

Last updated: 14 June 2019

## **PHILANTHUS**

*Philanthus* Fabricius, 1790:224. Type species: *Philanthus coronatus* Fabricius, 1790 [= *Sphex coronatus* Thunberg, 1784], designated by Shuckard, 1837:246.

*Symblephilus* Panzer, 1806:171 (authorship attributed to Jurine, as synonym of *Philanthus*). Type species: *Philanthus pictus* Panzer, 1797 [= *Vespa triangulum* Fabricius, 1775], designated by Pate, 1937c:62.

*Simblephilus* Jurine, 1807:185. Type species: *Vespa triangulum* Fabricius, 1775, designated by Morice and Durrant, 1915:402.

*Cheilopogonus* Westwood, 1835a:441. Type species: *Cheilopogonus punctiger* Westwood, 1835 [= *Vespa gibbosa* Fabricius, 1775], by monotypy.

*Philanthus* Guérin-Méneville, 1835:pl. 71, fig 8. Lapsus for *Philanthus* Fabricius, 1790.

*Anthophilus* Dahlbom, 1844:190. Type species: *Philanthus politus* Say, 1824, designated by Ashmead, 1899d:294.

*Chilopogon* Kohl, 1897a:329. Emendation of *Cheilopogonus* Westwood, 1834.

*Ephiphilanthus* Ashmead, 1899d:294. Type species: *Philanthus solivagus* Say, 1837, by original designation.

*Pseudanthophilus* Ashmead, 1899d:294. Type species: *Philanthus ventilabris* Fabricius, 1798, by original designation.

*Oclocletes* Banks, 1913b:423. Type species: *Philanthus sanbornii* Cresson, 1865, by original designation.

*Oclocletes* Mickel, 1916a:407. Lapsus or emendation of *Oclocletes* Banks, 1913.

Keys: Arnold, 1925:140 (southern African species); Strandtmann, 1946 (North America); de Beaumont, 1951c:299 (Europe), 1961a:210 (North Africa); van der Vecht, 1966 (three Oriental species); R. Bohart and Grissell, 1975 (North America); G. Ferguson, 1983a (*politus* group), 1984a (*zebratus* group); Gayubo, 1991a (Iberian Peninsula); Guichard, 1994a (Arabia); Gadallah, 1996 (Egypt).

Revisions: Gadallah, 1996 (Egyptian species).

Comparative life histories of North American *Philanthus*: Evans and O'Neill, 1988.

Nest: Barth, 1910:119

Review of biology: Kazenas, 2001b:241.

Presence of bacterium *Streptomyces* in female antennal glands: Kaltenpoth et al., 2005, 2006.

### **1. *adamsoni* Arnold**

*Philanthus adamsoni* Arnold, 1952:466, ♂. Holotype: ♂, Kenya: South Kulal (SAM). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### **2. *albopictus* Taschenberg**

*Philanthus albopictus* Taschenberg, 1880:782, ♂. Syntypes: Ethiopia: no specific locality (Halle). – Kohl, 1891:363 (in checklist of world *Philanthus*); Dalla Torre, 1897:482 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### **3. *albopilosus* Cresson**

*Philanthus albopilosus* Cresson, 1865c:91, ♂. Lectotype: ♂, USA: Illinois: no specific locality (ANSP), designated by Cresson, 1916:99. – Packard, 1866:55 (in key to North American *Philanthus*), 56 (bibliographic reference, geographic distribution); Cresson, 1887:280 (in catalog of North American Hymenoptera); Kohl, 1891:366 (in checklist of world *Philanthus*); Dalla Torre, 1897:482 (in catalog of world Hymenoptera); Cockerell, 1899a:141 (New Mexico); Viereck and Cockerell, 1904b:143 (in revision of *Philanthus* of New Mexico); H. Smith, 1908b:355 (in revision of Nebraskan Sphecidae; partly = *Philanthus barbiger*); Stevens, 1917:421 (North Dakota); Mickel,

1918b:386 (in catalog of Nebraskan Sphecidae); Strandtmann, 1945b:151 (in review of North American *Philanthus*), 1946:21 (in revision of North American species); Dreisbach, 1947:142, 143 (in key to *Philanthus* of Michigan); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); Evans and Lin, 1959:128 (nesting habits); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); Evans, 1975d:888 (nesting habits and male behavior in two widely separated populations); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Krombein, 1979b:1721 (in catalog of North American Hymenoptera, nest, list of prey); Hilchie, 1982:91 (geographic variation in prey and color), 110 (accessory burrows reviewed), 119 (range of *albocinctus albocinctus*: Canada: Alberta, Manitoba, Saskatchewan; USA: Illinois, Iowa, Montana, Nebraska, New York, North Dakota, Ohio, South Dakota); O'Neill and Evans, 1982:798 (major prey: family and genus); Evans and O'Neill, 1988:183 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:257 (reference to publication on nest parasite *Phrosinella fulvicornis* (Coquillett), a miltogrammine fly); Kurczewski, 1998d:250 (pine barrens in upstate New York); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Amarante, 2002:63 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Buck, 2004:27 (in checklist of Crabronidae of Ontario, Canada); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts). – **As *Anthophilus albopilosus***: Ashmead, 1899d:297 (new combination, in checklist of North American Crabronidae).

*Philanthus simillimus* Cresson, 1865c:95, ♀. Lectotype: ♀, USA: Illinois: no specific locality (ANSP), designated by Cresson, 1916:101. Synonymized with *Philanthus albopilosus* by Strandtmann, 1945b:151. – Packard, 1866:55 (in key to North American *Philanthus*), 56 (bibliographic reference, geographic distribution); Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:369 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Mickel, 1918b:387 (in catalog of Nebraskan Sphecidae).

#### **ssp. *manuelito* Hilchie**

*Philanthus albopilosus manuelito* Hilchie, 1982:120, ♀, ♂. Holotype: ♀, USA: Texas: Ward County: Manhattan State Park (USNM). Range: USA: Arizona, Colorado, Idaho, Kansas, New Mexico, Texas, Utah; Mexico: Chihuahua.

#### **4. *amabilis* Arnold**

*Philanthus amabilis* Arnold, 1946:79, ♀, ♂. Syntypes: Tanzania: Mbisi Forest near Sumbuwango (SAM). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Hancock, Chahwanda, and Mhlanga, 1995:39 (syntype in Bulawayo Museum).

#### **5. *ammochrysus* W. Schulz**

*Philanthus ammochrysus* W. Schulz, 1905b:59, ♂. Holotype: ♂, Tunisia: Sfax (depository?). – de Beaumont, 1949b:189 (in revision of northwest African *Philanthus*), 1950f:396 (Algeria), 1953g:119 (Morocco), 1961a:205 (diagnostic characters); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Dollfuss, 2017b:1246 (locality records from Jordan, Morocco, and Tunisia).

*Philanthus kruegeri* von Schulthess, 1926a:152, ♀, B (as *krügeri*, incorrect original diacritic mark). Syntypes: Libya: Cyrenaica: Agedabia (Zurich). Synonymized with *Philanthus ammochrysus* by de Beaumont, 1949b:189. – von Schulthess, 1926b:212 (redescription); Guiglia, 1934b:296 (Libya: bibliography and summary of locality records).

#### **ssp. *psammophilus* Bytinski-Salz**

*Philanthus ammochrysus psammophilus* Bytinski-Salz in de Beaumont and Bytinski-Salz, 1959:146, ♂, ♀. Holotype: ♂, Israel, Bat Yam (H. Bytinski-Salz coll.). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

#### **6. *arizonicus* R. Bohart**

*Philanthus arizonicus* R. Bohart, 1972:397, ♂. Holotype: ♂, USA: Arizona: Maricopa County: 18 mi south of Gila Bend (UCD). – R. Bohart and Grissell, 1975:6 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Krombein, 1979b:1721 (in catalog of North American Hymenoptera).

### 7. *arnoldi* Berland

*Philanthus arnoldi* Berland, 1936:278, ♀. Holotype: ♀, Mali: Niafouké (MNHN). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### 8. *asmarensis* Giordani Soika

*Philanthus asmarensis* Giordani Soika, 1939c:101, ♀, ♂ (authorship attributed to Arnold). Holotype: ♀, Eritrea: Asmara: Adi Caie (Venezia). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Dollfuss, 2017b:1247 (locality records from South Africa).

*Philanthus asmarensis* Arnold, 1940:104, ♀. Objective synonym of *Philanthus asmarensis* Giordani Soika, 1939. – Vanni, Bartolozzi, and Whitman-Mascherini, 1985:129 (one syntype in Firenze Univ.).

### 9. *avidus* Bingham

*Philanthus avidus* Bingham, 1896c:440, ♀. Holotype or syntypes: ♀, Burma: Tenasserim: no specific locality (BMNH). – Bingham, 1897:297 (redescription); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### 10. *banabacoa* Alayo Dalmau

*Philanthus banabacoa* Alayo Dalmau, 1968a:3, ♀, ♂. Syntypes: Cuba: Oriente: several localities (IZAC). – Alayo Dalmau, 1973:190 (in catalog of Cuban Hymenoptera); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); Alayo Dalmau, 1976:30 (in checklist of Cuban Sphecidae); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Alayo Soto, 1982:6 (prey: *Agapostemum poeyi* (Lucas), a halictid); Reyes and Hernández, 1995:3 (holotype in Inst. Ecol. Sist., La Havana, Cuba); Amarante, 2002:63 (in catalog of Neotropical Crabronidae); Hidalgo-Gato González, Reyes Sánchez, Mestre Novoa, Fernández García, Rodríguez-León Merino, Rodríguez Velázquez, Genaro Artola, and Fontenla Rizo, 2002:30 (syntypes deposited at IZAC); Genaro, 2006:58 (in checklist of Cuban Sphecidae and Crabronidae); Dollfuss, 2017b:1247 (Cuba: Guantanamo).

### 11. *barbatus* F. Smith

*Philanthus barbatus* F. Smith, 1856:473, ♂. Holotype or syntypes: ♂, North America: no specific locality (BMNH). – Cresson, 1962:236 (in catalog of North American Hymenoptera), 1865c:103 (original description copied); Packard, 1866:58 (bibliographic references, geographic distribution); Cresson, 1887:280 (in catalog of North American Hymenoptera); Kohl, 1891:366 (in checklist of world *Philanthus*); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Krombein, 1979b:1721 (in catalog of North American Hymenoptera, nesting sites, list of prey); Evans, 1982c:571 (nesting and territorial behavior); Evans and O'Neill, 1988:101 (male behavior, nesting habits); Spofford, Kurczewski, and Downes, 1989:261 (reference to publication on nest parasite: undetermined species of Miltogrammini); McDaniel, Schmidt, and Howard, 1992:27 (mandibular gland secretion); Evans, 1993:29 (male aggregations); Amarante, 2002:63 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Dollfuss, 2017b:1247 (locality records from Arizona, Colorado, and New Mexico).

*Philanthus albifrons* Cresson, 1865c:101, ♀, B. Lectotype: ♀, USA: Colorado: Rocky Mountains: no specific locality (ANSP), designated by Cresson, 1916:99. Synonymized with *Philanthus barbatus* by R. Bohart in R. Bohart and Menke, 1976:564. – Packard, 1866:55 (in key to North American *Philanthus*), 58 (bibliographic reference, geographic distribution); Cresson, 1887:280 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1891:366 (in checklist of world *Philanthus*); Dalla Torre, 1897:482 (in catalog of world Hymenoptera); Bridwell, 1899:209 (Kansas: no specific locality); Viereck, 1903a:67 (New Mexico: Beulah); Viereck and Cockerell, 1904b:144 (in revision of *Philanthus* of New Mexico); Snow, 1906:9 (Arizona); nec H. Smith, 1908b:356 (= *Philanthus serrulatae*); J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae); Strandtmann, 1945b:153 (in review of North American *Philanthus*), 1946:69 (in revision of North

American *Philanthus*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera). – As *Anthophilus albifrons*: Ashmead, 1899d:297 (new combination, in checklist of North American Crabronidae). *Philanthus henricus* Dunning, 1898b:153, ♀ (authorship attributed to Dunning and Cockerell). Holotype: ♀, USA: USA: New Mexico Gila National Forest (USNM). Synonymized with *Philanthus barbatus* by Strandtmann, 1945b:153, and by R. Bohart in R. Bohart and Menke, 1976:564. – Cockerell, 1899a:141 (New Mexico).

## 12. *barbiger* Mickel

As *Philanthus albopilosus*: H. Smith, 1908:355, partly (Nebraska), corrected to *Philanthus barbiger* by Mickel, 1916a:405.

*Philanthus barbiger* Mickel, 1916a:405, ♂, ♀. Holotype: ♂, USA: Nebraska: Harrison (UNL). – Mickel, 1918b:386 (in catalog of Nebraskan Sphecidae); Muma, 1952:22 (holotype in UNL), 28 (paratypes in UNL); R. Bohart and Griswell, 1975:6, 8 (in key to North American *Philanthus*, as full species), 8 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae, as new status by R. Bohart); Krombein, 1979b:1721 (in catalog of North American Hymenoptera); O'Neill and Evans, 1982:792-800 (prey use); Evans and O'Neill, 1988:134 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:257, 259 (references to publications on nest parasites *Phrosinella pilifrons* Allen and *Senotainia trilineata* (Wulp), miltogrammine flies); Kaltenpoth et al., 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands) Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts). – As *Philanthus politus barbiger*: Strandtmann, 1945b:154 (new status, in review of North American *Philanthus*), 1946:85 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera).

## 13. *basalis* F. Smith

*Philanthus basalis* F. Smith, 1856:473, ♀. Holotype or syntypes: ♀, Sri Lanka: no specific locality (BMNH). – de Motschoulsky, 1863:23 (Sri Lanka, listed); F. Smith, 1871a:371 (in catalog of Oriental Aculeata); Cameron, 1890b:248 (listed); Kohl, 1891:363 (in checklist of world *Philanthus*); Bingham, 1896a:446 (references), 1897:296 (redescription); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); van der Vecht, 1966:424 (description of ♂); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Krombein, 1981:9 (nesting habits), 22 (in revision of Sri Lanka Philanthinae); Radović, 1985:66 (sting apparatus analyzed); Evans and O'Neill, 1988:197 (review of nesting habits); Dollfuss, 2017b:1247 (Laos: Khammouan Province: Ban Khoun Ngeum at 18°07'N 104°29'E).

## *spp. tsunekii* Tano

*Philanthus basalis clypeatus* Tsuneki, 1963c:26, ♂, junior primary homonym of *Philanthus clypeatus* Thunberg, 1815.

Holotype: ♂, Thailand: Chiangmai (Sasayama). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Krombein, 1981:23 (comparison with nominotypical subspecies).

*Philanthus basalis tsunekii* Tano, 2008:82, substitute name for *Philanthus basalis clypeatus* Tsuneki.

## 14. *basilaris* Cresson

*Philanthus basilaris* Cresson, 1880a:xxxii, ♀, ♂. Lectotype: ♀, USA: Colorado: no specific locality (ANSP), designated by Cresson, 1916:99. – Cresson, 1887:280 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1891:366 (in checklist of world *Philanthus*); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); Viereck and Cockerell, 1904b:143 (in revision of *Philanthus* of New Mexico); H. Smith, 1908b:358 (in revision of Nebraskan Sphecidae); Strandtmann, 1945b:153 (in review of North American *Philanthus*), 1946:48 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); R. Bohart and Griswell, 1975:19 (as new synonym of *Philanthus zebratus*); R. Bohart and Menke, 1976:567 (as new synonym of *Philanthus zebratus* by R. Bohart); Krombein, 1979:1726 (as synonym of *Philanthus zebratus*); O'Neill and Evans, 1981:553 (predation by females on conspecific males),

1982:792-800 (prey use); O'Neill, 1983a:295 (territoriality, body size, and spacing in males); O'Neill and Evans, 1983b:175 (body size and alternative mating tactics); G. Ferguson, 1984a:291 (revised status, in revision of *zebratus* species group); Schmidt, O'Neill, Fales, McDaniel, and Howard, 1985:895 (volatiles from male mandibular glands); McDaniel, Howard, O'Neill, and Schmidt, 1987:227 (chemistry of male mandibular gland secretions); Evans and O'Neill, 1988:45 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:259 (reference to publication on nest parasite *Senotainia trilineata* (Wulp), a miltogrammine fly, as *basalaris*); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands). – **As *Ococletes basilaris***: Stevens, 1917:421 (new combination, North Dakota); Mickel, 1918b:390 (in catalog of Nebraskan Sphecidae).

### 15. *basilewskyi* Leclercq

*Philanthus basilewskyi* Leclercq, 1955i:408, ♂. Holotype: ♂, Rwanda: Nyanza Territory: Ndiza (MRAC). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae)

### 16. *bicinctus* (Mickel)

*Ococletes bicinctus* Mickel, 1916a:407, ♀. Holotype: ♀, USA: Colorado: Fort Garland (UNL). – Mickel, 1918:326 (...); Muma, 1952:21 (holotype in UNL). – **As *Philanthus bicinctus***: Strandtmann, 1945b:152 (new combination, in review of North American *Philanthus*), 1946:35 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); Evans, 1964b:275 (description of larva); Armitage, 1965:89 (nesting habits); Krombein, 1967:413 (listed); Evans, 1970:494 (Wyoming: Jackson Hole, nesting habits); R. Bohart and Grissell, 1975:5, 7 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Gwynne, 1978:89 (male territoriality); Krombein, 1979b:1721 (in catalog of North American Hymenoptera, nest sites, list of prey); Gwynne and O'Neill, 1980:220-223 (male territoriality results in higher predation by Asilidae); Gwynne, 1980:213 (male territoriality), 1981:130 (nesting habits); O'Neill and Evans, 1982:792-800 (prey use); G. Ferguson, 1984a:293 (in revision of *zebratus* species group); O'Neil, 1885:2188 (egg and prey size; sexual dimorphism in size); Schmidt, O'Neill, Fales, McDaniel, and Howard, 1985:895 (volatiles from male mandibular glands); Steiner, 1986:112 (references to publications on nesting habits); McDaniel, Howard, O'Neill, and Schmidt, 1987:227 (chemistry of male mandibular gland secretions); Evans and O'Neill, 1988:32 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:256, 259 (references to publications on nest parasites *Metopia argyrocephala* (Meigen) and *Senotainia trilineata* (Wulp), miltogrammine flies); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Dukas, 2005:1401 (predation on bumblebees significantly reduces prey population); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts).

*Ococletes hirticulus* Mickel, 1918a:326, ♂. Holotype: ♂, USA: Colorado: Ute Creek (UNL). Synonymized with *Philanthus bicinctus* by Krombein, 1967:413. – Muma, 1952:21 (holotype in UNL), 27 (paratypes in UNL). – **As *Philanthus hirticulus***: Strandtmann, 1945b:152 (new combination, in review of North American *Philanthus*), 1946:40 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera).

