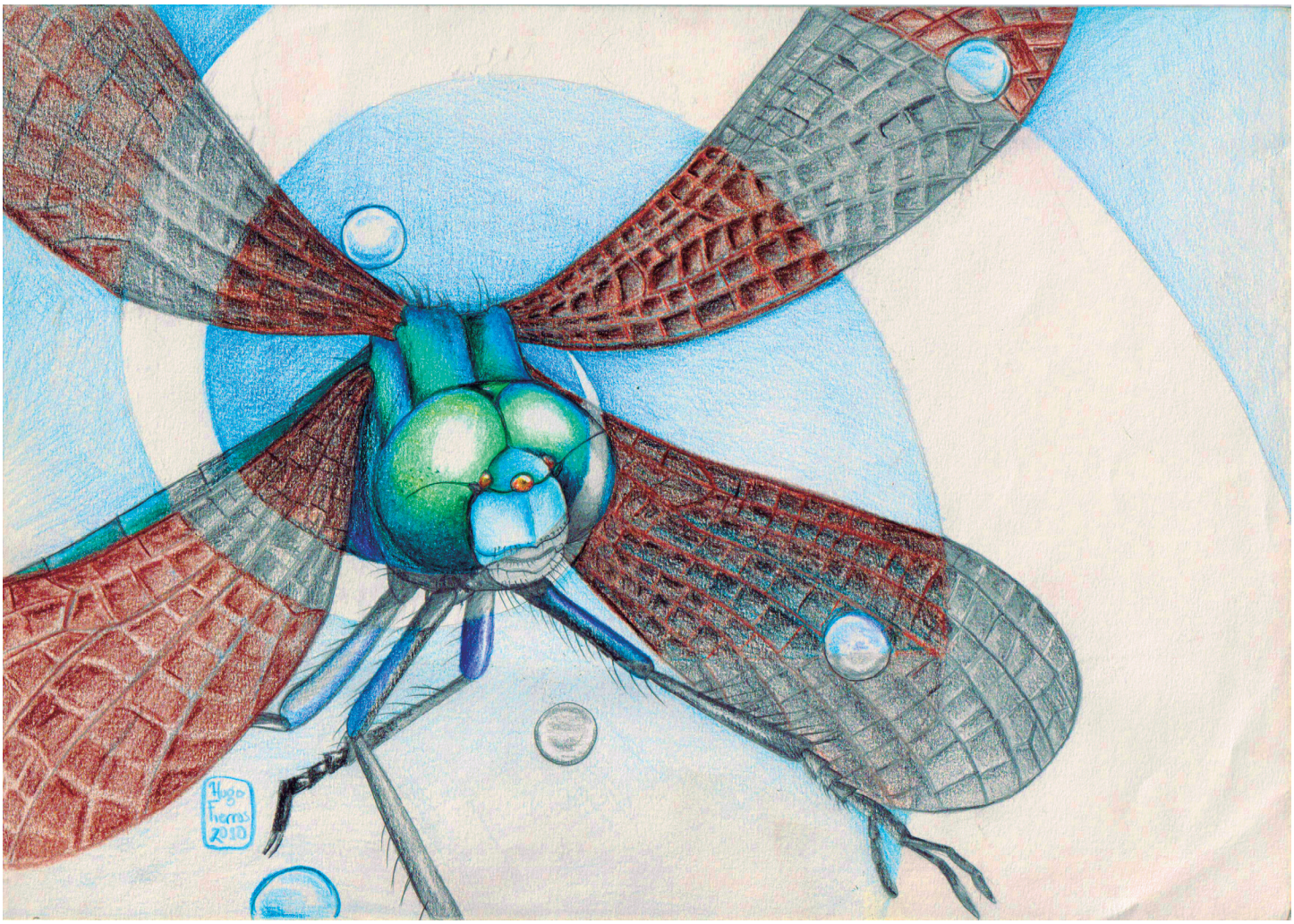

Dugesiana, Año 29, No. 2, (julio-diciembre, segundo semestre 2022), es una publicación semestral, editada por la Universidad de Guadalajara, a través del Centro de Estudios en Zoología, por el Centro Universitario de Ciencias Biológicas y Agropecuarias. Camino Ramón Padilla Sánchez # 2100, Nextipac, Zapopan, Jalisco, Tel. 37771150 ext. 33218, http://148.202.248.171/dugesiana/index.php/DUG/index, glenusmx@gmail.com. Editor responsable: José Luis Navarrete-Heredia. Reserva de Derechos al Uso Exclusivo 04-2009-062310115100-203, ISSN: 2007-9133, otorgados por el Instituto Nacional del Derecho de Autor. Responsable de la última actualización de este número: José Luis Navarrete-Heredia, Editor y Ana Laura González-Hernández, Asistente Editorial. Fecha de la última modificación 20 de julio de 2022.

Dugesiana 29(2): 171-179
Fecha de publicación: 20 julio 2022

ISSN 1405-4094 (edición impresa)
ISSN 2007-9133 (edición online)

Artículo
http://zoobank.org/A1599B78-8D12-4F4F-A1E9-451FE88AC2AF

Locusts and other pest grasshoppers (Orthoptera: Acrididae) on stamps

Las langostas y otros saltamontes plaga (Orthoptera: Acrididae) en las estampillas

Ricardo Mariño-Pérez
Department of Ecology and Evolutionary Biology, University of Michigan, 3600 Varsity Drive, 48108 Ann Arbor, MI, USA, ricmp@umich.edu; https://orcid.org/0000-0002-0566-1372

ABSTRACT

A comprehensive review of literature and online catalogues was conducted to present the diversity of locust and other pest grasshoppers (Orthoptera: Acrididae) on postal stamps. Fifty-one stamps (1961-2019) from 29 countries in four continents representing ten species are presented. Desert Locust, Red Locust and Migratory Locust are the true locust species depicted. Other seven pest grasshoppers were also recorded. African countries provide 80% of the stamps. Different elements present on the stamps such as life cycle, control methods for eradication, geographical correspondence and taxonomic issues are discussed.

