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## The genus *Pilobalia* Burmeister 1875 in Peru: updated checklist and distribution records (Coleoptera: Tenebrionidae: Pimeliinae: Nycteliini)

El género *Pilobalia* Burmeister 1875 en Perú: catálogo actualizado y registros de distribución (Coleoptera: Tenebrionidae: Pimeliinae: Nycteliini)

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**Abstract:** *Pilobalia* (Pimeliinae: Nycteliini) is an endemic genus of the Andean region of South America, distributed in Peru, Bolivia, Chile and Argentina. The objective of this work was to update the knowledge of the genus in the Peruvian territory, providing an updated checklist of species and new distribution records. From examination of around 580 specimens, a total of 26 species and two subspecies of *Pilobalia* are recorded for Peru, incorporating two that were not previously recorded, *P. decorata immaculata* (Blanchard) and *P. oblonga* (Blanchard). Also distribution maps and comments about its distribution patterns are provided.

**Keywords:** Andes, New records, Revision, South America, Species list.

**Resumen:** *Pilobalia* (Pimeliinae: Nycteliini) es un género endémico de la región andina de América del Sur, distribuido en Perú, Bolivia, Chile y Argentina. El objetivo del presente trabajo fue actualizar el conocimiento del género en el territorio peruano, aportando un catálogo actualizado de especies y nuevos registros de distribución. A partir del examen de alrededor de 580 especímenes, se registran un total de 26 especies y dos subspecies de *Pilobalia* para Perú, incorporando dos que no fueron catalogadas previamente, *P. decorata immaculata* (Blanchard) y *P. oblonga* (Blanchard). Además se presentan mapas de distribución y comentarios sobre sus patrones de distribución.

**Palabras clave:** Andes, Listado de especies, Nuevos registros, Revisión, Sudamérica.

**The genus *Pilobalia* Burmeister 1875 includes forty six species and four subspecies distributed in Andean environments of Peru, Bolivia, Chile and Argentina (Flores, 1997). This is the third most diverse genus of the Nycteliini tribe, a set of twelve genera and around 300 species endemic to the arid and semi-arid regions of South America (Flores, 1997; Flores, 1999; Flores & Vidal, 2000; Flores & Triplehorn, 2002).**

The first species of the genus *Pilobalia* were described under various other genera by Perty (1830), Erichson (1834, 1847), Blanchard (1843), Waterhouse (1844) and Kirsch (1886). Subsequently, the genus *Pilobalia* was proposed by Burmeister (1875) providing a morphological diagnosis

and listing the species known at that date. Fairmaire (1876; 1878; 1902; 1903) added five species and Gebien (1936) designated *Pilobalia decorata* (Erichson, 1834) as type species of the genus. In his revision of the Nycteliini tribe, Kulzer (1954) reviewed the genus, described twenty species, assigned subspecies rank to *Pilobalia immaculata* (Blanchard, 1843) and presented a key for all species known until then. Subsequent contributions of Kulzer (1955, 1958, 1959) added seven species and assigned subspecies rank to *Pilobalia murina* Kulzer, 1954. Later, Molinari (1968) and Peña (1973) described four and five species respectively, all of them from Argentina. More recently, Ferru & Pizarro-Araya (2007) offered the first Chilean records of *Pilobalia torresi* Molinari, 1968 and *Pilobalia escobari* Peña, 1973 based on specimens collected in the Altiplano of Tarapaca Region, including morphological redescriptions and environmental characterization of collection sites.

Within the tenebrionid fauna of Peru, the genus *Pilobalia* is currently represented by 25 species and one subspecies, with a high rate of endemism (about 96%) and with an imprecise number of undescribed species observed in collecting trips and entomological collections (Smith et al., 2015; Giraldo & Flores, 2016). Most of its species are distributed in Andean environments, including western Andean ranges (1000 m – 3800 m), inter-Andean valleys (1500m – 3300 m) and high plateaus or “Puna” (3800 m – 5000 m) (Giraldo & Flores, 2016) (Fig. 1a). Available published records account for its presence in particular habitats such as “lomas” vegetation in coastal desert (Aguilar, 1976), quinoa and potato crops (Escalante et al., 1981; Rasmussen et al., 2003) and high Andean *Polylepis* forests (Rossi et al., 2018).

The purpose of the present work is to update the knowledge of the genus *Pilobalia*, providing an updated checklist of *Pilobalia* species and new distribution records in Peruvian territory.