### 17. *bilineatus* Gravenhorst

*Philanthus bilineatus* Gravenhorst, 1807:278, sex not indicated. Holotype or syntypes: origin unknown, probably Germany (destroyed?). – Dalla Torre, 1897:483 (in catalog of world Hymenoptera); W. Schulz, 1912b:50 (original description copied); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### 18. *bilunatus* Cresson

*Philanthus bilunatus* Cresson, 1865c:97, ♂. Lectotype: ♂, USA: Illinois: no specific locality (ANSP), designated by Cresson, 1916:99. – Packard, 1866:55 (in key to North American *Philanthus*), 56 (bibliographic reference, geo-

graphic distribution, individual variation); Provancher, 1883b:643 (in revision of Canadian Hymenoptera); Cresson, 1887:280 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1891:367 (in checklist of world *Philanthus*); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); Dunning, 1897:70 (size variation); Ashmead, 1899d:297 (in checklist of North American Crabronidae); Harrington, 1902:222 (Canada: Ontario: Ottawa); H. Smith, 1908b:357 (in revision of Nebraskan Sphecidae); J. Smith, 1910:678 (in new list of insects of New Jersey); Faull, 1913:384 (Canada: Toronto region); Rohwer, 1916b:673, 674 (in catalog of Hymenoptera of Connecticut); Mickel, 1918b:386 (in catalog of Nebraskan Sphecidae); Rohwer *in Viereck*, 1925:673, 674 (in key to Sphecidae of Connecticut; Vanterbury, Hartford, North Haven); J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae); A. Brown, 1934:265 (Canada: Ontario: Timagami); Krombein, 1936:98 (New York: Buffalo; floral records); Brimley, 1938:447 (North Carolina: Highlands, Linville); Strandtmann, 1945b:154 (in review of North American *Philanthus*), 1946:95 (in revision of North American *Philanthus*); Dreisbach, 1947:143, 144 (in key to *Philanthus* of Michigan), 144 (Michigan: locality records); Strickland, 1947:128 (Canada: Alberta, as *bilunatum*); Burks *in* Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); Evans, 1957b:83 (description of larva); Evans and Lin, 1959:126 (nesting habits); Kurczewski and Kurczewski, 1963:148 (Pennsylvania: Presque Isle State Park); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Krombein, 1979b:1721 (in catalog of North American Hymenoptera, nesting sites, list of prey); Finnamore, 1982:236 (in Sphecid Fauna of Southern Quebec); Radović, 1985:66 (sting apparatus analyzed); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey); Evans and O'Neill, 1988:175 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:257, 259, 260 (references to publications on nest parasites *Phrosinella* sp., *Senotainia trilineata* (Wulp), and *Senotainia* sp. miltogrammine flies); Kurczewski and Acciavatti, 1990:61 (New York: Cayuga County); Ahlstrom, 1995:112 (in checklist of insects of North Carolina); Kurczewski, 1998d:250 (pine barrens in upstate New York); Skevington et al., 2001:128 (Canada: Ontario: Lambton County); Buck, 2004:27 (in checklist of Crabronidae of Ontario, Canada); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Ratzlaff, 2016:28 (Canada: first record from British Columbia: Central Interior), 38 (British Columbia: locality records); Dollfuss, 2017b:1247 (locality records from Canada and USA). – **As *Anthophilus bilunatus***: J. Smith, 1900:520 (new combination, in list of insects of New Jersey); Viereck, 1903d:120 (Maryland: College Park).

*Philanthus scelestus* Cresson, 1880a:xxxiii, ♀. Lectotype: ♀, USA: Colorado: no specific locality (ANSP), designated by Cresson, 1916:101. Synonymized with *Philanthus pacificus* by Kohl, 1891:369 and with *Philanthus bilunatus* by Strandtmann, 1945b:155. – Cresson, 1887:281 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Dunning, 1898b:152 (Colorado, New Mexico); Cockerell, 1899a:141 (New Mexico); Viereck and Cockerell, 1904b:144 (in revision of *Philanthus* of New Mexico). – **As *Anthophilus scelestus***: Ashmead, 1899d:297 (new combination, in checklist of North American Crabronidae).

*Philanthus assimilis* Banks, 1915:404, ♂, junior primary homonym of *Philanthus assimilis* Banks, 1913b:422. Holotype or syntypes: ♂, USA: New York: Boston which is at 42°37'N48°44'W (MCZ). Synonymized with *Philanthus bilunatus* by Strandtmann, 1945b:155.

*Philanthus consimilis* Banks, 1923:21, junior primary homonym of *Philanthus consimilis* Kohl, 1891. Substitute name for *Philanthus assimilis* Banks, 1915:404. – J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae).

### 19. *bimacula* de Saussure

*Philanthus bimacula* de Saussure, 1891:261, ♀ (actually ♂). Holotype or syntypes: ♂, Madagascar: no specific locality (MHNG). – de Saussure, 1892:535 (Madagascar; redescription, as ♂); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); Arnold, 1945:16 (Madagascar); Leclercq, 1962b:209 (Madagascar); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae; as *bimaculus*), 565 (footnote: nomenclatorial history); Leclercq, 1990b:120 (Madagascar, as *bimaculus*); Pulawski, 2003b:799 (in checklist of Malagasy Sphecidae); Madl,

2014a:1004 (in catalog of Ampulicidae, Crabronidae, and Sphecidae of Madagascar, with synonymy and locality records).

*Philanthus immitis* de Saussure, 1892:537, ♀. Syntypes: ♀, Madagascar: Antananarivo (MHNG). Synonymized with *Philanthus bimacula* by W. Schulz, 1911b:173. – Dalla Torre, 1897:487 (in catalog of world Hymenoptera).

### 20. *boharti* G. Ferguson

As *Philanthus serrulatae*: R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 17 (in revision of *Philanthus* of California), corrected to *Philanthus boharti* by G. Ferguson, 1983a:56.

*Philanthus boharti* G. Ferguson, 1983a:56, ♀, ♂. Holotype: ♂, USA: California: San Diego County: Borrego Springs (CAS).

### 21. *bredoi* Arnold

*Philanthus bredoi* Arnold, 1946:77, ♀ (as *Bredoi*, incorrect original capitalization). Holotype: ♀, Tanzania: Mbisi Forest near Sumbuwango (SAM). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### 22. *brevicornis* Guichard

*Philanthus brevicornis* Guichard, 1994a:209, ♀, ♂. Holotype: ♀, Kuwait: near Iraq (BMNH).

### 23. *bucephalus* F. Smith

*Philanthus bucephalus* F. Smith, 1856:472, ♂. Holotype or syntypes: ♂, Gambia: no specific locality (BMNH). – Kohl, 1891:363 (in checklist of world *Philanthus*); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); Bingham, 1902:213 (South Africa); Arnold, 1925:172 (in revision of southern African *Philanthus*), 1930:11 (in checklist of Afrotropical Sphecidae), 1946:82 (variation); Leclercq, 1969:1052 (locality records from West and Central Africa); R. Bohart and Menke, 1976:139 (in checklist of world Sphecidae); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Dollfuss, 2017b:1247 (locality records from Central African Republic, South Africa, and Zimbabwe).

*Philanthus spilaspis* Cameron, 1910:145, ♀, actually B (Brauns, 1917:240). Holotype or syntypes: ♀, South Africa: Transvaal: Pretoria (TMP). Synonymized with *Philanthus bucephalus* by Arnold, 1925:172. – Brauns, 1917:240 (holotype is a B)

### *ssp. rotundicollis* Arnold

*Philanthus bucephalus* race *rotundicollis* Arnold, 1925:174, ♀. Holotype: ♀, Nigeria: Abak (SAM). – Arnold, 1930:11 (in checklist of Afrotropical Sphecidae). – As *Philanthus bucephalus rotundicollis*: R. Bohart and Menke, 1976:564 (new status, in checklist of world Sphecidae).

### 24. *camerunensis* Tullgren

*Philanthus camerunensis* Tullgren, 1904:444, ♀. Holotype: ♀, Cameroon: Itoki (Stockholm). – Arnold, 1925:175 (unknown to the author); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### 25. *capensis* Dahlbom

*Philanthus capensis* Dahlbom, 1845:495, ♀. Holotype or syntypes: ♀, South Africa: Cape Province: no specific locality (depository?). – Kohl, 1891:363 (in checklist of world *Philanthus*); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); Brauns, 1911a:90 (host of chrysidid *Hedychrum coelestinum* Spinola), W. Schulz, 1912:94 (type not in Lund); Arnold, 1925:146 (in revision of southern African *Philanthus*, South Africa: Cape Province: Algoa Bay, Mossel Bay), 1930:10 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Gess and Gess, 1994:100 (visiting flowers of *Aspalathus spinescens*); S. Gess, 1996:295, 296 (floral records); S. Gess and F. Gess, 2003:129 (South Africa: visiting flowers of *Prenia pallens* (Ait.) N.E. Br., Aizoaceae, *Pteronia divaricata* (Berg.) Less., Asteraceae, *Aspalathus spinescens* Thunb., Fabaceae, *Hermannia* sp., Malvaceae, and *Leucadendron* sp., Proteaceae), 2006:10 (South Africa: visiting flowers of *Leucadendron* sp., Pro-

teaceae), 21 (Namibia, visiting flowers of *Hermannia* sp., Malvaceae); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Dollfuss, 2017b:1247 (locality records from South Africa).

### **ssp. nordicus Leclercq**

*Philanthus capensis* subsp. *nordicus* Leclercq, 1962a:395, ♀, ♂. Holotype: ♂, Tanzania: Mount Meru: Olkokola (MRAC). – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### **26. coarctatus Spinola**

*Philanthus coarctatus* Spinola, 1839:486, ♀, ♂. Lectotype: ♂, Egypt: no specific locality (Torino), designated by de Beaumont, 1952e:49. – Spinola, 1843b:XXXVI (represented in Berlin Museum under the name *Philanthus concinnus*). – Radoszkowski, 1876b:136 (Egypt); Magretti, 1884a:250 (eastern Africa); Kohl, 1891:363 (in checklist of world *Philanthus*); Magretti, 1884b:594 (Sudan: Sawakin, Sogodas, Atbara; Ethiopia: Metemma); Radoszkowski, 1888a:325 (male genitalia), 1892:579 (reference to Radoszkowski, 1888a); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); Longstaff, 1911:125 (Sudan: Khartum); Storey, 1916:107 (Egypt: Maadi); Morice, 1921:822 (Iraq: Baquba); Maidl, 1924:242 (Sudan: El Obeid, Sennar); von Schulthess, 1927:299 (Sudan: Port Sudan); Mellor, 1928:129 (Egypt); Guiglia, 1939c:182 (Libya); Mochi, 1939a:100 (in revision of Egyptian *Philanthus*); Guiglia, 1940a:281 (Libya: Wadi Mimum), 1942b:230 (Libya: Fezzan: Tin Alcun); Guiglia, 1943c:75 (Ethiopia: Gamo Gofa: Sagan – Omo region, var.?): Giner Marí, 1945e:230 (Western Sahara), 1947:21 (Western Sahara); de Beaumont, 1949b:191 (in revision of northwestern African *Philanthus*); Guiglia, 1950:233 (Ethiopia: Gamo Gofa: Asile, var.?): Arnold, 1951:99 (Ethiopia: Ufдем); de Beaumont, 1953a:173 (Mauritania), 1956a:185 (Libya; Chad: Tibesti; diagnostic characters); Grandi, 1957:387 (Libya: Tripolitania: Wadi Kaam); de Beaumont, 1958b:58 (Algeria: Tassili des Ajjer); de Beaumont and Bytinski-Salz, 1959:148 (Israel; color variation); de Beaumont, 1960b:229 (Libya), 1961a:209 (references to recent publications), 1962c:222 (Arabia: El Riyadh); Pulawski, 1964:68 (Egypt: Aswan, Luxor; Sudan: Wadi Halfa); de Beaumont, 1965b:772 (Chad: Ennedi); Derwesh, 1965:71 (Iraq: no specific locality, as *coarctus*); de Beaumont, 1967a:279 (Turkey; variation); Pulawski, 1967c:388 (Sudan: Khor Musa Pasha south of Wadi Halfa, Nile second cataract); Osborn and Krombein, 1969:16 (northwestern Sudan: Gebel 'Uweinat: Wadi Ain el Brins); Krombein, 1974b:451: (Egypt: Gebel 'Uweinat); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Kazenas, 1978b:49 (in key to Sphecidae of Kazakhstan and Central Asia); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Guichard, 1980:230 (Oman); Pagliano, 1980:125 (Italy: Sicilia); Roche, 1981:5 (in checklist of Sphecidae of United Arab Emirates); Pagliano, 1987:159 (Italy, in key to Italian Philanthini), 1988 (in revision of Italian Philanthinae), 1990:94 (in catalog of Italian Sphecidae); Gayubo, 1991a:129 (characteristics of the species); Guichard, 1991a:338 (Jordan), 1994a:210 (Arabian Peninsula); Roche and Zalat, 1994:117 (Egypt: Sinai Peninsula); Gadallah, 1996:71 (in revision of Egyptian *Philanthus*); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:289 (in Sphecid Fauna of Western Europe); Gadallah and Assery, 2004a:219 (in key to Sphecidae of Jeddah Region, Saudi Arabia), 232 (in catalog of Sphecidae of Saudi Arabia: Jeddah area), 2004b:1398 (skeletal parts of sting apparatus); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Roche, 2007a:126 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Ebrahimi, 2008:95 (first record from Iran: Sistan-Baluchistan: Iranshahr); Ljubomirov and Yildirim, 2008:124 (in catalog of Crabronidae of Turkey); Sakenin, Samin, and Bagriacik, 2010:17 (Iran: Khuzestan: Andimeshk); Schmid-Egger, 2011b:569 (United Arab Emirates: many localities), 571 (color photographs of male and female); Gadallah, Al Dhafer, Aldryhim, Fadl, and Elgharbawy, 2013:359 (in new catalog of Sphecidae of Saudi Arabia); Ebrahimi, 2014:47 (Iran: Sistān-Baluchestān: Irānshahr: Bampur); Pagliano, 2014:103 (specimens in M. Spinola collection, Torino, are *Philanthus coarctatus coarctatus* and *Philanthus pulchellus* Pagliano, 2014:103 (specimens in M. Spinola collection, Torino, as *ventilabris*, are *Philanthus ventilabris*); Schmid-Egger, 2014:591 (United Arab Emirates); Yildirim, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); S. Gess and Roosenschoon, 2016:106 (Dubai Desert



Conservation Reserve, visiting flowers of *Calotropis procera* (Aiton) W.T. Aiton, Apocynaceae, and of *Rhanterium epapposum* Oilv., Asteraceae); Dollfuss, 2017b:1247 (locality records from Algeria, Egypt, Ethiopia, Iran, Israel, Italy, Jordan, Mali, Morocco, Oman, Saudi Arabia, Sudan, Syria, Tunisia, Turkey, United Arab Emirates, Uzbekistan, and Yemen); Gülmez and Can, 2017:82 (Turkey: Erzincan Province); Jahantigh, Rakhshani. Mokhtari, and Ramroodi, 2017:82 (Iran: known from Khuzestan and Sistan-o Baluchestan provinces).

*Philanthus concinnus* Spinola, 1843b:XXXVI, sex not indicated, origin unknown, specimen(s) in Berlin Museum, as junior synonym of *Philanthus coarctatus*. Not available: first proposed as a junior synonym (Article 11.6).

*Philanthus niloticus* F. Smith, 1873c:415, ♀. Holotype or syntypes: ♀, Sudan: White Nile: no specific locality (BMNH). Synonymized with *Philanthus coarctatus* by de Beaumont, 1949b:191. – Storey, 1916:107 (Egypt: Ezbet el Nakhk, Maadi); Mellor, 1928:129 (Egypt); Mochi, 1939:102, (in revision of Egyptian *Philanthus*, description of ♂); Giner Marí, 1945b:362 (Western Sahara: El Aiun, Zug), 1947:21 (Western Sahara).

### **ssp. raptor Lepeletier de Saint Fargeau**

*Philanthus raptor* Lepeletier de Saint Fargeau, 1845:38, ♀. Holotype or syntypes: ♀, Algeria: Oran (MNHN). – Lucas, 1849:259 (Algeria: Oran; original description copied with modifications); F. Smith, 1856:471 (in catalog of Hymenoptera in British Museum); nec Costa, 1867c:97 and 1869b:113 (= *Philanthus coarctatus siculus*); Sichel, 1861:752 (Italy: Sicilia, probably *Philanthus coarctatus siculus*); Dours, 1874:143 (in catalog of Hymenoptera of France: Cannes); Marquet, 1875:204 (France: Hérault: Cette, now Sète, may in reality be *Philanthus venustus*); Girard, 1879:928 (geographic distribution); Marquet, 1881:189 (southern France, may in reality be *Philanthus venustus*); Acloque, 1897:82 (in Sphecidae Fauna of France and Algeria); Cavro, 1910:685 (France: Département du Nord: Féchain, may in reality be *Philanthus venustus*); nec Berland, 1925:46 (= *Philanthus pulchellus*); nec Guiglia, 1944b:11 and Grandi, 1954:236 (= *Philanthus venustus*); de Beaumont, 1949b:193 (in revision of northwest African *Philanthus*), 1950f:396 (Algeria), 1953g:119 (Morocco); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Gayubo, 1985c:172 (Morocco: Kebdana). – **As *Philanthus coarctatus raptor***: Pagliano, 1988:134 (new status), 1990 (in catalog of Italian Sphecidae).

*Philanthus maroccanus* Shestakov in Nadig, 1933:95, ♂, ♀. Syntypes: ♀, ♂, Morocco: Agadir, Azemmour, Goundafa, Marrakech, Tanger (originally Nadig coll., now Zurich and ZIN). Synonymized with *Philanthus raptor* by de Beaumont, 1949b:19. – Rungs, 1936:24 (Morocco: Erfoud, as *maroccanus*); Giner Marí, 1945b:359 (eastern Morocco: Muley Ali).

As *Philanthus melliniformis* (corrected to *Philanthus raptor* by de Beaumont, 1949b:191): Morice, 1911:93 (Algeria: Bône, Forest of Yakouren); von Schulthess, 1926b:212 (Tunisia: Monastir, Libya: Agebadia); Guiglia, 1934b:297 (Libya: bibliography and summary of locality records); .

As *Philanthus andalusiacus*: Bischoff, 1933:5 (Morocco), corrected to *Philanthus raptor* by de Beaumont, 1949b:191 and 1961a:210.

### **ssp. siculus Giordani Soika**

As *Philanthus sieboldti*: A. Costa, 1860:5 (in revision of Sphecidae of Kingdom of Naples, Italy) and 1863:66 (Italy: Calabria Ulteriore: littoral of Brancaleone, valle di Bruzzano, Reggio), corrected to *Philanthus raptor siculus* by de Beaumont, 1951c:311; De-Stefani, 1895:227 (in catalog of Sicilian Hymenoptera), present correction based on geographic distribution.

As *Philanthus raptor*: A. Costa, 1867c:97 and 1869b:113 (in revision of Italian Sphecidae), corrected to *Philanthus siculus* by de Beaumont, 1953c:311.

