

## Worldwide checklist of the island mutillid wasps (Hymenoptera Mutillidae)

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### ABSTRACT

The family of Mutillidae includes 776 taxa among species and subspecies recorded for 311 islands worldwide, whose distribution is provided in the present checklist. A brief review of some traits that characterize the insular faunas of these hymenopteran parasitoids is given. The main constraints to the dispersal on islands are due to the apterogyny and the occurrence of suitable hosts. Species richness is generally correlated with island size. Although probably still underestimated, the greatest number of species is found on Sri Lanka (82), Borneo (77), Madagascar (70) and Taiwan (61). Endemics are more than half (55%) of the whole insular mutillids and are found mostly in the oceanic islands and in those that have undergone to a long-time isolation. On the contrary, endemic genera are represented only on few islands (Madagascar, Sri Lanka and, secondarily, New Guinea, Sulawesi and Canary).

### KEY WORDS

Hymenoptera; Mutillidae; islands of the world; checklist; biogeography.

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### INTRODUCTION

The family Mutillidae includes 210 genera (Lelej & Brothers, 2008; see also Williams & Pitts, 2009; Williams et al., 2011; Brothers, 2012; Tu et al., 2014) and more than 4,300 species so far described. These latter are estimated to be about 6,000 (according to Lelej & Brothers, 2008), but their number is rather uncertain pending for further investigations that could lead to establish several new synonymies, because many species, and even a few genera, are still known only for one sex.

The strong sexual dimorphism typical of the members of this hymenopteran family makes indeed difficult the association between males (mostly winged) and females (all apterous), that is generally based on the direct observations of mating, although have been also used alternative methods such as live-caught females to attract

conspecific males (Manley, 1999) and molecular analysis (Pilgrim & Pitts, 2006).

Despite the uncertainty that still persists about the amount of true species belonging to this family, 428 (about 10% of those actually described), as well as 13 genera, are known to be exclusively distributed on islands. That confirms once again as the islands contribute disproportionately to the global biodiversity (Whittaker & Fernández-Palacios, 2006).

The occurrence of mutillids wasps on islands is however constrained by two morphological and biological traits: i) the low dispersal ability of the wingless females, and ii) their dependence on finding of suitable hosts, because Mutillidae are parasitoids that develop mainly on immature stages of other Hymenoptera (Brothers, 1989).

Consequently, the number of species on the islands presumably decrease with increase of their

degree of isolation, and thus the species richness should be greater on the continental islands rather than on the oceanic. By contrast, these latter could be more often characterized by processes of speciation and adaptive radiation.

The first information on insular mutillids is due to Fabricius (1775), who described *Mutilla antiguensis* from “insula Antigua” (Lesser Antilles, Caribbean Sea), a species still considered as valid although included among the taxa incertae sedis by Nonveiller (1990). Just few records were added during the first decades of the 19th century by Spinola (1839, 1841), Ghiliani (1842), Westwood (1843) and Lepeletier de Saint-Fargeau (1845), while several are those published since the second half of this century, thanks to the significant increase of the scientific expeditions to the islands carried out, among others, by naturalists such as Alfred Russell Wallace.

More recently, several studies specifically concerning the insular faunas of Mutillidae or that provide extensive faunal lists have been published (Arnone & Romano, 1995; Brothers, 2012; Brothers et al., 2011; Esaki, 1938; Hammer, 1950; Invrea, 1940, 1952c, 1955a, 1960, 1966; Krombein, 1949a, 1971, 1972; Lo Cascio & Romano, 2004; Lo Cascio et al., 2012; McCallan, 1990, 1991a; Mickel, 1928b, 1933, 1934, 1935; Nonveiller, 1972; Olsoufieff, 1938; Schembri, 1983; Strumia & Pagliano, 2014; Strumia et al., 2008; Terayama, 2005; Terayama et al., 2011; Tsuneki, 1972a, 1972b; Tsuneki et al., 1993, Turner, 1914; Turrisi, 1999a), but a comprehensive and updated overview of all the available data, often scattered in papers not eminently dealing with this hymenopteran family, is still lacking.

The aim of the present paper is to provide a checklist of the faunal records of Mutillidae for the islands worldwide (including the estuarine but excluding fluvial and lacustrine ones). A wide literature has been therefore checked in order to achieve a list as exhaustive as possible, even if cannot be excluded that some data may have been neglected, hence reporting of any omissions or mistakes, as well as that of new records, is enthusiastically welcomed.

In light of the available data, it was also possible to outline the main biogeographical traits of the island faunas, which are briefly analyzed and discussed in a separate paragraph.

## MATERIAL AND METHODS

### *Geographical setting*

310 islands distributed between 55°N and 42°S where Mutillidae have been recorded are listed and grouped in alphabetical order with in the respective ecoregions in Table 1; another island (High Island) has been mentioned in Table 2 but not in Table 1 (see below).

Ecoregions follow the geographic boundaries given by Olson et al. (2001) with the only exception of Palearctic which is here subdivided in two different regions (Western and Eastern), and are listed in clockwise order from East of Greenwich and from North to South (see also Fig. 1).

As the boundary between Indo-Malay and Australasia is still debated (see Simpson, 1977; New, 2002; Halloway, 2009 and references therein), in the present paper the Weber line was adopted following the proposals given by Holt et al. (2013). According to Echenique-Diaz et al. (2009), all the Japanese islands that lie south of latitude 31° N (Ryūkyū or Nansei Archipelago) are assigned to the Indo-Malay, while Ogasawara (or Bonin) Islands belong to the Oceania.

Island's name and localization have been checked using both the Island Directory provided by UNEP ([islands.unep.ch/isldir.htm](http://islands.unep.ch/isldir.htm)) and the GeoNames Search facility of the US National Geospatial-Intelligence Agency ([geonames.nga.mil/ggmagaz/](http://geonames.nga.mil/ggmagaz/)).

Some Japanese islands were named using alternatively the suffix -shima or -jima. Asterisks after the name indicate \*) that the island is artificially connected to the mainland (or to the nearest main island), \*\*) it is composed by two sub-islands (data given in the next columns concern the overall island), \*\*\*) the toponym quoted in literature without further indications concerns an island group (whose name is reported into square brackets), hence geographical data are referred to its larger island.

Two-letter code of the country is given according to the International Organization for Standardization ([www.iso.org](http://www.iso.org)). Surface and elevation are respectively indicated in Km<sup>2</sup> (with 0.5 approximation) and in m a.s.l. Isolation index was calculated according to the proposals given by Dahl (1991; see also [islands.unep.ch/isldir.htm](http://islands.unep.ch/isldir.htm)) and successively assigned to a numerical class (e.g. values ranging

from 1 to 10 are included in the class 10, from 11 to 20 in the class 20, etc.).

### Data sources

Data were gathered through the examination of a wide literature which includes worldwide or regional catalogues and monographs (André, 1899–1903, 1902; Baltazar, 1966; Bischoff, 1920–1921; Blake, 1871; Brothers et al., 2011; Cameron, 1892; 1897, 1898, 1900; Dalla Torre, 1897; Krombein, 1972, 1979b; Lelej, 1985, 2002, 2005; Lepeletier de Saint-Fargeau, 1845; Mickel, 1928a; Nonveiller, 1990; Olsoufieff, 1938; Ramakrishna, 1916; Sichel & Radoszkowski, 1869–1870), reviews of genera and/or species groups (Bradley, 1916a; Lelej & Krombein, 2001; Ljubomirov, 2011; Manley & Pitts, 2007; Mickel, 1938, 1939, 1941; Nonveiller, 1979a, 1994, 1995a, 1995b; Nonveiller & Četković, 1995, 1996; Petersen, 1988; Pitts & McHugh, 2002; Radoszkowski, 1885; Reck Bartholomay, 2014; Suárez, 1988; Tu et al., 2014; Williams & Pitts, 2007, 2013; Williams et al., 2012), or museum collections (André, 1896a, 1896b, 1898, 1907–1908, 1908a, 1908b, 1909; Casolari & Casolari Moreno, 1980; Hashimoto & Nakanishi, 1997; Ljubomirov, 2006; Matteini Palmerini, 1992; Pagliano, 2005; Smith, 1855, 1879; Spooner, 1942; Starr, 1993; Suárez, 1959a; Taeger et al., 2005; Zavattari, 1910a).

Other relevant references which have been consulted are:

W-PALEARCTIC. Alicata et al. (1975), Archer (1986, 2014), Arnone & Romano (1995, 1998), Báez & Ortega (1978), Baldock (2014, 2015), Berland (1925), Bigot (1958), Bischoff (1928, 1933), Bischoff & Nonveiller (1965), Bordoni (1980), Broad (2014), Canovai et al. (2000), Cecconi (1895), Cocquempot & Chambon (1992), Cocquempot & Rungs (2009), Compte Sart (1959), Costa (1856–1860, 1882, 1883, 1885, 1887), Deschamps (1898), De Stefani-Perez (1885–1886, 1887a, 1887b, 1897), Edwards (1997), Failla Tedaldi (1887), Garcia Mercet (1913), Garcias Font (1953), Generani et al. (2001), Ghiliani (1842), Gribodo (1880), Grimshaw (1913), Haeseler (2008), Hammer (1950), Hohmann et al. (1993), Invrea (1940, 1941b, 1942, 1951, 1952a, 1952b, 1952c, 1953, 1954, 1955a, 1955b, 1957, 1958, 1960, 1962, 1964, 1966), King (1915), Lelej et al. (2003a),

Leo (1989), Lo Cascio (2000, 2014), Lo Cascio & Romano (2004), Lo Cascio et al. (1998), Mantero (1905, 1909), Masi (1933), Mellor (1932), Mingo & Compte (1963), Monastra (1989, 1990), Nagy (1972), Nonveiller (1972, 1979b), Nonveiller et al. (1998), Pagliano (2003, 2011), Pagliano & Matteini Palmerini (2014), Pagliano & Strumia (2000, 2007, 2013), Richards (1980), Riggio (1885), Riggio & De Stefani-Perez (1887), Romano (2004, 2012), Saunders (1880, 1881, 1896, 1901, 1904), Schembri (1983, 1984), Schulthess (1929), Spicer (1873), Spinola (1839), Stelfox (1933), Strumia & Pagliano (2014), Strumia et al. (2008), Suárez (1959b, 1970, 1975), Turrisi (1999a, 1999b), Valletta (1971, 1979), Villarúbia & Español (1933), Yarrow (1954), Yeo & Corbet (1995), and Zavattari (1910b, 1912).

AFROTROPIC. André (1895, 1899, 1901a, 1903a, 1903b, 1904, 1905, 1908b), Atkins & Webb (2013), Brancsik (1891), Friese (1900), Garcia Mercet (1903), Gerstaecker (1871), Invrea (1941a), Krombein (1939, 1951), Lelej & Harten (2006), Lo Cascio et al. (2012), McCallan (1991a), Nonveiller & Petersen (1995), Olsoufieff (1936), Paulian (1950), Saussure (1890–1892, 1891), Schulthess (1919), Schulz (1912), Seyrig (1936), and Viette (1957, 1978).

INDO-MALAY. André (1907a, 1907b), Ashmead (1905a, 1905b), Bingham (1895, 1897), Brown (1906), Cameron (1902a, 1902b, 1903, 1909), Chen (1957), Cockerell (1927), Dammermann (1923, 1948), Easton (2001), Garcia Mercet (1903), Green (1912), Hammer (1962), Haneda (1982), Ikudome & Yamane (2009), Invrea (1943), Krombein (1978, 1979a, 1981, 1982), Krombein & Lelej (1999), Krombein et al. (1999), Lelej (1993, 1995, 1996b), Matsumura & Uchida (1926), Mickel (1933, 1934), Motschulsky (1863), Murota (1973a, 1973b), Pagden (1938), Rohwer (1910), Sakagami et al. (1996), Saussure (1867a, 1867b), Smith (1857–1858, 1858, 1861a), Sonan (1931), Tennent (1859), Terayama (2005), Terayama et al. (2011), Tsuneki (1972b, 1972c, 1982a, 1982b, 1993a, 1993b), Tsuneki et al. (1993), Turner (1911), Wickwar (1908), Williams (1919), Yamane (1983), Yamane et al. (1992, 1999), Yasumatsu (1934), and Zavattari (1913a).

E-PALEARCTIC. Fukasawa & Miyano (2010), Haneda (1979), Hisamatsu (2004), Lelej (1996a, 2012), Lelej & Yamane (1992), Lelej et al. (2001), Matsumura (1911), Mickel (1936), Miyamoto

(1959), Nagase (2004), Nagase & Kawashima (2012), Ogawa et al. (2012), Paik (1994, 1995), Sakagami (1980), Sakagami et al. (1982), Smith (1873, 1874), Takahashi (1993), Terayama (2005), Terayama et al. (2011), Tsuneki (1962, 1972a, 1973), Tsurusaki et al. (2012), Vertyankin (2010), Yasumatsu (1931, 1937), and Yoshida (1989).

AUSTRALASIA. André (1901b, 1905), Brothers (1971, 2012), Cameron (1901, 1907), Hill (1955), Jennings et al. (2013), Krombein (1971), Mantero (1900), Mickel (1935), Montague (1914), Smith (1859, 1861b), Turner (1912, 1914), Valentine & Walker (1983), Villemant (2011), Westwood (1843), Williams (1945), and Zavattari (1913b).

INDO-MALAY AND AUSTRALASIA. Mickel (1937), O'Toole (1975), Pagden (1949), Smith (1861–1862, 1864a, 1864b, 1865), and Smith & Wallace (1873).

OCEANIA. Esaki (1938), Krombein (1949a), Sugiura et al. (2013), Takahashi & Shimizu (2007), Tsuneki (1984), and Yasumatsu (1936, 1950).

NEARCTIC. Bradley (1916b), Cockerell (1915), Cooper (1953), Deyrup & Manley (1986), Hurd (1951), McAlister & McAlister (1993), Ortiz (1976), Seavey (1892), and Wilson & Pitts (2009).

NEOTROPIC. Alayo Dalmau (1975), Ashmead (1896, 1900), Askew (1980, 1994), Cambra & Quintero Arias (1992, 1993), Cresson (1865), Dow (1931), Elliott & Elliott (1994, 1996), Elliot et al. (2002), Evans (1972), Fox (1900), Genaro (1997), Genaro & Torres (1999), Krombein (1949b), Lenko (1964), McCallan (1942, 1950, 1990, 1991b), Mickel (1926, 1928b, 1952, 1961), Perez-Gelabert (2008), Pitts (2007), Portuondo Ferrer & Fernández Triana (2004), Quintero Arias & Cambra (2001), Schuster (1946), Snelling (2005), Spinola (1841), Starr & Hook (2003), and William (1926).

Finally, the checklist includes data from the list of the specimens identified by the late B. Petersen and kept in the Zoological Museum of the University of Copenhagen (hereafter ZMUC, available at: [www.zmuc.dk/EntoWeb/collections-databaser/Hymenoptera](http://www.zmuc.dk/EntoWeb/collections-databaser/Hymenoptera)); from the distributional maps of BWARS ([www.bwars.com](http://www.bwars.com)); unpublished records

for Gavdos Island which are based on specimens identified by the late G. Nonveiller and kept in the Natural History Museum of Crete (A. Trichas, in litteris 20.i.1999); some other unpublished records have been given in details in Table 3.

### Statistical analysis

The effects of geographical predictors on faunal ensembles were assessed by using simple linear regression analysis with 95% confidence limits and performed with the open source software PAST version 3.04 (Hammer et al., 2001). Evaluation of diversity indices and UPGMA analysis were done using MVSP® (Multivariate Statistical Package), version 3.22. Numbers that follow ± are referred to standard error.

### CHECKLIST

In Table 2, 719 species and 49 subspecies of Mutillidae are listed in alphabetical order with the respective insular distribution. Also, 8 species are indicated only at generic rank as quoted in literature; the only exception concerns "*Ephutomorpha*" sp. from New Guinea, recorded by André (1896a) and Mantero (1900) as the Australian *Ephutomorpha morosa* (Westwood, 1843), that according to Mickel (1935) probably represents a yet undescribed species.

Taxonomy and nomenclature follow those adopted by the most recent literature (see Data source), except for the genus *Smicromyrme* Thomson, 1870 which has been considered here as feminine gender (Romano & Lo Cascio, in preparation). For the species whose generic placement is still considered doubtful, genus name is indicated in quotes. That is the case, for instance, of the Madagascan species referred to genus *Trogaspidia* Ashmead, 1899 (see Brothers et al., 2011); or the whole genus *Ephutomorpha* André, 1902, appropriately defined by Krombein (1971) as a "portmanteau", which currently includes many Australasian species that should be assigned to other genera yet undescribed (see also Brothers, 2012).

In the next column "E" indicates when a taxon is exclusively distributed on islands (specifying whether it is an endemic subspecies). *Ephucilla*



*viet* (Lelej, 1995) and *Glossotilla illudens* Invrea, 1941 are known only for Dang Kho (Vietnam) and Koyaama (Somalia), respectively, but it is unlikely that are really endemic of these small coastal islands and their distribution range probably includes neighboring continental areas. Conversely, *Smicromyrme mauromoustakisi* Invrea, 1940 from Cyprus is treated as endemic, because a record for Palestine (Invrea, 1965) should be referred to an yet undescribed species (P. Lo Cascio, unpubl. data). Also, *Wallacidia vicina* (Sichel et Radoszkowski, 1870) is considered endemic of some Australasian islands because a record for India given by André (1894) was not confirmed by Lelej (2005).

#### **Species and records excluded from the checklist**

Records of Mutillidae have been taken into account in the checklist when identified at least at generic rank and excluding those as: the “velvet ants” mentioned by Weiskittle (2004) for Pea Island (35.42N, 075.30W; code: US; surface: 127.5 Km<sup>2</sup>; max elevation: 10 m a.s.l.; isolation: 10); an unspecified number of mutillids found on Coiba Island (7.28N, 081.46W; PA; 503.0; 425; 20) reported by Nieves-Aldrey & Fontal-Cazalla (1997); one unidentified morphospecies recorded by Elliot & Elliot (1984) for Cat Island (24.24N, 075.31W; BS; 386.5; 122; 50); two unidentified morphospecies recorded by Pizarro-Araya et al. (2014) for Chañaral Island (29.01S, 071.34W; CL; 5.0; 145; 10); twenty-four (according to Callan et al., 2011) or even twenty-five unidentified morphospecies (according to www.padil.gov.au: 80/barrow-island/) found during recent faunal investigations on Barrow Island (20.47S, 115.24E; AU; 234.0; 64; 10).

From the checklist have also been excluded: *Dasylabris lybica* (Invrea, 1940), recorded for Malta in the list of ZMUC collections (see www.zmuc.dk/EntoWeb/collections-databaser/Hymenoptera), whose occurrence needs to be confirmed; *Ephutomorpha gaudens* Zavattari, 1913, described for New Guinea but successively neglected by Mickel (1935), whose taxonomic value needs hence to be clarified; *Hoplomutilla gabbii* (Blake, 1879), whose old records for Jamaica are due to the erroneous label of a specimen kept in the British Museum collections (Mickel,

1939); *Krombeinidia unifasciata* (Smith, 1855), whose record for Sulawesi (Smith, 1858; see also Smith & Wallace, 1873) is doubtful (Lelej, 2005); *Mutilla marginata* Baer, 1848, recorded for Sicily by André (1899-1903) but not confirmed by Turrisi (1999); *Myrmosa macrocephala* Olivier, 1811, described from Java, which belongs to the family Tiphidae (see Lelej, 2005); *Odontomutilla urania* (Smith, 1857), whose terra typica is Melaka (Peninsular Malaysia) and not Borneo (Lelej, 2005); *Petersenidia gribodoi* (Magretti, 1892), whose records for Sumatra and New Guinea (Mantero, 1900) are due to erroneous identifications (Mickel, 1935); *Petersenidia subanalis* (Magretti, 1892), *Trogaspidia aulica* (Smith, 1855), *T. pilosella* (Magretti, 1892), *T. fortinata* (Cameron, 1899), and *T. pulchriceps* (Cameron, 1892), whose records for Sri Lanka (André, 1903a, 1907a; Bingham, 1897; Wickwar, 1908) have not been verified by Lelej (2005) and need to be confirmed; *Physetopoda discreta* (Cameron, 1897), whose record for Philippines (Bingham, 1897) is doubtful (Lelej, 2005); *Sinotilla decora* (Smith, 1879), whose record for Java (Zavattari, 1913a) is doubtful (Lelej, 2005); *Trogaspidia analis* (Lepelletier, 1845), whose records for Sri Lanka, Borneo, Sumatra, Bali, Sulawesi, Sumbawa, Ambon, Halmahera, Morotai, Ternate and Taiwan (André, 1907a; Zavattari, 1913b; Pagliano, 2005) have not been confirmed by Mickel (1935) and Lelej (2005); *Trogaspidia catanensis* (Rossi, 1794), whose record for Zanzibar (Zavattari, 1910a) must be certainly referred to another species; *Trogaspidia floralis* (Klug, 1829), whose record for Zanzibar (Bischoff, 1920-1921) is due to erroneous identification (Nonveiller & Petersen, 1995); *Trogaspidia rubripes* (André, 1901), recorded for Cyprus and supposed to be the opposite sex of *Neotrogaspidia hammeri* (Suárez, 1959) by Suárez (1959b), but recently treated as valid species by Lelej (2002), who however has excluded this island from its distribution range; *Trogaspidia repraesentans* (Smith, 1855), erroneously recorded by Smith & Wallace (1873) and Zavattari (1913b) for Borneo and Java, respectively (Mickel, 1935; Lelej, 2005); *Wallacidia sexmaculata* (Swederus, 1787) recorded by Lepelletier de Saint-Fargeau (1845) for Java from a specimen kept in the Spinola's collection (Regional Museum of Natural Sciences, Turin) doubtfully identified as

*Mutilla fuscipennis* Fabricius, 1804, but not confirmed by Lelej (2005; see also Pagliano, 2005).

