Amphibians of Ecuador

Craugastoridae. Volume III

Luis A. Coloma and
William E. Duellman

CRC Press
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Amphibians of Ecuador: Craugastoridae. Volume III is the third in a four-volume series that provides comprehensive, well-illustrated, and authoritative insights, making it an invaluable resource for biologists, conservationists, and others. The series explores, in comprehensive detail, the cultural history and the rich amphibian diversity of Ecuador, providing a thorough review of biogeography, amphibian declines, and conservation.

Volume III specifically focuses on Craugastoridae. Characteristics of each species are listed, defined, and compared to other similar species. Reproductive behavior, where known, is described, as are data on vocalizations. Amphibian distributions are detailed and illustrated with physiographic maps with dots. The volume also addresses the declines, extinctions, and conservation status of each species, noting their occurrence in reserves.

KEY FEATURES:

- Provides detailed and comprehensive accounts for all Craugastoridae species from Ecuador
- New data are incorporated for many species
- Describes with full color maps the distribution of all known taxa
- Includes information on the ecology, reproduction, and behavior of all taxa

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Craugastoridae

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Designed front cover image: A calling male of the cuico rain frog *Pristimantis unistrigatus* species in the gardens at Centro Jambatu de Investigación y Conservación de Anfibios in Quito, Ecuador, on 10 January 2014. Photo by Luis A. Coloma.

Designed back cover image: High-resolution computed tomography reconstruction of the skeleton of *Pristimantis duellmani*, 41.7 mm from snout to vent, from 5 km southeast of Chiriboga, Provincia Pichincha. Image by Daniel J. Paluh.

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In memory of José Q. Coloma

Contents

About the Authors

Luis A. Coloma

Coloma is an amphibian biologist who was born in Guaranda, Provincia Bolívar, Ecuador, in 1962. He received his *licenciatura* in biological sciences from Pontificia Universidad Católica del Ecuador (PUCE) in 1987. In 1991, he was granted an MA in the Department of Systematics and Ecology by the University of Kansas, where he was mentored by William E. Duellman; his thesis was "Ecuadorian Frogs of the Genus *Colostethus* (Anura: Dendrobatidae)." For his PhD, he was under the guidance of Linda Trueb; in 1997, he completed his dissertation, "Morphology, Systematics, and Phylogenetic Relationships among Frogs of the Genus *Atelopus* (Anura: Bufonidae)." For 19 years, from 1991 to 2010, he was professor and Senior Lecturer in charge of vertebrates and in charge of the herpetology section at the Escuela de Ciencias Biológicas at PUCE. He mentored 23 *licenciatura* students. Since 2011, he has been Director and Researcher at Centro Jambatu de Investigación y Conservación de Anfibios in Quito, Ecuador. Coloma has published 69 scientific papers, with 56 of these articles focused on amphibians indexed in Scopus (as of 31 May 2023). Additionally, he has published 32 outreach publications, among the latter two coffee table photo books: *Ecuador Megadiverso* and *Sapos, Ecuador Sapodiverso.*

He has described or co-described 31 new species of frogs, among which 28 are Ecuadorian frogs of the genera *Atelopus* (7), *Hyloxalus* (6), *Gastrotheca* (4), *Hyloscirtus* (4), *Engystomops* (3), *Pristimantis* (2), *Leucostethus* (1), and *Epipedobates* (1). Five species of frogs, one lizard, and one earthworm have been named in his honor by his colleagues. In 2007, he was awarded the Sabin Award for Conservation of Amphibians, presented by the World Conservation Union and Conservation International. In 2008, he received the Saint Louis Zoo Conservation Award in recognition of his extraordinary lifelong dedication to the conservation of Ecuadorian biodiversity. In 2009, he was appointed a member of the Latin American Academy of Sciences. Additional information about Coloma's life appears in Chapter 2 in Volume I and references therein.

William E. Duellman (1930–2022)

Duellman was a herpetologist who was born in Dayton, Ohio, on 6 September 1930. He passed away on 25 February 2022. He earned three degrees from University of Michigan—a BA (1951) in zoology with a minor in geography, an MS (1952) in zoology with a minor in botany, and a PhD (1956) in zoology with a minor in geology. His doctoral dissertation was on snakes of the genus *Leptodeira*. Since 1959, most of Duellman's academic life was at the University of Kansas, where he was a professor in the Department of Systematics and Ecology and Curator and Curator Emeritus of Herpetology in the Natural History Museum (now Biodiversity Institute). He published 386 titles (among them 12 books). Among these books are *Hylid Frogs of Middle America*, *An Equatorial Herpetofauna*, *Biology of Amphibians* (with Linda Trueb); *Cusco Amazónico: The lives of Amphibians and Reptiles in a Tropical Rainforest*, *Terrestrial Breeding Frogs* (Strabomantidae) *in Peru* (with Edgar Lehr); and *Marsupial Frogs and Allied Genera*. Duellman served as Major Professor for 12 master's and 34 PhD students, and he mentored seven post-doctoral scholars. During his time at the University of Kansas Natural History Museum, he built up the collection from 59,000 to more than 300,000 specimens through extensive field work by himself and with his students, and by acquiring other collections, making it the fourth largest herpetological collection in the United States and by far the most significant collection of the herpetofauna of Latin America. He described or co-described 252 species of amphibians from the Neotropics, among which 93 are from Ecuador. Six species of frogs and five species of reptiles are named in his honor. Additional information about Duellman's life is provided in Chapter 2 in Volume I and references therein.

Contributors

Juan C. Santos produced time-calibrated maximum likelihood phylogenetic trees illustrating the evolutionary relationships of amphibians in Ecuador; Daniel J. Paluh contributed to the production of microCT images and high-resolution computed tomography reconstructions of the skeletons of Ecuadorian amphibian genera. Pedro A. Coloma and Ítalo G. Tapia described the calls of *Pristimantis appendiculatus*, *P. carlosceroni*, *P. ecuadorensis*, *P. eugeniae*, *P. glandulosus*, *P. parvillus*, *P. pycnodermis*, and *P. sirnigeli*. The acknowledgments section further recognizes other contributions made by these individuals.

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Foreword

The documentation of biodiversity is not, by any means, easy. Although the complexity of nature is staggering, this particular Volume of the Encyclopedia—which focuses in the frog family Craugastoridae—is, to my taste, one of the best approximations that actually captures the core axes of amphibian diversity.

Craugastoridae (etymologically, the cliff-dancer frogs) is an extravagant and successful result of evolution. The family is composed entirely of direct-developing frogs, meaning that fertilized eggs are laid in terrestrial or arboreal sites, where they develop directly into tiny froglets, skipping all together an aquatic larval phase. This reproductive trait has had huge implications for the niches occupied by this family and, most likely, for the enormous diversification of this lineage, especially in the Andean mountains.

Globally, Craugastoridae contains 27 genera with 929 species. The tiny country known as Ecuador is home to eight genera and 281 species (and counting); in other words, Ecuador has 30% of the species in the family, highlighting, once again, the importance of this country in amphibian research and conservation.

The species richness of Craugastoridae is truly overwhelming; every amphibian taxonomist that works in South America likely has several undescribed species of this family resting on the shelves of a natural history museum, waiting for the elusive time to be formally described. In this context, the Encyclopedia will definitely accelerate the description of new species, facilitating a complete comparison among similar species.

Within Craugastoridae or, I should say, within terrestrial vertebrates, there is a genus that deserves particular attention, *Pristimantis*. No other terrestrial vertebrate rivals *Pristimantis* in terms of species richness. This Neotropical group contains no fewer than 610 species (Frost, 2024). They are a conspicuous component of communities from the lowland rainforests to the paramos (even close to the snow line). Within a particular ecosystem, they can be found hidden under the ground or close to the canopy. We still do not understand why *Pristimantis* is so specious when compared to other direct-developing frogs, and we know close to nothing about these frogs' natural history. What is obvious, however, is that these frogs show a remarkable ability to adapt and survive. Some evolutionary novelties include shape-shifting (*P. mutabilis*, *P. sobetes*) and parental care (*P. chocoensis*, *P. achatinus*). Also, remarkably, most *Pristimantis* species have managed to survive the catastrophic amphibian declines linked to the chytrid fungus *Batrachochytrium dendrobatidis*.

When going through the pages of this work, the reader recognizes what biology actually means—a mix of colors, shapes, behaviors, interactions, and threats. Everything is linked by a common history, but also with every species telling its own story.

The documentation of Ecuador's amphibian diversity, through the eyes and work of Luis A. Coloma and William E. Duellman†, represents a significant milestone. It is a foundational work that will catalyze new research and allow for a closer look at the fascinating hues of nature. This opus will instantly become a new standard for vertebrate studies and, hopefully, will represent a cornerstone for a much-needed integral conservation strategy for a country touched by the evolutionary wand.

REFERENCE

Frost, D. R. 2024. *Amphibian species of the world: An online reference*. Version 6.2. New York: American Museum of Natural History (2 September). Electronic Database. https://amphibiansoftheworld.amnh.org/.

Juan Manuel Guayasamin

Preface

In the preface of Volume I, there is a general recounting and reflection on the purpose and history of the complete opus (Volumes I–IV). Here, the focus is on a few events and taxa to highlight broader issues mostly relevant to the taxonomy and systematics of Ecuadorian taxa, for which we have compiled accounts for each species, genus, family, and order. Volume II includes the accounts of 213 species of Ecuadorian anurans of the families Pipidae, Telmatobiidae, Microhylidae, Dendrobatidae, Ranidae, Bufonidae, and Hylidae.

In 1758, Carl von Linnaeus formalized the modern system of binomial nomenclature to name species while also coining the binomial name (scientific name) for a species now known from Ecuador. The species is *Pipa pipa*, and his taxonomic action was solely based on illustrations of this frog originally collected in Suriname. Nearly a century passed before the first description of a frog named from Ecuador was made: *Atelopus ignescens* (the Jambato), described by the Italian scientist Emilio Cornalia in 1849 in a 15-line morphological account, which was an extensive description for those times. Two centuries later, in 1958, about 200 amphibian species were known from Ecuador. By 1980, this number had increased to 332 species, half of the species currently known in Ecuador, and they were described based on morphological evidence, with a few accounts also including osteological features and phylogenetic analyses, especially the taxonomic works by the research group at the University of Kansas, USA, led by William E. Duellman and Linda Trueb. By the end of 2022, when we ceased adding species to this opus, 655 species were known from Ecuador, and in the recent four decades, this was mostly due to efforts by Ecuadorian taxonomists and systematists. From 2023 up to December 2024, twenty additional, mostly cryptic species were described, and we included them in an addendum in Volume IV. One of the most recent descriptions is that of a cryptic species by the Ecuadorian Pablo Menéndez Guerrero and four collaborators (2024), *Rhinella bella* (beautiful toad), in a detailed 27-page paper that includes data and analyses based on extensive specimen collections, a molecular phylogenetic hypothesis, and the combined evidence of mtDNA sequence variation, morphology, bioacoustics, and environmental information.

The particular cases of *Pipa pipa*, *Atelopus ignescens*, and *Rhinella bella* illustrate the trend of taxonomic knowledge about amphibians in Ecuador, as well as the current accelerating pace, dynamism, and increasing complexity involved in describing this diversity, which is expected to increase substantially in the coming years (but see Löbl *et al*., 2023), especially in a country like Ecuador, where apparently no fewer than 230 species are awaiting discovery and description. However, this commendable progress is overshadowed by the poor or nonexistent knowledge in aspects of amphibian biology fields beyond morphology and short DNA sequences (e.g., natural history data, calls, tadpoles, embryos, distributions, population dynamics, ethology, genomics) for most of the species and, even worse, by the possible extinction of nearly 50 of the known species, including an entire family of aquatic frogs Telmatobiidae, a dozen *Atelopus* harlequin frogs, several monophasic marsupial frogs of the genus *Gastrotheca*; some craugastorids and *Hyloxalus* rocket frogs; and probably many other amphibians that were never documented.

The case of *Pipa pipa* helps to highlight the immense knowledge gaps that remain to be addressed. For example, it is nearly unbelievable that a species such as *Pipa pipa* is still poorly known in Ecuador. In an era of genomics, paradoxically, the molecular phylogeny of Ecuadorian populations, its morphological and geographic variation, and its taxonomy are pending issues. Furthermore, recent research (Fouquet *et al.,* 2022) suggests that Ecuadorian populations may not belong to *Pipa pipa*. This case highlights the missing pieces of basic systematic and taxonomic information and the still-inadequate samplings in museum collections. This is a generalized pattern also known for many other taxa (see, for example, remarks for most species of Microhylidae in Volume II or Gymnophiona in Volume IV).

Ironically, the case of the other mentioned species, *Atelopus ignescens*, whose taxonomy and systematics still have pending issues, serves to illustrate the catastrophe of amphibian extinctions and the desperate efforts to save a single population of an otherwise historically extremely abundant species having many populations. This has pushed the nascent Ecuadorian academic and conservationist community along with international collaborators to begin studying it in the contexts of population numbers, natural history, genomics, and ethnozoology (Vega-Yánez *et al*., 2024). However, this species is somewhat privileged given its cultural importance, while many hundreds of others suffering the same path of extinction are still awaiting attention.

The most recently described species, such as *Rhinella bella*, which is an extremely common species, is based on integrative taxonomic practices. This undoubtedly represents a step forward in gaining data and knowledge but also highlights the state of scientific developments, which are not free of controversy. This is especially true given contemporary discussions of still-contentious issues and fierce debates such as what defines a species, species boundaries, taxonomic anarchy, taxonomic inflation in the absence of appropriate geographic sampling, the discovery of cryptic diversity, genetic introgression, interspecific hybridization, and basic taxonomic practice-related topics (Garnett and Christidis, 2017; Cook *et al*., 2023; Arias-Cárdenas *et al*., 2024; Dubois *et al*., 2024).

To advance knowledge in various biological fields and reverse the extinction trends of over 400 species, it is

crucial to complete the description of Ecuadorian amphibians. This requires accelerating taxonomic research in Ecuador, significantly increasing governmental and international funding for museum collections and biobanks, digitizing collections, providing open access to information, and establishing legal frameworks that support the scientific exchange of taxonomic specimens and tissues to benefit biodiversity research.

REFERENCES

Arias-Cárdenas, A., L. S. Barrientos, C. Pardo-Diaz, A. Paz, A. J. Crawford, and C. Salazar. 2024. Taxonomic inflation and a reconsideration of speciation in the Andes: The case of the high-elevation tree frog *Dendropsophus molitor* (Anura: Hylidae). *Zoological Journal of the Linnean Society* 200: 763–775.

Cook, C. N., K. H. Redford, and M. W. Schwartz. 2023. Species conservation in the era of genomic science. *BioScience* 73: 885–890.

Dubois, A., W. Denzer, O. M. Entiasupe-Neto, T. Frétey, A. Ohler, A. M. Bauer, and R. A. Pyron. 2024. Nomenclatural problems raised by the recent description of a new anaconda species (Squamata, Serpentes, Boidae), with a nomenclatural review of the genus *Eunectes*. *Bionomina* 37: 8–58.

Fouquet, A., J. Cornuault, M. T. Rodrigues, F. P. Werneck, T. Hrbek, A. R. Acosta-Galvis, D. Massemin, P. J. R. Kok, and R. Ernst. 2022. Diversity, biogeography, and reproductive evolution in the genus *Pipa* (Amphibia: Anura: Pipidae). *Molecular Phylogenetics and Evolution* 170: 1–15.

Garnett, S., and L. Christidis. 2017. Taxonomy anarchy hampers conservation. *Nature* 546: 25–27.

Löbl, I., B. Klausnitzer, M. Hartmann, and F. Krell. 2023. The silent extinction of species and taxonomists—an appeal to science policymakers and legislators. *Diversity* 15: 1053.

Menéndez-Guerrero, P. A., S. P. L. dos Santos, M.-J. Salazar-Nicholls, D. M. Green, and S. R. Ron. 2024. Cryptic diversity in toads of the *Rhinella marina* species group (Anura, Bufonidae) with a subjectively beautiful new species from Western Ecuador. *Zoological Journal of the Linnean Society* zlad197.