*Philanthus siculus* Giordani Soika, 1944:10, ♂. Syntypes: ♂, Italy: Sicilia: Messina and Falcone (Venezia). – Grandi, 1954:236 (Italy: Sicilia). – **As *Philanthus raptor siculus***: de Beaumont, 1951c:311 (new status; in revision of European *Philanthus*); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Pagliano, 1987:160 (Italy, in key to Italian Philanthini), 1988:136 (revision, Italy: Sicilia and Calabria); Schembri, 1991:178 (first record from Malta). – **As *Philanthus coarctatus siculus***: Pagliano, 1988:134 (new subspecific combination), 1990:95 (in cata-

log of Italian Sphecidae); Gayubo, Borsato, and Osella, 1991:418 (Italy: Sicilia: Gela); Negrisola *in* Minelli, Ruffo, and La Posta, 1995b:8 (in catalog of Italian fauna); Schmid-Egger, 2003:756 (Italy: Sicilia: Armerina, Ragusa, Vendicari); Pagliano and Negrisola, 2005:302 (in Sphecid Fauna of Italy); Bitsch, 2010:117 (in supplement to vol. II of Faune de France, 1997: recent records from southern Italy and Malta reported, may be a good species); Schmid-Egger, Dandria, and Xuereb, 2016:81 (in checklist of Crabronidae of Maltese Islands).

### 27. *coronatus* (Thunberg)

*Sphex coronatus* Thunberg, 1784:25, sex not indicated (as *coronata*, incorrect original termination). Holotype or syntypes: France: Parisiis, now Paris (depository?). – Gmelin, 1790:2733 (redescription); Turton, 1801:495 (redescription); Dalla Torre, 1897:419 (in catalog of world Hymenoptera); W. Schulz, 1912:68 (type material missing in Thunberg collection). – **As *Philanthus coronatus***: Thunberg, 1815a:128 (new combination, diagnostic characters), 134 (redescription), 1815b:288 (diagnostic characters); Strohm, 1933:336 (Germany: Baden: Württemberg: Kaiserstuhl); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Radović and Krunić, 1979:unpaginated foldout (nesting in sand, foreleg structure); Schmidt, 1979b:297 (Germany: Baden-Württemberg); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Pagliano, 1980:125 (Italy: Veneto); Heath and Leclercq, 1981: map 16 (distribution in Europe); Gayubo, 1982b:49 (Spain: Salamanca: Cantagallo, as *coronatus coronatus*); Dollfuss, 1983b:24 (in catalog of Sphecidae of Austria: Burgenland: Podersdorf); Józán, 1985b:62 (Hungary S Lake Balaton), 82 (floral records), 85 (ecological and zoogeographic characteristics); Paik, 1985:203 (in list of Sphecidae of Korea); Radović, 1985:66 (sting apparatus analyzed); Westrich and Schmidt, 1985b:111 (Germany: endangered in Baden-Württemberg); Józán, 1986:374 (Hungary: Kiskunság National Park); Pagliano, 1987:159 (Italy, in key to Italian Philanthini); Schmidt and Westrich, 1987:358 (Germany: Mainz area); Tormos and Jiménez, 1987a:127 (Spain: Valencia), 1987b:317 (Spain: Valencia Province: Dehesa de El Saler); Józán, 1989:102 (Hungary: Tihany Natural Reserve); Pagliano, 1988 (in revision of Italian Philanthinae), 1990:94 (in catalog of Italian Sphecidae); Dollfuss, 1991:211 (in key to Sphecidae of North and Central Europe); Gayubo, Borsato, and Osella, 1991:418 (Italy, as *coronatus coronatus*); Day, 1991:xviii (summary of European Endangered Hymenoptera Lists); Józán, 1992c:290 (Hungary: Zselic Hills); Blagoveshchenskaya, 1994:91 (Russia: Ul'yanovsk Oblast'); Negrisola *in* Minelli, Ruffo, and La Posta, 1995b:8 (in catalog of Italian fauna); Scharrer, 1995:31 (Germany: Bayern: Lohr); Schmid-Egger, Risch, and Niehuis, 1995:205 (summary of records from Germany: Rheinland-Pfalz Province); Schmid-Egger, 1996a:19 (Germany: Kaiserstuhl and Tuniberg near Waltershofen); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: endangered); Voblenko, Gorobchishin, and Nesterov, 1996:15 (Ukraine); Voblenko, Gorobchishin, and Nesterov, 1996:15 (Ukraine); Wu and Zhou, 1996a:160 (in revision in Economic Insect Fauna of China); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:290 (in Sphecid Fauna of Western Europe); Schmidt and Schmid-Egger, 1997:25 (in checklist of German Sphecidae); Dollfuss, Gusenleitner, and Bregant, 1998:525 (Austria: summary of collecting records from Burgenland); Pagliano and Scaramozzino, 1999:158 (Italy: Piemonte: Borgomale); Blösch, 2000:404 (in Sphecid Fauna of Germany); Gayubo, González, and Torres, 2000:187 (Spain: Salamanca Province); Ljubomirov, 2000:6, 13 (Bulgaria, specimens in N. Nedelkov collection); Esenbekova and Kazenas, 2000:70 (southeast Kazakhstan: near Alma Ata, 25 km W Alma Ata, near Chilik, 10 km NW Chundzha, Zhabagly, 6 km west of Zhabagly); Józán, 2001:281 (Hungary: Somogy County); Kazenas, 2001b:51 (in checklist of Sphecidae of Kazakhstan and Central Asia), 244 (review of known biology); Ohl et al., 2001:141 (distribution in Germany by provinces); Józán, 2002:54 (Hungary: Mecsek Mountains); Kazenas, 2002a:134 (geographic distribution, collecting localities in Kazakhstan); Józán, 2003:228 (Hungary: Látányi Puszta Nature Conservation Area); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (in catalog of wasps and bees of Bayern, Germany); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:195 (Germany: Bayern: no longer endangered); Kazenas, 2004b:111 (Kazakhstan: western Tien Shan), 2004d:35 (Kazakhstan: Émba, Khar'kino); Shkuratov, 2004a:73 (Russia: Lugansk and Rostov Oblast's), 2004b:165 (Russia: Rostov Oblast': Gosudarstvennyi

- Muzey-Zapovednik M.A. Sholokhova); Pagliano and Negrisola, 2005:304 (in Sphecidae Fauna of Italy); Shorenko, 2005a:168 (Ukraine: Crimea); Gorobchishin, 2006:143 (Ukraine: Kyiv); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Ljubomirov, 2006:542 (Bulgaria: Rhodope Mountains: previous records summarized); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Jacobs, 2007:181 (in key to Crabronidae of Germany); Józán, 2007:180 (Hungary: Zselic hills); Kazenas, 2007a:93 (Kazakhstan: Akmal Oblast': Kurgandzhin Nature Reserve and vicinity); Vepřek and Straka, 2007:209 (in catalog of Sphecidae of Czech Republic and Slovakia, known from Moravia and Slovakia only); Yildirim and Ljubomirov, 2007:119 (Turkey: Erzurum: University campus and Oltu: Sütkans); Danilov, 2008:352 (Russia: Altayskiy Kray: Barnaul area); Danilov and Tshernyshev, 2008:44 (Russia: Novosibirsk Oblast': Karasuk area); Gayubo, González, Tormos, and Asís, 2008:140 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Kazenas, 2008b:114 (Kazakhstan: foothills of Zailiskiy Alatau: sometimes found on loess cliffs), 2008c:255 (Kazakhstan: village Koktum S Lake Alakol'); Ljubomirov and Yildirim, 2008:124 (in catalog of Crabronidae of Turkey); Zettel, Wiesbauer, and Zimmermann, 2008:137 (Austria: Burgenland: Podersdorf; first record from Niederösterreich: Hundsheimer Berg); Baños-Picón, Asís, Gayubo, and Tormos, 2009:314 (Spain: frequency of specimens collected with hand nets and Malaise traps); U. Frommer, 2009a:29 (Germany: in checklist of Sphecidae of Hessen); Shorenko, 2009:369 (in list of Sphecidae s.l. of Crimea); Bitsch, 2010:117 (in supplement to vol. II of Faune de France, 1997: recent records from Spain reported; France: first records from Isère: Arandon; Loir-et-Cher: Muides-sur-Loir, Suèvres; Loiret: Beaugency); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: very rare); Shorenko and Kononov, 2010:30 (Ukraine: several localities); Tüzün and Yüksel, 2010:4474 (Turkey: Niğde Province); Baghirov, 2011b:155 (Russia: Altayskiy Kray: Savvushka); Józán, 2011:184 (in checklist of Sphecidae s.l. of Hungary); Tischendorf, Frommer, Flügel et al., 2011:46 (Germany: extinct in Hessen, last collected in 1968); Wiesbauer and Zettel, 2011:269 (Austria: Niederösterreich: March = Morava lowland); Boillat, 2012:228 (Switzerland: in checklist of insects of Canton de Genève); Prisiy, 2012:51 (Russia: Belgorod Oblast'); Schmid-Egger and Krumm, 2012:39 (Germany: Baden-Württemberg: active population in Kaiserstuhl; prey: *Andrena*, *Colletes*, *Dasypoda*, *Lasioglossum*); Akulov and Proshchalykin, 2013:118 (Russia: Siberia: Krasnoyarsk Kray: Minusinsk, 45 km northeast of Minusinsk, and village Znamenka); Kazenas, 2013a:129-132 (color photographs of adult wasps, short information on geographic distribution and nesting habits), 2013b:499 (southeast Kazakhstan: 10 km NW Chundzha on Sharyn River); Bitsch, 2014:410 (reference to Schmid-Egger and Krumm, 2012); Kazenas, 2014a:138 (Kazakhstan: Karatau Mountain Range); Nemkov, 2014c:287 (recorded from Asiatic Russia by several authors; 45 km NE Minusinsk); J.-K. Kim, 2014:450 (in catalog of Sphecidae s.l. of Korean Peninsula); Pagliano, 2014:102 (specimens in M. Spinola collection, Torino, are *Philanthus coronus*, *Philanthus venustus*, *Philanthus coarctatus siculus* and *coarctatus raptor*); Protsenko, Fateryga, and Ivanov, 2014:39 (Crimea: Tavricheskoye in Krasnoperekop District, Tarkhankut Promontory); Yıldırım, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces, as *coronatus coronatus*); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); P. Rosa and Pagliano, 2015:104 (Italy: Lombardia and Piemonte: Parco del Ticino); Mokrousov and Popov, 2016:593 (Russia: Krasnodarskiy Kray); Danilov and Mokrousov, 2017b:255 (in catalog of Philanthinae of Russia); Dollfuss, 2017b:1249 (locality records from Bulgaria, China, France, Germany, Hungary, Italy, Kazakhstan, Kyrgyzstan, Mongolia, Portugal, Romania, Russia, Slovakia, Spain, and Syria); Shorenko, 2017:81 (in Crimea collected in June and July), 2018:131 (Crimea, including localities, habitats, and number of specimens).
- Philanthus coronatus* Fabricius, 1790:224, sex not indicated, junior secondary homonym of *Philanthus coronatus* (Thunberg, 1784). Lectotype: ♂, Italy (ZMUC), designated by van der Vecht, 1961a:61. Synonymized with *Philanthus coronatus* (Thunberg) by ... – Fabricius, 1793:288 (redescription), 1796:137 (in Index to his Entomologia Systematica, 1793), 1804:301 (redescription); Panzer, 1801, Heft 84:23 (in revision of German insects, illustration of habitus); Latreille, [1805]:314 (redescription); Panzer, 1806:173 (in critical review of his previous work); Thunberg, 1815a:128 (diagnostic characters), 134 (description, reference to Fabricius, 1793); Vander Linden, 1829:123 (bibliographic references, Italy: Bologna, southern Europe); Klug in Waltl, 1835:88 (in list of Hymenoptera of An-

dalusia); Dufour, 1841a:509 and 1841b:245 (digestive tract), 1841a:511 and 1841b:247 (male reproductive system), 1841a:512 and 1841b:248 (female reproductive system); Dahlbom, 1844:189 (in revision of Sphecidae and Pompilidae), 1845:XXIII (type material examined), 495 (in key to world *Philanthus*); Lepeletier de Saint Fargeau, 1845:36 (in revision of world Hymenoptera); Eversmann, 1849:398 (Russia: Orenburg Province and lower Volga area); F. Smith, 1856:468 (in catalog of Hymenoptera in British Museum); Schenck, 1857:153 (in revision of fossorial wasps of Germany); Taschenberg, 1858:83 (in key to Sphecidae of Germany); A. Costa, 1864c:124 (Italy: Campania: Benevento area); Taschenberg, 1866:192 (in revision of Hymenoptera of Germany); A. Costa, 1867c:96 (in revision of Italian Sphecidae); Kirchner, 1867:220 (in catalog of European Hymenoptera); Jaennicke, 1868:9 (Germany: Hessen: Büdingen); A. Costa, 1869b:112 (in revision of Italian Sphecidae), 1872a:31 (in revision of Sphecidae of Kingdom of Naples, Italy); P. Ivanov, 1872:152 (Ukraine: Khar'kiv Oblast': Kupyansk area); Dours, 1874:143 (in catalog of Hymenoptera of France); Martinez y Saez, 1874:31 (specimens from Spain: Madrid area, donated to Leon Dufour); Marquet, 1875:204 (France: Languedoc); Girard, 1879:928 (geographic distribution, on flowers of *Eryngium campestre*); Becker, 1880:153 (Russia: Sarepta, now Krasnoarmeysk S Volgograd); Kohl, 1880:168 (Italy: Trentino–Alto Adige); Magretti, 1881:120 (Italy: Lombardia: Comasco), 271 (in list of species discussed in this paper); Marquet, 1881:189 (southern France); Yaroshevskiy, 1881:124 (Ukraine: Khar'kiv Oblast': Khar'kiv, Kupyansk); Sajó, 1882:5 (Hungary); A. Costa, 1883:57 (Italy: Sardegna: valle del Galagone near Oliena); Kohl, 1883e:665 (Switzerland); von Heyden, 1884:119 (Germany: Mombach); Kohl, 1888b:727 (Austria: Tirol, now Italy: Alto Adige); Radoszkowski, 1888a:323 (male genitalia); F. Morawitz, 1889a:151 (China or Mongolia); Kohl, 1891:363 (in checklist of world *Philanthus*); Radoszkowski, 1892:579 (reference to Radoszkowski, 1888a); Sickmann, 1894:201 (China: Hopei Province: Tientsin); De Stefani Perez, 1895:227 (in catalog of Sicilian Hymenoptera); Acloque, 1897:82 (in Sphecid Fauna of France and Algeria); Dalla Torre, 1897:484 (in catalog of world Hymenoptera); Mocsáry, 1897:80 (Kingdom of Hungary, some localities are in today's Croatia); Flamary, 1898:38 (France: Saône-et-Loire: Mâcon area); Chyzer, 1902:33 (Hungary); de Cobelli, 1903:109 (Italy: Province of Trentino); Antiga and Bofill, 1904:22 (Spain: Cataluña Province); Váγγελ, 1905:167 (Hungary); Móczár and Henter, 1907:205 (Romania: Caraș-Severin: Mehadia); Schmiedeknecht, 1907:237 (in key to Hymenoptera of Central Europe); de Gaulle, 1908:120 (in catalog of French Hymenoptera); Graeffe, 1911:47 (Italy: Trieste area); Szilády, 1913:89 (Hungary: Holdvilág); Zavattari, 1913b:3 (Greece: Island of Rhodes); Honoré, 1919:268 (France: Seine-et-Oise: Bouray, La Ferté-Alais, Lardy, Saclas); Leininger, 1921:128 (Germany: Baden-Württemberg: Jöhlingen near Durlach); Enslin, 1922c:247 (Germany: Bayern: Lohr; prey: *Andrena gwynana*); Lauterborn, 1922:244 (Germany: Baden-Württemberg: Kaiserstuhl); Berland, 1925d:46 (in Sphecid Fauna of France); Coulon, 1925:117 (France: Toulouse; Spain); Strohm, 1925:211 (Germany: Baden-Württemberg: Isteiner Klotz, Kaiserstuhl); Kuznetzov-Ugamskij, 1927:249 (Kazakhstan: Aulie-Ata, now Djambul, and Khumsan); A. Müller, 1930:181 (common in former Dobrogea and Bessarabia); Schmiedeknecht, 1930:698 (in keys to Hymenoptera of North and Central Europe); Bernard, 1933:61 (France: Drôme: Dieulefit); Giner Marí, 1934:131 (Spain); Grandi, 1934:129 (Italy: Emilia-Romagna: Casalecchio di Reno); Zavadil, 1934:188 (Slovakia); Gussakovskij, 1934a:13 (China: Kansu Province); Bernard, 1935:62 (France: Var: Fréjus area); Vergne, 1935:117 (France: Auvergne: Lezoux, Pont-du-Chateau); Heldmann, 1936:103 (Germany: Hessen: Bergstrasse); Zavadil, Šusterka, and Bat'a, 1937:206 (in catalog of Sphecidae of Czechoslovakia); Móczár, 1939:5 (Hungary: Jászberény); Balthasar, 1941a:105 (Czech Republic: Bzenecko area); Yasumatsu, 1942c:107 (China: Beijing; Nei Mongol: Apaka at 44°N 114.96°E); Giner Marí, 1943a:111 (in Sphecid Fauna of Spain); Tsuneki, 1943a:15 (nesting habits); Guiglia, 1944b:10 (Italy); Deleurance, 1946b:67 (France: Bouche-du-Rhône: Camargue: Bois des Rièges); Dulac, 1947:53 (France: Saône-et-Loire Department: Creusot area); Balthasar, 1948:143 (Slovakia: Parkan); Zavadil *in* Zavadil and Šnoflak, 1948:165 (in key to Sphecidae of Czechoslovakia); de Andrade, 1949:12 (Portugal: Jugueiros, Valença do Minho); Scobiola, 1950:19 (Romania); de Beaumont, 1951c:303 (in revision of European *Philanthus*); Leclercq, 1951b:67 (yellow body pigments are pterines); Caruel, 1952b:101 (France: Marne Department); Cleu, 1953:50 (France: Ardèche River basin); Bischoff and Stadler, 1954:127 (Germany: Bayern: Romberg); Hertzog, 1954:100 (France: Bouches-du-