Furthermore, from the distribution of some species included in the checklist have been omitted the following doubtful records: *Blakeius bipunctatus* (Latreille, 1792) for Cyprus by André (1899-1903), not confirmed by Invrea (1940) and Hammer (1950); *Dasylabris maura carinulata* (Dalla Torre, 1897) for Rhodes by Pagliano (2005), which need to be confirmed; “*Ephutomorpha*” *australasiae* (Fabricius, 1804) and “*Ephutomorpha*” *fausta* (Smith, 1863), given respectively for New Britain and New Guinea by André (1898), which need to be confirmed; *Krombeinella thoracica* (Fabricius, 1793) for Sicily by several authors, not confirmed by Suárez (1988); *Myrmilla mutica* (André, 1903) for Cyprus by Bogusch (2006), not confirmed by Ljubomirov (2011); *Mutilla europaea* Linnaeus, 1758 for Sardinia by Costa (1887), not confirmed by Arnone & Romano (1998); the same for the “Inner Hebrides” and “Outer Hebrides” without further information, respectively by the Scottish Aculeate List ([www.hbrg.org.uk/SAL/index.html](http://www.hbrg.org.uk/SAL/index.html)) and the Outer Hebrides Biological Recording (<http://www.ohbr.org.uk>); *Myrmilla erythrocephala* (Latreille, 1792) for Kerkyra, not confirmed by Ljubomirov (2011); *Myrmilla lezginica* (Radoszkowski, 1885) for “Cyclades” without further information by André (1899-1903); *Physetopoda halensis* (Fabricius, 1787) for Lampedusa by Pagliano (2003), that has been successively referred to another species (see Pagliano, 2011); *Physetopoda pusilla* (Klug, 1835) and *P. scutellaris* (Latreille, 1792) for Cyprus, respectively, by Bischoff (1933) and Invrea (1940) and by Hammer (1950), which need to be confirmed; *Platymyrmilla quinquefasciata* (Olivier, 1811) for Sicily by Pagliano & Strumia (2007) on the basis of a doubtful record from Spinola’s collection (see also Pagliano, 2005); *Ronisia ghilianii* (Spinola, 1843) for Cyprus by Hammer (1950), which need to be confirmed; *Smicromyrme rufipes* (Fabricius, 1878) for Malta by Pagliano (2005) and Pagliano & Strumia (2007), which need to be confirmed; *Smicromyrme vladani* Nonveiller, 1972 for Malta, given in the list of ZMUC collections (see [www.zmuc.dk/EntoWeb/collections-databaser/Hymenoptera](http://www.zmuc.dk/EntoWeb/collections-databaser/Hymenoptera)), that should be confirmed; *Timulla mediata persa* Mickel, 1938 for Trinidad by

Nonveiller (1990), as the same island is inhabited by the nominal subspecies; *Trogaspidia rhea rhea* (Mickel, 1933) for “Japan” by Mickel (1933) without further information; *Trogaspidia subintrans* (Sichel et Radoszkowski, 1870) for Taiwan by Zavattari (1913a), not confirmed by Lelej (2005), as well as those for Timor (Sichel & Radoszkowski, 1869-1870), Sumatra and Borneo (Zavattari, 1913b), although not mentioned by Lelej (2005), need to be confirmed; *Wallacidia merops* (Smith, 1860), for New Guinea by André (1896a) and Mantero (1900), that according to O’Toole (1975) are due to erroneous identifications; *Wallacidia oculata* (Fabricius, 1804) for Bali, Flores, Sumba and Palawan by Zavattari (1913b), need to be confirmed; *Yamanetilla taiwaniana* (Zavattari, 1913) for “Japan” in the ZMUC material ([www.zmuc.dk/EntoWeb/collections-databaser/Hymenoptera](http://www.zmuc.dk/EntoWeb/collections-databaser/Hymenoptera)) without further information.

On the contrary, the checklist includes a record of *Myrmosa unicolor* Say, 1824 given by Bradley (1917) for High Island (Outer Banks, Virginia, US); this latter belongs to a group of barrier islands whose number changes through time due to dynamic processes or violent storms and its name has not been localized in the recent maps, thus the island is not listed in Table 1.

Although often the toponym “Cayenne” was used in past to indicate also continental areas of French Guiana, data given by Spinola (1841) have been included in the checklist because the author refers explicitly to specimens collected by Leprieur “dans les régions inexplorées de cette île” (see Spinola, 1840). For the same reason, the checklist takes into account also the data given by Lepeletier de Saint-Fargeau (1845) concerning this estuarine island.

A separate discussion concerns *Myrmilla reunionis* described by Zavattari (1909), that according to Brothers et al. (2011) is likely not from Reunion Island. Pagliano (2005) has reported two specimens kept in the Spinola’s collection labelled as “*Mutilla doueyi*” (a female) and “*Mutilla douei*” (a male) and indicated to be from “Isola di Bourbon” (the former name of Reunion) without further information; the female was sent in loan in 1999 to Guido Nonveiller and probably has been lost. Waiting for a confirmation of the occurrence of mutillids on this island, the above records have not been included in the checklist.

Island	Localization	Code	Surface	Elevation	Isolation
W-PALEARCTIC					
Andros	37.50N 24.52E	GR	371.0	994	10
Anglesey*	53.30N 04.40W	GB	654.0	222	10
Antikythera	35.51N 23.18E	GR	21.0	379	20
Asinara	41.04N 08.28E	IT	51.0	408	20
Astypalea	36.34N 26.22E	GR	97.0	506	30
Bagaud	43.00N 06.21E	FR	0.5	69	10
Baltrum	53.43N 07.23E	DE	7.0	10	10
Brač	43.34N 16.65E	HR	395.5	778	10
Budelli	41.16N 09.20E	IT	1.5	87	20
Capraia	43.05N 09.90E	IT	19.5	447	10
Capri	40.55N 14.25E	IT	10.5	585	10
Cavallo	41.22N 09.15E	FR	1.0	32	20
Chergui (Cherguia)	34.43N 11.13E	TN	99.0	13	10
Chios	38.23N 26.02E	GR	822.5	1297	10
Čiovo	43.30N 16.17E	HR	28.0	218	10
Comino	36.00N 14.20E	MT	3.5	75	30
Conigli	35.30N 12.33E	IT	0.05	26	30
Corsica	42.15N 09.15E	FR	8741.5	2706	30
Cres	44.90N 14.45E	HR	406.0	650	10
Crete	35.20N 25.00E	GR	8336.0	2456	30
Cyprus	35.10N 33.40E	CY	9234.5	2021	30
Djerba	33.47N 10.53E	TN	523.0	53	10
Elba	42.80N 10.25E	IT	223.5	1019	10
Embiez	43.04N 05.47E	FR	1.0	57	10
Euboea (Evvoia)	38.50N 24.00E	GR	3670.0	1743	10
Favignana	37.55N 12.19E	IT	20.0	302	10
Filicudi	38.34N 14.33E	IT	9.5	774	20
Folegandros	36.37N 24.54E	GR	32.0	455	20
Fuerteventura	28.42N 14.00W	ES	1633.5	807	30
Gataya el Bahria	33.43N 10.42E	TN	1.5	6	10
Gavdos	34.50N 24.05E	GR	33.0	345	30
Giannutri	42.15N 11.06E	IT	2.5	93	10
Giglio	42.21N 10.54E	IT	21.0	498	10
Gomera	28.11N 17.20W	ES	359.0	1487	50
Gorgona	43.25N 09.54E	IT	2.5	255	10
Gozo (Ghawdex)	36.02N 14.15E	MT	67.0	191	30

Table 1/1. Islands' list with geographical data (continued).



Island	Localization	Code	Surface	Elevation	Isolation
W-PALEARCTIC					
Gran Canaria	27.95N 15.62W	ES	1530.0	1426	40
Great Britain	55.00N 02.00W	GB	209331.0	1333	20
Gremdi	34.45N 11.19E	TN	2.0	3	10
Hayling*	50.78N 00.96W	GB	30.0	15	10
Herm	49.47N 02.45W	GB	2.0	106	20
Hierro	27.75N 18.00W	ES	290.5	1500	50
Hvar	43.14N 16.80E	HR	297.5	626	10
Ireland	53.00N 08.00W	IE/GB	81638.0	1032	30
Ischia	40.73N 13.95E	IT	46.5	792	10
Jālitah (Galita)	37.31N 08.56E	TN	9.0	391	20
Karpathos	35.37N 27.08E	GR	311.0	1215	20
Kassos	35.23N 26.55E	GR	69.5	550	20
Kastellorizo (Megisti)	36.08N 29.35E	GR	12.0	273	10
Kea	37.36N 24.20E	GR	129.0	560	20
Kefalonia	38.12N 20.36E	GR	775.5	1628	20
Kerkyra	39.36N 19.51E	GR	626.0	906	10
Korčula	42.95N 16.90E	HR	271.5	502	20
Kornat	43.44N 15.22E	HR	32.5	207	10
Kos	36.49N 27.08E	GR	288.0	846	10
Krk	45.12N 14.65E	HR	405.0	569	10
Kythera	36.14N 22.59E	GR	278.0	525	10
La Maddalena	41.13N 09.24E	IT	20.0	156	20
Lampedusa	35.30N 12.35E	IT	20.0	133	30
La Palma	28.68N 17.85W	ES	690.0	2423	50
Lavezzu	41.20N 09.15E	FR	0.5	40	20
Levanzo	37.59N 12.20E	IT	5.5	277	10
Linosa	35.51N 12.52E	IT	5.5	195	40
Lipari	38.29N 14.56E	IT	37.5	602	20
Lošinj	44.35N 14.23E	HR	52.5	588	10
Mallorca	39.62N 03.00E	ES	3667.0	1445	40
Malta	35.90N 14.45E	MT	246.0	253	40
Man	54.23N 04.55W	GB	572.5	621	30
Marettimo	37.58N 12.03E	IT	12.0	684	20
Menorca	39.95N 04.10E	ES	692.0	355	40
Milos	36.41N 24.27E	GR	151.0	758	20

Table 1/2. Islands' list with geographical data (continued).



Island	Localization	Code	Surface	Elevation	Isolation
W-PALEARCTIC					
Mljet	42.44N 17.31E	HR	98.0	514	10
Mykonos	37.26N 25.23E	GR	107.5	372	20
Naxos	37.03N 25.29E	GR	436.0	1008	20
Nisyros	36.35N 27.10E	GR	41.5	698	10
Norderney	53.42N 07.14E	DE	27.0	10	10
Panarea	38.38N 15.04E	IT	3.5	421	20
Pano Koufonissi	36.56N 25.36E	GR	4.0	114	20
Pantelleria	36.47N 11.59E	IT	83.0	836	30
Paros	37.03N 025.11E	GR	191.0	771	20
Piana dell'Asinara	40.58N 008.13E	IT	1.5	24	20
Pianosa	42.34N 010.04E	IT	10.0	27	20
Poros	37.32N 023.28E	GR	31.0	358	10
Porquerolles	42.59N 006.12E	FR	1.0	142	10
Rab	44.46N 014.46E	HR	86.0	408	10
Rava	44.01N 015.04E	HR	3.5	98	10
Rhodes	36.11N 027.56E	GR	1410.0	1215	20
Salina	38.33N 014.50E	IT	26.5	962	20
Samothraki	40.27N 025.35E	GR	184.0	1600	20
San Domino	42.06N 015.29E	IT	2.0	116	10
Sant'Antioco*	39.05N 008.40E	IT	109.0	271	20
Santa Maria	41.17N 009.22E	IT	2.0	49	30
San Pietro	39.15N 008.28E	IT	51.5	211	20
Sardinia	40.10N 009.10E	IT	23949.0	1834	40
Sicily	37.55N 014.25E	IT	25710.0	3350	10
Skiathos	39.10N 023.27E	GR	49.5	436	20
Skopelos	39.07N 023.41E	GR	90.0	680	20
Skyros	38.51N 024.33E	GR	212.5	792	20
Šolta	43.22N 016.18E	HR	58.0	238	10
Spargi	41.14N 009.20E	IT	4.0	155	30
Stromboli	38.47N 015.12E	IT	12.0	920	20
Syros (Syra)	37.25N 024.54E	GR	94.0	422	20
Tavolara	40.54N 009.42E	IT	6.0	564	20
Tenerife	28.25N 016.58W	ES	2008.0	3718	50
Thassos	40.40N 024.39E	GR	386.0	1203	10
Thira	36.24N 025.26E	GR	73.0	565	20

Table 1/3. Islands' list with geographical data (continued).

Island	Localization	Code	Surface	Elevation	Isolation
<b>W-PALEARCTIC</b>					
Tinos	37.35N 025.08E	GR	193.0	650	20
Ugljan	44.04N 015.09E	HR	51.0	286	10
Ustica	38.42N 013.10E	IT	8.5	239	20
Vis	43.02N 016.09E	HR	90.0	587	10
Vulcano	38.23N 014.58E	IT	21.0	499	20
Wangerooge	53.47N 007.54E	DE	9.5	10	10
Wight	50.67N 001.31W	GB	391.5	395	20
Zakynthos	37.47N 020.46E	GR	419.5	756	10
<b>AFROTROPIC</b>					
Bioko (Fernando Poo, Macias Nguema)	03.50N 008.70E	GQ	1935.0	3008	20
Fundo	05.03S 039.38E	TZ	9.5	10	20
Grande Comore (Njazidja) [Comoros] <sup>***</sup>	11.38S 043.20E	KM	1013.0	2631	60
Inhaca	26.00S 032.56E	MZ	52.0	104	10
Koyaama (Coicama)	00.38S 042.20E	SO	4.5	9	10
Madagascar	19.00S 047.00E	MG	587713.5	2876	60
Mafia (Chole Shamba)	07.51S 039.47E	TZ	422.2	53	10
Nosy Be	13.19S 048.15E	MG	290.5	214	50
Nosy Boraha (Sainte Marie)	16.53S 049.55E	MG	222.0	150	50
Nosy Komba	13.28S 048.20E	MG	30.0	570	30
Pemba (Al Kuh Dra)	05.13S 039.77E	TZ	890.0	95	20
Príncipe	01.60N 007.40E	ST	148.5	948	40
Samha	12.09N 053.02E	YE	41.0	779	30
São Tomé	00.25N 006.62E	ST	855.0	2024	40
Socotra	12.28N 053.54E	YE	3625.0	1526	30
Zanzibar (Unguja)	06.08S 039.20E	TZ	1574.5	195	20
<b>INDO-MALAY</b>					
Amami Ōshima	28.17N 129.23E	JP	712.5	694	60
Anak Krakatau	06.05S 105.25E	ID	2.5	181	40
Balabac	07.95N 117.50E	PH	319.0	568	50
Bali	08.40S 115.20E	ID	5416.5	3031	40
Basilan	06.50N 122.00E	PH	1265.5	1011	50
Batbatan (Guintacan)	11.28N 121.54E	PH	11.0	90	50
Biliran	11.58N 124.47E	PH	501.0	1340	50

Table 1/4. Islands' list with geographical data (continued).

<b>Island</b>	<b>Localization</b>	<b>Code</b>	<b>Surface</b>	<b>Elevation</b>	<b>Isolation</b>
INDO-MALAY					
Borneo	01.00N 113.00E	ID/MY	748168.0	4095	50
Cebu	10.30N 123.75E	PH	4467.5	1097	50
Con Dao (Con Soon)	08.41N 106.37E	VN	51.5	577	10
Dang Kho (Dong Cong)	21.06N 107.36E	VN	20.0	190	10
Flores	08.70S 121.00E	ID	14154.5	2370	40
Hainan	14.16N 109.40E	CN	33210.0	1840	20
Hainan	14.16N 109.40E	CN	33210.0	1840	20
Iriomote-jima	24.20N 123.48E	JP	289.5	469	60
Ishigaki-jima	24.46N 124.20E	JP	221.0	526	60
Iwo-jima	30.47N 130.17E	JP	11.0	703	40
Java (Jawa)	07.50S 110.00E	ID	138793.5	3676	50
Kakeromajima (Kageroma)	28.07N 129.14E	JP	77.0	326	60
Kangean	06.90S 115.35E	ID	188.0	390	40
Kuchinoshima	29.58N 129.55E	JP	13.5	628	60
Labuan	05.18N 115.13E	MY	75.0	85	40
Leyte	10.80N 125.00E	PH	7367.5	1349	50
Lombok	08.60S 116.36E	ID	4625.0	3726	50
Luzon	16.00N 122.00E	PH	109965.0	2934	50
Mactan	10.17N 123.57E	PH	62.0	10	30
Magong (Hokoto, Penghu)	23.34N 119.37E	TW	90.0	56	30
Mindanao	07.50N 125.00E	PH	97530.0	2954	70
Mindoro	12.90N 121.10E	PH	10572.0	2585	50
Miyakojima (Naaku)	24.16N 132.18E	JP	55.5	115	60
Negros	10.00N 123.00E	PH	13074.5	2435	50
Okinawa-jima	26.50N 128.00E	JP	1200.0	498	60
Palawan	10.00N 118.70E	PH	12188.5	2085	60
Paliat	06.58S 115.37E	ID	42.0	287	40
Panaitan	06.35S 105.12E	ID	118.5	187	40
Panay	11.10N 122.60E	PH	12011.0	2049	60
Peucang (Ujung Kulon)	06.44S 105.15E	ID	4.5	70	20
Phong Vong (Hon Vong)	09.55N 104.00E	VN	0.5	65	10
Polillo	14.85N 121.95E	PH	629.0	327	40
Rakata Besar (Krakatau)	06.09S 105.26E	ID	11.5	813	40
Rakata Kecil	06.05S 105.27E	ID	2.5	42	40
Samar	11.90N 125.30E	PH	12849.5	850	60

Table 1/5. Islands' list with geographical data (continued).



<b>Island</b>	<b>Localization</b>	<b>Code</b>	<b>Surface</b>	<b>Elevation</b>	<b>Isolation</b>
<b>INDO-MALAY</b>					
Sertung	06.05S 105.22E	ID	7.5	182	40
Sibuyan	12.50N 122.60E	PH	465.0	2057	40
Simeulue (Simalu)	02.65N 096.10E	ID	1754.0	481	20
Singapore (Pulau Ujong)	01.35N 103.80E	SG	536.5	163	10
Solor [Solor] <sup>***</sup>	08.28S 123.00E	ID	1292.0	1737	40
South Andaman	11.95N 092.67E	IN	1211.0	366	40
Sri Lanka	07.80N 080.60E	LK	67654.5	2524	20
Sulawesi (Celebes)	02.00S 121.00E	ID	180681.0	3455	60
Sumatra (Sumatera)	00.50S 102.00E	ID	443066.0	3804	20
Sumba (Soemba)	06.65S 120.00E	ID	10710.5	1225	50
Sumbawa (Soembawa)	08.50S 118.00E	ID	14386.0	2722	40
Takeshima	30.48N 130.25E	JP	4.0	220	40
Taiwan (Formosa)	23.38N 121.07E	TW	34506.5	3952	40
Tanegashima	30.36N 130.59E	JP	447.5	282	40
Tawi Tawi	05.20N 120.00E	PH	580.5	549	40
Thanh Lân (Thanh Lam)	21.01N 107.49E	VN	13.5	250	10
Thao Thu	09.17N 103.28E	VN	10.0	200	30
Timor	09.30S 125.50E	ID	28418.0	2963	40
Tokunoshima	27.46N 128.57E	JP	105.0	645	50
Yakushima	30.20N 130.31E	JP	500.5	1935	40
<b>E PALEARCTIC</b>					
Hachijō-jima	33.06N 139.37E	JP	62.5	854	40
Hokkaidō	43.00N 142.50E	JP	78719.5	2290	40
Honshū	36.50N 138.00E	JP	225800.5	3776	30
Izu Ōshima	34.44N 139.24E	JP	91.0	764	30
Jeju (Cheju, Quelpart)	33.23N 136.23E	KR	1848.0	1950	30
Kunashir	44.10N 145.90E	RU	1612.0	1820	40
Kyūshū	32.60N 131.10E	JP	37437.0	1788	30
Namhae	34.48N 127.46E	KR	300.0	786	10
Okushiri	42.09N 139.28E	JP	143.0	584	40
Sakhalin	50.00N 142.50E	RU	72493.0	1609	10
Shikoku <sup>*</sup>	33.40N 133.40E	JP	18554.5	1981	40
Shimoshima [Amakusa] <sup>***</sup>	32.23N 130.06E	JP	924.0	460	30
Tsushima <sup>**</sup>	34.40N 129.09E	JP	708.5	649	30

Table 1/6. Islands' list with geographical data (continued).



Island	Localization	Code	Surface	Elevation	Isolation
AUSTRALASIA					
Ambon (Amboina)	03.64S 128.19E	ID	806.0	1031	50
Bacan (Bachian, Batjan)	00.57S 127.58E	ID	1900.0	2011	50
Baronga (Paronga)	06.15S 150.28E	PG	2.0	30	30
Biak	01.00S 136.00E	ID	1832.0	740	30
Bougainville	06.20S 155.50E	SO	9318.0	2792	70
Buka	05.30S 154.70E	SO	682.5	365	60
Buru (Boeroe)	03.45S 126.56E	ID	8473.0	2700	50
Choiseul	07.01S 156.56E	SO	2970.5	1067	70
Daru	09.05S 143.12E	PG	14.5	27	30
Espiritu Santo	15.39S 166.85E	VU	3955.5	1877	70
Gebe (Gebeh)	00.04S 129.26E	ID	420.0	396	50
Gizo (Ghizo)	08.07S 156.75E	SO	35.0	<100	70
Grande Terre	21.40S 165.50E	NC	16648.5	1628	90
Guadalcanal	09.60S 160.20E	SO	5353.0	2447	80
Halmahera (Gilolo)	00.50N 128.00E	ID	18039.5	1635	60
Hermite	20.27S 115.31E	AU	10.0	54	10
Kai (Nuhu Yuut)	05.60S 133.00E	ID	549.5	801	50
Kiriwina	08.50S 151.05E	PG	266.5	55	50
Kolombangara (Nduke)	07.95S 157.05E	SO	688.0	1768	70
Larat (Tanimbar)	07.17S 131.81E	ID	216.0	55	40
Lihir (Niolam, Gerrit Denys)	03.14S 152.62E	PG	320.0	700	60
Makira (San Cristobal)	10.60S 161.85E	SO	3190.5	1250	80
Malaita	09.00S 161.00E	SO	3836.0	1433	80
Misool (Mysol)	01.87S 130.17E	ID	2033.5	561	50
Mono [Treasury] <sup>***</sup>	07.21S 155.34E	SO	36.0	350	70
Morotai (Morty)	02.34N 128.50E	ID	2266.5	1090	50
New Britain	05.70S 150.90E	PG	35144.5	2334	50
New Georgia	08.25S 157.60E	SO	2036.5	860	80
New Guinea	06.00S 140.50E	ID/PG	785753.0	5030	40
New Ireland	03.70S 152.50E	PG	7404.5	2150	50
New Hanover (Lavongai)	02.30S 150.15E	PG	1800.0	900	50
Nggela (Florida)	09.08S 160.25E	SO	386.0	<200	80
Normanby (Duau)	10.00S 151.00E	PG	1040.0	1100	40
North Island	38.00S 176.00E	NZ	111583.0	2796	90
Pavuvu [Russell] <sup>***</sup>	09.05S 159.10E	SO	120.0	543	80
Pins (Kounie)	22.60S 147.67E	NC	141.5	110	60

Table 1/7. Islands' list with geographical data (continued).

Island	Localization	Code	Surface	Elevation	Isolation
AUSTRALASIA					
Ranongga (Ronongo, Ganonga)	08.05S 156.55E	SO	148.0	869	70
Rendova	08.55S 157.30E	SO	411.5	1060	80
Roon (Ron)	02.23S 134.33E	ID	18.0	200	20
Salawati	01.15S 130.92E	ID	1623.0	925	40
Santa Isabel (Bughotu, Santa Ysabel)	08.00S 159.10E	SO	3665.0	1219	80
Savo	09.17S 159.83E	SO	30.0	485	80
Seram (Ceram)	03.26S 129.50E	ID	17454.0	3027	50
Taliabu [Sula]***	01.83S 124.88E	ID	2960.0	1638	50
Tanahbesar (Wokam) [Aru]***	05.79S 134.53E	ID	1604.0	239	30
Tasmania	42.00S 146.50E	AU	65022.0	1617	40
Ternate	00.84N 127.42E	ID	111.5	1721	40
Trimouille	20.23S 115.33E	AU	5.0	36	10
Tulagi (Tulaghi)	09.06S 160.08E	SO	5.5	200	70
Umboi (Rooke)	05.38S 147.55E	PG	930.0	1655	30
Vella Lavella (Mbilua)	07.75S 156.65E	SO	629.0	808	70
Waigeo (Amberi)	00.22S 130.84E	ID	3153.5	993	50
Woodlark (Muyuw)	09.10S 152.80E	PG	874.0	225	60
Yapen (Japen, Jobi)	01.85S 136.34E	ID	2278.0	1496	20
Yule	08.48S 146.31E	PG	16.0	33	20
OCEANIA					
Chichi-jima	27.04N 142.12E	JP	25.0	324	90
Nishi-jima	27.07N 142.10E	JP	0.5	100	90
Peleliu (Beliliou)	07.23N 134.25E	PW	13.0	30	90
NEARCTIC					
Anacapa	34.00N 119.37W	US	3.0	279	20
Bay Farm*	37.43N 122.13W	US	16.0	20	10
Catalina (Santa Catalina)	33.39N 118.43W	US	193.0	648	20
Cedar Key*	29.08N 083.02W	US	2.5	5	10
Cumberland	30.51N 081.26W	US	147.5	20	10
Fishers	41.16N 071.59W	US	11.0	5	10
Gardiners	41.05N 072.06W	US	12.0	15	10
Long Island*	40.48N 073.11W	US	3629.0	122	10
Matagorda	28.09N 096.44W	US	157.5	7	10

Table 1/8. Islands' list with geographical data (continued).

