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Notes on *Stenomacra tungurahuana* Brailovsky & Mayorga, 1997 (Hemiptera, Pyrrhocoroidea, Largidae)

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Abstract

Background

The hemipteran *Stenomacra tungurahuana* Brailovsky & Mayorga was described in 1997 and remains known from just two localities in Ecuador. No ecological information nor description of its colouration in life have been reported for the species.

New information

In this contribution, I present a new record of *S. tungurahuana* from San Isidro Lodge, province of Napo, that extends its distribution to the northeastern slopes of the Andes of Ecuador, ca. 108 km from its type locality. I discuss the accuracy of the two previously known localities of the species (Baños, type locality, and Quito), suggesting that these localities may be imprecise, and the specimens could have been actually collected on the eastern slopes of the Andes. I provide the first description of the colouration in life of *S. tungurahuana*, including photographs.

Keywords

Andes, distribution, iNaturalist, Larginae, Napo, new records, colouration

Introduction

Heteroptera is the most diverse suborder of hemipterans, comprising more than 45000 described species with broad trophic preferences, from phytophagous to hematophagous (Cassis 2019). Many heteropterans are of economic importance due to their role as

agricultural pests, biological controls, and disease vectors (Panizzi and Grazia 2015, Stonedahl and Dolling 1991.) Among members of the heteropteran superfamily Pyrrhocoroidea (including Largidae and Pyrrhocoridae), species of the genus *Dysdercus* (Pyrrhocoridae) are regarded as the most important pests due to the damages produced on cotton crops (Schaefer and Ahmad 2000, Schaefer 2015). However, very little is known about the natural history of most species of Pyrrhocoroidea (Panizzi and Grazia 2015, Schaefer and Ahmad 2000, Schaefer 2015, Schuh and Slater 1995), and more species may be of economic importance. For example, several species of *Largus* have been reported as minor pests of different crops at several localities across the Western Hemisphere (Bosq 1940, Schaefer and Ahmad 2000, Dellapé and Melo 2014); and *Stenomacra marginella* (Largidae) causes damage to a wide array of host trees and is considered a nuisance pest in Mexico (Báez-Santacruz et al. 2013, Lomeli-Flores et al. 2021, Reséndiz Martínez et al. 2019, Zaragoza Hernández et al. 2015).

The few species of Largidae from the Western Hemisphere for which data are available are phytophagous, and very little is known about its distribution and natural history (Schaefer 2015). Fourteen genera of Larginae occur from the USA to Argentina: *Acinocoris*, *Arhaphé*, *Armilargulus*, *Neolargulus*, *Fibrenus*, *Largulus*, *Largus*, *Pararhaphé*, *Paralargulus*, *Rosaphe*, *Stenomacra*, *Thaumastaneis*, *Theraneis*, and *Vasarhelyecoris* (Panizzi and Grazia 2015). The genus *Stenomacra* currently includes eight species: *Stenomacra atra*, *S. dissimilis*, *S. limbatipennis*, *S. magna*, *S. marginella*, *S. scapha*, *S. tungurahua*, and *S. turrialbana* (Brailovsky and Mayorga 1997, Stehlík 2013). Most species of *Stenomacra* are known from few localities in restricted geographic ranges. *Stenomacra marginella* is the most widespread species in the genus (inhabiting from USA to Brasil) and the only one with published information about its life history and ecology (Báez-Santacruz et al. 2013, Cuatrecasas and Cordero 2006, Nava-Gervasio et al. 2007, Oliver and Cordero 2009).

Stenomacra tungurahua Brailovsky and Mayorga, 1997 is the only species of the genus reported from Ecuador. This contribution aims to improve knowledge on *S. tungurahua* by providing a new record that considerably expands its geographic range, commenting on its distribution, and providing the first data about its colouration in life and natural history.