Rhône: Camargue); Vergne, 1955:4 (France: Auvergne); Vogrin, 1955:32 (Yugoslavia); Ceballos, 1956:365 (in catalog of Hymenoptera of Spain); Morel, Nouvel, and Ribaut, 1956:337 (France: Département des Pyrénées-Orientales); Bajári, 1957a:28 (in key to Hungarian Sphecidae); Bradley, 1957:49 (Lepeletier's specimens in Turin); Balthasar, 1958:337 (Slovakia: Čenkov, Štúrovo); Puławski, 1958a:165 (Bulgaria: Aitos, Kurilo, Sandanski, Varna); de Beaumont, 1959a:12 (Italy); Diniz, 1959:27 (Portugal: Jugueiros, Valença do Minho); Wolf, 1959b:31 (known from Germany, but not from Nassau); Noskiewicz and Puławski, 1960:73 (in key to Polish Sphecidae, not yet found in Poland); de Beaumont, 1961a:203 (Algeria; geographic variation); van der Vecht, 1961a:61 (study of type material); Lehrer and Scutaru, 1963:287 (Romania: Moldova: Mircești in Iași District); de Beaumont, 1964c:34 (in Sphecid Fauna of Switzerland, not recorded from Switzerland), 1965a:18 (Greece); Bonelli, 1966c:217 (Italy: Trentino–Alto Adige: Montagna); Gauss, 1966a:66 (Germany: Baden: Kaiserstuhl); de Beaumont, 1967a:278 (Turkey; variation); Gauss, 1967:551 (Germany: Baden-Württemberg); J. Heinrich, 1967:70 (Germany: Bayern: Gambach and Lohr areas); Scobiola-Palade, 1967a:161 (Romania: Constanța District: Băneasa, Iortmac), 1967b:39 (Romania); Benedek, 1968:71 (Hungary, visiting flowers of *Eryngium campestre* L.); Scobiola-Palade, 1968c:382 (Romania: Budești, Frătești); Romanova, 1969:133 (Russia: North Caucasus); Schmidt, 1969:161 (Germany: Rhein-Main area); Kazenas, 1970b:366 (Kazakhstan), 1971:161 (in Kazakhstan found only in southeastern mountains); Schmidt, 1971b:24 (Germany: Rheinland-Pfalz: was found in Mombacher Sand, see Heldmann, 1936); Tsuneki, 1971m:15 (China: Peking); Atanassov, 1972a:191 (Bulgaria: Stara Planina Mountains), 1972b:32, 48 (Bulgaria: Stara Planina Mountains); Balthasar, 1972:382 (in Sphecid Fauna of Czechoslovakia); Kazenas, 1972b:124 (Kazakhstan); Simon-Thomas, 1972:177 (France: Lot-et-Garonne); Erlandsson, 1974:60 (Spain); Kazenas, 1974b:109 (feeding on flowers of *Tamarix* sp. in Kazakhstan), 111 (feeding on flowers of *Saussurea* sp., Asteraceae, in Kazakhstan); Simon Thomas, 1976:4 (France: Lot-et-Garonne: Forêt de Campet); Kazenas, 1978b:48 (in key to Sphecidae of Kazakhstan and Central Asia); Marion, 1978:86 (France: Nièvre Department); Benedek, 1979:227 (Hungary: Bakony Hills: Felső-hegy); Preuss, 1980a:23 (Germany; endangered, nesting in dry soils); Hilchie, 1982:110 (accessory burrows reviewed); Tsuneki, 1982b:18 (known from Korea); Islamov, 1986:518; Evans and O'Neill, 1988:196 (review of nesting habits); Pagliano, 1988:137 (Italy, revision); Pádr in Šedivý, 1989a:166 (in checklist of Czechoslovakian Sphecidae); Gayubo, 1991a:128 (characteristics of the species); Minoranskiy and Shkuratov, 1996:81 (Russia: Rostov Oblast'); Shkuratov, 2000:55 (Russia: Rostov Oblast': Vëshenskaya village area at 49°37'N 41°45'E); Kazenas and Esenbekova, 2001:136 (Kazakhstan: Almatinskiy Nature Reserve); Shkuratov, 2002b:139 (Russia: Rostov Oblast': Rostovskiy Nature Reserve at 46°27'N 42°41'E); Rudoiskatel', 2010:148 (Russia: southern Ural Mountains). – **As *Simblephilus coronatus***: Jurine, 1807:188 (new combination, listed).

### **ssp. *ibericus* de Beaumont**

*Philanthus coronatus occidentalis* de Beaumont, 1951c:305, ♀, ♂. Holotype: ♀, Spain: Madrid (MNHN). Junior primary homonym of *Philanthus occidentalis* Strandtmann, 1946. – de Beaumont, 1962b:20 (Spain); Ceballos, 1964:88 (in supplement to catalog of Spanish Sphecidae); Diniz, 1966:6 (Portugal: Coimbra, Lousã, Rezende, Valença do Minho).

*Philanthus coronatus ibericus* de Beaumont, 1970b:38. Substitute name for *Philanthus occidentalis* de Beaumont, 1951. – R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Gayubo, 1982b:49 (Spain: Ávila, Cáceres, and Salamanca provinces), 1983e:236 (Spain: Salamanca Province); Gayubo and Tormos, 1984:23 (Spain: Valencia); Gayubo, 1985c:172 (Spain: Valladolid: Alcazarén), 1986d:121 (Spain: Zamora Province); Gayubo and Sanza, 1986:83 (Spain: Burgos); Gayubo, Asís, and Tormos, 1990b:79 (Spain: Cáceres, Segovia, and Zamora Provinces); Gayubo and Torres, 1991:Table I (Spain: Salamanca; effects of urban pressure); Gonzáles, Gayubo, and Torres, 1998:74, 75 (Spain: Valladolid Province); Gayubo, González, Tormos, and Asís, 2009:365 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); González, Gayubo, Asís, and Tormos, 2009:625 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park).

**ssp. *orientalis* Bytinski-Salz**

*Philanthus coronatus orientalis* Bytinski-Salz in de Beaumont and Bytinski-Salz, 1959:142, ♂. Holotype: ♂, Israel: Jerusalem (RMNH). – de Beaumont, 1969:82 (Turkey); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Ljubomirov and Yildirim, 2008:125 (in catalog of Crabronidae of Turkey); Yıldırım, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces).

**28. *crabroniformis* F. Smith**

*Philanthus crabroniformis* F. Smith, 1856:474, ♂. Holotype or syntypes: ♂, USA: California: no specific locality (BMNH). – Cresson, 1862:236 (in catalog of North American Hymenoptera), 1865c:104 (original description copied); Packard, 1866:58 (bibliographic reference, geographic distribution); Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:367 (in checklist of world *Philanthus*); Dalla Torre, 1897:484 (in catalog of world Hymenoptera); Viereck, 1903b:733 (California, New Mexico); Viereck and Cockerell, 1904b:143 (= *Philanthus multimaculatus*); Johnson and Ledig, 1918:24 (California: Claremont); Mickel, 1918b:388 (in catalog of Nebraskan Sphecidae); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); Evans, 1970:498 (Wyoming: Jackson Hole, nesting habits, list of prey); Horning and Barr, 1970:105 (USA: Idaho: Craters of the Moon National Monument); Alcock, 1954a:333 (USA: Washington: Seattle), 1974b:233 (nesting habits); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 8 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Evans, 1977d:26 (male behavior); Krombein, 1979b:1722 (in catalog of North American Hymenoptera, nesting sites, list of parasites and prey); O'Neill and Evans, 1982:798 (major prey: family and genus); Radović, 1985:66 (sting apparatus analyzed); Steiner, 1986:112 (references to publications on nesting habits); Evans and O'Neill, 1988:90 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:256, 257, 259 (references to publications on nest parasites *Metopia argyrocephala* (Meigen), *Phrosinella fulvicornis* (Coquillett), *Phrosinella fumosa* Allen and *Senotainia trilineata* (Wulp), miltogrammine flies); McDaniel, Schmidt, and Howard, 1992:27 (mandibular gland secretion); Evans, 1993:28 (male aggregations); Kaltenpoth et al., 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Ratzlaff, 2016:28 (Canada: British Columbia: from Krombein, 1979); Dollfuss, 2017b:1250 (locality records from USA).

*Philanthus flavifrons* Cresson, 1865c:102, ♀. Lectotype: ♀, USA: Colorado: Rocky Mountains: no specific locality (ANSP), designated by Cresson, 1916:100. Synonymized with *Philanthus crabroniformis* by R. Bohart in R. Bohart and Menke, 1976:564. – Packard, 1866:55 (in key to North American *Philanthus*), 58 (bibliographic reference, geographic distribution); Cresson, 1887:281 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1891:367 (in checklist of world *Philanthus*); Dalla Torre, 1897:486 (in catalog of world Hymenoptera); H. Smith, 1908b:357 (in revision of Nebraskan Sphecidae); Stevens, 1917:421 (North Dakota); Mickel, 1918b:388 (in catalog of Nebraskan Sphecidae); Strandtmann, 1945b:153 (in review of North American *Philanthus*), 1946:58 (in revision of North American *Philanthus*); Strickland, 1947:128 (Canada: Alberta: Lethbridge, Medicine Hat); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); G. Bohart, 1954:26 (preying on honey bee); Krombein, 1958f:197 (in supplement to catalog of North American Hymenoptera: preying on *Apis mellifera* Linnaeus); Evans, 1963c:113 (preying on honey bee reported); Stainer, 1959:66 (Canada: British Columbia: French Creek, Nanaimo); G. Bohart, Nye, and Hawthorn, 1970:48 (Utah: Logan, onion pollinator); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey); Steiner, 1986:112 (references to publications on nesting habits). – **As *Anthophilus flavifrons***: Ashmead, 1899d:297 (new combination, in checklist of North American Crabronidae).

*Philanthus californicus* Cresson, 1880a:xxxii, B. Lectotype: B, USA: Colorado: no specific locality (ANSP), designated by Cresson, 1916:99 (Article 74.6). Synonymized with *Philanthus californicus* by Strandtmann, 1945b:153, and with *Philanthus crabroniformis* by R. Bohart in R. Bohart and Menke, 1976:564. – Cresson, 1887:281 (in catalog

of North American Hymenoptera); Kohl, 1891:367 (in checklist of world *Philanthus*); Dalla Torre, 1897:483 (in catalog of world Hymenoptera).

*Philanthus sublimis* Cresson, 1880a:xxxii, B. Lectotype, B, USA: Colorado: no specific locality (ANSP), designated by Cresson, 1916:101. Synonymized with *Philanthus californicus* by Strandtmann, 1945b:153, and with *Philanthus crabroniformis* by R. Bohart in R. Bohart and Menke, 1976:564. – Cresson, 1887:281 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1891:369 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Dunning, 1898b:152 (Island of Vancouver). – **As *Anthophilus sublimis***: Ashmead, 1899d:297 (new combination, in checklist of North American Crabronidae).

*Liris magnificus* Provancher, 1895:130, ♂ (as *magnifica*, incorrect original termination), junior primary homonym of *Liris magnificus* Kohl, 1883. Lectotype: ♂, USA: California: Los Angeles (Laval Univ.), designated by Gahan and Rohwer, 1918:29. Synonymized with *Philanthus crabroniformis* by Krombein, 1958f:197, and also by R. Bohart in R. Bohart and Menke, 1976:564 (as new synonym).

### 29. *crotoniphilus* Viereck and Cockerell

*Philanthus crotoniphilus* Viereck and Cockerell, 1904b:145, B. Holotype: B, USA: New Mexico: Las Cruces (ANSP). – Cresson, 1928:49 (holotype in ANSP); Strandtmann, 1945b:153 (in review of North American *Philanthus*), 1946:62 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 9 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Krombein, 1979b:1722 (in catalog of North American Hymenoptera); Rust, Hanks, and Bechtel, 1983:406 (Nevada: Churchill County: Sand Mountain); Evans and O'Neill, 1988:114 (prey: *Apis mellifera*); Amarante, 2002:63 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands).

### 30. *curvimaculatus* (Cameron)

*Trachypus curvimaculatus* Cameron, 1910a:166, ♀. Holotype or syntypes: ♀, “Erythrina, Red Sea”, probably Eritrea (BMNH or OXUM). – **As *Philanthus curvimaculatus***: R. Bohart and Menke, 1976:564 (new combination, in checklist of world Sphecidae)

### 31. *decemmaculatus* Eversmann

*Philanthus decemmaculatus* Eversmann, 1849:399, sex not indicated. Holotype or syntypes: Russia: southern Ural Mountains: no specific locality (ZIN). – Dalla Torre, 1897:484 (in catalog of world Hymenoptera); W. Schulz, 1904b:94 (Russia: Siberia: Tomsk); Bytinski-Salz, 1956:224 (Turkey: Dinar, determination tentative); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Pulawski, 1978:187 (in key to Sphecidae of European part of former USSR); Esenbekova and Kazenas, 2000:70 (southeast Kazakhstan; no specific locality); Kazenas, 2001b:51 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:134 (geographic distribution, collecting localities in Kazakhstan), 2007a:93 (Kazakhstan: Akmala Oblast': Kurgandzhin Nature Reserve and vicinity); Ljubomirov and Yildirim, 2008:125 (in catalog of Crabronidae of Turkey); Nemkov, 2008b:25 (in catalog of Crabronidae of Asiatic Russia), 2009b:143 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Rudoiskatel', 2010:148 (Russia: southern Ural Mountains); Kazenas, 2012b:170 (Kazakhstan: Korgalzhin State Nature Reserve); Prisniy, 2012:51 (Russia: Belgorod Oblast'); Yildirim, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Danilov and Mokrousov, 2017b:255 (in catalog of Philanthinae of Russia); Shorenko, 2018:131 (Crimea, including localities, habitats, and number of specimens).

*Philanthus angustifrons* Kohl, 1891:355, ♂. Holotype or syntypes: ♂, Armenia: Arax River Valley (NHMW). Synonymized with *Philanthus decemmaculatus* by Pulawski, 1978:187. – Kohl, 1891:363 (in checklist of world *Philan-*

*thus*); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Dollfuss, 1989:11 (type material in NHMW); Kazenas, 2001b:51 (tentatively in checklist of Sphecidae of Kazakhstan and Central Asia).

### 32. *dentatus* Cameron

*Philanthus dentatus* Cameron, 1902d:65, ♀. Holotype or syntypes: ♀, India: Assam: Khasia Hills (OXUM). – Ramakrishna Aiyar, 1916:557 (in catalog of Indian aculeates described after Bingham, 1897); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae).

### 33. *depredator* F. Smith

*Philanthus depredator* F. Smith, 1856:470, ♂. Holotype or syntypes: ♂, India: no specific locality (BMNH). – F. Smith, 1871a:371 (in catalog of Oriental Aculeata); Cameron, 1890b:248 (India: West Bengal: Barrackpore); Kohl, 1891:363 (in checklist of world *Philanthus*); Bingham, 1897:295 (in Wasp and Bee Fauna of British India); Dalla Torre, 1897:484 (in catalog of world Hymenoptera); Rothney, 1903:105 (India: West Bengal: Barrackpore); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Dollfuss, 2017b:1250 (India: Tamil Nadu: 60 km southwest of Madurai at 9°21.6'N 77°26.6'E).

### 34. *desertorum* (F. Morawitz)

*Anthophilus desertorum* F. Morawitz, 1890:607, ♀. Holotype: ♀, Turkmenistan: Repetek (ZIN). – **As *Philanthus desertorum***: Kohl, 1891:363 (new combination, in checklist of world *Philanthus*); Dalla Torre, 1897:484 (in catalog of world Hymenoptera); F. Morawitz, 1897a:157 (description of ♂); Myartseva, 1963b:60 (Turkmenistan: lower Murgab River), 1965:92 (Turkmenistan: Akibay and Bayram-Ali district); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Kazenas, 1978b:46 (in key to Sphecidae of Kazakhstan and Central Asia), 1992c:28 (Turkmenistan: Repetek Nature Reserve), 2001b:51 (in checklist of Sphecidae of Kazakhstan and Central Asia); Danilov and Mokrousov, 2017b:255 (in catalog of Philanthinae of Russia); Dollfuss, 2017b:1250 (locality records from Turkey and Mongolia); Mokrousov, 2017b:16 (Russia: Kalmykia: 20 km east of Khulhuta: Davsna sands at 46.292°N 46.672°E; Uzbekistan: Baga-Abzal' 15 km north of Bukhara), 2017d:59 (South-East of European Russia: no specific locality).

### 35. *dichrous* Kohl

*Philanthus dichrous* Kohl, 1894:289, ♀. Syntypes: West Africa (country?): Batta and Kriby (TMP). – Dalla Torre, 1897:485 (in catalog of world Hymenoptera); Arnold, 1925:161 (in revision of southern African *Philanthus*), 1930:10 (in checklist of Afrotropical Sphecidae); Schouteden, 1930:93 (Zaire); Leclercq, 1955i:408 (Burundi); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Rodgers and Homewood, 1982:233 (Tanzania: Usambara Mountains); Dollfuss, 2017b:1250 (locality records from Central African Republic and Guinea).

### *ssp. abyssinicus* Arnold

*Philanthus dichrous* race *dolosus* var. *abyssinicus* Arnold, 1925:162, ♀. Holotype: Ethiopia: Harar (BMNH). – Arnold, 1930:11 (in checklist of Afrotropical Sphecidae); Scott in Arnold, 1933a:369 (Ethiopia: Harar District); Giordani Soika, 1939c:101 (Eritrea: Asmara: Keren); Arnold, 1951:100 (Ethiopia: Gore). – **As *Philanthus dichrous abyssinicus***: R. Bohart and Menke, 1976:564 (new status, in checklist of world Sphecidae).

### *ssp. dolosus* Kohl

*Philanthus dolosus* Kohl, 1894:290, ♀. Holotype or syntypes: ♀, Congo (possibly Zaire): Makuco (TMP). – Dalla Torre, 1897:485 (in catalog of world Hymenoptera). – **As *Philanthus dichrous* race *dolosus***: Arnold, 1925:161 (new status, in revision of southern African *Philanthus*), 1930:10 (in checklist of Afrotropical Sphecidae). – **As *Philanthus dichrous dolosus***: R. Bohart and Menke, 1976:564 (new status, in checklist of world Sphecidae).



### 36. *dimidiatus* Klug

*Philanthus dimidiatus* Klug, 1845:[27], p. 47, fig. 7, ♂. Holotype or syntypes: ♂, Sudan: Ambukohl on Nile west of Korti (ZMHU). – F. Smith, 1856:470 (in catalog of Hymenoptera in British Museum); Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:485 (in catalog of world Hymenoptera); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); D. Baker, 1997b:189 (in catalog of insect described by Klug, 1945); Pagliano, 2014:103 (specimens in M. Spinola collection, Torino, are *Philanthus dimidiatus*).

### 37. *dufourii* Lucas

*Philanthus dufourii* Lucas, 1849:258, ♀, actually ♂ (as *Dufourii*, incorrect original capitalization). Holotype: ♂, Algeria: Sétif (MNHN). – F. Smith, 1856:472 (in catalog of Hymenoptera in British Museum); Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:485 (in catalog of world Hymenoptera, as *dufourii*); de Beaumont, 1949b:187 (in revision of northwestern African *Philanthus*), 1951c:306 (in revision of European *Philanthus*), 1953g:119 (Morocco); Ceballos, 1956:365 (in catalog of Hymenoptera of Spain), 1959:229 (in supplement to catalog of Spanish Sphecidae); de Beaumont, 1961a:204 (Syria, Iran), 1967a:278 (Turkey; variation); Kazenas, 1970b:366 (Kazakhstan); R. Bohart and Menke, 1976:564 (in checklist of world Sphecidae); Kazenas, 1978b:48 (in key to Sphecidae of Kazakhstan and Central Asia); Gayubo, 1983e:236 (Spain: Salamanca Province); Gayubo and Tormos, 1984:23 (Spain: Valencia); Gayubo, 1986a:66 (Spain: Ciudad Real Province); Gayubo and Sanza, 1986:83 (Spain: Burgos); Tormos and Jiménez, 1987a:127 (Spain: Valencia); Gayubo, 1991a:129 (characteristics of species); Gayubo and Torres, 1991:Table I (Spain: Salamanca; effects of urban pressure); Tormos, Asís, and Gayubo, 1994:190, 224 (Spain: Albacete Province); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:291 (in Sphecid Fauna of Western Europe); Ljubomirov and Yildirim, 2008:126 (in catalog of Crabronidae of Turkey); Baños-Picón, Asís, Gayubo, and Tormos, 2009:314 (Spain: frequency of specimens collected with hand nets and Malaise traps); Murai and Amr, 2011:119 (recorded from Syria by de Beaumont, 1961); Ebrahimi, 2014:47 (Iran: Markazi: Khomein: Shahābieh); Yildirim, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:82 (Iran: known from Markazi Province); Dollfuss, 2017b:1250 (locality records from Algeria, Kyrgyzstan, and Turkey).

