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Insect fauna of Rancho Las Playitas, Municipalities of Arizpe and Bacoachi, Sonora, Mexico, and discussion of noteworthy species

La fauna de insectos y discusión de algunas especies de interés del Rancho Las Playitas, Municipios de Arizpe y Bacoachi, Sonora, México

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ABSTRACT

A total of 406 species in 313 genera, 70 families, and 11 orders of insects is documented from the Rancho Las Playitas area, Municipalities of Arizpe and Bacoachi, Sonora, Mexico. Distributions and locality records of selected noteworthy species are presented.

Key Words: Biogeography, insect fauna, Sonora

RESUMEN

Se documentan un total de 406 especies en 313 géneros, 70 familias y 11 órdenes de insectos en el área del Rancho Las Playitas en los municipios de Arizpe y Bacoachi, Sonora, México. Se incluyen localidades y distribución de algunas especies notables.

Palabras Clave: Biogeografía, fauna de insectos, Sonora

The northern limits of the New World tropics are in Sonora with tropical deciduous forest occurring as far north as the Sierra San Javier (26°N) and foothills thornscrub as far north as Arizpe (30.4°N) where it merges into desert grassland (Fig. 2) about 70-120 km south of the Arizona border (Van Devender and Reina-Guerrero, 2021) – the transition from the Neotropics into the North Temperate zone.

Plant diversity in Sonora is greatest in tropical deciduous forest in southern Sonora (Van Devender *et al.* 2000) and pine-oak forest in the Sierra Madre Occidental in eastern Sonora (Van Devender and Reina-Guerrero, 2016) with additional species found in temperate desert grassland to the north, woodlands and forests in the Sky Island Mountain ranges in the Madrean Archipelago in the northeast, and the Sonoran Desert to the west. Similar patterns of diversity in Sonora are seen for amphibians and reptiles (Lemos-Espinal *et al.* 2019), birds (Villaseñor-Gómez *et al.* 2010), and mammals (Castillo-Gómez *et al.* 2010). Species diversity in the insects, the largest group of Sonoran animals, is poorly known, but the pattern is likely similar to those seen in plants and vertebrates.

Shpeley and Van Devender (2022) summarized the Carabidae of Sonora. Atkinson (2019) presented the Platypodinae and Scolytinae (Curculionidae) of Sonora. Johnson (2018) provided a checklist of the Elateridae of Sonora. Bailowitz *et al.* (2017) published an annotated checklist of the butterflies of Sonora. The Odonata of Sonora were included in the book *A Field Guide to the Damselflies & Dragonflies of Arizona and Sonora* (Bailowitz *et al.* 2015). Alatorre-Bracamontes and Vásquez-Bolaños (2010) summarized the distributions of 290 species of ants in five states in northern Mexico, including Sonora.

Records of individual insect groups have been reported from tropical deciduous forest in the Sierra San Javier, Sonora, including Cerambycidae (Noguera *et al.* 2009), Chrysomelidae (Rodríguez-Mirón *et al.* 2021), and Odonata (González-Soriano *et al.* 2009) as well as Cantharidae, Lampyridae, Lycidae, Phengodidae, and Telegeusidae (Zaragoza-Caballero and Ramírez-García, 2009). Sánchez-Piñero and Aalbu (2002) summarized the records of Tenebrionidae from islands in the Gulf of California and the Pacific Ocean in Sonora and Baja California.

The only mixed insect fauna published for Sonora was based on specimens in ancient packrat (*Neotoma*) middens from the Sierra Bacha on the coast of the Gulf of California in the Central Gulf Coast subdivision of the Sonoran Desert (Van Devender and Hall, 1994). Arthropods (mostly insects) were identified in 42 families, 54 genera, and 37 species in 11 middens radiocarbon dated from 9,970 yr B.P. to modern. Ants and beetles were the most common specimens in the samples.

Here we report insects from the Rancho Las Playitas area near Bacoachi, Sonora (Fig. 1) to further document the species diversity of Sonora.

MATERIAL AND METHODS

Rancho Las Playitas has been in the Salazar family for four generations. It is located between Bacoachi and Bacanuchi (center: 30.598°N 110.094°W), 33 km north-northeast of Arizpe (30.4°N), and 50 km south-southeast of Cananea (31.0°N; Fig. 2). The ranch drains into the Río Sonora on the east and the Río Bacanuchi on the west. The ranch covers an area of 3,230 hectares in the municipalities of Arizpe and Bacoachi. It ranges from 1,060 to 1,590 m elevation with even higher elevations in the dramatic 1,650-m Cerro El Picacho in the center (Fig. 1).

The vegetation of Rancho Las Playitas is a foothills thornscrub-desert grassland transition. On rocky slopes, the shrubs *Lysiloma watsonii* (feather tree/*tepeguaje*), *Prosopis velutina* (velvet mesquite), *Mimosa dysocarpa* (velvetpod mimosa/*gatuño*), and *Fouquieria splendens* (ocotillo) are dominant (Van Devender *et al.* 2022). In areas with gentler slopes, the perennial grasses *Bouteloua chondrosioides*, *B. curtipendula*, and *B. repens* (sprucetop, sideoats, and hairy grama) are dominant. Rocky canyons with permanent water and riparian plants are scattered around the ranch, including Arroyo Padercitas, a deep narrow canyon with a perennial stream shaded by *Populus monticola* (Sonoran cottonwood/*huérigo*) trees. Van Devender *et al.* (2023) summarized the flora of the Rancho Las Playitas area. Turner *et al.* (2022) summarized the amphibians and reptiles for Rancho Las Playitas.

The Madrean Discovery Expeditions program at Greater Good Charities was first associated with Rancho Las Playitas in 2018 when Molina-Padilla and Salazar-Martínez maintained a network of wildlife cameras to document the mammal fauna. In 2019-2020, Salazar-Martínez photographed the animals, including insects, that he observed during general ranching activities on Rancho Las Playitas as part of a Madrean Discovery Expeditions Scholarship. Insects were inventoried extensively on Madrean Discovery Expeditions to Rancho Las Playitas on July 5-7, 2019, September 27 to October 5, 2021, April 18-23, 2022, and October 27-31, 2023. Additional observations and images were made on biweekly trips from October 2021 to August 2022 to monitor Rock Horned Lizards (*Phrynosoma ditmarsii*) fitted with radio transmitters (Turner *et al.* 2022).

Insects were collected with insect nets, dip nets in

aquatic habitats, by hand under rocks in the daytime, at ultraviolet light at night, etc. Pitfall traps were not used. Most of the insects were collected near the Rancho Las Playitas headquarters (30.598°N 110.094°W) in the Municipality of Bacoachi and at Aguaje el Palmillalito (30.560°N 110.161°W), Arroyo las Padercitas (30.576°N 110.129°W), and Barranco Basaitequi (30.582°N 110.120°W) in the Municipality of Arizpe, with additional observations and images from throughout the study area. Field activities were supported under SEMARNAT permits to Dr. Alejandro Zaldivar-Riverón.

Specimens or photographs were identified by the authors or by specialists, including Robert A. Behrstock (Acrididae, Bombyliidae), Margarethe Brummermann (general), Nico Franz (Curculionidae), Heidi Hopkins (Nyctiboridae), Paul J. Johnson (Elateridae), Joshua R. Jones (Neuroptera), M. Andrew Johnston (Tenebrionidae), Stephen W. Lingafelter (Cerambycidae), John D. Pinto (Meloidae), Allen F. Sanborn (Cicadidae), Justin O. Schmidt (Hymenoptera), William B. Warner (Scarabaeidae), and Richard L. Westcott (Buprestidae). All Hemiptera, Hymenoptera, butterflies, and Odonata, as well as identified specimens in other groups, including Carabidae, Chrysomelidae, Formicidae, Scarabaeidae, etc. were deposited into the Colección Nacional de Insectos, Instituto de Biología, Universidad Nacional Autónoma de México. Unidentified specimens were deposited into Hasbrouck Insect Collection at Arizona State University. All observations, records, and images are publicly available in the Madrean Discovery Expeditions database (madreandiscovery.org). The database only includes records identified to species or as aff., cf., or nr. species.

