Global distribution of the date stone beetle, *Coccotrypes dactyliperda* (Coleoptera: Curculionidae, Scolytinae)

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**ABSTRACT.** The paper presents a compilation of the documented occurrence of the date stone beetle *Coccotrypes dactyliperda* across the globe. The data presented here have been compiled based on an exhaustive search of academic journal databases, collections presented in research portals and digitised holdings of national libraries. A visualisation of the global distribution shows that the presence of *Coccotrypes dactyliperda* is circumscribed by climatic factors.

**Key words:** biogeography, historic ecology, palm

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**Introduction**

The date stone beetle, *Coccotrypes dactyliperda* (Fabricius, 1801) is a is a cryptic spermatophagus beetle of the Curculionidae family (Coleoptera: Curculionidae: Scolytinae: Dryocoetini), which was originally endemic to the Middle East where it was associated with the date palm horticultural complex. After emergence from hibernation, the first generation of female beetles to leave the brood chamber emerges during late July/early August and attacks green drupes of the date palm (*Phoenix dactylifera*), causing the bulk of these to abscise one to two days later. The species also predates the seeds of fallen dates, often after the pericarp has been consumed by other animals, such as rodents. This continues until August, when a second generation emerges from the seeds. The rate of abscission varies, but when the infructescences are not protected from beetle attack by chemical or physical (bags) means, production losses usually range between 20 and 40%. *Coccotrypes dactyliperda* feeds the albumen in the seeds of a wide range of palm species. It has been documented to feed on other seeds as well but oviposition does not occur (for a review of the biology and ecology of the species see Spennemann, 2019a).

Following an unexpected mass emergence of *Coccotrypes dactyliperda* in a germination experiment of animal dispersed *Phoenix canariensis* seeds (Spennemann et al., 2018), it was necessary to carry out background research on the biology and ecology of that beetle species (Spennemann, 2019a). In the process it
became clear that the species had attained a global distribution with humans as vectors. Dispersal occurred primarily in the form of date fruits for consumption, as seeds for horticultural endeavours and as vegetable ivory for button manufacture. While numerous sources made reference to the ‘cosmopolitan’ nature of the species, a systematic documentation of its distribution was conspicuously absent.

**Material and methods**

This brief study collates and places on record the documented occurrence of *Coccotrypes dactyliperda* across the globe. The data compiled here are based on a systematic search of academic journal databases, such as Primo, Scopus, GoogleScholar, systematic searches of Google as well as full-text searches of research portals, such as the Biodiversity Heritage Library (2018) and digitised holdings of national libraries, such as *Gallica* maintained by the Bibliothèque nationale de France (2018), or *Trove* maintained by the National Library of Australia (2018). Search terms were both formal (i.e. “dactyliperda + country”) and informal (“common name + country”), whereby care was exercised to use both current and past country names (e.g. Sri Lanka and Ceylon, Myanmar and Burma, etc.).

In the literature the beetle is often addressed under its common names, i.e. ‘date stone beetle,’ ‘date stone weevil,’ ‘palm seed borer,’ ‘Dattelkernborkenkäfer,’ ‘charançon des noyaux de dates,’ ‘scolyte des dates,’ ‘tomique du dattier’ and ‘palmzaadkever.’ In addition, given its proclivity to also infest palm seeds that were sources of vegetable ivory used for button manufacture, the species is also known as ‘(ivory) button beetle’ and ‘Steinnusskäfer’.

As it is not possible in a compilation such as this to re-verify each original identification, and thus relies on the accuracy of the original source, it must be noted that the species identification of the instances compiled in Table 1 must be read *cum grano salis*.

**Terminology**

The status of the species in the various countries (Table 1) has been classified as follows. ‘naturalised’ are observations where the *Coccotrypes dactyliperda* have established breeding populations outside their endemic range and in the natural environment. Classified as ‘introduced’ are observations where *Coccotrypes dactyliperda* have been recorded as arriving in a given country, but where the beetles cannot establish breeding populations outside environmentally controlled environments (such laboratories, greenhouses of nurseries and store/ware houses).

**Results**

The systematic literature review yielded 238 references that refer to the presence of *Coccotrypes dactyliperda*. The compilation comprises of 214 locational entries (Table 1) in 104 countries (Table 2). The beetle can be found on all continents bar Antarctica.