Vega-Yánez, M. A., A. B. Quezada-Riera, B. Rios-Touma, M. D. C. Vizcaíno-Barba, W. Millingalli, O. Ganzino, L. A. Coloma, E. E. Tapia, N. Dupérré, M. Páez-Vacas, D. Parra-Puente, D. Franco-Mena, G. Gavilanes, D. Salazar-Valenzuela, C. A, Valle, and J. M. Guayasamin. 2024. Path for recovery: An ecological overview of the Jambato Harlequin Toad (Bufonidae: *Atelopus ignescens*) in its last known locality, Angamarca Valley, Ecuador. *PeerJ* 12: e17344. https://doi.org/10.7717/peerj.17344.

Acknowledgments

While William E. Duellman is no longer with us, his indelible mark on the production of this opus and the near-completion of all species' accounts remains immeasurable. His unique perspective, wealth of experience, knowledge, and unwavering enthusiasm for this project, coupled with meticulous attention to detail, continue to serve as a source of inspiration. Hopefully, his passion for science and amphibians will forever be etched in these pages as a tribute to his titanic contribution to the field of amphibian biology, as well as to the enduring nature of his friendship and partnership that transcends time and space. Similarly, I must express my deepest gratitude to Linda Trueb (his partner), my teacher and mentor at KU, who has been by Bill's side in charting the progress of *Amphibians of Ecuador* since 2015, steadfastly supporting him through challenging times as he embarked on what would ultimately become his final Ecuadorian endeavor. Linda's unwavering commitment also extended to securing pat of the funding and seeing this encyclopedia through to its completion. In January 2023, her wise and practical advice was much appreciated. She said, "I really would urge you to cut off adding additional species at a logical time—e.g., no frogs described in 2023! Otherwise, you'll never see the end—kind of like Sisyphus pushing that stone ball up the side of the mountain."

As detailed in Chapter 2 (under the subtitle "From Anfibios de Ecuador to Amphibiawebecuador and to Anfibios del Ecuador-Bioweb at QCAZ") and briefly mentioned in the preface, this opus is the descendant of earlier endeavors involving a vast collective of individuals and friends, encompassing students, collectors, field companions, scientists, administrators, and more. I extend my deepest gratitude for their invaluable contributions. Also, among them, my immense appreciation for their input while at Pontificia Universidad Católica del Ecuador goes to Giovanni Onore, Néstor Acosta-Buenaño, Ítalo G. Tapia, Elisa Bonaccorso, and Juan M. Guayasamin. Onore has always been a source of inspiration and drive, even in the most difficult times. Tapia (the collection manager at the QCAZ) aided, with great energy and empathy, in the field, in the museum, and with the photography of frogs and their development. Many of the photos in the field and in the lab would have not been possible without his collecting efforts and his ability to raise them. Bonaccorso and Guayasamin collaborated throughout leading the JRS and SENECYT projects, which, in 2008–2010, provided the funding necessary to enhance the electronic version of AmphibiaWebEcuador. Since 2011, all of these individuals have continued to offer their support in numerous ways during my tenure at Centro Jambatu of Amphibian Research and Conservation (CJ), and I am immensely grateful. In particular, Onore welcomed CJ under the auspices of the *Fundación Otonga* until 2019, when CJ became an independent NGO. Acosta-Buenaño has been instrumental in building the CJ electronic Encyclopedia (SapopediaEcuador). He not only developed the conceptual and physical models of the database but also played a key role in its programming, design, and layout. His initiative, serenity, and drive are inspiring. During my time at the QCAZ and the establishment of CJ, I received generous support and encouragement from Mark Wanner (Saint Louis Zoo), Joseph Mendelson III, Ron Gagliardo, and Kevin Zippel of Amphibian Ark, and of Lauren A. O'Connell (Stanford University), and Kim L. Hoke (Colorado State University). Their actions spoke louder than words.

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Some of the authors of subtitles in Volumes I and IV also helped with other aspects of the complete opus in various ways. For example, Terán-Valdez, the CJ Collections Manager, edited and revised all of the accounts; she also helped to write descriptions of the tadpoles of 29 species and of many ontogenetic series. Her input to the encyclopedia in countless ways has been very valuable. She was always there (including non-working hours and vacations),

ready to help with anything. Camilo Rosero-Gómez helped with refining maps and associated data with amazing efficiency. Guarderas helped with many administrative tasks and the acquisition of funds related to the encyclopedia; Juan C. Santos reviewed the section about David C. Cannatella; Almendáriz provided some data, photos, and critically reviewed the sections titled "Peters and the Harlequin Frogs, a Rebirth for Amphibian Collections" in Chapter 2 of Volume I; Vigle also edited and reviewed the MECN section under the subtitle "The DHMECN Collection: From the Friends of Nature to the National Biodiversity Institute" in Chapter 2 of Volume I; Mónica Páez-Vacas edited part of the section that includes the information about calls of Ecuadorian frogs and also helped with the organization of the Red List table. Guayasamin aided in obtaining information of authors from Scopus.

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When compiling data included in this encyclopedia during my time at the QCAZ and CJ, I relied heavily on the invaluable assistance provided by the collection managers, curatorial assistants, volunteers, and their dedicated efforts in managing preserved specimens and the living collection. I am grateful for the support and contributions at the QCAZ of Ítalo G. Tapia (2002–2010) and Diego Almeida-Reinoso (2004–2010) and at CJ of Sofía Carvajal-Endara (2011–2013), Diego Almeida-Reinoso (2011–2014), Elicio E. Tapia (2011–2016), Manuel Morales-Mite (2015–2018), Morley Read (2017–2018), Sebastián Hernández-Nieto (2018), Andrea Terán-Valdez (2018–to date), and Amanda B. Quezada (2021).

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Finally, I dedicate this work with my profound and infinite gratitude to my extended family, and especially to Alexandra Quiguango Ubillús (my wife); to our sons, Pedro Antonio and José Miguel; and to my mother, Lida María Román. Their devoted emotional support surpasses any words I can write.

PHOTO AND ILLUSTRATION CREDITS

All photos and illustrations are appropriately credited in their respective figure captions. We have employed abbreviations for the primary authors of the majority of the photos, namely Luis A. Coloma (LAC), William E. Duellman (WED), Steven Guevara Salvador (SGS), and Diego Acosta López (DAL). The latter two worked at CJ focusing on photographic documentation and photo designing in 2016–2020 and from 2018 onwards, respectively. Steven generously and patiently assisted with the detective work of finding the data associated with thousands of photos that had not been completely labeled. Thanks go to Rafe M. Brown and Ana Motta for facilitating access to the KU photographic archive and diligently providing scans. We extend our special thanks go to Jaime Culebras, Amanda B. Quezada, Morley Read, Paul Székely, and Mario H. Yánez-Muñoz, who graciously shared numerous photos with us,

many of which were crucial to expand the photographic documentation of Ecuadorian amphibians. Additionally, we are grateful to Jorge Brito Molina, Juan Carlos Sánchez-Nivicela, Gregory O. Vigle (for his frog photos and photos of Kenneth Miyata), Carolina Reyes-Puig, Elicio E. Tapia, Fernando Coloma Román, Jan C. Verkade, Diego Batallas-Revelo, Juan P. Reyes-Puig, Ross Maynard (The Biodiversity Group), Amadeus Plewnia, Andreas Nöllert, John E. Simmons, Marinus S. Hoogmoed, J. S. Bermingham, Alejandro Arteaga, Fernando Rojas-Runjaic, Joel Sartore, Martín R. Bustamante, Ted Kahn, Cristian Paul Nieves, Diego Almeida-Reinoso, Erwin Patzelt, José Vieira-Fernandes, Mateo Vega-Yánez, Daniela Franco-Mena, Patricia A. Burrowes, Alex Achig, Frank Pichardo, Jazmín Buitrón, Jenna Welch (Division of Amphibians & Reptiles, Smithsonian Institution), Matthijs Hollanders, and Francesca Angiolani also contributed generously by providing sets of photos and/or unique important photos.

Accounts of Ecuadorian Craugastoridae

ORGANIZATION AND CONTENT OF ACCOUNTS

Following are the accounts of each of the 281 species belonging to the eight genera of the anuran family Craugastoridae included in this Volume III and that we recognize up to the year 2022. Accounts of new species described from January 2023 to January 2025 are included in the Addendum of Appendix 2, in Volume IV.

The phylogenetic placement of Craugastoridae is shown in Figure 0.1. Accounts of genera and species of Craugastoridae are in alphabetical order.

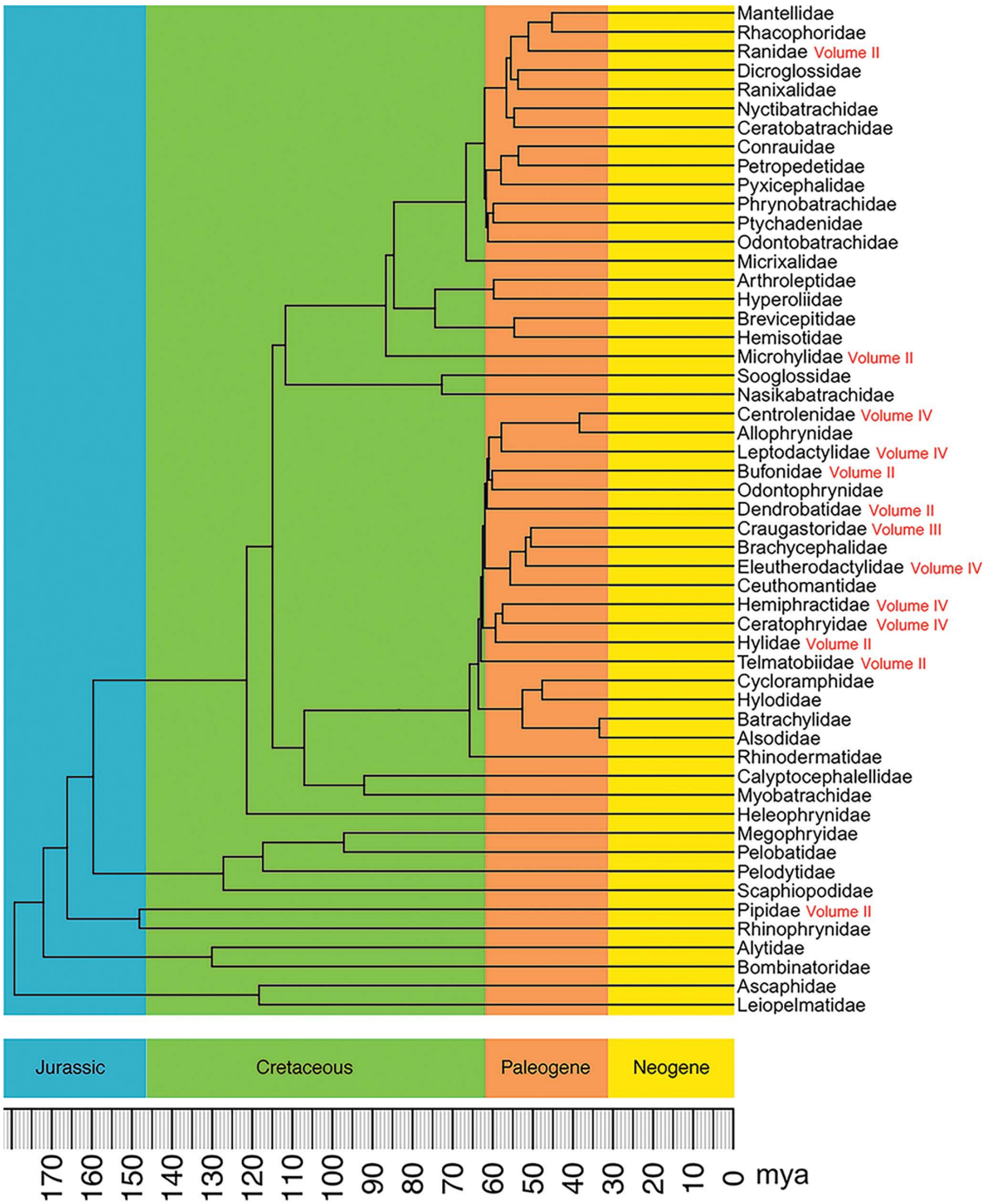

FIGURE 0.1 Topology of the families of Anura, extracted from a time-calibrated phylogenetic tree based on hundreds of loci. The families occurring in Ecuador are in red. The volume number in which the Ecuadorian families are included is indicated. Reprinted and modified from Portik *et al*. (2023) with permission from Elsevier.

Family and generic accounts include a section of contents. Each species account has the following structure:

(1) The currently recognized taxon name followed by the name of author(s) and year of publication. The discoverers of a species are the authors who describe it in accordance with the rules of the International Code of Zoological Nomenclature. The parentheses indicates that the original name has suffered changes through its taxonomic history. The scientific nomenclature is based on Frost (2023), with a few exceptions noted under Remarks of the corresponding account. Sometimes, the publication date that appears in a publication is different from the valid date when the work actually was published. In such cases, both dates are indicated in the references.

(2) The common name. The English standard common name, chosen by us, is provided. A compilation of these names is also given in Table 0.1. The Spanish standard common names, chosen by us, are indicated in Table 0.1. The Spanish name is not necessarily a translation of the English standard common name (see "Standardized Names in Spanish and English" in Chapter 1 in Volume I).

(3) The original name, author(s), year of publication, and page number. This is followed by type(s) information with museum number(s) and locality data. Type locality data were ordered from specific locality to country. In some cases, the spelling or description of the locality was corrected. Additionally, locality information was updated when necessary, such as current provincial allocations. Coordinates were excluded from this section, except when the type locality was not in Ecuador. For the original citations of locality data see Frost (2023 and onward).

(4) Synonym. If nomenclatural changes occurred to the original name, only the most recent modification to that name is included. The new name is followed by the author(s), year of publication, and page number. The synonymy information was primarily sourced from Frost (2023). For comprehensive and detailed lists of synonyms, please refer to his website hosted by The American Museum of Natural History. We opt not to incorporate subgenus names such as *Huicundomantis*.

(5) Distribution color bar. This represents the altitudinal regions of Ecuador. The bold line below the bar indicates region of occurrence. From left to right: western tropical (0–1000 m), western subtropical (1001–2000 m), western temperate (2001–3000 m), high Andean (3001–4800 m), eastern temperate (2001–3000 m), eastern subtropical (1001–2000 m), eastern tropical (0–1000 m).

(6) Etymology. When available, the etymological description in the original description is included. Otherwise, the intended meaning is interpreted, usually based on the Greek or Latin derivation. In a few cases, the vernacular name is also discussed.

(7) Identification. Definition (family and genera). This section (diagnosis *sensu* Wiley and Lieberman, 2011) is intended to convey more than synapomorphies or autapomorphies and may include any characters useful in demonstrating that the taxon is different from other taxa. Thus, readers can identify members of the taxon in the most concise manner possible without having to consult more detailed descriptions. It provides the characteristics of the taxa, which alone or in combination help to distinguish the taxon from other taxa. Descriptions of the color are in life, unless otherwise indicated. When available, phenotypic synapomorphies for families and genera are described. This identification information is generally derived from the literature, which is indicated under Key references. The features used to characterize, diagnose, and distinguish vary according to the taxa, and we have nearly transcribed the characters used by the authors in the original descriptions or posterior taxonomic revisions. Nonetheless, in a few cases and if necessary, we did some rewriting, corrections, or added information. For several species, we offer information on known masses primarily derived from CJ data. Many of the characteristics of families are taken from Duellman and Trueb (1994), Frost *et al.* (2006), and especially from the compilation published by Vitt and Caldwell (2014), AmphibiaWeb (2022), and references cited therein, although in some cases, we updated the information. For nearly all genera, a microCT scan of the skeleton of a representative species is provided in dorsal and ventral views. Identifications of species are usually accompanied with plates depicting photos of the male and female, intraspecific variation, and morphological details. We use the following morphological abbreviations throughout the text: SVL = snout–vent length.