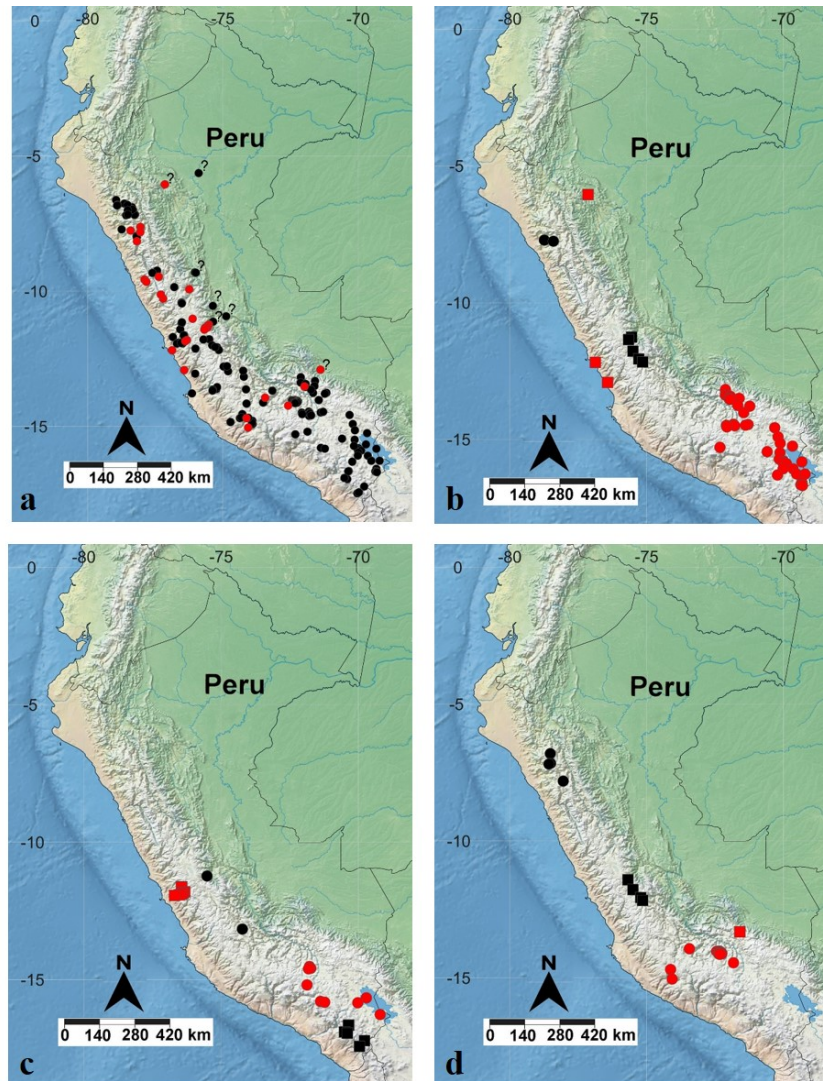
This study is based on direct and indirect examination of type and non-type specimens housed in the following collections: Natural History Museum Basel (NHMB, Christoph Germann), California Academy of Sciences, San Francisco, California, USA (CASC, Rachel Diaz-Bastin, Chris Grinter), Instituto Argentino de Investigaciones de Zonas Áridas, Mendoza, Argentina (IADIZA, Sergio Roig-Juñent, Gustavo Flores), Laboratorio de Entomología, Universidad Nacional Mayor de San Marcos, Lima, Perú (LEUSM, Eliana Quispitupac), Museo de Entomología Klaus Raven Büller, Universidad Nacional Agraria La Molina, Lima, Perú (MEKRB, Clorinda Vergara), Museo de La Plata, Universidad Nacional de La Plata, La Plata, Argentina (MLP, Nora Cabrera), Muséum National d'Histoire Naturelle, Paris, France (MNHN, Antoine Mantilleri, Christophe Rivier), Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Perú (MUSM, Mabel Alvarado), Laboratorio de Sanidad Vegetal, Servicio Nacional de Sanidad Agraria, Lima, Perú (SENASA, Graciano Tejada).

The primary source of distribution records were about 580 specimens examined in Peruvian entomological collections, namely LEUSM, MEKRB, MUSM and SENASA. Direct examination of type specimens

of eight Argentinean and two Peruvian species was carried out in IADIZA, through temporary loans from MLP (Cabrera et al., 2010). Indirect examination of type specimens housed at CASC, MNHN and NHMB was carried out through images sent by their respective curators, including two Peruvian and two Bolivian (CASC), four Peruvian (MNHN) and four Peruvian species (NHMB). Also specimens from Argentina and Bolivia were examined for comparative purposes at IADIZA. When type specimens were not accessible, dichotomic key, original descriptions and image plates presented by Kulzer (1954, 1955, 1958, 1959) were useful for species determination.

The checklist includes distribution status (endemic or new record), synonymy, type specimens examined (directly or indirectly), type localities (incorrectly spelled in quotation marks, doubtful with a question mark) and material examined, as available for each species. The distribution records of specimens that were not assigned to described species due to their poor condition, doubtful resemblance to known species, or preliminary assignment to undescribed species were summarized in a table indicating regions and provinces according to Peruvian territorial jurisdictions, number of specimens found for each of them, as well as geographic coordinates and altitude data. Overall, type and non-type localities were employed to plot distribution maps for the genus in Peru. The frequency of distribution records according to its latitude and altitude were plotted with histograms and their patterns were interpreted taking into account habitat selection of genus and collecting effort performed in Peruvian territory.

Distribution maps were elaborated using SimpleMapp (Shorthouse, 2010). Histogram plots for latitude and altitude data were elaborated with PAST software (Hammer et al., 2001).



**Fig. 1.**

**Distribution maps of genus *Pilobalia* in Peru.** a. Overall distribution of the genus, type localities (red circles), localities based on examined specimens (black circles), localities deserving verification (question marks). b. Distribution of *Pilobalia decorata decorata* (Erichson, 1834) (red circles), *Pilobalia alboscripta* Fairmaire, 1903 (black circles), *Pilobalia blancasi* Kulzer, 1958 (red squares) and *Pilobalia crassicornis* Kulzer, 1954 (black squares). c. *Pilobalia decorata immaculata* (Blanchard, 1843) (red circles), *Pilobalia crassicosta* Kulzer, 1954 (black circles), *Pilobalia michelbacheri* Kulzer, 1954 (red squares) and *Pilobalia oblonga* (Blanchard, 1843) (black squares). d. *Pilobalia decorata titschacki* Kulzer, 1954 (red circles), *Pilobalia ruficollis* Kulzer, 1954 (black circles), *Pilobalia unicolor* Kulzer, 1954 (red squares) and *Pilobalia weyrauchi* Kulzer, 1954 (black squares).

**Checklist of *Pilobalia* species recorded in Peru**

*Pilobalia alboscripta* Fairmaire, 1903 ENDEMIC (Fig. 1b)

Type specimen examined: Syntype (MNHN).

Type locality: La Libertad (Otuzco, Chuquisongo “Choquisongo” 2100 m).

Material examined: La Libertad, Otuzco, Sinsicap, 07°42'47.59"S 78°44'24.81"W, 2380 m, 12-III-2022, E. Gamboa, 1 (MUSM).

*Pilobalia baeri* Fairmaire, 1902 ENDEMIC

Type specimen examined: Syntype (MNHN).

Type locality: La Libertad (Santiago de Chuco 3000 m).

*Pilobalia becki* Kulzer, 1954 ENDEMIC (Fig. 2a)

Type specimens examined: Holotype (CASC), paratype (MLP).