RESULTS

A total of 406 species in 313 genera, 70 families, and 11 orders were documented in the Rancho Las Playitas insect fauna (Appendix 1). The orders with the most species were Lepidoptera (200 total, 154 moths, 46 butterflies), Coleoptera (117), Orthoptera (22), Odonata (20), and Hemiptera (16) and Hymenoptera (17). The families with the most species were Noctuidae (53, Lepidoptera), Erebidae (31, Lepidoptera), Carabidae (27, Coleoptera), Geometridae (26, Lepidoptera; Fig. 5B), Chrysomelidae (19, Coleoptera), Acrididae (16, Orthoptera; Figs. 10 A, B), Crambidae and Hesperidae (14 each, Lepidoptera; Fig. 6B), Coenagrionidae (11, Odonata; Fig. 9B), and Buprestidae (Coleoptera), Formicidae (Hymenoptera), Nymphalidae (Lepidoptera; Fig. 6A), and Scarabaeidae (Coleoptera; Fig. 3B) (10 each). The genera with the most species were *Ponomotia* Herrich-Schäffer, 1868 (Noctuidae, Lepidoptera) (8); *Argia* Rambur, 1844 (Coenagrionidae, Odonata) (Fig. 9B) and *Tarache* Hübner, 1823 (Noctuidae, Lepidoptera) (6 each); *Acmaeodera* Eschscholtz, 1829 (Buprestidae, Coleoptera); *Dasytutilla* Ashmead, 1899 (Mutillidae, Hymenoptera); *Lebia* Lastreille, 1802 (Carabidae, Coleoptera); *Leptinotarsa* Chevrolat in Djean, 1836 (Chrysomelidae, Coleoptera); *Melipotis* Hübner, 1818 (Erebidae, Lepidoptera), and

Spragueia Grote, 1875 (Noctuidae, Lepidoptera) (4 each); and *Apodemia* Grote, 1875 (Riodinidae, Lepidoptera); *Brachinus* Weber, 1801 (Carabidae, Coleoptera); *Chauliognathus* Hentz, 1930 (Cantharidae, Coleoptera); *Chlaenius* Bonelli, 1810 (Carabidae, Coleoptera); *Cotinis* Burmeister, 1842 (Scarabaeidae, Coleoptera) (Fig. 3B); *Euchaetes* Harris, 1841 (Erebidae, Lepidoptera); *Lacinipolia* McDunnough, 1937 (Noctuidae, Lepidoptera); *Manduca* Hübner, 1807 (Sphingidae, Lepidoptera); *Pheidole* Westwood, 1839 (Formicidae, Hymenoptera); *Frederickia* Ferguson, 2008 (Geometridae, Lepidoptera), and *Pero* Herrich-Schäffer, 1855 (Geometridae, Lepidoptera) (3 each).

DISCUSSION

The Madrean Discovery Expeditions database currently has 26,082 insect records in 4,022 taxa from Sonora based on specimens, photographs, observations, and literature. There are 14,308 records (1,910 taxa) of Lepidoptera, including 9,885 records (1,518 taxa) of moths, of which 5,584 records (1,411 taxa) are from Palting. Sonoran records in the database include 5,252 records (1,131 taxa) of Coleoptera; 2,267 records (103 taxa) of Odonata, including those observations from Bailowitz and Danforth, and records in González-Soriano (2009); 1,027 records (83 taxa) of Orthoptera; and 1,701 records (138 taxa) of Formicidae. These numbers are minimal because numerous species are undescribed, and the names of many described insects are not in the Taxonomic Thesaurus created from the Catalog of Life, and it was therefore not possible to search for such species. Many records in the database are from biotic expeditions to Sky Island mountain ranges in northeastern Sonora in the Madrean Archipelago Biodiversity Assessment (MABA) program of Sky Island Alliance (2009-2014) and the Madrean Discovery Expeditions program of Greater Good Charities (2015-2023). Additional Sonoran records are from the Symbiota Collections of Arthropods Network (SCAN, scan.bugs.org). The records from Rancho Las Playitas provide insect coverage for a new area in Sonora.

NOTEWORTHY SPECIES

The distribution, biogeography, and ecology of many species of insects in Sonora are poorly known. A few Rancho Las Playitas records are noteworthy.

Some species found at Rancho Las Playitas are widespread in tropical Mexico as far north as Sonora. These include the butterflies *Apodemia hepburni* Godman & Salvin, 1886 (Riodinidae) and *Microtia elva* H. Bates, 1864 (Nymphalidae) (Glassberg 2017, de la Maza 1987); the leaf-cutter ant *Atta mexicana* (Formicidae, Alatorre-Bramontes and Vásquez-Bolaños, 2010, Vásquez-Bolaños, 2011); the odonates *Argia anceps* Garrison, 1996 (Coenagrionidae, Fig. 9B) and *Dythemis maya* Calvert, 1906 (Libellulidae) (Bailowitz *et al.* 2015); the chafer beetle *Hologymnetis cinerea* Mannerheim, 1843 (Scarabaeidae, Ratcliffe 1992); and the shield-back bug *Pachycoris klugii* (Burmeister, 1835) (Scutelleridae, Maes, 1998, Fig. 4B).

Many of these species have casual records in Arizona and some have established breeding populations. With global warming, the northern range limits of more tropical species will expand northward.

The large black and white moth *Morpheus clenchi* Donahue, 1980 (Cossidae, Fig. 5A) is the northernmost representative of a genus that occurs throughout the Neotropics. In the United States, it is still known only from the vicinity of the type locality, Sycamore Canyon, Santa Cruz County, Arizona (Powell and Opler, 2009).

Cotinis sinitoc Deloya, Ibanez-Bernal & Nogueira, 2000 (Scarabaeidae) is a Sonoran endemic species (Fig. 3B) that was described based on specimens from Cócorit and Rosario de Tesopaco in tropical southern Sonora (Deloya *et al.* 2000). Rancho Las Playitas is a range extension of 312 km north-northeast of Rosario de Tesopaco.

Scaptolenus paltingi P.J. Johnson, 2013 (Elateridae) is a Sonoran endemic clickless rain click beetle that was described in honor of John D. Palting (Johnson, 2013). Rancho Las Playitas is the third locality for the species and 90 km north-northeast of the type locality in the Sierra Aconchi and 34 km west of the paratype locality in the Sierra La Púrica.

Aztecacris gloriosus (Acrididae) is a colorful grasshopper (Fig. 10A) in a monotypic genus that is endemic to the Arizona-Sonora border area. It was described from the Atascosa Mountains, Santa Cruz County, Arizona, and later reported in Mexico from the Sierra Las Avispas near Nogales, Sonora (Behrstock and Van Devender, 2015). Rancho Las Playitas is a range extension of 120 km to the southeast and the first record for the Municipality of Bacoachi.

Considering that the Arizona border is only 86 km to the north, some Rancho Las Playitas insects are temperate or southwestern United States species reaching their southern distributional limits. Several of them are new records for Sonora and Mexico, including *Cotinis impia* Deloya, Ibanez-Bernal & Nogueira, 2000 (Scarabaeidae, Deloya *et al.* 2000), *Pseudovates arizonae* Hebard, 1935 (Mantidae, Döring, 2022, Fig. 7A), *Oecanthus cf. rileyi* Baker, 1905 (Gryllidae; Walker, 1967, Fig. 10C), *Myrmecophilus manni* Schimmer, 1911 (Myrmecophilidae, Hebard, 1920), and *Diapheromera arizonensis* Caudell, 1903 (Diapheromeridae, Evans 2007). *Phrynotettix tshivavensis* (Halderman, 1852) (Romaleidae, Capinera *et al.* 2004) is new for Chihuahua, Sonora, and Mexico. *Chrysobothris lixa* Horn, 1886 (Buprestidae) is new for Sonora (Westcott and Clark, 2015, Fig. 10D).

Cotinis impia was previously only known from southern Arizona and adjacent New Mexico. The Las Playitas specimen is a southeastern range extension of 108 kilometers.

The unicorn mantis *Pseudovates arizonae* was previously only known from Arizona. The Barranco Basaitequi observation (Fig. 7A) represents a 100 km south-southeast range extension.

The tree cricket *Oecanthus cf. rileyi* (Fig. 10C) was previously known from the western United States. In Sonora, it has been found in foothills thornscrub from Rancho Las Playitas south to the Moctezuma area and the Sierra Murrieta near Bacanora.

Myrmecophilus manni is a tiny ant cricket that lives in

nests of numerous species of ants (Hebard, 1920). It was previously known from southern Washington south through the western United States to Arizona. In Sonora, it is known from the Sierra Elenita near Cananea in pine-oak forest south to Rancho Las Playitas, the Sierras Buenos Aires and Juriquipa in oak woodland, and to Álamos in tropical deciduous forest in southern Sonora. A second species *M. americanus* Saussure, 1877 was found in the same area as *M. manni* at Álamos. *Myrmecophilus americanus* appears to be mostly host specific to *Paratrechina longicornis* (Latreille, 1802), which is pretty much distributed worldwide except in cold temperate and colder areas (Wetterer and Hugel, 2008).

Diapheromera arizonensis was previously known from Arizona and adjacent New Mexico. In Sonora, it is known from near Naco in desert grassland and Cabullona in Chihuahuan desertscrub south to Rancho las Playitas and Sahuaripa in foothills thornscrub.

Chrysobothris lixa was previously known from Arizona, New Mexico, and Texas in the United States, and Baja California and Chihuahua in Mexico (Westcott and Clark, 2015). Rancho Las Playitas is 205 km south-southeast of the Catalina Spring type locality near Tucson, Arizona.