(8) Comparisons. Similar species are listed at the beginning of the paragraph, followed by comparisons to each of them. The comparisons were primarily conducted with Ecuadorian taxa; however, in some instances, comparisons were extended to include species from neighboring countries.

(9) Natural history. A synthesis of the most relevant aspects of these topics is provided, and the original sources or those that summarize them are mentioned under Key references. When relevant, collectors natural history data from specimens

deposited at CJ were added. The information of CJ number and collectors can be found in the CJ especies and specimens database. CJ laboratory notes were also included for species that are maintained *ex situ*. Vocalizations are briefly described in this section, but a more complete account of vocalizations for each species is provided in the Appendix, under the subtitle "Vocalizations of Ecuadorian Craugastoridae." Sources of call descriptions are also compiled in Table 0.2.

(10) Distribution. The distribution range in Ecuador and in other countries is outlined. Then, the species is located in the Ecuadorian provinces, and the altitude ranges in which it has been recorded are indicated, along with the area of extinct of occurrence.

Sometimes, the altitudes measured in the field do not exactly match those obtained from the coordinates in the geographic layers we used (WorldClim. Ver 2.1., Fick and Hijmans, 2017), thus we generally report the altitudes provided in the original publication. In a separate paragraph, we specify the ecosystems and biogeographic sectors (Ministerio del Ambiente del Ecuador, 2013) where the species occurs, along with the average annual rainfall and temperature in their distributional ranges. We provide a compilation of the distribution of each of the species in the ecosystems (Tables 3 and 4) and biogeographic sectors (Table 5). Dots maps for each of the species are presented. We incorporated new distributional records, especially from the CJ collections, and corrected errors and made refinements on the level of precision of distribution records previously provided by Ortega-Andrade *et al.* (2021) (see more details under "The Red List of Ecuadorian Amphibians" in Chapter 3 in Volume I). The localities data used to build the maps are available at CJ.

(11) Conservation. The IUCN category, source of species categorization, and its justification are specified, accompanied by supporting details regarding the conservation status (refer also to "The Red List of Ecuadorian Amphibians" in Chapter 3 in Volume I). Additionally, a comprehensive compilation of categorizations for all species can be found in Table 2. Information is provided regarding the occurrence in state (public) protected reserves, protected forests, biosphere reserves, and some private reserves. It is explicitly mentioned whether the species is listed in CITES.

(12) Content (order, family, genus accounts). The number of genera and species worldwide is provided based on Frost (2023) and up to December 2023, and the number of species in Ecuador follows this Encyclopedia.

(13) Remarks. Any pertinent information and comments not included in other sections are provided herein. Additionally, if available, phylogenetic information and sources are provided in accounts for all taxa. Figures of phylogenetic trees including taxa not occurring in Ecuador (taken from the literature) are also given for many genera and some groups of species. Phylogenies published after December 2022, as well as recent molecular analyses and the phylogeny by Portik *et al.* (2023), are not included or discussed in the Encyclopedia, given that they were published after we ceased updating information, except where explicitly indicated. For example, we incorporated Strabomantidae within Craugastoridae, as suggested by Portik *et al.* (2023); we mentioned the papers by Franco-Mena *et al.* (2023) and Székely *et al.* (2023) only when strictly necessary. The family accounts include a time-calibrated maximum likelihood phylogenetic tree depicting the evolutionary relationships of Ecuadorian species inferred from DNA sequences of mitochondrial and nuclear genes. The updated phylogeny of the Ecuadorian amphibian taxa up to the end of 2021 (done by Juan C. Santos) was derived initially from alignments of the two largest phylogenetic reconstructions of amphibians to date (Pyron, 2014; Jetz and Pyron, 2018). The master alignments of both studies were appended, and taxa not found in Ecuador were removed; duplicate taxa were also removed by choosing the one with more sequence data, and taxonomic nomenclature was updated following AmphibiaWeb (2022). The final sequence alignment was realigned using DECIPHER (Wright, 2016) and manually reviewed and adjusted, particularly the mitochondrial ribosomal gene sequences. Multiple alignment programs were used to provide a good starting point, but adjustments were made by eye (Felsenstein, 2004; Baum and Smith, 2013). The optimized alignment was then used for the phylogenetic estimation of sections of the global phylogeny, a maximum likelihood tree was estimated using IQ-TREE2 2.1.3 (Minh *et al.*, 2020), and node time constraints followed those of previous studies (Pyron, 2014; Jetz and Pyron, 2018). In some sections of the tree of Ecuadorian amphibians, the topology among the families of Hyloidea was constrained to match those of more comprehensive analyses with hundreds to thousands of nuclear genes and no mitochondrial data (Feng *et al.*, 2017; Hime *et al.*, 2021).

(14) Key references. This section presents references relevant to the Ecuadorian amphibian orders and species accounts. It is not intended to be an exhaustive list of publications but rather a selection of the most relevant ones. For a comprehensive

list of citations related to taxonomy, please refer to the most recent version of *Amphibian Species of the World* (Frost, 2023 and onward) or other revisionary works in specific fields. The references are presented in chronological order and include a brief description of the main topic covered. Additionally, authors of call descriptions are acknowledged. This section includes the references corresponding to information provided in most sections of the account, with the exception of the Conservation and Remarks sections, which have citations integrated throughout the text.

INSTITUTIONAL AND MUSEUM ABBREVIATIONS

Throughout the text, we use acronyms for institutions and museums. For museum abbreviations, see Frost (2023 and onward). The most commonly used museum or institutional abbreviations are:

CJ	Centro Jambatu de Investigación y Conservación de Anfibios, Ecuador.
DHMECN	División de Herpetología, Museo Ecuatoriano de Ciencias Naturales (part of INABIO, Instituto Nacional de Biodiversidad, Ecuador since 2017).
EPN	(museum) Escuela Politécnica Nacional, Museo de Zoología, Ecuador.
KU	University of Kansas, Museum of Natural History, Division of Herpetology, USA.
MCZ	Museum of Comparative Zoology, Harvard University, USA.
MHNG	Muséum d´histoire Naturelle, Geneva.
QCAZ	Museo de Zoología, Pontificia Universidad Católica del Ecuador.
ZSFQ	Universidad San Francisco de Quito, Museo de Zoología, Ecuador.
USNM	National Museum of Natural History, Division of Amphibians and Reptiles, USA.
MZUTI	Universidad Tecnológica Indoamérica, Museo de Zoología, Ecuador.

TABLE 0.1

List of Suggested Common Names in English and Spanish for the 281 Species of Ecuadorian Amphibians Included in This Volume. See "Standardized names in Spanish and English" in Chapter 1 in Volume I.

Barycholos pulcher	Pretty rainfrog	Cutín bonito
Craugastor longirostris	Long-snouted rainfrog	Cutín de rostro largo
Lynchius flavomaculatus	Yellow-groin rainfrog	Cutín de ingles amarillas
Lynchius megacephalus	Big-headed rainfrog	Cutín cabeza grande
Lynchius parkeri	Parker's rainfrog	Cutín de Parker
Lynchius simmonsi	Simmons's rainfrog	Cutín de Simmons
Niceforonia babax	Chattering rainfrog	Cutín charlatán
Niceforonia brunnea	Brown rainfrog	Cutín café
Niceforonia dolops	Waterfall rainfrog	Cutín de cascada
Niceforonia elassodiscus	Small-pad rainfrog	Cutín de almohadilla pequeña
Niceforonia nigrovittata	Black-striped rainfrog	Cutín de rayas negras
Niceforonia peraccai	Peracca's rainfrog	Cutín de Peracca
Noblella coloma	Coloma's litter frog	Cutín hojarasquero de Coloma
Noblella heyeri	Heyer's litter frog	Cutín hojarasquero de Heyer
Noblella lochites	Imprisoned litter frog	Cutín hojarasquero preso
Noblella mindo	Mindo litter frog	Cutín hojarasquero de Mindo
Noblella myrmecoides	Ant litter frog	Cutín hojarasquero hormiga
Noblella naturetrekii	Naturetrek's litter frog	Cutín hojarasquero de Naturetrek
Noblella personina	Masked litter frog	Cutín hojarasquero enmascarado
Noblella worleyae	Worley's litter frog	Cutín de Worley
Oreobates quixensis	Quijos rainfrog	Cutín de Quijos
Pristimantis acerus	Plain rainfrog	Cutín sencillo
Pristimantis achatinus	Agate rainfrog	Cutín ágata
Pristimantis actites	Gualita rainfrog	Cutín gualita
Pristimantis acuminatus	Pointed-snout rainfrog	Cutín de hocico puntiagudo
Pristimantis afrox	Afro rainfrog	Cutín afro
Pristimantis albujai	Albuja's rainfrog	Cutín de Albuja
Pristimantis allpapuyu	Cloud-land rainfrog	Cutín de nubes
Pristimantis almendariz	Almendriz's rainfrog	Cutín de Almendáriz

TABLE 0.1 (*Continued*)

List of Suggested Common Names in English and Spanish for the 281 Species of Ecuadorian Amphibians Included in This Volume See. "Standardized names in Spanish and English" in Chapter 1 in Volume I.

Pristimantis altamazonicus	Upper Amazon rainfrog	Cutín del Alto Amazonas
Pristimantis altamnis	Headwaters rainfrog	Cutín de vertiente
Pristimantis amaguanae	Amaguaña's rainfrog	Cutín de Amaguaña
Pristimantis anaiae	Anaí's rainfrog	Cutín de Anaí
Pristimantis andinodiabolus	Andean devil rainfrog	Cutín diablo andino
Pristimantis andinogigas	Giant Andean rainfrog	Cutín gigante andino
Pristimantis andinognomus	Diminutive rainfrog	Cutín minúsculo
Pristimantis anemerus	Wild's rainfrog	Cutín de Wild
Pristimantis apiculatus	Small-tubercle rainfrog	Cutín tuberculoso pequeño
Pristimantis appendiculatus	Proboscis rainfrog	Cutín de piquito
Pristimantis aquilonaris	Northern Peru rainfrog	Cutín del Norte de Perú
Pristimantis ardyae	Ardy's rainfrog	Cutín de Ardy
Pristimantis atillo	Atillo rainfrog	Cutín de Atillo
Pristimantis atratus	Black-thighed rainfrog	Cutín de muslo negro
Pristimantis aureolineatus	Yellow-lined rainfrog	Cutín de línea amarilla
Pristimantis balionotus	Speckled rainfrog	Cutín manchado
Pristimantis bambu	Bamboo rainfrog	Cutín de bambú
Pristimantis barrigai	Barriga's rainfrog	Cutín de Barriga
Pristimantis baryecuus	Deaf rainfrog	Cutín sordo
Pristimantis bellae	Bell's rainfrog	Cutín de Bell
Pristimantis bicantus	Two-note rainfrog	Cutín de dos notas
Pristimantis brevicrus	Short-legged rainfrog	Cutín de patas cortas
Pristimantis bromeliaceus	Bromeliad rainfrog	Cutín bromelícola
Pristimantis buckleyi	Buckley's rainfrog	Cutín de Buckley
Pristimantis buenaventura	Buenaventura rainfrog	Cutín de Buenaventura
Pristimantis burtoniorum	Burton's rainfrog	Cutín de Burton
Pristimantis caeruleonotus	Blue-spotted rainfrog	Cutín de manchas azules
Pristimantis cajamarcensis	Cajamarca rainfrog	Cutín de Cajamarca
Pristimantis cajanuma	Cajanuma rainfrog	Cutín de Cajanuma
Pristimantis calcarulatus	Small-calcar rainfrog	Cutín de calcar pequeño
Pristimantis caniari	Cañari rainfrog	Cutín cañari
Pristimantis caprifer	Chevron-backed rainfrog	Cutín de dorso chevron
Pristimantis carlosceroni	Cerón's rainfrog	Cutín de Cerón
Pristimantis carvalhoi	Carvalho's rainfrog	Cutín de Carvalho
Pristimantis cedros	Los Cedros rainfrog	Cutín de Los Cedros
Pristimantis celator	Hider rainfrog	Cutín escondedor
Pristimantis chalceus	Brass rainfrog	Cutín de bronce
Pristimantis chloronotus	Green-backed rainfrog	Cutín de dorso verde
Pristimantis chocoensis	Chocó rainfrog	Cutín del Chocó
Pristimantis chomskyi	Chomsky's rainfrog	Cutín de Chomsky
Pristimantis churuwiai	Churuwia's rainfrog	Cutín de Churuwia
Pristimantis cisnerosi	Cisneros' rainfrog	Cutín de Cisneros
Pristimantis citriogaster	Yellow-bellied rainfrog	Cutín de vientre amarillo
Pristimantis colodactylus	Short-fingered rainfrog	Cutín de dedos cortos
Pristimantis colomai	Coloma's rainfrog	Cutín de Coloma
Pristimantis colonensis	Colón rainfrog	Cutín de Colón
Pristimantis condor	Cóndor rainfrog	Cutín del Cóndor
Pristimantis conspicillatus	Amazonian rainfrog	Cutín amazónico
Pristimantis cremnobates	Cliff-dwelling rainfrog	Cutín de acantilado
Pristimantis crenunguis	Giant rainfrog	Cutín gigante
Pristimantis croceoinguinis	Colorful groin rainfrog	Cutín de ingle colorida

(*Continued*)

TABLE 0.1 (*Continued*)

List of Suggested Common Names in English and Spanish for the 281 Species of Ecuadorian Amphibians Included in This Volume. See "Standardized names in Spanish and English" in Chapter 1 in Volume I.

Pristimantis crucifer	Cross-like rainfrog	Cutín en forma de cruz
Pristimantis cryophilius	Cold rainfrog	Cutín frío
Pristimantis cryptomelas	Hidden black rainfrog	Cutín con negro oculto
Pristimantis curtipes	Short-footed rainfrog	Cutín de pies cortos
Pristimantis daquilemai	Daquilema's rainfrog	Cutín de Daquilema
Pristimantis degener	Different rainfrog	Cutín diferente
Pristimantis delius	Delius' rainfrog	Cutín de Delius
Pristimantis devillei	Devilles' rainfrog	Cutín de Deville
Pristimantis diadematus	Crowned rainfrog	Cutín coronado
Pristimantis dissimulatus	Bright-colored rainfrog	Cutín resplandeciente
Pristimantis duellmani	Duellman's rainfrog	Cutín de Duellman
Pristimantis ecuadorensis	Ecuadorian rainfrog	Cutín ecuatoriano
Pristimantis enigmaticus	Obscure rainfrog	Cutín obscuro
Pristimantis eremitus	Solitary rainfrog	Cutín solitario
Pristimantis eriphus	Bleating rainfrog	Cutín balador
Pristimantis ernesti	Williams' rainfrog	Cutín de Williams
Pristimantis erythros	Blood-red rainfrog	Cutín rojo sangre
Pristimantis esmeraldas	Esmeraldas rainfrog	Cutín de Esmeraldas
Pristimantis eugeniae	Del Pino's rainfrog	Cutín de Del Pino
Pristimantis exoristus	Exiled rainfrog	Cutín exiliado
Pristimantis festae	Festa's rainfrog	Cutín de Festa
Pristimantis floridus	Flores' rainfrog	Cutín de Flores
Pristimantis gagliardoi	Gagliardo's rainfrog	Cutín de Gagliardo
Pristimantis galdi	Gald's rainfrog	Cutín de Gald
Pristimantis ganonotus	Green rainfrog	Cutín verde
Pristimantis gentryi	Gentry's rainfrog	Cutín de Gentry
Pristimantis gladiator	Swordsman rainfrog	Cutín espadachín
Pristimantis glandulosus	Glandular rainfrog	Cutín glandular
Pristimantis glendae	Glenda's rainfrog	Cutín de Glenda
Pristimantis gloria	Gloria's rainfrog	Cutín de Gloria
Pristimantis gralarias	Gralarias rainfrog	Cutín de Gralarias
Pristimantis gualacenio	Gualaceño rainfrog	Cutín del Gualaceño
Pristimantis hamiotae	Miyata's rainfrog	Cutín de Miyata
Pristimantis hampatusami	Hampatusami rainfrog	Cutín hampatusami
Pristimantis hectus	Six-toed rainfrog	Cutín de seis dedos
Pristimantis huicundo	Huicundo rainfrog	Cutín de huicundo
Pristimantis ignicolor	Red-groined rainfrog	Cutín de ingle roja
Pristimantis illotus	Dirty rainfrog	Cutín sucio
Pristimantis incanus	Hoary rainfrog	Cutín ceniciento
Pristimantis incomptus	Unadorned rainfrog	Cutín poco llamativo
Pristimantis inusitatus	Uncommon rainfrog	Cutín raro
Pristimantis jimenezi	Jiménez de la Espada's rainfrog	Cutín de Jiménez de la Espada
Pristimantis katoptroides	Mirror rainfrog	Cutín espejo
Pristimantis kichwarum	Kichwa rainfrog	Cutín Kichwa
Pristimantis kirklandi	Kirkland's rainfrog	Cutín de Kirkland
Pristimantis kunam	Kunam's rainfrog	Cutín de Kunam
Pristimantis kuri	El Oro rainfrog	Cutín de El Oro
Pristimantis labiosus	Large-lipped rainfrog	Cutín labioso
Pristimantis lacrimosus	Tearful rainfrog	Cutín llorón
Pristimantis lanthanites	Hidden rainfrog	Cutín ocultador
Pristimantis latericius	Orange rainfrog	Cutín anaranjado

TABLE 0.1 (*Continued*)

List of Suggested Common Names in English and Spanish for the 281 Species of Ecuadorian Amphibians Included in This Volume. See "Standardized names in Spanish and English" in Chapter 1 in Volume I.