Type locality: Junin (Junin Lake).

*Pilobalia blancasi* Kulzer, 1958 ENDEMIC (Figs. 1b, 2b)

Type specimen examined: Holotype (NHMB).

Type localities: Lima (Atocongo, Quilmaná "Quilmará"), San Martín (Rioja).

Material examined: Lima, Cañete, Quilmaná, 300 m, 11-XI-1951, Jordan, 1 (MUSM); Lima, 15-IV-1958, F. Blancas, 2 (MUSM), lomas de Atocongo, 04-IX-1948, F. Blancas, 2 (MUSM), 30-X-1958, P. Aguilar, 2 (MEKRB), 12-X-1969, R. García, 1 (MUSM). San Martín, Rioja, 4 (MUSM). PERU (no data), 2 (MUSM).

*Pilobalia crassicornis* Kulzer, 1954 ENDEMIC (Fig. 1b)

Type localities: Junin (Tarma, Acobamba 2900 m and Carpapata "Carpapaca" 2300 m). Material examined: Junín, Chupaca, Comunidad Ñahuinpuquio, 3200m., 07-XII-2003, Rivera & Montgomery, 1 (MEKRB); Huancayo, Pucará, 3310 m., 30-IX-2005, S. Mayta, 1 (MEKRB); Jauja, 23-II-1998, J. Paucar, 1 (MEKRB).

*Pilobalia crassicosta* Kulzer, 1954 ENDEMIC (Fig. 1c)

Type localities: Arequipa, Junin (Huacapistana "Huacapistrana").

Material examined: Ayacucho, 08-IV-2004, A. Martínez, 1 (MEKRB). Junín, 20-XII-1960, Vargas, 1 (SENASA).

*Pilobalia decorata decorata* (Erichson, 1834) (Fig. 1b)

= *Pilobalia nebulosa* (Waterhouse, 1844)

Type localities: Southern Peru, Tacora and Titicaca plateaus.

Material examined: Arequipa, 10-X-1996, O. Marín, 2 (MEKRB), 06-VIII-1999, J. Huanca, 1 (MEKRB), Castilla, Orcopampa, 15°17'29.90"S 72°19'17"W, 3855 m, 10-II-2018, P. Sanchez, 1 (MUSM). Cusco, Canas, Langui, 14°27'32.39"S 71°17'34.8"W, 4296 m, 28-II-2022, A. Giraldo, 3 (MEKRB); Canchis, Sicuani, 11-II-2002, I. Pardo, 1 (MEKRB); Chumbivilcas, Chilloroya, pajonal, 4020 m, 14°30'09.63"S 71°46'52.51"W, VI-2012, J. Jara, 10 (MEKRB), Livitaca, 14°29'15.46"S 72°05'0.07"W, 3841 m, 21-III-2021, E. Quispe, 3 (MUSM), 14°32'46.90"S 72°04'05.87"W, 3841 m, 21-III-2021, E. Quispe, 1 (MUSM), Urasana, 4029 m., V-2012, J. Jara, 1 (MEKRB); Cusco, 08-X-1961, Molledo, 2 (SENASA), 06-I-1962, Molledo, 5 (SENASA), 05-VI-1974, C. Martinez, 1 (SENASA), 13-III-1971, P. Aguilar, 2 (MEKRB), 20-IV-1971, M. Buitrón, 2 (MEKRB), 10-VIII-1995, C. Marhuay, 1 (MEKRB), 04-IV-1998, N. Elguera, 2 (MEKRB), 03-VI-2001, M. Cárdenas, 1 (MEKRB), Sacsayhuamán, 3585 m, 27-IV-1977, R. García, 1 (MUSM), V-1979, N. Castro, 1 (MUSM); Paucartambo, Huancarani, 3500 m, 03-III-1975, G. Lamas, 1 (MUSM); Quispicanchi, Huaro, 13°45'33.3"S 71°39'59.6"W, 4246 m, 12-I-2021, M. Gill, 4 (MUSM); Urubamba, Chincheros, 08-VII-1996, W. Catalán, 2 (MEKRB). Puno, Azángaro, Arapa, II-1948, F. Blancas, 8 (MUSM), Azángaro, II-1948, F. Blancas, 1 (MUSM), San Antón,

14°34'31.40"S 70°19'01.27"W, 4062 m, 20-II-2022, J. Aragon, 12 (MUSM); Chucuito, 06-II-2013, J. Huanca, 11 (MEKRB), Huacullani, Comunidad Cóndor de Aconcahua, 16°39'41.72"S 69°21'52.03"W, 4183 m, 01-III-2010, E. Rázuri, 1 (MUSM), Comunidad de Cotoco, 16°41'23.20"S 69°18'18.69"W, 4070m., 05-III-2010, E. Rázuri, 1 (MUSM), Comunidad de Ingenio, 16°39'41.72"S 69°19'01.41"W, 4226m., 02-III-2010, E. Rázuri, 1 (MUSM), Comunidad de Yorohoco, 16°34'05.64"S 69°19'34.19"W, 3856 m, 06-III-2010, E. Rázuri, 1 (MUSM), Juli, 16°16'08.39"S 69°30'54"W, 4060 m, 23-II-2022, A. Giraldo, 1 (MEKRB); El Collao, Ilave, 3900 m, II-1948, Weyrauch, 11 (MUSM); Huancane, Miajachi, 28-II-1948, F. Blancas, 6 (MUSM); Lampa, 0.5 Km NE of Paratia, 15°27'07"S 70°35'38"W, II-2020, G. Sarabia, 3 (MEKRB); Puno, 1 (no data) (MUSM), 1940, Soukup, 1 (SENASA), 3900 m, II-1948, F. Blancas, 5 (MUSM), 15-IV-1948, J.E. Wille, 2 (SENASA), 12-II-1952, F. Blancas, 1 (MUSM), 23-II-1968, M. Delgado, 4 (SENASA), 3850 m, 27-IV-1974, R. García, 6 (MUSM), 31-VIII-1981, R.Ortiz, 3 (MEKRB), 26-31-XII-1981, G. Mamani, 3 (MEKRB), 13-I-1982, F. Wong, 4 (MEKRB), 20-I-1983, E. Deza, 4 (MEKRB), II-2020, H. Coaquira, 3 (MEKRB), Hacienda Umayo, III-1948, F. Blancas, 3 (MUSM), Lago Titicaca, 27-XI-1952, F. Blancas, 1 (MUSM), Pichacani, 1.3 km northeast to Ayuncora, 16°04'40.79"S 70°00'39.59"W, 3978 m, 15-I-2022, A. Giraldo, 2 (MEKRB), Pichacani, 5.8 km northeast to Puente Bello, 16°18'17.99"S 70°13'01.19"W, 4459 m, 24-II-2022, A. Giraldo, 2 (MEKRB), Toramipata, 3825m., 15°48'08"S 69°59'36"W, II-2015, J. Ugarte, 3 (MEKRB); San Román, Juliaca, III-1956, 1 (MUSM); Yunguyo, Cuturapi, 16°16'11.99"S 69°12'25.19"W, 3869 m, 02-III-2022, A. Giraldo, 1 (MEKRB).

