Check List the journal of biodiversity data

NOTES ON GEOGRAPHIC DISTRIBUTION

First record of *Heliangelus regalis* Fitzpatrick, Willard & Terborgh, 1979, Royal Sunangel (Apodiformes, Trochilidae), in the Andes Mountains of Ecuador

Carlos A. Proaño[1], Aini C. Chamba[1,2], David R. Goucher[1]

1 *Jungle Dave's Science Foundation, San Juan Bosco, Morona Santiago, Ecuador*
2 *LOUNAZ Museo de Zoología, Universidad Nacional de Loja, Loja, Loja, Ecuador*

Corresponding author: *Aini C. Chamba (aini1995celena@gmail.com)*

Abstract. *Heliangelus regalis* Fitzpatrick, Willard & Terborgh, 1979 is known to occur in northeastern Peru and southeastern Ecuador. We report the first record of a single female at Jungle Dave's Farm in the Ecuadorian Andes, 59 km northwest of its previously known range. The hummingbird was observed actively feeding on *Satyria leucostoma* (a species of Ericaceae) in a patch of scrubland within a cattle pasture for 58 days and displayed nonaggressive behavior towards other birds. This find provides new information on ecological flexibility of *H. regalis* in a human-modified landscape and provides novel insights into the behavior and natural history of this species.

Key words. Feeding, natural history, Near Threatened, new record, San Juan Bosco, range expansion

Proaño CA, Chamba AC, Goucher DR (2025) First record of *Heliangelus regalis* Fitzpatrick, Willard & Terborgh, 1979, Royal Sunangel (Apodiformes, Trochilidae), in the Andes Mountains of Ecuador. Check List 21 (5): 857–862. https://doi.org/10.15560/21.5.857

INTRODUCTION

Heliangelus regalis Fitzpatrick, Willard & Terborgh, 1979, is a medium-sized hummingbird measuring 9–10 cm in length. It has a short, straight bill and a deeply forked tail. This species is sexual dimorphic: males are uniformly vibrant violet-blue, whereas females are dark green with a cinnamon-colored underside marked by green-bronze disc-shaped spots and a broad, pale pectoral band. Males also have a longer tail than females (Fitzpatrick et al. 1979; Schulenberg et al. 2007; Freile and Restall 2018).

This species is distributed in northeastern Peru and southeastern Ecuador and occurs along the Cóndor Cordillera. In Ecuador, it inhabits the Nangaritza and Paquisha valleys in the Cóndor Cordillera (Krabbe and Lennart Ahlman 2009; Freile et al. 2011; Montalvo 2012; Olmedo 2019). In Peru, its range includes the Cóndor Cordillera, Colán Cordillera, Patricia Abra, Cajamarca, Azul Cordillera, Chachapoyas, and Moyobamba (Robbins et al. 1987; Fitzpatrick et al. 1979; Seddon et al. 1996; Dauphiné et al. 2007; Graves et al. 2011).

The global distribution of *H. regalis* is highly restricted and fragmented, covering approximately 64,000 km^2 at elevations between 1,250 and 2,200 m a.s.l.; there are an estimated 3,000–8,999 mature individuals in total (Dauphiné et al. 2007; Schulenberg et al. 2007; Freile and Restall 2018). This combination of a limited and fragmented range, small population size, and ongoing habitat loss due to deforestation has led to its classification as Near Threatened (BirdLife International 2022).

Heliangelus regalis inhabits humid dwarf forests and open shrubby patches with ericaceous plants, ferns, and lichen-covered shrubs. The dominant vegetation consists mainly of shrubs growing in sandy, nutrient-poor soils, often along ridgelines (Davies et al. 1997; Heynen et al. 2020; BirdLife International 2022). It has been observed in steep forested ravine, conserved or minimally disturbed areas (Heynen et al. 2020), and even in areas affected by regular fires (Schulenberg et al. 2007).

We report the first observations of *H. regalis* on the eastern slope of the Andes in southeastern Ecuador, specifically on a silvopastoral farm in San Juan Bosco, Morona Santiago Province, from November and December 2023. This farm is in an ecologically distinct setting that shares similarities with the Cóndor Cordillera, the previously known and closest habitat of *H. regalis*. The farm where we observed this species features montane forest remnants interspersed with pastureland. Although some floristic elements, such as ericaceous shrubs, are shared with the Cóndor Cordillera, the site is subject to relatively high levels of human disturbance.