Pristimantis laticlavius	Broad-striped rainfrog	Cutín de rayas anchas
Pristimantis latidiscus	Broad-disked rainfrog	Cutín de disco ancho
Pristimantis ledzeppelin	Led Zeppelin's rainfrog	Cutín de Ledzeppelin
Pristimantis leoni	León's rainfrog	Cutín de León
Pristimantis leucopus	White-footed rainfrog	Cutín de pies blancos
Pristimantis librarius	Librarians' rainfrog	Cutín de bibliotecarios
Pristimantis limoncochensis	Limoncocha rainfrog	Cutín de Limoncocha
Pristimantis lividus	Bluish-groined rainfrog	Cutín de ingle azulgrisácea
Pristimantis llanganati	Llanganati rainfrog	Cutín de Llanganati
Pristimantis lojanus	Loja rainfrog	Cutín de Loja
Pristimantis loujosti	Jost's rainfrog	Cutín de Jost
Pristimantis loustes	Spray zone rainfrog	Cutín de rocío
Pristimantis lucidosignatus	Pale-spotted rainfrog	Cutín de puntos pálidos
Pristimantis luscombei	Luscombe's rainfrog	Cutín de Luscombe
Pristimantis luteolateralis	Yellow-spotted rainfrog	Cutín de puntos amarillos
Pristimantis lutzae	Lutz's rainfrog	Cutín de Lutz
Pristimantis lymani	Lyman's rainfrog	Cutín de Lyman
Pristimantis malkini	Malkin's rainfrog	Cutín de Malkin
Pristimantis mallii	Malli's rainfrog	Cutín de Malli
Pristimantis marcoreyesi	Reyes' rainfrog	Cutín de Reyes
Pristimantis martiae	Crump's rainfrog	Cutín de Crump
Pristimantis maryanneae	Maryanne's rainfrog	Cutín de Maryanne
Pristimantis matidiktyo	Reticulated eye rainfrog	Cutín de ojos reticulados
Pristimantis matildae	Matilde's rainfrog	Cutín de Matilde
Pristimantis mazar	Mazar rainfrog	Cutín de Mazar
Pristimantis metabates	Leaping rainfrog	Cutín saltarín
Pristimantis miktos	Blended rainfrog	Cutín mezclado
Pristimantis miltongallardoi	Milton Gallardo's rainfrog	Cutín de Milton Gallardo
Pristimantis mindo	Mindo rainfrog	Cutín de Mindo
Pristimantis minimus	Minute rainfrog	Cutín minúsculo
Pristimantis modipeplus	Modest rainfrog	Cutín modesto
Pristimantis morlaco	Morlaco rainfrog	Cutín morlaco
Pristimantis multicolor	Multicolored rainfrog	Cutín multicolor
Pristimantis munozi	Muñoz's rainfrog	Cutín de Muñoz
Pristimantis muranunka	Muranunka rainfrog	Cutín de muranunka
Pristimantis muricatus	Tubercular rainfrog	Cutín tubercular
Pristimantis mutabilis	Mutable rainfrog	Cutín mutable
Pristimantis myersi	Myers' rainfrog	Cutín de Myers
Pristimantis nangaritza	Nangaritza rainfrog	Cutín de Nangaritza
Pristimantis nankints	Nankints rainfrog	Cutín de Nankints
Pristimantis nanus	Dwarf rainfrog	Cutín enano
Pristimantis nelsongalloi	Nelson Gallo's rainfrog	Cutín de Nelson Gallo
Pristimantis nephophilus	Cloud-loving rainfrog	Cutín nefelófilo
Pristimantis nietoi	Nieto's rainfrog	Cutín de Nieto
Pristimantis nigrogriseus	Black–gray rainfrog	Cutín grisáceo
Pristimantis nimbus	Cloud forest rainfrog	Cutín de bosque nuboso
Pristimantis nyctophylax	Watchman rainfrog	Cutín guardián
Pristimantis ocellatus	Ocellated rainfrog	Cutín ocelado
Pristimantis ocreatus	Booted rainfrog	Cutín de guantes
Pristimantis omarrhynchus	Omarrhynchus' rainfrog	Cutín de Omarrhynchus
Pristimantis omeviridis	Green forest rainfrog	Cutín del bosque verde

(*Continued*)

TABLE 0.1 (*Continued*)

List of Suggested Common Names in English and Spanish for the 281 Species of Ecuadorian Amphibians Included in This Volume. See "Standardized names in Spanish and English" in Chapter 1 in Volume I.

Pristimantis onorei	Onore's rainfrog	Cutín de Onore
Pristimantis orcesi	Orcés' rainfrog	Cutín de Orcés
Pristimantis orestes	Mountaineer rainfrog	Cutín montañero
Pristimantis ornatissimus	Most beautiful rainfrog	Cutín hermosísimo
Pristimantis orphnolaimus	Dusky-throated rainfrog	Cutín de garganta oscura
Pristimantis ortizi	Ortiz's rainfrog	Cutín de Ortiz
Pristimantis pahuma	Pahuma rainfrog	Cutín de Pahuma
Pristimantis paquishae	Paquisha rainfrog	Cutín de Paquisha
Pristimantis parvillus	Small rainfrog	Cutín pequeño
Pristimantis pastazensis	Pastaza rainfrog	Cutín de Pastaza
Pristimantis pataikos	Pataikos rainfrog	Cutín de Pataikos
Pristimantis paululus	Tiny rainfrog	Cutín diminuto
Pristimantis pecki	Peck's rainfrog	Cutín de Peck
Pristimantis percultus	Adorned rainfrog	Cutín adornado
Pristimantis peruvianus	Peruvian rainfrog	Cutín peruano
Pristimantis petersi	Peters' rainfrog	Cutín de Peters
Pristimantis petersioides	James Peters' rainfrog	Cutín de James Peters
Pristimantis philipi	Philip's rainfrog	Cutín de Philip
Pristimantis phoxocephalus	Pointed-head rainfrog	Cutín de cabeza puntiaguda
Pristimantis pichincha	Pichincha rainfrog	Cutín de Pichincha
Pristimantis pinchaque	Pinchaque rainfrog	Cutín pinchaque
Pristimantis pramukae	Pramuk's rainfrog	Cutín de Pramuk
Pristimantis prolatus	Long-headed rainfrog	Cutín de cabeza larga
Pristimantis proserpens	Non-jumping rainfrog	Cutín no saltarín
Pristimantis pseudoacuminatus	Pseudoacuminate rainfrog	Cutín pseudoacuminado
Pristimantis pteridophilus	Fern-lover rainfrog	Cutín filofílico
Pristimantis pugnax	Fighter rainfrog	Cutín luchador
Pristimantis punzan	Punzan rainfrog	Cutín de Punzan
Pristimantis puruscafeum	Puro Coffee's rainfrog	Cutín Puro Coffee
Pristimantis pycnodermis	Thick-skinned rainfrog	Cutín de piel gruesa
Pristimantis pyrrhomerus	Red-thighed rainfrog	Cutín de muslos rojos
Pristimantis quaquaversus	Variable rainfrog	Cutín variable
Pristimantis quinquagesimus	Bill's rainfrog	Cutín de Bill
Pristimantis quintanai	Quintana's rainfrog	Cutín de Quintana
Pristimantis resistencia	Resistance rainfrog	Cutín de resistencia
Pristimantis rhodoplichus	Pink-thighed rainfrog	Cutín de muslos rosados
Pristimantis rhodostichus	Pink-lined rainfrog	Cutín de líneas rosadas
Pristimantis riveti	Rivet's rainfrog	Cutín de Rivet
Pristimantis romanorum	Román's rainfrog	Cutín de Román
Pristimantis romeroae	Romero's rainfrog	Cutín de Romero
Pristimantis roni	Ron's rainfrog	Cutín de Ron
Pristimantis rosadoi	Rosado's rainfrog	Cutín de Rosado
Pristimantis rubicundus	Ruddy rainfrog	Cutín sonrosado
Pristimantis rufioculis	Red-eyed rainfrog	Cutín de ojos rojos
Pristimantis rufoviridis	Greenish-red rainfrog	Cutín verde rojizo
Pristimantis ruidus	Rough-skinned rainfrog	Cutín rugoso
Pristimantis sacharuna	Sacharuna rainfrog	Cutín sacharuna
Pristimantis samaniegoi	Samaniego's rainfrog	Cutín de Samaniego
Pristimantis sambalan	Sambalán rainfrog	Cutín de Sambalán
Pristimantis saturninoi	Father Saturnino's rainfrog	Cutín del Padre Saturnino

TABLE 0.1 (*Continued*)

List of Suggested Common Names in English and Spanish for the 281 Species of Ecuadorian Amphibians Included in This Volume. See "Standardized names in Spanish and English" in Chapter 1 in Volume I.

Pristimantis schultei	Schulte's rainfrog	Cutín de Schulte
Pristimantis scolodiscus	Pointed-disc rainfrog	Cutín de disco punteado
Pristimantis serendipitus	Fortuitous rainfrog	Cutín afortunado
Pristimantis simonbolivari	Bolívar's rainfrog	Cutín de Bolívar
Pristimantis sirnigeli	Simpson's rainfrog	Cutín de Simpson
Pristimantis skydmainos	Frowning rainfrog	Cutín ceñudo
Pristimantis sobetes	Elf rainfrog	Cutín elfo
Pristimantis spinosus	Spiny rainfrog	Cutín espinoso
Pristimantis sternothylax	Pectoral-sacked rainfrog	Cutín de saco pectoral
Pristimantis subsigillatus	Ornate-flank rainfrog	Cutín de flancos adornados
Pristimantis supernatis	High-Andean forest rainfrog	Cutín de bosque altoandino
Pristimantis surdus	Silent rainfrog	Cutín silencioso
Pristimantis tamia	Tamia's rainfrog	Cutín de Tamia
Pristimantis tenebrionis	Darkness-lover rainfrog	Cutín amante de la oscuridad
Pristimantis teslai	Tesla's rainfrog	Cutín de Tesla
Pristimantis thymalopsoides	Orange-dotted rainfrog	Cutín de puntos naranjas
Pristimantis thymelensis	Frailejón rainfrog	Cutín de Frailejón
Pristimantis tiktik	Tiktik rainfrog	Cutín tiktik
Pristimantis tinajillas	Tinajillas rainfrog	Cutín de Tinajillas
Pristimantis tinguichaca	Tinguichaca rainfrog	Cutín de Tinguichaca
Pristimantis torresi	Torres' rainfrog	Cutín de Torres
Pristimantis totoroi	Totoras rainfrog	Cutín de Totoras
Pristimantis trachyblepharis	Rough-eyelid rainfrog	Cutín de párpado rugoso
Pristimantis truebae	Trueb's rainfrog	Cutín de Trueb
Pristimantis tungurahua	Tungurahua rainfrog	Cutín de Tungurahua
Pristimantis ujucami	Ujukam's rainfrog	Cutín de Ujukam
Pristimantis unistrigatus	Cuico rainfrog	Cutín Cuico
Pristimantis variabilis	Variable amazonian rainfrog	Cutín amazónico variable
Pristimantis venegasi	Venegas' rainfrog	Cutín de Venegas
Pristimantis ventrimarmoratus	Marbled-belly rainfrog	Cutín de vientre marmoleado
Pristimantis ventristellatus	Ventristellatus rainfrog	Cutín de vientre estrellado
Pristimantis verecundus	Shy rainfrog	Cutín tímido
Pristimantis verrucolatus	Warty-flank rainfrog	Cutín con flancos verrugosos
Pristimantis versicolor	Variegated rainfrog	Cutín variado
Pristimantis vertebralis	Vertebralis rainfrog	Cutín vertebralis
Pristimantis vidua	Widow rainfrog	Cutín viudo
Pristimantis w-nigrum	Black-w rainfrog	Cutín gualita
Pristimantis walkeri	Walker's rainfrog	Cutín de Walker
Pristimantis waoranii	Waorani rainfrog	Cutín Waorani
Pristimantis yanezi	Yánez's rainfrog	Cutín de Yánez
Pristimantis yantzaza	Yantzaza rainfrog	Cutín de Yantzaza
Pristimantis yumbo	Yumbo rainfrog	Cutín Yumbo
Strabomantis anatipes	Webbed broad-headed rainfrog	Cutín cabezón palmeado
Strabomantis anomalus	Disc-less broad-headed rainfrog	Cutín cabezón sin disco
Strabomantis cerastes	Horned broad-headed rainfrog	Cutín cabezón cornudo
Strabomantis cornutus	Crowned broad-headed rainfrog	Cutín cabezón con cuernos
Strabomantis helonotus	Warty broad-headed rainfrog	Cutín cabezón verrugoso
Strabomantis necerus	Hornless broad-headed rainfrog	Cutín cabezón sin cuernos
Strabomantis sulcatus	Grooved broad-headed rainfrog	Cutín cabezón con surcos

TABLE 0.2

Summary of Endemism, Red List Categories, and Citations of References for Which Call Descriptions of 281 Species of Craugastoridae from Ecuador Have Been Published. Call descriptions are the ones that include quantitative data. Information on calls is given under accounts and in the Appendix "Vocalizations of Ecuadorian Craugastoridae." End = Endemism, E = endemic, CR = Critically Endangered, CR (PE) = Critically Endangered (Possibly Extinct), EN = Endangered, DD = Data Deficient, LC = Least Concern, NT = Near Threatened, VU = Vulnerable.