Materials and methods

Between 4–7 March 2021, opportunistic collections of insects were conducted while exploring the cloud forests of San Isidro Lodge (Cabañas San Isidro, -0.5911, -77.8794), county of Quijos, province of Napo, Republic of Ecuador. San Isidro is a private reserve, ca. 2 km SE from the town of Cosanga, encompassing old-growth and disturbed forest between 2000–2500 m. elevation. The specimen herein reported was photographed and deposited at the Museo de Zoología, Universidad San Francisco de Quito, Ecuador (ZSFQ) under patent 010-UBVSOTQ-DZ2E-MAAE-2021, issued by the Ministry of Environment, Water and Ecological Transition of Ecuador. Coordinates and elevations were obtained with a Garmin Handheld Navigator GPS, and all are reported under datum WGS84. I posted two photographs of the specimen (GBIF 2022) in iNaturalist (<https://www.inaturalist.org>, by California Academy of Science and National Geographic), a citizen

science web-based application designed to report and identify photo-based observations of biodiversity. Initial specific identification was provided by curators of iNaturalist (WonGun Kim and Michael Pirrello) and was later confirmed using the original description of the species (Brailovsky and Mayorga 1997).

Data resources

The iNaturalist research-grade observation of *Stenomacra tungurahuana*, including photographs, is available in GBIF 2022.

Taxon treatment

Stenomacra tungurahuana Brailovsky and Mayorga, 1997

- ITIS https://www.itis.gov/servlet/SingleRpt/SingleRpt.jsessionid=8BF7972262F3642D31CA30F24B6BF443?search_topic=TSN&search_value=1137229#null
- Encyclopedia of Life <https://eol.org/pages/55594650>
- GBIF <https://www.gbif.org/es/species/10865078>
- Catalogue of Life <https://www.catalogueoflife.org/data/taxon/522K5>

Nomenclature

Stenomacra tungurahuana Brailovsky and Mayorga, 1997 – Brailovsky and Mayorga (1997):4, new species, description, diagnosis, and greyscale drawing.

Material

- a. scientificName: *Stenomacra tungurahuana* Brailovsky & Mayorga, 1997;
originalNameUsageID: <https://www.gbif.org/es/species/10865078>; namePublishedIn: Brailovsky, H., and C. Mayorga. 1997. An analysis of the genus *Stenomacra* Stål with description of four new species, and some taxonomic rearrangements (Hemiptera: Heteroptera; Largidae). Journal of the New York Entomological Society 105(1–2): 1–14.; namePublishedInID: <https://www.jstor.org/stable/25010223>; nameAccordingTo: Brailovsky, H., and C. Mayorga. 1997. An analysis of the genus *Stenomacra* Stål with description of four new species, and some taxonomic rearrangements (Hemiptera: Heteroptera; Largidae). Journal of the New York Entomological Society 105(1–2): 1–14.; nameAccordingToID: <https://doi.org/10.15468/39omei>; acceptedNameUsage: *Stenomacra tungurahuana* Brailovsky and Mayorga, 1997; taxonomicStatus: accepte; taxonID: <https://www.gbif.org/es/species/10865078>; parentNameUsage: Largidae; higherClassification: Animalia;Arthropoda;Insecta;Hemiptera;Heteroptera;Pyrrhocoroidea;Largidae; kingdom: Animalia; phylum: Arthropoda; class: Insecta; order: Hemiptera; family: Largidae; taxonRank: species; nomenclaturalCode: ICZN; genus: *Stenomacra*; specificEpithet: *tungurahuana*; scientificNameAuthorship: Brailovsky and Mayorga, 1997; higherGeographyID: TGN: 1001446; higherGeography: South America; Ecuador; Napo; Quijos; San Isidro Lodge; continent: South America; country: Ecuador; countryCode: EC; stateProvince: Napo; county: Quijos; locality: San Isidro Lodge; verbatimLocality: San