Key words: Entomophilately, Cultural Entomology, Desert Locust, Red Locust, Migratory Locust, Bird Locust, Migratory Grasshopper.

RESUMEN

Se llevó a cabo una revisión exhaustiva de la literatura y de catálogos en línea para presentar la diversidad de langostas y otros saltamontes plaga (Orthoptera: Acrididae) en las estampillas postales. Se registraron cincuenta y un estampillas (1961-2019) de 29 países de cuatro continentes representando a diez especies. La langosta del desierto, la langosta roja y la langosta migratoria son las especies de langostas verdaderas presentes. Se registraron también otras siete especies de saltamontes plaga. Los países africanos aportan el 80% de las estampillas. Se discuten diferentes elementos presentes en las estampillas como el ciclo de vida, métodos de control para su erradicación, correspondencia geográfica y problemas taxonómicos.

Palabras clave: entomofilatelia, entomología cultural, langosta del desierto, langosta roja, langosta migratoria, langosta pájaro, saltamontes migratorio.

Philately is the activity of collecting postal stamps, being entomophilately the branch dedicated to insect-related stamps. The first stamp with an *insect* was issued in 1892 and since then, thousands have been circulated (Hamel 1990). *Insect* in terms of entomophilately refers to any terrestrial arthropods, including insects *sensu stricto* such as butterflies, beetles, bees, fleas, mosquitos, etc., but also groups such as spiders, ticks, myriapods, and terrestrial crustaceans. Some recent works treating certain groups include scorpions, dragonflies and damselflies, cockroaches, praying mantis, gaudy grasshoppers, beetles and scarabeids (Gómez y Junghans 2002, 2016, Gómez et al. 2015, Hernández-Baltazar y Gómez 2019, Kabourek 2017, López-Díaz y Gómez 2020, Mariño-Pérez 2020). In other cases, revisions per country have been made, such as for Cuba and Mexico (Mendoza et al. 2006, Reyes y Núñez 2008).