Island	Localization	Code	Surface	Elevation	Isolation
NEARCTIC					
Nantucket	41.28N 070.80W	US	272.5	9	10
Padre	26.50N 097.23W	US	541.0	15	10
Penikese	41.27N 070.55W	US	0.5	25	10
Sanibel*	26.26N 082.06W	US	86.0	1	10
Santa Cruz	34.00N 119.74W	US	256.0	753	20
St. Simon's	31.09N 081.23W	US	46.0	3	10
Tybee*	32.00N 080.50W	US	7.0	3	10
Vancouver	49.67N 125.50W	CA	31848.5	2192	10
NEOTROPIC					
Antigua	17.04N 061.47W	AG	277.0	402	50
Arapiranga	01.20S 048.34W	BR	44.0	30	10
Baltra (South Seymour)	00.45S 090.25W	EC	27.0	100	60
Cañas	07.24N 080.19W	PA	7.5	30	10
Cayenne	04.52N 052.19W	GF	207.0	234	10
Coiba	07.29N 081.45W	PA	493.0	400	20
Cuba	21.50N 079.00W	CU	105805.5	1975	40
Dominica	15.45N 061.45W	DM	787.5	1447	50
Eleuthera	25.04N 076.08W	BS	518.0	60	50
Great Exuma	23.32N 075.50W	BS	204.5	39	50
Grenada	12.10N 061.70W	GD	323.0	840	40
Guadeloupe**	16.20N 061.70W	GP	1496.5	1467	40
Guana	18.30N 064.37W	VG	3.5	30	50
Hispaniola	19.00N 071.00W	DO/HT	73929.0	3098	50
Juventud (Pinos)	21.65N 082.78W	CU	2237.5	310	40
Jamaica	18.20N 072.25W	JM	11189.5	2256	50
Little Cayman	19.70N 080.00W	KY	28.0	14	50
Marajó	00.55S 049.40W	BR	40100.0	40	10
Marco (Ilha do Marco)	00.35S 047.26W	BR	15.0	12	10
Maria Madre	21.60N 106.58W	MX	145.0	616	20
Martinique	14.65N 061.00W	MQ	1166.5	1397	50
Mustique	12.52N 061.10W	VC	5.5	150	50
Puerto Rico	18.20N 066.45W	PR	9100.0	1338	50
Rey	08.22N 078.53W	PA	234.0	86	20
Santa Cruz (Indefatigable)	00.60S 090.35W	EC	986.0	864	70

Table 1/9. Islands' list with geographical data (continued).



Island	Localization	Code	Surface	Elevation	Isolation
NEOTROPIC					
Santo Amaro*	23.56S 043.21W	BR	143.0	4	10
St. Croix	17.75N 064.75W	VI	214.0	355	40
St. John	18.35N 064.75W	VI	50.0	389	40
St. Vincent	13.15N 061.11W	VC	381.0	1234	40
Taboga	08.47N 079.33W	PA	12.0	300	20
Trinidad	10.40N 061.30W	TT	5008.5	940	20

Table 1/10. Islands' list with geographical data.

SPECIES	ISLANDS	
<i>Acrophotopsis eurygnatha</i> Schuster, 1958	Maria Madre	
<i>Ancistrotilla aenigmatica</i> Brothers, 2012	Grande Terre, Pins	E
<i>Ancistrotilla azurea</i> Brothers, 2012	Espiritu Santo	E
<i>Ancistrotilla bluensis</i> Brothers, 2012	Grande Terre	E
<i>Ancistrotilla caledonica</i> (André, 1896)	Grande Terre, Pins	E
<i>Ancistrotilla carbonaria</i> (Smith, 1855)	Tasmania	E
<i>Ancistrotilla nigra</i> Brothers, 2012	Grande Terre	E
" <i>Andreimyrmex</i> " <i>annexa</i> (Cameron, 1909)	Borneo	E
<i>Andreimyrmex davidi</i> (André, 1898)	Taiwan	
<i>Andreimyrmex neaera</i> (Mickel, 1935)	Borneo	E
<i>Andreimyrmex sarawakensis</i> Lelej, 1996	Borneo	E
<i>Andreimyrmex substriolata</i> (Chen, 1957)	Taiwan	
" <i>Andreimyrmex</i> " <i>virinata nitela</i> (Mickel, 1934)	Mindanao, Negros, Samar	E (ssp)
" <i>Andreimyrmex</i> " <i>virinata virinata</i> (Mickel, 1934)	Biliran, Luzon, Mindanao, Panay, Samar, Sibuyan	E (ssp)
" <i>Andreimyrmex</i> " <i>volupia</i> (Mickel, 1935)	Borneo	E
<i>Artiotilla biguttata</i> (Costa, 1858)	Brač, Corsica, Cyprus, Hvar, Korčula, Rhodes, Sicily	
<i>Ascetotilla carinata</i> (Smith, 1859)	Morotai, New Britain, New Guinea, Tanahbesar	E
<i>Ascetotilla clypeata</i> Brothers, 1971	New Guinea	E
<i>Ascetotilla ferruginata</i> Brothers, 1971	New Guinea	E
<i>Ascetotilla francae</i> Brothers, 1971	New Guinea	E
<i>Ascetotilla inermis</i> Brothers, 1971	New Guinea	E
<i>Ascetotilla notidana</i> Brothers, 1971	New Guinea	E
<i>Ascetotilla stanleyi</i> Brothers, 1971	New Guinea	E
<i>Ascetotilla uncinata</i> Brothers, 1971	New Guinea	E
<i>Aureotilla dispilota</i> (Sichel et Radoszkowski, 1869)	Madagascar	E
<i>Aureotilla hebraea</i> (Bischoff, 1920)	Madagascar	E

Table 2/1. Checklist and island distribution of the species (continued).



SPECIES	ISLANDS	
<i>Aureotilla madecassa</i> (Saussure, 1890)	Madagascar, Nosy Be	E
<i>Aureotilla preclara</i> (Bischoff, 1920)	Madagascar	E
<i>Aureotilla tulearica</i> (Olsoufieff, 1938)	Madagascar	E
<i>Australotilla modesta</i> (Smith, 1855)	Hermite, Trimouille	
<i>Bethsmymmilla alticola</i> Krombein et Lelej, 1999	Sri Lanka	E
<i>Bischoffitilla aesyca</i> (Cameron, 1902)	Borneo, Java	E
<i>Bischoffitilla ardescens</i> (Smith, 1873)	Amami Ōshima, Yakushima, Honshū, Izu Ōshima, Kyūshū, Shikoku, Tsushima	E
<i>Bischoffitilla aspera</i> (Cameron, 1900)	Sri Lanka	E
<i>Bischoffitilla brachynota</i> (Chen, 1957)	Taiwan	E
<i>Bischoffitilla byblis</i> (Mickel, 1934)	Luzon, Sibuyan	E
<i>Bischoffitilla calliopeia</i> (Mickel, 1935)	Borneo	E
<i>Bischoffitilla cardea</i> (Mickel, 1935)	Borneo	E
<i>Bischoffitilla carinulifera</i> (André, 1908)	Taiwan	E
<i>Bischoffitilla cebuensis</i> (Tsuneki, 1993)	Cebu	E
<i>Bischoffitilla clypealis</i> (Mickel, 1935)	Borneo	E
<i>Bischoffitilla concava</i> (Mickel, 1934)	Mindanao	E
<i>Bischoffitilla denticollis</i> (Motschulsky, 1863)	Sri Lanka	E
<i>Bischoffitilla deserta</i> (Smith, 1879)	Java, Kangean, Luzon, Sulawesi	E
<i>Bischoffitilla dictynna</i> (Mickel, 1934)	Mindanao	E
<i>Bischoffitilla disjuncta</i> (Mickel, 1934)	Luzon	E
<i>Bischoffitilla duplisquamata</i> (Chen, 1957)	Taiwan	E
<i>Bischoffitilla edolata</i> (Cameron, 1900)	Sri Lanka	E
<i>Bischoffitilla eminula</i> (Mickel, 1934)	Luzon	E
<i>Bischoffitilla erdae</i> (Zavattari, 1913)	Taiwan	E
<i>Bischoffitilla ernesti</i> (Cameron, 1900)	Sri Lanka	E
<i>Bischoffitilla facilis</i> (Smith, 1860)	Sulawesi	E
<i>Bischoffitilla formosana</i> (Zavattari, 1913)	Taiwan	E
<i>Bischoffitilla fucosa</i> (Mickel, 1934)	Mindanao	E
<i>Bischoffitilla galatea</i> (Mickel, 1934)	Luzon	E
<i>Bischoffitilla imparilis</i> (Mickel, 1934)	Luzon	E
<i>Bischoffitilla indecora</i> (Cameron, 1898)	Sri Lanka	E
<i>Bischoffitilla indocila</i> (Cameron, 1900)	Sri Lanka	E
<i>Bischoffitilla koxiana</i> (Chen, 1957)	Taiwan	E
<i>Bischoffitilla mickeli</i> (Chen, 1957)	Taiwan	E
<i>Bischoffitilla muii</i> (Mickel, 1935)	Java	E
<i>Bischoffitilla multidentata</i> (André, 1896)	Simeulue, Sumatra	
<i>Bischoffitilla murotai</i> (Tsuneki, 1993)	Amami Ōshima, Okinawa-jima	E
<i>Bischoffitilla oblectabilis</i> (Mickel, 1934)	Luzon	E

Table 2/2. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Bischoffitilla ocyote</i> (Mickel, 1934)	Luzon	E
<i>Bischoffitilla palaca</i> (Cameron, 1902)	Borneo, Sumatra	E
<i>Bischoffitilla persuasa</i> (Cameron, 1900)	Sri Lanka	E
<i>Bischoffitilla puerilis</i> (Cameron, 1897)	Sri Lanka	
<i>Bischoffitilla puliensis</i> (Tsuneki, 1972)	Taiwan	E
<i>Bischoffitilla pungens</i> (Smith, 1873)	Yakushima, Hachijō-jima, Honshū, Kyūshū, Shikoku	E
<i>Bischoffitilla roxane</i> (Mickel, 1934)	Negros	E
<i>Bischoffitilla saffica</i> (Zavattari, 1913)	Sulawesi	E
<i>Bischoffitilla sauteri lingnani</i> (Mickel, 1933)	Hainan	
<i>Bischoffitilla sauteri sauteri</i> (Zavattari, 1913)	Taiwan	E (ssp)
<i>Bischoffitilla subdebilis</i> (Mickel, 1934)	Luzon	E
<i>Bischoffitilla subtriangularis</i> (Mickel, 1934)	Mindanao	E
<i>Bischoffitilla sulphicilla</i> (Mickel, 1934)	Borneo, Mindanao	E
<i>Bischoffitilla teuta mindanaonis</i> (Tsuneki, 1993)	Mindanao	E (ssp)
<i>Bischoffitilla teuta teuta</i> (Mickel, 1934)	Luzon	E (ssp)
<i>Bischoffitilla teuta vicinaria</i> (Mickel, 1934)	Negros	E (ssp)
<i>Bischoffitilla trituberculata</i> (Mickel, 1933)	Taiwan	E
<i>Bischoffitilla tumidula</i> (Mickel, 1934)	Taiwan	
<i>Bischoffitilla umbrosa</i> (Mickel, 1934)	Luzon	E
<i>Bischoffitilla venatrix</i> (Mickel, 1935)	Borneo	E
<i>Blakeius bipunctatus</i> (Latreille, 1792)	Chergui, Corsica	
<i>Blakeius chiesii chiesii</i> (Spinola, 1839)	Asinara, Corsica, Sant'Antioco, Sardinia	E (ssp)
<i>Blakeius chiesii negrei</i> (Suárez, 1958)	Sicily	
<i>Blakeius leopoldinus</i> (Invrea, 1955)	Comino, Gozo, Levanzo, Lipari, Malta, Marettimo, Salina, Sant'Antioco, Sardinia, Sicily, Vulcano	
<i>Cephalotilla suarezi</i> Nonveiller, 1979	Bioko	E
" <i>Ceratotilla</i> " <i>dolosa zanzibarensis</i> (Garcia Mercet, 1903)	Zanzibar	E (ssp)
<i>Ceratotilla</i> sp.	Inhaca	
<i>Chryсотilla analis</i> (Olsoufieff, 1938)	Madagascar	E
<i>Chryсотilla antongilana</i> Bischoff, 1920	Madagascar	E
<i>Chryсотilla chauvini</i> (Olsoufieff, 1938)	Madagascar	E
<i>Chryсотilla consobrina</i> (André, 1901)	Madagascar	E
<i>Chryсотilla elongata</i> (Olsoufieff, 1938)	Madagascar	E
<i>Chryсотilla grandidieri</i> (Saussure, 1890)	Madagascar	E
<i>Chryсотilla honesta</i> (André, 1898)	Madagascar, Nosy Boraha	E
<i>Chryсотilla irradiata</i> (Olsoufieff, 1938)	Madagascar	E
<i>Chryсотilla menavudia</i> (Olsoufieff, 1938)	Madagascar	E
<i>Chryсотilla moerens</i> (André, 1899)	Madagascar	E
<i>Chryсотilla nataliae</i> (Olsoufieff, 1938)	Madagascar	E

Table 2/3. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Chrysotilla pretiosa</i> Bischoff, 1920	Madagascar	E
<i>Chrysotilla saussurei</i> (Olsoufieff, 1938)	Madagascar	E
<i>Chrysotilla sihanaka</i> (Saussure, 1890)	Madagascar	E
<i>Chrysotilla testacea</i> (Olsoufieff, 1938)	Madagascar	E
<i>Chrysotilla vadoni</i> (Olsoufieff, 1938)	Madagascar	E
<i>Chrysotilla variabilis</i> (Olsoufieff, 1938)	Madagascar, Nosy Boraha	E
<i>Ctenotilla porcella</i> (Turner, 1911)	Sri Lanka	
“ <i>Ctenotilla</i> ” <i>spiculata</i> (André, 1908)	Bioko	E
<i>Cystomutilla ruficeps</i> (Smith, 1855)	Corsica, Great Britain, Sardinia, Sicily	
<i>Cystomutilla teranishii</i> Mickel 1935	Hokkaidō, Honshū, Shikoku, Tsushima	
<i>Dasylabris angelae</i> Suárez, 1959	Gran Canaria	E
<i>Dasylabris argentipes</i> (Smith, 1855)	Sri Lanka	
<i>Dasylabris atrata</i> (Linnaeus, 1767)	Lampedusa	
<i>Dasylabris biblica</i> Invrea, 1950	Crete, Cyprus, Rhodes	
<i>Dasylabris canariensis</i> Suárez, 1970	Fuerteventura	E
<i>Dasylabris deckeni signaticeps</i> André, 1906	Koyaama	
<i>Dasylabris deponsa</i> Bischoff, 1921	Madagascar	E
<i>Dasylabris hurei</i> André, 1903	Madagascar	E
<i>Dasylabris juxtarenaria</i> Skorikov, 1935	Djerba, Lampedusa	
<i>Dasylabris manderstierinii cypria</i> (Sichel et Radoszkowski, 1870)	Crete, Cyprus, Gavdos, Rhodes	
<i>Dasylabris maura carinulata</i> (Dalla Torre, 1897)	Asinara, Corsica, Piana dell’Asinara, Santa Maria, San Pietro, Sardinia	E (ssp)
<i>Dasylabris maura maura</i> (Linnaeus, 1758)	Brač, Comino, Euboea, Hvar, Korčula, Krk, Levanzo, Lipari, Malta, Sicily, Syros, Thassos	
<i>Dasylabris porphyrea</i> (Gerstaecker, 1873)	Zanzibar	
<i>Dasylabris rubripilosa</i> Bischoff, 1921	Madagascar	E
<i>Dasylabris rubroaurea</i> (Sichel et Radoszkowski, 1869)	Madagascar	E
<i>Dasylabris rugosa</i> (Olivier, 1811)	Sri Lanka	
<i>Dasylabris scutilla</i> Skorikov, 1935	Crete, Gavdos	
<i>Dasylabris seyrigi</i> Olsoufieff, 1938	Madagascar	E
<i>Dasylabris trunciceps</i> Krombein, 1972	Madagascar	E
<i>Dasylabris unipunctata</i> Bischoff, 1921	Inhaca	
<i>Dasylabris voeltzkowi</i> Bischoff, 1921	Madagascar, Nosy Be, Nosy Komba	E
<i>Dasymutilla alesia</i> Banks, 1921	Long Island	
<i>Dasymutilla araneoides</i> (Smith, 1862)	Cañas, Rey	
<i>Dasymutilla asopus bexar</i> (Blake, 1871)	Long Island	
<i>Dasymutilla aureola</i> (Cresson, 1865)	Catalina	
<i>Dasymutilla bioculata</i> (Cresson, 1865)	Padre, Sanibel	
<i>Dasymutilla bouvieri</i> (André, 1898)	Hispaniola	E

Table 2/4. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Dasymutilla californica clio</i> (Blake, 1879)	Vancouver	
<i>Dasymutilla canella</i> (Blake, 1871)	Gardiners, Long Island	
<i>Dasymutilla coccineohirta</i> (Blake, 1871)	Bay Farm, Catalina	
<i>Dasymutilla cypris</i> (Blake, 1871)	Sanibel, St. Simon's	
<i>Dasymutilla gibbosa</i> (Say, 1836)	Fishers, Long Island, Nantucket, Penikese	
<i>Dasymutilla gloriosa</i> (Saussure, 1868)	Matagorda	
<i>Dasymutilla insulana</i> Mickel, 1926	Cuba, Juventud, Little Cayman	E
<i>Dasymutilla interrupta</i> Banks, 1921	Fishers, Long Island	
<i>Dasymutilla lepeletierii</i> (Fox, 1899)	Long Island, Penikese, St. Simon's, Tybee	
<i>Dasymutilla macilenta</i> (Blake, 1871)	Cedar Key, Sanibel	
<i>Dasymutilla macra</i> (Cresson, 1865)	Long Island	
<i>Dasymutilla melancholica</i> (Smith, 1879)	Hispaniola	E
<i>Dasymutilla militaris militaris</i> (Smith, 1855)	Jamaica	E (ssp)
<i>Dasymutilla militaris nigriceps</i> (Cresson, 1865)	Cuba, Great Exuma, Hispaniola, Little Cayman, Martinique	E (ssp)
<i>Dasymutilla mutata</i> (Blake, 1871)	Long Island, St. Simon's	
<i>Dasymutilla nigripes</i> (Fabricius, 1787)	Long Island	
<i>Dasymutilla occidentalis occidentalis</i> (Linnaeus, 1758)	Long Island, St. Simon's	
<i>Dasymutilla quadriguttata</i> (Say, 1823)	Long Island, Nantucket	
<i>Dasymutilla scaevola</i> (Blake, 1871)	Long Island	
<i>Dasymutilla spiniscapula</i> Manley et Pitts, 2007	Hispaniola	E
<i>Dasymutilla vesta</i> (Cresson, 1865)	Cumberland, Long Island, St. Simon's	
<i>Dasymutilla waco</i> (Blake, 1871)	Padre	
<i>Dentilla curtiventris</i> (André, 1901)	Antikythera, Crete, Euboea, Gavdos, Kefalonia, Kythera, Paros, Poros, Rhodes, Sicily, Zakynthos	
<i>Dentilla purcharti</i> Lo Cascio, Romano et Grita, 2012	Samha, Socotra	E
<i>Dentilla socotrana</i> Lo Cascio, Romano et Grita, 2012	Socotra	E
<i>Dolichomutilla sycorax</i> (Smith, 1855)	Fundo, Pemba, Zanzibar	
<i>Eosmicromyrmilla srilankensis</i> Lelej et Krombein, 2001	Sri Lanka	E
<i>Eotrogaspidia amans amans</i> (André, 1909)	Java, Kangean	E (ssp)
<i>Eotrogaspidia auroguttata</i> (Smith, 1855)	Hainan, Okinawa-jima, Taiwan	
<i>Ephucilla bacbo</i> (Lelej, 1996)	Borneo	
<i>Ephucilla drola drola</i> (Zavattari, 1913)	Taiwan	E (ssp)
<i>Ephucilla drupa</i> (Zavattari, 1913)	Taiwan	E
<i>Ephucilla guentheri</i> (Zavattari, 1913)	Taiwan	E
<i>Ephucilla naja</i> (Zavattari, 1913)	Ishigaki-jima, Taiwan	E
<i>Ephucilla poonaensis</i> (Cameron, 1892)	Sri Lanka	
<i>Ephucilla thalia</i> (Mickel, 1933)	Taiwan	E
<i>Ephucilla undata</i> (Chen, 1957)	Taiwan	E
<i>Ephucilla viet</i> (Lelej, 1995)	Dang Kho	(E)

Table 2/5. Checklist and island distribution of the species (continued).