Isidro Lodge (Cabañas San Isidro), a cerca de 2 km SE del pueblo de Cosanga;
verbatimElevation: 2050; verbatimCoordinates: -0.5911, -77.8794; verbatimLatitude: -0.5911; verbatimLongitude: -77.8794; verbatimCoordinateSystem: decimal degrees; verbatimSRS: WGS84; decimalLatitude: -0.5911; decimalLongitude: -77.8794; geodeticDatum: WGS84; georeferencedBy: Diego F. Cisneros-Heredia; georeferenceVerificationStatus: verified by collector; eventDate: 2021-03-06T12:00-0500; eventTime: T12:00-0500; year: 2021; month: 3; day: 6; verbatimEventDate: 06 Marzo 2021; habitat: montane evergreen forest; individualCount: 1; lifeStage: adult; preparations: pinned specimen; occurrenceDetails: <https://doi.org/10.15468/DL.2FFET4>; occurrenceStatus: present; otherCatalogNumbers: ZSFQ; associatedMedia: <https://doi.org/10.15468/DL.2FFET4>; identifiedBy: WonGun Kim; Michael Pirrello; Diego F. Cisneros-Heredia; identificationReferences: Brailovsky, H., Mayorga, C. 1997. An analysis of the genus *Stenomacra* Stal with description of four new species, and some taxonomic rearrangements (Hemiptera: Heteroptera: Largidae). Journal of the New York Entomological Society 105: 1–14.; type: Specimen; institutionCode: Museo de Zoología, Universidad San Francisco de Quito, ZSFQ; ownerInstitutionCode: ZSFQ; basisOfRecord: PreservedSpecimen

Diagnosis

The new specimen as *S. tungurahua* was identified based on the following diagnostic characteristics described by Brailovsky and Mayorga (1997): slender body, nearly parallel-sided; head in dorsal view and between eyes flat; eyes small and barely pedunculate, ocelli absent; antennal segment I uniformly slender; rostrum just reaching posterior margin of mesothorax; pronotum with anterior lobe not globose and humeral angles rounded; hemelytra macropterous; clavus and corium red-orange; hemelytral membrane whitish; antennal segments I–III, callar region of pronotal disc, and tibiae black Fig. 1.

Distribution

Brailovsky and Mayorga (1997) reported *S. tungurahua* from two localities: Baños (type locality) and Quito. The new locality presented herein, San Isidro Lodge, extends the distribution range of the species to the northeastern slopes of the Andes of Ecuador, ca. 108 km NE from the type locality and its altitudinal range by 250 m uphill Fig. 2.

The ecosystem at San Isidro Lodge (see Natural history below) is quite different from the ecosystems at Baños and Quito. Baños and Quito are on inter-Andean valleys (Fig. 2) with montane semideciduous or evergreen shrublands and forests with average yearly precipitation between 500–1500 mm, much lower than San Isidro that has an average yearly precipitation of 3000 mm/year. Although *S. tungurahua* could be a species occupying these different ecosystems, I propose that it is possible that Baños and Quito are imprecise localities for *S. tungurahua*. Baños (= Baños de Agua Santa, -1.3961, -78.4248, 1800 m elevation) is a famous collecting station at the entrance of the mountain pass between the Tungurahua volcano and Los Llanganates massif that connects the semi-arid inter-Andean valley of Patate and the humid eastern slopes of the Andes in central Ecuador (Brown 1941, IGM 2009, Terán 1984). Thus, it

is possible that the specimens of *S. tungurahuana* from Baños were collected in montane evergreen forests on the mountain pass, just a few hundred meters from the city of Baños, and not at the city of Baños itself. Quito (-0,2149, -78,5025, 2800 m) is on a highland plateau of the inter-Andean valley of Quito, next to the Pichincha massif (Brown 1941, Cisneros-Heredia et al. 2015, IGM 2009, Terán 1984). The specimens of *S. tungurahuana* from Quito were collected in 1930 by Raymond Benoist (1881–1970), a French botanist who made plant collections across the country (Astudillo Espinosa 1993, Benoist 1936, Benoist 1941, Stafleu and Mennega 1993). Between 1930 and 1931, he explored the valley of Quito, and the eastern Andean slopes near Pichincha, Napo and Baños (Benoist 1936, Benoist 1941, Thériot 1936). Benoist's specimens of *S. tungurahuana* could have been collected on the eastern Andean slopes of Napo or near Baños, instead of Quito. More inventories across the Andes of Ecuador are needed to confirm the presence of *S. tungurahuana* on inter-Andean valleys or its restriction to the eastern Andean slopes.