*Pilobalia decorata immaculata* (Blanchard, 1843) NEW COUNTRY RECORD (Fig. 1c)

= *Pilobalia opaca* (Kirsch, 1886)

= *Pilobalia alticola* (Kirsch, 1886)

Type localities: Bolivia (mountain range near to Potosí; Sajama 4500 m).

Material examined: Arequipa, Caylloma, Caylloma, 15°11'38.15"S 71°52'17.56"W, 4900 m, 15-VIII-2021, A. Aliaga, 2 (MUSM), 15-II-2022, E. Medina, 2 (MUSM), Pampa de Tocra, 15°47'31.19"S 71°22'40.8"W, 4325 m, 18-I-2022, A. Giraldo, 2 (MEKRB), San Antonio de Chuca, 15°49'22.8"S 71°13'44.39"W, 4358 m 27-II-2022, A. Giraldo, 1 (MEKRB). Cusco, Chumbivilcas, Chilloroya Alto, Mina Constancia, 14°31'34"S 71°46'52"W, 4139 m, 11-VI-2013, L. Huerto, 1 (MUSM), 14°35'21"S 71°44'13"W, 4380 m, 11-VI-2013, L. Huerto, 1 (MUSM), Pumacocha, 4029 m., V-2012, J. Jara, 7 (MEKRB). Puno, Puno, 1944, 2 (MUSM), 3800 m, II-1948, F. Blancas, 2 (MUSM), 3900 m, II-1948, Weyrauch, 1 (MUSM), 23-II-1968, M. Delgado, 11 (SENASA), Isla Amantani, 3900 m., III-1948, F. Blancas, 10 (MUSM); Yunguyo, Cuturapi, 16°16'11.99"S 69°12'25.19"W, 3869 m, 23-II-2022, A. Giraldo, 8 (MEKRB).

*Pilobalia decorata titschacki* Kulzer, 1954 ENDEMIC (Fig. 1d)

Type localities: Apurimac (37 km South of Andahuaylas), Ayacucho (Huacaña 3700 m “Huacana”, Querobamba 3500 m, Tayapampa 4000 m).

Material examined: Apurímac, Cotabambas, 14°07'37.65"S 72°15'34.45"W, 3798m., 22-24-I-2017, J. Suárez, 1 (MUSM), 14°03'43.37"S 72°18'36.89"W, 4326m., 29-30-I-2017, J. Suárez, 1 (MUSM), Chalhuhahuacho, C. C. Ccahuapirhua, 14°07'17.53"S 72°21'55.38"W, 4384 m, 23-III-2021, R. Coronel, 1 (MUSM), 14°08'05.93"S 72°20'27.92"W, 4030 m, 23-III-2021, J. Aragon, 1 (MUSM), 14°08'13.02"S 72°19'43.95"W, 3876 m, 24-III-2021, J. Aragon, 1 (MUSM), Chalcobamba, Qda. Itaña, 14°04'08.02"S 72°22'51.19"W, 4419 m, 03-III-2021, J. Aragon, 1 (MUSM), Ferrobamba, 14°05'18.54"S 72°20'51.01"W, 4376 m, J. Aragon, 1 (MUSM), 14°06'26.73"S 72°15'08.01"W, 3994 m, 18-III-2021, R. Coronel, 1 (MUSM), Coyllurqui, Huancuire, 14°01'05.37"S 72°20'36.04"W, 4367 m, 09-IV-2021, R. Coronel, 1 (MUSM), 14°01'24.64"S 72°20'48.85"W, 4442 m, 09-IV-2021, J. Aragon & A. Elme, 1 (MUSM), 14°02'21.48"S 72°23'06.43"W, 4351 m, 12-IV-2021, R. Coronel, 1 (MUSM), Pumamarca (Sallahue), 14°01'46.67"S 72°19'36.28"W, 4349 m, 24-II-01-III-2020, N. Zenteno & A. Silva, 1 (MUSM), Mina Las Bambas, sector Sagrapeña, 14°04'37.24"S 72°18'33"W, 4265 m, 01-III-2020, L. Perez, 2 (MUSM), Tambobamba, C. C. Antuyo, 14°04'32.38"S 72°16'03.88"W, 4244 m, 29-II-01-III-2020, N. Zenteno & A. Silva, 1 (MUSM); Grau, Progreso, Palcca, 14°01'52.88"S 72°26'28.02"W, 4148 m, 12-III-2021, R. Coronel, 2 (MUSM). Cusco, 1962, Molleda, 1 (MEKRB); Chumbivilcas, Urasana, 4029 m, V-2012, J. Jara, 21 (MEKRB), 5 (IADIZA).

*Pilobalia dorsoplicata* Fairmaire, 1876 ENDEMIC

Type locality: Peru (without further details).

Note: After examining the only type specimen housed at British Museum, Kulzer (1954) pointed out that an accurate determination of the species is unreliable, since the elytral pattern is completely lost and the "Peru" locality is too imprecise.