SPECIES	ISLANDS	
<i>Ephucilla yuliana</i> (Tsuneki, 1972)	Taiwan	E
<i>Ephuta cubensis</i> (Blake, 1871)	Cuba	E
<i>Ephuta emarginata</i> Mickel, 1952	Trinidad	
<i>Ephuta festata</i> Mickel, 1928	Cuba	E
<i>Ephuta flavidens</i> Mickel, 1952	Trinidad	
<i>Ephuta furcillata</i> Mickel, 1928	Cuba	E
<i>Ephuta prima</i> Genaro, 1997	Hispaniola	E
<i>Ephuta puteola</i> (Blake, 1879)	Long Island	
<i>Ephuta rubriceps</i> (Cresson, 1865)	Cuba	E
<i>Ephuta singularis</i> (Spinola, 1841)	Cayenne	
<i>Ephuta tholosa</i> Dow, 1931	Cuba	E
<i>Ephuta trinidadensis</i> Ashmead, 1904	Trinidad	E
<i>Ephutomma fletcheri</i> (Turner, 1911)	Sri Lanka	E
<i>Ephutomma montarcense</i> (Garcia Mercet in Giner Mari, 1944)	Mallorca	
" <i>Ephutomorpha</i> " <i>aerata</i> (André, 1896)	New Guinea	E
" <i>Ephutomorpha</i> " <i>agilis</i> (Smith, 1865)	New Guinea	E
" <i>Ephutomorpha</i> " <i>amoenola</i> Turner, 1914	Tasmania	E
" <i>Ephutomorpha</i> " <i>australasiae</i> (Fabricius, 1804)	Tasmania	
" <i>Ephutomorpha</i> " <i>azurea</i> (Mantero, 1900)	New Guinea	E
" <i>Ephutomorpha</i> " <i>biroi</i> André, 1905	New Guinea	E
" <i>Ephutomorpha</i> " <i>bivulnerata</i> (André, 1901)	North Island	
" <i>Ephutomorpha</i> " <i>blanda</i> (Erichson, 1842)	Tasmania	
" <i>Ephutomorpha</i> " <i>concinna</i> (Westwood, 1843)	Tasmania	E
" <i>Ephutomorpha</i> " <i>cordatiformis</i> Turner, 1914	Tasmania	E
" <i>Ephutomorpha</i> " <i>cyaneiceps</i> André, 1901	Kai	E
" <i>Ephutomorpha</i> " <i>damia</i> (Smith, 1863)	Seram	E
" <i>Ephutomorpha</i> " <i>dorsigera</i> (Westwood, 1843)	Tasmania	E
" <i>Ephutomorpha</i> " <i>elegans</i> (Westwood, 1843)	Tasmania	
" <i>Ephutomorpha</i> " <i>extranea</i> (André, 1896)	New Guinea, Yule	E
" <i>Ephutomorpha</i> " <i>fausta</i> (Smith, 1863)	Misool	E
" <i>Ephutomorpha</i> " <i>fulgida</i> (André, 1896)	New Guinea	E
" <i>Ephutomorpha</i> " <i>incisa</i> André, 1905	New Guinea	E
" <i>Ephutomorpha</i> " <i>inclyta</i> (André, 1896)	New Guinea	E
" <i>Ephutomorpha</i> " <i>lateralis</i> (Westwood, 1843)	Tasmania	E
" <i>Ephutomorpha</i> " <i>manteroi</i> Zavattari, 1913	New Guinea	E
" <i>Ephutomorpha</i> " <i>melanota</i> (André, 1896)	Morotai	
" <i>Ephutomorpha</i> " <i>mirabilis</i> (Smith, 1863)	New Guinea, Waigeo	E
" <i>Ephutomorpha</i> " <i>morosa</i> (Westwood, 1843)	Hermite	
" <i>Ephutomorpha</i> " <i>notabilis</i> (Smith, 1879)	Tasmania	E

Table 2/6. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>"Ephutomorpha" novoguineana</i> Zavattari, 1913	New Guinea	E
<i>"Ephutomorpha" pagdeni</i> Mickel, 1935	Guadalcanal, Malaita, Pavuvu	E
<i>"Ephutomorpha" pallidipes</i> (André, 1896)	New Guinea	E
<i>"Ephutomorpha" paradisiaca</i> Zavattari, 1913	New Guinea	E
<i>"Ephutomorpha" porrecticeps</i> Turner, 1914	Tasmania	
<i>"Ephutomorpha" postica</i> Turner, 1914	Tasmania	E
<i>"Ephutomorpha" praestans</i> André, 1905	New Guinea	E
<i>"Ephutomorpha" soluta</i> (Erichson, 1841)	Tasmania	E
<i>"Ephutomorpha" splendida</i> (Smith, 1879)	New Guinea	E
<i>"Ephutomorpha" subcristata</i> Turner, 1914	Tasmania	E
<i>"Ephutomorpha" uniformis</i> André, 1903	Tasmania	
<i>"Ephutomorpha" sp.</i>	New Guinea	?
<i>Eurymutilla curta</i> (André, 1896)	Ambon, Buru, New Guinea, Seram, Taliabu	E
<i>Eurymutilla sumbawae</i> (Zavattari, 1913)	Sumbawa	E
<i>Eurymutilla thera</i> (Smith, 1863)	Seram	E
<i>Glossotilla adelpha</i> (André, 1898)	Bioko, São Tomé	
<i>"Glossotilla" atricolor ochraceomaculata</i> (André, 1904)	São Tomé	E (ssp)
<i>Glossotilla illudens</i> Invrea, 1941	Koyaama	(E)
<i>"Glossotilla" luctifera</i> (André, 1903)	São Tomé	
<i>Glossotilla principis</i> (André, 1904)	Príncipe	E
<i>Glossotilla suavis</i> (Gerstaecker, 1871)	Zanzibar	
<i>Hemutilla hoozana</i> (Zavattari, 1913)	Taiwan	
<i>Hildebrandtia hildebrandti</i> (Saussure, 1890)	Madagascar	E
<i>Hoplocrates cephalotes</i> (Swederus, 1787)	Santo Amaro	
<i>Hoplocrates pompalis</i> Mickel, 1941	Trinidad	
<i>Hoplomutilla derasa</i> (Fabricius, 1804)	Cayenne	
<i>Hoplomutilla melana</i> (Spinola, 1841)	Cayenne	
<i>Hoplomutilla opima</i> Mickel, 1939	Trinidad	
<i>Indratilla gynandromorpha</i> Lelej, 1993	Sri Lanka	E
<i>Karlissaidia medvedevi</i> Lelej, 2005	Sri Lanka	E
<i>Karlissaidia turneri</i> Lelej, 2005	Sri Lanka	E
<i>Karunaratnea dilecta</i> (Cameron, 1897)	Sri Lanka	
<i>Karunaratnea palatupanae</i> Lelej, 2005	Sri Lanka	E
<i>Krombeinella beaumonti</i> (Invrea, 1953)	Sicily	
<i>Krombeinella thoracica</i> (Fabricius, 1793)	Corsica, Sant'Antioco, Sardinia	
<i>Krombeinidia albopunctata</i> (André, 1907)	Sri Lanka	E
<i>Krombeinidia bagrada</i> (Cameron, 1902)	Borneo	E
<i>Krombeinidia depressicornis</i> (Mickel, 1935)	Borneo	E
<i>"Krombeinidia" foveata</i> (Cameron, 1900)	Sri Lanka	E

Table 2/7. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Krombeinidia griseomaculata</i> (André, 1898)	Bali, Con Dao, Java, Thao Thu	
<i>Krombeinidia ira ira</i> (Cameron, 1902)	Borneo	
<i>Krombeinidia ira palawana</i> (Mickel, 1934)	Palawan	E (ssp)
<i>Krombeinidia lilliputiana</i> (André, 1894)	Sri Lanka	
<i>Krombeinidia nallinia</i> (Zavattari, 1913)	Bali, Java	E
“ <i>Krombeinidia</i> ” <i>ogiana</i> (Cameron, 1900)	Sri Lanka	
<i>Krombeinidia peterseni</i> Lelej, 1996	Sri Lanka	E
<i>Krombeinidia subfossata</i> (Chen, 1957)	Borneo	
<i>Kudakrumia mirabilis</i> Krombein, 1979	Sri Lanka	E
<i>Kurzenkotilla visrara</i> (Cameron, 1898)	Sri Lanka	E
<i>Labidomilla rufocephala</i> Olsoufieff, 1938	Madagascar	E
<i>Labidomilla tricuspis</i> (André, 1895)	Madagascar	E
<i>Lehritilla lanka</i> Lelej, 2005	Sri Lanka	
<i>Leucospilomutilla cerbera</i> (Klug, 1821)	Cayenne	
<i>Liomutilla canariensis</i> André, 1907	Gomera, Gran Canaria, Hierro, La Palma, Tenerife	E
<i>Lophomutilla triguttata</i> Mickel, 1952	Trinidad	
<i>Macromyrme bezdeki</i> Lo Cascio, Romano et Grita, 2012	Socotra	E
<i>Macromyrme sinuata</i> (Olivier, 1811)	Cyprus	
<i>Mickelomyrme aborlana aborlana</i> (Tsuneki, 1993)	Palawan	E (ssp)
<i>Mickelomyrme aborlana zamboangae</i> (Tsuneki, 1993)	Mindanao	E (ssp)
<i>Mickelomyrme bakeri</i> (Mickel, 1934)	Balabac, Labuan, Palawan	E
<i>Mickelomyrme bicristata</i> (Chen, 1957)	Hainan	E
<i>Mickelomyrme bidentata</i> (Tsuneki, 1993)	Luzon	
<i>Mickelomyrme hageni</i> (Zavattari, 1913)	Iriomote-jima, Ishigaki-jima, Okinawa-jima, Taiwan; Hachijō-jima	
<i>Mickelomyrme ilanica</i> (Tsuneki, 1972)	Taiwan	E
<i>Mickelomyrme norna</i> (Zavattari, 1913)	Taiwan	E
<i>Mickelomyrme palawanensis</i> (Mickel, 1934)	Palawan	E
<i>Mickelomyrme semperi nigrogastra</i> (Mickel, 1934)	Luzon, Palawan	E (ssp)
<i>Mickelomyrme semperi semperi</i> (Ashmead, 1904)	Luzon, Negros, Panay	E (ssp)
<i>Mickelomyrme tanoi</i> (Tsuneki, 1972)	Borneo	E
<i>Mickelomyrme zebina</i> (Smith, 1860)	Borneo, Cebu, Luzon, Mactan, Mindanao, Negros, Bacan	E
<i>Mutilla alticola</i> (André, 1904)	São Tomé	E
“ <i>Mutilla</i> ” <i>antiguensis</i> Fabricius, 1775	Antigua	
<i>Mutilla astarte astarte</i> Smith, 1855	Mafia	
<i>Mutilla astarte orientalis</i> Bischoff, 1920	Zanzibar	
<i>Mutilla auriger</i> Krombein, 1951	Madagascar	E
<i>Mutilla berlandi</i> Krombein, 1972	Madagascar	E

Table 2/8. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Mutilla bilunata</i> (Gerstaecker, 1857)	Zanzibar	
<i>Mutilla dentidorsis</i> André, 1908	Zanzibar	
<i>Mutilla diselena</i> s.l. Sichel et Radoszkowski, 1870	Pemba	
<i>Mutilla diselena germanica</i> Bischoff, 1920	Zanzibar	
<i>Mutilla europaea</i> Linnaeus, 1758	Great Britain, Norderney, Sicily, Wangerooge	
<i>Mutilla mikado</i> Cameron, 1900	Hokkaidō, Honshū, Jeju, Kyūshū, Sakhalin, Shikoku	
“ <i>Mutilla</i> ” <i>oberthuri</i> André, 1907	Zanzibar	
“ <i>Mutilla</i> ” <i>pygidialis</i> Gerstaecker, 1871	Zanzibar	E
<i>Mutilla quinquemaculata</i> Cyrillus, 1787	Astypalea, Budelli, Cavallo, Čiovo, Corsica, Crete, Cyprus, Elba, Euboea, Gavdos, Kassos, Kefalonia, La Maddalena, Lampedusa, Mallorca, Malta, Menorca, Pianosa, Rhodes, Sant’Antioco, Sardinia, Sicily	
<i>Mutilla scabrofoveolata</i> Sichel et Radoszkowski, 1869	Inhaca	
“ <i>Mutilla</i> ” <i>straba</i> Gerstaecker, 1871	Zanzibar	
“ <i>Mutilla</i> ” sp. 1	Zanzibar	E?
“ <i>Mutilla</i> ” sp. 2	Anak Krakatau, Panaitan, Peucang, Rakata Besar, Rakata Kecil, Sertung	
<i>Myrmilla calva</i> (Villiers, 1789)	Asinara, Brač, Corsica, Crete, Elba, Giglio, Gorgona, Gran Canaria, Kerkyra, Korčula, La Maddalena, Lipari, Mallorca, Pianosa, Rhodes, Sant’Antioco, Sardinia, Sicily, Ustica, Vis, Vulcano	
<i>Myrmilla capitata</i> (Lucas, 1846)	Asinara, Corsica, Favignana, La Maddalena, Lampedusa, Levanzo, Pianosa, Sant’Antioco, San Pietro, Sardinia, Sicily, Syros	
<i>Myrmilla caucasica</i> (Kolenati, 1846)	Cyprus, Kos, Nisyros, Rhodes	
<i>Myrmilla corniculata</i> (Sichel et Radoszkowski, 1869)	Kerkyra, Skopelos, Syros, Tinos	
<i>Myrmilla erythrocephala</i> (Latreille, 1792)	Brač, Corsica, Giglio, Hvar, Korčula, La Maddalena, Sardinia, Sicily, Ugljan, Vis	
<i>Myrmilla georgiae</i> Pagliano et Matteini Palmerini, 2014	Djerba, Gataya el Bahria	
<i>Myrmilla glabrata</i> (Fabricius, 1775)	Cyprus, Euboea, Kerkyra, Pano Koufonissi, Skyros, Syros	
<i>Myrmilla lezginica</i> (Radoszkowski, 1885)	Cyprus	
<i>Myrmilla mavromoustakisi</i> Hammer, 1950	Cyprus	E
<i>Myrmilla mutica</i> (André, 1903)	Crete, Hvar, Kefalonia, Kerkyra	
<i>Myrmilla troodosica</i> Hammer, 1950	Cyprus	E
<i>Myrmilla vutshetishi</i> Skorikov, 1927	Chios, Kerkyra	
<i>Myrmilla</i> sp.	Socotra	
<i>Myrmosa atra atra</i> Panzer, 1801	Anglesey, Corsica, Elba, Great Britain, Man, Sardinia, Sicily, Wight	
<i>Myrmosa atra erythrocephala</i> Yarrow, 1954	Ireland	E (ssp)
<i>Myrmosa eos</i> Lelej, 1981	Jeju, Namhae	
<i>Myrmosa unicolor</i> Say, 1824	“High Island” (= unidentified islet of Outer Banks)	
<i>Nanomutilla vaucheri</i> (Tournier, 1895)	Sardinia	
<i>Nemka chihpenchia</i> (Tsuneki, 1972)	Taiwan	E

Table 2/9. Checklist and island distribution of the species (continued).



SPECIES	ISLANDS	
<i>Nemka curvisquamata</i> (Chen, 1957)	Taiwan	E
" <i>Nemka</i> " <i>fallaciosa</i> (Cameron, 1898)	Sri Lanka	E
<i>Nemka limi nanhai</i> (Chen, 1957)	Hainan	E (ssp)
" <i>Nemka</i> " <i>litigiosa</i> (Cameron, 1898)	Sri Lanka	E
<i>Nemka</i> cfr. <i>philippa</i> (Nurse, 1903)	Peucang, Rakata Kecil, Sertung	
<i>Nemka pondicherensis</i> (Sichel et Radoszkowski, 1870)	Luzon, Sri Lanka, Timor	
" <i>Nemka</i> " <i>stulta</i> (Cameron, 1898)	Sri Lanka	E
<i>Nemka taiwanensis</i> (Mickel, 1933)	Taiwan	
<i>Nemka viduata insulae</i> (Invrea, 1940)	Cyprus	E (ssp)
<i>Nemka viduata macquarti</i> (Lepeletier, 1845)	Crete, Gavdos	E (ssp)
<i>Nemka viduata tunensis</i> (Fabricius, 1804)	Jalitah	
<i>Nemka viduata viduata</i> (Pallas, 1773)	Brač, Comino, Corsica, Elba, Euboea, Favignana, Giglio, Gozo, Karpathos, Kea, Kefalonia, Kerkyra, Korkula, Kos, Kythera, Lipari, Mallorca, Malta, Marettimo, Menorca, Naxos, Pano Koufonissi, Pianosa, Rhodes, Samothraki, San Pietro, Sardinia, Sicily, Skiathos, Stromboli, Vis, Vulcano	
<i>Nemka wotani</i> (Zavattari, 1913)	Magong, Sumbawa, Taiwan, Tanegashima, Yakushima; Honshū, Kyūshū	
<i>Neotrogaspidia haemarrhoa</i> (Zavattari, 1913)	Lombok, Sumbawa	E
<i>Neotrogaspidia hammeri</i> (Suárez, 1959)	Cyprus	
<i>Neotrogaspidia pustulata</i> (Smith, 1873)	Amami Ōshima, Iwo-jima, Miyakojima, Taiwan, Takeshima, Tanegashima, Yakushima, Hachijōjima, Honshū, Izu Ōshima, Jeju, Kyūshū, Namhae, Shikoku, Shimoshima, Tsushima, Chichi-jima, Nishi-jima	
<i>Neotrogaspidia serafica</i> (Zavattari, 1913)	Lombok, Solor, Sumbawa; Ambon	E
<i>Nonveilleridia bataviana</i> (André, 1909)	Java	
<i>Nordeniella pinguicula</i> (Turner, 1911)	Sri Lanka	E
<i>Nordeniella praestabilis</i> (André, 1907)	Sri Lanka	E
<i>Nordeniella thermophila</i> (Turner, 1911)	Sri Lanka	E
<i>Nordeniella wickwari</i> (Turner, 1911)	Sri Lanka	E
<i>Odontomutilla apiastra</i> Mickel, 1935	Bacan, Halmahera	E
<i>Odontomutilla aspratilis</i> Mickel, 1935	Borneo	
<i>Odontomutilla ceramensis</i> Mickel, 1935	Seram	E
<i>Odontomutilla cordigera</i> (Sichel et Radoszkowski, 1870)	Borneo, Java, Sumatra	
<i>Odontomutilla disparimaculata</i> (Sichel et Radoszkowski, 1869)	São Tomé	
<i>Odontomutilla familiaris anonyma</i> (Kohl, 1882)	Sumatra	E (ssp)
<i>Odontomutilla familiaris familiaris</i> (Smith, 1857)	Basilan, Borneo, Luzon, Mindanao, Negros, Samar, Singapore, Sumatra	
<i>Odontomutilla grossa</i> Mickel, 1935	Borneo	E
<i>Odontomutilla haematocephala</i> (André, 1896)	Sumatra	
<i>Odontomutilla herpa</i> (Cameron, 1902)	Borneo	E

Table 2/10. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Odontomutilla inanis</i> Mickel, 1935	Daru, New Britain, New Guinea	E
<i>Odontomutilla manifesta</i> (Smith, 1859)	New Guinea, Tanahbesar	E
<i>Odontomutilla mickeli</i> Lelej, 2005	Borneo, Sulawesi	E
<i>Odontomutilla papuana</i> Zavattari, 1913	New Guinea	E
<i>Odontomutilla perelegans</i> (Cameron, 1897)	Sri Lanka	
<i>Odontomutilla pompalis</i> Mickel, 1935	Borneo	E
<i>Odontomutilla rubrocapitata</i> Mickel, 1935	Borneo	
<i>Odontomutilla semifasciata</i> (André, 1896)	Solor, Sulawesi; New Guinea	E
<i>Odontomutilla smithi</i> Mickel, 1935	Sulawesi	E
<i>Odontomutilla subinterrupta</i> Zavattari, 1910	Borneo, Java, Simeulue, Timor	E
<i>Odontomutilla tamensis</i> (Cameron, 1907)	New Guinea	E
<i>Odontomutilla thymele</i> Mickel, 1935	Borneo	E
<i>Odontomutilla trichocondyla</i> (André, 1894)	Sri Lanka	
<i>Odontomutilla zimrada maxima</i> Bischoff, 1920	Zanzibar	
<i>Orientidia cavicola</i> (Tsuneki, 1993)	Mindanao	E
<i>Orientidia circumcincta</i> (André, 1896)	Sumatra	
<i>Orientidia dayak</i> (Lelej, 1996)	Borneo	E
<i>Orientidia nigerrima</i> (Mickel, 1934)	Biliran, Luzon, Mindanao, Samar	E
<i>Orientidia proserpina proserpina</i> (Smith, 1857)	Basilan, Borneo, Java, Mindanao, Negros, Panay	E (ssp)
<i>Orientidia proserpina sibuyanensis</i> (Mickel, 1934)	Sibuyan	E (ssp)
<i>Orientidia proserpina tibiata</i> (Mickel, 1934)	Basilan, Borneo, Mindanao, Negros, Palawan, Sibuyan	E (ssp)
<i>Orientilla aureorubra</i> (Sichel et Radoszkowski, 1870)	Sri Lanka	
<i>Orientilla desponsa</i> (Smith, 1855)	Hainan, Taiwan	
<i>Orientilla kallata</i> (Nurse, 1902)	Sri Lanka	
<i>Orientilla remota</i> (Cameron, 1897)	Sri Lanka	E
<i>Pagdenidia erato</i> (Mickel, 1935)	Borneo	E
<i>Pagdenidia selene</i> (Pagden, 1949)	Java	E
<i>Pagdenidia sondaica</i> (Pagden, 1949)	Java	E
<i>Paramyrmosa brunnipes</i> (Lepelletier, 1845)	Asinara, Corsica, Crete, Mallorca, Rhodes, Sardinia, Sicily	
<i>Pertyella decora</i> Mickel, 1952	Trinidad	
“ <i>Petersenidia</i> ” <i>boopis</i> (Kohl, 1882)	Sulawesi	E
<i>Petersenidia dercetis</i> (Mickel, 1935)	Borneo	E
“ <i>Petersenidia</i> ” <i>dohertyi</i> (Zavattari, 1913)	Sumbawa	E
<i>Petersenidia fukudai</i> (Tsuneki, 1972)	Amami Ōshima, Kakeromajima, Okinawa-jima, Tokunoshima, Yakushima, Kyūshū, Shikoku	E
<i>Petersenidia hylonome</i> (Mickel, 1935)	Borneo	E
<i>Petersenidia javanica</i> (Dalla Torre, 1897)	Java	E
<i>Petersenidia macassarica</i> (Zavattari, 1913)	Sulawesi	E

Table 2/11. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Petersenidia nedyme</i> (Mickel, 1935)	Borneo	E
<i>Petersenidia neglecta</i> (Smith, 1860)	Sulawesi	E
<i>Petersenidia olbia</i> (Cameron, 1902)	Borneo	E
<i>Petersenidia pfafneri</i> (Zavattari, 1913)	Taiwan	E
<i>Petersenidia psecas</i> (Mickel, 1935)	Borneo	E
<i>Petersenidia rapa</i> (Zavattari, 1913)	Okinawa-jima, Taiwan	
<i>Petersenidia spatale</i> (Mickel, 1935)	Borneo	E
<i>Petersenidia spiracularis dilutemacula</i> (Chen, 1957)	Taiwan	E (ssp)
<i>Petersenidia stella</i> (Zavattari, 1913)	Sumatra	E
<i>Petersenidia sticticornis nigridia</i> (Mickel, 1934)	Mindanao, Samar	E (ssp)
<i>Petersenidia sticticornis sticticornis</i> (Mickel, 1934)	Mindanao, Samar	E (ssp)
<i>Petersenidia sumatrensis</i> (André, 1896)	Sumatra	E
<i>Petersenidia temeraria</i> (Mickel, 1934)	Luzon	E
<i>Petersenidia thoracica</i> (Smith, 1860)	Sulawesi	E
<i>Physetopoda cingulata</i> (Costa, 1858)	Corsica	
<i>Physetopoda consociata</i> (Cameron, 1898)	Sri Lanka	E
<i>Physetopoda daghestanica</i> (Radoszkowski, 1885)	Corsica, Krk, Mallorca, Sicily	
<i>Physetopoda fumigata</i> (Turner, 1911)	Sri Lanka	E
<i>Physetopoda fusculina</i> (Invrea, 1955)	Lavezzu, Sant'Antioco, San Pietro, Sardinia	E
<i>Physetopoda halensis</i> (Fabricius, 1787)	Bagaud, Krk, Malta, Rab, Sicily	
<i>Physetopoda lampedusia</i> (Invrea, 1957)	Gremdi, Lampedusa, Mallorca, Sicily	
<i>Physetopoda ligustica</i> (Invrea, 1951)	Mallorca, Malta, Sicily	
<i>Physetopoda lucasii</i> (Smith, 1855)	Corsica, Elba, Pantelleria, Pianosa, Sardinia, Sicily, Ustica	
<i>Physetopoda mendizabali</i> (Suárez, 1956)	Asinara, Sardinia	
<i>Physetopoda mirabilis</i> (Hammer, 1962)	Sri Lanka	
<i>Physetopoda nuptura</i> (Garcia Mercet, 1905)	Malta, Sicily	
<i>Physetopoda punctata</i> (Latreille, 1792)	Comino, Corsica, Lampedusa, Linosa, Malta, Sardinia, Sicily	
<i>Physetopoda pusilla</i> (Klug, 1835)	Asinara, Corsica, Elba, Gorgona, Lampedusa, Levanzo, Lipari, Mallorca, Malta, Pianosa, Sardinia, Sicily, Vis	
<i>Physetopoda scutellaris</i> (Latreille, 1792)	Corsica, Krk, Pianosa, Sicily	
<i>Physetopoda sericeiceps</i> (André, 1901)	Asinara, Corsica, Mallorca, Sant'Antioco, Sardinia	
<i>Physetopoda silviae</i> Pagliano, 2011	Lampedusa	E
<i>Physetopoda trioma</i> (Invrea, 1955)	Asinara, Corsica, Lavezzu, Sant'Antioco, Sardinia	E
<i>Physetopoda uncinata</i> (Lucas, 1846)	Malta, Menorca	
<i>Platymyrmilla quinquefasciata</i> (Olivier, 1811)	Andros, Crete, Karpathos, Kerkyra, Rhodes, Syros	
<i>Pristomutilla ianthis</i> (Turner, 1911)	Sri Lanka	
<i>Pristomutilla kibweziana</i> Bischoff, 1920	Zanzibar	
<i>Pristomutilla octacantha</i> (Garcia Mercet, 1903)	Bioko	