Colouration

The original description of *S. tungurahuana* reported only the colours of preserved specimens and did not provide information about its colouration in life. The new specimen of *S. tungurahuana* was in life (Fig. 1) as follows (colours in preservative reported by Brailovsky and Mayorga (1997) between square brackets): head, including antennal and rostral segments, light to dark grey [black], basal join of antennal segments I brownish-grey [red orange]; pronotum red with callar region grey [red orange with callar region black]; scutellum grey [black with apex red orange]; clavus and corium velvet red [red orange]; hemelytral membrane cream [white]. The colouration of legs was not described in detail by Brailovsky and Mayorga (1997), just mentioning that tibiae are black. The new specimen showed trochanters, coxae and basal third of femora velvet red, with the rest of femora, tibiae, and tarsi dark grey. Abundant silvery setae covered all grey surfaces (Fig. 1).

Natural history

The specimen of *S. tungurahuana* from San Isidro Lodge was found in old-growth montane evergreen forest, on the leaves of an Asteraceae, ca. 20 cm over the ground. Climatic data from Cosanga (ca. 2 km away straight-line) and Baeza (ca. 13 km away straight-line) show that the area receives on average 3000 mm per year (range 2300–3500 mm/year), with a drier season from October to February, and mean monthly temperatures ranging between 15–17 °C (INHAMI 2003).

Discussion

The new record of *Stenomacra tungurahuana* presented herein extends significantly the geographic range of the species. However, the uncertainty about the previously known localities shows the urgent need of up-to-date research on the species. While *S. tungurahuana* is the only species of the genus currently reported in Ecuador, *S. marginella*

has been recorded in southern Colombia, ca. 25 km from the Ecuadorian border (Brailovsky and Mayorga 1997) and its presence in the country is expected.

The lack of information about species distributions (i.e., the Wallacean shortfall) is one of the most significant shortfalls hampering large-scale knowledge and conservation of invertebrates (Cardoso et al. 2011, Hortal et al. 2015). Over 40 years ago, Froeschner (1981) presented the most recent attempt to catalogue the heteropteran fauna from mainland Ecuador, and subsequent works have focused on reviewing genera, describing new species, and reporting new records (e.g., Añino et al. 2020, Brailovsky and Barrera 2018, Cianferoni and Buzzetti 2012, Gil-Santana 2019, Ortega-León and Thomas 2010, Sites 1990, Swanson 2019, Swing 2012, Vaca-Moyano et al. 2017). Many Ecuadorian heteropterans remain known from single localities, and there is little funding and institutional support for running local and national inventories, consolidating scientific biological collections, and improving national taxonomic expertise. Fortunately, citizen science tools like iNaturalist have become an important source of biological observations, offering opportunities to obtain international taxonomic support from world specialists and decolonising taxonomy (e.g., Cisneros-Heredia and Peñaherrera-Romero 2020, Cisneros-Heredia and Valencia 2022, Forero and Mejía-Soto 2021, Pinedo-Escatel and Dietrich 2020, van der Heyden 2019).

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References

- Añino YJ, Sumba-Zhongor MB, Naranjo-Morán JA, Rodríguez R, Santos-Murgas A, Zachrisson B (2020) Primer reporte de *Brachyplatys subaeneus* (Westwood) (Heteroptera: Plataspidae) en Ecuador y el listado sinóptico de sus plantas hospedantes. Idesia 38: 113-118. <https://doi.org/10.4067/S0718-34292020000100113>
- Astudillo Espinosa C (1993) Herbario Nacional del Ecuador. Boletín de Informaciones Científica Nacionales de la Casa de la Cultura Ecuatoriana (124)77-86.
- Báez-Santacruz J, Cervantes-Peredo L, Ponce-Saavedra J (2013) Ciclo de vida de *Stenomacra marginella* (Hemiptera: Heteroptera: Largidae). Revista mexicana de biodiversidad 84 (4): 1292-1297. <https://doi.org/10.7550/rmb.35923>
- Benoist R (1936) Espèces nouvelles de Phanérogames sudaméricaines. Bulletin de la Société Botanique de France (83)802-809. <https://doi.org/10.1080/00378941.1936.10834037>