**Discussion**

When considering the publications chronologically, the identification and descriptive effort showed a steady increase on a decadal basis, with the effort significantly expanding in the past two decades (Figure 1). The descriptive effort changed its geographic focus over time, concurrent with increased opportunity to work outside Europe. In the nineteenth century the overwhelming majority were reports derived from European locations (Table 2). During the twentieth century the effort expanded globally.

When considering the data geographically, we note a high number of
records the areas where the beetle is endemic with every country represented, followed by a high representation in Europe (both naturalised and introduced) and Central and Southern Africa (naturalised). Other regions are less well represented (Table 3).

The documented records of the global distribution (Table 1) have been mapped in Figure 2. Plotted is the representation by country, and where available, at a state or provincial level. This visualisation shows that the presence of *Coccotrypes dactyliperda* is circumscribed by climatic factors. The contiguous nature of the area where it has been documented archaeologically (e.g. Costantini & Audisio, 2000; Panagiotakopulu et al., 2010) and where it can be regarded as endemic is evident. There are also clear zones both to the north and south where the species has become naturalised, as well as peripheral zones where it is on record as introduced by where it does not thrive (Table 1). These zones are circumscribed by both temperatures, in particular frost, and by humidity. A number of peripheral areas, in particular in Africa south of the Sahara (i.e. Mauritania, Mali, Niger and Chad) currently lack positive records of the beetle’s presence. While given the comparative dryness in most areas this may reflect reality, it is more likely due to a lack of comprehensive research.

*Coccotrypes dactyliperda*, while originally associated with the true date palm *Phoenix dactylifera*, readily infests the Canary Islands date palm, *P. canariensis*. The nineteenth and early twentieth century horticultural trade in this palm as an ornamental species in private and public spaces (Spennemann, 2018a, 2019b; Zona, 2008), led to a global distribution in all subtropical, temperate zones of the world (Spennemann, 2018b). This it is likely that *C. dactyliperda* will have also distributed as part of that trade.

| Country | Status | Comments and References |
|---------|--------|-------------------------|
| **North Africa** | | |
| Algeria | endemic | (Anonymous, 1846; Lucas, 1849); et seq. (Decaux, 1890; Fleutiaux, 1901) El-Kala (Lucas, 1846) various oases (Balachowsky, 1949) |
| Egypt | endemic | (Attia & Kamel, 1965; Boraei, 1994; Gentry, 1965; Mostafa et al., 2017) Alexandria (in dum nut buttons) (Schedl, 1959) Nile Delta (in dates) (Donia et al., 2002) northern Sinai (El-Sherif et al., 1998) Siwa Oasis, 1935 (Schedl, 1950) Sharkia (Willcocks, 1913 [1914]) El-Bahria Oasis (Ali et al., 2002, 2003) |
| Libya | endemic | (significant pest: Gentry, 1965) |
Table 1. Continued

