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Distribution records of the main forensically important species of beetles (Insecta: Coleoptera) in Peru

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ABSTRACT. Eighteen species of Coleoptera were determined as the most frequently recorded beetles in different bibliographic references and entomological collections. The distribution of forensically important beetle species in Peru was obtained from reviewing of biodiversity surveys, forensic entomological succession studies and systematic revisions, as well as specimen examination in six Peruvian entomological collections. Peruvian distribution at region, province, and ecological region level are provided for the eighteen species belonging to Cleridae (*Necrobia* Olivier, 1795), Dermestidae (*Dermestes* Linnaeus, 1758), Histeridae (*Euspilotus* Lewis, 1907, *Saprinus* Erichson, 1834, *Xerosaprinus* Wenzel, 1962), Staphylinidae (*Creophilus* Leach, 1819, *Oxelytrum* Gistel, 1848), and Trogidae (*Omorgus* Erichson, 1847, *Polynoncus* Burmeister, 1876) families. These species can be considered priorities for future forensic studies in Peru.

Keywords: Andes, carrion, bibliographic review, necrophilous, Neotropics, scavenger

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INTRODUCTION

Forensic entomology is a promising discipline in forensic science. The high frequency of forensic cases involving insects demands greater application in criminal investigations (Lutz et al., 2021), and in response to this demand, its methodology and techniques have been progressively consolidated (Singh et al., 2022). Globally, beetles of forensic importance have been recognized in the families Anthicidae, Carabidae, Cleridae, Dermestidae, Geotrupidae, Histeridae, Hybosoridae, Hydrophilidae, Lathridiidae, Leiodidae, Monotomidae, Nitidulidae, Ptinidae, Scarabaeidae, Staphylinidae, Tenebrionidae and Trogidae, according to studies conducted in the Nearctic (Nadeau et al., 2015), Neotropical (Almeida et al., 2015), Oriental (Bala & Singh, 2015) and Palaearctic (Sawaby et al., 2016) regions. For forensic science, the valuable biological traits of Coleoptera are long duration of immature stages for better estimation of minimum postmortem interval and the development of tough structures for obtaining toxicological samples (Midgley et al., 2010).

In Peru, there are still no published records of entomofauna associated with forensic cases. However, forensic entomological succession studies have been conducted using bio-models in the coastal region (Iannacone, 2003; Grados, 2014; Ginés et al., 2015; Sarmiento & Padilla, 2015; Murrugarra, 2016; Villanueva, 2016; Villanueva & Seclén, 2016; Andrade et al., 2018; Medina et al., 2018; Chamochumbi et al., 2022; Esquiagola, 2022; Lázaro, 2021; Jaime, 2023), the Andean region (Peceros, 2011; Oré, 2017; Cortéz, 2021; Infante, 2021; Briceño et al., 2022) and the Amazon region (Pizango et al., 2019; Torres, 2020). In recent years, knowledge of necrophilous insect assemblages has increased by searching and examining stranded marine vertebrate carcasses (Saavedra et al., 2019; Iannacone et al., 2023). The objective of the present work is to provide distribution records for the main species of forensically important beetles in Peru, according to their availability in previous publications and the specimens found in entomological collections.

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MATERIAL AND METHODS

The starting point for the taxa treated in this work is the genera and species known for their forensic importance in Peru, as established by Giraldo-Mendoza (2021). Distribution records were obtained from published biodiversity surveys (e.g. Andrade & Hava, 2018; Iannacone et al., 2023; Rossi et al., 2018), forensic entomological succession studies(e.g. Andrade et al., 2018; Briceño et al., 2022; Chamochumbi et al., 2022), and systematic revisions of particular families or subfamilies(e.g. Arriagada, 2015; Costa-Silva et al., 2024; Peck & Anderson, 1985). Another source of records was the label data of specimens housed in the following Peruvian entomological collections: Estación Experimental Agraria Illpa-INIA (ILLPA), Museo de Entomologia Klaus Raven Büller-UNALM (MEKRB), Museo de Historia Natural Javier Prado-UNMSM (MUSM), Laboratorio de Sanidad Vegetal-SENASA (SENASA), Laboratorio de Entomologia-UNASAM (UNASAM) and Museo de Historia Natural Victor Baca Aguinaga-UNPRG (UNPRG). Label data, including region, province, locality, sexagesimal coordinates, elevation, trap or substrate, date of collection, name of collector, number of specimens, and entomological collection in parentheses, are presented for all specimens.

The specimens of Histeridae that were deposited in the entomological collections were determined by two specialists, Gerardo Arriagada and Alexey Tishechkin. Their names were given in brackets for these specimens. The unidentified specimens were studied by help of references and keys to determine families, genera or species of Coleoptera (Almeida & Mise, 2009), Dermestidae (Háva & Kalik, 2005; Andrade & Háva, 2018), Silphinae (Peck & Anderson, 1985), and Trogidae (Scholtz, 1990; Costa-Silva et al., 2020, 2024). Distribution data were arranged into six ecological regions based on the criteria proposed by the Ministerio del Ambiente de Perú (MINAM, 2018): 1) coastal desert, coastal strip west of the Andes (< 1500 m), 2) dry forest, northern xeric vegetation west of the Andes (< 2800 m), 3) Andean foothills, cacti and shrub vegetation in the western range and inter-Andean valleys (1500–3500 m), 4) Andean highlands, grasslands, relict forests and wetlands (> 3500 m), 5) montane forest, cloud forests east of the Andes (600–3000 m); 6) tropical rainforest, lowland forests east of the Andes (< 600 m). For each species, the Peruvian distribution at the regional, provincial, and ecological regions are provided, as well as published records (references) and material examined (label data provided here). Distribution maps were created using Simple Mappr (Shorthouse, 2010).

RESULTS

Eighteen species of forensically important beetles in Peru were determined and listed below based on their taxonomy. Peruvian distribution of the species at region, province, and ecological region levels are provided. The distribution data of 385 records of these species were obtained from previous publications and direct examination of 610 specimens housed in Peruvian entomological collections

Taxonomic hierarchy

Class Insecta Linnaeus, 1758

Order Coleoptera Linnaeus, 1758

Family Cleridae Latreille, 1802

Subfamily Korynetinae Laporte, 1836

Genus *Necrobia* Olivier, 1795

***Necrobia ruficollis* (Fabricius, 1775)**

Material examined. (3 specimens) PERU, 1 (MEKRB), on seabird remains, Ica, Pisco, San Andrés (13°43'15.47"S 76°13'18.79"W), III-2014, A. Giraldo leg.; 2 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa (20 m), Y. Murrugarra leg.

Distribution. Cosmopolitan. PERU. Callao, Huanuco (Huanuco), Ica (Chincha, Pisco), La Libertad (Trujillo), Lima (Lima) (Murrugarra, 2016; Villanueva, 2016; Torres, 2020; Lázaro, 2021; Iannacone et al., 2023). In coastal deserts and montane forests (Fig. 1A).