- Benoist R (1941) Plantas recolectadas en la República de l'Equateur. Bulletin de la Société Botanique de France (88)431-439. <https://doi.org/10.1080/00378941.1941.10834246>
- Bosq JM (1940) Lista preliminar de los hemipteros (heteropteros), especialmente relacionados con la agricultura nacional (continuación). Revista de la Sociedad Entomológica Argentina X: 399-417.
- Brailovsky H, Mayorga C (1997) An analysis of the genus *Stenomacra* Stal with description of four new species, and some taxonomic rearrangements (Hemiptera: Heteroptera; Largidae). Journal of the New York Entomological Society 105: 1-14.
- Brailovsky H, Barrera E (2018) El género *Stenoscelidea* en Ecuador, con descripción de dos nuevas especies y nuevos registros (Hemiptera: Heteroptera: Coreidae: Stenoscelideini). Dugesiana 25: 139-146. <https://doi.org/10.32870/dugesiana.v25i2.7048>
- Brown FM (1941) A gazetteer of entomological stations in Ecuador. Annals of the Entomological Society of America 34 (4): 809-851. <https://doi.org/10.1093/aesa/34.4.809>
- Cardoso P, Erwin TL, Borges PA, New TR (2011) The seven impediments in invertebrate conservation and how to overcome them. Biological Conservation 144 (11): 2647-2655. <https://doi.org/10.1016/j.biocon.2011.07.024>
- Cassis G (2019) True bugs (Insecta: Hemiptera: Heteroptera): Evolution, classification, biodiversity and biology. Reference Module in Life Sciences. Elsevier <https://doi.org/10.1016/B978-0-12-809633-8.20710-3>
- Cianferoni F, Buzzetti FM (2012) The genus *Hydrometra* Latreille in Ecuador with description of a new species (Hemiptera: Heteroptera: Gerromorpha: Hydrometridae). Zootaxa 3274: 55-62. <https://doi.org/10.11646/zootaxa.3274.1.6>
- Cisneros-Heredia DF, Amigo X, Arias D, Arteaga J, Bedoya J, Espinoza S, Montenegro E, Nazati G, Carrión J (2015) Reporte del 1er Conteo Navideño de Aves de Quito, Ecuador. ACI Avances en Ciencias e Ingenierías 7: 37-51. <https://doi.org/10.18272/aci.v7i2.256>
- Cisneros-Heredia DF, Peñaherrera-Romero E (2020) Invasion history of *Harmonia axyridis* (Pallas, 1773) (Coleoptera: Coccinellidae) in Ecuador. PeerJ 8: 10461. <https://doi.org/10.7717/peerj.10461>
- Cisneros-Heredia DF, Valencia RF (2022) Comments on snails of the genus *Zoniferella* from Ecuador (Mollusca: Achatinidae), with restriction of the type locality "Los Puentes" for several species of Gastropoda and Arachnida. bioRxiv <https://doi.org/10.1101/2022.03.03.482746>
- Cuatianquiz C, Cordero C (2006) Experimental manipulation of male behaviour during copulation in *Stenomacra marginella* (Heteroptera: Largidae): effect on copula duration, female remating and oviposition. Behavioural processes 73 (2): 222-7. <https://doi.org/10.1016/j.beproc.2006.05.007>
- Dellapé PM, Melo MC (2014) Pyrrhocoroidea. In: Roig-Juñent S, Claps LE, Morrone JJ (Eds) Biodiversidad de Artrópodos Argentinos. Vol. 3. Editorial INSUE, Buenos Aires, 439-448 pp.
- Forero D, Mejía-Soto A (2021) A striking sexually dimorphic new species of *Castolus* (Hemiptera: Heteroptera: Reduviidae) from Colombia, with new records from Neotropical countries and taxonomic notes on the genus. Zootaxa 5048: 538-560. <https://doi.org/10.11646/zootaxa.5048.4.4>