*Philanthus bolivari* Mercet, 1914:445 and 447, ♀, ♂ (as *Bolivari*, incorrect original capitalization). Syntypes: Spain: Madrid, Ávila, and Alicante (MNCN). Synonymized with *Philanthus dufourii* by de Beaumont, 1949b:188 and 1951c:306. – Giner Marí, 1942a:70 (Spain: Valencia Province), 1943a:112 (in Sphecid Fauna of Spain); Martin Albaladeo and Izquierdo Moya, 2006:118 (type in Museo Nacional de Ciencias Naturales, Madrid). – As *Philanthus dufourii bolivari*: Diniz, 1966:6 (new status, Portugal: Oeiraz, Rezende).

### 38. *elegantissimus* Dalla Torre

*Philanthus elegans* F. Smith, 1873c:415, ♀, junior primary homonym of *Philanthus elegans* F. Smith, 1856, now in *Trachypus*. Holotype or syntypes: ♀, northern India, perhaps Pakistan: no specific locality (BMNH). – Cameron, 1890b:248 (listed); Kohl, 1891:364 (in checklist of world *Philanthus*); Bingham, 1897:297 (in Wasp and Bee Fauna of British India).

*Philanthus elegantissimus* Dalla Torre, 1897:485. Substitute name for *Philanthus elegans* F. Smith, 1873. – R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Esenbekova and Kazenas, 2000:70 (southeastern Kazakhstan: 60 km E Chilik); Kazenas, 2001b:51 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:135 (geographic distribution, collecting localities in Kazakhstan), 2008a:105 (Southeastern Kazakhstan: 15 km east of Ayak-Kalkan, 20 km S Aydarly, 60 km E Chilik), 2013b:499 (southeast Kazakhstan: 60 km E Chilik); Mokrousov and Gromenko, 2015:126 (Uzbekistan: Sundukli Desert at 38°57'45"N, 64°32'26"E).

*Philanthus marikovskii* Kazenas, 1978a:662, ♂. Holotype: ♂, Kazakhstan: Ili River Valley, 15 km east of Ayak-kalkan (ZIN). Synonymized with *Philanthus elegantissimus* by Kazenas, 2000a:51. – Kazenas, 1978b:49 (in key to Sphecidae of Kazakhstan and Central Asia).

### 39. *femoralis* Arnold

*Philanthus femoralis* Arnold, 1946:76, ♂. Holotype: ♂, Zambia: Tupela in Mweru District (SAM). – R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### 40. *flagellarius* R. Turner

*Philanthus flagellarius* R. Turner, 1918c:460, ♀. Syntypes: ♀, Tanzania: Usangu and Linongwe Districts (BMNH). – Arnold, 1925:165 (in revision of southern African *Philanthus*), 1930:11 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Dollfuss, 2017b:1251 (locality records from Central African Republic and Zimbabwe; description of ♂).

### 41. *flavipes* Arnold (preoccupied)

*Philanthus flavipes* Arnold, 1949:274, ♂. Holotype: ♂, Zambia: Abercorn, now Mbala (SAM). Junior primary homonym of *Philanthus flavipes* Fabricius, 1781, now in *Palarus* – R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### 42. *fossulatus* R. Turner

*Philanthus fossulatus* R. Turner, 1918c:459, ♀. Holotype or syntypes: ♀, Somalia: Bohotle (BMNH). – Arnold, 1925:166 (original description copied), 1930:11 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### 43. *foveatus* Arnold

*Philanthus foveatus* Arnold, 1933b:55, ♀, ♂. Syntypes: Zaire: Burunga (MRAC). – Arnold, 1943:73 (Zaire); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### 44. *fuscipennis* Guérin-Méneville

*Philanthus fuscipennis* Guérin-Méneville, 1844:443, sex not indicated. Holotype or syntypes: Senegal: shores of Casamance River (MSNG). – F. Smith, 1856:472 (in catalog of Hymenoptera in British Museum); Kohl, 1891:364 (in checklist of world *Philanthus*); Gribodo, 1895:352 (Mozambique, redescription); Dalla Torre, 1897:486 (in catalog of world Hymenoptera); Bingham, 1902:213 (South Africa); R. Turner, 1918c:459 (synonymy, variation); Arnold, 1925:171 (in revision of southern African *Philanthus*), 1930:11 (in checklist of Afrotropical Sphecidae); Guiglia, 1948b:180 (type material in Genova), 191 (redescription); Leclercq, 1969:1053 (Congo Brazzaville); I. Robertson, 1969:480 (Tanzania: Ukiriguru); R. Bohart and Menke, 1976:139 (in checklist of world Sphecidae), 565 (in checklist of world Sphecidae); Rodgers and Homewood, 1982:233 (Tanzania: Usambara Mountains); S. Gess and F. Gess, 2003:129 (South Africa: visiting flowers of *Foeniculum vulgare* Mill, Apiaceae); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Dollfuss, 2017b:1251 (locality records from Central African Republic, Ethiopia, Guinea, Kenya, Malawi, Mali, Mozambique, Namibia, South Africa, Tanzania, Zambia, and Zimbabwe).

*Philanthus temerarius* Kohl, 1894:290, ♂. Syntypes: ♂, Country unknown: Batta (TMP). Synonymized with *Philanthus fuscipennis* by Leclercq, 1969:1053. – Dalla Torre, 1897:491 (in catalog of world Hymenoptera); W. Schulz, 1906:308 (Fernando Po, now Bioko, description of ♀); Schoutedden, 1930:93 (Zaire). – As *Philanthus fuscipennis* race *temerarius*: Arnold, 1925:172 (new status, in revision of southern African *Philanthus*), 1930:11 (in checklist of Afrotropical Sphecidae).

*Philanthus usambarensis* Stadelmann, 1897:Figure 11. .... – : Arnold, 1925:175 (as probable synonym of *Philanthus fuscipennis temerarius*). – R. Bohart and Menke, 1976:565 (as tentative synonym of *Philanthus fuscipennis*).

? *Philanthus undussumae* Stadelmann, 1897:55 (explanation of Figure 11).

### **ssp. *consimilis* Kohl**

*Philanthus consimilis* Kohl, 1891:349, ♀, ♂. Syntypes: South Africa: Western Cape Province: Cape of Good Hope: no specific locality (NHMW, ZMHU). – Kohl, 1891:363 (in checklist of world *Philanthus*); Dalla Torre, 1897:484 (in catalog of world Hymenoptera); R. Turner, 1918c:461 (as synonym of *Philanthus fuscipennis*). – **As *Philanthus fuscipennis consimilis***: Giordani Soika, 1939c:102 (new status, Eritrea: Adi Ugri); Guiglia, 1939d:55 (Ethiopia: Sidamo: Malca Guba), 1943c:75 (Ethiopia: Gamo Gofa: Sagan – Omo region), 1950:233 Ethiopia: Gamo Gofa: Gondaraba at 4°58'N 36°49'E); Arnold, 1951:100 (Ethiopia: Bishoftu, Jowaha); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Dollfuss, 1989:11 (type material in NHMW).

*Philanthus reticulatus* Cameron, 1908a:270, ♀. Holotype or syntypes: ♀, Tanzania: Mount Kilimanjaro: Kibonoto (NRS). Synonymized with *Philanthus fuscipennis* by R. Turner, 1918c:461 and with *Philanthus fuscipennis consimilis* by Bohart and Menke, 1976:565.

### **ssp. *laetus* Gribodo (preoccupied)**

*Philanthus fuscipennis* var. *laetus* Gribodo, 1895:353, B, junior primary homonym of *Philanthus laetus* Fabricius, 1793, now in *Cerceris*. Holotype: B, Mozambique: Lourenço Marquês, now Maputo (Mus. Genova). – Penati and Mariotti, 2015: 73 (in list of Hymenoptera described by G. Gribodo). – **As *Philanthus fuscipennis laetus***: R. Bohart and Menke, 1976:565 (new status, in checklist of world Sphecidae).

### **45. *genalis* Kohl**

*Philanthus genalis* Kohl, 1891:349, ♀, ♂. Syntypes: Egypt: Sinai: Tor (NHMW) and Libyan Desert: no specific locality (ZMHU). – Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:486 (in catalog of world Hymenoptera); Mochi, 1939a:99 (in revision of Egyptian *Philanthus*); de Beaumont, 1956a:184 (Libya), 1961a:202 (diagnostic characters); Pulawski, 1967c:387 (Sudan: Khor Musa Pasha south of Wadi Halfa); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Al-Houty, 1989:162 (Kuwait: Abdelli, Jal Al-Zor, Sobiya, Sulabiya); Dollfuss, 1989:11 (type material in NHMW); Guichard, 1991a:338 (Jordan), 1994a:209 (United Arab Emirates); Roche and Zalut, 1994:117 (Egypt: Sinai Peninsula); Gadallah, 1996:70 (in revision of Egyptian *Philanthus*); Roche, 2007a:126 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Schmid-Egger, 2011b:569 (recorded from United Arab Emirates by Guichard, 1991a), 2014:591 (United Arab Emirates), 592 (color photographs of female); Dollfuss, 2017b:1252 (Egypt: Dahshur and Wadi el Tih).

### **46. *gibbosus* (Fabricius)**

*Vespa gibbosa* Fabricius, 1775:370, sex not indicated. Holotype: ♂, North America: no specific locality (ZMUC). – Fabricius, 1781:466 (redescription), 1787:292 (redescription), 1793:275 (redescription), 1804:261 (redescription); W. Schulz, 1912:82 (is a *Philanthus*, single male of Fabricius in Kiel Museum). – **As *Anthophilus gibbosus***: Dahlbom, 1844:192 (new combination, in revision of Sphecidae and Pompilidae), 1845:497 (in key to *Anthophilus*). – **As *Philanthus gibbosus***: Klug, 1846:42 (new combination, belongs to subsection *Anthophilus* of *Philanthus*; as *nodosus*, a lapsus), Taschenberg, 1875:403 (Illinois); Kohl, 1891:367 (in checklist of world *Philanthus*); Dalla Torre, 1897:486 (in catalog of world Hymenoptera); H. Smith, 1908b:358 (in revision of Nebraskan Sphecidae); J. Smith, 1910:678 (in new list of insects of New Jersey); Mickel, 1918b:389 (in catalog of Nebraskan Sphecidae); Reinhard, 1924:363 (number of generations, nesting habits, description of larva and cocoon); J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae); E. Reinardt, 1929b:94 and 117 (nesting habits); Peckham, 1934b:260 (Missouri: St. Albans and St. Louis; digging reported); Krombein, 1936:94 (New York: Buffalo, gregarious nesting), 98 (floral records); Brimley, 1938:447 (North Carolina: statewide); Strandtmann, 1945b:153 (in review of North American *Philanthus*), 1946:72 (in revision of North American *Philanthus*); Dreisbach, 1947:142, 143 (in key to *Philanthus* of Michigan), 144 (Michigan: locality records); Strickland, 1947:128 (Canada: Alberta:

Lethbridge, Medicine Hat, as *gibbosum*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); Krombein, 1952a:95 (USA: Virginia: Westmoreland State Park; prey: *Augochloropsis cuprea* (Smith)); K. Cooper, 1953:34 (Massachusetts: Penikese Island); Krombein, 1953b:124 (visiting flowers of *Pluchea* sp.), 133 (North Carolina: Kill Devil Hills), 1956a:43 (prey: *Halictus versatus* Robertson); Evans, 1957b:82 (description of larva); Evans and Lin, 1959:124 (nesting habits); Evans and Linsley, 1960:32 (casual member of sleeping aggregation at Southwest Research Station, Arizona); Evans, 1963c:113 (comparison of behavior with *Philanthus politus* and *solivagus*); Krombein, 1963f:277 (Maryland: Plummers Island near Washington, D.C.); Kurczewski and Kurczewski, 1963:148 (Pennsylvania: Presque Isle State Park); Cazier and Mortenson, 1965a:174 (nesting habits); Wray, 1967:123 (North Carolina: Kill Devils Hills); N. Lin, 1968:10 (sleeping inside nests); Alcock, 1970:218 (male behavior); G. Bohart, Nye, and Hawthorn, 1970:48 (Utah: Logan, onion pollinator); Evans, 1973b:302 (burrow sharing and transfer); Alcock, 1954a:333 (USA: Washington: Seattle); Alcock, 1974b:241 (nesting habits, comparison with *Philanthus crabroniformis*); Barrows and Snyder, 1974:314 (list of prey: halictine bees); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 9 (in revision of *Philanthus* of California); Evans, 1975a:264 (slow colonizer of new habitats), Hurd and Linsley, 1975:117 (Arizona: Cochise County: Douglas; on flowers of *Larrea tridentata* (De Candolle) Coville, Zygophyllaceae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); C. Ward et al., 1977:156 (associated with mesquite (*Prosopis glandulosa* Torr.), Fabaceae); L. Davis, 1978:217 (North Carolina: Kill Devil Hills, data from Krombein, 1953a); N. Lin, 1978b:234 (defending individual hunting territories, hunting behavior); Krombein, 1979b:1722 (in catalog of North American Hymenoptera, nesting sites, list of parasites and prey); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection); Finnamore, 1982:237 (in Sphecid Fauna of Southern Quebec); O'Neill and Evans, 1982:798 (major prey: family and genus); Packer, 1985:293 (Mexico; prey: *Halictus hesperus* Smith; nest), 297 (short review of nesting habits); Parks, 1986:35 (Torrey Pines State Reserve); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey); Steiner, 1986:112 (references to publications on nesting habits); Evans and O'Neill, 1988:32 (male behavior, burrow sharing, nesting habits, nest structure, natural enemies); Spofford, Kurczewski, and Downes, 1989:256, 257, 259 (references to publications on nest parasites *Hilarella hilarella* (Zetterstedt), *Metopia argyrocephala* (Meigen), *Phrosinella fulvicornis* (Coquillett), *Senotainia trilineata* (Wulp), and *Senotainia* sp. near *trilineata* (Wulp), miltogrammine flies), 257, 261 (nest parasites: *Phrosinella aurifacies* Downes, a miltogrammine fly, and undetermined species of Miltogrammini); Kurczewski and Acciavatti, 1990:61 (New York: Cayuga County); Spofford and Kurczewski, 1990:747, 748, 751 (nest parasites: *Phrosinella aurifacies* Downes, *Senotainia trilineata* (Van der Wulp), and unknown species of Miltogrammini, Sarcophagidae), 1992:1000 (species of miltogrammine parasites listed), 1002 (counter-cleptoparasitic behavior: freeze-stop and face-off, diversionary flight), 1003 (chasing flight), 1005 (post-larvipositional counter-cleptoparasitic behavior: clean prey); Ahlstrom, 1995:113 (in checklist of insects of North Carolina); Hanson and Menke, 1995:649 (extends south to El Salvador); Kurczewski, 1998d:250 (pine barrens in upstate New York); Melo, 2000:98 (nest usurpation and temporary association with nest owner); Skevington et al., 2001:128 (Canada: Ontario: Lambton County); Amarante, 2002:63 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Ohl and Linde, 2003:151 (number of ovarioles); Buck, 2004:27 (in checklist of Crabronidae of Ontario, Canada); Kaltenpoth, Göttler, Herzner, and Strohm, 2005:478 (presence of streptomycetes bacteria in female antennal glands); Giles and Ascher, 2006:231 (New York: Black Rock Forest Preserve); Kaltenpoth et al., 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Horta Vega, Pinson Domínguez, Barrientos Lozano, and Correa Sandoval, 2007: 46 (Mexico: Tamaulipas); Pagliano, 2014:104 (specimens in M. Spinola collection, Torino, are *Philanthus gibbosus*); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Ratzlaff, 2016:28 (Canada: British Columbia: from R. Bohart and Grissell, 1977 and Krombein, 1979); Dollfuss, 2017b:1252 (USA: locality records).

- Philanthus punctatus* Say, 1824:342, ♂. Holotype or syntypes: ♂, USA: Pennsylvania: no specific locality (destroyed). Synonymized with *Philanthus gibbosus* by Strandtmann, 1945b:154. – F. Smith, 1856:474 (in catalog of Hymenoptera in British Museum); Le Conte, 1859a:231 (original description copied); Cresson, 1862:236 (in catalog of North American Hymenoptera), 1865c:100 (in revision of North American Philanthinae); Packard, 1866:55 (in key to North American *Philanthus*), 58 (bibliographic references, geographic distribution); Cresson, 1873:227 (Texas); Snow, 1881:95 (in checklist of Hymenoptera of Kansas: Douglas County: no specific locality); Cresson, 1887:281 (in catalog of North American Hymenoptera); C. Robertson, 1894:457 (visiting flowers of *Solidago nemoralis* Ait.), 460 (visiting flowers of *Aster paniculatus* Lam.), 1896:73 (visiting flowers of *Polygonum hydropiperoides* Michx.); Dalla Torre, 1897:489 (in catalog of world Hymenoptera); Dunning, 1897:69 (Connecticut); G. Peckham and E. Peckham, 1898:109 (nesting habits); Bridwell, 1899:209 (Kansas: no specific locality); Adlerz, 1904:138 (known prey: halictids); G. Peckham and E. Peckham, 1905:154 (several specimens present in one nest, nest construction and structure, preying on halictids); Snow, 1906:9 (Arizona); Rohwer, 1916b:673 (in catalog of Hymenoptera of Connecticut; New Haven, North Haven, Prospect, Westbrook); Rau, 1922:21 (USA: Missouri: Silica); Rohwer in Viereck, 1925:673 (in key to Sphecidae of Connecticut); Rau, 1938b:542 (sleeping habits); Strickland, 1947:128 (Canada: Alberta: Medicine Hat); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey); Steiner, 1986:112 (references to publications on nesting habits). – **As *Anthophilus punctatus***: J. Smith, 1900:520 (new combination, in list of insects of New Jersey); Viereck, 1903d:120 (Maryland: College Park).
- Cheilopogonus punctiger* Westwood, 1835a:441, sex not indicated. Syntypes: USA: Indiana: New Harmony (originally in "Mus. Soc. Nat. Hist., Belfast", now apparently destroyed: R. Bohart and Grissell, 1975:10). Synonymized with *Philanthus gibbosus* by Strandtmann, 1945b:153. – Cresson, 1862:237 (in catalog of North American Hymenoptera).
- Anthophilus gibbosus* Dahlbom, 1844:192, ♀, ♂, junior secondary homonym of *Philanthus gibbosus* Fabricius, 1775. Synonymized with *Philanthus gibbosus* Fabricius by Strandtmann, 1946:72. – Dahlbom, 1845:497 (in key); Amaranthe, 2005a:13 (correction to his 2002 catalog).
- Philanthus xanthostigma* Cameron, 1891a:131, ♀. Lectotype: ♀, Mexico: Guerrero: Chilpancingo (BMNH), designated by R. Bohart and Grissell, 1975:10. Synonymized with *Philanthus gibbosus* (Fabricius) by R. Bohart and Grissell, 1975:10 and by R. Bohart in R. Bohart and Menke, 1976:565. – Kohl, 1891:370 (in checklist of world *Philanthus*); Dalla Torre, 1897:494 (in catalog of world Hymenoptera). – **As *Pseudanthophilus xanthostigma***: Ashmead, 1899d:297 (tentative new combination, in checklist of North American Crabronidae).
- Philanthus maculifrons* Cameron, 1891a:132, ♂. Holotype or syntypes: ♂, Mexico: Guanajuato: Jaral (BMNH). Synonymized with *Philanthus gibbosus* (Fabricius) by R. Bohart in R. Bohart and Menke, 1976:565. – Kohl, 1891:368 (in checklist of world *Philanthus*); Dalla Torre, 1897:488 (in catalog of world Hymenoptera). – **As *Pseudanthophilus maculifrons***: Ashmead, 1899d:297 (tentative new combination, in checklist of North American Crabronidae).
- Philanthus punctatus* var. *cockerelli* Dunning, 1897:69. Lectotype: ♀, USA: New Mexico: Las Cruces (ANSP), designated by Cresson, 1928:49. Synonymized with *Philanthus gibbosus* by Strandtmann, 1945b:154. – Dunning, 1898b:152 (recognition); Cockerell, 1899a:141 (New Mexico); Viereck and Cockerell, 1904b:143 (in revision of *Philanthus* of New Mexico); Snow, 1906:9 (Arizona: Oak Creek 20 mi. SW Flagstaff, as *punctatus cockerelli*).
- Philanthus chilopsidis* Cockerell, 1899a:141. Not available: published as synonym of *Philanthus punctatus* var. *cockerelli* (Article 11.6). Synonymized with *Philanthus gibbosus* (Fabricius) by R. Bohart and Grissell, 1975:10, and by R. Bohart in R. Bohart and Menke, 1976:565.
- Anthophilus melanaspis* Cameron, 1905l:377, ♀. Holotype or syntypes: ♀, Mexico: no specific locality (BMNH). Synonymized with *Philanthus gibbosus* (Fabricius) by R. Bohart and Grissell, 1975:10, and by R. Bohart in R. Bohart and Menke, 1976:566.
- Anthophilus maculiventris* Cameron, 1905l:377, ♀. Holotype or syntypes: ♀, Mexico: no specific locality (BMNH). Synonymized with *Philanthus gibbosus* (Fabricius) by R. Bohart and Grissell, 1975:10, and by R. Bohart in R. Bohart and Menke, 1976:566.