*Pilobalia freyi* Kulzer, 1954 ENDEMIC

Type specimen examined: Holotype (NHMB).

Type locality: Lima? (Pativilca River “Rio Pativilia” 3300-3600 m Huaraz to Huacho route).

*Pilobalia gracilipes* Kulzer, 1954 ENDEMIC

Type locality: Junin (Tarma River, Palca 2800 m).

*Pilobalia haagi* Fairmaire, 1878 ENDEMIC

Type locality: Peru (without further details).

*Pilobalia lineata* Kulzer, 1958 ENDEMIC

Type locality: Peru (without further details).

*Pilobalia löffleri* Kulzer, 1955 ENDEMIC

Type localities: Ancash (Cohuptal? 4600 m in Huaraz zone, dry slope west to Huaraz 4200 m, highland between Quilcayhuanca “Quilquaihuanca” and Shallapa “Schallaptal”).

*Pilobalia michelbacheri* Kulzer, 1954 ENDEMIC (Figs. 1c, 2c)

Type specimen examined: Holotype (CASC).

Type localities: Lima (Matucana, San Miguel de Viso “Viso, Rio Rimai” 2700 m).

Material examined: Lima, Huarochirí, 28-V-1974, P. Hocking, 1 (MUSM), carretera central km 70, 26-IV-1945, 2 (MUSM), Huanza, 11°37'20.54"S 76°25'48.54"W, 3910 m, 15-VII-2021, M. Rodriguez, 1 (MUSM), 11°37'51.34"S 76°26'53.01"W, 3900 m, 15-III-2021, M. Rodriguez, 2 (MUSM), Matucana, 23-VI-2001, S. Díaz, 1 (MEKRB), San Bartolomé, 04-VI-2003, E. Arango, 1 (MEKRB), San Jerónimo de Surco, V-2014, A. Solano, 2 (MEKRB); Lima, Chosica, 13-IV-2003, W. Soto, 1 (MEKRB).

*Pilobalia oberthüri* Kulzer, 1954 ENDEMIC (Fig. 2d)

Type specimens examined: Holotype, allotype, two paratypes (MNHN).

Type locality: Cajamarca (Cajabamba 4000 m).

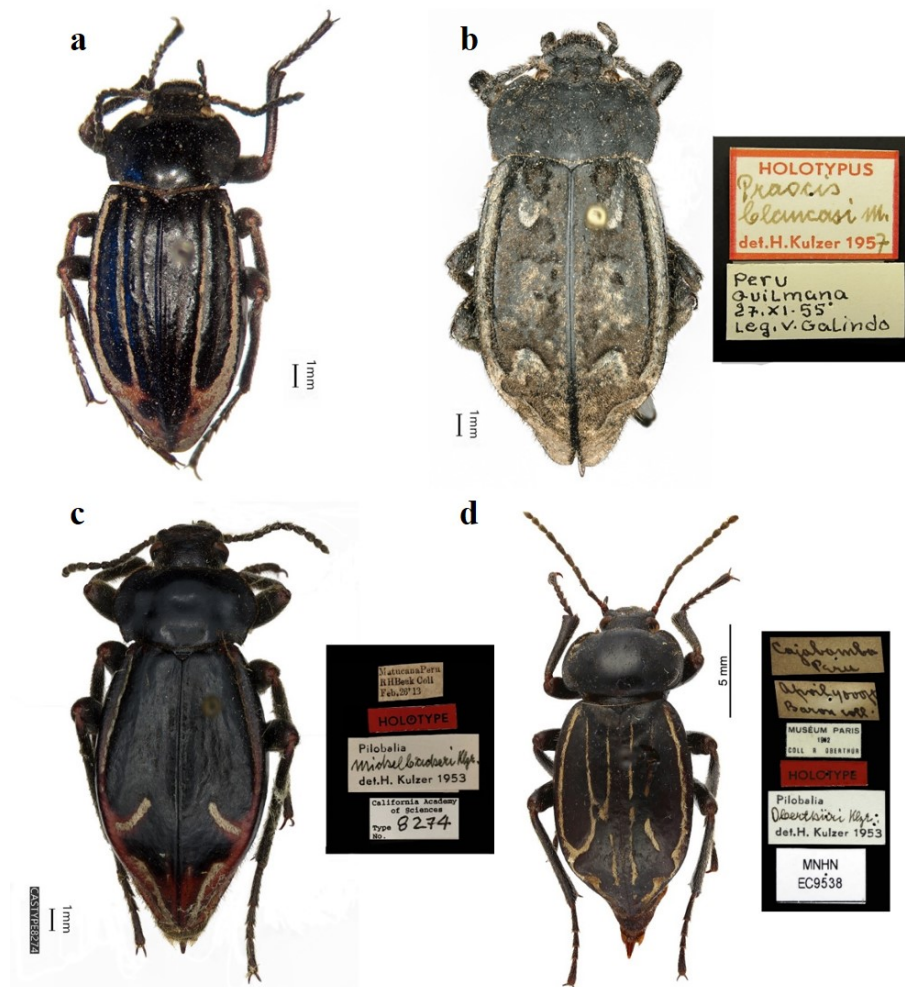


Fig. 2.

Habitus of type specimens in dorsal view. a. *Pilobalia becki* Kulzer, 1954 MLP paratype (photo by Gustavo Flores). b. *Pilobalia blancasi* Kulzer, 1958 NHMB holotype (photo by Christoph Germann). c. *Pilobalia michelbacheri* Kulzer, 1954 CASC holotype (photo by Rachel Diaz-Bastin). d. *Pilobalia oberthüri* Kulzer, 1954 MNHN holotype (photo by Christophe Rivier).

*Pilobalia oblonga* (Blanchard, 1843) NEW COUNTRY RECORD  
(Fig. 1c)

Type locality: Puna highlands of mountain range (no mention of any country).