| Country         | Status       | Comments and References                                                                 |
|-----------------|--------------|-----------------------------------------------------------------------------------------|
| Bengasi         | endemic      | (Scaëtta, 1926); 1922 Bengasi (Gridelli, 1930)                                          |
| Zanzur Coastal Oasis | endemic     | Martin, 1958                                                                            |
| Tripoli Coastal Oasis | endemic     | Martin, 1958                                                                            |
| Tagiura Coastal Oasis | endemic     | Martin, 1958                                                                            |
| Latrun Coastal Oasis | endemic     | Martin, 1958                                                                            |
| Ras el Hilal Coastal Oasis | endemic     | Martin, 1958                                                                            |
| Morocco         | endemic      | (Ait-Oubahou & Yahia, 1999)                                                             |
| Faroudant       |              | (Schedl, 1971)                                                                          |
| Sudan           | endemic      | (Schedl, 1948)                                                                          |
| Khartoum        |              | (Gredler, 1877)                                                                         |
| Tunisia         | endemic      | (Anonymous, 1846) et seq. (Decaux, 1890; Macquardt, 1852; MEDD, 2009)                   |
| Djerba          |              | (Balachowsky, 1949)                                                                     |
| Middle East     |              |                                                                                         |
| Iran            | endemic      | (Latifian, 2016) not listed: (Shafiean, 2017)                                            |
| Iraq            | endemic      | (Bureau of Entomology and Plant Quarantine, 1950)                                        |
| Israel          | endemic      | (Bodenheimer, 1937) et seq. (Gentry, 1965; Zchori-Fein et al., 2006)                    |
|                 |              | Lake Kinneret (Schedl, 1969)                                                            |
|                 |              | Bet She’an Valley (Bar-Shalom & Mendel, 2001); in stored dates (uncommon occurrence)   |
|                 |              | (Donahaye & Calderon, 1964)                                                             |
|                 |              | Upper Jordan Valley (Kehat et al., 1974)                                                |
| Jordan          | endemic      | (Mashal & Albeidat, 2006); reputedly absent in the Southern Jordan Valley (Al Antary et al., 2015; Bar-Shalom & Mendel, 2001; Kehat et al., 1976) |
| Lebanon         | endemic?     | presumed endemic, no references found                                                    |
| Syria           | endemic?     | presumed endemic, but reputedly non-existent: (Syrian Government, 2009); not reported in Hussain (1974). |
| Oman            | endemic      | (Elwan, 2000)                                                                           |
| Palestine       | endemic      | Gaza Strip (Bar-Shalom & Mendel, 2001; Radwan, 2017), present                           |
|                 |              | West Bank (Bar-Shalom & Mendel, 2001; Kehat et al., 1976) reputedly absent in the Southern Jordan Valley |
| Saudi Arabia    | endemic      | (Al Dhafer & Alayeid, 2014; Belala et al., 1999; Hammad et al., 1981)                    |
| Central and Southern Africa |              |                                                                                         |
| Cameroon        | naturalised  | (Schaufuss, 1905)                                                                       |
| Djibouti        | naturalised  | (Fairmaire, 1892)                                                                       |
Table 1. Continued

| Country       | Status   | Comments and References                                |
|---------------|----------|-------------------------------------------------------|
| Equatorial Guinea | naturalised       | (Hagstrum & Subramanyam, 2009)                         |
| Eritrea       | naturalised   | ca 1907 (Del Guercio, 1919) et seq. (Abate, 1988)     |
| Ethiopia      | naturalised   | (Azerefgne et al., 2009)                              |
| Kenya         | naturalised   | coastal strip (Gardner, 1957)                         |
| Liberia       | naturalised   | (Bureau of Entomology and Plant Quarantine, 1928)     |
| Madagascar    | naturalised   | (Schedl, 1961, 1977)                                  |
| Malawi        | naturalised   | (Hagstrum & Subramanyam, 2016)                        |
| Mauritius     | naturalised   | (Schedl, 1961)                                       |
| Mozambique    | naturalised   | (Schedl, 1961)                                       |
| Nigeria       | naturalised   | (Aisagbonhi, 1988)                                   |
| Senegal       | naturalised   | (Schedl, 1961)                                       |
| Seychelles    | naturalised   | (Schedl, 1977) Mahé (Beaver, 1987b; Pelsue & O’Brien, 2009) |
| Sierra Leone  | naturalised   | (Hagstrum & Subramanyam, 2016)                        |
| Somalia       | naturalised   | ca 1907 (Del Guercio, 1919)                           |
| South Africa  | introduced    | (Schedl, 1957)                                       |
|               | naturalised   | Durban, Natal (Van der Merwe, 1921, 1923) in buttons, but self-sustaining |
|               |               | Port Elizabeth (Van der Merwe, 1921) in buttons       |
|               |               | Pretoria, Transvaal 1915 (Schedl, 1961) origin not specified |
|               |               | Kelly Hill, KwaZulu-Natal (Schedl, 1961) origin not specified |
| Tanzania      | naturalised   | (Hagedorn, 1913)                                     |
|               |               | Tanga 1918 (Schedl, 1959)                             |
| Uganda        | naturalised   | (Hargreaves, 1922)                                   |
|               |               | Kampala 1932 (Schedl, 1959)                           |
| Europe        |            |                                                        |
| Austria       | introduced    | (Reitter, 1894; Sturm, 1826);                        |
|               |               | Kärnten (Pacher, 1853)                                |
|               |               | Oberösterreich, found in imported dates (Dalla Torre von Thunberg-Sternhoff, 1880; Schilsky, 1889) |
|               |               | Niederösterreich, found in imported dates but not naturalised (Wichmann, 1927) |
|               |               | Vienna found in imported dates but not naturalised (Wichmann, 1927, 1955); rare (Redtenbacher, 1874) |
|               |               | South Tyrol 1873 (Gredler, 1873; Targioni Tozzetti, 1874) |
| Belgium       | introduced    | (Lameere, 1900)                                      |
|               |               | Namur (Vreurick, 1910)                               |
|               |               | Liege (Eichhoff, 1879)                               |
Table 1. Continued