**47. glaber Kohl**

*Philanthus glaber* Kohl, 1891:348, ♀. Holotype: ♀, Russia: Siberia: no specific locality (ZMHU). – Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:486 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Danilov and Mokrousov, 2017b:255 (in catalog of Philanthinae of Russia); Mokrousov, 22017b:16 (Russia: Altai Republic: 12 km southeast of Kosh-Agach at 49.91°N 88.76°E; China: Nei Mongol: Huang He valley between Denkou and Baotou and Alashan, Dingyuanqing, now Bayanhot).

*Philanthus rubriventris* Kazenas, 1970b:366, ♀. Holotype: ♀, Kazakhstan: Alma-Ata Oblast': near Ili (ZIN). Synonymized with *Philanthus glaber* by Mokrousov, 2017b:16. – Kazenas, 1974b:109 (feeding on flowers of *Tamarix* sp. and *Euphorbia* spp., Euphorbiaceae in Kazakhstan), 111 (feeding on flowers of *Berberis iliensis*, Berberidaceae, in Kazakhstan); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Kazenas, 1978b:49 (in key to Sphecidae of Kazakhstan and Central Asia); Esenbekova and Kazenas, 2000:70 (southeast Kazakhstan: 3 km NE and 15 km southeast of Borandysu, 10 km northwest of Chundzha); Kazenas, 2001b:52 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:135 (geographic distribution, collecting localities in Kazakhstan), 2008a:106 (southeastern Kazakhstan: Bartogay, 3 km northeast and 15 km southeast of village Borandysu, 11 km northwest of Chundza, Kapchagay), 2013a:134 (color photograph of adult wasp, short information on geographic distribution), 2013b:499 (southeast Kazakhstan: 3 km northeast and 15 km southwest of Borandysu, 11 km northwest of Chundzha on Sharyn River).

*Philanthus kaszabi* Tsuneki, 1971:418, ♀. Holotype: ♀, Mongolia: Uvs Aymag: Bagnuur (TMB). Synonymized with *Philanthus glaber* by Mokrousov, 2017b:16. – R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Nemkov in Nemkov, Kazenas, Budrys, et Antropov, 1995:467 (in key to Sphecidae of Russian Far East); Nemkov, 2008b:25 (in catalog of Crabronidae of Asiatic Russia), 2009b:143 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Dollfuss, 2017b:1253 (Mongolia: locality records, description of ♂).

**48. gloriosus Cresson**

*Philanthus gloriosus* Cresson, 1865c:86, ♀. Lectotype: ♀, USA: Colorado: no specific locality (ANSP), designated by Cresson, 1916:100. – Packard, 1866:54 (in key to North American *Philanthus*), 55 (bibliographic reference, geographic distribution); Cresson, 1887:281 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1891:368 (in checklist of world *Philanthus*); Dalla Torre, 1897:486 (in catalog of world Hymenoptera); Bridwell, 1899:209 (Kansas: no specific locality); Cockerell, 1899a:141 (New Mexico); Viereck and Cockerell, 1904b:143 (in revision of *Philanthus* of New Mexico); H. Smith, 1908b:359 (in revision of Nebraskan Sphecidae); Mickel, 1918b:386 (in catalog of Nebraskan Sphecidae); Strandtmann, 1945b:152 (in review of North American *Philanthus*), 1946:31 (in revision of North American *Philanthus*); Strickland, 1947:128 (Canada: Alberta: Medicine Hat, as *gloriosum*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); R. Bohart and Grissell, 1975:5, 7 (in key to North American *Philanthus*), 11 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Krombein, 1979b:1723 (in catalog of North American Hymenoptera); G. Ferguson, 1984a:291 (in revision of *zebratus* species group); Menke, 1986c:35 (Utah: Emery County: San Rafael Desert); Amarante, 2002:63 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Dollfuss, 2017b:1252 (Cuba: no specific locality).

*Philanthus insignatus* Banks, 1913b:421, ♀. Holotype: ♀, Texas: Alpine (AMNH). Synonymized with *Philanthus gloriosus* by Strandtmann, 1945:152.

**49. gwaaiensis Arnold**

*Philanthus gwaaiensis* Arnold, 1929c:407, ♂. Holotype: ♂, Zimbabwe: Gwaai (SAM). – Arnold, 1930:11 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

**50. *hellmanni* (Eversmann)**

*Anthophilus hellmanni* Eversmann, 1849:400, ♀, ♂ (as *Hellmanni*, incorrect original capitalization). Syntypes: "in campis transuralensibus" = Kazakhstan: no specific locality (ZIN). – Radoszkowski, 1888a:326 (redescription, male genitalia, ♀ = *Mellinus sabulosus*); Ed. André, 1889:250 (in revision of Sphecidae of Europe and Algeria), 21\* (bibliographic references); F. Morawitz, 1889a:153 (China: Kukuhotu, description of ♂); Radoszkowski, 1892:579 (reference to Radoszkowski, 1888a); Sickmann, 1894:201 (China: Hopei Province: Kalgan). – **As *Philanthus hellmanni***: Kohl, 1891:364 (new combination, in checklist of world *Philanthus*); F. Morawitz, 1893b:420 (Tajikistan: Khimartob in Yagnob River valley); Dalla Torre, 1897:487 (in catalog of world Hymenoptera); Yasumatsu, 1942c:107 (China: Nei Mongol: Apaka at 44°N 114.96°E); Tsuneki, 1971:417 (Mongolia), 1971m:15 (China: Inner Mongolia: Apaka); Kazenas, 1978b:46 (in key to Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:186 (in key to Sphecidae of European part of former USSR); Kazenas, 1980e:82 (Russia: Primorskiy Kray); Nemkov, 1986:108 (Russia: Irkutsk Oblast'), 1992b:250 (Russia: Far East: Natalino near Khingan Nature Reserve); Nemkov *in* Nemkov, Kazenas, Budryś, et Antropov, 1995:467 (in key to Sphecidae of Russian Far East); Wu and Zhou, 1996a:161 (in revision in Economic Insect Fauna of China); Kazenas, 2001b:51 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:135 (geographic distribution, collecting localities in Kazakhstan); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Baghirov, 2007:93 (Russia: southwestern Siberia, as *hellmanni*); Danilov, 2008:352 (Russia: Altayskiy Kray: Barnaul area); Nemkov, 2008b:25 (in catalog of Crabronidae of Asiatic Russia), 2009b:143 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia), 2009c:238 (Russia: Primorskiy Kray: Lazovsky Nature Reserve); Baghirov, 2011b:155 (Russia: Altayskiy Kray: Savvushka; Altay Republic: Aktash, Chike-Taman, Kosh-Agach); Nemkov, 2012c:447 (in catalog of Crabronidae of Russian Far East); Mokrousov, 2015a:538 (southeastern European Russia); Danilov and Mokrousov, 2017b:255 (in catalog of Philanthinae of Russia); Dollfuss, 2017b:1252 (Mongolia: locality records).

***spp. sibiricus* Radoszkowski**

*Philanthus Hellmanni* B: Eversmann, 1849:400 (segmento abdominis primo rufo). Corrected to *Philanthus sibiricus* by Radoszkowski, 1888a:325.

*Philanthus sibiricus* Radoszkowski, 1888a:325, ♀. Holotype or syntypes: ♀, Russia: Vladivostok (Kraków?). – Kohl, 1891:364 (as new synonym of *Philanthus hellmanni*). – **As *Philanthus hellmanni* var. *sibiricus***: Dalla Torre, 1897:487 (new status, in catalog of world Hymenoptera); – **As *Philanthus hellmanni sibiricus***: R. Bohart and Menke, 1976:565 (new status, in checklist of world Sphecidae).

**51. *histrion* Fabricius**

*Philanthus histrion* Fabricius, 1804:301, sex not indicated. Holotype or syntypes: ♀, Senegal: no specific locality (ZMUC). – Thunberg, 1815b:289 (diagnostic characters), 297 (redescription); Taschenberg, 1875:404 (redescription); Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:486 (in catalog of world Hymenoptera); Bingham, 1902:213 (South Africa); R. Turner, 1918c:463 (synonymy, range: E. Africa from Harar to Natal, Angola); Arnold, 1925:147 (in revision of southern African *Philanthus*), 1930:10 (in checklist of Afrotropical Sphecidae); Schouteden, 1930:93 (Zaire); Guiglia, 1932:126 (Ethiopia: Harer); Scott *in* Arnold, 1933a:369 (Ethiopia: Hawash); Guiglia, 1939d:54 (Ethiopia: Sidamo: Neghelli, now Negele); Arnold, 1960a:83 (South Africa: Drakensberg Mountains); van der Vecht, 1961a:61 (study of type material); Leclercq, 1962a:397 (Tanzania: Mount Hanang, color variation); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); S. Gess, 1996:277 (floral records); S. Gess and F. Gess, 2003:129 (South Africa: visiting flowers of *Foeniculum vulgare* Mill., Apiaceae, and *Helichrysum* sp., Asteraceae); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Dollfuss, 2017b:1252 (locality records from Cameroon, Kenya, Malawi, Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe).

*Philanthus schoenherri* Dahlbom, 1845:496, ♀, ♂ (as *Schönherri*, incorrect original capitalization and diacritic mark).

Syntypes: South Africa: Cape Province: no specific locality (Lund). Synonymized with *Philanthus histrio* by Kohl, 1891:364, synonymy confirmed by W. Schulz, 1912:94.

*Philanthus formosus* F. Smith, 1856:471, ♂. Holotype or syntypes: ♂, South Africa: Cape Province: Cape of Good Hope (BMNH). Synonymized with *Philanthus histrio* by Kohl, 1891:364.

*Philanthus flavolineatus* Cameron, 1908:271, ♀. Syntypes: Tanzania: Mount Kilimanjaro: Kibonoto (NRS). Synonymized with *Philanthus histrio* by R. Turner, 1913:744 and 1918c:463.

*Philanthus trichocephalus* Cameron, 1910:146, ♂. Holotype or syntypes: ♂, South Africa: Transvaal: Middleburg (TMP). Synonymized with *Philanthus histrio* by Brauns, 1917:240 (as *trichocephalus*).

### **ssp. *distinctus* Arnold**

*Philanthus histrio distinctus* Arnold, 1951:100, ♂. Holotype: ♂, Ethiopia: Debra Sina (BMNH). – R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### **ssp. *eritranus* Bischoff**

*Philanthus flavolineatus eritranus* Bischoff, 1915b:156, ♂. Syntypes: Eritrea: no specific locality (ZMHU). – Arnold, 1925:175 (unknown to the author). – As *Philanthus histrio eritranus*: R. Bohart and Menke, 1976:565 (new subspecific combination, in checklist of world Sphecidae).

### **52. *impatiens* Kohl**

*Philanthus impatiens* Kohl, 1891:359, ♀. Holotype or syntypes: ♀, South Africa: Western Cape Province: Cape of Good Hope area (NHMW). – Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:487 (in catalog of world Hymenoptera); Arnold, 1925:153 (description of B, in revision of southern African *Philanthus*), 1930:10 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Dollfuss, 1989:11 (type material in NHMW).

### **53. *inversus* Patton**

*Philanthus inversus* Patton, 1879d:355, ♀. Lectotype: ♀, USA: nw. Kansas: no specific locality (ANSP), designated by R. Bohart and Grissell, 1975:11. – Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:368 (in checklist of world *Philanthus*); Dalla Torre, 1897:487 (in catalog of world Hymenoptera); Bridwell, 1899:209 (Kansas: no specific locality); H. Smith, 1908b:358 (in revision of Nebraskan Sphecidae); Mickel, 1918b:388 (in catalog of Nebraskan Sphecidae); Strandtmann, 1945b:153 (in review of North American *Philanthus*), 1946:66 (in revision of North American *Philanthus*); Strickland, 1947:128 (Canada: Alberta: Lethbridge, Medicine Hat, as *inversum*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 11 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Krombein, 1979b:1723 (in catalog of North American Hymenoptera); O'Neill and Evans, 1982:792-800 (prey use); McCorquodale, 1986:1623 (flight characteristics as defense against *Senotainia trilineata*); Evans and O'Neill, 1988:112 (nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:259 (reference to publication on nest parasite *Senotainia trilineata* (Wulp), a miltogrammine fly); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Ratzlaff, 2016:28 (Canada: British Columbia: from R. Bohart and Grissell, 1975).

### **54. *kohlii* F. Morawitz**

*Philanthus kohlii* F. Morawitz, 1890:605, ♂ (as *Kohlii*, incorrect original capitalization). Syntypes: ♂, Turkmenistan: Dort-kuyu (ZIN). – Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:487 (in catalog of world Hymenoptera); Myartseva, 1963b:60 (Turkmenistan: lower Murgab River), 1965:92 (Turkmenistan: Akibay and Bayram-Ali district), 1971b:179 (occurs only in deserts of Turkmenistan); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Kazenas, 1992c:28 (Turkmenistan: Repetek Nature Reserve), 2001b:51 (in checklist



of Sphecidae of Kazakhstan and Central Asia), 2002a:135 (geographic distribution, collecting localities in Kazakhstan); Yildirim and Ljubomirov, 2005:1806 (first record from Turkey: Erzincan, Kahramanmaraş, and Malatya provinces); Ljubomirov and Yildirim, 2008:126 (in catalog of Crabronidae of Turkey); Yildirim, 2012:77 (Turkey: Iğdır: Karakoyunlu: Taşburun; Tunceli:Mazgirt: Lalaycı); Yildirim, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Mokrousov and Gromenko, 2015:126 (Uzbekistan: Sundukli Desert at 38°57'45"N, 64°32'26"E and 5 km north of Mubarek at 39°18'31"N, 65°8'20"E); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:20 (Turkey: Tunceli: Çiçekli); Dollfuss, 2017b:1253 (Kazakhstan: locality records, color variation).

### 55. *kokandicus* Radoszkowski

*Philanthus kokandicus* Radoszkowski, 1877:52, ♀, ♂ (as *Kokandicus*, incorrect original capitalization). Syntypes: Kyrgyzstan: Shakhimardan (ZMMU). – Radoszkowski, 1888a:325 (male genitalia); Kohl, 1891:353 (redescription), 364 (in checklist of world *Philanthus*); Radoszkowski, 1892:579 (reference to Radoszkowski, 1888a); Dalla Torre, 1897:488 (in catalog of world Hymenoptera); Gussakovskij, 1935:445 (Tajikistan); Myartseva, 1972a:91 (Turkmenistan); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Kazenas, 1978b:48 (in key to Sphecidae of Kazakhstan and Central Asia); Islamov, 1986:518 (Uzbekistan: Surkhandarya and Tashkent Oblast's); Nazarova, 1998:42 (Tajikistan: Tigrovaya Balka Nature Reserve); Kazenas, 2001b:52 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:135 (geographic distribution, collecting localities in Kazakhstan); Nazarova, 2005:94 (alfalfa fields in southwestern Tajikistan); Yildirim and Ljubomirov, 2005:1806 (first record from Turkey: Bitlis, Erzurum, and Kars provinces); Ljubomirov and Yildirim, 2008:127 (in catalog of Crabronidae of Turkey); Yildirim, 2012:77 (Turkey: Erzurum: Oltu); Yildirim, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Dollfuss, 2017b:1254 (Uzbekistan: locality records).

### 56. *komarowi* F. Morawitz

*Philanthus komarowi* F. Morawitz, 1890:603, ♀ (as *Komarowi*, incorrect original capitalization). Holotype or syntypes: ♀, Transcaspiya: no specific locality (ZIN). – Kohl, 1891:362 (redescription), 364 (in checklist of world *Philanthus*); Dalla Torre, 1897:488 (in catalog of world Hymenoptera, as *komarowii*); Morice, 1911:93 (Algeria: Biskra; as *komarowii*); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Kazenas, 1978b:48 (in key to Sphecidae of Kazakhstan and Central Asia), 1992c:28 (Turkmenistan: Repetek Nature Reserve), 2001b:52 (in checklist of Sphecidae of Kazakhstan and Central Asia).

### 57. *laticeps* Arnold

*Philanthus laticeps* Arnold, 1925:160, ♀. Holotype: ♀, Nigeria: Lafia (BMNH). – Arnold, 1930:10 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Diniz, 1964b:23 (Guinea Bissau, redescription); Dollfuss, 2017b:1254 (Uganda: southwest of Hioma Rwerda).