Locusts are a group of grasshoppers that are able to present a phenomenon called locust phase polyphenism. This is an extreme density-dependent phenotypic plasticity situation where cryptic and solitarious individuals can form dense migrating swarms by transforming into conspicuous gregarious individuals. This transformation is not only in color and behavior but also in morphology, reproductive physiology and biochemistry. The result is two phases, the solitarious (greenish individuals) and the gregarious (yellowish and reddish-orange individuals). Currently, there are seventeen species of grasshoppers that have been identified as expressing locust phase polyphenism and can be considered true locust species. They belong to six Acrididae subfamilies: Cyrtacanthacridinae, Oedipodinae, Calliptaminae, Gomphocerinae, Acridinae and Melanoplinae (Cigliano et al. 2022). There are also other non-locust species of grasshoppers in the above-mentioned subfamilies that occasionally aggregate, but without any change or phase as in the true locust species (Some of these non-locust species have common names such as Bird Locust but technically they do not qualify as true locusts). Both locust and non-locust grasshoppers have agricultural importance and cause great economic losses worldwide (COPR 1982, Song 2005).

The aim of this work is to compile the stamps with locust, other pest grasshoppers and activities related to their pest control.

MATERIAL AND METHODS

The basis of this work comes from Hamel (1991). This reference compiles information about all the stamps with

insect-related content up to 1990. The websites http://www.asahi-net.or.jp/~CH2M-NITU/indexe.htm, hipstamp.com and ebay.com provided valuable information, particularly for the subsequent years (1991-2021). The map from figure 4 was created using mapchart.net.

RESULTS

Fifty-one stamps from 29 countries in four continents representing ten species are presented. Even though a comprehensive review on the above-mentioned websites and the Atlas of Insects on stamps of the world (Hamel 1991) was conducted, there is the possibility that some stamps are missing. For instance, three stamps from Russia (1931; grasshopper), Eswatini (1985; grasshopper) and Japan (1986; locust) were included in the catalogue of Hamel (1991) but were not found online for further corroboration and evaluation. The stamp information is presented by chronological order with notes about country (current name first, other previous names after), name on stamp, other name given, monetary value, taxonomic identity (when possible), geographical correspondence, and previous references. All the stamps are presented in figures 1-3 in the same chronological order as in the text. In figure 1 from Afghanistan (1961) to Niger (1985). In figure 2 from Benin (1987) to Senegal (1996) and in figure 3 from Qatar (1998) to Liberia (2019).

1961. Afghanistan, *Schistocerca gregaria* (Forskål, 1775) (Desert Locust).
Value: 15 and 150 Puls.
Geographical correspondence: Yes, this species is distributed in Afghanistan.
Reference. p. 76 (Hamel 1991).

1963. Angola, *Nomadacris septemfasciata* (Serville, 1838) (Red Locust).
Other name given: gafanhoto vermelho.
Value: 2$50 Escudos.
15th anniversary of Red Locust control campaign 1948-1963.
Geographical correspondence: Yes, this species is distributed in Angola.
Reference. p. 64, 82 (Hamel 1991).

1963. Morocco [España IFNI], *Schistocerca gregaria* (Desert Locust).
Value: 50 cents.
Geographical correspondence: Yes, this species is distributed in Morocco.
Reference. p. 176 (Hamel 1991).

1964. Iran, *Schistocerca gregaria* (Desert Locust).
Value: 2 Rial.
Geographical correspondence: Yes, this species is distributed in Iran.
Reference. p. 178 (Hamel 1991).

1964. Mali, *Locusta migratoria migratorioides* (Reiche & Fairmaire, 1849) (African Migratory Locust).
Other name given: Criquet migrateur africain.
Value: 5, 10 and 20 Francs.
African Migratory Locust invasion area (1928-1942) and aerial treatment
Geographical correspondence: Yes, this subspecies is distributed in Mali.
Reference. p. 212 (Hamel 1991).

1969. Bhutan, *Locusta migratoria* (Linnaeus, 1758) (Migratory Locust).
Value: 10 Chetrum.
The stamp is in 3-D.
Geographical correspondence: Yes, this species is distributed in Bhutan.
Reference. p. 95 (Hamel 1991).

1969. Djibouti [AFARS & ISSAS], *Schistocerca gregaria* (Desert Locust).
Value: 15, 50 and 55 Francs.
Anti-Locust Campaign methods such as helicopter and plane spraying.
Geographical correspondence: Yes, this species is distributed in Djibouti.
Reference. p. 64, 75 (Hamel 1991).