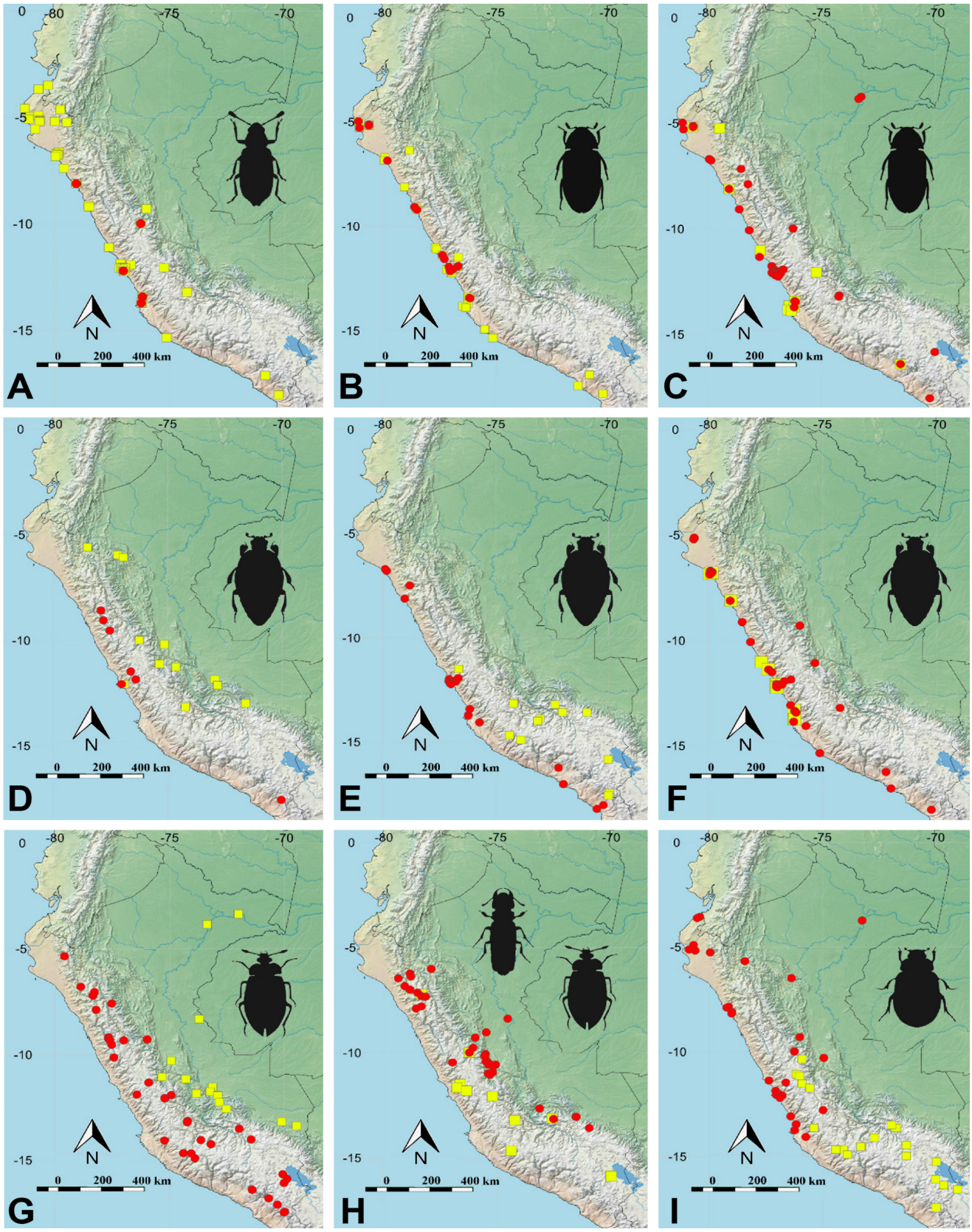

Figure 1. Distribution maps of main forensically important beetles in Peru: **A.** *N. ruficollis* (red circles), *N. rufipes* (yellow squares); **B.** *D. ater* (red circles), *D. frischii* (yellow squares); **C.** *D. maculatus* (red circles), *D. peruvianus* (yellow squares); **D.** *E. ater* (red circles), *E. azureus* (yellow squares); **E.** *E. decoratus* (red circles), *E. lepidus* (yellow squares); **F.** *S. caerulescens* (red circles), *X. chiliensis* (yellow squares); **G.** *O. anticola* (red circles), *O. cayennense* (yellow squares); **H.** *O. discicolle* (red circles), *C. maxillosus* (yellow squares); **I.** *O. suberosus* (red circles), *P. peruanus* (yellow squares).

Necrobia rufipes (DeGeer, 1775)

Material examined. (111 specimens) PERU, 10 (MEKRB), on sea lion carcass, Ancash, Santa, Samanco, Vesique beach (09°12'30.04"S 78°29'04.32"W), 27-II-2018, A. Giraldo & R. Gasani, leg.; 5 (MUSM), Callao, La Punta, (12°04'26.39"S 77°09'57.59"W, 10 m); 12 (MEKRB), Huánuco, Leoncio Prado, Tingo Maria, 10-VII-1981, Mosquera leg.; 2 (MUSM), on coastal desert, direct searching, Ica, Nasca, Marcona (15°20'47.5"S 75°07'27.1"W, 58 m), 19-III-2019, I. Galindo leg.; 3 (MUSM), Ica, Pisco, Pisco (13°42'50.40"S 76°11'02.39"W, 10 m); 1 (MEKRB), on seabird remains, Ica, Pisco, San Andres (13°43'15.47"S 76°13'18.79"W), III-2014, A. Giraldo leg.; 1 (MEKRB), on slaughterhouse waste, La Libertad, Pacasmayo, Pacasmayo (07°23'49.20"S 79°34'17.01"W) 19-XII-2018, A. Giraldo leg.; 1 (MEKRB), on sea lion carcass, Lambayeque, Chiclayo, Pimentel, Pimentel beach (06°50'28.82"S 79°56'15.53"W), 20-IX-2018, A. Giraldo leg.; 1 (MEKRB), on Humboldt penguin carcass, Lima, Huaura, Huacho (11°06'25.00"S 77°37'04.00"W), 10-VIII-2018, A. Giraldo leg.; 2 (SENASA), Lima, Lima, 20-IV-1944, J. Lamas leg.; 2 (SENASA), Lima, Lima, 11-IV-1962, Lung leg.; 19 (MEKRB), Lima, Lima, 10-XI-1963, K. Raven leg.; 3 (MEKRB), Lima, Lima, 10-XII-1963, K. Raven leg.; 1 (MEKRB), Lima, Lima, 01-II-1965, C. Olivares leg.; 1 (MEKRB), Lima, Lima, 24-VII-1968, O. Velarde leg.; 1 (MEKRB), Lima, Lima, 15-XII-1968, O. Velarde leg.; 2 (MEKRB), Lima, Lima, X-1970, I. Caceres leg.; 7 (SENASA), Lima, Lima, 25-IX-1972, T. Grundy leg.; 1 (SENASA), Lima, Lima, 14-XII-1972, C. Valle leg.; 1 (SENASA), Lima, Lima, 15-IV-1980, W. Diaz leg.; 12 (MUSM), 1 (SENASA), Lima, Lima, 30-V-1980, W. Diaz leg.; 4 (MUSM), Lima, Barranco (20 m); 1 (MUSM), Lima, Lima, Chorrillos, Pantanos de Villa (20 m); 4 (MEKRB), Lima, Lima, La Molina, 17-XII-1980, J. Musto leg.; 1 (MEKRB), Lima, Lima, La Molina, 22-II-2005, S. Mayta leg.; 1 (MEKRB), Lima, Lima, La Molina, 05-V-2005, M. Cardozo leg.; 1 (MEKRB), Lima, Lima, La Molina, 16-V-2005, M. Cardozo leg.; 1 (MEKRB), Lima, Lima, La Molina, 18-VII-2005, S. Diaz leg.; 1 (MEKRB), Lima, Lima, La Molina, 18-II-2006, J. Alvarado leg.; 5 (MUSM), Lima, Lima, San Miguel (12°04'37.19"S 77°05'05.99"W, 45 m); 1 (MUSM), on sea lion carcass, Lima, Lima, Villa El Salvador, Venecia beach (12°14'31.20"S 76°56'45.59"W, 2 m); 1 (MUSM), on garbage dump, Moquegua, Mariscal Nieto, near to Cerro baúl archaeological site (17°06'46.79"S 70°50'27.59"W, 2030 m), 24-II-2022, A. Giraldo leg.; 1 (MEKRB), on green turtle carcass, Tumbes, Contralmirante Villar, Zorritos, Zorritos beach (03°40'38.10"S 80°40'20.00"W, 10 m), 19-IX-2018, A. Giraldo leg.

Distribution. Cosmopolitan. PERU. Ancash (Santa), Ayacucho (Huamanga), Callao, Huanuco (Huanuco, Leoncio Prado), Ica (Chincha, Nasca, Pisco), Junin (Huancayo), La Libertad (Pacasmayo, Trujillo), Lambayeque (Chiclayo, Ferreñafe), Lima (Huarochiri, Huaura, Lima), Moquegua (Mariscal Nieto), Piura (Ayabaca, Huancabamba, Morropon, Paita, Piura, Sechura, Sullana, Talara), Tacna (Tacna), Tumbes (Contralmirante Villar, Zarumilla) (Iannacone, 2003; Peceros, 2011; Ginés et al., 2015; Sarmiento & Padilla, 2015; Murrugarra, 2016; Villanueva & Seclén, 2016; Villanueva, 2016; Oré, 2017; Andrade et al., 2018; Medina et al., 2018; Juárez & González, 2019, 2024; Saavedra et al., 2019; Torres, 2020; Cortéz, 2021; Lázaro, 2021; Chamochumbi et al., 2022; Esquiagola, 2022; Iannacone et al., 2023; Jaime, 2023). In coastal deserts, dry forests, Andean foothills, and montane forests (Fig. 1A).