Material examined: Moquegua, Mariscal Nieto, Carumas, 16°38'52"S 70°20'48"W, III-2015, M. Deza, 5 (MEKRB), 16°39'41.20"S 70°21'53.43"W, 4371 m, 22-23-II-2021, L. Ramirez, 1 (MUSM), 16°54'16.54"S 70°30'26.00"W, 4659 m, 22-23-II-2021, L. Ramirez, 3 (MUSM). Puno, El Collao, Capaso, Challapalca, 17°13'15.6"S 69°46' 37.2"W, 4305 m, 23-II-2022, A. Giraldo, 3 (MEKRB). Tacna, Candarave, Laguna Suches, 16°56'57.69"S 70°24'09.87"W, 4462 m, pajonal, VIII-2015, Y. Callohuari, 1 (MEKRB); Tarata, near to Ticaco, 17°25'44.39"S 69°57'46.79"W, 4247 m, 23-II-2022, A. Giraldo, 1 (MEKRB).

*Pilobalia ornata* Kulzer, 1958 ENDEMIC

Type locality: Ancash (Laguna Conococha "Cenococha" 4150 m).

*Pilobalia philippi* Kulzer, 1958 ENDEMIC

Type locality: La Libertad (Otuzco, Chuquizongo "Choquisongo" 2100 m).

*Pilobalia ruficollis* Kulzer, 1954 ENDEMIC (Fig. 1d)

Type locality: La Libertad (Huamachuco).

Material examined: Cajamarca, Cajamarca, 1969, J. Alata, 3 (SENASA), Cumbemayo, 3300 m., 30-VI-2002, M. Diéguez, 6 (MUSM); Hualgayoc, El Tambillo, 1877, A. Raimondi, 3 (MUSM).

*Pilobalia soror* Kulzer, 1958 ENDEMIC (Fig. 3a)

Type specimen examined: Holotype (NHMB).

Type locality: Peru (without further details).

*Pilobalia subnuda* Kulzer, 1954 ENDEMIC (Fig. 3b)

Type specimen examined: Paratype (MLP)

Type locality: Lima? (Pativilca River "Pativilia" 3300-3600 m Huaraz to Huacho route).

*Pilobalia tenella* Kulzer, 1954 ENDEMIC (Fig. 3c)

Type specimen examined: Paratype (MNHN).

Type locality: La Libertad (Otuzco, Chuquizongo "Choquisongo" 2100 m).

*Pilobalia tristis* Kulzer, 1954 ENDEMIC

Type localities: Apurimac (Mamara), Cusco, Madre de Dios.

*Pilobalia unicolor* Kulzer, 1954 ENDEMIC (Figs. 1d, 3d)

Type specimen examined: Holotype (NHMB).

Type locality: Cusco (Cajea? 3900 m).

Material examined: Cusco, Paucartambo, 18-IV-1993, L. González, 1 (MEKRB).

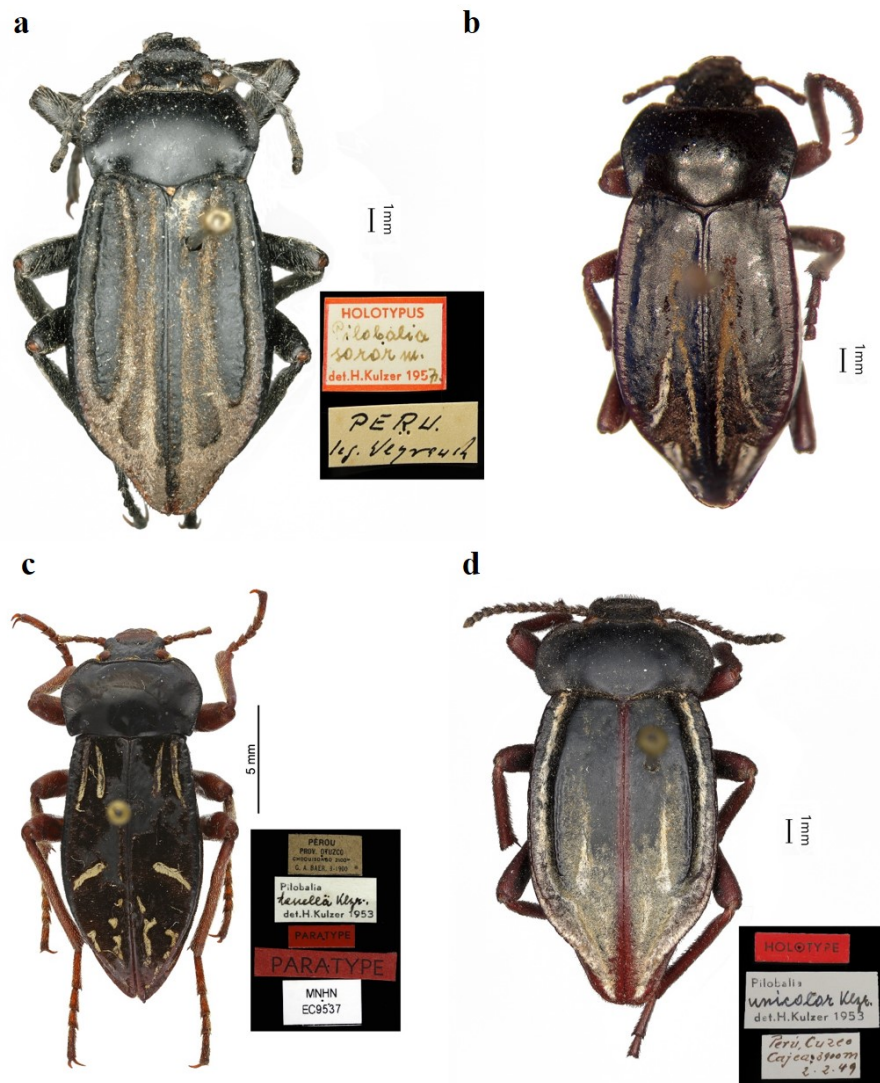


Fig. 3.