Phrynotettix tshivavensis is a large lubber grasshopper that is common in Arizona and New Mexico but is also known from near Casas Grandes in northwestern Chihuahua (Fig. 10D). In Sonora, it is found in the northeastern Sky Island mountain ranges.

The moths *Olceclostera seraphica* (Dyar, 1906) (Apelodidae) and *Philtraea elegantaria* (Edwards, 1881) (Geometridae) are interesting Mexican species in mostly northern genera that reach their northern distributional limits in the Arizona-Sonora borderlands. *Olceclostera seraphica* is best known from western Texas with a few records in New Mexico and southern Arizona (Powell and Opler 2009). Only a few records are known from Sonora. Although the type locality of *P. elegantaria* is Tucson, Arizona, this elegant species (Fig. 5B) is uncommon in the United States. It is widespread in the borderlands of northeastern Sonora.

Even when insect groups like the Carabidae are relatively well-known in Sonora, collections in different areas augment the knowledge of their distributions. *Brachinus fumans* (Fabricius, 1781), *B. mexicanus* Dejean, 1831, *Calleida cordicollis* Putzeys, 1845, *Calosoma angulatum* Chevrolat, 1834, *Chlaenius chaudiroi* G. Horn, 1876, *C. leucoscelis* Chevrolat, 1834, *Cymindis punctigera punctigera* (LeConte, 1851), *Galerita mexicana* Chaudoir, 1872, *Lebia tuckeri* (Case, 1920), *Notiobia brevicollis* (Chaudoir, 1837), *N. mexicana* Dejean, 1829, *Pasimachus californicus* Chaudoir, 1850, *Selenophorus concinnus* Schaeffer, 1910, *Stenomorphus convexior* Notman, 1922, and *Tetracha carolina* Linnaeus, 1767 are new carabid records for the Municipality of Arizpe (Shpeley and Van Devender, 2022).

LOCALITY RECORDS

Locality records for the Sonoran noteworthy insects are from the Madrean Discovery Expeditions and SCAN data-

bases. For rare species, all records are included. For more common species, selected records from northern Sonora are presented.

COLEOPTERA: Buprestidae: *Chrysobothris lixa*. Municipality of Arizpe. Barranco del Basaitequi, Rancho las Playitas, 14.8 km WSW of Bacoachi, 30.568°N 110.104°W, 1261 m elev., 21-Apr-2022, A. C. Thomson-M. Scarabaeidae: ***Cotinis impia*.** Municipality of Bacoachi. Rancho Viejo, 10.3 km E of Bacanuchi, 30.606°N 110.129°W, 1180 m elev., 26-Sep-2019, T. R. Van Devender; Municipality of Cananea. 1.2 km NE of Cananea, 31.000°N 110.253°W, 1531 m elev., 23-Sep-2019, T. R. Van Devender. ***Cotinis sinitoc*.** Municipality of Arizpe. Arroyo Padercitas, Rancho las Playitas, 15.6 km WSW of Bacoachi, 30.576°N 110.129°W, 1140 m elev., 6-Jul-2019, D. S. Turner (Fig. 3B). ***Hologymnetis cinerea*.** Municipality of Arizpe, Barranco del Basaitequi, Rancho las Playitas, 14.8 km WSW of Bacoachi, 30.568°N 110.104°W, 1261 m elev., 29-Sep-2021, R. W. Van Devender; 12.0 km WNW of Sinoquique, 30.193°N 110.361°W, 1091 m elev., 7-Aug-2018, E. Makings; Municipality of Bacoachi. Rancho Viejo, 10.3 km E of Bacanuchi, 30.606°N 110.129°W, 1180 m elev., 26-Sep-2019, T. R. Van Devender; Municipality of Cananea. 1.2 km NE of Cananea, 30.997°N 110.253°W, 1531 m elev., 23-Sep-2019, T. R. Van Devender; Municipality of Mazatán. W side of Mazatán, 29.005°N 110.148°W, 550 m elev., 26-Jun-2012, T. R. Van Devender; Municipality of Villa Pesqueira, 1.8 km SSE of Nácori Grande, 29.045°N 110.046°W, 673 m elev., 11-Jul-2019, A. L. Reina-Guerrero; 0.9 km NNE of Nácori Grande, 29.066°N 110.048°W, 644 m elev., 8-Aug-2012, T. R. Van Devender. ***Scaptolenus paltingi*.** Municipality of Aconchi. Rancho los Alisos, 9.4 km WSW of Aconchi, Sierra Aconchi, 29.798°N 110.320°W, 1301 m elev., 2-Jul-2013, T. R. Van Devender, J. D. Palting; Municipality of Bacoachi. Rancho las Playitas, 12.5 km WSW of Bacoachi, 30.595°N 110.092°W, 1438 m elev., 6-Jul-2019, J. D. Palting, T. R. Van Devender; Municipality of Nacozari de García. Rancho El Jarazo, 22.4 km N of Nacozari de García, Sierra la Púrica, 30.576°N 109.733°W, 1595 m elev., 16-Jul-2013, T. R. Van Devender, J. D. Palting.

HEMIPTERA: Scutelleridae: *Pachycoris klugii*. Municipality of Aconchi. Rancho los Alisos, 9.4 km WSW of Aconchi, Sierra Aconchi, 29.798°N 110.320°W, 1301 m elev., 2-Sep-2012, T. R. Van Devender; Municipality of Bacoachi. W side of Picacho de Bacoachi, Rancho las Playitas, 12.2 km WSW of Bacoachi, 30.600°N 110.089°W, 1510 m elev., 7-Jul-2019, S. D. Carnahan (Fig. 4B).

HYMENOPTERA: Formicidae: *Atta mexicana*. Municipality of Arizpe. Barranco del Basaitequi, Rancho las Playitas, 14.8 km WSW of Bacoachi, 30.568°N 110.104°W, 1261 m elev., 30-Sep-2021; T. R. Van Devender; Municipality of Bacoachi. Rancho las Playitas, 12.5 km WSW of Bacoachi, 30.595°N 110.092°W, 1438 m elev., 6-Jul-2019, T. R. Van Devender; Municipality of Cananea. Rancho El Chiltepin, 23.3 km S of Cananea, foothills of the Sierra Manzanal, 30.772°N 110.289°W, 1299 m elev., 13-Sep-2014, T. R. Van Devender; Municipality of General Plutarco Elías Calles. 2.1 km SSE of Sonoyta, northern foothills of the Sierra Cubabi, 31.846°N 112.856°W, 423 m elev., 17-Mar-2013, T. R. Van Devender; Municipality of Ímuris. Rancho Agua Caliente, 17.2 km N of Ímuris, 30.954°N 110.853°W, 975 m elev., 28-Mar-2010, T.R. Van Devender.