Family Dermestidae Latreille, 1804

Subfamily Dermestinae Latreille, 1804

Genus *Dermestes* Linnaeus, 1758

Dermestes ater DeGeer, 1774

Material examined. (65 specimens) PERU, 10 (MEKRB), Ancash, Santa, Chimbote, 02-XI-1963, K. Raven leg.; 4 (MEKRB), on sea lion carcass, Ancash, Santa, Samanco, Vesique beach (09°12'30.04"S 78°29'04.32"W), 27-II-2018, A. Giraldo & R. Gasani leg.; 9 (MEKRB), Ica, Chincha, Chincha, 11-VII-1993, F. Cazorla leg.; 1 (MEKRB), Lambayeque, Chiclayo, cerro Reque (06°51'18.00"S 79°47'38.39"W, 36 m), 09-VIII-2023, A. Giraldo leg.; 4 (MEKRB), Lima, Huarochiri, Santa Eulalia, 08-I-2022, H. Gamarra leg.; 1 (MUSM), Lima, Huaura, Lachay lomas, 16-X-1976, R. Garcia leg.; 1 (MUSM), Lima, Lima, V-1957, F. Blancas leg.; 1 (MUSM), Lima, Lima, VIII-1957, F. Blancas leg.; 12 (MEKRB), Lima, Lima, 05-I-1964, Aranda leg.; 1 (MEKRB), Lima, Lima, 16-VI-1968, Millones leg.; 2 (SENASA), Lima, Lima, 15-XI-1968,

M. Delgado leg.; 2 (SENASA), Lima, Lima, 15-II-1974, L. Castillo leg.; 5 (MEKRB), Lima, Lima, 15-X-1977, H. Blancas leg.; 2 (MEKRB), Lima, Lima, 13-VI-1981, R. Ortiz leg.; 1 (MEKRB), Lima, Lima, La Molina, 26-V-1968, Del Valle leg.; 4 (MEKRB), Lima, Lima, La Molina, 09-X-1977, J. Alcazar leg.; 4 (MEKRB), on domestic pigeon carcass, Lima, Lima, Los Olivos (11°56'31.20"S 77°04'15.59"W, 75 m), 01-25-I-2024, A. Giraldo leg.; 1 (MEKRB), Lima, Lima, Surco, 27-IV-1995, C. Vergara leg.

Distribution. Cosmopolitan. PERU. Ancash (Santa), Ica (Chincha), Lambayeque (Chiclayo), Lima (Huaral, Huarochiri, Huaura, Lima), Piura (Paita, Piura) (Peceros, 2011; Andrade & Háva, 2018; Andrade et al., 2018; Juárez & González, 2019; Saavedra et al., 2019; Lázaro, 2021; Jaime, 2023). In coastal desert and dry forests (Fig. 1B).

Dermestes frischii Kugelann, 1792

Material examined. (63 specimens) PERU, 2 (MEKRB), on sea lion carcass, Ancash, Santa, Samanco, Vesique beach (09°12'30.04"S 78°29'04.32"W), 27-II-2018, A. Giraldo & R. Gasani leg.; 1 (MEKRB), Cajamarca, Cutervo, Cutervo (2700 m), 04-XI-2001, J. Llontop leg.; 22 (MEKRB), Callao, 03-I-1995, L. Arroyo leg.; 4 (MEKRB), on ray carcass, Ica, Chincha, Qala beach (13°21'39.60"S 76°13'08.39"W, 17 m), 18-II-2022, A. Giraldo leg.; 1 (MUSM), on coastal desert, direct searching, Ica, Nasca, Marcona (15°20'47.5"S 75°07'27.1"W, 58 m), 19-III-2019, I. Galindo leg.; 1 (MUSM), Ica, Palpa, Changuillo, Coyungo, Puerto Caballa (14°56'29.7"S 75°29'04.3"W, 0 m), 02-IV-2010, D. Silva & M. Vilchez leg.; 2 (MEKRB), on sea lion carcass, Ica, Pisco, Paracas, Lagunillas beach (13°53'49.20"S 76°18'50.39"W, 17 m), 19-II-2022, A. Giraldo leg.; 2 (MUSM), Ica, Pisco San Gallán island (13°50'31.20"S 76°27'03.59"W), 24-VIII-1999; 2 (MEKRB), on seabird remains, Ica, Pisco, San Andrés (13°43'15.47"S 76°13'18.79"W), III-2014, A. Giraldo leg.; 3 (MEKRB), on sea lion carcass, Lambayeque, Chiclayo, Pimentel, Pimentel beach (06°50'28.82"S 79°56'15.53"W), 20-IX-2018, A. Giraldo leg.; 5 (MUSM), on pitfall trap (rotten squid), Lima, Canta, left bank of Chillon river, near to Chaperito bridge (11°29'17.7"S 76°38'58.7"W, 2357 m), 11-V-16-VII-2006, M. Dieguez & A. Asenjo leg.; 1 (MEKRB), on Humboldt penguin carcass, Lima, Huaura, Huacho (11°06'25"S 77°37'04"W), 10-VIII-2018, A. Giraldo leg.; 2 (MEKRB), on pitfall trap (rotten flaked tuna), Lima, Huaura, Lachay lomas (11°21'28.80"S 77°22'08.39"W), 25-V-2018, A. Giraldo leg.; 1 (MEKRB), Lima, Huaura, Vegueta, Don Martin island, 27-X-2016, J. Figueroa leg.; 1 (MUSM), Lima, Lima, 19-V-1971, C. Luna Victoria leg.; 2 (MEKRB), Lima, Lima, La Molina, 19-XI-2006, H. Velasquez leg.; 1 (MEKRB), Lima, Lima, La Molina, 26-XII-2006, A. Camargo leg.; 1 (MEKRB), Lima, Lima, San Juan de Miraflores, Villa Jardín, 14-III-1994, S. Rondon leg.; 2 (MUSM), on sea lion carcass, Lima, Lima, Villa El Salvador, Venecia beach (12°14'31"S 76°56'44"W, 2 m), 13-II-2013, S. Pizarro leg.; 1 (MEKRB), on garbage dump, Moquegua, Mariscal Nieto, near to Cerro baúl archaeological site (17°06'46.79"S 70°50'27.59"W, 2030 m), 24-II-2022, A. Giraldo leg.; 6 (SENASA), Ilo, Ilo, 05-IV-2005, W. Diaz leg.

Distribution. Cosmopolitan. PERU. Ancash (Santa), Cajamarca (Cutervo), Callao, Ica (Chincha, Nasca, Palpa, Pisco), La Libertad (Trujillo), Lambayeque (Chiclayo), Lima (Canta, Huarochiri, Huaura, Lima), Moquegua (Mariscal Nieto), Piura (Paita, Piura), Tacna (Tacna) (Ciro et al., 2008; Peceros, 2011; Ginés et al., 2015; Sarmiento & Padilla, 2015; Murrugarra, 2016; Villanueva, 2016; Andrade & Háva, 2018; Andrade et al., 2018; Juárez & González, 2019; Saavedra et al., 2019; Lázaro, 2021; Chamochumbi et al., 2022; Esquiagola, 2022; Iannacone et al., 2023; Jaime, 2023). In coastal deserts, dry forests, and Andean foothills (Fig. 1B).

Dermestes maculatus De Geer, 1774

Material examined. (269 specimens) PERU, 4 (SENASA), Ancash, Santa, 06-IX-1963, Salinas leg.; 10 (MEKRB), Ancash, Santa, Chimbote, 02-XI-1963, K. Raven leg.; 2 (MEKRB), Arequipa, Arequipa, 03-X-1996, M. Guzman leg.; 1 (MEKRB), Arequipa, Arequipa, 28-IX-2012, L. Cruz leg.; 1 (MUSM), Ayacucho, Huamanga, Ayacucho, IV-1969; 1 (MUSM), Cajamarca, Cajamarca 06-XI-1975, E. Angeles leg.; 3 (MEKRB), 4 (SENASA), Callao, 15-XI-1963, M. Delgado leg.; 4 (MUSM), Callao, 30-VIII-1964, M. Delgado leg.; 2 (MUSM), Callao, 03-I-1995, L. Arroyo leg.; 1 (MUSM), Callao, La Punta, 30-IX-1968, L. Campos leg.; 1 (MUSM), Callao, La Punta, 11-X-1968, L. Campos leg.; 1 (MUSM), Callao, La Punta, 14-X-1968, L.