| Country         | Status       | Comments and References                                                                                                                                 |
|-----------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Croatia         | introduced   | Zagreb and Rijeka, in imported dates but not naturalised (Ernö, 1922; Langhoffer, 1915a, 1915b)                                                        |
| Cyprus          | naturalised  | (Gentry, 1965)                                                                                                                                          |
| Czech Republic  | introduced   | 1824 (Opiz, 1824); <1900 (Sečrová & Laštůvka, 2005)                                                                                                    |
| Denmark         | introduced   | Copenhagen, in imported dates and betel nuts 1877, (Lovendal, 1889; Lovendal, 1898) (Hansen, 1956)                                                  |
| England         | introduced   | (Duff, 2012); (Wakely, 1943) in dates; Middlesex Oct 1920 (Ashby, 1941); Glamorgan, Wales (Tomlin, 1935)                                                                                   |
| France          | introduced   | (Fleutiaux, 1901; Grenier, 1863; Vérard & Joly, 1852)                                                                                                    |
|                 | naturalised  | Paris in dates 1803 (Latreille, 1803) et seq. (Boitard, 1828, 1834; Dejean, 1837; Latreille, 1825; Rengade, 1866)                             |
|                 |              | Alsace, in date seeds, rare (Wencker & Silbermann, 1866)                                                                                                 |
|                 |              | Bordeaux, in dates (Commission Entomologique, 1853)                                                                                                     |
|                 |              | Lyon, in date seeds (Locard, 1877; Rey, 1892)                                                                                                             |
|                 |              | Reims, in date seeds (Warnier, 1895) (offered for swap)                                                                                                |
|                 |              | Seine-Inférieure, in date seeds, common (Mocquerys, 1857)                                                                                               |
|                 |              | (Dechaux, 1890)                                                                                                                                                                                                |
|                 |              | coast of the Mediterranean, very common (Balachowsky, 1949); Marseille (de Boissy, 1921)                                                                  |
|                 |              | South-West (Balachowsky, 1949)                                                                                                                              |
|                 |              | Midi (de Boissy, 1921)                                                                                                                                    |
|                 |              | Brittany (Balachowsky, 1949)                                                                                                                                |
|                 |              | Corsica (Balachowsky, 1949) acclimatized, very common                                                                                                      |
| Germany         | introduced   | (Bureau of Entomology and Plant Quarantine, 1933)                                                                                                        |
|                 |              | Bavaria (Kittel, 1883)                                                                                                                                 |
|                 |              | Silesia, Breslau 1838 (Letzner, 1840), 1877 (Rudel, 1877)                                                                                                 |
|                 |              | Thuringia, Erfurt (Hubenthal, 1926)                                                                                                                        |
|                 |              | Hamburg (Hagedorn, 1904) et seq. (Weidner, 1964)                                                                                                           |
|                 |              | Rhineland (Bach, 1854)                                                                                                                                 |
| Gibraltar       | naturalised  | (Perez & Bensusan, 2017)                                                                                                                                   |
| Greece          | naturalised  | (Vassilaina-Alexopoulou et al., 1986)                                                                                                                        |
|                 |              | Crete (Hellrigl, 2002) acclimatised                                                                                                                                 |
| Hungary         | naturalised  | (György & Podlussány, 2005)                                                                                                                                 |
| Iceland         | introduced   | (Comparini et al., 2018)                                                                                                                                 |