- Froeschner RC (1981) Heteroptera or true bugs of Ecuador: A partial catalog. Smithsonian Contributions to Zoology 322: 1-147. <https://doi.org/10.5479/si.00810282.322>
- GBIF (2022) GBIF Occurrence Download [*Stenomacra tungurahua* Brailovsky & Mayorga, 1997]. Global Biodiversity Information Facility. URL: <https://doi.org/10.15468/DL.2FFET4>
- Gil-Santana HR (2019) New records, taxonomic notes, and the description of a new species of Reduviidae (Hemiptera: Heteroptera) from Ecuador. Zootaxa 4613: 502-520. <https://doi.org/10.11646/zootaxa.4613.3.5>
- Hortal J, Bello F, Diniz-Filho JA, Lewinsohn TM, Lobo JM, Ladle RJ (2015) Seven shortfalls that beset large-scale knowledge of biodiversity. Annual Review of Ecology, Evolution, and Systematics 46: 523-549. <https://doi.org/10.1146/annurev-ecolsys-112414-054400>
- IGM (2009) Mapa Físico República del Ecuador. Instituto Geográfico Militar, Quito.
- INHAMI (2003) Anuarios Meteorológicos 19–20, 1982–1992. Instituto Nacional de Meteorología e Hidrología.
- Lomeli-Flores JR, Terrón-Sierra R, Rodríguez-Navarro S, Marín Cruz VH (2021) New records of a parasitoid of *Stenomacra marginella* (Herrich-Schaefer) (Hemiptera: Largidae) in Mexico. Journal of Agricultural and Urban Entomology 37 (1): 1-5. <https://doi.org/10.3954/1523-5475-37.1.1>
- Nava-Gervasio S, Ortiz-Ordoñez E, Uría-Galicia E (2007) Estudio anatomo-histológico del sistema digestivo de *Stenomacra marginella* (Eric-Schaeffer, 1850) (Hemiptera: Heteroptera: Largidae). Acta Zoológica Mexicana 23 (3): 49-57.
- Oliver C, Cordero C (2009) Multiple mating reduces male survivorship but not ejaculate size in the polygamous insect *Stenomacra marginella* (Heteroptera: Largidae). Evolutionary Ecology 23: 417-424. <https://doi.org/10.1007/s10682-007-9239-8>
- Ortega-León G, Thomas DB (2010) Especie nueva de *Eritrachys* (Hemiptera: Pentatomidae: Ochlerini) de Ecuador. Revista mexicana de biodiversidad 81: 61-64. <https://doi.org/10.22201/ib.20078706e.2010.001.213>
- Panizzi AR, Grazia J (2015) True bugs (Heteroptera) of the Neotropics, Entomology in Focus. Springer Netherlands <https://doi.org/10.1007/978-94-017-9861-7>
- Pinedo-Escatel JA, Dietrich CH (2020) Review of the enigmatic Neotropical leafhopper genus *Brazosa* Oman and other potentially related Athysanini genera (Hemiptera: Auchenorrhyncha: Cicadellidae: Deltocephalinae), with descriptions of South American new genera and species. Zootaxa 4830: 401-454. <https://doi.org/10.11646/zootaxa.4830.3.1>
- Reséndiz Martínez JF, GuzmánDíaz L, Muñoz Viveros AL, OlveraCoronel LP, Pacheco Hernández MdL, Arriola Padilla VJ (2019) Insectos y ácaros fitófagos del arbolado en el Parque Recreativo y Cultural Tezozómoc, Azcapotzalco, Ciudad de México. Revista mexicana de ciencias forestales 10 (56): 149-173. <https://doi.org/10.29298/rmcf.v10i56.454>
- Schaefer C, Ahmad I (2000) Cotton stainers and their relatives (Pyrrhocoroidea: Pyrrhocoridae and Largidae). In: Schaefer C, Panizzi AR (Eds) Heteroptera of Economic Importance. CRC Press, Boca Raton, FL, 828 pp. [ISBN 0-8493-0695-7].
- Schaefer CW (2015) Cotton stainers (Pyrrhocoridae) and bordered plant bugs (Largidae). In: Panizzi A, Grazia J (Eds) True bugs (Heteroptera) of the Neotropics.