Species	End	Red List	Call References
Barycholos pulcher	E	LC	Non-described
Craugastor longirostris		LC	Non-described
Lynchius flavomaculatus	E	VU	Non-described
Lynchius megacephalus	E	CR	Non-described
Lynchius parkeri		CR	Non-described
Lynchius simmonsi	E	EN	Non-described
Niceforonia babax		CR (PE)	Non-described
Niceforonia brunnea	E	EN	Non-described
Niceforonia dolops		CR (PE)	Non-described
Niceforonia elassodiscus		VU	Non-described
Niceforonia nigrovittata		LC	Non-described
Niceforonia peraccai	E	EN	Non-described
Noblella coloma	E	CR	Non-described
Noblella heyeri		EN	Non-described
Noblella lochites	E	VU	Batallas R. and Brito M. (2014)
Noblella mindo	E	DD	Non-described
Noblella myrmecoides		NT	Non-described
Noblella naturetrekii	E	CR	Reyes-Puig *et al.* (2019)
Noblella personina	E	EN	Harvey *et al.* (2013); Batallas and Brito (2016a)
Noblella worleyae	E	EN	Reyes-Puig *et al.* (2020)
Oreobates quixensis		LC	Non-described
Pristimantis acerus	E	EN	Non-described
Pristimantis achatinus		LC	Lynch and Myers (1983)
Pristimantis actites	E	VU	Non-described
Pristimantis acuminatus		LC	Duellman (1978)
Pristimantis afrox		VU	Non-described
Pristimantis albujai	E	CR	Non-described
Pristimantis allpapuyu	E	CR	Non-described
Pristimantis almendariz	E	CR	Non-described
Pristimantis altamazonicus		LC	Ortega-Andrade *et al.* (2017)
Pristimantis altamnis	E	LC	Non-described
Pristimantis amaguanae	E	DD	Non-described
Pristimantis anaiae	E	DD	Non-described
Pristimantis andinodiabolus	E	CR	Sánchez-Nivicela *et al.* (2021)
Pristimantis andinogigas	E	CR	Yánez-Muñoz *et al.* (2019)
Pristimantis andinognomus	E	EN	Non-described
Pristimantis anemerus		DD	Non-described
Pristimantis apiculatus		EN	Non-described
Pristimantis appendiculatus		EN	Coloma and Tapia (this publication)
Pristimantis aquilonaris		LC	Non-described
Pristimantis ardyae	E	VU	Non-described
Pristimantis atillo	E	CR	Non-described
Pristimantis atratus	E	VU	Non-described

TABLE 0.2 (*Continued*)

Summary of Endemism, Red List Categories, and Citations of References for Which Call Descriptions of 281 Species of Craugastoridae from Ecuador Have Been Published. Call descriptions are the ones that include quantitative data. Information on calls is given under accounts and in the Appendix "Vocalizations of Ecuadorian Craugastoridae." End = Endemism, E = endemic, CR = Critically Endangered, CR (PE) = Critically Endangered (Possibly Extinct), EN = Endangered, DD = Data Deficient, LC = Least Concern, NT = Near Threatened, VU = Vulnerable.

Species	End	Red List	Call References
Pristimantis aureolineatus		LC	Non-described
Pristimantis balionotus	E	EN	Székely *et al.* (2020)
Pristimantis bambu	E	VU	Arteaga-Navarro and Guayasamin (2011)
Pristimantis barrigai	E	CR	Non-described
Pristimantis baryecuus	E	EN	Non-described
Pristimantis bellae	E	EN	Non-described
Pristimantis bicantus	E	VU	Guayasamin and Funk (2009)
Pristimantis brevicrus		LC	Ortega-Andrade *et al.* (2017)
Pristimantis bromeliaceus		VU	Batallas and Brito (2014a)
Pristimantis buckleyi		LC	Non-described
Pristimantis buenaventura	E	VU	Non-described
Pristimantis burtoniorum	E	DD	Non-described
Pristimantis caeruleonotus		EN	Non-described
Pristimantis cajamarcensis		VU	Non-described
Pristimantis cajanuma	E	CR	Non-described
Pristimantis calcarulatus	E	VU	Hutter and Guayasamin (2015)
Pristimantis caniari	E	CR	Ramírez-Jaramillo *et al.* (2018)
Pristimantis caprifer		CR (PE)	Non-described
Pristimantis carlosceroni	E	CR	Coloma and Tapia (this publication)
Pristimantis carvalhoi		LC	Non-described
Pristimantis cedros	E	EN	Hutter and Guayasamin (2015)
Pristimantis celator		EN	Non-described
Pristimantis chalceus		NT	Non-described
Pristimantis chloronotus		EN	Non-described
Pristimantis chocoensis	E	EN	Non-described
Pristimantis chomskyi	E	CR	Non-described
Pristimantis churuwiai	E	VU	Non-described
Pristimantis cisnerosi		EN	Non-described
Pristimantis citriogaster		VU	Non-described
Pristimantis colodactylus		EN	Non-described
Pristimantis colomai		EN	Valencia-Zuleta *et al.* (2016)
Pristimantis colonensis		EN	Non-described
Pristimantis condor	E	LC	Non-described
Pristimantis conspicillatus		LC	Duellman (1978)
Pristimantis cremnobates	E	EN	Non-described
Pristimantis crenunguis	E	EN	Non-described
Pristimantis croceoinguinis		LC	Duellman (1978)
Pristimantis crucifer	E	VU	Non-described
Pristimantis cryophilius	E	VU	Non-described
Pristimantis cryptomelas		VU	Non-described
Pristimantis curtipes		NT	Non-described
Pristimantis daquilemai		EN	Non-described
Pristimantis degener		EN	Non-described
Pristimantis delius		LC	Non-described
Pristimantis devillei		VU	Non-described

(*Continued*)

TABLE 0.2 (*Continued*)

Summary of Endemism, Red List Categories, and Citations of References for Which Call Descriptions of 281 Species of Craugastoridae from Ecuador Have Been Published. Call descriptions are the ones that include quantitative data. Information on calls is given under accounts and in the Appendix "Vocalizations of Ecuadorian Craugastoridae." End = Endemism, E = endemic, CR = Critically Endangered, CR (PE) = Critically Endangered (Possibly Extinct), EN = Endangered, DD = Data Deficient, LC = Least Concern, NT = Near Threatened, VU = Vulnerable.

Species	End	Red List	Call References
Pristimantis diadematus		LC	Non-described
Pristimantis dissimulatus	E	EN	Non-described
Pristimantis duellmani		EN	Non-described
Pristimantis ecuadorensis	E	CR	Coloma and Tapia (this publication)
Pristimantis enigmaticus		LC	Non-described
Pristimantis eremitus		VU	Hutter *et al.* (2016)
Pristimantis eriphus		VU	Non-described
Pristimantis ernesti	E	CR	Non-described
Pristimantis erythros	E	CR	Non-described
Pristimantis esmeraldas	E	VU	Non-described
Pristimantis eugeniae	E	EN	Coloma and Tapia (this publication)
Pristimantis exoristus		EN	Non-described
Pristimantis festae	E	EN	Holzheuser and Merino-Viteri (2019)
Pristimantis floridus	E	VU	Non-described
Pristimantis gagliardoi	E	EN	Non-described
Pristimantis galdi		LC	Non-described
Pristimantis ganonotus	E	VU	Batallas and Brito (2016b)
Pristimantis gentryi	E	EN	Non-described
Pristimantis gladiator	E	VU	Non-described
Pristimantis glandulosus	E	VU	Coloma and Tapia (this publication)
Pristimantis glendae	E	DD	Non-described
Pristimantis gloria	E	EN	Non-described
Pristimantis gralarias	E	CR	Non-described
Pristimantis gualacenio	E	CR	Non-described
Pristimantis hamiotae	E	CR	Non-described
Pristimantis hampatusami	E	EN	Non-described
Pristimantis hectus		EN	Non-described
Pristimantis huicundo	E	EN	Non-described
Pristimantis ignicolor	E	EN	Non-described
Pristimantis illotus		EN	Non-described
Pristimantis incanus	E	EN	Non-described
Pristimantis incomptus	E	LC	Non-described
Pristimantis inusitatus	E	EN	Non-described
Pristimantis jimenezi	E	CR	Páez and Ron (2019)
Pristimantis katoptroides		LC	Non-described
Pristimantis kichwarum	E	LC	Non-described
Pristimantis kirklandi	E	DD	Non-described
Pristimantis kunam	E	DD	Non-described
Pristimantis kuri	E	EN	Non-described
Pristimantis labiosus		EN	Non-described
Pristimantis lacrimosus		LC	Batallas and Brito (2014a)
Pristimantis lanthanites		LC	Non-described
Pristimantis latericius	E	CR	Batallas and Brito (2014a)
Pristimantis laticlavius		VU	Non-described
Pristimantis latidiscus		LC	Non-described

TABLE 0.2 (*Continued*)

Summary of Endemism, Red List Categories, and Citations of References for Which Call Descriptions of 281 Species of Craugastoridae from Ecuador Have Been Published. Call descriptions are the ones that include quantitative data. Information on calls is given under accounts and in the Appendix "Vocalizations of Ecuadorian Craugastoridae." End = Endemism, E = endemic, CR = Critically Endangered, CR (PE) = Critically Endangered (Possibly Extinct), EN = Endangered, DD = Data Deficient, LC = Least Concern, NT = Near Threatened, VU = Vulnerable.

Species	End	Red List	Call References
Pristimantis ledzeppelin	E	CR	Non-described
Pristimantis leoni		EN	Non-described
Pristimantis leucopus		EN	Non-described
Pristimantis librarius	E	LC	Non-described
Pristimantis limoncochensis		NT	Non-described
Pristimantis lividus	E	EN	Non-described
Pristimantis llanganati	E	EN	Non-described
Pristimantis lojanus		EN	Székely *et al.* (2021)
Pristimantis loujosti	E	CR	Non-described
Pristimantis loustes		CR (PE)	Non-described
Pristimantis lucidosignatus	E	DD	Non-described
Pristimantis luscombei		LC	Non-described
Pristimantis luteolateralis	E	NT	Non-described
Pristimantis lutzae	E	EN	Non-described
Pristimantis lymani		LC	Non-described
Pristimantis malkini		LC	Non-described
Pristimantis mallii	E	CR	Non-described
Pristimantis marcoreyesi	E	EN	Non-described
Pristimantis martiae		LC	Non-described
Pristimantis maryanneae	E	DD	Non-described
Pristimantis matidiktyo	E	LC	Non-described
Pristimantis matildae	E	CR	Non-described
Pristimantis mazar	E	EN	Guayasamin and Arteaga (2013)
Pristimantis metabates		VU	Non-described
Pristimantis miktos		LC	Non-described
Pristimantis miltongallardoi	E	DD	Non-described
Pristimantis mindo	E	EN	Arteaga-Navarro *et al.* (2013)
Pristimantis minimus	E	EN	Non-described
Pristimantis modipeplus	E	EN	Non-described
Pristimantis morlaco	E	DD	Sánchez-Nivicela *et al.* (2022)
Pristimantis multicolor	E	CR	Non-described
Pristimantis munozi	E	EN	Rojas-Runjaic *et al.* (2014)
Pristimantis muranunka	E	CR	Brito *et al.* (2017)
Pristimantis muricatus	E	VU	Non-described
Pristimantis mutabilis	E	EN	Guayasamin *et al.* (2015)
Pristimantis myersi		EN	Non-described
Pristimantis nangaritza	E	CR	Non-described
Pristimantis nankints	E	DD	Non-described
Pristimantis nanus	E	DD	Non-described
Pristimantis nelsongalloi	E	DD	Valencia *et al.* (2019)
Pristimantis nephophilus		NT	Non-described
Pristimantis nietoi	E	EN	Non-described
Pristimantis nigrogriseus	E	EN	Non-described
Pristimantis nimbus	E	CR	Non-described
Pristimantis nyctophylax	E	NT	Non-described

(*Continued*)

TABLE 0.2 (*Continued*)

Summary of Endemism, Red List Categories, and Citations of References for Which Call Descriptions of 281 Species of Craugastoridae from Ecuador Have Been Published. Call descriptions are the ones that include quantitative data. Information on calls is given under accounts and in the Appendix "Vocalizations of Ecuadorian Craugastoridae." End = Endemism, E = endemic, CR = Critically Endangered, CR (PE) = Critically Endangered (Possibly Extinct), EN = Endangered, DD = Data Deficient, LC = Least Concern, NT = Near Threatened, VU = Vulnerable.

Species	End	Red List	Call References
Pristimantis ocellatus		CR	Non-described
Pristimantis ocreatus	E	EN	Non-described
Pristimantis omarrhynchus	E	DD	Bejarano-Muñoz *et al.* (2022)
Pristimantis omeviridis		NT	Non-described
Pristimantis onorei	E	DD	Non-described
Pristimantis orcesi	E	VU	Non-described
Pristimantis orestes	E	CR	Urgiles *et al.* (2019)
Pristimantis ornatissimus	E	EN	Non-described
Pristimantis orphnolaimus	E	NT	Non-described
Pristimantis ortizi	E	CR	Non-described
Pristimantis pahuma	E	EN	Hutter and Guayasamin (2015)
Pristimantis paquishae	E	NT	Brito *et al.* (2014)
Pristimantis parvillus		NT	Coloma and Tapia (this publication)
Pristimantis pastazensis	E	EN	Non-described
Pristimantis pataikos		VU	Non-described
Pristimantis paululus	E	VU	Non-described
Pristimantis pecki		VU	Non-described
Pristimantis percultus	E	CR	Non-described
Pristimantis peruvianus		LC	Non-described
Pristimantis petersi	E	VU	Carrión-Olmedo and Ron (2021)
Pristimantis petersioides	E	VU	Batallas and Brito (2016a); Carrión-Olmedo and Ron (2021)
Pristimantis philipi	E	CR	Non-described
Pristimantis phoxocephalus	E	CR	Páez and Ron (2019)
Pristimantis pichincha	E	CR	Non-described
Pristimantis pinchaque	E	EN	Non-described
Pristimantis pramukae		DD	Non-described
Pristimantis prolatus	E	LC	Non-described
Pristimantis proserpens	E	EN	Non-described
Pristimantis pseudoacuminatus		NT	Non-described
Pristimantis pteridophilus	E	VU	Non-described
Pristimantis pugnax		CR	Non-described
Pristimantis punzan	E	CR	Non-described
Pristimantis puruscafeum	E	VU	Non-described
Pristimantis pycnodermis	E	EN	Coloma and Tapia (this publication)
Pristimantis pyrrhomerus	E	CR	Non-described
Pristimantis quaquaversus		LC	Non-described
Pristimantis quinquagesimus		EN	Non-described
Pristimantis quintanai	E	CR	Non-described
Pristimantis resistencia	E	DD	Non-described
Pristimantis rhodoplichus		NT	Non-described
Pristimantis rhodostichus		NT	Non-described
Pristimantis riveti	E	EN	Non-described
Pristimantis romanorum	E	EN	Non-described
Pristimantis romeroae	E	DD	Non-described

TABLE 0.2 (*Continued*)

Summary of Endemism, Red List Categories, and Citations of References for Which Call Descriptions of 281 Species of Craugastoridae from Ecuador Have Been Published. Call descriptions are the ones that include quantitative data. Information on calls is given under accounts and in the Appendix "Vocalizations of Ecuadorian Craugastoridae." End = Endemism, E = endemic, CR = Critically Endangered, CR (PE) = Critically Endangered (Possibly Extinct), EN = Endangered, DD = Data Deficient, LC = Least Concern, NT = Near Threatened, VU = Vulnerable.