Campos leg.; 12 (MEKRB), Ica, Chincha, Chincha, 11-VII-1993, F. Cazorla leg.; 4 (MUSM), Ica, Pisco, Pisco beach, 03-VII-1963, R. Garcia leg.; 6 (MUSM), Lima, Huarochiri, Santa Eulalia, 04-III-1965, R. Garcia leg.; 1 (MUSM), Lima, Huaura, La Cruz island, 15-IX-1950, F. Blancas leg.; 6 (MUSM), Lima, Lima, 14-X-1947, F. Blancas leg.; 4 (MUSM), Lima, Lima, V-1957, F. Blancas leg.; 5 (MUSM), Lima, Lima, VIII-1957, F. Blancas leg.; 1 (MUSM), Lima, Lima, 23-XI-1957, F. Blancas leg.; 7 (SENASA), Lima, Lima, 11-IV-1962, Lung leg.; 2 (MEKRB), 1 (SENASA), Lima, Lima, 03-IX-1962, Lung leg.; 10 (SENASA), Lima, Lima, 24-X-1963, M. Delgado leg.; 20 (MEKRB), Lima, Lima, 05-I-1964, Aranda leg.; 8 (MEKRB), Lima, Lima, IV-1965, Cisneros leg.; 2 (MEKRB), Lima, Lima, 18-VI-1965, Korytkowski leg.; 2 (MEKRB), Lima, Lima, 02-VII-1968, A. Almestar leg.; 1 (MEKRB), Lima, Lima, 10-VII-1968, O. Velarde leg.; 5 (MEKRB), Lima, Lima, 12-VIII-1968, E. Almonte leg.; 2 (SENASA), Lima, Lima, IX-1968, E. Almonte leg.; 6 (SENASA), Lima, Lima, 27-XII-1969, M. Delgado leg.; 4 (SENASA), Lima, Lima, 1971; 2 (SENASA), Lima, Lima, 16-X-1971, F. Velazco leg.; 1 (SENASA), Lima, Lima, 21-IX-1972, J. Grundy leg.; 7 (SENASA), Lima, Lima, 25-IX-1972, J. Grundy leg.; 4 (SENASA), Lima, Lima, 15-II-1974, L. Castillo leg.; 2 (MEKRB), Lima, Lima, 24-VII-1974, M. Buitrón leg.; 1 (MEKRB), Lima, Lima, 19-VIII-1974, M. Buitrón leg.; 1 (MUSM), Lima, Lima, 13-II-1976, M. Galvez leg.; 7 (MEKRB), Lima, Lima, 09-XI-1976, D. Ojeda leg.; 1 (MEKRB), Lima, Lima, 12-VII-1980, R. Marin leg.; 2 (MEKRB), Lima, Lima, 15-XI-1999, E. Ormachea leg.; 9 (MUSM), Lima, Lima, Agua Dulce, 20-II-1967, L. Campos leg.; 7 (MUSM), Lima, Lima, Barranco, 22-IV-1968, L. Campos leg.; 2 (MUSM), Lima, Lima, Barranco, 30-IV-1968, L. Campos leg.; 1 (MUSM), Lima, Lima, Barranco, 08-V-1968, L. Campos leg.; 6 (MUSM), Lima, Lima, Chosica; 1 (MEKRB), Lima, Lima, Cieneguilla, 20-X-1977, M. Martinez leg.; 1 (MUSM), Lima, Lima, La Herradura beach, 05-II-1969, L. Campos leg.; 3 (MEKRB), Lima, Lima, La Molina, 18-V-1968, Del Valle leg.; 2 (MEKRB), Lima, Lima, La Molina, 06-VIII-1973; 1 (MEKRB), Lima, Lima, La Molina, 06-XI-1977, N. Martinez leg.; 1 (MEKRB), Lima, Lima, La Molina, 20-XI-1977, N. Martinez leg.; 2 (MEKRB), Lima, Lima, La Molina, 05-X-1980, R. Marin leg.; 1 (MEKRB), Lima, Lima, La Molina, 02-XI-1980, R. Marin leg.; 1 (MEKRB), Lima, Lima, La Molina, 19-IX-1987, G. Hospina leg.; 1 (MEKRB), Lima, Lima, La Molina, 23-IV-1991, J. Anteparra leg.; 1 (MEKRB), Lima, Lima, La Molina, 20-V-1991, R. Rodriguez leg.; 1 (MEKRB), Lima, Lima, La Molina, 22-VI-1991, J. Iannacone leg.; 1 (MEKRB), Lima, Lima, La Molina, 24-X-1991, E. Lujan leg.; 5 (MEKRB), Lima, Lima, La Molina, 26-X-1992, R. Beingolea leg.; 1 (MEKRB), Lima, Lima, La Molina, 07-VIII-1993, J. Donet leg.; 2 (MEKRB), Lima, Lima, La Molina, 13-II-1996, R. Castillo leg.; 9 (MEKRB), Lima, Lima, La Molina, 26-V-1996, J. Nina leg.; 2 (MEKRB), Lima, Lima, La Molina, 22-VI-1996, A. Guerra leg.; 3 (MUSM), Lima, Lima, La Molina, 28-IX-1996, A. Jeri leg.; 1 (MEKRB), Lima, Lima, La Molina, 13-XI-1996, R. Castillo leg.; 5 (MEKRB), Lima, Lima, La Molina, 26-XI-1996, R. Marin leg.; 2 (MEKRB), Lima, Lima, La Molina, 15-V-2004, H. Velasquez leg.; 1 (MEKRB), Lima, Lima, La Molina, 03-VII-2004, C. Vega leg.; 6 (MEKRB), on pitfall trap (rotten fish), Lima, Lima, Los Olivos (11°56'31.20"S 77°04'15.59"W, 75 m), 05-IV-2012, A. Giraldo leg.; 1 (MEKRB), on rat carcass, Lima, Lima, Los Olivos (11°56'31.20"S 77°04'15.59"W, 75 m), 21-IV-2022, A. Giraldo leg.; 3 (MEKRB), on domestic pigeon carcass, Lima, Lima, Los Olivos (11°56'31.20"S 77°04'15.59"W, 75 m), 01-25-I-2024, A. Giraldo leg.; 2 (MEKRB), on pitfall trap (rotten squid), Lima, Lima, Los Olivos (11°56'31.20"S 77°04'15.59"W, 75 m), 09-III-2024, A. Giraldo leg.; 4 (MUSM), Lima, Lima, Lurin, 18-XII-1968, L. Campos leg.; 1 (MEKRB), Lima, Lima, Lurin, 20-III-1973; 1 (MUSM), Lima, Lima, Lurin, 18-II-1975, R. Garcia leg.; 1 (MEKRB), Lima, Lima, UNMSM campus, 06-X-2012, J. Miñano leg.; 1 (MEKRB), Lima, Lima, Vitarte, 04-VI-1964, A. Martinez leg.; 3 (SENASA), Loreto, Maynas, 25-VIII-1964, C. Olivares leg.; 1 (MEKRB), Puno, Puno, 26-IV-1971.

Distribution. Cosmopolitan. PERU. Ancash (Santa), Arequipa (Arequipa), Ayacucho (Huamanga), Cajamarca (Cajamarca), Callao, Huanuco (Huanuco), Ica (Chincha, Pisco), La Libertad (Sanchez Carrion, Trujillo), Lambayeque (Chiclayo), Lima (Huarochiri, Huaura, Lima), Loreto (Maynas), Piura (Paita, Piura), Puno (Puno), Tacna (Tacna) (Murphy, 1925; Koepcke & Koepcke, 1952; Iannacone, 2003; Peceros, 2011; Ginés et al., 2015; Murrugarra, 2016; Villanueva & Seclen, 2016; Villanueva, 2016; Oré, 2017; Andrade & Háva, 2018; Andrade et al., 2018; Medina et al., 2018; Juárez & González, 2019; Pizango et al., 2019; Saavedra et al., 2019; Torres, 2020; Lázaro, 2021; Briceño et al., 2022; Esquiagola, 2022; Iannacone et al., 2023; Jaime, 2023). In coastal deserts, dry forest, Andean foothills, Andean highlands, montane forests, and tropical rainforests (Fig. 1C).

Dermestes peruvianus Laporte, 1840

Material examined. (22 specimens) PERU, 1 (SENASA), Arequipa, Arequipa, IV-1959, Sanchez Aguirre leg.; 1 (MUSM), Ica, Pisco, Pisco beach, 03-VII-1963, R. Garcia leg.; 4 (MEKRB), on sea lion carcass, Ica, Pisco, Paracas, Lagunillas beach (13°53'49.20"S 76°18'50.39"W, 17 m), 19-II-2022, A. Giraldo leg.; 1 (MEKRB), Ica, Pisco, San Gallán island, VI-2002, L. Alza leg.; 5 (MEKRB), Junin, Huancayo, Huancayo, 15-I-1977, M. Palacios leg.; 6 (MEKRB), Junin, Huancayo, Huancayo, 28-XII-1977, J. Alcazar leg.; 2 (MUSM), Lima, Huaura, Don Martin island, 20-IV-1965, M. Peña leg.; 2 (MEKRB), Lima, Lima, La Molina, 12-VII-1979, E. Vasquez leg.

Distribution. Cosmopolitan. PERU. Arequipa (Arequipa), Ica (Chincha, Pisco), Junin (Huancayo), La Libertad (Trujillo), Lima (Huaura, Lima), Piura (Ayabaca, Huancabamba) (Murphy, 1925; Villanueva, 2016; Juárez & González, 2018, 2019, 2021; Lázaro, 2021; Iannacone et al., 2023). In coastal desert and Andean foothills (Fig. 1C).