OPEN ACCESS

Academic editor: Rodolpho Credo Rodrigues
Received: 30 October 2024
Accepted: 12 September 2025
Published: 30 September 2025

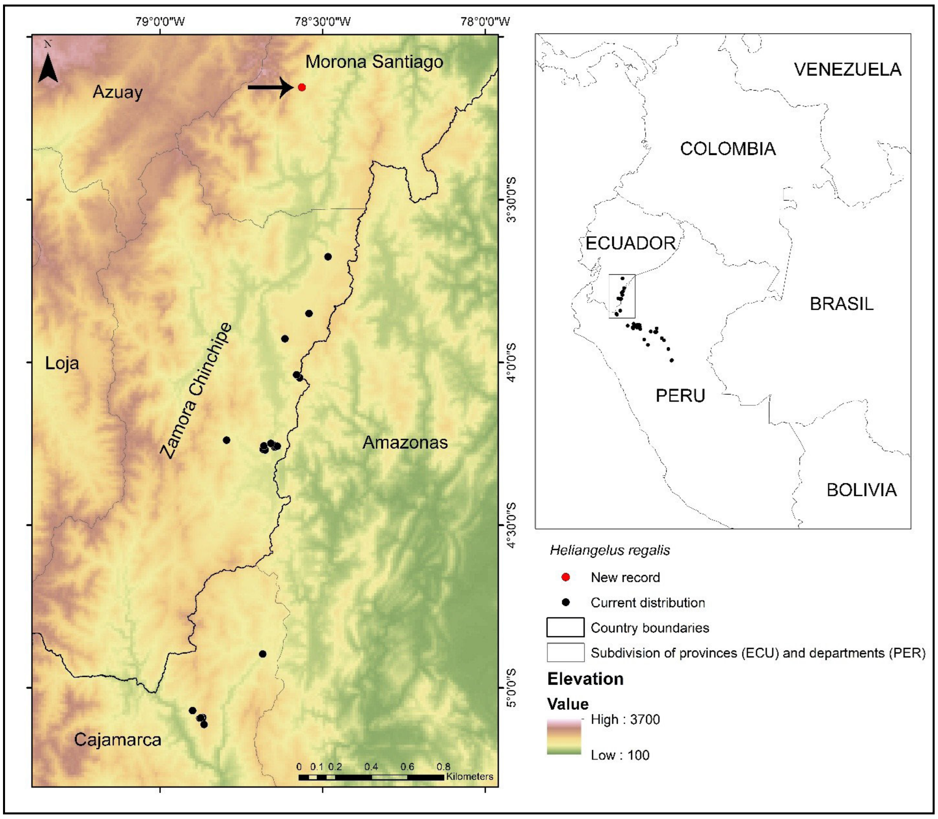

Figure 1. New record of *Heliangelus regalis* (red dot). Black dots indicate previous records in the Amazonas, Cajamarca, San Martín, and Loreto departments (Peru), and Morona Santiago and Zamora Chinchipe provinces (Ecuador).

METHODS

Jungle Dave's Farm (Figure 1) is a 57 ha silvopastoral farm located in San Juan Bosco, Morona Santiago Province, in the southeastern foothills of the Ecuadorian Andes, at 1,600–2,000 m a.s.l. (03°09′16.5″S, 078°33′55.4″W, at approximate center of the farm). The farm borders the Siete Iglesias Municipal Conservation Area and features a heterogeneous landscape composed of grazing pastures and forest fragments. The dominant ecosystem is evergreen lower montane forest of the southeastern Andes (MAE 2012).

Following the initial observation of *H. regalis* in November 2023, we conducted daily surveys along pre-existing trails between 6:00 am to 6:00 pm, with observation intervals of up to 6 h. We used Vortex Diamondback HD 10 × 42 mm binoculars and Nikon D7500 camera equipped with a 200–500 mm F5.6 Nikon lens to document the species. We recorded activity patterns, floral association, and behavioral interactions.

