, previously unexplored sites. This is the case for the forests on the western slopes of the eastern Andes of central Peru. Little scientific work has been performed there, and the region links with terrorism and drug traffic in the 1980s and 1990s made explorations unsafe. Nevertheless, the pacification process starting in the early 2000s has allowed scientists to explore the region. Aware of the potential of this area, one of us (GC) performed a small field survey in a montane forest in Huánuco Department in June 2018 and collected three specimens of a rare terrestrial gymnophthalmid lizard. Herein we describe these specimens as a new species of *Selvasaura* based on morphological and molecular evidence.

Materials and methods

Fieldwork

We collected specimens in the morning while conducting opportunistic visual surveys in the upper Chontayacu River, central Peru, in October 2018. We euthanized specimens with T61 (Embrutamide), fixed them in 10% formalin, and stored them in 70% ethanol. Before fixation, we obtained tissue samples (liver) from all individuals and stored them in absolute ethanol. We fixed everted hemipenes of the holotype and paratype CORBIDI 21866 using hot water, following Zaher (1999). Specimens and tissue samples are deposited in the Herpetology Collection of Centro de Ornitología y Biodiversidad (CORBIDI). All specimens captured for this study are covered by permit RJ N° 003-2014-SERNANP-RCS-JEF029-2016-SERFOR-DGGSPFFS issued by Servicio Nacional de Areas Protegidas de Peru.

Morphology

The format of the description and terminology of the morphological characters follow Oftedal (1974), Chávez et al. (2017), Sánchez-Pacheco et al. (2018), Moravec et al. (2018), and Echevarría et al. (2021). The specimens were sexed by gonads exposition. Specimens with SVL ≤ 30 mm were considered juveniles. We took measurements using precision callipers and rounding to the nearest 0.1 mm. For characters recorded on both sides, we present data as right/left. We follow Sánchez-Pacheco et al. (2018) for hemipenial terminology. We used high-resolution photographs taken in the field and follow Köhler (2012) to describe the coloration in life of the type series. Morphological data for *Selvasaura brava* were taken from original description (Moravec et al. 2018). Revised specimens are listed in Appendix 1. Habitat is described based on GC field notes. Threat status was evaluated using the criteria of the IUCN Red List of Threatened Species (IUCN 2022). High-resolution versions of photographs of the type specimens (including additional photographs not shown in this article) have been uploaded to MorphoBank (project number: 4511; http://www.morphobank.org), where they are available for download.

Genetic analyses

We analysed DNA sequences of the new species to confirm generic placement and to investigate its phylogenetic affinities. We obtained fragments of the nuclear oocyte maturation factor gene (c-mos), and the three mitochondrial genes: small subunit rRNA (*12S*), large subunit rRNA (*16S*), and NADH dehydrogenase subunit 4 (*ND4*) from the holotype (CORBIDI 21865) and adult paratype (CORBIDI 21866). We extracted DNA from samples of muscle tissue preserved in 90% ethanol. We used the primers and protocols for the polymerase chain reactions described in Moravec et al. (2018). We purified PCR products with Exosap-IT (Affymetrix, Santa Clara, CA, USA), and shipped purified products to MCLAB (San Francisco, CA, USA) for sequencing in both directions. We deposited new sequences in GenBank (Appendix 2). Additionally, we obtained sequences from GenBank (https://www.ncbi.nlm.nih.gov/genbank/) of 17 additional terminals (Appendix 2). We choose outgroups according to Moravec et al. (2018), i.e., *Petracola ventrimaculata* and species of the genera *Cercosaura* and *Proctoporus*. We used Geneious, version 11.1.5 (Biomatters, http://www.geneious.com/) to assemble pair end reads, to generate a consensus sequence, and to align our novel and GenBank sequences with the MAFFT v7.017 alignment program. We trimmed aligned sequences and concatenated all sequences for a total length of 1935 bp (346 bp for *12S*, 509 bp for *16S*, 644 bp for *ND4*, and 436 bp for *c-mos*). Our analysis included 19 terminals. We employed a Maximum Likelihood inference approach using IQ-TREE v1.6.12 (Nguyen et al. 2015) for phylogenetic inference of the concatenated sequence of the four gene fragments. We used the GTR+G+I substitution model for the three mitochondrial genes, and HKY+G+I for *c-mos* following Moravec et al. (2018), and ran analyses with the ultrafast bootstrap method (10,000 bootstrap alignments).

Nomenclatural act

The electronic version of this article in Portable Document Format (PDF) will represent a published work according to the International Commission on Zoological Nomenclature (ICZ), and hence the new name contained in the electronic version is effectively published under that Code from the electronic edition alone. This published work and the nomenclatural acts it contains have been registered in ZooBank, the online registration system for the ICZN. The ZooBank LSIDs (Life Science Identifiers) can be resolved and the associated information viewed through any standard web browser by appending the LSID to the prefix http://zoobank.org/. The LSID for this publication is: urn:lsid:zoobank.org:pub: F76580A7-0F79-4109-8F0F-4047EDC2A223.

Results

Generic placement

The phylogeny using three mitochondrial and one nuclear gene fragments confirms the generic placement of the new species within *Selvasaura* (Fig. 1). According to our Maximum Likelihood tree, the new species is the sister taxon of the recently described *S. almendarizae* and of an unnamed species of *Selvasaura* from El Pangui, Zamora-Chinchipe Province, Ecuador (QCAZ 12891). Uncorrected p-distances for *16S* are ≤3.5% between the new species and any other *Selvasaura* species (2.0±0.1% with *S. brava*, 3.0% with *S. almendarizae*, and 3.5% with *S. evasa*), but exceed 4% for all other Cercosaurinae.