LEPIDOPTERA: Apatelodidae: *Olceclostera seraphica*. Municipality of Bacoachi. Rancho las Playitas, 12.5 km WSW of Bacoachi, 30.595°N 110.092°W, 1438 m elev., 6-Jul-2019, J. D. Palting; Municipality of Ímuris. Rancho El Aribabi, Río Cocóspera, 20.3 km ENE of Ímuris, Sierra Azul, 30.856°N 110.666°W, 990 m elev., 20-Aug-2009, J. D. Palting. Cossidae: ***Morpheis clenchi*.** Municipality of Bacoachi. Rancho las Playitas, 12.5 km WSW of Bacoachi, 30.595°N 110.092°W, 1438 m elev., 6-Jul-2019, J. D. Palting; Municipality of Moctezuma. Rancho San Fernando, E side of Sierra de la Madera, 17.4 km W of Huásabas, 20.5 km ENE of Moctezuma, 29.929°N 109.482°W, 1490 m elev., 5-Aug-2010, J. D. Palting; Municipality of Nogales. Rancho Las Avispas, 15.5 km SW of Nogales, Sierra Las Avispas, 31.193°N 111.101°W, 1200 m elev., 21-Jul-2012, J. D. Palting; Municipality of Sahuaripa. Rancho La Tigre, 8.7 km ESE of Güisamopa, 28.622°N 109.020°W, 1364 m elev., 24-Aug-2021, J.D. Palting; Municipality of San Felipe de Jesús. Rancho El Llano, 14.5 km WNW of San Felipe de Jesús, Sierra Los Locos, 29.878°N 110.387°W, 1304 m elev., 5-Aug-2019, J. D. Palting. Geometridae: ***Philtraea elegantaria*.** Municipality of Agua Prieta. Rancho El Pinito, 56.5 km ESE Agua Prieta, Sierra San Luis, 31.191°N 108.941°W, 1432 m elev., 7-Sep-2009, J. D. Palting; Rancho Los Ojos Calientes, El Cajón Bonito, 48.6 km ESE of Agua Prieta, Sierra San Luis, 31.278°N 109.001°W, 1298 m elev., 23-Apr-2017, J. D. Palting; Municipality of Arizpe. Arroyo Padercitas, Rancho las Playitas, 15.6 km WSW of Bacoachi, 30.576°N 110.129°W, 1149 m elev., 3-Oct-2021, R. W. Van Devender (Fig. 5B); Rancho La Cieneguita, 14.9 km WNW of Arizpe, Sierra San Antonio, 30.353°N 110.325°W, 1148 m elev., 1-May-2011, J. D. Palting; Barranco del Basaitequi, Rancho las Playitas, 14.8 km WSW of Bacoachi, 30.568°N 110.104°W, 1261 m elev., 28-Sep-2021, T. R. Van Devender; Municipality of Bacoachi. Rancho las Playitas, 12.5 km WSW of Bacoachi, 30.595°N 110.092°W, 1438 m elev., 6-Jul-2019, J. D. Palting; Rancho las Playitas, 17.1 km WSW of Bacoachi, 30.576°N 110.134°W, 1139 m elev., 14-Apr-2019, G. Molina-Padilla; Municipality of Cananea. El Pinal Canyon, 17.9 km SSE of Cananea, Sierra el Alacrán, 30.835°N 110.229°W, 1577 m elev., 15-Sep-2018, J. D. Palting; Municipality of Ímuris. Rancho El Aribabi, Río Cocóspera, 20.3 km ENE of Ímuris, Sierra Azul, 30.856°N 110.666°W, 990 m elev., 20-Aug-2009, J. D. Palting; Municipality of Nacozari de García. Campo Bonito, Arroyo Chinoso, 1.6 km below Mina El Tigre tailings, 39.9 km WNW Bavispe, Sierra El Tigre, 30.580°N 109.269°W, 1246 m elev., 18-Mar-2010; Municipality of Nogales. Rancho Las Avispas, 15.5 km SW of Nogales, Sierra Las Avispas, 31.193°N 111.101°W, 1200 m elev., 21-Jul-2012. Riodinidae: ***Apodemia heburni*.** Municipality of Arizpe. Arroyo Toro Muerto, 2.6 km SW of Arizpe, E side of Sierra San Antonio, 30.321°N 110.191°W, 841 m elev., 15-Mar-1995, D. Danforth; Municipality of Bacoachi, 7.4 km SW of Bacoachi, 30.573°N 110.007°W, 1104 m elev., 20-May-2022, T. R. Van Devender; Municipality of Ímuris. 8 mi S of Cíbata, 30.958°N 110.863°W, 988 m elev., 9-Aug-1991, J. P. Brock; Municipality of Nogales. Cañón Plancha de Platas, Rancho Esmeralda, 16 km WSW of Nogales, Sierra las Avispas, 31.212°N 111.128°W, 1090 m elev., 27-Oct-2010, J. P. Brock; Municipality of Santa Ana. Arroyo Cajón del Agua, 19.6 km NW of Cucurpe, Sierra Cucurpe, 30.411°N 110.888°W, 939 m elev., 20-Mar-2018,

R. A. Bailowitz, D. Danforth; ***Microtia elva*.** Municipality of Arizpe. Arroyo Las Padercitas, Rancho las Playitas, 16.8 km WSW of Bacoachi, 30.576°N 110.129°W, 1140 m elev., 30-Sep-2021, T. R. Van Devender; Municipality of Cananea. La Cieneguita de Santa Águeda, 15.2 km SE of Cananea, northern Sierra El Alacrán, 30.880°N 110.178°W, 1408 m elev., 27-Oct-2018, G. Molina-Padilla; W edge of Cuitaca, 31.007°N 110.498°S, 1267 m elev., 23-Sep-2006, H. Brodtkin, T. Wood, S. Williamson; Municipality of Nogales. Cañada Adrián, 16.5 km WSW of Nogales, Sierra Las Avispas, 31.220°N 111.137°W, 1109 m elev., 29-Sep-2013, R. A. Bailowitz.

MANTODEA: Mantidae: *Pseudovates arizonae*. Municipality of Arizpe. Barranco Basaitequi, 15.2 km WSW of Bacoachi, Rancho Las Playitas, 30.569°N 110.109°W, 1231 m elev., 21-Apr-2022, J. G. Martínez-Valenzuela (Fig. 7B); Municipality of Fronteras. Rancho Capulín, 23.5 km WSW of Fronteras, Sierra Buenos Aires., 30.762°N 109.824°W, 1429 m elev., 2-Jul-2016, J. D. Palting.

ODONATA: Coenagrionidae: *Argia anceps*. Municipality of Agua Prieta. Río San Bernardino, Rancho San Bernardino, 25.4 km E of Agua Prieta, 31.295°N 109.258°W, 1104 m elev., 19-Sep-2017, R. A. Bailowitz, D. Danforth; Punta del Agua, Cajón Bonito, Rancho la Victoria, 56.5 km ESE of Agua Prieta, Sierra San Luis, 31.223°N 108.943°W, 1406 m elev., 23-Apr-2017, D. Danforth, F. Heath; Municipality of Bacoachi. Rancho las Playitas, 16.3 km WSW of Bacoachi, 30.582°N 110.129°W, 1140 m elev., 14-Apr-2019, G. Molina-Padilla; Municipality of Ímuris. Río Cocóspera, Rancho Aribabi, 18.8 km ENE of Ímuris, Sierra Azul, 30.854°N 110.665°W, 990 m elev., 11-Apr-2019, R. A. Bailowitz, D. Danforth; Municipality of Nogales. Cañada Adrián, 16.5 km WSW of Nogales, Sierra Las Avispas, 31.220°N 111.137°W, 1109 m elev., 29-Sep-2013, R. A. Bailowitz; Municipality of Santa Ana. Arroyo Cajón del Agua, 19.6 km NW of Cucurpe, Sierra Cucurpe, 30.412°N 110.888°W, 939 m elev., 20-Mar-2018, R.A. Bailowitz, D. Danforth (Fig. 9B). Libellulidae: ***Dythemis maya*.** Municipality of Bacadéhuachi. 10.5 km E of Bacadéhuachi, Sierra de Bacadéhuachi, 29.810°N 109.027°W, 1228 m elev., 3-Sep-2011, J. D. Palting; Municipality of Bacoachi. Rancho las Playitas, 15.6 km WSW of Bacoachi, 30.582°N 110.129°W, 1140 m elev., 4-Nov-2019, G. Molina-Padilla, J. A. Salazar-Martínez; Municipality of Cumpas. Rancho Carrizal, 15.5 km E of Cumpas, 29.995°N 109.618°W, 934 m elev., 28-Sep-2018, D. E. Moreno-Urías; Municipality of Ímuris. Río Cocóspera, Rancho Aribabi, 18.8 km ENE of Ímuris, Sierra Azul, 30.854°N 110.665°W, 990 m elev., 11-Apr-2019, R. A. Bailowitz, D. Danforth; Municipality of Santa Ana. Arroyo Cajón del Agua, 19.6 km NW of Cucurpe, Sierra Cucurpe, 30.412°N 110.888°W, 939 m elev., 20-Sep-2019, R. A. Bailowitz, D. Danforth.

ORTHOPTERA: Acrididae: *Aztecacris gloriosus*. Municipality of Bacoachi. Rancho las Playitas, 13.8 km WSW of Bacoachi, 30.596°N 110.105°W, 1347 m elev., J. A. Salazar-Martínez (Fig. 10A). Gryllidae: ***Oecanthus cf. rileyi*.** Municipality of Arizpe. Barranco Basaitequi, 14.9 km WSW of Bacoachi, Rancho Las Playitas, 30.598°N 110.104°W, 1261 m elev., 29-Sep-2021, T.R. Van Devender; Municipality of Bacanora. Rancho las Tierras de Jiménez, 14.2 km SW of Bacanora, Sierra de Murrieta, 28.901°N 109.514°W, 1387 m elev., 14-Sep-2022, H. Sil-