Table 2/12. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Pristomutilla pauliani</i> (Krombein, 1951)	Madagascar	E
<i>Promecidia bonthainensis</i> (André, 1896)	Sulawesi	E
<i>Promecidia mamblia</i> (Cameron, 1902)	Borneo	
<i>Promecidia rubrocyanea</i> (Mickel, 1935)	Borneo	E
<i>Promecidia saturnia samawangensis</i> (Mickel, 1935)	Borneo	E (ssp)
<i>Promecidia saturnia saturnia</i> (Mickel, 1935)	Singapore	
<i>Promecidia yamanei</i> Lelej, 1996	Borneo	E
<i>Promecilla calliope</i> (Smith, 1857)	Borneo	E
<i>Promecilla cyanosoma</i> Turner, 1911	Sri Lanka	E
<i>Promecilla delia</i> (Mickel, 1935)	Borneo	E
<i>Promecilla hyale</i> (Mickel, 1934)	Mindanao	E
<i>Promecilla philippinensis</i> Lelej, 2005	Luzon, Mindanao	E
<i>Promecilla yerburghi</i> (Cameron, 1892)	Sri Lanka	
<i>Protrogaspidia celebensis</i> (André, 1905)	Sulawesi	E
<i>Protrogaspidia volatilis</i> (Smith, 1858)	Sulawesi	E
<i>Pseudophotilla alluaudi</i> (André, 1907)	Madagascar	E
<i>Pseudophotilla argenteopicta</i> (Sichel et Radoszkowski, 1869)	Madagascar	E
<i>Pseudophotilla venustula</i> (Saussure, 1890)	Madagascar, Nosy Be	E
<i>Pseudomethoca argyrocephala</i> (Gerstaecker, 1874)	Cuba, Guana, Puerto Rico, St. John	
<i>Pseudomethoca</i> cf. <i>tournieri</i> (Kohl, 1882)	Trinidad	
<i>Pseudomethoca crepera</i> (Cresson, 1902)	Trinidad	
<i>Pseudomethoca flaviceps</i> (André, 1906)	Hispaniola	E
<i>Pseudomethoca grilloi</i> Genaro, 1997	Cuba	E
<i>Pseudomethoca merengue</i> Genaro, 1997	Hispaniola	E
<i>Pseudomethoca olgae</i> Schuster, 1946	St. Croix	E
<i>Pseudomethoca plagiata</i> (Gerstaecker, 1874)	Trinidad	
<i>Pseudomethoca propinqua</i> (Cresson, 1865)	Long Island	
<i>Pseudomethoca salti</i> Mickel, 1928	Cuba	E
<i>Pseudomethoca simillima</i> (Smith, 1855)	Long Island	
<i>Pseudomethoca uncinata</i> Ashmead, 1900	St. Vincent	E
<i>Pseudomethoca willei</i> Mickel, 1969	Cañas, Coiba, Taboga	
<i>Pseudophotopsis armeniaca</i> (Skorikov, 1935)	Cyprus	
<i>Pseudophotopsis aurea</i> (Klug, 1829)	Socotra	
<i>Pseudophotopsis komarovii</i> (Radoszkowski, 1885)	Cyprus	
<i>Pseudophotopsis maura</i> Bischoff, 1920	Socotra	
<i>Pseudophotopsis obliterated</i> (Smith, 1855)	Cyprus	
<i>Pseudophotopsis schachruda</i> (Skorikov, 1935)	Cyprus	
<i>Pseudophotopsis syriaca</i> (André, 1900)	Tinos	

Table 2/13. Checklist and island distribution of the species (continued).



SPECIES	ISLANDS	
<i>Radoszkowskitilla ceylonica</i> (Lelej, 1993)	Sri Lanka	
<i>Radoszkowskitilla sinhala</i> Lelej, 2005	Sri Lanka	E
<i>Radoszkowskitilla tamila</i> Lelej, 2005	Sri Lanka	E
<i>Rhopalomutilla javana</i> Pagden, 1938	Java	E
<i>Rhopalomutilla oceanica</i> Mickel, 1935	Borneo	E
<i>Ronisia barbarata</i> (Linnaeus, 1758)	Comino, Conigli, Gozo, Lampedusa, Linosa, Malta, Pantelleria	
<i>Ronisia barbarula</i> (Petersen, 1988)	Mallorca	
<i>Ronisia brutia brutia</i> (Petagna, 1787)	Capraia, Capri, Corsica, Elba, Euboea, Favignana, Filicudi, Folegandros, Giannutri, Giglio, Gorgona, Hvar, Ischia, Kastellorizo, Kefalonia, Kerkyra, Korčula, Krk, Kythera, La Maddalena, Lavezzi, Levanzo, Lipari, Malta, Marettimo, Milos, Naxos, Panarea, Paros, Pianosa, Rhodes, Salina, San Domino, Sant'Antioco, Sardinia, Sicily, Skiathos, Syros, Thira, Ugljan, Vis, Vulcano, Zakynthos	
<i>Ronisia brutia minoensis</i> Nonveiller, 1972	Astypalea, Crete, Karpathos	E (ssp)
<i>Ronisia brutia valca</i> (Petersen, 1988)	Cyprus	E (ssp)
<i>Ronisia ghilianii</i> (Spinola, 1843)	Asinara, Capraia, Corsica, Gorgona, La Maddalena, Lipari, Mallorca, Menorca, Panarea, Pianosa, Sant'Antioco, Santa Maria, San Pietro, Sardinia, Sicily, Spargi	
<i>Ronisia marocana</i> (Olivier, 1811)	Djerba, Lampedusa, Malta, Sicily	
<i>Serendibiella trunconomalia</i> (Radoszkowski, 1885)	Sri Lanka	E
<i>Seriatospidia biseriata</i> (Saussure, 1891)	Zanzibar	
<i>Seyrigilla cloitrei</i> (Olsoufieff, 1938)	Madagascar	E
<i>Seyrigilla holomelaena</i> (André, 1899)	Madagascar	E
<i>Seyrigilla nigroaurea</i> (Sichel et Radoszkowski, 1869)	Madagascar, Nosy Be	E
<i>Seyrigilla olsoufieffi</i> (Krombein, 1972)	Madagascar	E
<i>Seyrigilla splendida</i> (Olsoufieff, 1938)	Madagascar	E
<i>Seyrigilla sylvicola</i> (Krombein, 1972)	Madagascar	E
<i>Sigilla dorsata</i> (Fabricius, 1798)	Corsica, Embiez, Porquerolles, Sant'Antioco, Sardinia	
<i>Sinotilla gracillima</i> (Smith, 1857)	Borneo	E
<i>Sinotilla gribodoana</i> (Invrea, 1943)	Borneo	E
<i>Sinotilla lambirensis</i> Lelej, 1996	Borneo	E
<i>Sinotilla petina</i> (Mickel, 1937)	Borneo	E
<i>Sinotilla runcina</i> (Zavattari, 1913)	Borneo	E
<i>Sinotilla serpa</i> (Zavattari, 1913)	Taiwan	E
<i>Sinotilla yakushimensis</i> (Yasumatsu, 1934)	Yakushima	E
" <i>Smicromyrme</i> " <i>adusta</i> (André, 1908)	Zanzibar	E
<i>Smicromyrme aponis</i> Tsuneki, 1993	Mindanao	E
<i>Smicromyrme asinarenis</i> Pagliano et Strumia, 2007	Asinara, Sardinia	E

Table 2/14. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Smicromyrme ausonia</i> Invrea, 1950	Asinara, Corsica, Cyprus, Elba, Kerkyra, Lipari, Pianosa, Sicily	
<i>Smicromyrme autonoe</i> Mickel, 1934	Palawan	E
<i>Smicromyrme basalis annularis</i> Mickel, 1934	Luzon	E (ssp)
<i>Smicromyrme basalis basalis</i> (Smith, 1879)	Borneo, Mindanao	E (ssp)
<i>Smicromyrme borneo</i> Lelej, 1996	Borneo	E
<i>Smicromyrme caecina</i> (Cameron, 1903)	Borneo	E
<i>Smicromyrme caerulea</i> Mickel, 1934	Samar	E
<i>Smicromyrme calacuasana</i> Tsuneki, 1993	Palawan	E
<i>Smicromyrme chuchiana</i> Tsuneki, 1993	Taiwan	E
<i>Smicromyrme coromandelica</i> (Motschulsky, 1863)	Sri Lanka	
<i>Smicromyrme corriasi</i> Pagliano, 2013	Sardinia	E
<i>Smicromyrme cristinae</i> Lo Cascio, 2000	Pano Koufonissi	E
<i>Smicromyrme dardanus dardanus</i> (Smith, 1857)	Borneo	
<i>Smicromyrme dardanus salacia</i> Mickel, 1935	Borneo	E (ssp)
<i>Smicromyrme deidamia</i> (Smith, 1857)	Borneo	E
<i>Smicromyrme desiderata</i> (Turner, 1911)	Sri Lanka	E
<i>Smicromyrme devia</i> (Cameron, 1909)	Borneo, Simeulue	E
<i>Smicromyrme electra</i> Mickel, 1935	Sulawesi	E
<i>Smicromyrme esterina</i> Pagliano, 1983	Sicily	
<i>Smicromyrme fura anthracipes</i> Mickel, 1934	Luzon	E (ssp)
<i>Smicromyrme fura fura</i> Mickel, 1934	Basilan, Luzon, Mindanao, Negros, Panay, Samar, Sibuyan	E (ssp)
<i>Smicromyrme gineri</i> Invrea, 1953	Djerba	
<i>Smicromyrme herophile</i> Mickel, 1935	Java	E
<i>Smicromyrme hombucciana</i> Tsuneki, 1982	Taiwan	E
<i>Smicromyrme ilerda ilerda</i> (Cameron, 1902)	Borneo	E (ssp)
<i>Smicromyrme ilerda sparsilis</i> Mickel, 1934	Mindanao	E (ssp)
<i>Smicromyrme jacobsoni</i> (André, 1907)	Java	E
<i>Smicromyrme kuanfuana</i> Tsuneki, 1972	Taiwan	E
<i>Smicromyrme lavinia atrata</i> Mickel, 1934	Samar	E (ssp)
<i>Smicromyrme lavinia lavinia</i> Mickel, 1934	Luzon, Mindanao, Palawan	E (ssp)
<i>Smicromyrme lewisi</i> Mickel, 1935	Iwo-jima, Kuchinoshima, Tanegashima, Hokkaidō, Honshū, Izu Ōshima, Kunashir, Kyūshū, Namhae, Okushiri, Sakhalin, Shikoku, Tsushima	
<i>Smicromyrme lochia</i> Mickel, 1937	Borneo	
<i>Smicromyrme maculofasciata</i> (Saussure, 1867)	Sri Lanka	E
<i>Smicromyrme mauromoustakisi</i> Invrea, 1940	Cyprus	E
<i>Smicromyrme meator</i> Mickel, 1935	Borneo	E
<i>Smicromyrme melanolepis</i> (Costa, 1884)	Asinara, Corsica, Gorgona, Lipari, Marettimo, Sardinia, Sicily	

Table 2/15. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Smicromyrme minahassae</i> (Zavattari, 1913)	Sulawesi	E
<i>Smicromyrme mindanaonis</i> Tsuneki, 1993	Mindanao	E
<i>Smicromyrme monticelli</i> (Zavattari, 1910)	Zanzibar	
<i>Smicromyrme neglecta</i> Hammer, 1962	Sri Lanka	
<i>Smicromyrme nigriceps</i> Nonveiller, 1959	Crete, Gavdos	
<i>Smicromyrme ocellata</i> (Saussure, 1867)	Sri Lanka	
<i>Smicromyrme opistomelas</i> Invrea, 1950	Sardinia	
<i>Smicromyrme palacala</i> Tsuneki, 1993	Palawan	E
<i>Smicromyrme partita</i> (Klug, 1835) sensu lato	Comino, Lampedusa, Lipari, Mallorca, Malta, Sicily	
<i>Smicromyrme perisii</i> (Sichel et Radoszkowski, 1870)	Asinara, Cavallo, Corsica, Sant'Antioco, Sardinia	E
<i>Smicromyrme posthuma</i> (Cameron, 1898)	Sri Lanka	E
<i>Smicromyrme pulawskii</i> Suárez, 1975	Rhodes	
<i>Smicromyrme punctinota</i> Mickel, 1935	Borneo	E
<i>Smicromyrme riccardoi</i> Pagliano et Matteini Palmerini, 2014	Djerba	
<i>Smicromyrme ruficollis cerasae</i> Invrea, 1952	Asinara, Corsica, San Pietro, Sant'Antioco, Sardinia	E (ssp)
<i>Smicromyrme ruficollis ruficollis</i> (Fabricius, 1793)	Cres, Giglio, Gozo, Hvar, Kos, Krk, Lipari, Mallorca, Malta, Pianosa, Rab, Sicily, Stromboli, Vulcano	
<i>Smicromyrme rufipes</i> (Fabricius, 1787)	Baltrum, Corsica, Giglio, Great Britain, Hayling, Herm, Hvar, Krk, Pianosa, Wight	
<i>Smicromyrme rufisquamulata</i> Bischoff, 1921	Inhaca	
<i>Smicromyrme scitula</i> Mickel, 1935	Borneo	E
<i>Smicromyrme sexmaculata</i> Hammer, 1962	Sri Lanka	
<i>Smicromyrme sicana</i> (De Stefani, 1887)	Corsica, Elba, Kornat, Krk, Malta, Pianosa, Sardinia, Sicily	
<i>Smicromyrme strandi</i> (Zavattari, 1913)	Taiwan	
<i>Smicromyrme suberrata</i> Invrea, 1957	Asinara, Lampedusa, Mallorca, Malta, Sicily	
<i>Smicromyrme sulcisia</i> Invrea, 1955	Corsica, Elba, Lipari, Mallorca, Sardinia, Sicily, Vulcano	
<i>Smicromyrme thia</i> Mickel, 1933	Taiwan	E
<i>Smicromyrme trinotata</i> (Costa, 1858)	Corsica, Lipari, Sardinia, Sicily	
<i>Smicromyrme turanica</i> (Morawitz, 1893)	Crete, Rhodes	
<i>Smicromyrme vladani</i> Nonveiller, 1972	Crete	E
<i>Smicromyrme</i> sp. 1	Gran Canaria	
<i>Smicromyrme</i> sp. 2	Korčula, Vis	
" <i>Smicromyrme</i> " sp. 3	Inhaca	
<i>Sphaerophthalma cargilli</i> Cockerell, 1895	Jamaica	E
<i>Sphaerophthalma galapagensis</i> (Williams, 1926)	Baltra, Santa Cruz (EC)	E
<i>Sphaerophthalma gulltopp</i> Williams et Pitts, 2007	Trinidad	
<i>Sphaerophthalma retifera</i> (Dow, 1931)	Hispaniola	

Table 2/16. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Sphaerophthalma unicolor</i> (Cresson, 1865)	Anacapa, Santa Cruz (US)	
<i>Spilomutilla consolidata</i> (Cameron, 1900)	Sri Lanka	
<i>Spilomutilla eltola</i> (Cameron, 1898)	Sri Lanka	E
<i>Spilomutilla lanka</i> Lelej, 2005	Sri Lanka	E
<i>Spilomutilla sri</i> Lelej, 2005	Sri Lanka	E
<i>Squamulotilla exilipunctata</i> Chen, 1957	Jeju	
<i>Standfussidia taprobane</i> Lelej, 2005	Sri Lanka	E
<i>Stenomutilla argentata</i> (Villers, 1789)	Asinara, Corsica, Sant'Antioco, San Pietro, Sardinia, Sicily	
<i>Stenomutilla bicornuta</i> Nonveiller, 1994	Cyprus	E
<i>Stenomutilla bizonata</i> (Smith, 1855)	Euboea, Hvar, Rhodes	
<i>Stenomutilla collaris</i> (Fabricius, 1787)	Djerba, Sicily	
<i>Stenomutilla freyi</i> (Brancsik, 1891)	Madagascar, Nosy Be	E
<i>Stenomutilla hottentotta</i> (Fabricius, 1804)	Comino, Favignana, Gozo, Levanzo, Malta, Marettimo, Sicily	
<i>Stenomutilla intermixta</i> Krombein, 1972	Madagascar	E
<i>Stenomutilla lavaudeni ambilobe</i> Krombein, 1972	Madagascar	E (ssp)
<i>Stenomutilla lavaudeni lavaudeni</i> Olsoufieff, 1938	Madagascar	E (ssp)
" <i>Stenomutilla</i> " <i>manni</i> Krombein, 1971	Makira	E
<i>Storozhenkotilla aurofasciata</i> (André, 1907)	Sri Lanka	
<i>Storozhenkotilla cicatricifera</i> (André, 1894)	Sri Lanka	
<i>Strangulotilla dioscoridea</i> Lo Cascio, Romano et Grita, 2012	Samha, Socotra	E
<i>Strangulotilla krombeini</i> Lelej, 2005	Sri Lanka	E
<i>Strangulotilla minor</i> (André, 1905)	São Tomé	E
<i>Sylvotilla globithorax</i> (Olsoufieff, 1938)	Madagascar	E
<i>Sylvotilla globiventris</i> (Olsoufieff, 1938)	Madagascar	E
<i>Sylvotilla robinsoni</i> (Olsoufieff, 1938)	Madagascar	E
<i>Sylvotilla touvenoti</i> (Olsoufieff, 1938)	Madagascar	E
<i>Taimyrmosa cara</i> Lelej, 2005	Taiwan	E
<i>Taimyrmosa mongolica</i> (Suárez, 1974)	Honshū, Jeju, Sakhalin, Shikoku	
<i>Taimyrmosa nigrofasciata</i> (Yasumatsu, 1931)	Yakushima, Hokkaidō, Honshū, Kyūshū, Okushiri, Shikoku	E
<i>Taiwanomyrme friekae</i> (Zavattari, 1913)	Taiwan	
<i>Taiwanomyrme taiwana</i> (Tsuneki, 1993)	Taiwan	E
<i>Timulla absentia</i> Mickel, 1938	Cañas, Rey	
<i>Timulla ashmeadi</i> Mickel, 1938	Grenada, Guadeloupe, Jamaica, St. Vincent	E
<i>Timulla bitaeniata</i> (Spinola, 1841)	Cayenne, Trinidad	
<i>Timulla byblis</i> Mickel, 1937	Trinidad	
<i>Timulla centroamericana</i> (Dalla Torre, 1897)	Taboga	
<i>Timulla dominica</i> Mickel, 1938	Dominica	E

Table 2/17. Checklist and island distribution of the species (continued).



SPECIES	ISLANDS	
<i>Timulla eriphyla</i> Mickel, 1938	Trinidad	
<i>Timulla ferrugata</i> (Fabricius, 1804)	Long Island; Eleuthera	
<i>Timulla guadeloupensis</i> Mickel, 1937	Guadeloupe	E
<i>Timulla leona</i> (Blake, 1871)	Padre	
<i>Timulla leucippe</i> Mickel, 1938	Marajò	
<i>Timulla mediata mediata</i> (Fabricius, 1805)	Grenada, St. Vincent, Trinidad	
<i>Timulla mediata persa</i> Mickel, 1938	Marajò	
<i>Timulla nisa</i> Mickel, 1938	Trinidad	
<i>Timulla odice</i> Mickel, 1938	Santo Amaro	
<i>Timulla rectanguloides</i> Mickel, 1938	Grenada, Mustique, St. Vincent	E
<i>Timulla rectangula</i> (Spinola, 1841)	Cayenne, Trinidad	
<i>Timulla rufiventris</i> (Klug, 1821)	St. Vincent	
<i>Timulla rufogastra</i> (Lepeletier, 1845)	Trinidad	
<i>Timulla rufosignata</i> (Bradley, 1916)	Long Island	
<i>Timulla runata</i> Mickel, 1938	Taboga	
<i>Timulla senex</i> (Guérin-Meneville, 1844)	Cuba, Juventud	E
<i>Timulla trimaculosa</i> Mickel, 1938	Jamaica	E
<i>Timulla vagans vagans</i> (Fabricius, 1798)	Long Island	
<i>Timulla zonata</i> (Spinola, 1841)	Cayenne	
<i>Traumatmutilla americana</i> (Linnaeus, 1758)	“West Indies” (Ashmead, 1900)	
<i>Traumatmutilla incerta</i> (Spinola, 1841)	Cayenne	
<i>Traumatmutilla indica</i> (Linnaeus, 1758)	Cayenne, Marco, Trinidad	
<i>Traumatmutilla latona</i> Mickel, 1952	Trinidad	
<i>Traumatmutilla oculifera</i> (Smith, 1855)	Arapiranga, Marco	
<i>Traumatmutilla spegea</i> (Fabricius, 1804)	Cayenne, Marajó, Marco, Trinidad	
<i>Traumatmutilla vidua</i> (Klug, 1821)	Marco	
<i>Tricholabioides apicipennis</i> (Cameron, 1897)	Sri Lanka	E
<i>Trispilotilla indostana</i> (Smith, 1855)	Sri Lanka	
<i>Trogaspidia agapeta</i> (Cameron, 1902)	Borneo, Sumatra	E
<i>Trogaspidia albertisi</i> (André, 1896)	Misool, New Guinea, Roon, Salawati, Seram, Tanahbesar, Waigeo	E
<i>Trogaspidia albibrunea</i> Chen, 1957	Taiwan	
<i>Trogaspidia alecto leucotricha</i> (Bischoff, 1920)	Zanzibar	
<i>Trogaspidia andamana</i> Hammer, 1962	South Andaman	E
<i>Trogaspidia anthylla</i> (Smith, 1860)	Ambon, Bacan, Halmahera, Seram	E
“ <i>Trogaspidia</i> ” <i>aurantissima</i> Olsoufieff, 1938	Madagascar	E
“ <i>Trogaspidia</i> ” <i>aurolimbata</i> (André, 1901)	Madagascar	E
“ <i>Trogaspidia</i> ” <i>aurovittata</i> (André 1899)	Madagascar	E
<i>Trogaspidia bakeri</i> (Mickel, 1934)	Basilan, Mindanao, Samar	E