In October 2024, coinciding with a renewed flowering event of the same *Satyria leucostoma* Sleumer (Ericaceae) plant previously visited by *H. regalis*, we installed two Ceyomur CY95 wildlife cameras near the flowers. The cameras were set to medium-detection sensitivity and programmed to capture 30 s videos upon detecting movement. This setup aimed to monitor possible bird–flower interaction in the event of a return by *H. regalis* the year following the initial observations.

To contextualize our observations, we retrieved 1,080 historical occurrence records of *H. regalis* from GBIF (2025) (Figure 1). The dataset was cleaned by discarding records lacking geographic coordinates or dates, as well as duplicates. Additional quality control steps included correcting decimal errors in some coordinates and reversing latitudes and longitudes whenever necessary. In several cases, the recorded municipalities and provinces did not match the location shown in the QGIS, requiring manual adjustments to the data. Records identified as spatial outliers or with inconsistent taxonomic information were also excluded. After filtering, 769 occurrence records were retained. Google Earth was used as a reference for visual verification, and the final distribution map was generated in QGIS v. 3.28.2 (QGIS 2022) in which distances between records were measured.

RESULTS

Heliangelus regalis **Fitzpatrick, Willard & Terborgh, 1979**
Figure 2,

New record. Ecuador — Morona Santiago • Jungle Dave's Farm; 03°09′17.5″S, 078°33′49.4″W; 1,730 m a.s.l.; 13 November 2023, 3:16 pm; C. Proaño obs.; 1 adult ♀.

Figure 2. Photographic records of a female *Heliangelus regalis* feeding on *Setaria leucostoma*. **A, B.** 13 November 2023; pollen is visible on the tip of the beak. **C, D.** 14 December 2023, showing a distinctive feeding perch pattern. Photographs: Carlos Proaño.

Helliangelus regalis was observed feeding on the flowers of *S. leucostoma* in pasture plot dominated by *Setaria sphacelata* (Schumach). Stapf & C.E. Hubb ex Moss (Poaceae) (Figure 3). The observation was made in a small patch of bushes adjacent to a fence in an open silvopastoral area, approximately 150 m from the nearest forest. Additional observations of this single female followed in November and December 2023 (58 days in total).

Figure 3. Landscape views of the location where *Heliangelus regalis* was recorded and remained for 58 days (black arrow). A shrub patch in a pasture area (*Setaria sphacelate*), along with other shrubs and trees, can be seen in the silvopastoral plot adjacent to the forest.

Identification. *Heliangelus regalis* is recognized by its deep-blue, forked tail, metallic-green back extending to the lateral flanks, and cream-ochre belly with bright-green markings (Schulenberg et al. 2007; Freile and Restall 2018). Additionally, it had a white half-collar, white throat with greenish speckles, and a white postocular spot (Figure 2A, B).

Activity. On the first day of observation (13 November 2023), *H. regalis* fed on *S. leucostoma* (Ericaceae) (Figure 4A). A distinct feeding pattern was noted, where the individual landed in front of the flower, fed, and then flew to adjacent branches to repeat the process (Figure 2C, D).

On day 5 and 6 (17–18 November 2023), *H. regalis* was also observed feeding on an *Elleanthus robustus* (Rchb.f.) Rchb.f. C. (Orchidaceae). Although this event was not photographed, an image of the plant is provided (Figure 4C). Despite visiting both types of flowers, the individual clearly preferred Ericaceae, spending most of its time feeding and resting, as captured in a video recorded on 20 December 2023 (Jungle Dave's Science Foundation 2024).

Over the 58 days during which *H. regalis* was observed feeding on *S. leucostoma*, several other species of bird visited the same bush, including *Aglaiocercus kingii* (Lesson, 1832), *Adelomyia melanogenys* (Fraser, 1840), *Diglossa lafresnayii* (Boissonneau, 1840), *Heliodoxa leadbeateri* (Bourcier, 1843), *Colibri coruscans* (Gould, 1846), *Ocreatus peruanus* (Gould, 1849), *Euphonia mesochrysa* Salvadori, 1873, and *Diglossa glauca* Sclater & Salvin, 1876. Only *D. lafresnayii* approached the corollas of *S. leucostoma*, but no interaction was observed between *H. regalis* and this flower piercer (Figure 4B).