Species	End	Red List	Call References
Pristimantis roni	E	EN	Yánez-Muñoz *et al.* (2014)
Pristimantis rosadoi		VU	Non-described
Pristimantis rubicundus	E	VU	Non-described
Pristimantis rufioculis		EN	Non-described
Pristimantis rufoviridis	E	CR	Non-described
Pristimantis ruidus	E	CR	Non-described
Pristimantis sacharuna	E	VU	Non-described
Pristimantis samaniegoi	E	CR	Non-described
Pristimantis sambalan	E	CR	Non-described
Pristimantis saturninoi	E	DD	Brito *et al.* (2017)
Pristimantis schultei		VU	Non-described
Pristimantis scolodiscus		EN	Non-described
Pristimantis serendipitus		EN	Non-described
Pristimantis simonbolivari	E	CR	Non-described
Pristimantis sirnigeli	E	EN	Coloma and Tapia (this publication)
Pristimantis skydmainos		LC	Non-described
Pristimantis sobetes	E	EN	Non-described
Pristimantis spinosus	E	VU	Non-described
Pristimantis sternothylax		VU	Non-described
Pristimantis subsigillatus		EN	Non-described
Pristimantis supernatis		VU	Non-described
Pristimantis surdus	E	EN	Non-described
Pristimantis tamia	E	DD	Non-described
Pristimantis tenebrionis	E	VU	Non-described
Pristimantis teslai	E	VU	Non-described
Pristimantis thymalopsoides	E	EN	Non-described
Pristimantis thymelensis		VU	Non-described
Pristimantis tiktik	E	CR	Non-described
Pristimantis tinajillas	E	EN	Non-described
Pristimantis tinguichaca	E	VU	Brito *et al.* (2016)
Pristimantis torresi	E	CR	Székely *et al.* (2021)
Pristimantis totoroi	E	EN	Páez and Ron (2019)
Pristimantis trachyblepharis	E	EN	Non-described
Pristimantis truebae	E	EN	Non-described
Pristimantis tungurahua	E	EN	Non-described
Pristimantis ujucami	E	DD	Non-described
Pristimantis unistrigatus		LC	Non-described
Pristimantis variabilis		LC	Non-described
Pristimantis venegasi	E	DD	Non-described
Pristimantis ventrimarmoratus		VU	Non-described
Pristimantis ventristellatus	E	DD	Non-described
Pristimantis verecundus		EN	Non-described
Pristimantis verrucolatus	E	EN	Páez and Ron (2019)
Pristimantis versicolor	E	VU	Székely *et al.* (2020)
Pristimantis vertebralis	E	VU	Non-described

(*Continued*)

TABLE 0.2 (*Continued*)

Summary of Endemism, Red List Categories, and Citations of References for Which Call Descriptions of 281 Species of Craugastoridae from Ecuador Have Been Published. Call descriptions are the ones that include quantitative data. Information on calls is given under accounts and in the Appendix "Vocalizations of Ecuadorian Craugastoridae." End = Endemism, E = endemic, CR = Critically Endangered, CR (PE) = Critically Endangered (Possibly Extinct), EN = Endangered, DD = Data Deficient, LC = Least Concern, NT = Near Threatened, VU = Vulnerable.

Species	End	Red List	Call References
Pristimantis vidua	E	EN	Székely *et al.* (2020)
Pristimantis w-nigrum		EN	Non-described
Pristimantis walkeri	E	LC	Non-described
Pristimantis waoranii	E	NT	Non-described
Pristimantis yanezi	E	NT	Non-described
Pristimantis yantzaza	E	EN	Valencia *et al.* (2017)
Pristimantis yumbo	E	EN	Non-described
Strabomantis anatipes		CR (PE)	Non-described
Strabomantis anomalus		CR	Non-described
Strabomantis cerastes		CR (PE)	Non-described
Strabomantis cornutus		EN	Non-described
Strabomantis helonotus	E	CR (PE)	Non-described
Strabomantis necerus	E	CR (PE)	Non-described
Strabomantis sulcatus		LC	Non-described

TABLE 0.3

Ecuadorian Ecosystems (*sensu* Ministerio de Ambiente del Ecuador, 2013) and the Abbreviations Used Herein

Ecosystem	Abbreviation
Deciduous Forest of Cordillera Costera of Ecuatorial Pacific	DFCCEP
Deciduous Forest of Lowlands of Jama-Zapotillo	DFLJZ
Deciduous Low Montane Forest of Catamayo-Alamor	DLMFCA
Deciduous Montane Foothill Forest of Catamayo-Alamor	DMFFCA
Deciduous Shrub and Grasslands of Beaches of Litoral	DSGBL
Desert Shrub of Lowlands of Jama-Zapotillo	DSLJZ
Desert Shrub of South of the Valleys	DSSV
Evergreen Forest of Lowlands of Aguarico-Putumayo-Caquetá	EFLAPC
Evergreen Forest of Lowlands with Bamboo of Amazonia	EFLBA
Evergreen Forest of Lowlands of Ecuatorial Chocó	EFLEC
Evergreen Forest of Lowlands of Fan of Pastaza	EFLFP
Evergreen Forest of Lowlands of Napo-Curaray	EFLNC
Evergreen Forest of Lowlands of Tigre-Pastaza	EFLTP
Evergreen Forest of Páramo	EFP
Evergreen Forest on Sandstone Plateaus of Cordillera del Cóndor in Lowland Ecuadorian Amazonia	EFSPCCLEA
Evergreen Grassland and Shrub of Páramo of Volcán Sumaco	EGSPVS
Evergreen High Montane Forest of Catamayo-Alamor	EHMFCA
Evergreen High Montane Forest of Cordillera Occidental of the Andes	EHMFCOA
Evergreen High Montane Forest of North of Cordillera Oriental of the Andes	EHMFNCOA
Evergreen High Montane Forest of South of Cordillera Oriental of the Andes	EHMFSCOA
Evergreen Low Montane Forest of Catamayo-Alamor	ELMFCA
Evergreen Low Montane Forest of Cordilleras Cóndor-Kutukú	ELMFCCK
Evergreen Low Montane Forest of Cordillera Occidental of the Andes	ELMFCOA
Evergreen Low Montane Forest of Galeras	ELMFG
Evergreen Low Montane Forest of North of Cordillera Oriental of the Andes	ELMFNCOA
Evergreen Low Montane Forest of Cordillera Costera of Ecuatorial Chocó	ELMFCCEC
Evergreen Low Montane Forest of South of Cordillera Oriental of the Andes	ELMFSCOA
Evergreen Low Montane Forest on Sandstone Plateaus of Cordilleras Cóndor-Kutukú	ELMFSPCCK
Evergreen Montane Forest of Cordilleras Cóndor-Kutukú	EMCCCK
Evergreen Montane Forest of Catamayo-Alamor	EMFCA
Evergreen Montane Forest of Cordillera Occidental of the Andes	EMFCOA
Evergreen Montane Foothill Forest of Catamayo-Alamor	EMFFCA
Evergreen Montane Foothill Forest of Cordilleras Cóndor-Kutukú	EMFFCCK
Evergreen Montane Foothill Forest of Cordillera Occidental of the Andes	EMFFCOA
Evergreen Montane Foothill Forest of Galeras	EMFFG
Evergreen Montane Foothill Forest of North of Cordillera Oriental of the Andes	EMFFNCOA
Evergreen Montane Foothill Forest on Outcrops of Limestone Rock of Amazonian Cordilleras	EMFFOLRAC
Evergreen Montane Foothill Forest of South of Cordillera Oriental of the Andes	EMFFSCOA
Evergreen Montane Foothill Forest on Sandstone Plateaus of Cordilleras Cóndor-Kutukú	EMFFSPCCK
Evergreen Montane Forest of North of the Cordillera Oriental of the Andes	EMFNCOA
Evergreen Montane Forest of South of the Cordillera Oriental of the Andes	EMFSCOA
Evergreen Montane Forest on Sandstone Plateaus of Cordillera del Cóndor	EMFSPCC
Evergreen Montane Shrub from North of the Andes	EMSNA
Evergreen Montane Shrub from South of the Andes	EMSSA
Evergreen Riparian Shrub from Cordillera Oriental of the Andes	ERSCOA
Evergreen Seasonal Flooded Forest of Alluvial Plain Jama-Zapotillo	ESFFAPJZ
Evergreen Seasonal Forest of Lowlands of Ecuatorial Chocó	ESFLEC
Evergreen Seasonal Forest of Lowlands of Jama-Zapotillo	ESFLJZ
Evergreen Shrub and Grassland of Páramo	ESGP

(*Continued*)

TABLE 0.3 (*Continued*)

Ecuadorian Ecosystems (*sensu* Ministerio de Ambiente del Ecuador, 2013) and the Abbreviations Used Herein

Ecosystem	Abbreviation
Evergreen Subnivarean Grassland and Shrub of Páramo	ESGSP
Evergreen Seasonal Low Montane Forest of Catamayo-Alamor	ESLMFCA
Evergreen Seasonal Low Montane Forest of Cordillera Costera of Ecuatorial Pacific	ESLMFCCEP
Evergreen Seasonal Montane Foothill Forest of Catamayo-Alamor	ESMFFCA
Evergreen Seasonal Montane Foothill Forest of Cordillera Costera of Ecuatorial Chocó	ESMFFCCEC
Evergreen Seasonal Montane Foothill Forest of Cordillera Costera of Ecuatorial Pacífic	ESMFFCCEP
Evergreen Seasonal Montane Foothill Forest of Cordillera Occidental of the Andes	ESMFFCOA
Evergreen Shrub and Montane Grassland of Cordillera del Cóndor	ESMGCC
Evergreen High Montane Shrub from Southern Páramo	EHMSSP
Flooded Forest of Alluvial Plain of Amazonia	FFAPA
Flooded Forest of Alluvial Plain of Ecuatorial Chocó	FFAPEC
Flooded Forest of Alluvial Plain of Rivers of Andean and Amazonian Cordilleras Origin	FFAPRAAC
Flooded Forest of Alluvial Plain of Rivers of Amazonian Origin	FFAPRAO
Flooded Forest of Intertidal Plain of Ecuatorial Chocó	FFIPEC
Flooded Forest and Lacustrine-riparian Vegetation of Amazonian Black Waters	FFLVABW
Flooded Forest of Palms of Alluvial Plain of Amazonia	FFPAPA
Flooded Grassland of Páramo	FGP
Flooded Lacustrine-riparian of the Alluvial Plain of Amazonia	FLAPA
Flooded Lacustrine Grassland of Ecuatorial Pacific	FLGEP
Flooded Riparian Grassland of Lowlands of Ecuatorial Chocó	FRGLEC
Flooded Riparian Grassland of Lowlands of Jama-Zapotillo	FRGLJZ
Forest and Semideciduous Shrub of North of the Valleys	FSSNV
Forest and Semideciduous Shrub of South of the Valleys	FSSSV
Grassland of Páramo	GP
High Superior Humid Montane Grassland of Páramo	HSHMGP
Low Forest and Deciduous Shrub of Lowlands of Jama-Zapotillo	LFDSLJZ
Low Montane Lacustrine Grassland of South of Cordillera Oriental of the Andes	LMLGSCOA
Mangrove of Ecuatorial Chocó	MEC
Mangrove of Jama-Zapotillo	MJZ
Rosette Caulescent and Grassland of Páramo (Frailejones)	RCGP
Semideciduous Forest of Cordillera Costera of Ecuatorial Pacific	SFCCEP
Semideciduous Forest of Lowlands of Jama-Zapotillo	SFLJZ
Semideciduous Low Montane Forest of Catamayo-Alamor	SLMFCA
Semideciduous Montane Foothill Forest of Catamayo-Alamor	SMFFCA
Semideciduous Montane Foothill Forest of South of Cordillera Oriental of the Andes	SMFFSCOA
Semideciduous Shrub of South of the Valleys	SSSV
Subnivarean Humid Grassland of Páramo	SHGP
Ultra Humid Subnivarean Grassland of Páramo	UHSGP

TABLE 0.4

Distribution in 87 ecosystems (*sensu* Ministerio de Ambiente del Ecuador, 2013) of 281 Species of Ecuadorian Craugastoridae. Fresh Water (W) and intervened areas (I) are also included. Abbreviations are given in Table 0.3

Barycholos pulcher	DFLJZ, SFCCEP, SFLJZ, ESFLEC, ESFLJZ, ESLMFCCEP, ESMFFCCEP, ESMFFCA,
Craugastor longirostris	EFLEC, EFLEC, ELMFCCEC, ELMFCOA, EMFFCOA, MEC
Lynchius flavomaculatus	ELMFSCOA
Lynchius megacephalus	EMFSCOA
Lynchius parkeri	EMFCA
Lynchius simmonsi	ELMFCCK, ELMFSPCCK, EMFFCCK
Niceforonia babax	ELMFCOA
Niceforonia brunnea	EHMFNCOA
Niceforonia dolops	ELMFNCOA, EMFFNCOA
Niceforonia elassodisca	FFAPRAAC, EMFNCOA, GP
Niceforonia nigrovittata	FFAPRAO, FFAPRAAC, FFAPA, EFLFP, EFLAPC, EFLNC, EFLTP, ELMFNCOA, EMFFCCK, EMFFNCOA
Niceforonia peraccai	EHMFNCOA, EMFNCOA, GP
Noblella coloma	EMFCOA
Noblella heyeri	ESMFFCA, EMFCA, EMFSCOA
Noblella lochites	EHMFSCOA, ELMFCCK, ELMFSPCCK, EMFSCOA, EMFFCCK
Noblella mindo	ELMFCOA
Noblella myrmecoides	FFAPA, EFLFP, EMFFCCK, EMFFSCOA
Noblella naturetrekii	EMFNCOA
Noblella personina	ERSCOA, ELMFCCK, ELMFNCOA, ELMFSCOA, EMFFCCK
Noblella worleyae	ELMFCOA, EMFFCOA
Oreobates quixensis	FFAPRAO, FFAPRAAC, FFLVABW, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, ELMFNCOA, EMFNCOA, EMFFNCOA
Pristimantis acerus	EHMFNCOA, EMFNCOA
Pristimantis achatinus	EMSNA, LFDSLJZ, DFLJZ, DMFFCA, FFAPEC, SFCCEP, SFLJZ, EFLEC, ESLMFCCEP, ESMFFCCEC, ESMFFCCEP, ESMFFCOA, ESMFFCA, ELMFCCEC, ELMFCOA, EMFCOA, EMFCA, EMFFCOA, EMFFCA, MEC
Pristimantis actites	EHMFCOA, ELMFCOA, EMFCOA, EMFFCOA, FSSNV, GP
Pristimantis acuminatus	FFAPRAO, FFAPA, EFLFP, EFLTP, EMFFCCK
Pristimantis afrox	EFLEC
Pristimantis albujai	ELMFSCOA
Pristimantis allpapuyu	EHMFCOA
Pristimantis almendariz	ELMFCCK
Pristimantis altamazonicus	FFAPRAO, FFAPRAAC, FFLVABW, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EMFFCCK, EMFFNCOA
Pristimantis altamnis	EFLAPC, EMFFNCOA
Pristimantis amaguanae	EFLTP, EMFFNCOA
Pristimantis anaiae	ELMFNCOA
Pristimantis andinodiabolus	EHMFSCOA
Pristimantis andinogigas	ESGP
Pristimantis andinognomus	ESGP, EMFSCOA
Pristimantis anemerus	EMFCA
Pristimantis apiculatus	ELMFCOA, EMFCOA
Pristimantis appendiculatus	ELMFCOA, EMFCOA, EMFFCOA
Pristimantis aquilonaris	EMFSCOA
Pristimantis ardyae	EMFNCOA
Pristimantis atillo	ESGP, EHMFSCOA, GP
Pristimantis atratus	ELMFCCK, ELMFSCOA, EMCCCK, EMFSCOA, EMFFSCOA
Pristimantis aureolineatus	FFAPRAAC, EFLFP, EFLAPC, EFLNC, EFLTP, EMFFNCOA
Pristimantis balionotus	EHMFSCOA, ELMFSCOA, EMFSCOA
Pristimantis bambu	EHMFSCOA, GP
Pristimantis barrigai	EMCCCK

(*Continued*)

TABLE 0.4 (*Continued*)

Distribution in 87 ecosystems (*sensu* Ministerio de Ambiente del Ecuador, 2013) of 281 Species of Ecuadorian Craugastoridae. Fresh Water (W) and intervened areas (I) are also included. Abbreviations are given in Table 0.3