Morphologically, the new species can be differentiated from species of the genus *Andinosaura*, *Euspondylus*, *Gelanesaurus*, *Oreosaurus*, *Petracola*, *Riama*, most *Anadia* and *Placosoma* by having an undivided lower palpebral disc (vs. divided), and from *Pholidobolus* because the lower palpebral disc is transparent (vs. opaque). Furthermore, the new species is distinguished from species of *Centrosaura*, *Echinosaura*, *Gelanesaurus*, *Kataphractosaurus*, *Neusticurus*, and *Potamites* by having homogeneous rectangular dorsal scales (vs. heterogeneous, granular and tuberculate dorsal scales); from *Cercosaura* by the absence of enlarged gular scales (vs. medial gulars distinctly enlarged forming longitudinal rows); from *Dendrosauridion* and *Wilsonosaura* by having keeled dorsal scales (vs. smooth or slightly keeled respectively); from *Macropholidus* by bearing a great reduction in the size of the lateral scales (vs. no reduction); and from *Proctoporus* by bearing lateral scales adjacents to ventrals non granular (vs. granular).

Taxonomy

***Selvasaura candesi* sp. nov.**

https://zoobank.org/A28E0931-47C7-4B21-A792-D0E301E59B69

Figs 2–4

Type material. ***Holotype.*** Peru • Adult male; Huánuco Department, Marañón Province, 11 km SW San Pedro de Chonta, on the road to Antaquero Community; 8°42'59.6"S, 76°57'22.3"W; 2,458 m; 15 Oct. 2018; G. Chávez leg.; CORBIDI 21865 (Figs 2A, B, 3A, B, 4).

Paratypes. Peru • 1 ♂ adult, 1 juvenile, collected with the holotype; G. Chávez leg.; CORBIDI 21866 (Figs 2C, D, 3C, D), CORBIDI 21867 (Fig. 2E, F).

Diagnosis. A medium sized lizard (adult males SVL 28.3–49.5 mm, n=2) characterized by the following combination of morphological features: 1) body slender, dorsoventrally depressed in males, females unknown; 2) head slightly short, pointed, about 1.6 times longer than wide; 3) ear opening distinct, moderately recessed;

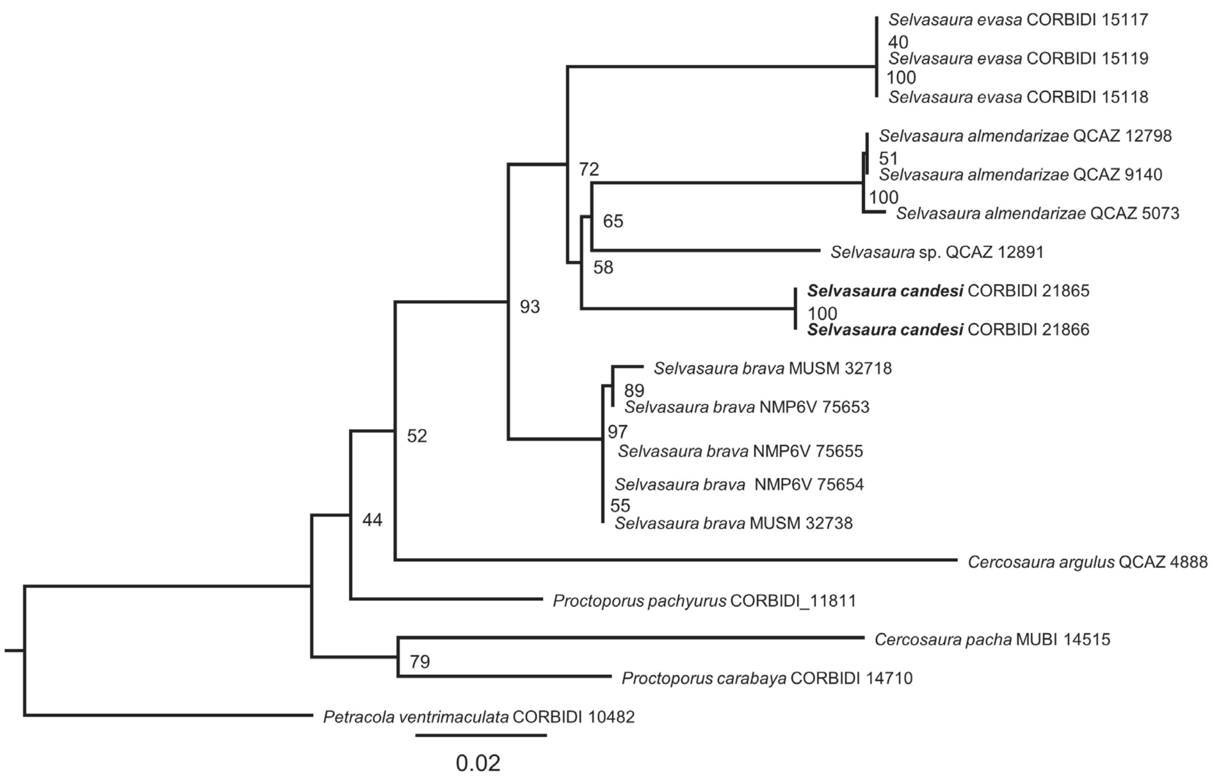

Figure 1. Phylogenetic tree of *Selvasaura*. Maximum Likelihood analysis based on a concatenated dataset of three mitochondrial (*12S*, *16S*, *ND4*) and one (*c-mos*) nuclear gene fragments, showing the relationships among *Selvasaura candesi* sp. nov. (in bold), its congeners, and species of *Proctoporus*, *Cercosaura*, and *Petracola* (Gymnophthalmidae). ML bootstrap values are indicated at each node.