Global distribution of *Coccotrypes dactyliperda*
Table 1. Continued

| Country | Status | Comments and References |
|---------|--------|-------------------------|
| Italy   | introduced | northern Italy (Abbazzi et al., 1995)  
Trento, South Tyrol (De Bertolini, 1872)  
Milan (Schedl, 1961)  
Lombardy (De Bertolini, 1872) (but see below, Sarca Valley)  
naturalised? | Genoa (Bernabò, 1990) but absent in 1990  
Piedmont (Baudi, 1889; Porta, 1932)  
Lombardy (Porta, 1932)  
Sarca Valley, Lombardy (Wichmann, 1955)  
southern Italy (Abbazzi et al., 1995)  
Puglia (Longo et al., 1991)  
Basilicata (Longo et al., 1991)  
Liguria (Porta, 1932)  
Campania (Porta, 1932)  
Lazio (Porta, 1932)  
Calabria (Longo et al., 1991; Schedl, 1961)  
Ischia (Buchner, 1861)  
Sardinia (Bargagli, 1873; Gatti, 2011; Ragusa, 1924)  
Sicily (Kirkendall & Faccoli, 2010; Ragusa, 1924)  
Lipari I., Aeolian Islands (Lapiana & Sparacio, 2006) |
| Malta   | naturalised | (Mifsud & Knížek, 2009) |
| Monaco  | naturalised | (Ponel et al., 2011) |
| Montenegro | naturalised | (Comparini et al., 2018) (Roganović, 2013) |
| Netherlands | introduced | (Vorst, 2010) |
| Poland  | introduced | Galicia (Kleine, 1913a); Silesia (Gerhardt, 1910) |
| Portugal | naturalised | (Bureau of Entomology and Plant Quarantine, 1943) |
| Romania | introduced | Transylvania (Seidlitz, 1891) |
| Russia  | introduced | Leningrad Region (Mandelshtam & Popovichev, 2000; Chilakhseva, 2011) introduced, not acclimatised  
Yaroslavl Region (Chilakhseva, 2011) introduced, not acclimatised |
| Spain   | naturalised | Valencia, naturalised by 1872 (Arcas, 1873)  
Elche naturalised by 1869 (Dieck, 1870) et seq. (Gómez Vives, 2004)  
Barcelona (Guni y Martorell, 1888; Kleine, 1913b; Rosiqué et al., 2018) |
| Switzerland | introduced | Neuchatel 1842 (Siebold, 1846) in date seed;  
Schaffhausen (Stierlin, 1866, 1906) in date seed |
| Turkey  | naturalised | (Bureau of Entomology and Plant Quarantine, 1951)  
Izmir (Fleutiaux, 1901) |
| Ukraine | introduced | Ternopil (Rybinski, 1903) at railway station |
Table 1. Continued

| Country            | Status      | Comments and References                      |
|--------------------|-------------|----------------------------------------------|
| **Asia and South East Asia** |             |                                               |
| China              | naturalised | (Yan et al., 2010)                           |
| India              | naturalised | Bengal, Calcutta (Blanford, 1895); Bombay (South Kanara) (Beeson, 1939); Kerala (Daniel & Kumar, 1979; Nair & Oommen, 1968); Karnataka (Daniel & Kumar, 1979); Maharashtra (Malti & Saha, 2009); Punjab (Batra, 1972; Sohi & Batra, 1972) (since ca 1969); United Provinces (Beeson, 1939); Uttarakhand (Roonwal, 1971); Tamil Nadu (Rao & Janaki, 1953; Roonwal, 1971); Uttar Pradesh (Malti & Saha, 2009) |
| Indonesia          | introduced  | Bogor 1923 (ex Australia) (Kalshoven, 1958)  |
| Japan              | naturalised | (Goto, 2009)                                 |
| Malaysia           | naturalised | (Beeson, 1939); Penang (Beaver & Browne, 1978) |
| Myanmar            | naturalised | (Hagstrum & Subramanyam, 2016)                |
| Singapore          | naturalised | (Browne, 1961)                               |
| Sri Lanka          | naturalised | (Speyer, 1918) et seq. (Beeson, 1939; Roonwal, 1971; Schedl, 1959) |
| Thailand           | naturalised | (Beaver & Browne, 1975)                       |
|                    |             | Chiang Mai (Schedl, 1961) as *Coccotrypes laboulbenei* |
| **Oceania**        |             |                                               |
| Australia          | naturalised | New South Wales (Spennemann et al., 2018); Queensland (Spennemann et al., 2018); Northern Territory (Spennemann et al., 2018); Norfolk Island (Director of National Parks, 2018) |
| Bonin Islands      | naturalised | (Nobuchi, 1985)                              |
| Fiji               | introduced  | Viti Levu, from dates 1918, not established (Beaver, 1987a); Ovalau (Bryan, 1924) |
| Galapagos Islands  | naturalised | (Bright & Peck, 1998)                        |
| Hawai‘i            | naturalised | 1916 (Swezey, 1928); Kauai 1927 (Schedl, 1941); 1928 (Swezey, 1941); Hawai‘i 1931 (Schedl, 1941; Swezey, 1932, 1941); Oahu1907 (Schedl, 1941, 1948; Swezey, 1928, 1941) |
| New Caledonia      | naturalised | (Balachowsky & Mesnil, 1935)                 |
| New Guinea         | introduced  | New Britain 1935 (Schedl, 1942)              |
|                    | naturalised | (Setliff, 2007)                              |
|                    |             | Madang (Iamba et al., 2018)                  |
| Ogasawara Islands  | naturalised | (Ogasawara Islands, 2017)                    |
Table 1. Continued