After 38 days, most of the flower clusters of *S. leucostoma* had fallen, and the last corolla had turned brown. *Heliangelus regalis* was last observed feeding on a nearby *Bromelia* sp., approximately 6 m from the *S. leucostoma* shrubs. Once the flowering period ended, the hummingbird was no longer observed in the area and has not since returned to the site. Additional *S. leucostoma* individuals and other *H. regalis* were searched for in the surrounding area without success.

DISCUSSION

This study reports the first documented occurrence of *Heliangelus regalis* in the Andes, extending the known distribution of this species approximately 59 km northwest of its previously known northernmost record in the Cóndor Cordillera. The previous northernmost record is of a specimen collected on 31 July 2011

Figure 4. A. *Setaria leucostoma*. **B.** *Diglossa lafresnayii* feeding on *S. leucostoma*. **C.** *Elleanthus robustus* was also used as a food source by *Heliangelus regalis*. Photographs: Carlos Proaño.

in El Pangui, Zamora Chinchipe Province, and deposited in the Museo de Historia Natural "Gustavo Orcés V." (MEPN-O:1238) of the Escuela Politécnica Nacional (Montalvo 2012).

Our new observations may indicate either an expansion of the geographic distribution of *H. regalis* or an instance of vagrancy, as has been observed in other bird species. For example, *Hemitriccus cinnamomeipectus* Fitzpatrick & O'Neill, 1979 has been reported in the Cóndor Cordillera, although it is typically found on the eastern slopes of the Andes in Morona Santiago Province (Agreda et al. 2005; Vera et al. 2023). Similarly, *Nothocercus bonapartei* (G.R. Gray, 1867), a species usually associated with the Andes, has been documented in the Cóndor Cordillera, where its presence has been interpreted as a possible continuity of distribution from the western slopes of the range toward the upper Nangaritza river basin (Ordóñez-Delgado et al. 2017). Other records also highlight this pattern, such as the hummingbird *Heliodoxa schreibersii* (Bourcier, 1847), an Andean species that has likewise been reported from the Cóndor Cordillera (Vogt 2007). These records suggest that the occurrence of *H. regalis* in the Andes may similarly reflect transient movements or overlooked continuity between adjacent ranges.

Heliangelus regalis was not observed at its food source at the farm during the same months of the following year (October–December 2024) at a time when *S. leucostoma* was once again flowering. This supports our hypothesis that the individual was a transient visitor rather than part of a resident population. Its presence in an atypical habitat may reflect exploratory behavior possibly triggered by habitat disturbance or changes in resource availability, such as those resulting from ongoing deforestation and mining in the Cóndor Cordillera in Ecuador (Warnaars 2013; Lorenzo et al. 2019; Jiménez Carrión 2020).

The female *H. regalis* was observed exclusively in an area dominated by Ericaceae and seen to be primarily feeding on *S. leucostoma*. Although this nectar source was relatively scarce, it constituted the main resource for this individual, consistent with previous reports of *S. leucostoma* as the main food of *H. regalis* in Peru (Seddon et al. 1996; Freile et al. 2011). Our observation aligns with known associations of *H. regalis* with plants of the family Ericaceae, reinforcing the reliability of this record as evidence of its presence in the Andes of Ecuador. Considering the limited availability of *S. leucostoma* in the study area, this find highlights the importance of targeted sampling in habitats dominated by Ericaceae and adds to recent records that expand the species' geographic range.

Robbins et al. (1987) noted the absence of *H. regalis* from the Cutucú Cordillera despite comparable elevation and habitat conditions. Our findings raise the possibility that *H. regalis* could also occur in the Cutucú Cordillera, suggesting either greater ecological flexibility than previously understood or a potential undersampling issue in the area. Increased year-round monitoring may reveal additional undocumented species and improve our understanding of bird community dynamics in this transitional region.