1972. Zambia, *Nomadacris septemfasciata* (Red Locust).
Value: 25 Ngwee.
Zambia Conservation Year 1972.
Geographical correspondence: Yes, this species is distributed in Zambia.
Reference. p. 64, 305 (Hamel 1991).

1973. Rwanda, *Ornithacris cyanea imperialis* Rehn, 1943 (Bird Locust).
Value: 2 Francs.
Geographical correspondence: Yes, this subspecies is distributed in Rwanda.
Reference. p. 255 (Hamel 1991).

1978. Ivory Coast, (Criquet Rubané).
Value: 10 Francs
Geographical correspondence: The common name in French means “banded grasshopper” in English. This common name could be assigned to different members of Band-winged grasshoppers (subfamily Oedipodinae) such as *Oedipoda caerulescens* (Linnaeus, 1758) or *Acrotylus insubricus* (Scopoli, 1786) (none of them distributed in Ivory Coast). *A. insubricus* is frequently confused with *A. patruelis*, which is distributed in Ivory Coast.
Reference. p. 182 (Hamel 1991).

1979. Ivory Coast, *Locusta migratoria* (Migratory Locust).
Value: 65 Francs.

Geographical correspondence: Yes, this species is distributed in Ivory Coast.
Reference. p. 182 (Hamel 1991).

1981. Burkina Faso [RÉPUBLIQUE DE HAUTE-VOLTA], *Locusta migratoria* (Migratory Locust).
Value: 65 Francs.
Geographical correspondence: Yes, this species is distributed in Burkina Faso.
Reference. p. 297 (Hamel 1991).

1984. Portugal, Four Locusts
Value: 16 Escudos.
Four Locusts on ceramic tile from XIX Century by R. Bordallo Pinheiro.
Geographical correspondence: N/A.
Reference. p. 247 (Hamel 1991).

1985. Niger, *Oedaleus* sp.
Value: 85 Francs.
Geographical correspondence: Two species of the genus are known to cause agricultural damage in Niger, *Oedaleus nigeriensis* Uvarov, 1926 and *O. senegalensis* (Krauss, 1877).
Reference. p. 232 (Hamel 1991).

1987. Benin, *Locusta migratoria* (Migratory Locust).
Value: 100 Francs.
Campaign against Migratory Locust.
Geographical correspondence: Yes, this species is distributed in Benin.
Reference. p. 93 (Hamel 1991).

1988. Cabo Verde, Locust.
Value: 16 Escudos.
Geographical correspondence: N/A.
Reference. p. 107 (Hamel 1991).

1988. Eswatini [Swaziland], *Nomadacris septemfasciata* (Red Locust).
Value: 2 Emalangeni.
Geographical correspondence: Yes, this species is distributed in Eswatini.
Reference. p. 276 (Hamel 1991).

1988. Mauritania, *Schistocerca gregaria* (Desert Locust).
Other name given: Criquets pèlerins.
Value: 5, 20, 24, 40 and 88 UM.
Geographical correspondence: Yes, this species is distributed in Mauritania.
Reference. p. 216 (Hamel 1991).

1989. Algeria, *Schistocerca gregaria* (Desert Locust).
Value: 1 Dinar.
Geographical correspondence: Yes, this species is distributed in Algeria.
Reference. p. 81 (Hamel 1991).

1989. Niger, *Schistocerca gregaria* (Desert Locust).
Other name given: Criquet pèlerin.
Value: 85 Francs.
Geographical correspondence: Yes, this species is distributed in Niger.
Reference. p. 232 (Hamel 1991).

1991. Malawi, *Nomadacris septemfasciata* (Red Locust).
Value: 20 Tambala.
Geographical correspondence: Yes, this species is distributed in Malawi.

1994. Mali, *Locusta migratoria* (Migratory Locust).
Other name given: Criquet migrateur.
Value: 240 Francs.
Geographical correspondence: Yes, this species is distributed in Mali.

1994. Mali, *Kraussaria anguilifera* (Krauss, 1877).
Value: 200 Francs.
Geographical correspondence: Yes, this species is distributed in Mali.