| Country          | Status       | Comments and References                                                                 |
|------------------|--------------|-----------------------------------------------------------------------------------------|
| New Zealand      | naturalised | (Brockerhoff et al., 2006; Bureau of Entomology and Plant Quarantine, 1945); Auckland 2000 (Brockerhoff et al., 2003); Whangarei 2000 (Brockerhoff et al., 2003) |
| Solomon Islands  | naturalised? | (Hagstrum & Subramanyam, 2016)                                                          |
| Azores Islands    | naturalised  | (Meijer et al., 2011)                                                                    |
| Canary Islands    | naturalised  | (Berg et al., 2003); Gran Canaria (Garcia, 1991); Tenerife (Siverio & Montesdeoca, 1990) |
| Cap Verde        | naturalised  | (Hernández & González, 2011)                                                            |
| Madeira          | naturalised  | (Hagedorn, 1910b; Município de Santana, 2012; Schedl, 1963)                              |
| Caribbean        |              |                                                                                         |
| Bahamas          | naturalised  | (Barriga-Tuñón & Kirkendall, 2017)                                                      |
| Bermuda          | naturalised  | (Ogilvie, 1928); but no longer in 1989 (Hilburn & Gordon, 1989)                         |
| Costa Rica       | naturalised  | (Bureau of Entomology and Plant Quarantine, 1950)                                        |
| Cuba             | naturalised  | (Blackwelder, 1947; Cruz et al., 2008; Peck, 2005)                                       |
| Jamaica          | naturalised  | (Bright, 1985)                                                                          |
| Montserrat       | naturalised  | (Ivie et al., 2008)                                                                     |
| Puerto Rico      | naturalised  | (Bright, 1985; Bright & Torres, 2006; Medina Gaud & Martorell, 1973)                     |
| Trinidad         | naturalised  | 1950 (Bureau of Entomology and Plant Quarantine, 1951); 1952 (ALA, 2018); (Bright, 1981) |
| South America    |              |                                                                                         |
| Argentina        | naturalised  | (Blackwelder, 1947; Schedl, 1966)—Buenos Aires (Begrano, Isla Martin Garcia, Cap Federal) (Schedl, 1961); Entre Rios (Concordia) (Schedl, 1961) |
| Brazil           | naturalised  | 1948 (Nunberg, 1958); (Schedl, 1966); Minas Gerais (Schedl, 1972)                        |
| Chile            | naturalised  | Antofagasta (Kirkendall, 2018; Schedl, 1972)                                            |
| Colombia         | naturalised  | (Blackwelder, 1947)                                                                     |
| Ecuador          | naturalised  | (Campos, 1929; De Sanabria, 1921; Hagedorn, 1904)                                       |
| Guyana           | naturalised  | (Hagedorn, 1910a; Nunberg, 1958)                                                        |
| Panama           | naturalised  | (Blackwelder, 1947; Bureau of Entomology and Plant Quarantine, 1951)                     |
| Peru             | naturalised  | 1942 (Nunberg, 1958); Amazon (Delobel et al., 1995)                                      |
| Uruguay          | naturalised  | (Ruffinelli, 1967; Schedl, 1948)                                                        |
| Venezuela        | naturalised  | (Blackwelder, 1947)                                                                     |
**Table 1.** Continued