**Habitus of type specimens in dorsal view.** a. *Pilobalia soror* Kulzer, 1958 NHMB holotype (photo by Christoph Germann). b. *Pilobalia subnuda* Kulzer, 1954 MLP paratype (photo by Gustavo Flores). c. *Pilobalia tenella* Kulzer, 1954 MNHN paratype (photo by Christophe Rivier). d. *Pilobalia unicolor* Kulzer, 1954 NHMB holotype (photo by Christoph Germann).

*Pilobalia voogdi* Kulzer, 1954 ENDEMIC

Type locality: Huánuco 1900 m.

*Pilobalia weyrauchi* Kulzer, 1954 ENDEMIC (Fig. 1d)

Type locality: Junin (Tarma 3300-3800 m).

Material examined: Junín, Huancayo, 21-IV-1978, J. Alcázar, 9 (MEKRB), 24-XI-2012, C. Huaripata, 1 (MEKRB), Pucará, 30-IX-2005, S. Mayta, 2 (MEKRB); Jauja, 7 Km NE Jauja, 3390 m., 22-XI-2004, N. Lara, 1 (MEKRB).

According to the updated checklist presented here, the genus *Pilobalia* in Peru is now represented by 26 species and two subspecies. It has been possible to examine type specimens of eleven species, which represents a 39% of the recorded species and subspecies in Peru. In the Peruvian collections, specimens corresponding to 10 species and two subspecies

were found, namely *P. alboscripta*, *P. blancasi*, *P. crassicornis*, *P. crassicosta*, *P. decorata decorata*, *P. decorata immaculata*, *P. decorata titschacki*, *P. michelbacheri*, *P. oblonga*, *P. ruficollis*, *P. unicolor* and *P. weyrauchi*. Otherwise, sixteen species are currently known only from their type specimens and are not properly represented in Peruvian collections. Among these species with poorly known distribution, *P. baeri*, *P. becki*, *P. freyi*, *P. gracilipes*, *P. löffleri*, *P. oberthüri*, *P. ornata*, *P. philippi*, *P. subnuda*, *P. tenella*, *P. tristis* and *P. voogdi* have more or less well-defined type localities, so their distributions must be restricted and hitherto overlooked by collecting surveys in Peru. For *P. haagi*, *P. lineata* and *P. soror*, the label data of type specimens only indicates "Peru" without further details, so its precise distribution will only be defined with more collecting effort. The status of *P. dorsoplicata* is even more uncertain following notes by Kulzer (1954), with a type specimen extensively damaged and bearing label data "Peru", so this species should be declared *nomen dubium* according to International Code of Zoological Nomenclature.

Distribution records of undetermined specimens of genus *Pilobalia* are presented in Table I. These records include 275 specimens from 15 regions and 41 provinces of the Peruvian territory. A high number of specimens not reliably assigned to described species is not surprising for a genus of wingless darkling beetles prone to speciation by vicariant orographic barriers and this biological trait partly explains why its systematics studies are still in progress.