Family Histeridae Gyllenhal, 1808

Subfamily Saprininae Blanchard, 1845

Genus *Euspilotus* Lewis, 1907

Euspilotus ater Arriagada, 2015

Material examined. (52 specimens) PERU, 1 (MEKRB), Ancash, Huaraz, Huaraz, U. Mayolo leg. [G. Arriagada det.]; 1 (MEKRB), Ancash, Huaylas, Caraz (2256 m), 12-VI-2004, R. Rodríguez leg. [G. Arriagada det.]; 1 (MUSM), on pitfall trap (rotten squid), Lima, Huarochiri, 5 km E of Matucana (2545 m), 12-III-30-IV-2006, V. M. Diéguez leg. [G. Arriagada det.]; 2 (MEKRB), 2 (MUSM), on pitfall trap (rotten chicken gizzards), Lima, Huarochiri, Matucana (2380 m), 08-IV-08-V-2004, V. M. Diéguez leg. [G. Arriagada det.]; 18 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 18-24-VI-2013, L. Grados leg.; 13 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 27-30-VI-2013, L. Grados leg.; 2 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 03-VII-2013, L. Grados leg.; 9 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 22-26-I-2014, L. Grados leg.; 3 (MEKRB), on pitfall trap (rotten flaked tuna), Tacna, Tarata, Tarata near to Mirador La Apacheta (17°33'35.99"S 70°01'48.00"W, 3460 m), 22-II-2022, A. Giraldo leg.

Distribution. Argentina, Chile. PERU: Ancash (Corongo, Huaraz, Huaylas), Lima (Canta, Huarochiri, Lima), Tacna (Tarata) (Grados, 2014; Arriagada, 2015). In coastal desert and Andean foothills (Fig. 1D).

Euspilotus azureus Sahlberg, 1823

Material examined. (69 specimens) PERU, 1 (MUSM), Amazonas, Bagua, Achaguay Alto (05°35'23.99"S 78°30'10.80"W, 688 m) [G. Arriagada det.]; 15 (MUSM), Ayacucho, Huamanga, Ayacucho (13°09'25.20"S 74°12'35.99"W, 2760 m) [G. Arriagada det.]; 2 (MUSM), Cusco, La Convención, CC Timpia (12°07'19.19"S 72°49'22.79"W, 445 m) [G. Arriagada det.]; 28 (MEKRB), Junin, Chanchamayo, San Ramon, 07-V-2015, J. Huanca leg.; 4 (MEKRB), Lima, Lima, La Molina, 09-X-1977, J. Alcázar leg.; 2 (MEKRB), Lima, Lima, La Molina, 15-X-1977, H. Blancas leg.; 1 (MEKRB), Lima, Lima, La Molina, 22-X-1977, M. Palacios leg.; 1 (MEKRB), Lima, Lima, La Molina, 12-VIII-1980, R. Marín leg.; 4 (MEKRB), Lima, Lima, La Molina, 15-XI-1980, F. Wong leg.; 1 (MEKRB), Lima, Lima, La Molina, 15-IV-1991, L. Gonzáles leg.; 1 (MEKRB), on pitfall trap (rotten flaked tuna), Lima, Lima, San Diego, Chillón river (11°56'12.34"S 77° 04'59.05"W), 06-23-XI-2023, A. Giraldo leg.; 7 (MEKRB), Pasco, Oxapampa, Palcazú, 06-V-2015, J. Huanca leg.; 1 (MUSM), San Martín, Moyobamba, Fundo Pabloyacu (06°04'04.79"S 76°56'38.40"W, 1061 m) [G. Arriagada det.]; 1 (MUSM), San Martín, Rioja, Yuracyacu (05°57'07.19"S 77°11'13.19"W, 805 m) [G. Arriagada det.].

Distribution. Central and South America. PERU. Amazonas (Bagua), Ayacucho (Huamanga), Cusco (La Convencion, Paucartambo), Huanuco (Huanuco), Junin (Chanchamayo, Satipo), Lima (Lima), Pasco (Oxapampa), San Martin (Moyobamba, Rioja) (Degallier, 1981; Arriagada, 2015; Torres, 2020). In coastal deserts, Andean foothills, montane forests, and tropical rainforests (Fig. 1D).

Euspilotus decoratus (Erichson, 1834)

Material examined. (181 specimens) PERU, 1 (MEKRB), Arequipa, Caylloma, Majes (16°14'23.99"S 72°14'09.60"W, 1420 m); 1 (MUSM), Arequipa, Islay, Mollendo (17°01'15.60"S 72°01'01.19"W, 69 m) [G. Arriagada det.]; 1 (MEKRB), Ica, Ica, 22-X-1991, Aleman leg.; 1 (MEKRB), Ica, Pisco, Paracas PFLGN (13°44'52.79"S 76°13'40.79"W), IV-2011, A. Giraldo leg.; 4 (MUSM), Ica, Pisco, Pisco beach (13°42'46.79"S 76°13'15.60"W, 10 m) [G. Arriagada det.]; 1 (MEKRB), La Libertad, Gran Chimú, Cascas, 24-XII-1971, C. Luna Victoria leg.; 2 (MEKRB), La Libertad, Trujillo, Trujillo, 04-VIII-1973, E. Carbonell leg.; 10 (MEKRB), Lima, Lima, 10-XII-1963, K. Raven leg.; 1 (MEKRB), Lima, Lima, 22-XI-1965, S. Román leg.; 5 (MEKRB), Lima, Lima, 27-IV-1968, L. del Valle leg.; 4 (MEKRB), Lima, Lima, 18-VI-1968, W. Dale leg.; 1 (MEKRB), Lima, Lima, 13-VII-1974, M. Buitrón leg.; 3 (MEKRB), Lima, Lima, 27-VII-1975, M. Buitrón leg.; 1 (SENASA), Lima, Lima, 11-V-1977, H. Picho leg.; 1 (MEKRB), Lima, Lima, 5-X-1977, H. Blancas leg.; 1 (MEKRB), Lima, Lima, 12-III-1978, M. Ortiz leg.; 3 (MEKRB), Lima, Lima, 12-VIII-1980, R. Marin leg.; 4 (MEKRB), Lima, Lima, 15-IV-1981, C. Calderon leg.; 1 (MEKRB), 7 (MUSM), 1 (SENASA), Lima, Lima, 24-IV-1981, R. Ortiz leg. [G. Arriagada det.]; 10 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 15-19-VI-2013, L. Grados leg.; 16 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 22-30-VI-2013, L. Grados leg.; 11 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 01-08-VII-2013, L. Grados leg.; 23 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 12-30-VII-2013, L. Grados leg.; 5 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 01-28-VIII-2013, L. Grados leg.; 26 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 21-31-I-2014, L. Grados leg.; 4 (MUSM), Lima, Lima, Barranco (12°08'24.00"S 77°01'22.79"W, 20 m) [G. Arriagada det.]; 2 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa (12°13'01.20"S 76°59'13.19"W), 15-II-2007, Y. Murrugarra leg.; 1 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa (12°13'01.20"S 76°59'13.19"W), 14-XI-2007, Y. Murrugarra leg.; 1 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa (12°13'01.20"S 76°59'13.19"W), 02-I-2008, Y. Murrugarra leg.; 1 (MEKRB), Lima, Lima, Cieneguilla, 10-X-1995, F. Mamani leg.; 3 (MUSM), Lima, Lima, La Herradura beach (12°10'30"S 77°02'02.40"W, 10 m) [G. Arriagada det.]; 1 (MEKRB), Lima, Lima, La Molina, 16-IV-1968, del Valle leg.; 4 (MEKRB), Lima, Lima, La Molina, 17-XII-1974, F. Hinostroza leg.; 1 (MEKRB), Lima, Lima, La Molina, 10-III-1977, N. Martínez leg.; 4 (MEKRB), Lima, Lima, La Molina, 09-X-1977, J. Alcázar leg.; 3 (MEKRB), Lima, Lima, La Molina, 22-X-1977, M. Palacios leg.; 1 (MEKRB), Lima, Lima, La Molina, 07-IX-1989, G. Hospina leg.; 1 (MEKRB), Lima, Lima, La Molina, 20-II-1990, A. Ramos leg.; 1 (MEKRB), Lima, Lima, La Molina, 09-XII-1992, E. Echegaray leg.; 2 (MEKRB), Lima, Lima, La Molina, 07-VIII-1993, J. Donet leg.; 1 (MEKRB), Lima, Lima, La Molina, 13-I-1996, D. Fonseca leg.; 1 (MEKRB), Lima, Lima, La Molina, 10-XII-1996, C. Maihuay leg.; 1 (MEKRB), on pitfall trap (rotten squid), Lima, Lima, Los Olivos (11°56'31.20"S 77°04'15.59"W, 75 m), 09-III-2024, A. Giraldo leg.; 2 (MUSM), Lima, Lima, San Miguel (12°10'30"S 77°02'02.40"W, 45 m) [G. Arriagada det.]; 1 (MEKRB), Tacna, Tacna, La Yarada, Los Palos beach (18°11'59.99"S 70°32'09.60"W, 60 m), Y. Callohuari leg.