| Country                  | Status     | Comments and References                                                                 |
|-------------------------|------------|----------------------------------------------------------------------------------------|
| **North America**        |            |                                                                                        |
| Mexico                  | naturalised| (Atkinson & Martinez, 1985); Cuernavaca (Atkinson et al., 1986); Baja California del Sur (Linsley, 1943; Romero, 2017) |
| U.S.A.                  | introduced | (Fauvel, 1889a, 1889b) et seq. (Hamilton, 1894) Chicago (Riley, 1894) in Italian exhibit at the 1893 World Fair; Washington, DC (Ulke, 1903) in dates New York (Swaine, 1909) |
|                         | naturalised| (Blake & Russel, 1943) Arizona (Wood & Bright, 1992) California, acclimatised pre 1926 (Van Dyke, 1927) et seq. (Bright & Stark, 1973; Holzman et al., 2009; Linsley, 1943; Seybold et al., 2016; Swezey, 1941) Los Angeles (Van Dyke, 1927) Riverside City (Van Dyke, 1927) Northern Baja California (Horn, 1897) Florida (Atkinson et al., 1991) Texas (Wood & Bright, 1992) |

**Figure 1.** Decadal frequency of publications summarised in (Table 1). The decade 2010 has been scaled up to a full 10 years.
Table 2. Summary of regional representation of *Coccotrypes dactyliperda* (in % per century).

| Region                        | 1800s | 1900s | 2000s |
|-------------------------------|-------|-------|-------|
| Middle East                   | 7.1   | 12.9  |       |
| North Africa                  | 11.1  | 6.5   |       |
| Central and Southern Africa   | 2.8   | 13.6  | 9.7   |
| Europe                        | 75.0  | 29.3  | 29.0  |
| Asia and South East Asia      | 2.8   | 9.3   | 8.1   |
| North America                 | 8.3   | 7.9   | 3.2   |
| Atlantic Islands              | 1.4   | 6.5   |       |
| Caribbean                     | 4.3   |       | 8.1   |
| South America                 | 7.9   | 1.6   |       |
| Oceania                       | 7.1   | 14.5  |       |
| Total                         | 36    | 140   | 62    |

Table 3. Summary of representation of *Coccotrypes dactyliperda* by region and status.

| Region                        | endemic | naturalised | introduced | Total |
|-------------------------------|---------|-------------|------------|-------|
| Middle East                   | 9       |             |            | 9     |
| North Africa                  | 6       |             |            | 6     |
| Central and Southern Africa   | 19      |             |            | 19    |
| Europe                        | 12      | 14          |            | 26    |
| Asia and South East Asia      | 9       | 1           |            | 10    |
| North America                 | 2       |             |            | 2     |
| Atlantic Islands              | 4       |             |            | 4     |
| Caribbean                     | 8       |             |            | 8     |
| South America                 | 10      |             |            | 10    |
| Oceania                       | 9       | 1           |            | 10    |
| Total                         | 15      | 73          | 16         | 104   |

Figure 2. Geographical Distribution of *Coccotrypes dactyliperda*. 
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Conflict of Interests
The author declares that there is no conflict of interest regarding the publication of this paper.

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*Coccotrypes dactyliperda* (Coleoptera: Curculionidae, Scolytinae)

چکیده: مقاله حاضر بر اساس مستندات علمی در مورد پراکنش سوسک سنگی خرما *Coccotrypes dactyliperda* در سراسر جهان تهیه شده است. داده‌ها بر اساس جستجوی جامع پایگاه‌های جهانی، مجموعه‌های ارائه شده در پورتال‌های تحقیقاتی و منابع دیجیتالی کتابخانه‌های ملی ارائه شده است. مشاهده پراکنش جغرافیایی نشان داد که انتشار سوسک سنگی خرما توسط عوامل اقلیمی محدود شده است.

واژگان کلیدی: جغرافیای زیستی، تاریخچه بوم‌شناسی، نخل روغنی