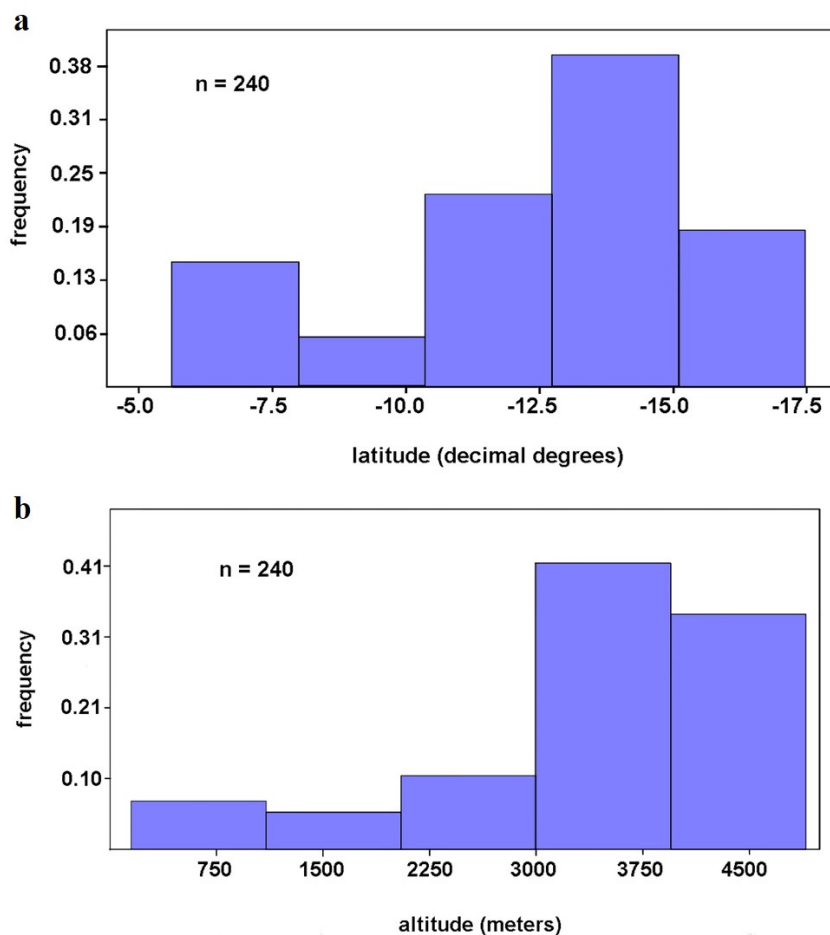
Region	Province (specimens)	Latitude	Longitude	Altitude	
Loreto	Maynas (2)	-5.630	-75.894	148	
Cajamarca	Santa Cruz (8)	-6.626	-78.945	2035	
		-6.805	-78.998	2723	
		-6.829	-78.911	3338	
	Huigayoc (2)	-6.757	-78.640	1668	
	San Almagú (1)	-6.811	-78.883	3533	
	Celendin (2)	-6.896	-78.557	4000	
		-6.974	-78.337	3975	
	Cajamarca (52)		-6.931	-78.444	4015
			-6.941	-78.472	4098
			-6.958	-78.461	4025
			-6.985	-78.461	3798
			-6.988	-78.481	4094
			-6.992	-78.477	4050
			-7.003	-78.516	3807
			-7.006	-78.487	4026
			-7.015	-78.308	2940
			-7.030	-78.320	3770
			-7.038	-78.335	3530
			-7.066	-78.347	3500
		-7.162	-78.243	3600	
	-7.175	-78.266	3450		
	-7.624	-78.046	2554		
La Libertad	Cajabamba (1)	-7.624	-78.046	2554	
	Santiago de Chaco (9)	-7.962	-78.192	4055	
Huanuco		-7.999	-78.181	3871	
	Leoncio Prado (3)	-9.302	-76.036	847	
		-9.314	-75.997	659	
	Dos de Mayo (1)	-9.847	-76.797	3500	
Ancash	Huamaco (1)	-9.929	-76.240	1900	
	Carhuaz (2)	-9.323	-77.604	2720	
Pasco	Daniel Alcides Carrión (6)	-10.413	-76.527	4055	
		-10.437	-76.514	4024	
		-10.451	-76.516	4125	
	Oxapampa (1)	-10.541	-75.369	2350	
Junin	Chanchamayo (4)	-10.925	-74.877	525	
		-11.124	-75.380	820	
	Tarma (1)	-11.417	-75.683	3050	
	Junta (2)	-11.786	-75.718	3800	
	Huancayo (9)	-12.001	-75.394	3282	
Lima		-12.067	-75.917	3249	
	Huara (6)	-11.146	-76.514	4585	
		-11.150	-76.516	4628	
		-11.185	-76.525	4358	
	Caña (3)	-11.407	-76.575	3583	
		-11.695	-76.847	940	
	Huancavelica (24)		-11.631	-76.448	3900
			-11.845	-76.386	3378
			-11.893	-76.553	1719
			-11.901	-76.664	1036
			-11.911	-76.541	1450
			-11.912	-76.529	1600
		-11.929	-76.489	2550	
	Lima (2)		-11.927	-76.696	850
	Yanayes (9)		-12.122	-76.013	4000
Cñete (1)		-13.049	-76.022	2346	
Huancavelica	Huancavelica (12)	-12.771	-74.849	3385	
		-12.785	-74.871	3676	
	Angares (4)	-12.960	-74.806	4088	
	Huaytari (8)	-13.545	-75.213	4295	
		-13.619	-75.235	4325	
		-13.637	-75.375	3778	
	-13.676	-75.383	3473		
Ica	Chacra (3)	-13.778	-76.142	1850	
	Nasca (3)	-14.837	-74.716	2350	
Ayacucho	Huanta (1)	-12.940	-74.248	2500	
	Cangallo (4)	-13.629	-74.144	4000	
	Tucumán (19)		-14.151	-74.124	4386
			-14.158	-74.124	4245
			-14.543	-74.279	3432
			-14.665	-74.319	4174
			-14.681	-74.061	3841
			-14.693	-74.369	4000
			-14.786	-73.908	4213
			-14.800	-73.910	4347
			-14.863	-73.924	4172
			-14.909	-73.899	4089
	-13.810	-72.120	3600		
	-13.379	-72.122	3605		
Cusco	Urubamba (2)				
	Cusco (6)	-13.430	-71.941	4041	
		-13.508	-71.982	3700	
		-13.522	-71.983	3400	
		-13.542	-71.949	3354	
Quispicanchi (3)		-13.789	-71.231	2794	
		-13.755	-71.172	4270	
		-13.639	-71.241	3162	
Apurimac	Cuechis (1)	-14.025	-71.454	3450	
	Andahuaylas (5)		-13.678	-73.172	4010
			-14.119	-73.511	4004
	Cotabambas (8)		-14.050	-72.252	4060
			-14.054	-72.254	4097
		-14.068	-72.269	4083	
	-14.078	-72.226	3912		
Puno	Puno (3)	-15.543	-70.024	3310	
	-15.961	-69.992	3961		
Tacna	Tarata (41)	-17.442	-69.981	3921	
	-17.474	-70.031	3083		

**Table I.**  
**Distribution records of undetermined specimens of the genus *Pilobalia***  
**arranged in regions and provinces of Peruvian territory. Specimen numbers in**  
**parentheses. Geographic coordinates in decimal degrees and altitude in meters**

Taking into account all the available distribution records, distribution maps were elaborated, including 240 localities (Fig. 1). These records place the northern limit of the Nycteliini tribe to around 6°S, some 7° further north than on the map presented by Flores & Triplehorn (2002). As expected according to previous works (Peña 1973, Giraldo & Flores 2016), records are mostly located along the different altitude levels of the Andes mountain range, with very few to the west (coastal desert) and east (tropical forests) of the Andes. The records in the coastal desert are located between 12–13°S, these correspond specifically to *Pilobalia blancasi* collected in patches of fog-dependent vegetation called "lomas", as documented in early works by Aguilar (1976) and by the specimens found in the collections. The label data of some specimens suggest that they were collected in tropical areas between 5–13°S, from 150 to 2200 meters of altitude. At first glance, tropical areas do not have suitable

habitats for the genus, however the presence of semi-arid patches or dry micro-habitats cannot be ruled out, which should be verified with a greater collection effort in these places.

The histogram plot of latitude data shows higher frequencies (0.57) for southern latitudes from 12°30'0" S (Fig. 4a). This pattern could be explained by the fact that the Southern Peruvian Andes have a wider area, mostly covered with highland grasslands, which are also easier places for collecting, using a combination of pitfall trapping and direct searching under rocks. The histogram plot of altitude data shows higher frequencies (0.76) for altitudes above 3000 m (Fig. 4b). This means that the genus *Pilobalia* would have largest populations and species number inhabiting highland plains and interandean valleys, while ravines covered with cacti and shrubs at lower altitudes would be secondary habitats. Also, as stated above, collecting is easier in larger areas and more difficult in narrow places, where populations could also be smaller.



**Fig. 4.**  
**Histogram plots for distribution data of genus *Pilobalia* in Peru. a. latitude (decimal degrees). b. altitude (meters).**

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