Distribution. Chile. PERU. Arequipa (Caylloma, Islay), Ica (Chincha, Ica, Pisco), La Libertad (Gran Chimu, Trujillo), Lambayeque (Chiclayo), Lima (Huarochiri, Lima), Tacna (Tacna) (Peceros, 2011; Grados, 2014; Ginés et al., 2015; Murrugarra, 2016; Villanueva, 2016; Medina et al. 2018; Lázaro, 2021; Esquiagola, 2022; Iannacone et al., 2023). In coastal desert (Fig. 1E).

Euspilotus lepidus (Erichson, 1847)

Material examined. (9 specimens) PERU, 1 (MUSM), Apurimac, Abancay, Tamburco (13°53'16.79"S 73°03'25.20"W, 4049 m) [G. Arriagada det.]; 1 (MUSM), Apurimac, Aymaraes, Chapimarca (13°59'49.19"S 73°09'32.40"W, 2896 m) [G. Arriagada det.]; 1 (MUSM), Ayacucho, Huamanga, Ayacucho (13°09'25.20"S 74°12'35.99"W, 2760 m) [G. Arriagada det.]; 1 (MUSM), Ayacucho, Lucanas, Chaviña (14°54'28.79"S 73°53'56.40"W, 4000 m) [G. Arriagada det.]; (Arriagada com pers.), Cusco, Cusco, San Jerónimo, Pacchayoc (13°34'58.80"S 72°03'39.60"W, 3850 m); 1 (MEKRB), Cusco, Urubamba, Ollantaytambo, Piscacucho (13°12'50.40"S 72°22'58.79"W, 2715 m); (Arriagada com pers.), Lima, Canta, Canta (11°29'16.79"S 76°39'0.0"W, 2357 m); 1 (SENASA), Puno, Puno, 07-V-2004, D. Cotrado leg.; 2 (MEKRB), on pitfall trap (rotten flaked tuna), Tacna, Tarata, near to Ticaco (17°26'31.20"S 69°58'51.59"W, 3921 m), 23-II-2022, A. Giraldo leg.; 1 (MEKRB), on pitfall trap (rotten flaked tuna), Tacna, Tarata, near to Mirador La Apacheta (17°33'35.99"S 70°01'48.0"W, 3460 m), 22-II-2022, A. Giraldo leg.

Distribution. Argentina, Bolivia, Chile. PERU. Apurimac (Abancay, Aymaraes), Ayacucho (Huamanga, Lucanas), Cusco (Cusco, Quispicanchi, Urubamba), Lima (Canta), Puno (Puno), Tacna (Tarata) (Lewis, 1904; Rossi et al., 2018; Infante, 2021). In Andean foothills and Andean highlands (Fig. 1E).

Genus *Saprinus* Erichson, 1834

Saprinus caerulescens (Hoffmann, 1803)

Material examined. (106 specimens) PERU, 12 (SENASA), Ancash, Santa, 10-X-1979, L. Chang leg. [A. Tishechkin det.]; 4 (MEKRB), Arequipa, Caylloma, Majes (1420 m), 02-VII-2015, L. Linares leg.; 4 (MEKRB), Arequipa, Caylloma, Majes (1420 m), 03-VII-2015, L. Linares leg.; 2 (MEKRB), Arequipa, Caylloma, Majes (1420 m), 20-VII-2015, L. Linares leg.; 2 (MEKRB), Arequipa, Islay, Mollendo, 26-XII-1996, O. Morón leg.; 1 (MEKRB), Huánuco, Leoncio Prado, Tingo María, 29-V-1999, L. Gil leg.; 1 (MEKRB), on ray carcass, Ica, Chincha, Qala beach (13°21'39.60"S 76°13'08.39"W, 17 m), 18-II-2022, A. Giraldo leg.; 1 (MUSM), on coastal desert, direct searching, Ica Nasca, Marcona (15°20'47.5"S 75°07'27.1"W, 58 m), 19-III-2019, I. Galindo leg. [G. Arriagada det.]; 4 (MUSM), Ica, Pisco, Paracas (20 m) [G. Arriagada det.]; 1 (MEKRB), Junín, Chanchamayo La Merced 18-VIII-2012, J. Miñano leg.; 4 (MUSM), Lambayeque, Chiclayo, Santa Rosa (06°52'33.60"S 79°55'37.20"W, 10 m) [G. Arriagada det.]; 2 (MEKRB), on sea lion carcass, Lambayeque, Chiclayo, Pimentel, Pimentel beach (06°50'28.82"S 79°56'15.53"W), 20-IX-2018, A. Giraldo leg.; 1 (MEKRB), Lima, Cañete, 15-IV-2006, R. Capcha leg.; 1 (MEKRB), Huaral, Huaral, V-2008, L. Medina leg.; 18 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 15-30-VI-2013, L. Grados leg.; 5 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 01-04-VII-2013, L. Grados leg.; 2 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 12-15-VII-2013, L. Grados leg.; 1 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 30-VII-2013, L. Grados leg.; 9 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 21-25-I-2014, L. Grados leg.; 3 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa (12°13'01.20"S 76°59'13.19"W), 15-II-2007, Y. Murrugarra leg.; 1 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa (12°13'01.20"S 76°59'13.19"W), 29-VI-2007, Y. Murrugarra leg.; 1 (MEKRB), Lima, Lima, Cieneguilla, 10-X-1995, M. Mamani leg.; 1 (MEKRB), Lima, Lima, La Molina, 06-I-1982, Madrid leg.; 1 (MEKRB), Lima, Lima, La Molina, 23-IV-1991, J. Anteparra leg.; 1 (MEKRB), Lima, Lima, La Molina, 02-V-1991, R. Rodriguez leg.; 1 (MEKRB), Lima, Lima, La Molina, 15-VII-1991, J. Iannacone leg.; 1 (MEKRB), Lima, Lima, La Molina, 24-X-1991, E. Luján leg.; 1 (MEKRB), Lima, Lima, La Molina, 24-X-1992, R. Beingolea leg.; 2 (MEKRB), Lima, Lima, La Molina, 15-VI-1996, A. Jeri leg.; 1 (MEKRB), Lima, Lima, La Molina, 18-VIII-1996, M. Castillo leg.; 3 (MEKRB), Lima, Lima, La Molina, 18-IX-1996, R. Castillo leg.; 2 (MEKRB), Lima, Lima, La Molina, 27-IX-1996, A. Guerra leg.; 2 (MEKRB), Lima, Lima, La Molina, 13-XI-1996, W. Catalán leg.; 4 (MEKRB), Lima, Lima, La Molina, 10-XII-1996, M. Narrea leg.; 2 (MEKRB), Lima, Lima, La Molina, 20-XII-1996, R. Lázaro leg.; 2 (MEKRB), Lima, Lima, La Molina, 24-XII-1996, M. Narrea leg.; 1 (MEKRB), Lima, Lima, La Molina, 18-XII-1998, G. Tejada leg.; 1 (MEKRB), Lima, Lima, La Molina, 08-XI-2002, M. Chávez leg.; 1 (MEKRB), Lima, Lima, La Molina, VI-2008, L. Medina leg.; 1 (MEKRB), Lima, Lima, La Molina, 03-II-2009, M. Rivera leg.

Distribution. Palearctic, including the Azores and Cape Verde islands (native). PERU (introduced), Ancash (Santa), Arequipa (Caylloma, Islay), Ayacucho (Huamanga), Huanuco (Leoncio Prado), Ica (Chincha, Nasca, Pisco), Junin (Chanchamayo), La Libertad (Trujillo), Lambayeque (Chiclayo), Lima (Cañete, Huaral, Huarochiri, Huaura, Lima), Piura (Piura), Tacna (Tacna) (Arriagada, 1987; Giraldo-Mendoza, 2002; Peceros, 2011; Grados, 2014; Ginés et al., 2015; Villanueva & Seclen, 2016; Villanueva, 2016; Oré, 2017; Andrade et al., 2018; Medina et al., 2018; Lázaro, 2021; Chamochumbi et al., 2022; Esquiagola, 2022; Iannacone et al., 2023; Jaime, 2023). In coastal deserts, dry forests, Andean foothills, and montane forests (Fig. 1F).