### 58. *lepidus* Cresson

*Philanthus lepidus* Cresson, 1865c:92, B. Holotype: B, USA: Colorado: Rocky Mountains: no specific locality (ANSP). – Packard, 1866:55 (in key to North American *Philanthus*), 56 (bibliographic reference, geographic distribution); Cresson, 1887:281 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1891:368 (in checklist of world *Philanthus*); Dalla Torre, 1897:488 (in catalog of world Hymenoptera); Cresson, 1916:101 (holotype in ANSP); Stevens, 1917:421 (North Dakota); J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae); Strandtmann, 1945b:155 (in review of North American *Philanthus*), 1946:97 (in revision of North American *Philanthus*); Dreisbach, 1947:143, 144 (in key to *Philanthus* of Michigan), 145 (Michigan: locality records); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); Kurczewski and Kurczewski, 1963:148 (Pennsylvania: Presque Isle State Park); Evans, 1964c:142 (nesting habits), 1966b:466 (illustration of nest entrance); R. Bohart and Grissell, 1975:6, 7 (in key to North Ameri-

can Philanthinae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Krombein, 1979b:1723 (in catalog of North American Hymenoptera, nesting sites, list of parasites and prey); Finnamore, 1982:239 (in Sphecidae Fauna of Southern Quebec); Hilchie, 1982:110 (accessory burrows reviewed); O'Neill and Evans, 1982:798 (major prey: family and genus); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey); Evans and O'Neill, 1988:169 (nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:257, 261 (nest parasites: *Phrosinella aurifacies* Downes, a miltogrammine fly, and undetermined species of Miltogrammini), 259, 260 (references to publications on nest parasites *Senotainia trilineata* (Wulp), *Senotainia* sp. near *trilineata* (Wulp), and *Senotainia vigilans* Allen, miltogrammine flies); Kurczewski and Acciavatti, 1990:61 (New York: Cayuga County); Spofford and Kurczewski, 1990:747, 748, 751 (nest parasites: *Phrosinella aurifacies* Downes, *Senotainia trilineata* (Van der Wulp), and unknown species of Miltogrammini, Sarcophagidae), 1992:1000 (species of miltogrammine parasites listed), 1002 (counter-cleptoparasitic behavior: diversionary flight); Ahlstrom, 1995:113 (in checklist of insects of North Carolina); Kurczewski, 1998d:250 (pine barrens in upstate New York); Buck, 2004:27 (in checklist of Crabronidae of Ontario, Canada), 31 (distribution within Ontario), 70 (first record from Ontario: list of localities); Kaltenpoth et al, 2006:1405 (presence of *Streptomycetes philanthi* in female antennal glands).

*Philanthus carolinensis* Banks, 1913b:422, ♀. Holotype or syntypes: ♀, USA: North Carolina: Southern Pines (AMNH or MCZ). Synonymied with *Philanthus lepidus* by Strandtmann, 1945b:155. – Brimley, 1938:447 (North Carolina: Harnett County, Southern Pines).

*Philanthus carolinensis* var. *reductus* Banks, 1921:18, sex not indicated. Syntypes: USA: Maryland: Chesapeake Bay; and North Carolina: Black Mountain: no specific locality (MCZ). Synonymized with *Philanthus lepidus* by Strandtmann, 1945b:155. – Brimley, 1938:447 (North Carolina: statewide).

As *Philanthus pulcher* (part): Skevington et al., 2001:128 (Canada: Ontario: Lambton County), corrected to *Philanthus lepidus* by Buck, 2004:76.

### 59. *levini* R. Bohart

*Philanthus levini* R. Bohart, 1972:398, ♀, ♂. Holotype: ♂, USA: California: Los Angeles County: 3 mi. southwest of Pearlblossom (UCD). – R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 12 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Krombein, 1979b:1723 (in catalog of North American Hymenoptera).

### 60. *limatus* Bingham

*Philanthus limatus* Bingham, 1909:180, ♀. Syntypes: ♀, Uganda: Mubuku Valley in eastern Ruwenzori (BMNH). – Arnold, 1925:175 (unknown to the author), 1943:73 (Zaire); Leclercq, 1955i:409 (Burundi, Rwanda, redescription); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

*Philanthus ruandanus* Bischoff, 1915a:473, ♂. Holotype: ♂, SW Rwanda: tropical forest (ZMHU). Synonymized with *Philanthus limatus* by Leclercq, 1955i:407. – Arnold, 1925:175 (unknown to the author).

### 61. *lingyuanensis* Yasumatsu

*Philanthus lingyuanensis* Yasumatsu, 1935a:14, 24, ♂. Holotype: ♂, China: Liaoning: Lingyuan (depository?) – Tsunekuni, 1967e:2 (China: Manchuria); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Nagase, 2006b:2 (specimen collected by First Scientific Expedition to Manchoukou, 1933, now part of eastern China).

### 62. *loeflingi* Dahlbom

*Philanthus loeflingi* Dahlbom, 1845:495, ♀ (as *Loeflingi*, incorrect original termination). Holotype or syntypes: ♀, South Africa: Kwazulu Natal: Port Natal, now Durban (Lund). – Gribodo, 1881b:250 (Ethiopia: kingdom of Scioa = Schioa: Let-Marefia, redescription); Kohl, 1891:351 (redescription), 365 (in checklist of world to North American Philanthinae); Dalla Torre, 1897:488 (in catalog of world Hymenoptera); Cameron, 1908a:269 (Tanzania: Mount Kilimanjaro); W. Schulz, 1911b:172 (Gribodo's specimens are a different species); R. Turner, 1918c:463 (synony-

my); Arnold, 1925:149 (in revision of southern African *Philanthus*, as *Loefflingi*), 1930:10 (in checklist of Afrotropical Sphecidae, as *Loefflingi*); Schouteden, 1930:93 (Zaire, as *Loflingi*); Guiglia, 1932:126 (Ethiopia: Harer, Let-Marefia), 1939a:199 (Ethiopia: Gonder, as *Loefflingi*); de Beaumont, 1967b:505 (South Africa: KwaZulu-Natal); Bonelli, 1976:227 (nesting in sandy soil, as *loefflingi*); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); F. Gess, 1981:21 (South Africa: 18 km WNW Grahamstown; nesting in friable soils; as *loefflingi*); Rodgers and Homewood, 1982:233 (Tanzania: Usambara Mountains, as *loefflingi*); Guichard, 1994a:210 (South Yemen, as *loefflingi*); S. Gess and F. Gess, 2003:129 (South Africa: visiting flowers of *Foeoniculum vulgare* Mill., Apiaceae, and *Maytenus linearis* (L. f.), Celastraceae, and *Acacia karoo* Hayne, Fabaceae); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 2007 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts, as *loefflingi*); Dollfuss, 2017b:1254 (locality records from Central African Republic, Kenya, Malawi, Nigeria, South Africa, Tanzania, Uganda, Yemen, Zambia, and Zimbabwe).

*Philanthus innominatus* Bingham, 1902:212, ♀. Holotype or syntypes: ♀, South Africa: Pretoria (BMNH). Synonymized with *Philanthus loefflingi* by R. Turner, 1918c:463.

### **ssp. *meneliki* Arnold**

*Philanthus loefflingi* var. *meneliki* Arnold, 1925:150, ♂ (as *Meneliki*, incorrect original capitalization). Syntypes: Ethiopia: Harar (BMNH). – Arnold, 1930:10 (in checklist of Afrotropical Sphecidae), 1933a:354 (Ethiopia: Doukam and Harar District), 1951:100 (Ethiopia: Bishoftu). – As *Philanthus loefflingi meneliki*: R. Bohart and Menke, 1976:565 (new status, in checklist of world Sphecidae).

### **63. *madagascariensis* Brèthes**

*Philanthus petiolatus* de Saussure, 1892:538, ♀, ♂ (incorrectly referred to as published in de Saussure, 1891), junior primary homonym of *Philanthus petiolatus* Spinola, 1842 (now in *Trachypus*). Syntypes: Madagascar: Imerina Province: no specific locality (MHNG). – Dalla Torre, 1897:489 (in catalog of world Hymenoptera).

*Philanthus madagascariensis* Brèthes, 1910:277. Substitute name for *Philanthus petiolatus* de Saussure, 1892 (incorrectly referred to as published in de Saussure, 1891). – R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Leclercq, 1990b:120 (Madagascar); Pulawski, 2003b:799 (in checklist of Malagasy Sphecidae); Madl, 2014a:1005 (in catalog of Ampulicidae, Crabronidae, and Sphecidae of Madagascar, with synonymy and locality records); Dollfuss, 2017b:1255 (Madagascar: Antananarivo: Manankazo).

*Philanthus ranavalonae* Arnold, 1945:16 (as *Ranavalonae*, incorrect original capitalization). Unnecessary substitute name for *Philanthus petiolatus* de Saussure, 1892. – Arnold, 1945:16 (redescription); Madagascar; Leclercq, 1962b:209 (Madagascar, variation).

### **64. *major* Kohl**

*Philanthus major* Kohl, 1891:352, ♂, ♀. Syntypes: South Africa: Port Natal (NHMW) and Cape of Good Hope (NHMW, ZMHU). – Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:488 (in catalog of world Hymenoptera); Arnold, 1925:166 (original description translated into English), 1930:11 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Dollfuss, 1989:11 (type material in NHMW); Dollfuss, 2017b:1255 (Ethiopia: Illubabor: 15 km southwest of Bedele).

### **65. *melanderi* Arnold**

*Philanthus melanderi* Arnold, 1925:156, ♀, ♂ (authorship attributed to Brauns; as *Melanderi*, incorrect original capitalization). Holotype: sex not indicated, South Africa: Eastern Cape Province: Willowmore (TMP). – Arnold, 1930:10 (in checklist of Afrotropical Sphecidae), 1935a:499 (South Africa: Kalahari); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); S. Gess, 1996:282 (floral records); Hancock, Chahwanda, and Mhlanga, 1995:39 (syntype in Bulawayo Museum); S. Gess and F. Gess, 2003:130 (as *melanderi* complex, Namibia, South Africa: visiting flowers of *Galenia populosa* (Eckl. and Zeyh.) Sond., Aizoaceae, *Athanasia* sp., Asteraceae, *Euclea crispa*

(Thunb.) Guerke, Ebenaceae, *Chamaesyce glanduligera* (Pax) Koutnik, Euphorbiaceae, *Indigofera* sp., Fabaceae, and *Limeum argute-carinatum* Wawra and Peyr., Molluginaceae); Dollfuss, 2017b:1255 (South Africa: locality records).

### 66. *michelbacheri* R. Bohart

*Philanthus michelbacheri* R. Bohart, 1972:400, ♀, ♂. Holotype: ♂, USA: Mexico: Baja California Norte: Rancho Santa Margarita 28 mi S El Arco (CAS). – R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae).

### 67. *minor* Kohl

*Philanthus minor* Kohl, 1891:358, ♀. Holotype: ♀, Egypt: no specific locality (ZMHU). – Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:488 (in catalog of world Hymenoptera); Mochi, 1939a:96 (in revision of Egyptian *Philanthus*, as *minor* Handlirsch); de Beaumont, 1949b:190 (in revision of northwest African *Philanthus*); nec de Beaumont, 1953a:173 (= *Philanthus schulthessi*); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Guichard, 1994a:210 (United Arab Emirates, Egypt, Tunisia, Chad, Mali, Sudan, Mauritania, variation discussed); Gadallah, 1996:72 (in revision of Egyptian *Philanthus*); Roche, 2007a:127 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Schmid-Egger, 2011b:569 (United Arab Emirates: north of Ajman, Mahafiz), 2014:591 (United Arab Emirates: Mahafiz); Dollfuss, 2017b:1255 (locality records from Morocco and Tunisia).

### 68. *mongolicus* F. Morawitz

*Philanthus mongolicus* F. Morawitz, 1889:151, ♀, ♂. Syntypes: China: Ta-wan, Djin-tasy, Balk-noor in Ordos (ZIN). – Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:488 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Kazenas, 2001b:51 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:135 (geographic distribution, collecting localities in Kazakhstan); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Dollfuss, 2017b:1255 (Mongolia: locality records).

### 69. *multimaculatus* Cameron

*Philanthus multimaculatus* Cameron, 1891a:133, ♂. Lectotype: ♂, Mexico: Veracruz: Atoyac (BMNH), designated by R. Bohart and Grissell, 1975:12 (Article 74b). – Kohl, 1891:368 (in checklist of world *Philanthus*); Dalla Torre, 1897:488 (in catalog of world Hymenoptera, misspelled as *multiannulatus*); Cockerell, 1899a:141 (New Mexico); Alcock, 1975a:222 (nesting habits), 1975f:889 (male territorial behavior); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 12 (in revision of *Philanthus* of California); Hurd and Linsley, 1975:117 (on flowers of *Larrea tridentata* (De Candolle) Coville, Zygophyllaceae; New Mexico: Hidalgo County: Lordsburg); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Kumar, Lavigne, Lloyd, and Pfadt, 1976:51 (USA: Colorado: Pawnee National Grassland); Krombein, 1979b:1723 (in catalog of North American Hymenoptera, nesting sites, list of parasites and prey); O'Neill and Evans, 1982:798 (major prey: family and genus); Rust, Hanks, and Bechtel, 1983:406 (Nevada: Churchill County: Sand Mountain); Rust, Menke, and Miller, 1985:47 (California: Channel Islands); Parks, 1986:35 (Torrey Pines State Reserve); Evans and O'Neill, 1988:105 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:259, 260 (references to publications on nest parasites *Senotainia trilineata* (Wulp), *Senotainia* sp. near *trilineata* (Wulp), and *Senotainia* sp., miltogrammine flies); Amarante, 2002:63 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Blösch, 2006:58 (males and females spend nights in the same galleries); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Ratzlaff, 2016:28 (Canada: British Columbia: from Krombein, 1979). – As *Pseudanthophilus multimaculata* [sic]: Ashmead, 1899d:297 (tentative new combination, in checklist

of North American Crabronidae).— *As Anthophilus multimaculatus*: Rohwer, 1917a:244 (new combination, California: Santa Barbara).

*Philanthus anna* Dunning, 1897:68, ♀. Lectotype: ♀, USA: Colorado: no specific locality (ANSP), designated by R. Bohart and Grissell, 1975:12. Synonymized with *Philanthus multimaculatus* by Dunning, 1898b:154, by R. Bohart and Grissell, 1975:12, and by R. Bohart in R. Bohart and Menke, 1976:565 (as new synonym). — Strandtmann, 1945b:153 (in review of North American *Philanthus*, as *anna*), 1946:53 (in revision of North American *Philanthus*, as *annae*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); Cazier and Mortenson, 1965a:197 (nesting habits); G. Bohart, Nye, and Hawthorn, 1970:48 (Utah: Logan, onion pollinator); Horning and Barr, 1970:105 (USA: Idaho: Craters of the Moon National Monument); Frommer, 1988:94 (California: Riverside County: Deep Canyon).

*Philanthus annae* Dunning, 1898b:154. Unjustified emendation of *Philanthus anna* 1897. — Cockerell, 1899a:141 (New Mexico). — Strickland, 1947:128 (Canada: Alberta: Lethbridge).

*Philanthus cleomae* Dunning, 1898b:152, ♀. Lectotype: ♀, USA: California: San Bernardino County: no specific locality (ANSP), designated by R. Bohart and Grissell, 1975:12. Synonymized with *Philanthus annae* by Strandtmann, 1945b:153, and with *Philanthus multimaculatus* by R. Bohart and Grissell, 1975:12, and R. Bohart in R. Bohart and Menke, 1976:565 (as new synonym). — Cockerell, 1899a:141 (New Mexico); Johnson and Ledig, 1918:24 (California: Claremont, as *cleome*).

*Philanthus subversus* Banks, 1915:405, B. Lectotype: B, USA: Arizona: Palmerlee (MCZ), designated by R. Bohart and Grissell, 1975:12. Synonymized with *Philanthus annae* by Strandtmann, 1945b:153, and with *Philanthus multimaculatus* by R. Bohart and Grissell, 1975:12, and R. Bohart in R. Bohart and Menke, 1976:565 (as new synonym).

*Philanthus yakima* Banks, 1919:85, ♀. Holotype or syntypes: ♀, USA: Washington: Yakima (MCZ). Synonymized with *Philanthus annae* by Strandtmann, 1945b:153, and with *Philanthus multimaculatus* by R. Bohart in R. Bohart and Menke, 1976:565.

As *Philanthus crabroniformis*: Viereck and Cockerell, 1904b:143 (in revision of *Philanthus* of New Mexico), corrected to *Philanthus annae* by Strandtmann, 1945b:153.

### 70. *namaqua* Arnold

*Philanthus namaqua* Arnold, 1925:159, ♀ (authorship attributed to Brauns). Holotype: ♀, South Africa: Northern Cape Province: Port Nolloth. — Arnold, 1930:10 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### 71. *nasalis* R. Bohart

*Philanthus nasalis* R. Bohart, 1972:401, ♂, ♂. Holotype: ♂, USA: California: Contra Costa County: Antioch (UCD). — R. Bohart and Grissell, 1975:6, 8 (in key to North American *Philanthus*), 13 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Krombein, 1979b:1723 (in catalog of North American Hymenoptera); Powell, 1981:55 (USA: California: Antioch).

### 72. *natalensis* Arnold

*Philanthus natalensis* Arnold, 1925:152, ♀ (authorship attributed to Brauns). Holotype: ♀, South Africa: KwaZulu-Natal: Durban (TMP). — Arnold, 1930:10 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### 73. *neomexicanus* Strandtmann

*Philanthus neomexicanus* Strandtmann, 1946:53, ♀, ♂. Holotype: ♂, USA: New Mexico: Mesilla Park (USNM). — Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); Muma, 1952:28 (paratype in UNL); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 14 (in revision of *Philanthus* of California); Hurd and Linsley, 1975:117 (Arizona: Cochise County: Portal; on flowers of *Larrea tridentata* (De

Candolle) Coville, Zygothylacidae); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Krombein, 1979b:1723 (in catalog of North American Hymenoptera); Gambino, 1985:226 (California: Point Reyes; prey including syrphid *Sphaerophoria cylindrica* (Say)); Evans and O'Neill, 1988:138 (Gambino, 1985, observations reported); Frommer, 1988:94 (California: Riverside County: Deep Canyon); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae).

#### 74. *nepalensis* Bingham

*Philanthus nepalensis* Bingham, 1908:356, ♂. Holotype: ♂, Nepal: Katmandu (BMNH). – Bingham, 1908:357 (in key separating *Philanthus punjabensis* and *nepalensis*); Ramakrishna Aiyar, 1916:557 (in catalog of Indian aculeates described after Bingham, 1897); R. Bohart and Menke, 1976:565.

#### 75. *nigritus* Gravenhorst

*Philanthus nigritus* Gravenhorst, 1807:278, sex not indicated (as *nigrita*, incorrect original termination). Holotype or syntypes: origin unknown, probably Germany (destroyed?). – Dalla Torre, 1897:489 (in catalog of world Hymenoptera); W. Schulz, 1912b:50 (original description copied); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

#### 76. *nigrohirtus* R. Turner

*Philanthus nigrohirtus* R. Turner, 1918c:461, ♀, ♂. Syntypes: Kenya, Rwanda, Uganda (BMNH). – Arnold, 1925:164 (in revision of southern African *Philanthus*), 1930:11 (in checklist of Afrotropical Sphecidae), 1943:73 (Zaire); Leclercq, 1955i:408 (Burundi); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Rodgers and Homewood, 1982:233 (Tanzania: Usambara Mountains); Dollfuss, 2017b:1255 (locality records from Benin, Central African Republic, Ethiopia, Kenya, Malawi, Mozambique, Zambia, and Zimbabwe).