va-Kurumiya; Municipality of Moctezuma. Nícora, 2.0 km SSW of Moctezuma, 29.780°N 109.680°W, 616 m elev., 17-Nov-2021, H. Silva-Kurumiya; Rancho La Gotera, 29.8 km SSW of Moctezuma, 29.557°N 109.797°W, 745 m elev., 21-Sep-2021, H. Silva-Kurumiya (Fig. 10C). Myrmecophilidae: *Myrmecophilus americanus*. Municipality of Álamos. Rancho Acosta, Álamos, 27.023 109.925, 372 m elev., 10-Mar-2022, R. A. Johnson; *Myrmecophilus manni*. Municipality of Álamos. Rancho Acosta, Álamos, 27.023 109.925, 372 m elev., 6-Mar-2022, R. A. Johnson; Municipality of Arizpe. Barranco Basaitequi, 14.8 km WSW of Bacoachi, Rancho Las Playitas, 30.568°N 110.104°W, 1261 m elev., 22-Jan-2022, R. A. Johnson; Municipality of Fronteras. El Aserradero, 24.0 km WSW of Fronteras, Sierra Buenos Aires, 30.727°N 109.820°W, 1703 m elev., 16-Aug-2016, R. A. Johnson; Municipality of Nacozari de García. 2.0 km S of Santo Domingo, 15.9 km SE of Nacozari de García, Sierra Juriquipa, 30.268°N 109.580°W, 1470 m elev., 14-Aug-2017, R. A. Johnson; Rancho San Felipe, 1.3 km S of Santo Domingo, 15.4 km SE of Nacozari de García, Sierra Juriquipa, 30.271°N 109.583°W, 1488 m elev., 15-Aug-2017, R. A. Johnson; Rancho la Zulema, 15.9 km SE of Nacozari de García, Sierra Juriquipa, 30.284°N 109.560°W, 1687 m elev., 1-Aug-2017, R. A. Johnson. Romaleidae: *Phrynotettix tshivavensis*. Municipality of Agua Prieta. Rancho El Pinito, 56.5 km ESE Agua Prieta, Sierra San Luis, 31.191° N 108.941°W, 1432 elev., 7-Sep-2009, J. D. Palting; Municipality of Arizpe. Barranco del Basaitequi, Rancho las Playitas, 14.8 km WSW of Bacoachi, 30.568°N 110.104°W, 1261 m elev., 28-Sep-2021, T. R. Van Devender; Represo María Luisa, Rancho las Playitas, 14.7 km WSW of Bacoachi, 30.582°N 110.110°W, 1317 m elev., R. W. Van Devender; Municipality of Bacadéhuachi. Aseradero La Matancita, 14.0 km ENE of Bacadéhuachi, Sierra de Bacadéhuachi, 29.837°N 109.000°W, 1674 m elev., 31-Jul-2011, T.R. Van Devender; Municipality of Bacoachi. W side of Picacho de Bacoachi, Rancho las Playitas, 12.2 km WSW of Bacoachi, 30.597°N 110.089°W, 1510 m elev., 7-Jul-2019, S. D. Carnahan (Fig. 10B); El Álamo, Rancho Las Playitas, 14.3 km WSW of Bacoachi, 30.595°N 110.111°W, 1337 m elev., G. Molina-Padilla; Municipality of Bavispe. N of Mina el Tigre, 30.1 km WNW of Bavispe, Sierra el Tigre, 30.602°N 109.221°W, 1936 m elev., 12-Aug-2015, T. R. Van Devender; Municipality of Cananea. Observatorio Astrofisico ‘Guillermo Haro’, Sierra Mariquita, 9.4 km of NNW Cananea, 31.054°N 110.383°W, 2422 m elev., 19-Sep-2010, T. R. Van Devender; Arroyo el Quince, Sierra Elenita, ca. 10.1 km WNW of Cananea, 31.002°N 110.388°W, 2001 m elev., 1-May-2016, M. Brummermann; Municipality of Fronteras. El Aserradero, 24.0 km WSW of Fronteras, Sierra Buenos Aires, 30.727°N 109.814°W, 1707 m elev., C. Hedgcock; 7.9 km ESE of Esqueda, 30.698°N 109.508°W, 1275 m elev., 16-Aug-2017, T. R. Van Devender; Municipality of Ímuris. Rancho El Salto, 26.7 km ESE Ímuris, Sierra Azul, 30.729°N 110.579°W, 2047 m elev., 31-Jul-2011, T. R. Van Devender; Municipality of Nacozari de García. Rancho el Tigre, 27.2 km WNW of Bavispe, Sierra el Tigre, 30.583°N 109.198°W, 2300 m elev., 11-Aug-2015, J. D. Palting; Pilaes de Nacozari, 6.5 km SE of Nacozari de García, Sierra Nacozari, 30.328°N 109.630°W, 1413 m elev., J. D. Palting; Rancho la Zulema, 15.9 km SE of Nacozari de García, Sierra Juriquipa, 30.284°N 109.560°W, 1687 m elev., 13-Jul-2017, T. R. Van

Devender; Municipality of San Felipe de Jesús. Rancho El Llano, 14.5 km WNW of San Felipe de Jesús, Sierra Los Locos, 29.878°N 110.387°W, 1304 m elev., R. W. Van Devender.

PHASMATODEA: Diapheromeridae: *Diapheromera arizonensis*. Municipality of Agua Prieta. Arroyo Guadalupe, Rancho Puerta Blanca, 40.3 km E of Agua Prieta, 31.332°N 109.089°W, 1285 m elev., 29-Sep-2009, J. O. Schmidt; Municipality of Arizpe. Arroyo Las Padercitas, Rancho las Playitas, 16.8 km WSW of Bacoachi, 30.576°N 110.129°W, 1140 m elev., 30-Sep-2021, A. L. Reina-Guerrero; Barranco del Basaitequi, Rancho las Playitas, 14.8 km WSW of Bacoachi, 30.568°N 110.104°W, 1261 m elev., 16-Oct-21, T. R. Van Devender; Municipality of Bacoachi, Arroyo Agua Verde, Rancho las Playitas, 14.4 km WSW of Bacoachi, 30.678°N 110.116°W, 1284 m elev., 26-Sep-2019, T. R. Van Devender; Municipality of Nacozari de García. Rancho Viejo, 17.2 km N of Nacozari de García, Sierra la Púrica, 30.531°N 109.756°W, 1644 m elev., 8-Aug-2013, L. E. Stevens; Municipality of Sahuaripa. Sahuaripa, 29.062°N 109.242°W, 441 m elev., 13-Sep-2022, G. Molina-Padilla.

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Appendix 1. Checklist of the insects of the Rancho Las Playitas area. Taxa arranged alphabetically by order, family, genus, and species.

BLATTOIDEA

Nyctiboridae

Nyctibora tetrasticta Hebard, 1922

COLEOPTERA

Anthicidae

Duboisius cf. *barri* (Abdullah, 1964)

Buprestidae

Acmaeodera decipiens LeConte, 1858
Acmaeodera flavomarginata Kerremans, 1897
Acmaeodera gibbula Hespeneheide, 2007
Acmaeodera solitaria Van Dyke, 1942
Agrilus paraimpexus Casey, 1909
Chrysobothris lixa Horn, 1886
Chrysobothris rossi (LeConte, 1854)
Hippomelas planicauda (LeConte)
Hippomelas sphenicus (Crotch, 1874)
Lampetis webbii Horn, 1885

Cantharidae

Chauliognathus lewisi (LeConte, 1858)
Chauliognathus misellus Chaudoir
Chauliognathus profundus Chevrolat

Carabidae

Brachinus elongatulus Chaudoir, 1878
Brachinus fumans (Fabricius, 1781)
Brachinus mexicanus Dejean, 1831
Calleida cordicollis Putzeys, 1845
Calosoma angulatum Chevrolat, 1834
Chlaenius chaudoiri G. Horn, 1876
Chlaenius forreri Bates, 1884
Chlaenius leucoscelis Chevrolat, 1834
Colliuris lioptera (Bates, 1891)
Coptodera brunnea Shpeley & Ball, 1993
Cymindis punctigera punctigera (LeConte, 1851)
Discoderus robustus G. Horn, 1883
Dyscolus falli (Darlington, 1936)
Dyscolus megalops (Bates, 1882)
Galerita mexicana Chaudoir, 1872
Helluomorphoides latitarsis (Casey, 1931)
Lebia atriceps LeConte, 1863
Lebia cymindoides Bates, 1883
Lebia pimalis Chaudoir
Lebia tuckeri (Case, 1920)
Notiobia brevicollis (Chaudoir, 1837)
Notiobia mexicana Dejean, 1829
Pasimachus californicus Chaudoir, 1850
Selenophorus concinnus Schaeffer, 1910
Stenomorphus convexior Notman, 1922
Tetracha carolina Linnaeus, 1767

Cerambycidae

Aneflus protensus LeConte, 1853
Anelaphus piceus Santos-Silva, 2007

Derobrachus geminatus LeConte, 1873
Derobrachus hovorei Bates, 1885
Moneilema gigas Motschulsky, 1845
Oncideres rhodosticta Gory, 1831
Prionus californicus (Say, 1824)
Sphaenothecus bilineatus (Gory & Percheron, 1833)
Stenaspis solitaria (Rogers, 1856)

Chrysomelidae

Acalymma trivittatum (Mannerheim, 1843)
Calligrapha serpentina (Rogers, 1856)
Diabrotica undecimpunctata Mannerheim, 1843
Disonycha glabrata (Fabricius, 1775)
Disonycha politula Horn, 1889
Exema conspersa (Mannerheim, 1843)
Leptinotarsa decemlineata (Say, 1824)
Leptinotarsa haldemani (Rogers, 1856)
Leptinotarsa peninsularis (Horn, 1894)
Leptinotarsa cf. *tumamoca* Tower, 1918
Malacorhinus sp. nov.
Neobrotica pluristica Fall, 1910
Pachybrachis cf. *bullatus* Fall, 1915
Paranapiacaba tricincta (Say, 1824)
Saxinis cf. *hornii* Fall, 1909
Scelida nigricornis (Jacoby, 1888)
Syphrea flavicollis (Jacoby, 1884)
Zygogramma arizonica Schaeffer, 1906
Zygogramma tortuosa (Rogers, 1856)