1996. Burkina Faso, *Locusta migratoria* (Migratory Locust).
Other name given: Criquet migrateur.
Value: 25, 75 and 250 Francs.
Geographical correspondence: Yes, this species is distributed in Burkina Faso.

1996. Senegal, *Schistocerca gregaria* (Desert Locust).
Other name given: Criquet pèlerin.
Value: 75 Francs.
Geographical correspondence: Yes, this species is distributed in Senegal.

1998. Qatar, *Locusta migratoria* (Migratory Locust).
Value: 2 Riyals.
Geographical correspondence: Yes, this species is distributed in Qatar.

2000. Niger, *Schistocerca gregaria* (Desert Locust).
Value: 200 Francs.
Geographical correspondence: Yes, this species is distributed in Niger.

2002. Dominica, *Melanoplus sanguinipes* (Fabricius, 1798) [*M. mexicanus* (Saussure, 1861)] (Migratory Grasshopper).
Value: 1.50 Eastern Caribbean dollar.
Geographical correspondence: No, this species is only found in North America.

2002. Grenada, *Melanoplus sanguinipes* [*M. mexicanus*] (Migratory Grasshopper).

Value: 1.50 Eastern Caribbean dollar.
Geographical correspondence: No, this species is only found in North America.

2005. Eswatini [Swaziland], *Locusta migratoria migratoria* [*Schistocerca solitaria*] (Migratory Locust).
Other name given: Lidziya.
Value: 85 cents.
Geographical correspondence: No, this subspecies is not distributed in Eswatini.

2005. Eswatini [Swaziland], *Nomadacris septemfasciata* (Red Locust).
Other name given: Ingwelebovu.
Value: 1.10 Emalangeni.
Geographical correspondence: Yes, this species is distributed in Eswatini.

2005. Eswatini [Swaziland], *Schistocerca gregaria flaviventris* (Burmeister, 1838) (Southern African Desert Locust).
Other name given: Libhulamdzaka.
Value: 2.45 Emalangeni.
Geographical correspondence: Yes, this subspecies is distributed in Eswatini.

2005. Eswatini [Swaziland], *Locusta migratoria migratorioides* (African Migratory Locust).
Other name given: Liboni.
Value: 3.35 Emalangeni
Geographical correspondence: Yes, this subspecies is distributed in Eswatini.

2007. Malaysia, *Valanga nigricornis* (Burmeister, 1838) (Javanese Bird Grasshopper).
Other name given: Belalang kunyit.
Value: 50 sen.
Geographical correspondence: Yes, this species is distributed in Malaysia.

2008. Ascension Island, *Schistocerca gregaria* (Desert Locust).
Value: 30 pence.
Geographical correspondence: Yes, the subspecies *Schistocerca gregaria flaviventris* occurs in Ascension Island.

2009. DPR Korea, *Locusta migratoria* (Migratory Locust).
Value: 120 Won.
Geographical correspondence: Yes, this species is distributed in DPR Korea.

2011. Tanzania, *Locusta migratoria* (Migratory Locust).
Value: 700 shillings.
Geographical correspondence: Yes, the species is distributed in Tanzania.

2011. Tanzania, *Nomadacris septemfasciata* (Red Locust).
Value: 900 shillings.
Geographical correspondence: Yes, the species is distributed in Tanzania.

2013. Uruguay, *Borellia bruneri* (Rehn, 1906) (Langosta criolla o Tucura).
Value: 15 Pesos.
Geographical correspondence: Yes, this species is distributed in Uruguay.

2019. Liberia, *Locusta migratoria* (Migratory Locust).
Value: 300 Liberian dollars.
Geographical correspondence: Yes, this species is distributed in Liberia.

DISCUSSION

The three true locust species depicted in stamps are *Schistocerca gregaria* (Desert Locust), *Nomadacris septemfasciata* (Red Locust) both in subfamily Cyrtacanthacridinae and *Locusta migratoria* (Migratory Locust), subfamily Oedipodinae. The non-locust species depicted are *Ornithacris cyanea imperialis* (Bird Locust), *Valanga nigricornis* (Javanese Bird Grasshopper) and *Kraussaria anguilifera* (Cyrtacanthacridinae). *Oedaleus* sp. (Oedipodinae), *Melanoplus sanguinipes* (Migratory Grasshopper) (Melanoplinae), and *Borellia bruneri* (Langosta criolla o Tucura) (Gomphocerinae).