Table 2/18. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Trogaspidia bicincta</i> (Saussure, 1867)	Sri Lanka	E
<i>Trogaspidia boniense</i> (Mickel, 1935)	Sulawesi	E
<i>Trogaspidia bryanti</i> (Mickel, 1937)	Borneo	E
<i>Trogaspidia castellana castellana</i> (Garcia Mercet, 1903)	Luzon	E (ssp)
<i>Trogaspidia castellana islandica</i> (Mickel, 1934)	Basilan, Biliran, Mindanao, Samar	E (ssp)
<i>Trogaspidia castellana princesa</i> (Mickel, 1934)	Palawan	E (ssp)
<i>Trogaspidia castellana sandakanensis</i> (Mickel, 1935)	Borneo, Labuan	E (ssp)
<i>Trogaspidia castellana tayabasensis</i> (Mickel, 1934)	Luzon, Polillo	E (ssp)
<i>Trogaspidia castellana visayensis</i> (Mickel, 1934)	Batbatan, Negros, Panay, Sibuyan	E (ssp)
<i>Trogaspidia castellana whiteheadi</i> (Mickel, 1934)	Luzon	E (ssp)
<i>Trogaspidia catanensis</i> (Rossi, 1792)	Rava, Sicily	
<i>Trogaspidia chiaiensis</i> Tsuneki, 1993	Taiwan	E
<i>Trogaspidia cooki</i> (André, 1895)	New Guinea	
<i>Trogaspidia cressida</i> (Cameron, 1900)	Sri Lanka	E
<i>Trogaspidia cydippe</i> (Mickel, 1935)	Borneo	E
<i>Trogaspidia depressula</i> (Mickel, 1934)	Luzon	E
“ <i>Trogaspidia</i> ” <i>ditissima</i> (André, 1905)	Madagascar	E
<i>Trogaspidia doricha</i> (Smith, 1860)	Ambon, Bacan, New Guinea, Seram	E
<i>Trogaspidia eremita eremita</i> (Mickel, 1934)	Basilan, Biliran, Luzon, Mindanao, Negros, Panay, Polillo, Samar	E (ssp)
<i>Trogaspidia eremita umbra</i> (Mickel, 1934)	Luzon, Polillo	E (ssp)
<i>Trogaspidia esakii</i> Yasumatsu, 1950	Peleliu	E
<i>Trogaspidia exilis</i> (Smith, 1859)	Ambon, Kai	E
<i>Trogaspidia fervida</i> (Smith, 1860)	Sulawesi	E
<i>Trogaspidia formosana</i> (Matsumura, 1911)	Taiwan	
<i>Trogaspidia fuscipennis concava</i> (Mickel, 1933)	Taiwan	E (ssp)
<i>Trogaspidia greeni</i> Hammer, 1962	Sri Lanka	E
<i>Trogaspidia hoffmanni</i> (Mickel, 1933)	Hainan	
<i>Trogaspidia ianthea ianthea</i> (Smith, 1860)	Bacan, Halmahera, Ternate	E (ssp)
<i>Trogaspidia ianthea rubiginosa</i> (André, 1896)	Ambon, Seram	E (ssp)
<i>Trogaspidia implicata</i> (Mickel, 1935)	Sulawesi	E
“ <i>Trogaspidia</i> ” <i>incerta</i> Olsoufieff, 1938	Madagascar	E
<i>Trogaspidia indagatrix indagatrix</i> (Mickel, 1935)	Ambon	E (ssp)
<i>Trogaspidia indagatrix menadoensis</i> (Mickel, 1935)	Sulawesi	E (ssp)
<i>Trogaspidia intermedia</i> (Saussure, 1867)	Sri Lanka	
<i>Trogaspidia iphis</i> (Mickel, 1925)	Java	E
<i>Trogaspidia kauarae</i> (Cameron, 1892)	Sri Lanka	
<i>Trogaspidia kinabalensis</i> Tsuneki, 1972	Borneo	E
<i>Trogaspidia lanceolata</i> Chen, 1957	Taiwan	E

Table 2/19. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Trogaspidia lignani</i> (Mickel, 1933)	Hainan	
<i>Trogaspidia lodina</i> (Cameron, 1905)	Borneo	E
<i>Trogaspidia luzonica luzonica</i> (Radoszkowski, 1885)	Luzon	E (ssp)
<i>Trogaspidia luzonica panayensis</i> (Mickel, 1934)	Negros, Panay, Sibuyan	E (ssp)
“ <i>Trogaspidia</i> ” <i>magnifica</i> (Bischoff, 1920)	Madagascar	E
<i>Trogaspidia major</i> Nonveiller et Petersen, 1995	Inhaca	
<i>Trogaspidia manuilensis</i> (Brown, 1906)	Basilan, Borneo, Luzon, Mindanao, Negros, Palawan, Panay	E
“ <i>Trogaspidia</i> ” <i>mariae bogdanovi</i> Olsoufieff, 1938	Madagascar	E
<i>Trogaspidia medon</i> (Smith, 1855)	Zanzibar	
“ <i>Trogaspidia</i> ” <i>micheli</i> Olsoufieff, 1938	Madagascar	E
<i>Trogaspidia nereis</i> (Kohl, 1882)	Java	E
<i>Trogaspidia nodoa</i> (Mickel, 1933)	Hainan	
<i>Trogaspidia oceanica oceanica</i> (André, 1896)	Baronga, Biak, Lihir, New Britain, New Guinea, New Ireland, Umboi, Yapen	
<i>Trogaspidia oceanica papuana</i> (Krombein, 1971)	Kiriwina, New Guinea, Normanby, Woodlark, Yule	E (ssp)
<i>Trogaspidia oceanica tulagiensis</i> (Mickel, 1935)	Bougainville, Buka, Choiseul, Gizo, Guadalcanal, Kolombangara, Malaita, New Georgia, Nggela, Pavuvu, Ranonga, Rendova, Santa Isabel, Savo, Tulagi, Treasury, Vella Lavella	E (ssp)
<i>Trogaspidia oceanitis</i> (Mickel, 1935)	Sulawesi, Ambon	E
<i>Trogaspidia orestes orestes</i> (Krombein, 1971)	New Guinea	E (ssp)
<i>Trogaspidia orestes trobriandensis</i> (Krombein, 1971)	Kiriwina, Normanby, Woodlark	E (ssp)
<i>Trogaspidia ovatula aurifera</i> (Mickel, 1934)	Luzon	E (ssp)
<i>Trogaspidia ovatula ovatula</i> (Mickel, 1934)	Sibuyan	E (ssp)
<i>Trogaspidia pacifica</i> Tsuneki, 1972	Taiwan	E
<i>Trogaspidia pentheus</i> (Smith, 1860)	Bacan, New Guinea	E
“ <i>Trogaspidia</i> ” <i>politana</i> (Bischoff, 1920)	Madagascar	E
<i>Trogaspidia probabilis</i> Hammer, 1962	South Andaman	E
“ <i>Trogaspidia</i> ” <i>pulcherrima</i> (André, 1905)	Madagascar	E
“ <i>Trogaspidia</i> ” <i>radachkovskii</i> Olsoufieff, 1938	Madagascar	E
<i>Trogaspidia rhea rhea</i> (Mickel, 1933)	Hainan, Taiwan	E (ssp)
“ <i>Trogaspidia</i> ” <i>sanctaemariae</i> (André, 1901)	Nosy Boraha	E
<i>Trogaspidia sansibarensis</i> Bischoff, 1920	Zanzibar	
<i>Trogaspidia sarawaka</i> (Mickel, 1935)	Borneo	E
<i>Trogaspidia saussurei</i> Lelej, 2005	Sri Lanka	E
<i>Trogaspidia scapus</i> (Mickel, 1937)	Borneo	E
“ <i>Trogaspidia</i> ” <i>seyrigiana</i> Olsoufieff, 1938	Madagascar	E
<i>Trogaspidia tethys prodiga</i> (Mickel, 1935)	Borneo	E (ssp)
<i>Trogaspidia tethys melanesia</i> (Mickel, 1935)	Ambon	E (ssp)
<i>Trogaspidia tethys tethys</i> (Mickel, 1934)	Negros, Palawan, Taiwan	E (ssp)

Table 2/20. Checklist and island distribution of the species (continued).

SPECIES	ISLANDS	
<i>Trogaspidia themis</i> (Peringuey, 1898)	Inhaca	
“ <i>Trogaspidia</i> ” <i>tricolora</i> Olsoufieff, 1938	Madagascar	E
<i>Trogaspidia tridepressa</i> Tsuneki, 1993	Luzon	E
<i>Trogaspidia vallicola</i> Tsuneki, 1993	Taiwan	E
“ <i>Trogaspidia</i> ” <i>venustulaeformis</i> (Bischoff, 1920)	Madagascar	E
<i>Trogaspidia vetustata</i> (Bingham, 1911)	Grande Comore, Inhaca	
<i>Trogaspidia villosa</i> (Fabricius, 1775)	Sri Lanka	
“ <i>Trogaspidia</i> ” <i>vitsika</i> Olsoufieff, 1938	Madagascar	E
<i>Trogaspidia yasumatsui maai</i> (Krombein, 1971)	New Hanover, New Ireland	E (ssp)
<i>Trogaspidia yasumatsui yasumatsui</i> (Krombein, 1971)	New Britain, Umboi	E (ssp)
<i>Trogaspidia yuliensis</i> Tsuneki, 1972	Taiwan	E
“ <i>Trogaspidia</i> ” <i>zanacaeformis</i> Bischoff, 1920	Madagascar	E
<i>Tropidotilla cypriadis</i> Invrea, 1940	Cyprus	
<i>Tropidotilla grisescens</i> (Lepeletier, 1845)	Brač, Crete, Korčula, Sicily	
<i>Tropidotilla litoralis</i> (Petagna, 1787)	Brač, Cres, Crete, Elba, Euboea, Giglio, Kerkyra, Korčula, Kos, Lipari, Lošinj, Mljet, Mykonos, Pianosa, Rava, Rhodes, Sant’Antioco, San Pietro, Sardinia, Sicily, Šolta, Syros, Tavolara, Vulcano	
<i>Tsunekimyrmec fluctuata</i> (Smith, 1865)	Borneo, Mindanao, Negros, Samar, Tawi Tawi, Morotai	E
<i>Vanhartenidia tricolor</i> (Klug, 1829)	Djerba	
<i>Wallacidia conversa</i> (Chen, 1957)	Taiwan	
<i>Wallacidia humbertiana</i> (Saussure, 1867)	Sri Lanka	
<i>Wallacidia itambusa</i> (Cockerell, 1927)	Luzon	E
<i>Wallacidia kangeana</i> (Pagden, 1949)	Kangean, Paliat	E
<i>Wallacidia laratense</i> (Mickel, 1935)	Larat	E
<i>Wallacidia leytense</i> (Tsuneki, 1993)	Leyte	E
<i>Wallacidia melmora</i> (Cameron, 1905)	Borneo, Java, Rakata Besar, Sulawesi, Sumatra	E
<i>Wallacidia merops</i> (Smith, 1860)	Bacan, Gebe, Halmahera, Morotai, Ternate	E
<i>Wallacidia oculata</i> (Fabricius, 1804)	Dang Kho, Hainan, Phong Vong, Taiwan, Thanh Lân	
<i>Wallacidia opulenta</i> (Smith, 1855)	Sri Lanka	
<i>Wallacidia paloeana</i> (Pagden, 1949)	Sulawesi	E
<i>Wallacidia philippinense</i> (Smith, 1855)	Balabac, Borneo, Cebu, Luzon, Mindanao, Mindoro, Negros, Palawan, Panay, Polillo, Solor, Sulawesi, Ambon	E
<i>Wallacidia retinula</i> (Chen, 1957)	Taiwan	
<i>Wallacidia rosemariae</i> (O’Toole, 1975)	Flores, Lombok, Sumbawa	E
<i>Wallacidia singapora</i> (Mickel, 1935)	Singapore	
<i>Wallacidia sumbana</i> (Pagden, 1949)	Sumba	E
<i>Wallacidia timorensis</i> (O’Toole, 1975)	Timor	E
<i>Wallacidia vicina</i> (Sichel et Radoszkowski, 1870)	Ambon, New Guinea, Seram, Yule	E

Table 2/21. Checklist and island distribution of the species (continued).



SPECIES	ISLANDS	
<i>Xystromutilla cornigera</i> (Cresson, 1902)	Trinidad	
<i>Xystromutilla turrialba</i> Casal, 1969	Taboga	
<i>Yamanetilla andromeda</i> (Mickel, 1934)	Luzon, Mindanao, Negros, Samar	E
<i>Yamanetilla cassiope</i> (Smith, 1857)	Borneo	
<i>Yamanetilla nipponica</i> (Tsuneki, 1972)	Honshū, Kyūshū, Shikoku	E
<i>Yamanetilla pedaria</i> (Mickel, 1934)	Basilan, Mindanao, Palawan	
<i>Yamanetilla taiwaniana</i> (Zavattari, 1913)	Taiwan	
<i>Zavatilla gutrunae gutrunae</i> (Zavattari, 1913)	Taiwan	E (ssp)
<i>Zavatilla logei</i> (Zavattari, 1913)	Taiwan	E
<i>Zeugomutilla bainbriggei</i> (Turner, 1911)	Sri Lanka	E
<i>Zeugomutilla horni</i> (André, 1907)	Sri Lanka	E
<i>Zeugomutilla recondita</i> (Cameron, 1900)	Sri Lanka	E

Table 2/22. Checklist and island distribution of the species.

Species	Examined material
<i>Blakeius bipunctatus</i> (Latreille, 1792)	Chergui (TN), 20.IV.2005, R. Vilardo leg. (1 ex., PLC).
<i>Blakeius leopoldinus</i> (Invrea, 1955)	Salina (IT), 26.VII.2012, Fossa delle Felci, P. Lo Cascio and F. Grita leg. (3 exx., PLC).
<i>Dasylabris juxtarenaria</i> Skorikov, 1935	Djerba (TN), Ras al-Kastil, 13.IV.2005, P. Lo Cascio leg. (2 exx., PLC).
<i>Dolichomutilla sycorax</i> (Smith, 1855)	Pemba (TZ), I.2015, F. La Piana leg. (1 ex., PLC).
<i>Mutilla diselena</i> Sichel et Radoszkowski, 1870	Pemba (TZ), I.2015, F. La Piana leg. (1 ex., PLC).
<i>Mutilla quinque maculata</i> Cyrillus, 1787	Astypalea (GR), 25.IV.1999, P. Lo Cascio leg. (1 ex., PLC); Kassos (GR), 16-18.X.2000, P. Lo Cascio leg. (1 ex., PLC).
<i>Myrmilla caucasica</i> (Kolenati, 1846)	Nisyros (GR), 30.IV.1999, P. Lo Cascio leg. (1 ex., PLC).
<i>Myrmilla georgiae</i> Pagliano et Matteini Palmerini, 2014	Gataya el Bahria (TN), 10.IV.2015, P. Lo Cascio & P. Ponel leg. (1 ex., PLC).
<i>Myrmilla glabrata</i> (Fabricius, 1775)	Pano Koufonissi (GR), IX.1997, P. Lo Cascio leg. (1 ex., PLC).
<i>Nemka viduata viduata</i> (Pallas, 1773)	Pano Koufonissi (GR), IX.1997, P. Lo Cascio leg. (3 exx., PLC); Stromboli (IT), Rina Grande, 30.VII.2015, P. Lo Cascio leg. (3 exx., PLC).
<i>Physetopoda halensis</i> (Fabricius, 1787)	Bagaud (FR), 3.VI.2013, P. Ponel leg. (1 ex., PP).
<i>Physetopoda lampedusia</i> (Invrea, 1957)	Gremdi (TN), 27.III.2014, P. Ponel leg. (1 ex., PP).
<i>Ronisia brutia brutia</i> (Petagna, 1787)	Folegandros (GR), IX.1997, P. Lo Cascio leg. (1 ex., PLC); Panarea (IT), Punta del Corvo, 11.V.2008, P. Lo Cascio leg. (1 ex., PLC); Salina (IT), Fossa delle Felci Mount, 26.VII.2012, P. Lo Cascio and F. Grita leg. (1 ex., PLC).
<i>Ronisia brutia minoensis</i> Nonveiller, 1972	Astypalea (GR), Aghios Ioannis, 26.IV.1999, P. Lo Cascio leg. (1 ex., PLC).
<i>Sigilla dorsata</i> (Fabricius, 1798)	Embiez (FR), 22.IV.2013, P. Ponel leg. (1 ex., PP).

Table 2/22. Table 3. Unpublished records included in the checklist. The acronyms are as follows: PLC, Pietro Lo Cascio collection, Lipari (Italy); PP, Philippe Ponel collection, Marseille (France).

## FAUNAL AND BIOGEOGRAPHICAL OUTLINES

The records of Mutillidae on islands concern 774 among species and subspecies (including 8 identified at generic rank), equal to about 18% of those currently accepted as valid. Of course, this number is provisional, because many islands are still unexplored or their faunal knowledge cannot be considered as exhaustive. For instance, according to Brothers (2012) the fauna of New Caledonia includes 4 species so far described, but also a large number (probably 14 more) not yet identified; and Portuondo Ferrer & Fernández-Triana (2003) estimated the probable occurrence of 16 species on Cuba, where hitherto only 11 have been recorded. The same is also strongly suggested by the noteworthy discrepancy between the number of species known for Sicily (42) and for New Guinea (36), a tropical island thirty times larger and moreover considered one of the global biodiversity hotspots.

Despite this gap in knowledge, on the basis of the data provided in the checklist is anyhow possible to delineate an overview of the main biogeographical features of the island faunas, which are briefly discussed in the following paragraphs.

### *Dispersal*

As already stated in the Introduction, the main limits to the dispersal of Mutillidae on islands are related to some traits of their natural history, and primarily to the apterogyny. This would be indirectly supported by the fact that several genera whose males are also wingless, such as the Oriental Ticoplineae *Cameronilla* Lelej in Lelej & Krombein, 2001 and *Hindustanilla* Lelej in Lelej & Krombein, 2001, or the Afrotropical Sphaerophthalminae *Brachymutilla* André, 1901 and *Apteromutilla* Ashmead, 1903, are fully absent on oceanic islands. Sri Lanka is inhabited by the endemic monospecific genus *Indratilla* Lelej, 1993 as well as by some species of *Spilomutilla* Ashmead, 1903 with males apterous or having rudimentary wings (Lelej, 1993, 2005), but this island is geologically part of the Indian subcontinent and was in land connection to mainland India during the Pleistocene sea-regressions (Voris, 2000). Also, the Myrmillinae *Blakeius chiesii* (Spinola, 1839), *B. leopoldinus* Invrea, 1955 and *Myrmilla capitata* (Lucas, 1846) are found on

Mediterranean islands that generally lie near to the mainland or, such the rather isolated Sardinia and Corsica, represent fragments of continental landmass (Advokaat et al., 2014).

Except for the cases above mentioned, the females may expand the range of dispersal through the phoretic copulation, and Mutillidae have colonized remote insular groups such as Solomons (Mickel, 1935; 1937; Krombein, 1971), New Caledonia (André, 1896a; Brothers, 2012), New Zealand (Valentine & Walker, 1983), Ogasawara (Yasumatsu, 1936), Palau (Esaki, 1938), Vanuatu (Brothers, 2012) and, in the other side of the Pacific, the Galápagos (Williams, 1926). Some of them belonging to ancient continental landmasses, although characterized by long-term isolation (e.g. New Caledonia), but others have indeed volcanic origin and have never been connected to the neighboring mainland. Vanuatu, that lies 1,900 Km far from Australia, represents a remarkable case of isolation, although the sea barrier between these islands and the nearest continent is interrupted by intermediate steps (New Caledonia); is not by chance that the only species found on Espiritu Santu belongs to the genus *Ancistrotilla* Brothers, 2012, the same occurring on New Caledonia and whose distribution is also extended to Australia and New Guinea (Brothers, 2012).

Conversely, Kuhlmann (2006) has highlighted the rapid loss of Mutillidae as well as other groups of parasitic Hymenoptera eastwards of Melanesia, while Zimmermann (1942) and Williams (1947) remarked the lack of this family on large archipelagoes such as Polynesia, Hawaii, and most part of Micronesia (see also Krombein, 1949a). The same has been observed by Bequaert (1929) for the Archipelago of Bermuda (N-Atlantic), as confirmed also by more recent surveys (see Hilburn et al., 1990).

While the absence of mutillids is then rather understandable for these extremely remote islands, as well as for Bermuda, Azores and St. Helena in the Atlantic, Chagos, Seychelles and Mauritius in the Indian Ocean, it is not so easily explained for other less distant from the continental landmasses: for instance, Fernando de Noronha (370 Km), Madeira and Cape Verde (both around 600 Km) in the Atlantic, or Lord Howe (750 Km) in the Pacific. This latter, despite its very small area (<15 Km<sup>2</sup>), is inhabited by 225 species of parasitoids and

predatory wasps belonging to 31 families, many of which are brachypterous or even apterous (Jennings & Austin, 2015), but curiously not by Mutillidae, although the island could have both suitable habitats and hosts.

Is therefore to believe that isolation is not just a question of distance, but related to the nature of wind system, as observed for the Antillean butterflies by Spencer-Smith et al. (1988), or of course even stochastic.

An intriguing example for understanding time and space scales of the island colonization is given by that of the volcanic micro-archipelago of Krakatau (Indonesia) after the devastating eruption occurred in 1883. Forty years later, Dammermann (1923) recorded the occurrence of females belonging to two unidentified species (only one on Sertung, both on Rakata Besar) not found during previous surveys (see Jacobson, 1909), and once again Dammermann (1948) reported two and three unidentified species, respectively, for these islands. O'Toole (1975) remarked that at least one of them, *Wallacidia melmora* (Cameron, 1905), is able to overcome narrow sea barriers (about 50 Km) thanks to the peculiar morphology of the genitalia that ensures a prolonged female phoresy during the mating, assuming however as the colonization of new islands must necessarily occurred after the settling of its potential hosts.

Also passive dispersal (by human-mediated, accidental introductions) may play a role in the occurrence of mutillids wasps on insular environments. The Australian "*Ephutomorpha*" *bivulnerata* (André, 1901) not long ago recorded for North Island has been interpreted in this sense (Valentine & Walker, 1983). Furthermore, two females and one male of *Sphaerophthalma pensylvanica* (Lepeletier, 1845) were recently found yet in New Zealand during the reclamation of used vehicles imported from United States (Toy, 2007); the latter record was anyway not included in the present checklist because it concerns an unnatural context. Likewise, Sugiura et al. (2013) considered *Neotrogaspidia pustulata* (Smith, 1873) an alien species in the Ogasawara Islands.

### *Species richness*

As shown in figure 1, the islands of the Indo-Malay ecoregion host the highest number of

species (356), some of which are also distributed in the neighboring regions (7 shared with Australasia, 7 with E Palearctic, and 1 with this latter and Oceania). Mutillidae are generally characterized by a greater diversity in the tropical and subtropical regions of the world (Lelej & Brothers, 2008), while in the northern areas their number strongly decrease, and this pattern seems to be confirmed also on islands when comparing Nearctic to Neotropic, or W-Palearctic to Afrotropical. It should be noted that two of the three species occurring in Great Britain have been included among the "notable" at national level due to their relative rarity (Falk, 1991). However, the noteworthy species richness of Indo-Malay may be explained also by the fact that this region includes the islands characterized by the highest number of species (Sri Lanka and Borneo, respectively with 82 and 77), as well as countries where occur a large number of islands (Indonesia and Philippines).

A highly significant correlation between island size and number of species ( $\log_{\text{species}} - \log_{\text{area}}$ :  $r = 0.569$ ,  $P = 0.0004$ ) was found for  $N = 39$  islands with a surface  $>10,000 \text{ Km}^2$  (excluding North Island, where the only occurring species has been surely introduced; Great Britain, Ireland, Vancouver and Sakhalin, whose faunal impoverishment realistically reflects a latitudinal constraint; and Marajó, that according to the literature has not been adequately investigated) (Fig. 2).