Cleridae

Cymatodera fuscula LeConte, 1852
Enoclerus quadrisignatus (De Geer, 1775)

Coccinellidae

Coccinella septempunctata (Linnaeus, 1763)
Coleomegilla maculata Guérin-Méneville, 1842
Cycloneda sanguinea (Mulsant, 1866)
Hippodamia convergens (LeConte, 1856)
Olla v-nigrum (Linnaeus, 1758)

Curculionidae

Ericydeus lautus Aubé, 1838

Dynastidae

Strategus cf. *aloeus* Laporte, 1835

Dytiscidae

Laccophilus fasciatus (Say, 1830)
Laccophilus pictus (Gray, 1832)
Rhantus gutticollis LeConte, 1854
Thermonectus marmoratus (Olivier, 1791)

Elateridae

Chalcolepidius smaragdinus Motschulsky, 1859
Diplostethus arizonensis (Schaeffer, 1905)

Scaptolenus paltingi P.J. Johnson, 2013
Vesperelater arizonicus (Hyslop, 1918)

Erotylidae

Ischyryus cf. quadripunctatus Dugés, 1878

Gyrinidae

Dineutus sublineatus (Chevrolat, 1834)

Hydrophilidae

Hydrophilus insularis (Laporte de Castelnau, 1840)
Tropisternus cf. affinis Gorham, 1884

Lycidae

Lycus fernandezi (Say, 1824)
Lycus sanguineus Horn, 1891

Meloidae

Epicauta corvina (LeConte, 1858)
Epicauta segmenta Schaeffer
Nemognatha nigripennis LeConte, 1853
Pyrota akhurstiana (Horn, 1887)
Pyrota obliquefascia Horn, 1874

Melolonthidae

Phyllophaga cf. lenis (Casey, 1915)

Mycteridae

Mycterus quadricollis LeConte, 1866

Oedemeridae

Oxaxis laevicollis (Horn, 1896)

Scarabaeidae

Anomala delicata Casey, 1915
Canthon indigaceus Matthews, 1962
Chrysina gloriosa (Fall, 1905)
Copris lecontei Gory & Percheron, 1883
Cotinis impia Deloya & Ibanez-Bernal & Nogueira, 2000
Cotinis mutabilis (Fabricius, 1787)
Cotinis sinitoc Deloya, Ibanez-Bernal & Nogueira, 2000
Digitonthophagus gazella Casey, 1890
Oxygryllus ruginasus LeConte, 1851

Tenebrionidae

Argoporis alutacea Blaisell, 1909
Argoporis costipennis Solier, 1848
Eleodes anthracinus Blaisdell, 1909
Eleodes eschscholtzi (Say, 1824)
Eupsophulus castaneus (Horn, 1870)
Eusattus reticulatus LeConte, 1851
Stenomorpha marginata (Fabricius, 1775)
Stenomorpha obovata (LeConte, 1851)

Trogossitidae

Temnoscheila virescens Fabricius, 1875

DIPTERA

Asilidae

Archilestris magnificus (Walker, 1854)

Bombyliidae

Hemipenthes jaennickeana (Osten Sacken, 1896)

HEMIPTERA

Belostomatidae

Abedus herberti Hidalgo, 1935

Cicadidae

Cacama sp.
Cornuplura curvispinosa (Davis, 1936)
Diceroprocta swalei (Distant, 1904)

Coreidae

Acanthocephala thomasi (Uhler, 1872)

Largidae

Largus californicus (Van Duzee, 1923)

Lygaeidae

Melacoryphus lateralis Dallas, 1852
Melanopleurus belfragei (Stål, 1874)

Nepidae

Ranatra quadridentata Stål, 1862

Pyrrhocoridae

Dysdercus bimaculatus (Stål, 1854)

Reduviidae

Apiomerus flaviventris Herrich-Schaeffer, 1846
Pselliopus zebra (Stål, 1862)
Rasahus biguttatus (Say, 1832)
Triatoma recurva (Stål, 1868)
Triatoma rubida (Uhler, 1894)

Scutelleridae

Pachycoris klugii (Burmeister, 1835)

HYMENOPTERA

Apidae

Xylocopa varipuncta Patton, 1879

Formicidae

Atta mexicana (Smith, 1858)
Camponotus cf. festinatus (Buckley, 1866)
Camponotus fragilis (Pergande, 1893)
Crematogaster dentinodis Forel, 1901
Forelius pruinosus (Roger, 1863)
Novomessor albisetosus (Mayr, 1886)
Pheidole obtusospinosa Pergande, 1896
Pheidole rhea Wheeler, 1908
Pheidole tepicana Pergande, 1896

Pogonomyrmex barbatus (Smith, 1858)

Mutillidae

Dasymutilla asteria Mickel, 1936
Dasymutilla cf. *digitopulchra* (Smith 1855)
Dasymutilla nogalensis Mickel, 1928
Dasymutilla vestita (Lepeletier, 1845)

Sphecidae

Sphex lucae de Saussure, 1867
Polistes comanchus de Saussure, 1857

LEPIDOPTERA (Heterocera)

Apatelodidae

Apatelodes pudefacta Dyar, 1904
Olceclostera seraphica (Dyar, 1906)

Cossidae

Morpheis clenchi Donahue, 1980

Crambidae

Achyra occidentalis Packard, 1873
Epipagis disparilis Dyar, 1910
Frechinia helianthiales (Murt., 1897)
Jativa castanealis (Hulst, 1886)
Lamprosema canacealis Walker, 1859
Loxostege albicerialis Grote, 1878
Mimoschinia rufofascialis (Stephens, 1834)
Palpita quadristigmalis Guenée, 1854
Petrophila jaliscalis Schaus, 1906
Psara obscuralis (Lederer, 1863)
Pyrausta augustalis (Felder & Rogenhofer, 1875)
Pyrausta aurea Butler, 1875
Terastia meticulosalis Guenée, 1854
Urola nivalis (Drury, 1773)

Erebidae

Apantesis incorrupta (Edwards, 1881)
Ascalapha odorata (Linnaeus, 1758)
Bruceia pulverina Neumoegen, 1893
Bulia deducta Morrison, 1874
Caenurgina erechtea Cramer, 1782
Callistege diagonalis Dyar, 1898
Celiptera valina Schaus, 1901
Cisthene tenuifascia Harvey, 1875
Crambidia cephalica Grote & Robinson, 1870
Ctenucha venosa Walker, 1884
Estigmene albida Stretch, 1874
Euchaetes antica Walker, 1856
uchaetes fusca Rothschild, 1910
Euchaetes zella Dyar, 1902
Focillidia texana Hampson 1913
Hemeroplanis historialis (Grote, 1882)
Heteranassa mima (Harvey 1876)
Hypercompe suffusa Schaus, 1889
Lesmone detrahens (Walker 1858)

Matigramma inopinata Franclemont, 1986
Melipotis indomita Walker 1857
Melipotis jucunda Hübner, 1818
Melipotis novanda Guenée, 1852
Melipotis perpendicularis Guenée, 1852
Obrima rinconada Scaus, 1894
Pseudohemihyalea edwardsi Packard, 1864
Pseudogyria versuta Harvey, 1875
Ptichodis ovalis Grote, 1883
Pygarctia roseicapitis Neumoegen & Dyar, 1893
Toxonprucha excavata Walker, 1865
Zale lunata Drury, 1770

Geometridae

Anacamptodes obliquaria Grote, 1883
Antepione imitata Edwards, 1884
Arcobara multilineata Hulst 1887
Chloraspilates bicoloraria arizonaria Grote, 1882
Chlorochlamys appellaria Pearsall, 1911
Cyclophora nanaria Walker, 1861
Dichordophora phoenix Prout, 1912
Eubarnesia ritaria Grossbeck, 1910
Eucaterva variaria Grote, 1882
Frederickia cyda (Druce, 1893)
Frederickia hypaethrata (Grote, 1881)
Frederickia s-signata (Packard, 1873)
Glaucina eupetheciaria Grote, 1883
Hydriomena chiricahuata Swett, 1909
Nemoria zelotes Ferguson, 1969
Pero flavisaria Grossbeck, 1906
Pero meskaria (Packard, 1876)
Pero radiosaria Hulst, 1886
Phaeoura cristifera Hulst, 1896
Philtraea elegantaria (Edwards, 1881)
Pigia multilineata Hulst, 1887
Pioneta ochreatea Ferris, 2010
Psamatodes abydata (Guenée, [1858])
Synchlora frondaria Guenée, 1857
Taeniogramma octolineata (Hulst, 1887)
Tornos erectarius Grossbeck, 1909