4) nasals separated by an undivided frontonasal; 5) prefrontals, frontal, frontoparietals, parietals, interparietal, and postparietals present; 6) parietals polygonal, slightly longer than wide; 7) supraoculars four, anteriormost fused (2 individuals) or not (1 individual) with anteriormost superciliary; 8) superciliary series complete, consisting in four scales; 9) nasal plate divided posterior to nostril; 10) loreal present, in contact with second supralabial; 11) supralabials seven; 12) genials in four pairs, first and second pairs in contact; 13) collar present, containing 9–10 enlarged scales; 14) dorsals in 40–41 transverse rows, rectangular, nearly twice as long as wide, subimbricate, keeled; 15) ventrals in 24–25 transverse rows; square to rectangular, juxtaposed, smooth; 17) scales around midbody 38–43; 18) lateral scales at midbody reduced in size, in 8–9 rows; 19) limbs pentadactyl, all digits clawed;20) forelimb reaching anteriorly the third supralabial; 21) subdigital lamellae under Finger IV 14–16; 22) subdigital lamellae under Toe IV 19–21; 23) femoral pores per thigh 9–10 in males; 24) rectangular preanal scales large, four in number; 25) tail about 0.4 times longer than body; 26) caudals larger than wide, subimbricate, rugose dorsally, smooth ventrally; 27) lower palpebral disc transparent, undivided; 28) dorsal surface of head, body and limbs brown with black speckling, dorsal surface of tail pale brown to reddish brown; a thick yellowish brown vertebral stripe on dorsum, a row of 1–2 faded black rings on each flank; throat creamy white with minute black spots or blotches within each scale; belly yellow (creamy white in juveniles) with minute black spots within each scale; ventral surfaces of limbs yellow or yellowish orange; anal area saffron yellow or reddish yellow; tail red or reddish orange in males (pale red in juveniles) with fine black speckling; iris pale orange in males.

Differential diagnosis. *Selvasaura candesi* sp. nov. differs from *S. brava* by having keeled dorsal scales in adults (vs rugose), a larger number of dorsal rows 40–41 (vs 33–36), a higher number of lateral scales 8–9 (vs 6–7), a larger number of scales around midbody 38–43 (vs 32–34), a yellow belly in adult males (vs creamy white), and black minute spots or small blotches within every ventral scale (vs grey speckles). The new species differs from *S. almendarizae* (Torres-Carvajal et al. 2021) and *S. evasa* (Echevarría et al. 2021) by having a higher number of dorsal scale rows (40–41 vs 25–32 in *S. almendarizae* and 33–38 in *S. evasa*), keeled dorsal scales (vs striated in *S. almendarizae*), a higher number of lateral scales with 8–9 rows at the level of midbody (vs 5 in *S. almendarizae* and 0–3 in *S. evasa*) and by bearing a yellow belly in adult males (vs cream in *S. evasa*).

Description of the holotype. Body slender; legs moderately long, tail complete; head length 24.0% of SVL, head width 15.7% of SVL; snout pointed, moderately long, eye-nose distance 29.6% of HL; neck distinct, collar present; head scales smooth; rostral scale wider than long, slightly higher than adjacent supralabials, in contact with frontonasal, nasals, and first supralabials; frontonasal pentagonal, slightly wider than long; prefrontals present, in wide contact medially; frontal longer than wide, in contact with second and third supraoculars; frontoparietals pentagonal, longer than wide, in contact with third and fourth supraoculars, parietals and interparietal; supraoculars four, not in contact with superciliars; superciliary series complete, consisting of four shields; anteriormost superciliar not fused with anteriormost supraocular, in contact with prefrontal and loreal anteriorly; parietals in contact with frontoparietals, fourth supraocular, dorsalmost postocular, one temporal and two postparietals; interparietal longer than wide, in contact with three postparietals posteriorly; postparietals five; nasal shield divided posterior to nostril, in contact with first and second supralabial; frenocular triangular, in contact with loreal anteriorly, anteriormost superciliar dorsally, second and third (at one point) supralabial ventrally, suboculars posteriorly, on both sides; palpebral disc oval, translucent, undivided; postoculars three; temporals polygonal, supratympanic temporal one; supralabials six, fourth below the centre of eye; infralabials six; mental wider than long, in contact with first infralabials; postmental single, pentagonal, in contact with first and second infralabials; genials in four pairs, first and second pair in contact medially, first pair in contact with second and third infralabials, second pair in contact with third and fourth infralabials, third pair in contact with fourth and fifth infralabials, fourth pair in contact with fifth and sixth infralabials; gulars 14; plates along collar 10; dorsal scales homogenous, rectangular, longer than wide, keeled, in 40 transverse rows; dorsals (enlarged scales) around body at fifth transverse ventral scale row 10, at 10th transverse ventral scale row 13, at 15th transverse ventral scale row 15; laterals (smaller than dorsals) at fifth transverse ventral scale row 9–10, at 10th transverse ventral scale row 9–8, at 15th transverse ventral scale row 10–10; ventrals squared to rectangular, juxtaposed, in 24 transverse rows; longitudinal rows of ventrals at midbody 10; scales around midbody 43; anterior preanal plate scales two; posterior preanal plate scales four; scales on tail rectangular, subimbricate, slightly keeled dorsally at tail base, smooth and juxtaposed ventrally; subdigital lamellae under Finger IV 15/15 (4/5 distal lamellae single and smooth, remaining lamellae divided in two subconical segments); subdigital lamellae under Toe IV 22/21 (4/4 distal lamellae single and smooth, remaining lamellae divided in two subconical segments); femoral pores 9/10.