Genus *Xerosaprinus* Wenzel, 1962

Xerosaprinus chiliensis (Marseul, 1855)

Material examined. (19 specimens) PERU, 3 (MUSM), Ica, Pisco, Paracas (13°44'52.79"S 76°13'40.79"W, 10 m) [G. Arriagada det.]; 1 (MEKRB), on pitfall trap, Ica, Pisco, Paracas, PFLGN, IV-2011, A. Giraldo leg.; 1 (MEKRB), on sea lion carcass, Lambayeque, Chiclayo, Pimentel, Pimentel beach (06°50'28.82"S

79°56'15.53"W), 20-IX-2018, A. Giraldo leg.; 4 (MUSM), Lima, Huaura, Don Martín island (11°01'11.99"S 77°40'12"W, 10 m) [G. Arriagada det.]; 1 (MEKRB), on pitfall trap (rotten flaked tuna), Lima, Huaura, Lachay lomas (11°21'28.80"S 77°22'08.39"W, 400 m), 25-V-2018, A. Giraldo leg.; 1 (MEKRB), Lima, Lima 18-VI-1968, W. Dale leg.; 1 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 02-VII-2013, L. Grados leg.; 1 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 28-VIII-2013, L. Grados leg.; 2 (MEKRB), on pig carcass, Lima, Lima, El Agustino, 24-I-2014, L. Grados leg.; 1 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa, 15-II-2007, Y. Murrugarra leg.; 1 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa, 07-XI-2007, Y. Murrugarra leg.; 2 (MEKRB), on pig carcass, Lima, Lima, Chorrillos, Pantanos de Villa, 12-XI-2007, Y. Murrugarra leg.

Distribution. Chile. PERU: Ica (Chincha, Pisco), La Libertad (Trujillo), Lambayeque (Chiclayo), Lima (Huaura, Lima) (Arriagada, 1985; Grados, 2014; Murrugarra, 2016; Medina et al., 2018). In the coastal desert (Fig. 1F).

Family Staphylinidae Latreille, 1802

Subfamily Silphinae Latreille, 1807

Genus *Oxelytrum* Gistel, 1848

Oxelytrum anticola (Guérin-Méneville, 1855)

Material examined. (27 specimens) PERU, 1 (UNASAM), Ancash, Carhuaz, Carhuaz (2638 m); 1 (UNASAM), Ancash, Carhuaz, Marcara (2726 m); 1 (UNASAM), Ancash, Huaraz, Huaraz (3052 m); 1 (UNASAM), Ancash, Huari, Pontó (2700 m); 1 (UNASAM), Ancash, Yungay, Mancos, Tingua (2575 m); 2 (UNASAM), Ancash, Yungay, Tumpa (3006 m); 4 (MUSM), on sheep carcass, Ayacucho, Lucanas, Puquio (14°40'51.59"S 74°03'39.60"W, 3841m), 21-I-2022, A. Giraldo leg.; 1 (MUSM), on sheep carcass, Ayacucho, Lucanas, Puquio (14°40'51.59"S 74°03'39.60"W, 3841m), 02-III-2022, A. Giraldo leg.; 1 (MUSM), Ayacucho, Sucre, Santiago de Paucaray (14°03'09.78"S 73°38'29.21"W, 3276 m), 09-XI-2021, E. Gamboa leg.; 4 (UNPRG), on cougar carcass, Cajamarca, Cajamarca, Namora, Fundo Santa María (07°12'32.39"S 78°21'10.79"W, 2967 m); 1 (MUSM), Cajamarca, San Miguel, Tongod (06°47'41.71"S 78°52'55.66"W, 3588 m), 07-V-2021, N. Zenteno leg.; 1 (MUSM), on pitfall trap, Ica, Palpa, Tibillo (14°04'24.87"S 75°13'35.06"W, 3187 m), 07-08-XI-2021, L. Ramírez leg.; 1 (MUSM), Junín, Huancayo, Pariahuanca (11°54'41.40"S 74°56'20.30"W, 3355 m), 23-VI-2019, E. Medina leg.; 2 (MUSM), on dog carcass, Puno, Puno, Pichacani, 1.3 km NE to Ayuncora (16°04'40.79"S 70°00'39.59"W, 3978 m), 24-II-2022, A. Giraldo leg.; 5 (MUSM), on pitfall trap (rotten flaked tuna), Tacna, Tarata, near to Ticaco (17°26'31.20"S 69°58'51.59"W, 3921 m), 23-II-2022, A. Giraldo leg.

Distribution. Bolivia, Ecuador. PERU. Ancash (Bolognesi, Carhuaz, Huaraz, Huari, Yungay), Apurimac (Aymaraes), Arequipa (Arequipa), Ayacucho (Huamanga, Lucanas, Sucre), Cajamarca (Cajamarca, San Miguel), Cusco (Canchis, Cusco), Ica (Palpa), Junin (Huancayo, Jauja), La Libertad (Bolivar, Sanchez Carrion), Lima (Huarochiri), Moquegua (Mariscal Nieto), Piura (Ayabaca, Huancabamba), Puno (Puno), Tacna (Candarave, Tarata) (Giraldo-Mendoza, 2016; Bustamante et al., 2017; Oré, 2017; Rossi et al., 2018; Infante, 2021; Juárez & González, 2019, 2021; Briceño et al., 2022). In Andean foothills and Andean highlands (Fig. 1G).

Oxelytrum cayennense (Sturm, 1826)

Material examined. Not available.

Distribution. South America. PERU. Cusco (La Convencion), Junin (Chanchamayo, Satipo), Loreto (Loreto, Maynas), Madre de Dios (Tambopata), Pasco (Oxapampa), Puno (Sandia), Ucayali (Coronel Portillo) (Giraldo-Mendoza, 2016; Bustamante et al., 2017; Pizango et al., 2019). In montane forests and tropical rainforests (Fig. 1G).

Oxelytrum discicolle (Brullé, 1840)

Material examined. (3 specimens) PERU, 3 (SENASA), Cajamarca, Cajamarca, 23-IX-1972, L. Arriaga leg.

Distribution. North, Central and South America. PERU. Amazonas (Bongara), Cajamarca (Cajamarca, Chota, Cutervo, Santa Cruz, San Marcos, San Miguel), Cusco (La Convencion, Paucartambo, Quispicanchi, Urubamba), Huanuco (Huanuco, Leoncio Prado), La Libertad (Otuzco), Lima (Cajatambo), Pasco (Oxapampa), Ucayali (Coronel Portillo, Padre Abad) (Giraldo-Mendoza, 2016; Bustamante et al., 2017; Torres, 2020). In Andean foothills and montane forest (Fig. 1H).

Subfamily Staphylininae Latreille, 1802

Genus *Creophilus* Leach, 1819

Creophilus maxillosus (Linnaeus, 1758)

Material examined. (17 specimens) PERU, 4 (UNPRG), on cougar carcass, Cajamarca, Cajamarca, Namora, Fundo Santa María (07°12'32.39"S 78°21'10.79"W, 2967 m); 1 (MUSM), Cusco, La Convención, Santa Teresa (13°07'45.98"S 72°35'38.86"W, 2736 m); 9 (MEKRB), Puno, Puno, 12-VIII-1996, M. Mamani leg.; 3 (ILLPA), Puno, Puno, 28-X-2003, P. Delgado leg.

Distribution. Palaearctic (native), South America (introduced). PERU. Ayacucho (Huamanga, Lucanas), Cajamarca (Cajamarca), Cusco (La Convencion), Huanuco (Huanuco), Junin (Huancayo), Lima (Canta, Huarochiri), Puno (Puno) (Asenjo & Clarke, 2007; Oré, 2017; Torres, 2020; Cortéz, 2021; Infante, 2021). In Andean foothills, Andean highlands, and montane forest (Fig. 1H).

Family Trogidae MacLeay, 1819

Genus *Omorgus* Erichson, 1847

Omorgus suberosus (Fabricius, 1775)