Seddon et al. (1996) reported sex-based altitudinal differences in Peru, with 60% of the males observed at 1,950 m a.s.l. and 90% of the females observed at 1,750 m a.s.l. The female observed in this study was recorded at 1,730 m a.s.l. which aligns closely with this pattern. The ecological characteristic of the site is a transition zone between Amazonian and Andean ecosystems, suggesting that the species may respond to habitat shifts caused by human activity and seek alternative suitable environments to maintain its ecological roles.

As of February 2025, eBird data reported 320 bird species at Jungle Dave's Farm and 1,036 in the wider Morona Santiago Province. These figures underscore the biological richness of the region and highlight the need for ongoing ornithological surveys. Determining whether *H. regalis* represents an occasional visitor or is establishing a new range will help clarify its conservation status. Moreover, documenting vagrant species in disturbed landscapes can provide valuable insights into the resilience and adaptability of Amazonian bird communities under environmental pressure.

ACKNOWLEDGEMENTS

We thank the Jungle Dave's Science Foundation team and Marco Jiménez for identifying the Ericaceae plant. We are also grateful to Héctor Cadena, Juan C. Sánchez, and María C. Ríos for their valuable review of previous drafts of this manuscript and their constructive suggestions. Finally, we sincerely acknowledge the academic editor and anonymous reviewers, without whose careful guidance and feedback this manuscript would not have been possible.

ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

Funding

This study was supported by David Goucher, through Jungle Dave's Science Foundation and Conciencia Amazónica.

Author contributions

Conceptualization: CAP, ACC, DRG. Formal analysis: ACC, CAP. Funding acquisition: DRG. Investigation: CAP. Visualization: ACC. Writing – original draft: ACC, CAP. Writing – review and editing: ACC, DRG, CAP.

Author ORCID iDs

Carlos A. Proaño https://orcid.org/0009-0002-5692-5777
Aini C. Chamba https://orcid.org/0000-0002-2549-2473
David R. Goucher https://orcid.org/0009-0008-3555-2629

Data availability

All data that support the findings of this study are available in the main text. Supplemental file. A short video of *Heliangelus regalis* feeding from *Satyria leucostoma* is available for viewing at https://youtu.be/MWclvIC9-Cw?si=6EXWG9KDv1Acy4rk

REFERENCES

Agreda A, Nilsson J, Tonato L, Román H (2005) A new population of Cinnamon-breasted Tody-tyrant *Hemitriccus cinnamomeipectus* in Ecuador. Cotinga 24: 16–18.

BirdLife International (2022) *Heliangelus regalis*. The IUCN Red List of Threatened Species 2022: e.T22687901A210187058. https://doi.org/10.2305/iucn.uk.2022-1.rlts.t22687901a210187058.en. Accessed on: 2025-02-01.

Dauphiné N, Tsamajain S, Cooper RJ (2008) A new location and altitudinal range extension for Royal Sunangel *Heliangelus regalis*. Cotinga 30: 83–84.

Davies WN, Barnes R, Butchart HM, Fernandez M, Seddon N (1997) The conservation status of birds on the Cordillera de Colán, Peru. Bird Conservation International 7 (2): 181–195. https://doi.org/10.1017/s0959270900001490

Fitzpatrick JW, Willard DE, Terborgh JW (1979) A new species of hummingbird from Perú. Boletín Wilson 91 (2): 177–186.

Freile JF, Piedrahita P, Buitrón-Jurado G, Rodríguez CA, Jadán O, Bonaccorso E (2011) Observations on the natural history of the Royal Sunangel (*Heliangelus regalis*) in the Nangaritza Valley, Ecuador. The Wilson Journal of Ornithology 123 (1): 85–92. https://doi.org/10.1676/10-054.1

GBIF (2025) GBIF Occurrence. GBIF. https://doi.org/10.15468/DI.Q79dz9. Accessed on: 2025-01-30.