Lasiocampidae

Apotolype brevicrista Dyar, 1895
Malacosoma incurva Edwards, 1882

Limacodidae

Cryptophobetron oropeso Barnes, 1905

Megalopygidae

Norape sorpresa Wagner & Matson, 2022
Norape tenera (Druce, 1897)

Noctuidae

Acontia areli Strecker, 1898
Acontia quadriplaga Smith
Aleptina inca Dyar, 1902

Alypiodes bimaculata Herrich-Schäffer, 1853
Amyna stricta Walker, 1858
Anicla biformata Lafontaine 2004
Bagisara buxea Grote, 1881
Bagisara laverna Druce 1889
Bryolymnia mixta Lafontaine & Walsh, 2010
Cobubatha lixiva (Grote, 1882)
Emarginea percara (Morrison, 1875)
Euscirrhopterus gloveri Grote & Robinson, 1868
Euxoa auxiliaris (Grote, 1873)
Feltia subterranea (Fabricius, 1794)
Grotella tricolor Bernard, 1904
Helicoverpa zea (Boddie, 1850)
Hemibryomima chryselectra Grote, 1880
Hemieuxoa rudens Harvey, 1874
Hexorthodes accurata Edwards, 1882
Lacinipolia rodora Dyar, 1911
Lacinipolia strigicollis Wallengren, 1860
Lacinipolia triplehorni Selman & Leuschner, 2001
Leucania oxacana Schaus, 1898
Magusa divaricata Grote, 1874
Metaponpneumata rogenhoferi Möschler, 1890
Micrathetis triplex Walker, 1857
Neumoegenia poetica Grote, 1882
Ogdoconta moreno Barnes 1907
Oruza albocostaliata Packard, 1876
Oxycnemis advena Grote, 1882
Peridroma saucia (Hubner, 1808)
Ponometia acutus Smith, 1905
Ponometia candefacta (Hübner, 1831)
Ponometia clausula Grote, 1883
Ponometia phecolisca (Druce 1889)
Ponometia semiflava Guenee 1852
Ponometia septuosa Blanchard & Knudson 1986
Ponometia tripartita Smith, 1903
Ponometia venustula Walker, 1865
Properigea continens (Edwards, 1885)
Prothrinax luteomedia (Smith, 1907)
Spragueia dama Guenée, 1952
Spragueia funeralis Grote, 1881
Spragueia jaguaralis Hampson, 1910
Spragueia obatra (Morrison)
Tarache expolita (Grote, 1882)
Tarache geminocula Ferris & Lafontaine 2009
Tarache idella Barnes, 1905
Tarache lanceolata Grote, 1879
Tarache lucasi Smith, 1900
Tarache quadriplaga Smith 1900
Tripudia limbatus Edwards, 1881
Tripudia luxuriosa Smith, 1900

Notodontidae

Dasylopha seriata Druce, 1887
Datana perfusa Dyar, 1923
Heterocampa averna Barnes & McDunnough, 1910
Litodonta wymola (Barnes, 1905)

Notela jaliscana Schaus, 1901
Schizura biedermani Barnes & McDunnough, 1911

Psychidae

Oiketeticus townsendi Townsend, 1894

Saturniidae

Agapema anona Ottolengui, 1903
Agapema galbina Clemens, 1860
Anisota oslari Rothschild, 1907
Citheronia splendens Druce, 1886
Hemileuca junio Packard, 1872
Hemileuca tricolor Packard, 1872
Rothschildia cincta Tepper, 1882
Syssphinx hubbardi (Dyar, 1902)

Sphingidae

Agrius cingulata Fabricius, 1775
Erinnyis obscura (Fabricius, 1775)
Hyles lineata (Fabricius, 1775)
Manduca quinquemaculata (Haworth)
Manduca rustica (Fabricius, 1775)
Manduca sexta (Linnaeus, 1763)
Proserpinus terlooii Edwards, 1875

LEPIDOPTERA (Rhopalocera)

Hesperiidae

Atrytonopsis edwardsi Barnes & McDunnough, 1916
Burnsius albescens Plötz, 1884
Burnsius philetas (Edwards, 1881)
Cecropterus casica (Herrich-Schäffer, 1869)
Cecropterus dorantes (Stoll, 1790)
Celotes nessus (Edwards, 1877)
Cogia hippalus (Edwards, 1882)
Erynnis funeralis (Scudder & Burgess, 1870)
Lerodea eufala (Edwards, 1869)
Oarisma aurantiaca (Hewitson, 1868)
Oarisma minima (Edwards, 1870)
Pholisora catullus (Fabricius, 1793)
Staphylus ceos (Edwards, 1870)
Systasea zampa (Edwards, 1876)

Lycaenidae

Brephidium exile (Boisduval 1852)
Callophrys gryneus siva (Edwards, 1874)
Echinargus isola (Reakirt, 1867)
Hemiargus ceraunus (Fabricius, 1793)
Leptotes marina (Reakirt, 1868)
Ministrymon leda (Edwards, 1882)
Strymon istapa (Reakirt, 1867)
Strymon melinus Hübner, 1818

Nymphalidae

Anthanassa texana (Edwards, 1863)
Asterocampa leilia (Edwards, 1874)
Chlosyne lacinia (Geyer, 1837)

Danaus gilippus (Cramer, 1775)
Dione vanillae (Linnaeus, 1758)
Dymasia dymas (Edwards, 1877)
Junonia evarete (Cramer, 1779)
Danaus gilippus (Cramer, 1775)
Dione vanillae (Linnaeus, 1758)
Dymasia dymas (Edwards, 1877)
Junonia evarete (Cramer, 1779)
Libytheana carinenta (Cramer, 1777)
Microtia elva H. Bates, 1864
Vanessa cardui (Linnaeus, 1758)

Papilionidae

Battus philenor (Linnaeus, 1771)
Heraclides rumiko Shiraiwa & Grishin, 2014
Papilio multicaudata W.F. Kirby, 1884

Pieridae

Abaeis mexicana (Boisduval, 1836)
Nathalis iole Boisduval, 1836
Phoebis agarithe (Boisduval, 1836)
Phoebis sennae (Linnaeus, 1758)
Pontia protodice (Boisduval & LeConte, 1830)
Pyrisitia proterpia (Fabricius, 1775)
Zerene cesonia (Stoll, 1790)

Riodinidae

Apodemia hepburni Godman & Salvin, 1886
Apodemia mejicanus (Behr, 1865)
Apodemia palmerii (Edwards, 1870)
Calephelis nemesi (Edwards, 1871)

MANTODEA

Mantidae

Pseudovates arizonae Hebard, 1935
Stagmomantis californica Rehn & Hebard, 1909
Stagmomantis limbata (Hahn, 1835)
Asterocampa leilia (Edwards, 1874)
Chlosyne lacinia (Geyer, 1837)

MEGALOPTERA

Corydalidae

Corydalus texanus Banks, 1903

NEUROPTERA

Ascalaphidae

Ululodes mexicanus (McLachlan, 1871)

Mermeontidae

Vella fallax (Rambur, 1842)

ODONATA

Aeshnidae

Anax junius (Drury, 1773)

Coenagrionidae

Apanisagrion lais (Selys, 1876)
Argia anceps Garrison, 1996

Argia extranea (Hagen, 1861)
Argia hinei Kennedy, 1918
Argia nahuana Calvert, 1902
Argia pallens Calvert, 1902
Argia plana Calvert, 1902
Enallagma civile (Hagen, 1861)
Enallagma praevarum (Hagen, 1861)
Hesperagrion heterodoxum (Selys, 1868)
Telebasis salva (Hagen, 1861)

Lestidae

Archilestes grandis (Rambur, 1842)

Libellulidae

Dythemis maya Calvert, 1906
Erythrodiplax basifusca (Calvert, 1895)
Libellula saturata Uhler, 1857
Orthemis ferruginea (Fabricius, 1775)
Perithemis intensa Kirby, 1889
Pseudoleon superbus (Hagen, 1861)
Sympetrum corruptum (Hagen, 1861)

ORTHOPTERA

Acrididae

Acantherus piperatus Scudder & Cockerell, 1902
Arphia pseudonietana (Thomas, 1870)
Aztecacris gloriosa (Hebard, 1935)
Barytettix humphreysii (Thomas, 1875)
Conozoa carinata Rehn, 1907
Dactylotum bicolor Charpentier, 1843
Heliastus benjamini Caudell, 1905
Hippopedon gracilipes (Caudell, 1905)
Lactista azteca (Saussure, 1861)
Leprus wheeleri Saussure, 1888
Melanoplus differentialis (Thomas, 1865)
Melanoplus lakinus (Scudder, 1878)
Schistocerca albolineata (Thomas, 1875)
Schistocerca nitens (Thunberg, 1815)
Syrbula montezuma (Saussure, 1861)
Trimerotropis pallidipennis (Burmeister, 1838)

Gryllidae

Oecanthus cf. rileyi Baker, 1905

Myrceophilidae

Myrmecophilus manni Schimmer, 1911

Romaleidae

Brachystola magna (Girard, 1853)
Phrynotettix tshivavensis (Haldeman, 1852)
Taeniopoda eques (Burmeister, 1838)

Tettigoniidae

Insara elegans (Scudder, 1901)

PHASMATODEA

Diapheromeridae

Diapheromera arizonensis Caudell, 1903



Fig. 1. Cerro Picacho de Bacoachi towers over Rancho Las Playitas. Photo by Ana L. Reina-Guerrero.