Measurements of the holotype (in mm): SVL 49.5; TL 38.5; HL 12.3; HW 7.7; HD 5.4; EN 3.6; FLL 12.0; HLL 19.7; AGD 24.8.

Colouration of the holotype in life (Fig. 2A, B). Head, body, and limbs pale brown dorsally with black speckling, dorsal surface of tail pale brown with reddish brown lateral areas; a pale brown vertebral stripe bordered laterally by black discontinuous stripes (nearly inconspicuous as they run towards the tip of the tail), vertebral stripe about two dorsal scales wide extending

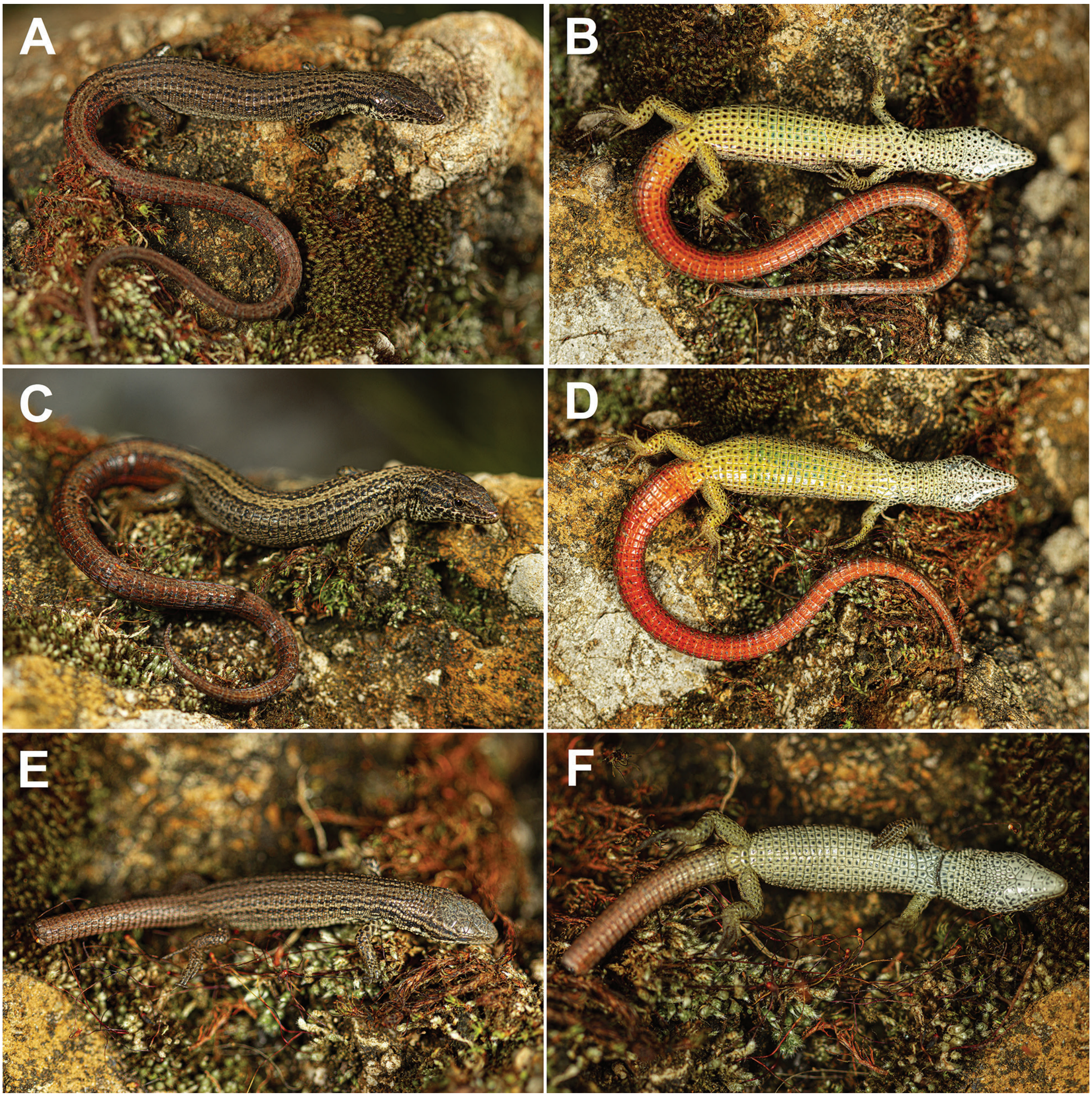

Figure 2. Dorsal (left) and ventral (right) views of (**A, B**) the male holotype (CORBIDI 21865, SVL = 49.5 mm), (**C, D**) male paratype (CORBIDI 21866, SVL = 49.1 mm), and (**E, F**) juvenile paratype (CORBIDI 21867, SVL = 28.3 mm) of *Selvasaura candesi* sp. nov.