Graves GR, Lane DF, O'neill JP, Valqui T (2011) A distinctive new subspecies of the Royal Sunangel (Aves: Trochiliformes; *Heliangelus regalis*) from the Cordillera Azul, northern Peru. Zootaxa 3002: 52–58. https://doi.org/10.11646/zootaxa.3002.1.5

Heynen I, Boesman FD, Kirwan GM (2020) Royal Sunangel (*Heliangelus regalis*), version 1.0. In: Hoyo J, Elliott A, Sargatal J, Christie D, Juana E (Eds.) Birds of the world. Cornell Lab of Ornithology, Ithaca, New York, USA. https://doi.org/10.2173/bow.roysun1.01

Jiménez Carrión ÁA (2020) Análisis del efecto de la legislación especial para la extracción de recursos naturales no renovables en áreas protegidas: Bloques 31 y 43 del Parque Nacional Yasuní. Bachelor's thesis, Escuela Politécnica Nacional, Quito, Ecuador, 26 pp.

Jungle Dave's Science Foundation (2024) Royal Sunangel. YouTube. https://youtu.be/MWclvIC9-Cw?si=6EXWG9KDv1Acy4rk. Accessed on: 2024-10-24.

Krabbe N, Lennart Ahlman F (2009) Royal Sunangel *Heliangelus regalis* at Yankuam Lodge, Ecuador. Cotinga 31: 69.

Lorenzo C, Rioja-Paradela T, Carrillo-Reyes A, Sántiz-López E, Bolaños-Citalán J (2019) Projected impact of global warming on the distribution of two pocket mouse species with implications on the conservation of *Heteromys nelsoni* (Rodentia: Heteromyidae). Revista De Biología Tropical 67 (6): 1210–1219. https://doi.org/10.15517/rbt.v67i6.36321

MAE (2012) Sistema de clasificación de los ecosistemas del Ecuador continental. Subsecretaria de Patrimonio Natural, Quito, Ecuador, 143 pp. https://www.ambiente.gob.ec/wp-content/uploads/downloads/2012/09/LEYENDA-ECOSISTEMAS_ECUADOR_2.pdf. Accessed on: 2025-09-18.

Montalvo D (2012) Notas de distribución de aves en la Cordillera del Cóndor. Revista Politécnica 30 (3): 172–178.

Olmedo I (2019) *Heliangelus regalis*. Aves del Ecuador. Versión 2019.0. Museo de Zoología, Pontificia Universidad Católica del Ecuador. https://bioweb.bio/faunaweb/avesweb/FichaEspecie/Heliangelus%20regalis. Accessed on: 2024-08-10.

Ordóñez-Delgado L, López F, Reyes-Bueno F (2017). Primer Registro de Tinamú Serrano Nothocercus bonapartei (Tinamiformes: Tinamidae) en la cordillera del Cóndor, sureste de Ecuador. *Revista Ecuatoriana de Ornitología*, (1).

QGIS (2022) QGIS version 3.28.2. https://qgis.org/en/site/.

Freile J, Restall R (2018) Birds of Ecuador. Bloomsbury Publishing, London, UK, 238–239.

Robbins MB, Ridgely RS, Schulenberg TS, Gill FB (1987) The avifauna of the Cordillera de Cutucú, Ecuador, with comparisons to other Andean localities. Proceedings of the Academy of Natural Sciences of Philadelphia 139: 243–259.

Seddon N, Barnes R, Burchart S, Davies C, Fernández, M (1996) Recent observations and notes on the ecology of the Royal Sunangel *Heliangelus regalis*. Bulletin of the British Ornithologists Club, 116: 46–49.

Schulenberg TS, Stotz DF, Lane DF, O'Neill JP, Parker TA (2007) Birds of Peru. Princeton field guides. Princeton University Press, Princeton, USA, 664 pp.

Vera D, Aguilar JM, Goucher DR (2023) Tirano Todi Pechicanelo *Hemitriccus cinnamomeipectus*, primer registro en los Andes del Ecuador. Revista Ecuatoriana de Ornitología 9 (2): 146–148. https://doi.org/10.18272/reo.v9i2.3020

Vogt CA (2007). Range extensions and noteworthy records for mainland Ecuador. Bulletin of the British Ornithologists' Club 127 (3): 228–233.

Warnaars XS (2013) Territorial transformations in El Pangui, Ecuador: understanding how mining conflict affects territorial dynamics, social mobilization, and daily life. In: Bebbington A, Bury J (Eds) Subterranean struggles: new dynamics of mining, oil, and gas in Latin America. University of Texas Press, Austin, USA, 149–172 pp.