Likewise, highly significant correlations were found for Mediterranean (excluding those not adequately investigated,  $N = 47$ :  $r = 0.830$ ,  $P = 0.0001$ ) (Fig. 3), Japanese and Nansei ( $N = 21$ :  $r = 0.758$ ,  $P = 0.0001$ ) (Fig. 4), Indo-Malay (excluding Nansei,  $N = 49$ :  $r = 0.717$ ,  $P = 0.0001$ ), Australasian (excluding North Island,  $N = 54$ :  $r = 0.511$ ,  $P = 0.0002$ ; including Australia,  $N = 55$ :  $r = 0.640$ ,  $P = 0.0001$ ), Caribbean ( $N = 19$ :  $r = 0.615$ ,  $P = 0.004$ ) (Fig. 5), and Afrotropic islands ( $N = 15$ :  $r = 0.721$ ,  $P = 0.003$ ) (Fig. 6).

Highly significant linear correlations were also found between number of species and island elevation, that may give an indirect indication of the environmental heterogeneity of such territories, for Mediterranean ( $r = 0.840$ ,  $P = 0.0001$ ), Indo-Malay ( $r = 0.586$ ,  $P = 0.0001$ ), Japanese and Nansei ( $r = 0.850$ ,  $P = 0.0001$ ), Australasian ( $r = 0.614$ ,  $P = 0.0006$ ), and Caribbean (excluding Trinidad,  $N = 18$ :  $r = 0.695$ ,  $P = 0.001$ ).

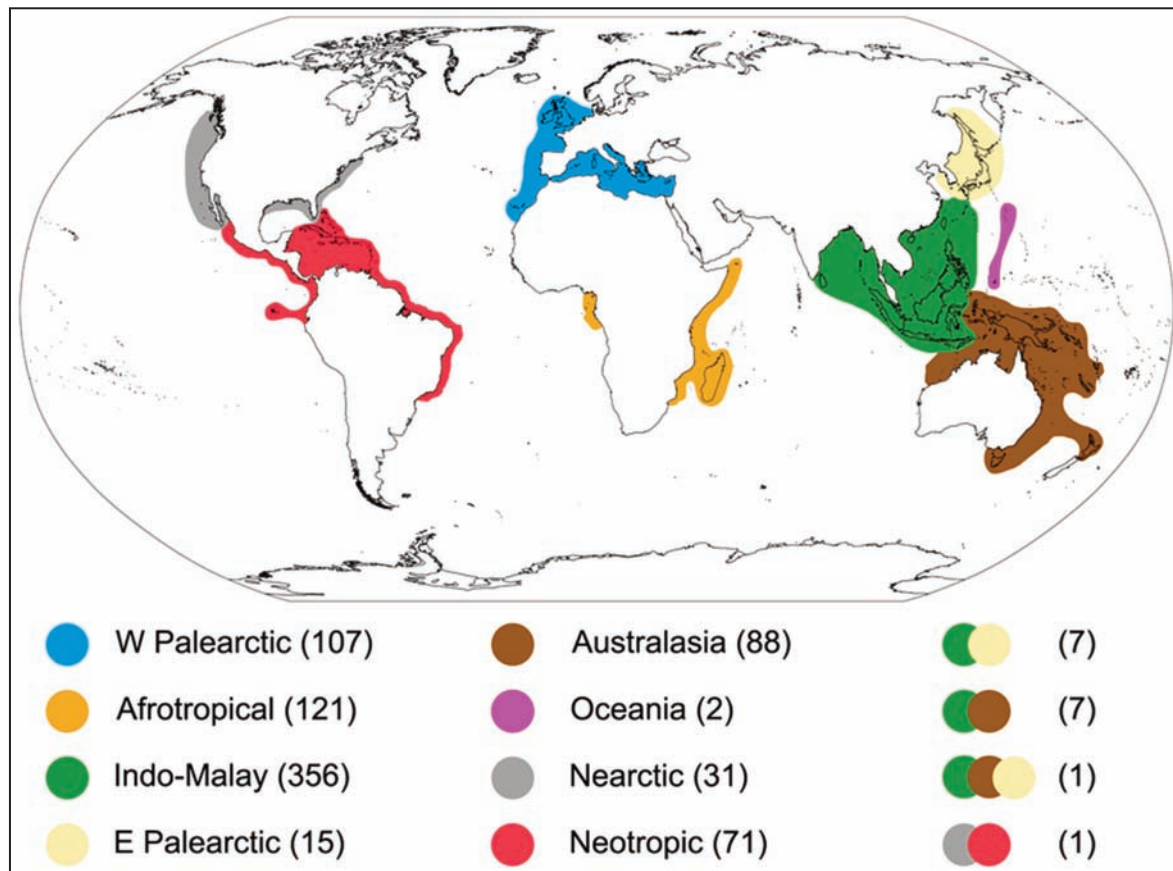


Figure 1. Number of species recorded for islands within each ecoregion. The overlapping circles and the relative number correspond to the species in common between different ecoregions.

Few islets with a surface less than 1 Km<sup>2</sup> are home to mutillids, and their localization is generally very close to the mainland: Phong Vong (< 0.5 Km<sup>2</sup>) belongs to the small coastal archipelago of Phu Quoc (southern Viet Nam); Penikese (0.3) lies in the Buzzard Bay (Massachusetts, US); Embiez (0.9) is a strongly anthropized coastal islet of southern France, while Bagaud (0.45) belongs to the Hyeres Archipelago; Lavezzu (0.7), together with the nearby Cavallo (1.2), belongs to an island group not far from the southern coast of Corsica, with which it was connected until recent times; Conigli (0.04), that can be considered the smaller example of viable surface, represents a fragment of the adjacent Lampedusa Island (Channel of Sicily, Mediterranean) and both were in connection to North Africa during the Last Glacial Maximum.

The only tiny oceanic islet inhabited by mutillids is Nishi-jima (0.49) in the Ogasawara Ar-

chipelago (Japan), but the only species found there is the same occurring on the nearby Chichi-jima.

#### *Species to genus ratio*

Species to genus ratio (S/G) has long been recognized as measure of the taxonomic disharmony of insular faunas (see Gillespie & Roderick, 2002), but in the case of Mutillidae it seems rather an indirect indicator of how the island faunas are depauperate in comparison to those of the neighboring continental areas.

Although not easily verifiable for many of the islands listed in Table 1, due to the uncertainties that still concern the status of some genera on the whole (such as *Ephutomorpha*) or their representatives in some areas (e.g. *Trogaspidia* in the Malagasy region), average S/G is clearly found to decrease on islands when comparing Japan ( $1.2 \pm 0.13$ ) and Nansei ( $1.33 \pm 0.23$ ) to China ( $3.62 \pm 0.66$ : data



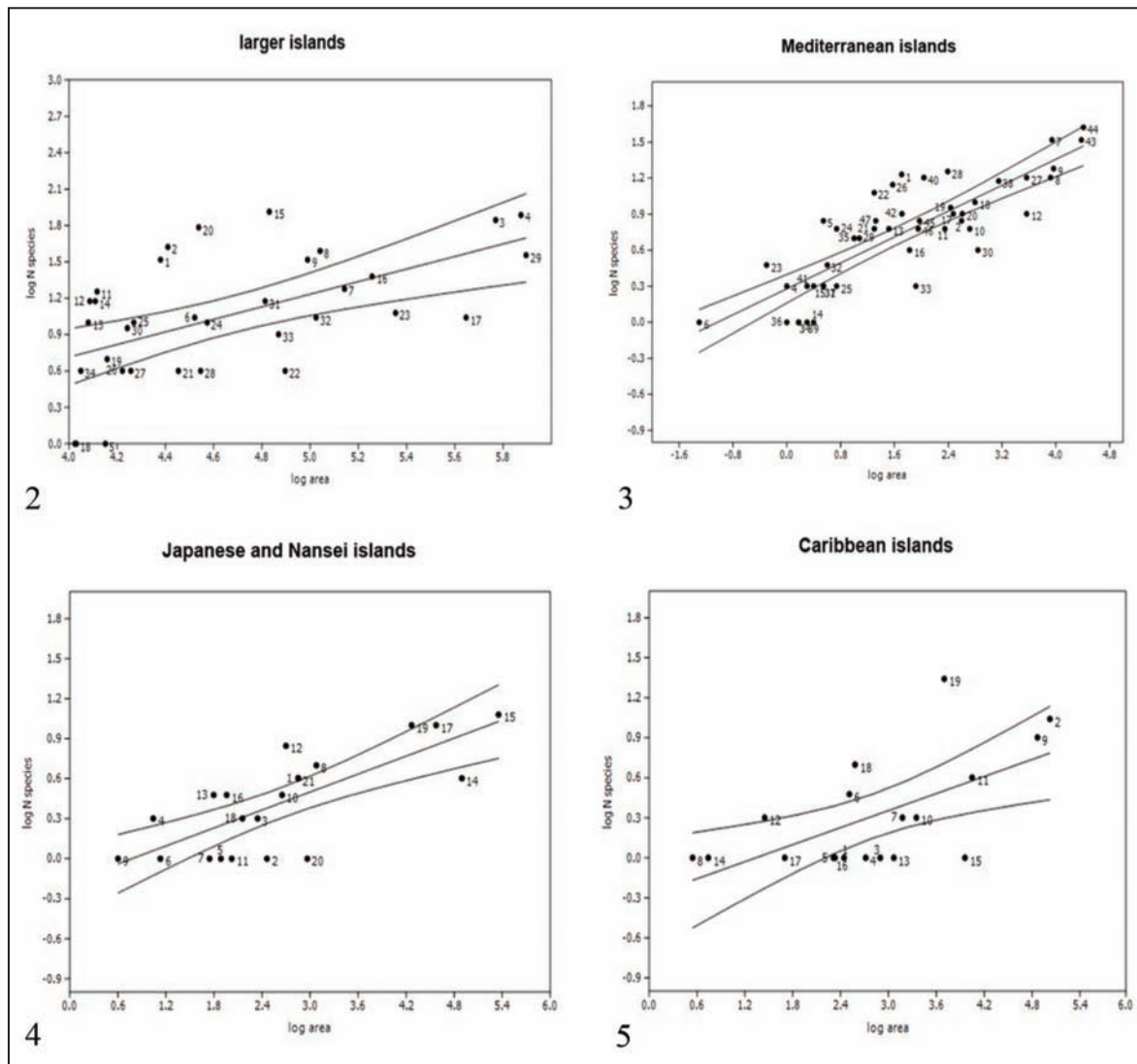


Figure 2. Species-area plot ( $\log_{\text{species}} - \log_{\text{area}}$ ) for islands > 10,000 Km<sup>2</sup>. Numbers are as follows: 1) Sardinia; 2) Sicily; 3) Madagascar; 4) Borneo; 5) Flores; 6) Hainan; 7) Java; 8) Luzon; 9) Mindanao; 10) Mindoro; 11) Negros; 12) Palawan; 13) Panay; 14) Samar; 15) Sri Lanka; 16) Sulawesi; 17) Sumatra; 18) Sumba; 19) Sumbawa; 20) Taiwan; 21) Timor; 22) Hokkaidō; 23) Honshū; 24) Kyūshū; 25) Shikoku; 26) Grande Terre; 27) Halmahera; 28) New Britain; 29) New Guinea; 30) Seram; 31) Tasmania; 32) Cuba; 33) Hispaniola; 34) Jamaica.

Figure 3. Species-area plot ( $\log_{\text{species}} - \log_{\text{area}}$ ) for Mediterranean islands. Numbers are as follows: 1) Asinara; 2) Brač; 3) Budelli; 4) Cavallo; 5) Comino; 6) Conigli; 7) Corsica; 8) Crete; 9) Cyprus; 10) Djerba; 11) Elba; 12) Euboea; 13) Gavdos; 14) Giannutri; 15) Gorgona; 16) Gozo; 17) Hvar; 18) Kerkyra; 19) Korčula; 20) Krk; 21) La Maddalena; 22) Lampedusa; 23) Lavezzi; 24) Levanzo; 25) Linosa; 26) Lipari; 27) Mallorca; 28) Malta; 29) Marettimo; 30) Menorca; 31) Panarea; 32) Pano Koufonissi; 33) Pantelleria; 34) Piana dell'Asinara; 35) Pianosa; 36) Porquerolles; 37) Rava; 38) Rhodes; 39) San Domino; 40) Sant'Antioco; 41) Santa Maria; 42) San Pietro; 43) Sardinia; 44) Sicily; 45) Syros; 46) Vis; 47) Vulcano.

Figure 4. Species-area plot ( $\log_{\text{species}} - \log_{\text{area}}$ ) for Japanese and Nansei islands. Numbers are as follows: 1) Amami Ōshima; 2) Iriomote-jima; 3) Ishigaki-jima; 4) Iwo-jima; 5) Kakeromajima; 6) Kuchinoshima; 7) Miyakojima; 8) Okinawa-jima; 9) Takeshima; 10) Tanegashima; 11) Tokunoshima; 12) Yakushima; 13) Hachijō-jima; 14) Hokkaidō; 15) Honshū; 16) Izu Ōshima; 17) Kyūshū; 18) Okushiri; 19) Shikoku; 20) Shimoshima; 21) Tsushima.

Figure 5. Species-area plot ( $\log_{\text{species}} - \log_{\text{area}}$ ) for Caribbean islands. Numbers are as follows: 1) Antigua; 2) Cuba; 3) Dominica; 4) Eleuthera; 5) Great Exuma; 6) Grenada; 7) Guadeloupe; 8) Guana; 9) Hispaniola; 10) Juventud; 11) Jamaica; 12) Little Cayman; 13) Martinique; 14) Mustique; 15) Puerto Rico; 16) St. Croix; 17) St. John; 18) St. Vincent; 19) Trinidad.

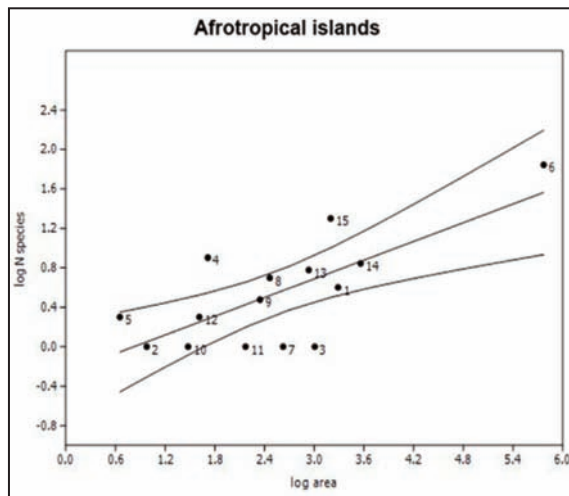


Figure 6. Species-area plot ( $\log_{\text{species}} - \log_{\text{area}}$ ) for Afrotropical islands. Numbers are as follows: 1) Bioko; 2) Fundo; 3) Grande Comore; 4) Inhaca; 5) Koyaama; 6) Madagascar; 7) Mafia; 8) Nosy Be; 9) Nosy Boraha; 10) Nosy Komba; 11) Príncipe; 12) Samha; 13) São Tomé; 14) Socotra; 15) Zanzibar.

from Lelej, 2005; Tu et al., 2014), while respect to this latter the most “continental” Taiwan has a S/G only slightly lower ( $3.16 \pm 0.75$ ); Sri Lanka ( $2.54 \pm 0.37$ ) to India ( $5.07 \pm 1.44$ : data from Lelej, 2005); Socotra ( $1.40 \pm 0.24$ ) to Yemen ( $2.05 \pm 0.33$ : data from Lelej & Harten, 2006, 2014); Sicily ( $2.33 \pm 0.59$ ) and Sardinia ( $2.00 \pm 0.55$ ) to Italy ( $2.66 \pm 0.65$ : data from Pagliano & Strumia, 2007); Crete ( $1.60 \pm 0.26$ ) and Cyprus ( $1.63 \pm 0.43$ ) to, respectively, Greece ( $2.55 \pm 0.58$ : data from Lelej et al., 2003a, 2003b; Pagliano, 2009) and Turkey ( $3.09 \pm 0.56$ : data from Yildirim & Lelej, 2012).

Furthermore, S/G for the above Mediterranean islands seems to decrease in proportion to their size with a significant difference (Kruskal-Wallis:  $H = 7.343$ ,  $P = 0.03$ ). A similar trend, albeit not statistically significant, is found both within the Greater Antilles (Cuba:  $2.75 \pm 0.85$ ; Hispaniola:  $2.00 \pm 0.70$ ; Jamaica:  $1.33 \pm 0.33$ ) and in comparison to the smaller but “continental” Trinidad ( $2.33 \pm 0.64$ ).

### Faunal affinities

Average linkage cluster analysis (UPGMA) using Jaccard’s coefficient was performed in order to evaluate the faunal similarity within four island groups.

Australasian islands (Fig. 7) constitute a clearly distinct group from Lesser Sundas and Sulawesi and are characterized by two main clusters: in the first are included Maluku and the coastal islands of western New Guinea (Biak, Misool, Roon, Salawati, Umboi, Waigeo, Yapen), while in the other are grouped New Guinea, its eastern satellites (Baronga, Daru, Kiriwina, Lihir, Normanby, Woodlark, Yule) and Bismarck Archipelago (New Britain, New Ireland, New Hanover). The greater faunistic affinity found between Papuan and Bismarck islands is due to their geographical proximity, but also to the fact that their faunas represent fractions of the high diversity of New Guinea.

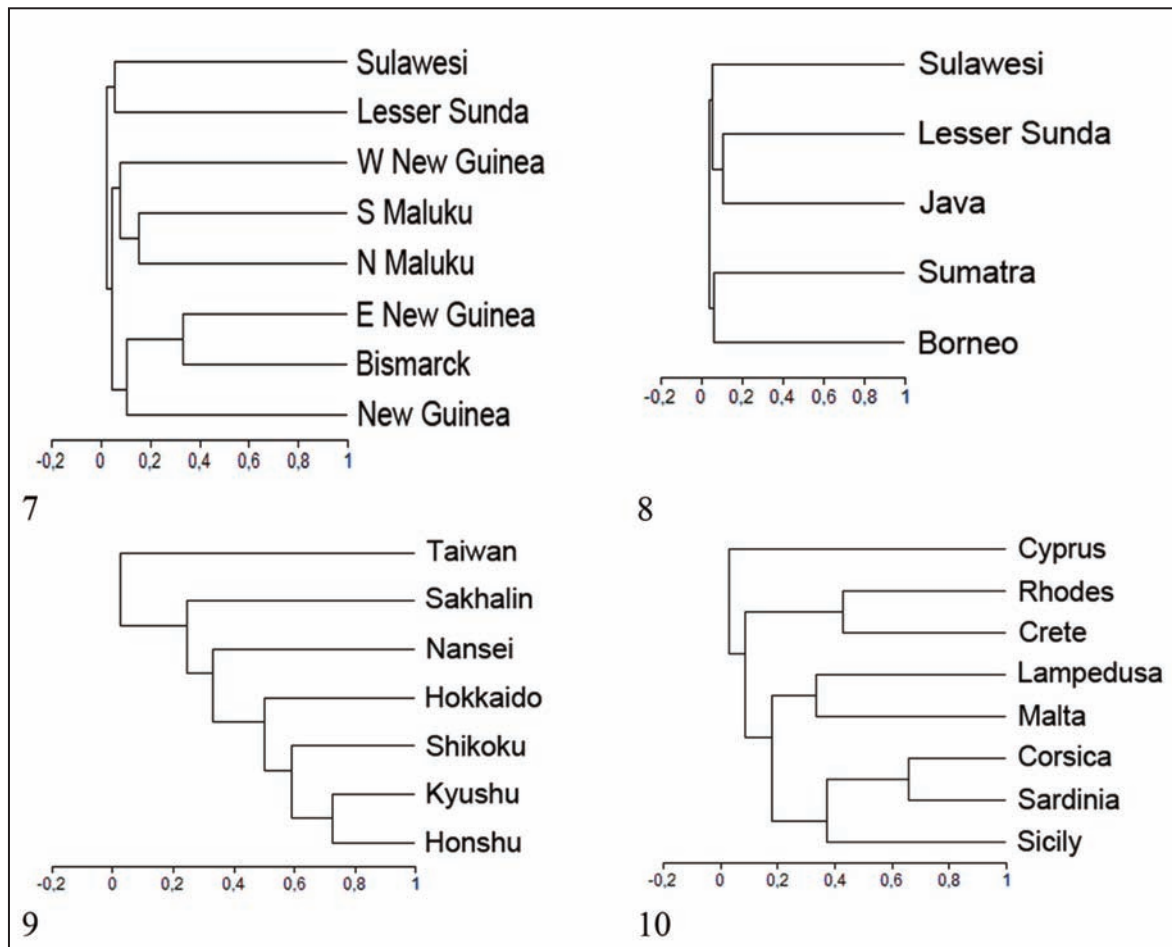
Within the Sunda Islands (Fig. 8), where some islands (Sulawesi, Borneo, Java) host a large number of single-island endemics (SIEs), there is a very low degree of similarity. Borneo and Sumatra are grouped in one of the two main clusters, while the other includes Java, Lesser Sundas and, slightly separate, Sulawesi.

On the contrary, Japanese islands (Fig. 9) are characterized by a remarkable faunistic affinity and, secondarily, have a certain similarity with Nansei group and Sakhalin. With this latter, Japanese islands share some Palearctic elements widely distributed in the continental areas, namely *Mutilla* Mikado Cameron, 1900, *Cystomutilla teranishii* Mickel, 1935 and *Taimyrmosa mongolica* (Suárez, 1974), that conversely are lacking in the Nansei. Although Nansei belong to the Indo-Malay region, it should be noted that these islands are more closely related to Japan than to Taiwan, whose isolated cluster fits well to its noteworthy faunal distinctiveness.

Finally, the clusters of the Mediterranean area (Fig. 10) seem to reflect mainly the geographical closeness of the islands: the greater similarities were found between Corsica and Sardinia, which indeed belong to a distinct western insular group that includes also Sicily; for Malta and Lampedusa, that lie in the Channel of Sicily and relatively close to North Africa; and for Crete and Rhodes, both placed in the Aegean Sea. Probably due to its easternmost and isolated localization, Cyprus shows a very low degree of similarity with all these islands.

### Endemism

Endemism at generic rank occurs only in a restricted number of larger islands. Five distinctive



Figures 7–10. Dendrograms obtained by UPGMA clustering of some Australasian (Fig. 7), Sunda (Fig. 8), Japanese and Nansei (Fig. 9) and Mediterranean islands/island groups (Fig. 10) according to the Jaccard index similarity matrix.

genera occur both on Sri Lanka (*Bethsmymilla* Krombein et Lelej, 1999; *Indratilla* Lelej, 1993; *Kudakrumia* Krombein, 1979; *Serendibiella* Lelej, 2005; *Standfussidia* Lelej, 2005) and Madagascar (*Aureotilla* Bischoff, 1920; *Hildebrandetia* Özdikmen, 2005; *Pseudolophotilla* Nonveiller et Četković, 1995; *Seyrigilla* Krombein, 1972; *Sylvotilla* Viette, 1978), but should be noted that at least 19 Madagascan species currently ascribed to genus *Trogaspidia* Ashmead, 1899 are however belonging to other genera yet undescribed (see Brothers et al., 2011), hence the number of endemics for this island is underestimated. Endemic genera inhabit also Sulawesi (*Protrogaspidia* Lelej, 1996) and New Guinea and its adjacent islands (*Ascetotilla* Brothers, 1971) (Fig. 11), although Brothers (2012) stated that some species occurring on this latter and

assigned to *Ephutomorpha* could belong to other genera yet undescribed. Within the W Palearctic, the only insular distinctive genus is known for the Canary Archipelago (*Liomotilla* André, 1907). Finally, *Jamaitilla* Casal, 1965, described for Jamaica, has been synonymized by Quintero & Cambra (2001).