ontohead anteriorly and the tail caudally; a discontinuous black dorsolateral stripe extending on each side from above tympanum to base of tail; a discontinuous black stripe running from postoculars, across parietals, reaching neck and running longitudinally below black borders of the vertebral stripe, and disappearing at the level of hindlimbs; a black stripe extending from post oculars to insertion of forelimbs; two black rings on each flank; ventrolateral parts of flanks whitish brown; throat creamy white with minute dark spots inside the individual scales; belly yellow with dark spots within each scale; ventral surfaces of forelimbs creamy yellow, ventral surfaces of hindlimbs saffron yellow, anal area saffron yellow, base of the tail reddish orange, rest of tail aurora red or red; iris pale orange.

Colouration of the holotype in preservative. General colouration pattern is as described for the holotype in life. The dorsal colouration on head, body and tail is dark brown with black markings. The throat is creamy yellow, belly greyish white, tail pinkish yellow. Ventral surfaces of limbs are yellow.

Hemipenial morphology. The completely everted, left hemipenis is a bicapitate organ measuring about 5.5 mm (Fig. 4A–D). Its shape is conical, unilobed, with proximal region distinctly thinner than the distal region. The hemipenial body does not possess filiform appendages. A total of sixteen, mostly continuous flounces extend across the entire asulcate face. The three most proximal flounces are transversally oriented, the other thirteen are laterally oriented, with a central vertex directed distally.

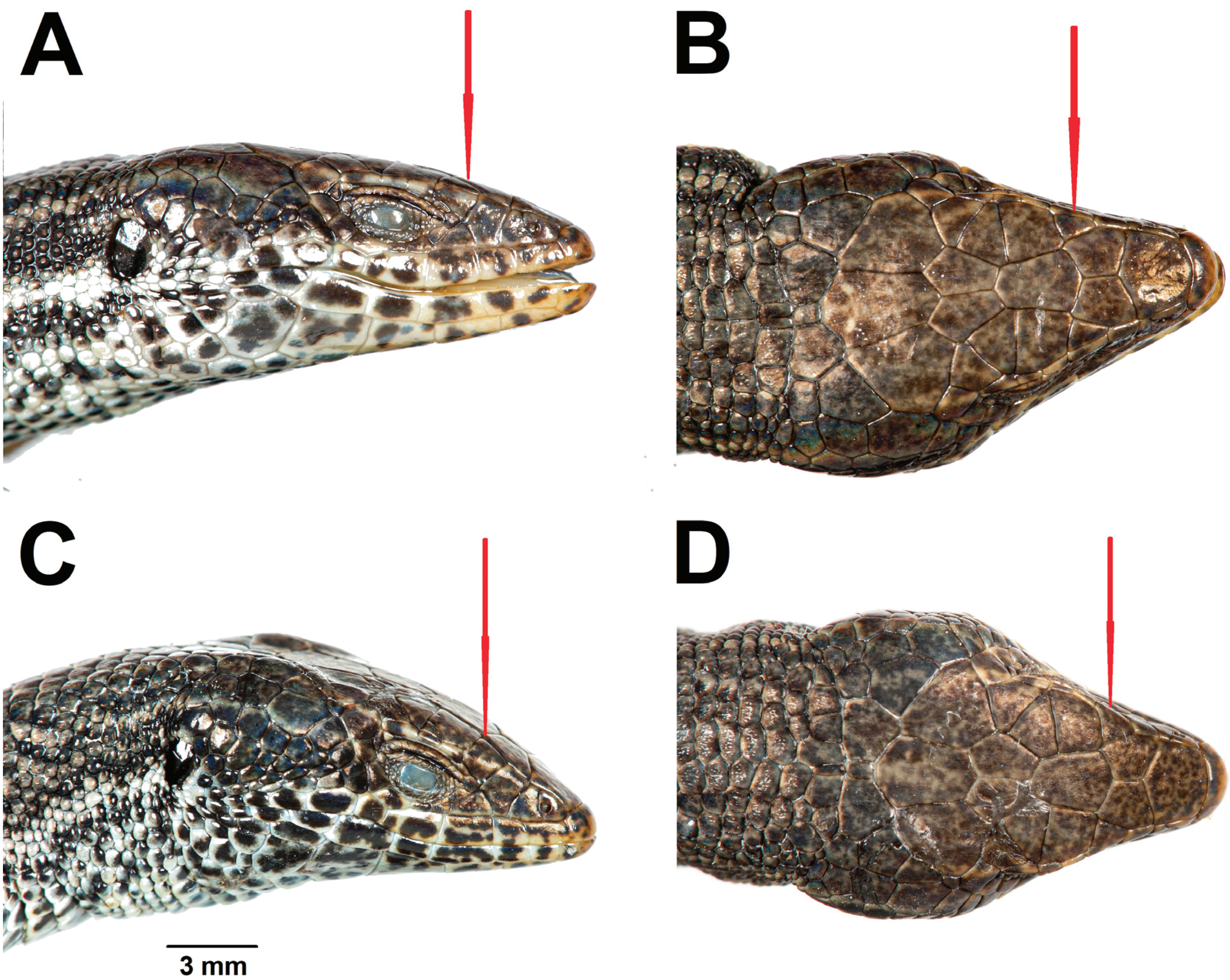

Figure 3. Heads in lateral (left) and dorsal (right) view of adult males of *Selvasaura candesi* sp nov. **A, B.** Holotype, CORBIDI 21865, SVL=49.5 mm; **C, D.** Paratype, CORBIDI 21866, SVL=49.1 mm. Red arrows show variation in the condition of anteriormost supraocular: **A, B.** Not in contact with superciliaries; **C, D.** Fused to anteriormost superciliary.