Entomology in Focus. Vol. 2. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-9861-7_17

- Schuh RT, Slater JA (1995) True bugs of the World (Hemiptera: Heteroptera), classification and natural history. Cornell University Press, Ithaca, 336 pp.
- Sites RW (1990) Naucorid records from Amazonian Ecuador (Heteroptera: Naucoridae). Florida Entomologist 73: 334-335. <https://doi.org/10.2307/3494819>
- Stafleu FA, Mennega EA (1993) Taxonomic literature: a selective guide to botanical publications and collections with dates, commentaries and types. Supplement II: Be-Bo. International Association for Plant Taxonomy, Koeltz Scientific Books, Königstein.
- Stehlik JL (2013) Review and reclassification of the Old World genus *Physopelta* (Hemiptera: Heteroptera: Largidae). Acta Entomologica Musei Nationalis Pragae 53: 505-584.
- Stonedahl GM, Dolling WR (1991) Heteroptera identification: a reference guide, with special emphasis on economic groups. Journal of Natural History 25: 1027-1066. <https://doi.org/10.1080/00222939100770661>
- Swanson DR (2019) A new species of ambush bug (Heteroptera: Reduviidae: Phymatinae) from Ecuador and Peru. Proceedings of the Entomological Society of Washington 121: 279-289. <https://doi.org/10.4289/0013-8797.121.2.279>
- Swing K (2012) Observaciones preliminares sobre la historia natural de membrácidos representativos (Hemiptera, Auchenorrhyncha, Cicadomorpha: Membracidae and Aetalionidae) en la Reserva de Biosfera del Yasuní, incluyendo los primeros informes de 13 géneros de Ecuador y la provincia de Orellana. ACI Avances en Ciencias e Ingenierías 4: 17-30. <https://doi.org/10.18272/aci.v4i2.102>
- Terán F (1984) Geografía del Ecuador. Edition 11. Libresa, Quito.
- Thériot I (1936) Mousses de l'Equateur. Revue Bryologique et Lichénologique, Nouvelle Série IX: 5-36.
- Vaca-Moyano F, Enríquez S, Arrivillaga-Henríquez J, Villacrés-Guevara E, Araujo P, Benítez-Ortiz W (2017) Actualización de la distribución geográfica de *Triatoma dispar* (Hemiptera: Reduviidae: Triatominae) en Ecuador. Revista colombiana de entomología 43: 255-261. <https://doi.org/10.25100/socolen.v43i2.5952>
- van der Heyden T (2019) First record of *Microtomus cinctipes* (Stål) (Heteroptera: Reduviidae: Hammacerinae) in Panama and a recent record of the species in Ecuador. RCHE 45: 201-203. <https://doi.org/10.35249/rche.45.2.19.5>
- Zaragoza Hernández AY, Cetina Alcalá VM, López López MÁ, Chacalo Hilú A, de la Isla de Bauer MdL, Alvarado Rosales D, Gonzalez Rosas H (2015) Identificación de daños en el arbolado de tres parques del Distrito Federal. Revista Mexicana de Ciencias Forestales 6 (32): 63-82. <https://doi.org/10.29298/rmcf.v6i32.99>



Figure 1.

First known photographs of *Stenomacra tungurahua* Brailovsky and Mayorga, 1997 from San Isidro Lodge, province of Napo, Republic of Ecuador, showing its colouration in life.



Figure 2.

Topographic map of the Republic of Ecuador showing the known localities of *Stenomacra tungurahua*. 1: Baños, type locality; 2: Quito; 3: San Isidro Lodge. Note the location of Baños and Quito in inter-Andean valleys, while the new locality of San Isidro Lodge lies on the eastern Andean slopes