Conversely, more than half (55.8%) of the species and subspecies occurring on islands or island groups are endemic. SIEs are widely represented among specific and infraspecific taxa inhabiting large or small islands, but particularly on these latter rate of endemism may reach very high percentage values, as consequence of to their lower faunal richness. This is the case, indeed, of islands such as Fuerteventura, Príncipe, Leyte, South Andaman, Sumba, Espiritu Santo, Makira, Dominica, St. Croix, or archipelagoes such as New Caledonia and

Galápagos, for which the only/few recorded species is/are strictly endemic/s.

Figure 12 shows as the values may vary remarkably depending on the island typology. Among the larger ones, Madagascar confirms its peculiar character by hosting a wholly unique fauna, that similarly than other taxonomic groups reflects its ancient isolation (Goodman & Benstead, 2004).

High values are also found in some Greater Antilles (75% on Hispaniola, 70.8% on Cuba) and some Australasian and Indo-Malay large islands (70.8% on Sulawesi, 69.4% on New Guinea, 66.6% on Tasmania, 64.9% on Borneo).

The highly significant correlation ( $r = 0.856$ ,  $P = 0.0001$ ) found between isolation index and percentage of endemism for several islands or

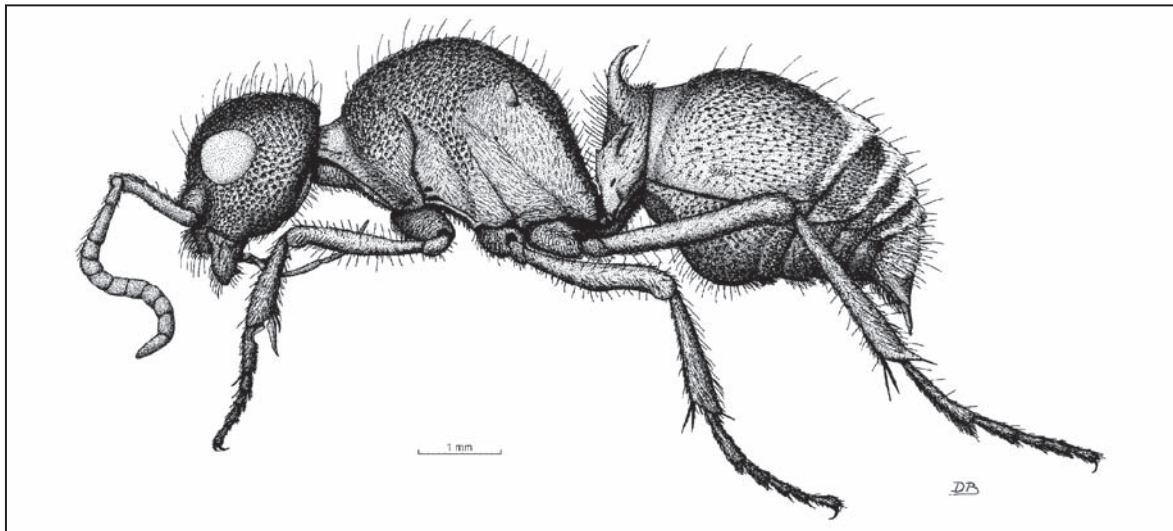


Figure 11. *Ascetotilla uncinata* Brothers, 1971, a remarkable endemic species of New Guinea (courtesy of Denis J. Brothers).

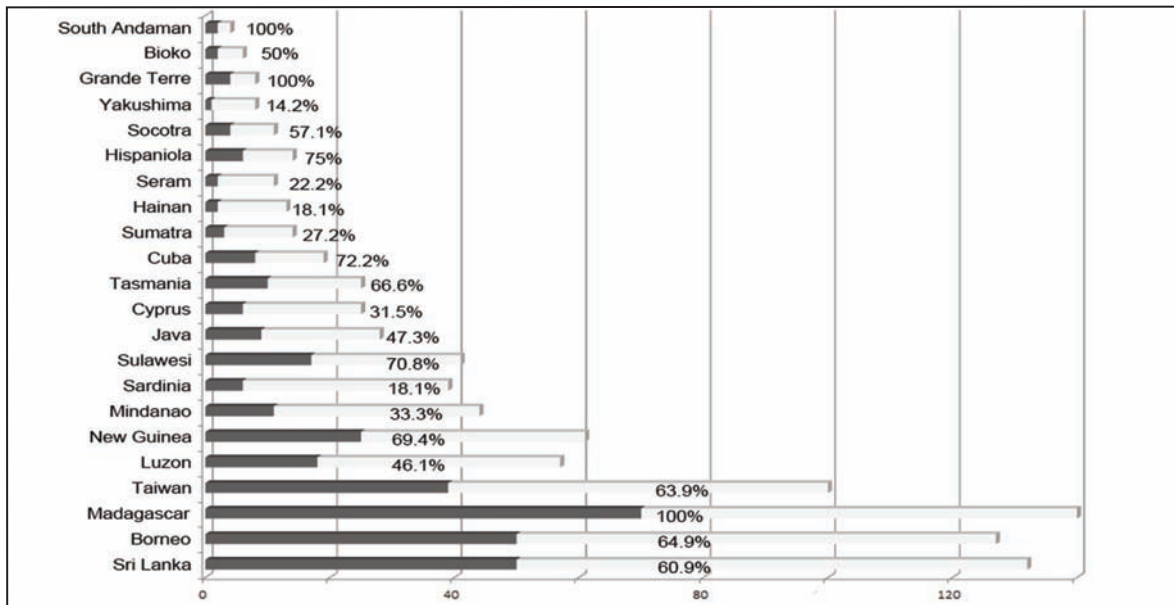


Figure 12. SIEs percentages (in dark grey) in comparison to the whole number of occurring species (in light grey) on selected islands.



archipelagoes (Fig. 13) suggests that speciation processes may be largely influenced by geographical factors, such the distance from mainland. SIEs have usually low values both in the continental islands and in those placed in closed basins (e.g. Sardinia and Cyprus in the Mediterranean). Despite the remarkable number of distinctive genera occurring on Sri Lanka, 40% of the species is indeed distributed also in the mainland. Furthermore, SIEs are absent from many Lesser Sundas (Bali, Flores, Lombok and smaller islands), in the larger Japanese islands such as Honshū, Hokkaidō and Kyūshū, in most of the W Palearctic and in all the Nearctic, which were part of continental landmasses until recent time (Last Glacial Maximum). However, considering separately each island from its insular group, not always at an oceanic origin corresponds a high level of endemism: for instance, among the Nansei only Yakushima hosts SIEs, with a value just equal to 14%.

When considering the endemics with an intra-island/archipelago distribution range, the higher percentages are found for those most isolated and inhabited by few species (e.g. Galápagos and Solomons) (Fig. 14). Fairly high percentages also occur for the islands of Gulf of Guinea, Canary and Lesser Antilles (excluding Trinidad), while both on Japanese and Nansei the endemics are <50%. Despite their geographical closeness, northern Maluku (which include Ambon, Bacan, Buru, Gebe, Halmahera, Morotai, Seram, Taliabu and Ternate) harbor a large number of species than the southern islands of the same group (Kai, Larat and Tanahbesar), but also twice of percentage of endemics (see Fig. 14). Southern Maluku derived from eastern Gondwana margin (northern Australia and southern New Guinea), while the Halmahera block (N Maluku) is thought to have originated on the Pacific plate and moved westward along the New Guinea margin to its present position (see Heads, 2013 and references therein). The different historical geography would then to account for the significant difference found in the rate of endemism for these sub-archipelagoes.

### Niche shift

As evidenced by Brothers (1989), records given in literature about the hosts of Mutillidae concern a very low number of species, and in general the bio-

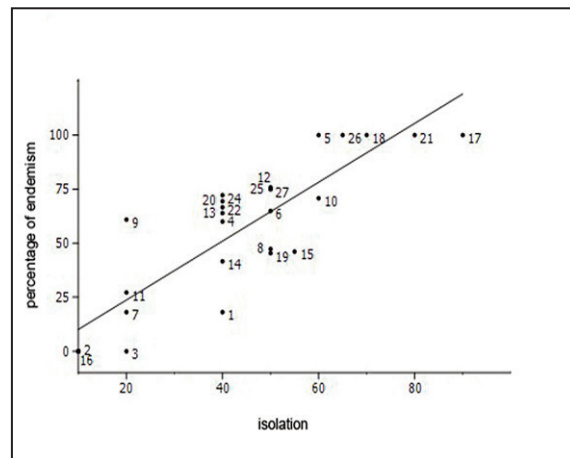


Figure 13. The relationship between isolation index (see Table 1) and percentage of endemism for some islands or archipelagoes. Numbers are as follows: 1) Sardinia; 2) Sicily; 3) Great Britain; 4) Canary; 5) Madagascar; 6) Borneo; 7) Hainan; 8) Java; 9) Sri Lanka; 10) Sulawesi; 11) Sumatra; 12) Philippines; 13) Taiwan; 14) Japanese; 15) Nansei; 16) Sakhalin; 17) Grande Terre; 18) Espiritu Santo; 19) N Maluku; 20) New Guinea; 21) Solomons; 22) Tasmania; 23) Vancouver; 24) Cuba; 25) Hispaniola; 26) Galápagos; 27) Jamaica.

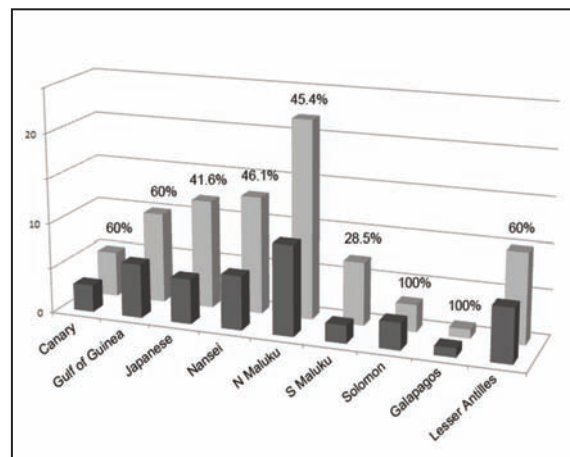


Figure 14. Intra-archipelago endemics percentages (dark grey columns) in comparison to the whole number of occurring species (light grey columns) on selected islands' groups. Lesser Antilles are here considered excluding Trinidad.

logy of these hymenopteran is little known, so eventual examples of “island rule” (sensu Gillespie & Roderick, 2002) within mutillid wasps must be viewed with caution. Nevertheless, a case of niche shift from the usual hosts (other Hymenoptera) occurring in an insular environment has been



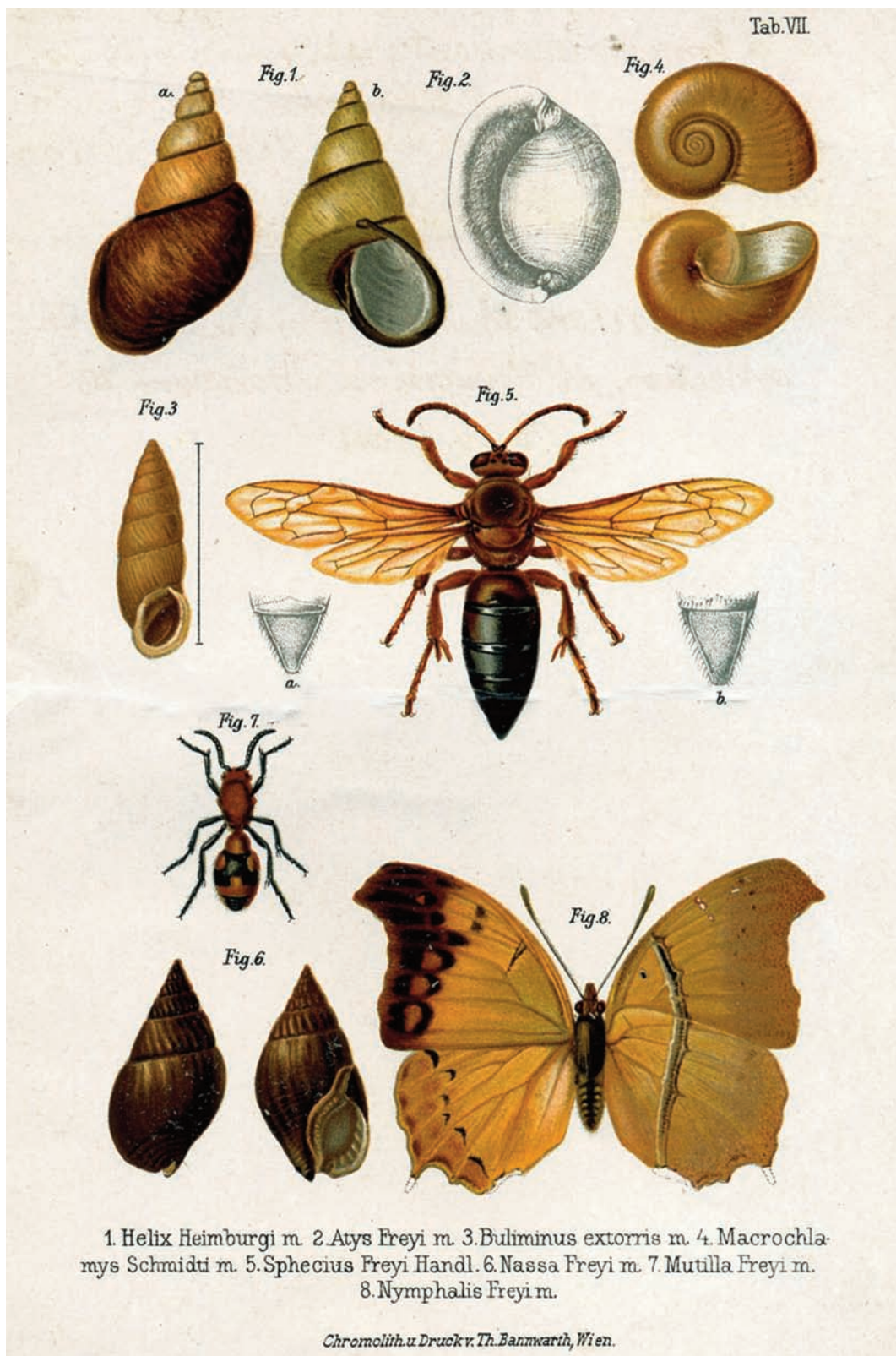


Figure 15. *Stenomutilla freyi* Branksic, 1891 from the original plate published by Branksic (1891: plate 7, fig. 7).

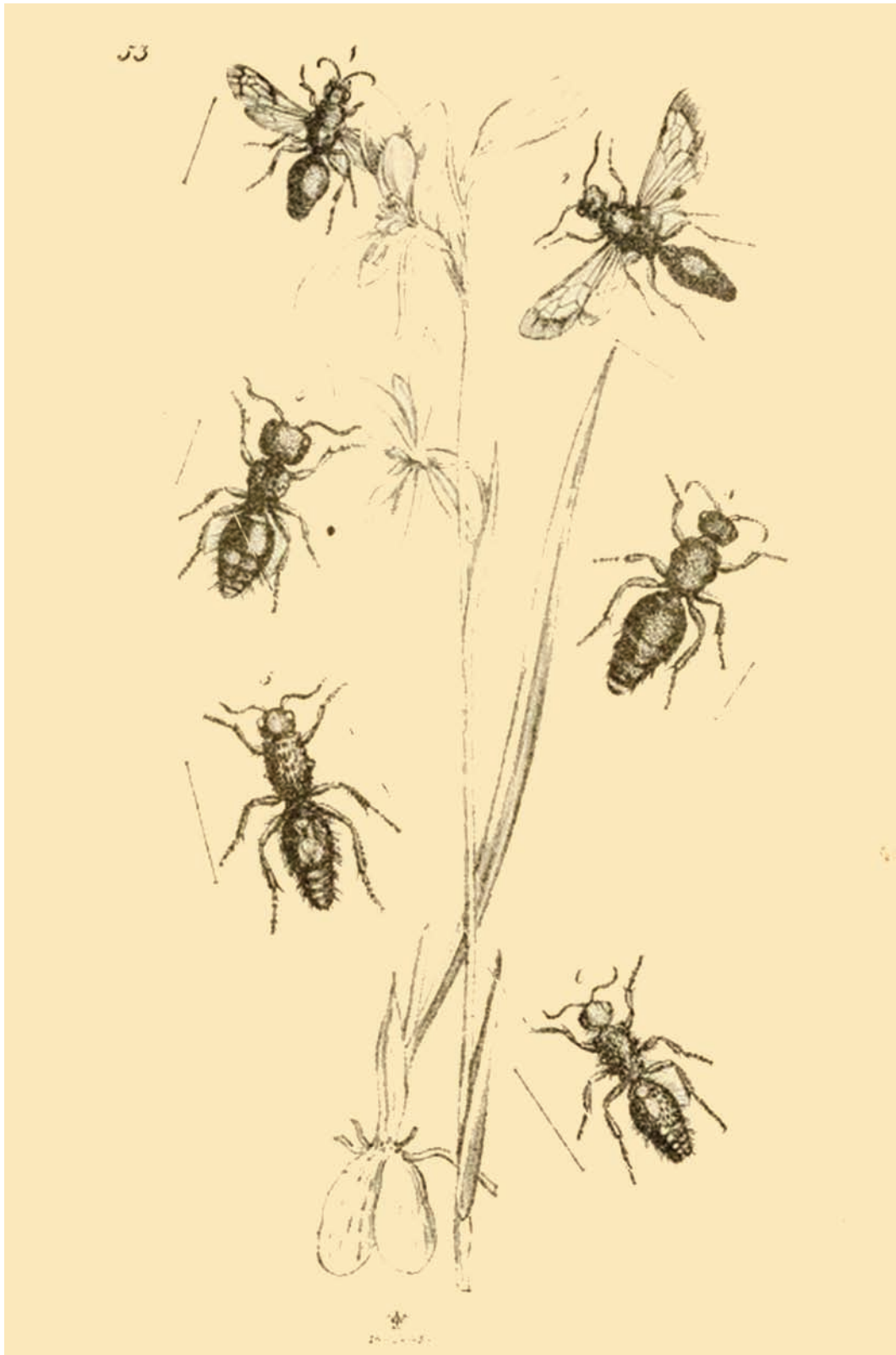


Figure 16. Some mutillids described from Tasmania by Westwood (1843: plate LIII), currently assigned to the genus *Ephutomorpha*.

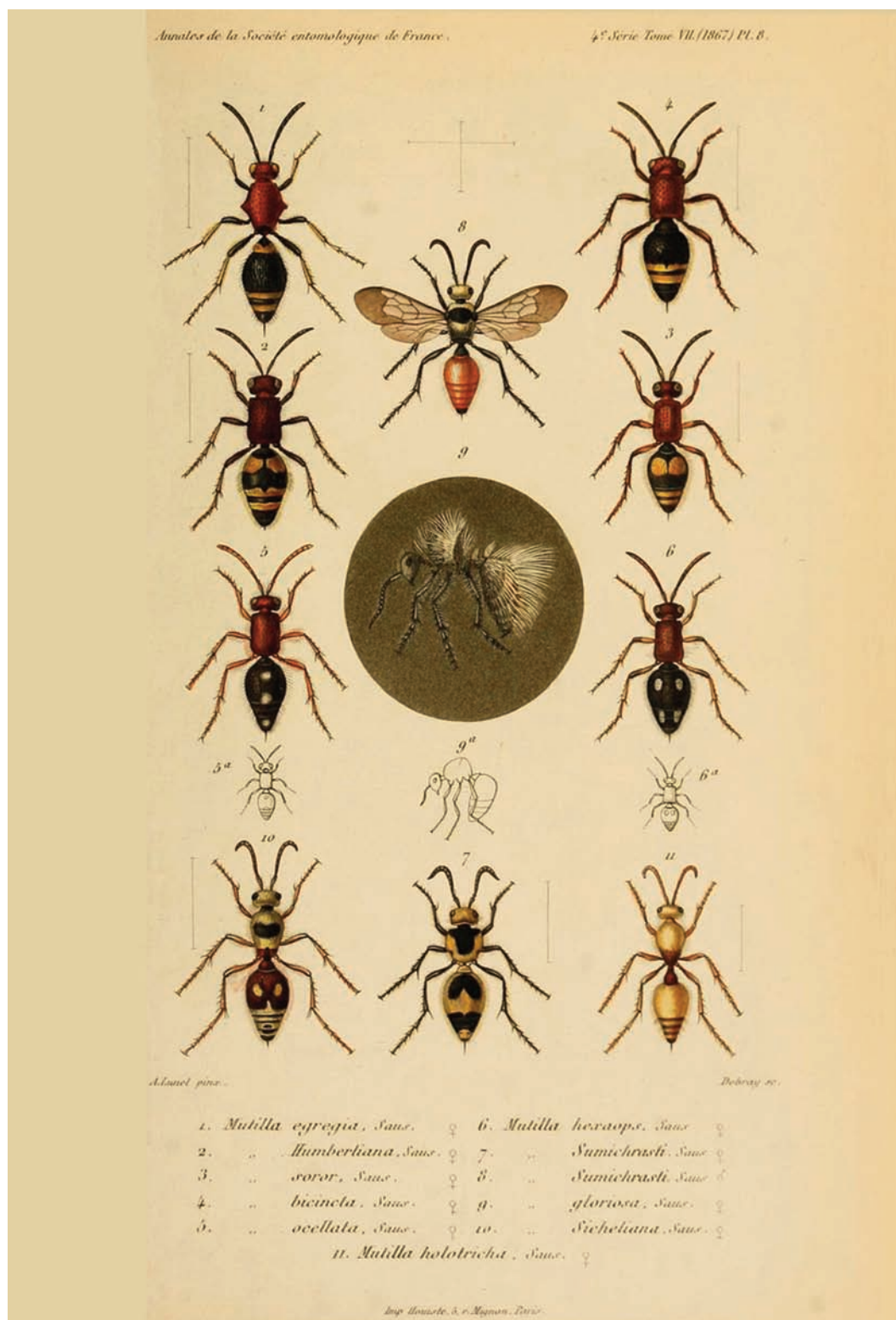


Figure 17. Some species from Sri Lanka described and illustrated by Saussure (1867b: plate 8, figs. 1–6): *Mutilla egregia* (1) has been synonymized with *Orientilla aureorubra* (Sichel et Radoszkowski, 1870); *M. humbertiana* (2) is now placed in the genus *Wallacidia*; *M. soror* (3) and *M. bicincta* (4) are now placed in the genus *Trogaspidia*; *M. ocellata* (5) is now placed in the genus *Smicromyrme*; *M. hexaops* (6) has been synonymized with *Trogaspidia villosa* (Fabricius, 1775).



documented by Seyrig (1936) and concerns the Madagascan *Stenomutilla freyi* (Brancsik, 1891 (Fig. 15) as parasitoid of the larva of *Parasa reginula* Saalmüller, 1884 (Lepidoptera Limacodidae). Although some species have been observed to parasitize immature stages of other orders of insects, such as Diptera, Coleoptera and Blattodea (see Amini et al., 2014 and references therein), this is so far the only record of host association with a moth.

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