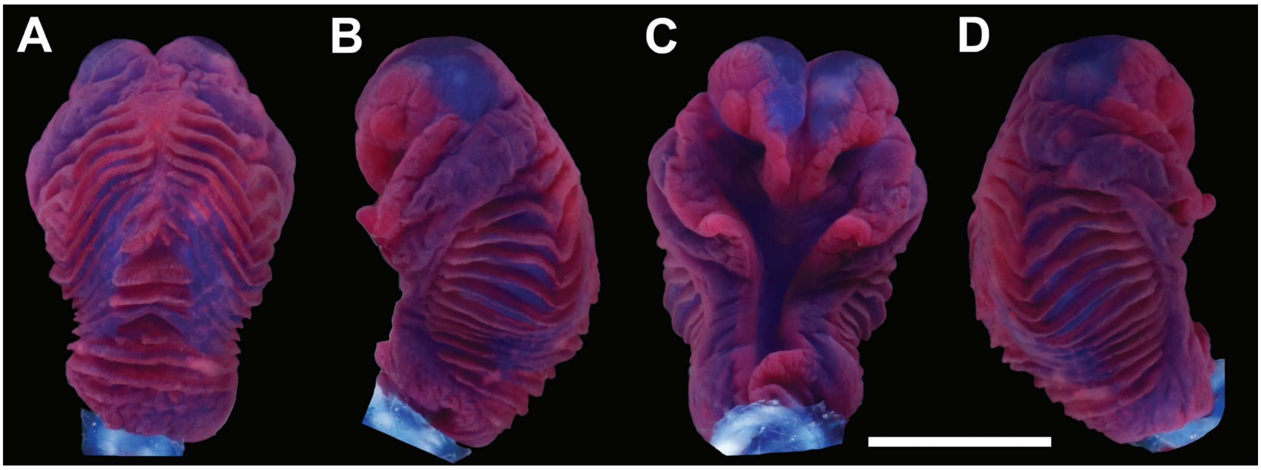

Figure 4. Left hemipenis of the holotype (CORBIDI 21865) showing: **A.** Asulcate; **B.** Left; **C.** Sulcate, and **D.** Right side of the organ. Scale bar: 2.5 mm.

The asulcate central nude is narrow. Lateral body flounces ornamentation consists in a series of comb-like spicules over the distal part of the hemipenial body. Sulcus spermaticus begins at the hemipenial base and extends in a straight broad line until it divides into two branches at the distal third of the organ. The sulcus spermaticus is bordered laterally by fleshy nude areas which expand in two branches, which are divided by a central fleshy fold.

Variations. General scutellation data of the type series is given in Table 1. Sexual dimorphism is unknown. We noticed some variation among the type series: male CORBIDI 21866 (Fig. 3C, D) has the anteriormost supraocular fused to the anteriormost superciliar on both sides. Also, the same specimen bears a single black ring at the level of the insertion of forelimbs (Fig. 2C, D). Regarding colouration, juvenile CORBIDI 21867 (Fig. 3E, F) has a colour pattern consisting of pale brown tones on dorsum, paler than adults, vertebral and dorsolateral stripes fading at the middle of dorsum, venter creamy white with minute black spots inside individual scale and tail reddish yellow.

Etymology. The specific epithet "candesi" refers to the acronym CANDES (Consultores Asociados en Naturaleza y Desarrollo) in recognition of their efforts supporting the herpetological research in Peruvian territory.

Distribution, natural history, and threat status. This species is known only from the type locality, a montane forest in the upper basin of Chontayacu River at 2,400 m a.s.l. in the western slopes of the eastern Andes of central Peru (Fig. 5). The type locality is a deforested area (Fig. 6B) at the transition between cattle pastures and patches of montane forest. We found all specimens around 11:00 a.m. under stones alongside a stream surrounded by grass and small herbs. No other sympatric reptile was found. We noticed a heavy presence of livestock in nearby areas, as well as patches of burnt grassland, which is triggered by farmers to regrow grass plants (*Festuca*, *Stipa* spp.) and to open new pasture grounds for cattle. Despite these threats, the paucity of data on the geographic distribution of this species prevents further assessment of its threat status. Therefore, we recommend the Data Deficient category for the IUCN Red List. Future surveys should document the range of the species and assess the importance of potential threats.