Pristimantis baryecuus	ELMFSCOA, EMFSCOA
Pristimantis bellae	ELMFNCOA, EMFNCOA
Pristimantis bicantus	ERSCOA, ELMFNCOA, ELMFSCOA, EMFNCOA, EMFSCOA, EMFFNCOA, LMLGSCOA
Pristimantis brevicrus	FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EFLTP, EMFFCCK, EMFFNCOA
Pristimantis bromeliaceus	EFLFP, ELMFCCK, ELMFSCOA, ELMFSPCCK, EMCCCK, EMFSCOA, EMFFCCK
Pristimantis buckleyi	ESGP, EHMFCOA, EHMFNCOA, EMFCOA, GP, FGP, RCGP
Pristimantis buenaventura	ESMFFCOA, ESMFFCA, EMFCA
Pristimantis burtoniorum	EMFNCOA
Pristimantis caeruleonotus	ESGP, EMFCA, EMFSCOA
Pristimantis cajamarcensis	SLMFCA, ELMFSCOA, EMFCA, EMFSCOA
Pristimantis cajanuma	EHMFSCOA, EMFSCOA
Pristimantis calcarulatus	ELMFCOA, EMFCOA
Pristimantis caniari	GP
Pristimantis caprifer	EFLEC, EMFFCOA
Pristimantis carlosceroni	EMFCOA
Pristimantis carvalhoi	FFAPRAAC, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EFLTP, EMFFCCK,
Pristimantis cedros	ELMFCOA
Pristimantis celator	EMSNA, EHMFCOA, EMFCOA
Pristimantis chalceus	EFLEC, ESMFFCCEC, ELMFCOA, EMFCOA, EMFFCOA
Pristimantis chloronotus	ESGP, EHMFNCOA, EMFNCOA
Pristimantis chocoensis	EFLEC, EMFFCOA
Pristimantis chomskyi	EHMFCA
Pristimantis churuwiai	ERSCOA, ELMFCCK, ELMFNCOA, ELMFSCOA, EMCCCK, EMFSPCC, EMFFSCOA
Pristimantis cisnerosi	EFLEC, EMFFCOA
Pristimantis citriogaster	SMFFSCOA, EMFFCCK, EMFFSCOA, EMFFOLRAC
Pristimantis colodactylus	ELMFSCOA, EMFSCOA, GP
Pristimantis colomai	EMFFCOA
Pristimantis colonensis	EHMFNCOA, EMFNCOA
Pristimantis condor	ELMFCCK, ELMFSCOA, ELMFSPCCK, EMCCCK, EMFSPCC, EMFFCCK, EMFFSCOA, EMFFOLRAC,
Pristimantis conspicillatus	ERSCOA, FFAPRAO, FFAPRAAC, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, ELMFNCOA, ELMFSCOA, EMFFCCK, EMFFNCOA, EMFFOLRAC
Pristimantis cremnobates	EFLFP, ELMFNCOA, EMFNCOA, EMFFNCOA
Pristimantis crenunguis	ELMFCOA, EMFCOA, EMFFCOA
Pristimantis croceoinguinis	FFAPRAO, FFLVABW, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EFLTP, EMFFG, EMFFCCK, EMFFNCOA, EMFFOLRAC
Pristimantis crucifer	ELMFCOA, EMFCOA, EMFFCOA
Pristimantis cryophilius	EHMFCOA, EHMFSCOA, EMFSCOA, GP
Pristimantis cryptomelas	ESGP, EHMFSCOA, ELMFCCK, ELMFSCOA, EMFCA, EMFSCOA
Pristimantis curtipes	EMSNA, ESGP, EHMFCOA, EHMFNCOA, ELMFCCK, EMFCOA, GP, HSHMGP, FGP, UHSGP, RCGP
Pristimantis daquilemai	ELMFCCK, EMCCCK
Pristimantis degener	ELMFCOA, EMFFCOA
Pristimantis delius	FFAPRAAC, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EFLTP, EMFFCCK,
Pristimantis devillei	EHMFNCOA, EMFNCOA
Pristimantis diadematus	FFAPRAO, FFAPRAAC, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EFLTP, ELMFSPCCK, EMFFCCK, EMFFNCOA, EMFFSCOA, EMFFOLRAC, EMFFSPCCK
Pristimantis dissimulatus	ELMFCOA, EMFCOA
Pristimantis duellmani	ELMFCOA, EMFCOA
Pristimantis ecuadorensis	I
Pristimantis enigmaticus	FFAPRAO, FFAPA, EFLNC, EFLTP, EMFFNCOA, EMFFOLRAC
Pristimantis eremitus	ELMFCOA, EMFCOA
Pristimantis eriphus	EHMFNCOA, ELMFNCOA, EMFNCOA, EMFFNCOA
Pristimantis ernesti	EMFNCOA

TABLE 0.4 (*Continued*)

Distribution in 87 ecosystems (*sensu* Ministerio de Ambiente del Ecuador, 2013) of 281 Species of Ecuadorian Craugastoridae. Fresh Water (W) and intervened areas (I) are also included. Abbreviations are given in Table 0.3

Pristimantis erythros	GP
Pristimantis esmeraldas	FFAPEC, EFLEC, ESFLJZ, ELMFCCEC, EMFFCOA
Pristimantis eugeniae	ELMFCOA, EMFCOA
Pristimantis exoristus	ELMFCCK, ELMFSPCCK, EMFFOLRAC
Pristimantis festae	EHMFNCOA, EMFNCOA, GP
Pristimantis floridus	ELMFCOA, EMFCOA, EMFFCOA
Pristimantis gagliardoi	EHMFSCOA
Pristimantis galdi	ERSCOA, EFLFP, EFLNC, ELMFCCK, ELMFNCOA, ELMFSCOA, EMCCCK, EMFNCOA, EMFSPCC, EMFFCCK, EMFFSCOA
Pristimantis ganonotus	ERSCOA, ELMFCCK, ELMFNCOA, EMCCCK, EMFNCOA
Pristimantis gentryi	EHMFCOA, GP
Pristimantis gladiator	EHMFNCOA, EMFNCOA, GP
Pristimantis glandulosus	EHMFNCOA, ELMFNCOA, ELMFSCOA, EMFNCOA, GP
Pristimantis glendae	EMFNCOA, LMLGSCOA
Pristimantis gloria	ESGP, EHMFSCOA, GP
Pristimantis gralarias	EMFCOA
Pristimantis gualacenio	EMFSCOA
Pristimantis hamiotae	ELMFCOA, EMFCOA
Pristimantis hampatusami	SFLJZ, ESMFFCOA, ESMFFCA, EMFFCA
Pristimantis hectus	ELMFCOA, EMFCOA
Pristimantis huicundo	EHMFNCOA, EMFNCOA
Pristimantis ignicolor	EHMFNCOA, EMFNCOA
Pristimantis illotus	ELMFCOA, EMFCOA, EMFFCOA
Pristimantis incanus	ELMFNCOA, EMFNCOA, EMFSCOA
Pristimantis incomptus	ERSCOA, ELMFCCK, ELMFNCOA, ELMFSCOA, ELMFSPCCK, EMFSCOA, EMFFCCK, EMFFNCOA, EMFFOLRAC, EMFFSPCCK
Pristimantis inusitatus	EHMFNCOA, ELMFNCOA, EMFNCOA
Pristimantis jimenezi	EHMFCOA, EMFCOA
Pristimantis katoptroides	ERSCOA, FFAPRAAC, EFLFP, ELMFCCK, ELMFNCOA, EMFNCOA, EMFFG, EMFFCCK, EMFFSCOA, EMFFOLRAC, EMFFSPCCK
Pristimantis kichwarum	FFAPRAO, FFAPA, FFPAPA, EFLAPC, EFLNC, EFLTP, EMFFNCOA
Pristimantis kirklandi	I
Pristimantis kunam	LMLGSCOA
Pristimantis kuri	ESMFFCA
Pristimantis labiosus	ELMFCOA, EMFCOA, EMFFCOA
Pristimantis lacrimosus	FFAPA, EFLFP, EFLNC, EFLTP, ELMFNCOA, EMFFCCK, EMFFNCOA
Pristimantis lanthanites	FFAPRAO, FFAPRAAC, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EFLTP, EMFFG, EMFFCCK, EMFFNCOA
Pristimantis latericius	EMFSCOA
Pristimantis laticlavius	EFLEC, ELMFCOA, EMFCOA, EMFFCOA
Pristimantis latidiscus	EFLEC, ELMFCCEC, EMFFCOA
Pristimantis ledzeppelin	ELMFCCK, EMCCCK
Pristimantis leoni	EHMFCOA, ELMFCOA, EMFCOA, GP
Pristimantis leucopus	EMFNCOA
Pristimantis librarius	FFAPRAO, EFLFP, EFLNC, EFLTP, EMFFNCOA
Pristimantis limoncochensis	FFLVABW, FFPAPA, EFLAPC, EFLNC
Pristimantis lividus	EHMFNCOA, EMFNCOA
Pristimantis llanganati	ELMFNCOA, EMFNCOA
Pristimantis lojanus	EMSSA, EMFCA, EMFSCOA
Pristimantis loujosti	EMFNCOA
Pristimantis loustes	EMFFCOA
Pristimantis lucidosignatus	ELMFCOA

(*Continued*)

TABLE 0.4 (*Continued*)

Distribution in 87 ecosystems (*sensu* Ministerio de Ambiente del Ecuador, 2013) of 281 Species of Ecuadorian Craugastoridae. Fresh Water (W) and intervened areas (I) are also included. Abbreviations are given in Table 0.3

Pristimantis luscombei	FFAPRAO, FFAPRAAC, FFAPA, FFPAPA, EFLFP, EFLNC, EFLTP, EMFFCCK,
Pristimantis luteolateralis	ELMFCOA, EMFFCOA
Pristimantis lutzae	EHMFCOA, GP
Pristimantis lymani	EMSSA, SMFFCA, ESLMFCA, ESMFFCA, EHMFSCOA, EMFCA, EMFSCOA, FSSSV
Pristimantis malkini	FFAPRAO, FFAPRAAC, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EFLTP, FLAPA
Pristimantis mallii	ELMFNCOA, EMFNCOA
Pristimantis marcoreyesi	EHMFNCOA, EMFNCOA
Pristimantis martiae	FFAPRAO, FFAPA, EFLFP, EFLAPC, EFLNC, EFLTP, ELMFCCK, EMCCCK, EMFFNCOA
Pristimantis maryanneae	EMFNCOA
Pristimantis matidiktyo	FFAPRAO, FFAPA, EFLNC, EFLTP, EMFFCCK, EMFFNCOA
Pristimantis matildae	ESGP, EMFSCOA
Pristimantis mazar	EHMFSCOA, GP
Pristimantis metabates	I
Pristimantis miktos	FFAPRAO, FFAPRAAC, FFAPA, FFPAPA, EFLFP, EFLNC, EFLTP
Pristimantis miltongallardoi	ELMFNCOA, EMFNCOA
Pristimantis mindo	ELMFCOA, EMFFCOA
Pristimantis minimus	EMFFCCK, EMFFOLRAC
Pristimantis modipeplus	GP
Pristimantis morlaco	EMSSA, EMFSCOA
Pristimantis multicolor	ESGP, EMFCA
Pristimantis munozi	EHMFCOA
Pristimantis muranunka	ESMHCC, EMFSPCC
Pristimantis muricatus	ESFLJZ, ELMFCCEC, EMFFCOA
Pristimantis mutabilis	ELMFCOA, EMFCOA, EMFFCOA
Pristimantis myersi	ESGP, EHMFNCOA
Pristimantis nangaritza	ELMFSPCCK, EMFFSPCCK
Pristimantis nankints	ELMFCCK, EMFFCCK
Pristimantis nanus	EMFSPCC
Pristimantis nelsongalloi	ELMFNCOA, ELMFSCOA, EMFNCOA, EMFSPCC
Pristimantis nephophilus	ELMFSCOA, EMCCCK, EMFFSCOA
Pristimantis nietoi	EFLEC, ELMFCCEC, EMFFCOA
Pristimantis nigrogriseus	ELMFCCK, ELMFNCOA, ELMFSCOA, EMFNCOA, EMFSCOA, EMFFCCK
Pristimantis nimbus	EMFSCOA
Pristimantis nyctophylax	ELMFCCEC, ELMFCOA, EMFCOA, EMFFCOA
Pristimantis ocellatus	EMFCOA
Pristimantis ocreatus	EHMFNCOA, EMFCOA, ESGSP, RCGP
Pristimantis omarrhynchus	ELMFNCOA, EMFNCOA
Pristimantis omeviridis	FFAPA, EFLAPC, EFLNC
Pristimantis onorei	EMFCOA
Pristimantis orcesi	EHMFCOA, EHMFNCOA, EMFCOA, GP, UHSGP
Pristimantis orestes	EHMFSCOA, ELMFSCOA, EMFSCOA, GP
Pristimantis ornatissimus	ELMFCOA, EMFFCOA
Pristimantis orphnolaimus	FFAPA, EFLFP, EFLNC, EFLTP
Pristimantis ortizi	EHMFNCOA, EMFCOA, EMFNCOA
Pristimantis pahuma	EMFCOA
Pristimantis paquishae	EMCCCK
Pristimantis parvillus	EFLEC, ESLMFCCEP, ESMFFCCEC, ELMFCCEC, ELMFCOA, EMFCOA, EMFFCOA
Pristimantis pastazensis	ELMFNCOA, EMFNCOA
Pristimantis pataikos	EMFFSCOA
Pristimantis paululus	FFAPA, EFLNC, EMFFNCOA
Pristimantis pecki	EFLFP, ELMFCCK, ELMFSPCCK, EMCCCK, EMFFCCK
Pristimantis percultus	ELMFSCOA, EMFSCOA

TABLE 0.4 (*Continued*)

Distribution in 87 ecosystems (*sensu* Ministerio de Ambiente del Ecuador, 2013) of 281 Species of Ecuadorian Craugastoridae. Fresh Water (W) and intervened areas (I) are also included. Abbreviations are given in Table 0.3

Pristimantis peruvianus	FFAPA, EFLFP, EFLAPC, EFLNC, ELMFCCK, ELMFNCOA, EMCCCK, EMFFCCK
Pristimantis petersi	ELMFNCOA, EMFNCOA, EMFFNCOA
Pristimantis petersioides	ERSCOA, ELMFNCOA, ELMFSCOA, EMFNCOA, EMFSCOA, EMFFNCOA
Pristimantis philipi	EHMFCOA, GP, ESGSP
Pristimantis phoxocephalus	EMFCOA
Pristimantis pichincha	EHMFCOA
Pristimantis pinchaque	ELMFNCOA
Pristimantis pramukae	ELMFCCK, EMFSPCC
Pristimantis prolatus	EFLNC, ELMFCCK, ELMFNCOA, ELMFSCOA, EMCCCK, EMFNCOA, EMFFCCK, EMFFNCOA
Pristimantis proserpens	ELMFCCK, EMCCCK, EMFSCOA, EMFFCCK
Pristimantis pseudoacuminatus	FFAPA, EFLNC, EMFFNCOA
Pristimantis pteridophilus	ELMFCOA, EMFCOA, EMFFCOA, RCGP
Pristimantis pugnax	ELMFNCOA
Pristimantis punzan	EMFNCOA
Pristimantis puruscafeum	EMFNCOA
Pristimantis pycnodermis	ESGP, EHMFSCOA, ELMFSCOA, EMFSCOA, GP
Pristimantis pyrrhomerus	EHMFCOA
Pristimantis quaquaversus	ERSCOA, FFAPRAAC, EFLFP, EFLNC, ELMFCCK, ELMFNCOA, ELMFSCOA, EMCCCK, EMFFG, EMFFCCK, EMFFNCOA, EMFFSCOA, EMFFOLRAC
Pristimantis quinquagesimus	ELMFCOA, EMFCOA
Pristimantis quintanai	EMFSCOA
Pristimantis resistencia	EMFNCOA
Pristimantis rhodoplichus	EHMFCA, EMFCA
Pristimantis rhodostichus	ELMFCCK, ELMFSCOA, ELMFSPCCK, EMCCCK
Pristimantis riveti	EHMFNCOA, RCGP
Pristimantis romanorum	ELMFCOA, EMFCOA
Pristimantis romeroae	ELMFNCOA
Pristimantis roni	ERSCOA, ELMFSCOA, EMFSCOA, LMLGSCOA
Pristimantis rosadoi	EFLEC, ELMFCCEC, EMFFCOA
Pristimantis rubicundus	ELMFNCOA, ELMFSCOA, EMFSCOA, EMFFNCOA
Pristimantis rufioculis	I
Pristimantis rufoviridis	EMFCOA
Pristimantis ruidus	EMFCOA
Pristimantis sacharuna	EMFNCOA
Pristimantis samaniegoi	EHMFSCOA, EMFSCOA
Pristimantis sambalan	EMFSCOA
Pristimantis saturninoi	EMFSCOA, GP
Pristimantis schultei	ELMFCCK, EMCCCK, EMFSCOA, GP
Pristimantis scolodiscus	ELMFCOA, EMFCOA, EMFFCOA
Pristimantis serendipitus	ELMFCCK, ELMFSCOA, EMCCCK, EMFFSCOA, EMFFOLRAC
Pristimantis simonbolivari	EHMFCOA, HSHMGP
Pristimantis sirnigeli	EHMFCOA, ELMFCOA, EMFCOA
Pristimantis skydmainos	FFAPA, EFLNC, EFLTP
Pristimantis sobetes	ELMFCOA, EMFCOA
Pristimantis spinosus	ELMFCCK, ELMFSCOA, EMFSCOA, GP
Pristimantis sternothylax	EMFCA
Pristimantis subsigillatus	EMFFCOA
Pristimantis supernatis	EMFNCOA
Pristimantis surdus	EMSNA, EHMFCOA, ELMFCOA, EMFCOA, GP
Pristimantis tamia	ELMFNCOA, ELMFNCOA, EMFFNCOA, EMFFNCOA
Pristimantis tenebrionis	EFLEC, EMFFCOA