The country of origin of the stamps reflects well where the most damaging plagues occur. Forty-one stamps are from Africa (80%), 6 from Asia (12%), 3 from the Americas (6%) and one from Europe (2%). Twenty-three out of 29 countries only have one stamp. Tanzania and Afghanistan have two stamps, Niger has three stamps, Burkina Faso and Mali have four stamps and Eswatini has five stamps (figure 4). There has not been a decade since 1960's without the presence of locust and other pest grasshoppers (figure 5). These results are similar to the ones found by Mariño-Pérez (2020) with other Orthoptera family, Pyrgomorphidae.

Different stages are illustrated such as eggs (Mauritania 1988, Ascension Island 2008), nymphs (Ivory Coast 1979, Burkina Faso 1996, Niger 2000, Ascension Island 2008), entire life cycle (Mauritania 1988). Also, other behavior such as oviposition (Mauritania 1988, Burkina Faso 1996) and locusts in action devastating crops are shown (Zambia 1972, Benin 1987). Even swarms are represented (Niger 1989).

Different methods of locust control are shown such as fumigation by plane (Mali 1964, Djibouti 1969, Algeria 1989), by helicopter (Djibouti 1969), by truck (Algeria 1989), by hand (Benin 1987). Some historical events are illustrated such as 15th anniversary of the Locust Campaign against Red Locust (Angola 1963) and the African Migratory Locust Invasion from 1928-1942 (Mali 1964).

There are few geographical errors but the great majority of the species depicted in the stamps are present in the respective country that issued them. The major mistakes were found on the Dominica and Grenada 2002 stamps, both countries in the Caribbean. The grasshopper depicted is not distributed in the Caribbean, only in Canada, United States and Mexico. Additionally, the scientific name is incorrect. The Migratory Grasshopper is named *Melanoplus mexicanus* when it should be *M. sanguinipes*. This error is common due to the fact that *M. sanguinipes* has been widely misidentified as *M. mexicanus* and is likely to be the species recorded under that name as causing severe damage to crops in Mexico (COPR 1982). It is curious as well that the same figure is used in both stamps (only inclined 45 degrees in Grenada stamp). Another error was in the Eswatini 2005 stamp where the subspecies mentioned (*Locusta migratoria migratoria*) is not distributed there (only in the Northern Hemisphere), the correct subspecies present there is *Locusta migratoria migratorioides*. Two stamps (Dominica 2002 and Ascension Island 2008) are divided in two parts; the first one has perforations to split apart.

Regarding taxonomical errors, on Eswatini 2005 stamp, the name *Schistocerca solitaria* is incorrect, being the correct one *Locusta migratoria migratoria.* On Niger 1989 and on both Tanzania 2011 stamps, the specific names of the scientific names start with capital letter (Gregaria, Migratoria and Septemfasciata) when only the genus name must start with capital letter (to show hierarchy between genus and species). On Niger 2000 stamp, there is a mistake (*Schistocera*) instead of *Schistocerca*. In multiple cases, the genus and specific names are not written in italics (or other contrasting typeface) to distinguish the name from surrounding text, as the International Commission on Zoological Nomenclature requires.

Not all the stamps are cancelled by the correspondent Postal Organization of the countries, especially in the recent years. However, the objective of this article is not to evaluate the legitimacy of the stamps but to compile them to analyze the species present and methods of pest control. Some countries produce stamps for collectors and never were utilized for postal purposes.

Recibido: 25 de febrero 2022
Aceptado: 11 de mayo 2022

LITERATURE CITED

Cigliano, M.M., H. Braun, D.C. Eades and D. Otte. 2022. Orthoptera Species File. Version 5.0/5.0. http://Orthoptera.SpeciesFile.org. Fecha de consulta: 2 de febrero de 2022.

Centre for Overseas Pest Research. 1982. *The locust and grasshopper agricultural manual*. London, UK: Overseas Pest Research.

Gómez, B. y C. Junghans. 2002. Los Scarabaeoidea (Insecta: Coleoptera) en la filatelia. *Cuadernos de Biodiversidad*, (11): 10-14.