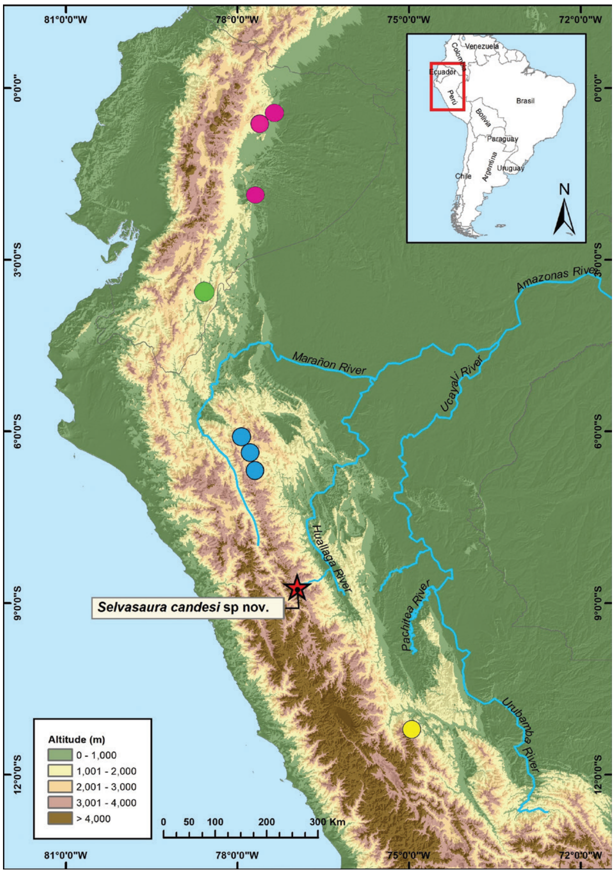

Figure 5. Map showing the distribution of the *Selvasaura candesi* sp. nov. (red star), *Selvasaura almendarizae* (fucsia circles), *Selvasaura brava* (yellow circle), *Selvasaura evasa* (blue circles) and an unnamed Ecuadorian population of *Selvasaura* (green circle) mentioned by Torres-Carvajal et al. (2016).

Discussion

We present morphological and genetic evidence that supports our recognition of a new species of *Selvasaura* from Peru. Regarding scutellation, we noted that condition of supraoculars is variable in the new species (anteriormost supraocular fused or not to the anteriormost superciliar) as is noted in *S. evasa*, whereas it appears stable in *S. brava* (anteriormost supraocular fused to anteriormost superciliary). Despite the condition of supraoculars as a diagnostic character in *S. brava* (Moravec et al. 2018) we suggest that future fieldwork aiming the collection of more specimens of *S. brava* is needed to better assess the condition of supraoculars. Since variation in scutellation is common among Andean cercosaurini (Kohler and Lehr 2004; Goicoechea et al. 2012, 2013), we suggest

Table 1. Measurements and pholidosis of *Selvasaura* lizards.

Characters	*Selvasaura candesi* sp. nov. (n = 3)	*Selvasaura brava* (n = 10)	*Selvasaura evasa* (n = 7)	*Selvasaura almendarizae* (n = 3)
Maximum SVL in Adult males	49.5	45.9	46.1	39.7
Supralabials	7	7	7–8	–
Scales in collar	9–10	9–11	9–10	7–19
Transverse rows of dorsals	40–41	33–36	33–38	25–32
Laterals at midbody	8–9	6–7	0–3	5
Scales around midbody	38–43	32–34	32–34	–
Transverse rows of ventrals	24–25	22–25	20–25	22–23
Ventrals across belly	10–10	10–10	10–12	8–10
Preanal plate scales	4	4	4–5	4
Lamellae under Finger IV	15–16	14–16	14–19	12–16
Lamellae under Toe IV	21–19	19–22	17–24	18–20
Femoral Pores in Adult males (per leg)	9–10	7–9	9–12	9–12

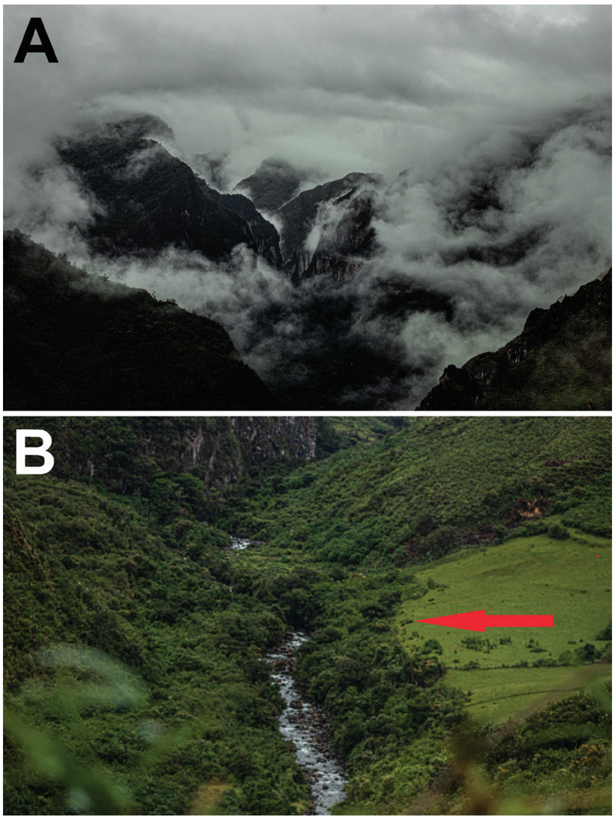

Figure 6. Photographs of the area where *Selvasaura candesi* sp. nov. was found. **A.** Panoramic view of the mountains and the cloud forests at the type locality in the western Andes of central Peru; **B.** Habitat and microhabitat (shown by red arrow) of *S. candesi* alongside the Chontayacu River, Huánuco Department, Peru.

that an integrative taxonomy approach is a critical tool to identify *Selvasaura* lizards. The importance of integrative taxonomy to gymnophthalmid lizards has been discussed previously by Goicoechea et al. (2012) and Torres-Carvajal et al. (2016).