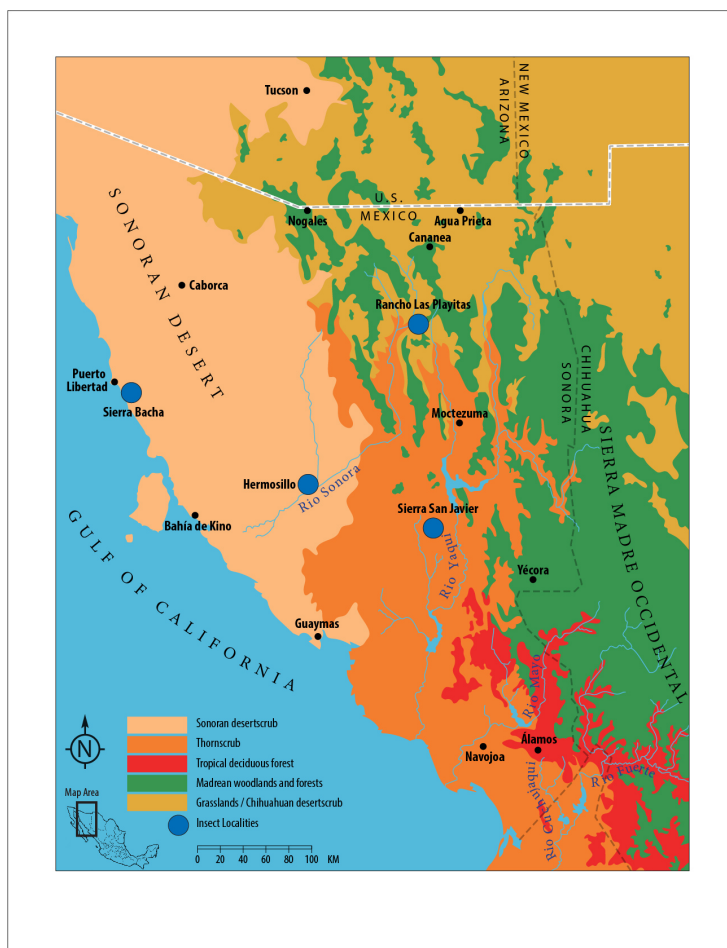


Fig. 2. Map of the Rancho Las Playitas and other insect faunas mentioned in the text. Based on Brown and Lowe (1978).

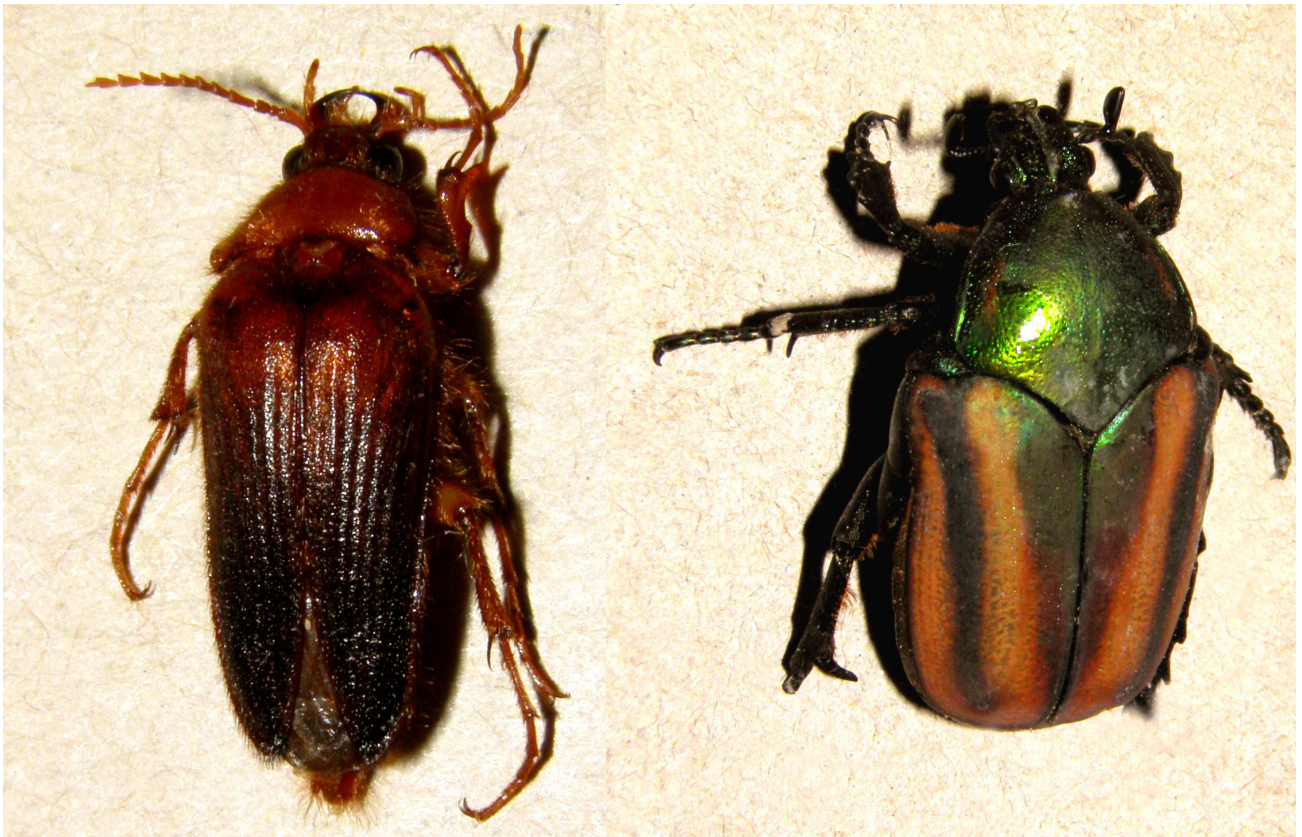


Fig. 3. Coleoptera. **A.** *Scaptolenus paltingi* (Elateridae). Rancho Las Playitas. **B.** *Cotinis sinitoc* (Scarabaeidae). Arroyo Las Padercitas. Photos by T. R. Van Devender.



Fig. 4. Hemiptera. **A.** *Apiomerus flaviventris* (Reduviidae). Arroyo Las Padercitas. Photo by Gertrudis Yanes-Arvayo. **B.** *Pachycoris klugii* (Scutelleridae). Rancho Las Playitas. Photo by Susan D. Carnahan.



Fig. 5. Lepidoptera (moths): **A.** *Morpheis clenchi* (Cossidae). Rancho Las Playitas. Photo by Susan D. Carnahan. **B.** *Philtraea elegantaria* (Geometridae). Arroyo Las Padercitas Photo by R. Wayne Van Devender.



Fig. 6. Lepidoptera (butterflies). **A.** *Asterocampa leilia* (Nymphalidae). **B.** *Oarisma aurantiaca* (Hesperiidae). Barranco Basaitequi. Photos by Guillermo Molina-Padilla.



Fig. 7. Mantodea (Mantidae). **A.** *Pseudovates arizonae*. **B.** *Stagmomantis californica*. Barranco Basaitequi. Photos by J. Gerardo Martínez-Valenzuela. and Guillermo Molina-Padilla.



Fig. 8. **A.** *Corydalus texanus* (Megaloptera: Corydalidae). Aguaje el Palmillalito. **B.** *Ululodes mexicanus* (Neuroptera: Ascalaphidae). Barranco Basaitequi. Photos by Guillermo Molina-Padilla.



Fig. 9. Odonata. **A.** *Archilestes grandis* (Lestidae). Aguaje el Palmillalito. Photo by Guillermo Molina-Padilla. **B.** *Argia anceps* (Coenagrionidae). Arroyo Cajón del Agua, Sierra Cucurpe. Photo by Doug Danforth.



Fig. 10. Orthoptera. **A.** *Aztecacris gloriosus* (Acrididae). Rancho Las Playitas. Photo by José Abel Salazar-Martínez. **B.** *Heliastus benjamini* (Acrididae). Barranco Basaitequi. Photo by Guillermo Molina-Padilla. **C.** *Oecanthus cf. rileyi* (Gryllidae). Rancho La Gotera. Photo by Hugo Silva-Kurumiya. **D.** *Phrynotettix tschivavensis*. (Romaleidae). Rancho Las Playitas. Photo by Susan D. Carnahan.