Gómez, B. y C. Junghans. 2016. Los alacranes (Arachnida: Scorpionida) en la filatelia. *Dugesiana*, 23(1): 37-43.

Gómez, B., M.R. Domínguez y C. Junghans. 2015. Las cucarachas (Blattodea) representadas en los sellos postales (entomofilatelia). (pp.77-82). In: Castaño-Meneses, G. y J.L. Navarrete-Heredia (Eds.). *Avances en la entomología cultural mexicana*. UNAM-CUCBA-Universidad de Guadalajara.

Hamel, D.R. 1990. Insects on stamps. *American Entomologist*, 36(4): 273-281.

Hamel, D.R. 1991. *Atlas of Insects on Stamps of the World*. Tico Press, Falls Church. Virginia, Estados Unidos.

Hernández-Baltazar, E. y B. Gómez. 2019. Los Mantodea en la filatelia (Insecta: Dictyoptera). *Dugesiana*, 26(2): 71-76.

Kabourek, V. 2017. Beetles on Stamps. *Ethnoentomology,* 1(1): 52-72.

López-Díaz, J.A. y B. Gómez. 2020. Los Odonata (Insecta) en la entomofilatelia. *Dugesiana,* 27(1): 3-10.

Mariño-Pérez, R. 2020. Gaudy grasshoppers (Orthoptera: Pyrgomorphidae) on stamps. *Metaleptea,* 40(1): 30-35.

Mendoza, M., I. Pacheco, M.A. Sarmiento y M.L. Zurita. 2006. Entomofilatelia en México: un tributo a la amistad de los insectos. *Boletín de la Sociedad Entomológica Aragonesa*, (38): 443-449.

Reyes, E. y R. Núñez. 2008. La entomología en la filatelia cubana. *Boletín Sociedad Entomológica Aragonesa*, (43): 459-462.

Song, H. 2005. Phylogenetic perspectives on the evolution of locust phase polyphenism. *Journal of Orthoptera Research*, 14(2): 235-245.

Figure 1. Stamps from Afghanistan (1961) to Niger (1985).

Figure 2. Stamps from Benin (1987) to Senegal (1996).

Figure 3. Stamps from Qatar (1998) to Liberia (2019).