Regarding hemipenial morphology, *S. candesi* sp. nov., has unilobed hemipenis like *S. evasa* (Echevarría et al. 2021) and *S. almendarizae* (Torres-Carvajal et al. 2021). Therefore, three of the four species of *Selvasaura* have unilobed hemipenis, whereas the fourth species, *Selvasaura brava*, has a bilobed hemipenis according to Moravec et al. (2018). Since the photos provided in the original description do not allow us to analyse properly the hemipenial morphology of *S. brava*, and interspecific variation of this character is very rare within gymnophthalmid genera we suggest further morphological revisions on its type material to confirm the condition and shape of its genitalia. In the meantime, our results support Echevarría et al. (2021) in suggesting that a unilobed hemipenis should be considered a synapomorphy of the genus.

Our phylogenetic analysis of four concatenated gene fragments (three mitochondrial and one nuclear) agrees with previous findings suggesting that specimen QCAZ 12891 from El Pangui, Zamora-Chinchipe Province, Ecuador may represent a new taxon (Torres-Carvajal et al. 2016; Moravec et al. 2018; Echevarría et al. 2021; Torres-Carvajal et al. 2021). Future taxonomic work should elucidate the relationships between this putative taxon and the two closely related species: *S. almendarizae* and *S. candesi*.

Selvasaura lizards are known from a handful of places from the Andes of central Peru to northern Ecuador (Fig. 5). Despite their scattered distribution, all localities appear to share a geographic pattern, lying on the eastern Andes. The distance between them is too long to assume that it represents the actual distribution of the genus; instead, we believe that there are still some gaps to be filled. Additionally, *Selvasaura* lizards appear to adapt to open areas and human buildings (Moravec et al. 2018; Echevarría et al. 2021; this work) which could make them easy to find by researchers. Nevertheless, currently there are no other records of the genus. Thus, further fieldwork and the revision of museum collections could bring some news on the knowledge of their taxonomy and biogeography.

Arboreal habits previously reported for *S. brava* (Moravec et al. 2018) and some specimens of *S. almendarizae* and *S. evasa* (Torres-Carvajal et al. 2021; Echevarría et al. 2021 respectively) appear not being shared by the new species described herein. We found all individuals of *S. candesi* under rocks with no trees nearby. Moreover, our search within the forests was unsuccessful in finding additional specimens. Likewise, we observed individuals of *S. candesi* moving actively under rock clusters far from trees, contrary to the observations by Moravec et al. (2018) of *S. brava* climbing trunks and columns, by Torres-Carvajal et al. (2021) of *S. almendarizae* perched on a leaf, 1 m above the ground, and by Echevarría et al. (2021) of *S. evasa* individuals occupying terrestrial bromeliads. Moravec et al. (2018) and Echevarría et al. (2021) noted that *S. brava* and *S. evasa* respectively, can use open areas and human buildings too. Assuming similar habits may exist in other species, we consider that *S. candesi* could occur in a wider habitat range. However, further fieldwork is needed to confirm whether *S. candesi* is a terrestrial specialist or otherwise, a generalist capable of occupying different habitats.

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Appendix 1

Material examined.

Selvasaura evasa. PERU: SAN MARTIN: Huicungo CORBIDI 15115–20.

Selvasaura almendarizae. ECUADOR: PASTAZA: Centro Ecológico Zanjarajuno QCAZR9140.

Selvasaura almendarizae. ECUADOR: NAPO: Wildsumaco Wildlife Sanctuary QCAZR5073, QCAZR12798.

Appendix 2

Table A1. GenBank accession numbers for the taxa and genes sampled in this study.

Species	Voucher	*12S*	*16S*	*ND4*	*c-mos*
S. almendarizae	QCAZ 5073	MW204462	MW204460	MW655619	MW655617
S. almendarizae	QCAZ 9140	MW204463	MW204461	NA	MW655618
S. almendarizae	QCAZ 12798	KU902206	KU902281	KU902362	KU902125
S. brava	MUSM 32718	MH579609	MH579645	NA	MH579700
S. brava	MUSM 32738	MH579612	MH579648	NA	MH579703
S. brava	NMP6V 75653	MH579611	MH579647	NA	MH579702
S. brava	NMP6V 75654	MH579613	MH579649	NA	MH579704
S. brava	NMP6V 75655	MH579610	MH579646	NA	MH579701
S. candesi	CORBIDI 21865	**OQ848614**	**OQ848616**	**OQ851467**	**OQ851469**
S. candesi	CORBIDI 21866	**OQ848615**	**OQ848617**	**OQ851468**	**OQ851470**
S. evasa	CORBIDI 15117	KU902203	KU902278	KU902359	KU902122
S. evasa	CORBIDI 15118	KU902204	KU902279	KU902360	KU902123
S. evasa	CORBIDI 15119	KU902205	KU902280	KU902361	KU902124
Selvasaura sp.	QCAZ 12891	KU902207	NA	KU902363	KU902126
Cercosaura argulus	QCAZ 4888	KP874738	KP874790	KP874900	KP874842
Cercosaura pacha	MUBI 14515	MT531388	MT524456	MT522847	MT512510
Proctoporus carabaya	CORBIDI 14710	KU902164	KU902245	KU902321	KU902083
Proctoporus pachyurus	CORBIDI_11811	KU902178	KU902255	KU902335	KU902097
Petracola ventrimaculata	CORBIDI 10482	KP874775	KP874827	KP874937	NA