(*Continued*)

TABLE 0.4 (*Continued*)

Distribution in 87 ecosystems (*sensu* Ministerio de Ambiente del Ecuador, 2013) of 281 Species of Ecuadorian Craugastoridae. Fresh Water (W) and intervened areas (I) are also included. Abbreviations are given in Table 0.3

Pristimantis teslai	GP
Pristimantis thymalopsoides	EMFCOA
Pristimantis thymelensis	EHMFNCOA, GP, ESGSP, RCGP
Pristimantis tiktik	GP
Pristimantis tinajillas	EMFSCOA
Pristimantis tinguichaca	EMFNCOA, EMFSCOA, GP
Pristimantis torresi	EMFCA
Pristimantis totoroi	EHMFCOA
Pristimantis trachyblepharis	ERSCOA, ELMFNCOA, EMFFNCOA
Pristimantis truebae	EHMFCOA, EMFCOA, HSHMGP, ESGSP
Pristimantis tungurahua	EMFNCOA
Pristimantis ujucami	ERSCOA, ELMFSCOA, EMFFSCOA
Pristimantis unistrigatus	EMSNA, EHMFCOA, EHMFNCOA, EMFCOA, FSSNV, GP, FGP
Pristimantis variabilis	FFAPA, FFPAPA, EFLAPC, EFLNC, EFLTP, ELMFNCOA, EMFNCOA, EMFFCCK,
Pristimantis venegasi	EMFNCOA
Pristimantis ventrimarmoratus	ERSCOA, EFLFP, EFLNC, ELMFNCOA, ELMFSCOA, EMCCCK, EMFNCOA, EMFFCCK,
Pristimantis ventristellatus	ELMFCCK, EMCCCK, EMFSPCC
Pristimantis verecundus	EMFCOA, EMFFCOA
Pristimantis verrucolatus	EHMFCOA, GP
Pristimantis versicolor	ESGP, EHMFCA, EHMFSCOA, ELMFCCK, ELMFSCOA, EMFSCOA, GP
Pristimantis vertebralis	EMSNA, EHMFCOA, ELMFCOA, EMFCOA, EMFFCOA, GP
Pristimantis vidua	EHMFSCOA, ELMFSCOA, GP
Pristimantis w-nigrum	EMSNA, EHMFCOA, EHMFNCOA, ELMFNCOA, ELMFSCOA, EMFCOA, EMFNCOA, EMFSCOA, HSHMGP
Pristimantis walkeri	LFDSLJZ, DFLJZ, SFCCEP, SMFFCA, EFLEC, ESLMFCCEP, ESMFFCCEP, ESMFFCOA, ELMFCCEC, ELMFCOA, EMFFCOA
Pristimantis waoranii	EFLAPC
Pristimantis yanezi	EMFNCOA
Pristimantis yantzaza	ELMFCCK, ELMFSPCCK, EMCCCK, EMFSPCC
Pristimantis yumbo	EHMFCOA, ELMFCOA, EMFCOA
Strabomantis anatipes	ELMFCOA
Strabomantis anomalus	EFLEC, ESMFFCCEC, EMFFCOA
Strabomantis cerastes	EMFFCOA
Strabomantis cornutus	EFLFP, EFLNC, ELMFCCK, ELMFNCOA, ELMFSCOA, EMFNCOA
Strabomantis helonotus	I
Strabomantis necerus	ELMFCOA, EMFCOA
Strabomantis sulcatus	FFAPRAO, FFAPA, FFPAPA, EFLFP, EFLAPC, EFLNC, EFLTP, ELMFNCOA, EMFFNCOA

TABLE 0.5

Distribution of 281 Species of Ecuadorian Craugastoridae in 15 Biogeographic Sectors (*sensu* Ministerio de Ambiente del Ecuador, 2013). Abbreviations are as follows: Amazonian Cordilleras = AC; Aguarico-Putumayo-Caquetá = APC; Catamayo-Alamor = CA; Cordillera Costera of Chocó = CCC; Cordillera Costera of Equatorial Pacific = CCEP; Cordillera Occidental of the Andes = COA; Equatorial Chocó = EC; Fan of Pastaza = FP; Jama-Zapotillo = JZ; Northern Cordillera Oriental of the Andes = NCOA; Napo-Curaray = NP; Páramo = P; Southern Cordillera Oriental of the Andes = SCOA; Tigre-Pastaza = TP; Valleys = V.

Species	AC	APC	CA	CCC	CCEP	COA	EC	FP	JZ	NC	NCOA	P	SCOA	TP	V	# Sectors
Barycholos pulcher			X	X	X	X	X		X							6
Craugastor longirostris				X	X	X	X		X							5
Lynchius flavomaculatus													X			1
Lynchius megacephalus													X			1
Lynchius parkeri												X				1
Lynchius simmonsi	X															1
Niceforonia babax						X										1
Niceforonia brunnea											X	X				2
Niceforonia dolops										X	X					2
Niceforonia elassodisca											X	X				2
Niceforonia nigrovittata	X	X						X		X	X			X		6
Niceforonia peraccai											X	X				2
Noblella coloma						X										1
Noblella heyeri			X						X				X			3
Noblella lochites	X										X	X	X			4
Noblella mindo						X										1
Noblella myrmecoides	X	X						X					X	X		5
Noblella naturetrekii											X					1
Noblella personina	X										X		X			3
Noblella worleyae						X										1
Oreobates quixensis		X						X		X	X		X	X		6
Pristimantis acerus											X					1
Pristimantis achatinus	X			X	X	X	X		X						X	7
Pristimantis actites						X						X			X	3
Pristimantis acuminatus	X							X		X	X			X		5
Pristimantis afrox							X									1

(*Continued*)

TABLE 0.5 (*Continued*)

Distribution of 281 Species of Ecuadorian Craugastoridae in 15 Biogeographic Sectors (*sensu* Ministerio de Ambiente del Ecuador, 2013). Abbreviations are as follows: Amazonian Cordilleras = AC; Aguarico-Putumayo-Caquetá = APC; Catamayo-Alamor = CA; Cordillera Costera of Chocó = CCC; Cordillera Costera of Equatorial Pacific = CCEP; Cordillera Occidental of the Andes = COA; Equatorial Chocó = EC; Fan of Pastaza = FP; Jama-Zapotillo = JZ; Northern Cordillera Oriental of the Andes = NCOA; Napo-Curaray = NP; Páramo = P; Southern Cordillera Oriental of the Andes = SCOA; Tigre-Pastaza = TP; Valleys = V.

Species	AC	APC	CA	CCC	CCEP	COA	EC	FP	JZ	NC	NCOA	P	SCOA	TP	V	# Sectors
Pristimantis albujai													X			1
Pristimantis allpapuyu						X										1
Pristimantis almendariz	X															1
Pristimantis altamazonicus	X	X						X		X	X			X		6
Pristimantis altamnis		X								X	X					3
Pristimantis amaguanae										X				X		2
Pristimantis anaiae											X					1
Pristimantis andinodiabolus												X				1
Pristimantis andinogigas												X				1
Pristimantis andinognomus												X	X			2
Pristimantis anemerus			X													1
Pristimantis apiculatus						X										1
Pristimantis appendiculatus						X										1
Pristimantis aquilonaris													X			1
Pristimantis ardyae											X					1
Pristimantis atillo												X	X			2
Pristimantis atratus	X											X	X			3
Pristimantis aureolineatus		X						X		X	X			X		5
Pristimantis balionotus			X									X	X			3
Pristimantis bambu												X	X			2
Pristimantis barrigai	X															1
Pristimantis baryecuus													X			1
Pristimantis bellae											X					1
Pristimantis bicantus											X		X			2
Pristimantis brevicrus	X	X						X		X	X			X		6

Species	AC	APC	CA	CCC	CCEP	COA	EC	FP	JZ	NC	NCOA	P	SCOA	TP	V	# Sectors
Pristimantis bromeliaceus	X							X					X			3
Pristimantis buckleyi						X					X	X				3
Pristimantis buenaventura			X			X			X						X	4
Pristimantis burtoniorum											X					1
Pristimantis caeruleonotus												X	X			2
Pristimantis cajamarcensis			X			X						X	X			4
Pristimantis cajanuma												X	X			2
Pristimantis calcarulatus						X										1
Pristimantis caniari												X				1
Pristimantis caprifer						X	X									2
Pristimantis carlosceroni						X										1
Pristimantis carvalhoi	X	X						X		X	X			X		6
Pristimantis cedros						X										1
Pristimantis celator						X						X				2
Pristimantis chalceus						X	X									2
Pristimantis chloronotus											X	X				2
Pristimantis chocoensis						X	X									2
Pristimantis chomskyi												X				1
Pristimantis churuwiai	X										X		X			3
Pristimantis cisnerosi						X	X									2
Pristimantis citriogaster	X										X		X			3
Pristimantis colodactylus												X	X			2
Pristimantis colomai						X										1
Pristimantis colonensis											X					1
Pristimantis condor	X												X			2
Pristimantis conspicillatus	X	X						X		X	X		X	X		7
Pristimantis cremnobates	X							X			X		X			4
Pristimantis crenunguis						X	X									2
Pristimantis croceoinguinis	X	X						X		X	X			X		6
Pristimantis crucifer						X					X					2
Pristimantis cryophilius											X	X	X			3
Pristimantis cryptomelas	X											X	X			3

(*Continued*)

TABLE 0.5 (*Continued*)

Distribution of 281 Species of Ecuadorian Craugastoridae in 15 Biogeographic Sectors (*sensu* Ministerio de Ambiente del Ecuador, 2013). Abbreviations are as follows: Amazonian Cordilleras = AC; Aguarico-Putumayo-Caquetá = APC; Catamayo-Alamor = CA; Cordillera Costera of Chocó = CCC; Cordillera Costera of Equatorial Pacific = CCEP; Cordillera Occidental of the Andes = COA; Equatorial Chocó = EC; Fan of Pastaza = FP; Jama-Zapotillo = JZ; Northern Cordillera Oriental of the Andes = NCOA; Napo-Curaray = NP; Páramo = P; Southern Cordillera Oriental of the Andes = SCOA; Tigre-Pastaza = TP; Valleys = V.

Species	AC	APC	CA	CCC	CCEP	COA	EC	FP	JZ	NC	NCOA	P	SCOA	TP	V	# Sectors
Pristimantis curtipes	X					X					X	X			X	5
Pristimantis daquilemai	X															1
Pristimantis degener						X										1
Pristimantis delius	X	X						X		X	X			X		6
Pristimantis devillei											X					1
Pristimantis diadematus	X	X						X		X	X		X	X		7
Pristimantis dissimulatus						X										1
Pristimantis duellmani						X										1
Pristimantis ecuadorensis						X										1
Pristimantis enigmaticus	X							X		X	X			X		5
Pristimantis eremitus						X										1
Pristimantis eriphus											X	X				2
Pristimantis ernesti											X					1
Pristimantis erythros												X				1
Pristimantis esmeraldas				X		X	X		X							4
Pristimantis eugeniae						X										1
Pristimantis exoristus	X												X			2
Pristimantis festae											X	X				2
Pristimantis floridus						X										1
Pristimantis gagliardoi												X	X			2
Pristimantis galdi	X							X		X	X		X			5
Pristimantis ganonotus	X										X		X			3
Pristimantis gentryi						X						X				2
Pristimantis gladiator											X	X				2
Pristimantis glandulosus											X	X	X			3
Pristimantis glendae											X		X			2

Species	AC	APC	CA	CCC	CCEP	COA	EC	FP	JZ	NC	NCOA	P	SCOA	TP	V	# Sectors
Pristimantis gloria												X	X			2
Pristimantis gralarias						X										1
Pristimantis gualacenio													X			1
Pristimantis hamiotae						X										1
Pristimantis hampatusami			X			X			X							3
Pristimantis hectus						X										1
Pristimantis huicundo											X	X				2
Pristimantis ignicolor											X					1
Pristimantis illotus						X										1
Pristimantis incanus											X		X			2
Pristimantis incomptus	X										X		X			3
Pristimantis inusitatus											X					1
Pristimantis jimenezi						X						X				2
Pristimantis katoptroides	X							X			X		X			4
Pristimantis kichwarum		X								X	X			X		4
Pristimantis kirklandi											X					1
Pristimantis kunam													X			1
Pristimantis kuri			X			X										2
Pristimantis labiosus						X	X									2
Pristimantis lacrimosus	X	X						X		X	X		X	X		7
Pristimantis lanthanites	X	X						X		X	X			X		6
Pristimantis latericius													X			1
Pristimantis laticlavius						X	X						X			3
Pristimantis latidiscus				X		X	X									3
Pristimantis ledzeppelin	X															1
Pristimantis leoni						X						X				2
Pristimantis leucopus											X					1
Pristimantis librarius								X		X	X		X	X		5
Pristimantis limoncochensis		X								X	X					3
Pristimantis lividus											X	X				2
Pristimantis llanganati											X					1
Pristimantis lojanus			X										X			2

(*Continued*)

TABLE 0.5 (*Continued*)

Distribution of 281 Species of Ecuadorian Craugastoridae in 15 Biogeographic Sectors (*sensu* Ministerio de Ambiente del Ecuador, 2013). Abbreviations are as follows: Amazonian Cordilleras = AC; Aguarico-Putumayo-Caquetá = APC; Catamayo-Alamor = CA; Cordillera Costera of Chocó = CCC; Cordillera Costera of Equatorial Pacific = CCEP; Cordillera Occidental of the Andes = COA; Equatorial Chocó = EC; Fan of Pastaza = FP; Jama-Zapotillo = JZ; Northern Cordillera Oriental of the Andes = NCOA; Napo-Curaray = NP; Páramo = P; Southern Cordillera Oriental of the Andes = SCOA; Tigre-Pastaza = TP; Valleys = V.

Species	AC	APC	CA	CCC	CCEP	COA	EC	FP	JZ	NC	NCOA	P	SCOA	TP	V	# Sectors
Pristimantis loujosti											X					1
Pristimantis loustes						X										1
Pristimantis lucidosignatus						X										1
Pristimantis luscombei	X	X						X		X	X		X	X		7
Pristimantis luteolateralis						X										1
Pristimantis lutzae						X						X	X			3
Pristimantis lymani			X			X			X			X	X		X	6
Pristimantis malkini		X						X		X	X			X		5
Pristimantis mallii											X					1
Pristimantis marcoreyesi											X					1
Pristimantis martiae	X	X						X		X	X			X		6
Pristimantis maryanneae											X					1
Pristimantis matidiktyo	X	X								X	X			X		5
Pristimantis matildae												X	X			2
Pristimantis mazar						X						X	X			3
Pristimantis metabates	X															1
Pristimantis miktos								X		X				X		3
Pristimantis miltongallardoi											X					1
Pristimantis mindo						X										1
Pristimantis minimus	X															1
Pristimantis modipeplus						X					X	X			X	4
Pristimantis morlaco						X						X	X		X	4
Pristimantis multicolor												X				1
Pristimantis munozi						X										1
Pristimantis muranunka	X															1
Pristimantis muricatus				X		X			X							3