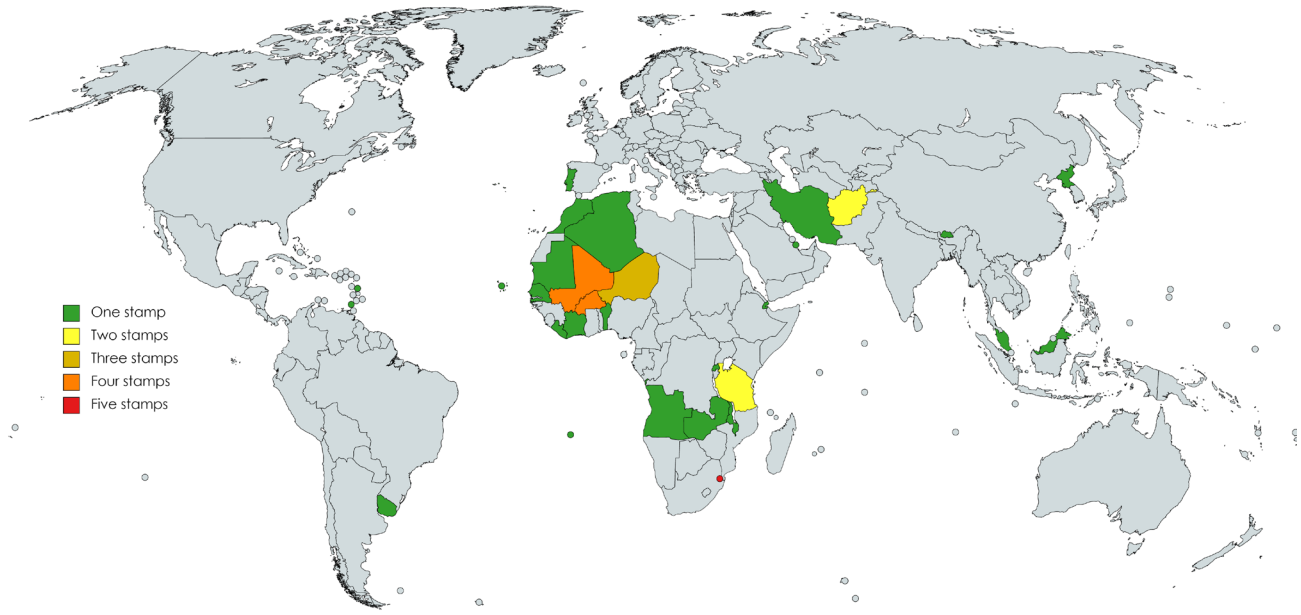

Figure 4. Locust and other pest grasshoppers stamps richness per country. Created with mapchart.net®.

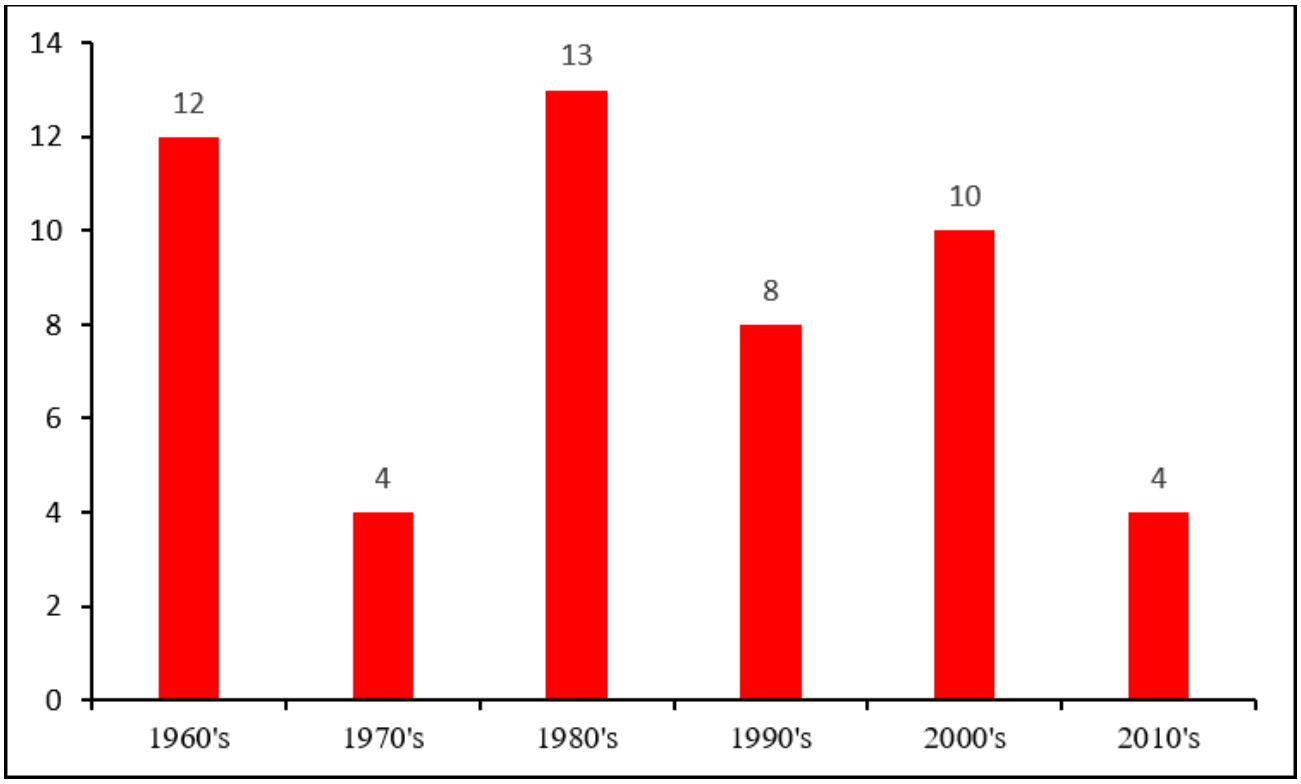

Figure 5. Number of stamps with locusts and other pest grasshoppers by decade.