Material examined. (58 specimens) PERU, 1 (MEKRB), Huancavelica, Huancavelica, 17-XI-2006, Z. Cardenas leg.; 1 (MEKRB), Huanuco, Leoncio Prado, Tingo Maria, 17-IV-1999, L. Gil leg.; 2 (MEKRB), Huanuco, Leoncio Prado, Tingo Maria, 13-II-2000, D. Ruiz leg.; 1 (MEKRB), Ica, Chincha, Chincha, 20-IV-2002, D. Luque leg.; 1 (MEKRB), Ica, Ica, 01-VI-2008, P. Bello leg.; 6 (MEKRB), La Libertad, Ascope, Cartavio, 1959, Riccini leg.; 1 (MEKRB), La Libertad, Ascope, Cartavio, II-1960, Montoya leg.; 2 (MEKRB), La Libertad, Trujillo, Moche, 11-VIII-1996, R. Castillo leg.; 1 (MEKRB), La Libertad, Trujillo, Trujillo, 15-V-1999, L. Gil leg.; 1 (MEKRB), La Libertad, Trujillo, Trujillo, 01-XI-2009, L. M. Cruces leg.; 2 (MEKRB), Lima, Cañete, San Vicente de Cañete, 11-I-1998, J. Herrera leg.; 2 (MEKRB), Lima, Lima, 15-XI-1964, Olivares leg.; 2 (MEKRB), Lima, Lima, 22-I-1965, Olivares leg.; 3 (MEKRB), Lima, Lima, 25-I-1965, K. Raven leg.; 2 (MEKRB), Lima, Lima, 15-II-1965, K. Raven leg.; 3 (MEKRB), Lima, Lima, 20-II-1965, K. Raven leg.; 1 (MEKRB), Lima, Lima, 20-IV-1965, K. Raven leg.; 1 (MEKRB), Lima, Lima, 14-II-1968, Del Valle leg.; 4 (MEKRB), Lima, Lima, 10-XII-1968, E. Almonte leg.; 2 (MEKRB), Lima, Lima, 04-I-1969, Del Valle leg.; 3 (SENASA), Lima, Lima, 13-III-1969, M. Delgado leg.; 1 (SENASA), Lima, Lima, 15-XII-1980, A. Decheco leg.; 1 (MEKRB), Lima, Lima, 07-I-1986, K. Raven leg.; 1 (MEKRB), Lima, Lima, La Molina, 27-II-1968, Del Valle leg.; 2 (MEKRB), Lima, Lima, La Molina, 06-X-1996, Mayhuay leg.; 1 (MEKRB), Lima, Lima, La Molina, 29-IX-1997, J. Vasquez leg.; 1 (MEKRB), Lima, Lima, La Molina, 15-X-1997, J. Vasquez leg.; 1 (MEKRB), Lima, Lima, La Molina, 24- II-2002, C. Ono leg.; 3 (MEKRB), Lima, Lima, La Molina, 22-II-2005, S. Mayta leg.; 1 (MEKRB), Lima, Lima, La Molina, 07-I-2006, W. Ojeda leg.; 1 (MEKRB), Lima, Lima, La Molina, 15-XI-2009, S. Santos leg.; 1 (MEKRB), Lima, Lima,Vitarte, 15-XII-2000, J. Hop leg.; 1 (MEKRB), Pasco, Oxapampa, Puerto Bermudez, 15-VII-2009, J. Garcia leg.; 1 (MEKRB), San Martin, San Martin, Tarapoto, 20-IX-1975, P. Aguilar leg.

Distribution. Africa, Asia, Australia, and Europe (introduced). North, Central, and South America (native). PERU. Amazonas (Bagua), Huancavelica (Huancavelica), Huanuco (Huanuco, Leoncio Prado), Ica (Chincha, Ica, Pisco), La Libertad (Ascope, Trujillo), Lima (Canta, Cañete, Huaura, Lima), Loreto (Maynas), Pasco (Oxapampa), Piura (Piura, Sullana), San Martin (San Martin), Tumbes (Tumbes) (Aguilar, 1976; Scholtz, 1990; Giraldo-Mendoza, 2002; Andrade et al., 2018; Costa-Silva et al., 2020; Torres, 2020). In coastal deserts, dry forests, Andean foothills, montane forests, and tropical rainforests (Fig. 1I).

Genus *Polynoncus* Burmeister, 1876

Polynoncus peruanus (Erichson, 1847)

Material examined. (23 specimens) PERU, 2 (MEKRB), on sheep carcass, Ayacucho, Lucanas, Puquio (14°40'51.59"S 74°03'39.60"W, 3841 m), 21-I-2022, A. Giraldo leg.; 1 (MEKRB), on garbage dump, Cusco, Canas, Langui, Langui Lake mirador (14°27'32.39"S 71°17'34.80"W, 4296 m), 28-II-2022, A. Giraldo leg.; 4 (MEKRB), on garbage dump, Huancavelica, Huaytará, near to Huaytará (13°38'13.20"S 75°22'30.00"W, 3778 m), 25-I-2022, A. Giraldo leg.; 6 (MEKRB), on wool remains, Puno, Chucuito, Juli, near to Sorapa (16°21'53.99"S 69°38'41.99"W, 3942 m), 14-I-2022, A. Giraldo leg.; 7 (MEKRB), on dog carcass, Puno, Puno, Pichacani, 1.3 km NE to Ayuncora (16°04'40.79"S 70°00'39.59"W, 3978 m), 24-II-2022, A. Giraldo leg.; 3 (MEKRB), on pitfall trap (rotten flaked tuna), Tacna, Tarata, near to Ticaco (17°26'31.20"S 69°58'51.59"W, 3921 m), 23-II-2022, A. Giraldo leg.

Distribution. Chile. PERU. Apurimac (Aymaraes, Grau), Ayacucho (Lucanas), Cusco (Canas, Cusco, Espinar), Huancavelica (Huaytara), Huanuco (Ambo), Junin (Jauja, Junin, Yauli), Puno (Chucuito, Puno, San Roman), Tacna (Tarata) (Scholtz, 1990; Infante, 2021; Costa-Silva et al., 2024). In Andean highlands (Fig. 1I).

DISCUSSION

Considering the distribution records presented in this work, some patterns can be recognized, assuming the Andes Mountains are a potential barrier to species dispersion. These patterns are the following: 1) *Dermestes ater*, *Euspilotus decoratus,* and *Xerosaprinus chiliensis* restricted to ecological regions west to Andes; 2) *Oxelytrum cayennense* restricted to ecological regions east to Andes; 3) *Euspilotus lepidus*, *Oxelytrum anticola* and *Polynoncus peruanus* restricted to Andean ecological regions; 4) *Dermestes frischii*, *Dermestes peruvianus* and *Euspilotus ater* extending from the Andean foothills towards the west; 5) *Creophilus maxillosus* and *Oxelytrum discicolle* extending from the Andean foothills towards the east; 6) *Necrobia ruficollis* in coastal desert and montane forests at both sides of Andes; 7) *Dermestes maculatus*, *Euspilotus azureus*, *Necrobia rufipes*, *Omorgus suberosus* and *Saprinus caerulescens* inhabiting between four to six distinct ecological regions at both sides of Andes. The distributions of the eighteen species discussed here could be wider in Peru since most of them have a high dispersal capacity and are able to inhabit human-modified environments. Also, a greater sampling effort would allow a better definition of these distributions. Although the information presented here was obtained through independent collection and research efforts, it is valuable and should be available for the other species previously listed by Giraldo-Mendoza (2021). In Peru, more comprehensive studies are needed to determine the biological cycle of species, the abundance and frequency of species in specific localities, and the distribution of species assemblages along altitudinal or anthropogenic disturbance gradients. According to broad thematic reviews published in recent years (Lutz et al., 2021; Singh et al., 2022), these kinds of studies are necessary for the progress of forensic entomology.

AUTHOR'S CONTRIBUTION

The author confirms his contribution to the whole processing steps in the research, conceptualization, collecting the specimens, preparation of the manuscript, and illustrations. He read and approved the final version of the manuscript.

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AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in ILLPA, MEKRB, MUSM, SENASA, UNASAM, and UNPRG entomological collections and are available from the curator upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included plants and arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

The author declares that there is no conflict of interest regarding the publication of this paper.

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گزارش انتشار گونه‌های مهم سخت‌بال‌پوشان در پزشکی قانونی (Insecta: Coleoptera) در پرو

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چکیده: هجده گونه از سخت‌بال‌پوشان به عنوان رایج‌ترین سوسک‌های ثبت شده در منابع مختلف کتاب‌شناختی و مجموعه‌های حشره‌شناسی مشخص شدند. انتشار گونه‌های سخت‌بال‌پوشان مهم از نظر پزشکی قانونی در پرو از طریق بررسی نظرسنجی‌های تنوع زیستی، مطالعه متوالی منابع حشره‌شناسی پزشکی قانونی و بازنگری‌های سیستماتیک به‌دست آمد. همچنین نمونه‌های موجود در شش مجموعه حشره‌شناسی کشور پرو مورد بررسی قرار گرفتند. توزیع گونه‌های در مناطق مختلف کشور پرو در سطح استانی و منطقه اکولوژیک برای هجده گونه متعلق به خانواده‌های Cleridae (*Necrobia* Olivier, 1795)، Dermestidae (*Dermestes* Linnaeus, 1758)، Histeridae (*Euspilotus* Lewis, 1907, *Saprinus* Erichson, 1834, *Xerosaprinus* Wenzel, 1962)، Staphylinidae (*Creophilus* Leach, 1819, *Oxelytrum* Gistel, 1848) و Trogidae (*Omorgus* Erichson, 1847, *Polynoncus* Burmeister, 1876) ارایه شد. این گونه‌ها در مطالعات آینده پزشکی قانونی در پرو می‌توانند در اولویت باشند.

واژگان کلیدی: آند، لاشه، مرور کتابشناختی، مرده‌خواری، نئوتروپیک، لاشخور