#### *ssp. calvus* R. Turner

*Philanthus nigrohirtus* subsp. *calvus* R. Turner, 1918c:462, ♀, ♂. Syntypes: Zambia: Luangwa Valley (BMNH). – Arnold, 1925:165 (in revision of southern African *Philanthus*); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae). – **As *Philanthus nigrohirtus* race *calvus***: Arnold, 1930:11 (new status, in checklist of Afrotropical Sphecidae).

#### 77. *nitidus* Magretti

*Philanthus nitidus* Magretti, 1884c:595, ♀, ♂. Syntypes: Sudan: Dar el Salaam; Ethiopia: Atbara River near Metemma (MSNG). – Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:489 (in catalog of world Hymenoptera); W. Schulz, 1911b:170 (redescription); Guiglia, 1939b: (Ethiopia: Lake Tana: Barentu, color variation); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae). – **As *Philanthus stygius* ssp. *nitidus***: Guiglia, 1943c:75 (new status, Ethiopia: Gamo Gofa: Sagan – Omo region). – **As *Philanthus stygius* var. *nitidus***: Guiglia, 1950:232 (new status, Ethiopia: Gamo Gofa: Caschei).

#### 78. *nobilis* Kohl

*Philanthus nobilis* Kohl, 1891:354, sex not indicated. Syntypes: Azerbaijan: Helenendorf, now Khanlar; and Armenia: Arax River valley (NHMW). – Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:489 (in catalog of world Hymenoptera); Kazenas, 1970b:366 (Kazakhstan); R. Bohart and Menke, 1976:1891 (in checklist of world Sphecidae); Dollfuss, 1989:11 (type material in NHMW); Kazenas, 2001b:52 (tentatively in checklist of Sphecidae of Kazakhstan and Central Asia).

#### 79. *notatulus* F. Smith

*Philanthus notatulus* F. Smith, 1862:57, ♀. Holotype or syntypes: ♀, Indonesia: Sulawesi: Menado (BMNH). – F. Smith, 1863b:136 (known from Sulawesi), 1871a:370 (in catalog of Oriental Aculeata); Cameron, 1890b:248 (listed); Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:489 (in catalog of world Hymenoptera); von Schulthess, 1935:305 (Indonesia: Flores, Kelimotote, determination tentative); van der Vecht, 1966:425

(species definition, subspecies), 430 (description of subspecies *notatulus notatulus*); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Dollfuss, 2017b:1256 (locality records from Indonesia, Laos, Malaysia, and Thailand).

### **ssp. *concinnus* Bingham**

*Philanthus concinnus* Bingham, 1896c:442, ♀. Holotype or syntypes: ♀, Burma: Tenasserim: no specific locality (BMNH). – Bingham, 1897:442 (in Wasp and Bee Fauna of British India); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, probably not identical with Bingham's species); Pagliano, 2014:103 (specimens in M. Spinola collection, Torino, are *Philanthus coarctatus coarctatus*). – **As *Philanthus notatulus concinnus***: van der Vecht, 1966:426 (new status, redescription); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Pham, Kumar and Danilov, 2015:1596 (in list of Sphecidae s.l. of Vietnam).

*Philanthus angustatus* R. Turner, 1919f:394, ♂. Holotype: ♂, Vietnam: Tonkin: Chapa (BMNH). Tentatively synonymized with *Philanthus notatulus concinnus* by Bohart and Menke, 1976:565.

### **ssp. *formosanus* Tsuneki**

*Philanthus formosanus* Tsuneki, 1973f:40, ♀. Holotype: ♀, Taiwan: Chiai Prefecture: Chuchi (T. Morota coll.). – Murota, 1973b:117 (Taiwan); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Porter, Stange, and Wang, 1999:14 (in checklist of Sphecidae of Taiwan). – **As *Philanthus notatulus formosanus***: Tsuneki, 1974, Hymenopt. Comm., 1:28 (new status, in Japanese), 1975:35 (new status); R. Bohart and Menke, 1976:628 (in checklist of world Sphecidae); Tsuneki, 1984b:50 (Philippines: Luzon: Baguio City); Hua, 2006:281 (in list of Chinese insects, geographic distribution).

### **ssp. *javanus* van der Vecht**

*Philanthus notatulus javanus* van der Vecht, 1966:427, ♀, ♂. Holotype: ♀, Indonesia: East Java: Blawan Estate in Idjen Mountains (RMNH). – R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### **ssp. *wegneri* van der Vecht**

*Philanthus notatulus wegneri* van der Vecht, 1966:430, ♀. Holotype: ♀, Indonesia: Lesser Sunda Islands: West Flores: Rane Mese (Basel). – R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae).

### **80. *nursei* (Bingham)**

*Trachypus nursei* Bingham, 1898a:108, ♀, ♂. Syntypes: Yemen: Lahej and Shaik Othman (BMNH). – **As *Philanthus nursei***: R. Bohart and Menke, 1976:565 (new combination, in checklist of world Sphecidae).

### **81. *occidentalis* Strandtmann**

*Philanthus occidentalis* Strandtmann, 1946:66, ♀, ♂. Holotype: ♂, USA: California: Inyo County: Lone Pine (CAS). – Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 14 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Krombein, 1979b:1723 (in catalog of North American Hymenoptera).

### **82. *oraniensis* Arnold**

*Philanthus oraniensis* Arnold, 1925:152, ♀ (authorship attributed to Brauns). Holotype: ♀, South Africa: Free State: Bloemfontain (TMP). – Arnold, 1930:10 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae)

### **83. *ordinarius* Bingham**

*Philanthus ordinarius* Bingham, 1896c:441, ♀. Holotype or syntypes: ♀, Burma: Tenasserim: no specific locality (BMNH). – Bingham, 1897:296 (in Wasp and Bee Fauna of British India); Iwata and Yoshikawa, 1961:399 (Thailand); Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

**84. *pacificus* Cresson**

*Philanthus pacificus* Cresson, 1880a:xxxii, ♂. Lectotype: ♂, USA: Nevada: no specific locality (ANSP), designated by Cresson, 1916:101. – Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:368 (in checklist of world *Philanthus*); Dalla Torre, 1897:489 (in catalog of world Hymenoptera); Cockerell, 1899a:141 (New Mexico); Viereck, 1903b:733 (New Mexico); Viereck and Cockerell, 1904b:144 (in revision of *Philanthus* of New Mexico); H. Smith, 1908b:355 (in revision of Nebraskan Sphecidae); Stevens, 1917:421 (North Dakota); Mickel, 1918b:387 (in catalog of Nebraskan Sphecidae); Evans, 1970:501 (Wyoming: Jackson Hole, nesting habits, list of prey); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 15 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:566 (new status, in checklist of world Sphecidae); Krombein, 1979b:1724 (in catalog of North American Hymenoptera); O'Neill and Evans, 1982:798 (major prey: family and genus); Rust, Hanks, and Bechtel, 1983:406 (Nevada: Churchill County: Sand Mountain; as *pacificus pacificus*); Rust, Menke, and Miller, 1985:47 (California: Channel Islands); Evans and O'Neill, 1988:129 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:259 (reference to publication on nest parasite *Senotainia trilineata* (Wulp), a miltogrammine fly); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Kaltenpoth et al., 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Ratzlaff, 2016:28 (Canada: British Columbia: from R. Bohart and Grissell, 1975); Dollfuss, 2017b:1256 (Washington: Benton County: Prosser). – **As *Anthophilus pacificus***: Ashmead, 1899d:297 (new combination, in checklist of North American Crabronidae); Rohwer, 1917a:244 (California: Alameda and Santa Barbara Counties). – **As *Philanthus politus pacificus***: Strandtmann, 1945b:154 (new status, in review of North American *Philanthus*), 1946:86 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); Powell and Chemsak, 1959a:115 (nesting habits); Horning and Barr, 1970:106 (USA: Idaho: Craters of the Moon National Monument); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey).

**ssp. *arizonae* Dunning**

*Philanthus arizonae* Dunning, 1898b:155, ♂. Holotype: ♂, USA: Arizona: Phoenix (ANSP). – Strandtmann, 1946:86 (as synonym of *Philanthus pacificus*); R. Bohart and Grissell, 1975:15 (as synonym of *Philanthus pacificus*). – **As *Philanthus pacificus arizonae***: R. Bohart in R. Bohart and Menke, 1976:566 (new status, in checklist of world Sphecidae); Krombein, 1979b:1724 (in catalog of North American Hymenoptera, nesting sites, list of parasites and prey); Parks, 1986:35 (Torrey Pines State Reserve); Amarante, 2002:64 (in catalog of Neotropical Crabronidae).

*Anthophilus hirticeps* Cameron, 1905l:376, ♂. Lectotype: ♂, Mexico: no specific locality (BMNH), designated by R. Bohart and Grissell, 1975:15 (Article 74b). Synonymized with *Philanthus pacificus* by R. Bohart and Grissell, 1975:15 and with *Philanthus pacificus arizonae* by R. Bohart in R. Bohart and Menke, 1976:566.

*Philanthus assimilis* Banks, 1913b:422, ♀. Lectotype: ♀, USA: California: Shasta (AMNH), designated by R. Bohart and Grissell, 1975:15 (Article 74b). Synonymized with *Philanthus politus pacificus* by Strandtmann, 1945b:154, and with *Philanthus pacificus arizonae* by R. Bohart in R. Bohart and Menke, 1976:566.

**85. *pallidus* Klug**

*Philanthus pallidus* Klug, 1845:[28], plate 47, fig. 8, ♂. Holotype or syntypes: ♂, Sudan: Ambukohl on Nile west of Korti (ZMHU). – F. Smith, 1856:470 (in catalog of Hymenoptera in British Museum); Kohl, 1891:362 (redescription), 365 (in checklist of world *Philanthus*); Dalla Torre, 1897:489 (in catalog of world Hymenoptera); Arnold, 1925:174 (Kohl's 1891 description translated into English), 1930:11 (in checklist of Afrotropical Sphecidae); Scott in Arnold, 1933a:369 (described from Ethiopia); Guiglia, 1939a:199 (Eritrea: Massawa = Mitsi'wa); Mochi, 1939a:98 (in revision of Egyptian *Philanthus*); Giner Marí, 1945b:362 (Morocco: Western Sahara: Tisla); de Beaumont, 1949b:188 (in revision of northwest African *Philanthus*), 1953a:173 (Mauritania); de Beaumont and Bytinski-Salz, 1959:146 (Israel); de Beaumont, 1961a:205 (geographic distribution); R. Bohart and Menke,



1976:566 (in checklist of world Sphecidae); Roche, 1981:5 (in checklist of Sphecidae of United Arab Emirates); Guichard, 1994a:211 (Arabian Peninsula); Gadallah, 1996:72 (in revision of Egyptian *Philanthus*); D. Baker, 1997b:189 (in catalog of insect described by Klug, 1945); Gadallah and Assery, 2004a:219 (in key to Sphecidae of Jeddah Region, Saudi Arabia); Gadallah and Assery, 2004a:232 (in catalog of Sphecidae of Saudi Arabia); Roche, 2007a:127 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Schmid-Egger, 2011b:569 (United Arab Emirates: north of Ajman, Mahafiz), 572 (color photograph of female); Gadallah, Al Dhafer, Aldryhim, Fadl, and Elgharbawy, 2013:359 (in new catalog of Sphecidae of Saudi Arabia); Ebrahimi, 2014:47 (Iran: Hormozgān: Bandar-e Lengeh); Schmid-Egger, 2014:591 (United Arab Emirates); S. Gess and Roosenschoon, 2016:106 (Dubai Desert Conservation Reserve, visiting flowers of *Calotropis procera* (Aiton) W.T. Aiton, Apocynaceae, and of *Centaurea pseudosinaica* Czerep., Asteraceae); Dollfuss, 2017b:1256 (Egypt: Wadi el Tih); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:82 (Iran: known from Hormozgan Province).

As *Philanthus schulthessi*: Guichard, 1980:230 (Oman), corrected to *Philanthus pallidus* by Guichard, 1994a:211.

### 86. *parkeri* G. Ferguson

*Philanthus parkeri* G. Ferguson, 1983a:58, ♀, ♂. Holotype: ♂, USA: Utah: Emery County: 2 mi north of Goblin Valley State Preserve (USNM). – Stubblefield, 1985:5 (prey: bees and *Pluto*); Evans and O'Neill, 1988:112 (Stubblefield 1985 observations reported); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts).

### 87. *pilifrons* Cameron

*Philanthus pilifrons* Cameron, 1908:271, ♀ (March). Syntypes: ♀, Tanzania: Mount Kilimanjaro: Kibonoto (NRS). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae). – As synonym of *Philanthus ugandicus*: R. Turner, 1918c:463 (color variation), Arnold, 1925:150 (as synonym of *Philanthus ugandicus*); Dollfuss, 2017b:1256 (locality records from Cameroon and Zimbabwe).

*Philanthus ugandicus* Magretti, 1908:188, ♀. Holotype or syntypes: ♀, Kenya: Rift Valley Province: Naivasha (MNHN). Synonymized with *Philanthus pilifrons* by R. Turner, 1918c:463. – R. Turner, 1918c:463 (revision); Arnold, 1925:150 (in revision of southern African *Philanthus*), 1930:10 (in checklist of Afrotropical Sphecidae), 1933a:354 (Ethiopia: Wachacha Ravine near Addis Ababa, between Jem-Jem and Addis Ababa, Mount Zukwala), 1951:100 (Ethiopia: Addis Ababa, Dessie, and Zuquala); Leclercq, 1955i:408 (Burundi); de Beaumont, 1967b:505 (South Africa: KwaZulu-Natal).

### ssp. *xanthogaster* Cameron

*Philanthus xanthogaster* Cameron, 1908a:269, ♀. Holotype or syntypes: ♀, Tanzania: Mount Meru lowlands: Ngare na nyuki (NRS). – As *Philanthus ugandicus* var. *xanthogaster*: Arnold, 1925:151 (new status, description of ♂), 1930:10 (in checklist of Afrotropical Sphecidae). – As *Philanthus pilifrons xanthogaster*: R. Bohart and Menke, 1976:566 (new status, new subspecific combination, in checklist of world Sphecidae).

### 88. *politus* Say

*Philanthus politus* Say, 1824:113, sex not indicated. Holotype or syntypes: Pennsylvania: no specific locality (destroyed). – Klug, 1846:42 (belongs to subsection *Anthophilus* of *Philanthus*); F. Smith, 1856:474 (in catalog of Hymenoptera in British Museum); Le Conte, 1859a:113 (original description copied), 232 (reference to original description); Cresson, 1862:236 (in catalog of North American Hymenoptera), 1865c:94 (in revision of North American Philanthinae); Packard, 1866:55 (in key to North American *Philanthus*), 56 (bibliographic references, geographic distribution); Cresson, 1887:281 (in catalog of North American Hymenoptera); Provancher, 1888:417 (in addition to Sphecid Fauna of Quebec: Ontario: Ottawa); Kohl, 1891:369 (in checklist of world *Philanthus*); Robertson, 1894:460 (visiting flowers of *Aster paniculatus* Lam.); Dalla Torre, 1897:489 (in catalog of world Hymenop-

- tera); Dunning, 1897:69 (Connecticut); Viereck and Cockerell, 1904b:143 (in revision of *Philanthus* of New Mexico); H. Smith, 1908b:356 (in revision of Nebraskan Sphecidae); J. Smith, 1910:678 (in new list of insects of New Jersey); Rohwer, 1916b:673, 675 (in catalog of Hymenoptera of Connecticut); Mickel, 1918b:387 (in catalog of Nebraskan Sphecidae); Rau and Rau, 1918:109 (nesting habits); Rau, 1922:21 (USA: Missouri: Silica); Rohwer in Viereck, 1925:673, 675 (in key to Sphecidae of Connecticut; Poquonock); J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae); Brimley, 1938:447 (North Carolina: Aberdeen, Biltmore, Bryson City, Cruso, Fairmont, Harnett County, Hendersonville, Laurel Hill, Overhills, Swannanoa); Strandtmann, 1945b:154 (in review of North American *Philanthus*), 1946:77 (in revision of North American *Philanthus*); Dreisbach, 1947:142, 143 (in key to *Philanthus* of Michigan), 145 (Michigan: locality records); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); Evans, 1957b:84 (description of larva); Evans and Lin, 1959:116 (nesting habits, as *politus politus*); Evans, 1963c:113 (comparison of behavior with *Philanthus gibbosus* and *solvagus*), fig. 17 after p. 134 (photograph of female at her nest); Kurczewski and Kurczewski, 1963:148 (Pennsylvania: Presque Isle State Park); Evans, 1975a:264 (slow colonizer of new habitats); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Krombein, 1979b:1724 (in catalog of North American Hymenoptera, nesting sites, list of prey); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection); Finnamore, 1982:240 (in Sphecid Fauna of Southern Quebec); O'Neill and Evans, 1982:798 (major prey: family and genus); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey); Evans and O'Neill, 1988:112 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:257, 259, 260 (nest parasites: *Phrosinella aurifacies* Downes and *Sphenometopia tergata* (Coquillett), miltogrammine flies, references to publications on nest parasites *Phrosinella fulvicornis* (Coquillett), *Senotainia trilineata* (Wulp), and *Senotainia vigilans* Allen, miltogrammine flies); Kurczewski and Acciavatti, 1990:61 (New York: Cayuga County); Spofford and Kurczewski, 1990:747, 748, 749, 750 (nest parasites: *Phrosinella aurifacies* Downes, *Senotainia trilineata* (Van der Wulp), *Senotainia vigilans* Allen, and *Sphenometopia tergata* (Coquillett), Sarcophagidae), 1992:1000 (species of miltogrammine parasites listed), 1002 (counter-cleptoparasitic behavior: freeze-stop and face-off, diversionary flight); Ahlstrom, 1995:113 (in checklist of insects of North Carolina); Kurczewski, 1998d:250 (pine barrens in upstate New York); Sugar et al., 1998:16 (Canada: southern Ontario); Skevington et al., 2001:128 (Canada: Ontario: Lambton County); Buck, 2004:27 (in checklist of Crabronidae of Ontario, Canada); Kaltenpoth et al., 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Pagliano, 2014:104 (specimens in M. Spinola collection, Torino, are *Philanthus politus*). – **As *Anthophilus politus***: Dahlbom, 1844:190 (new combination, in revision of Sphecidae and Pompilidae), 1845:496 (in key to *Anthophilus*); Ashmead, 1899d:297 (in checklist of North American Crabronidae); J. Smith, 1900:520 (in list of insects of New Jersey); Harrington, 1902:222 (Canada: Ontario: Ottawa).
- Philanthus dubius* Cresson, 1865c:96, B. Lectotype: B, USA: Illinois: no specific locality (ANSP), designated by Cresson, 1916:100. Synonymized with *Philanthus politus* by Packard, 1866:56. – Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:367 (in checklist of world *Philanthus*, may be a synonym of *Philanthus politus*); Dalla Torre, 1897:485 (in catalog of world Hymenoptera); Dunning, 1897:69 (Connecticut); J. Smith, 1910:678 (in new list of insects of New Jersey); Rohwer, 1916b:673, 674 (in catalog of Hymenoptera of Connecticut); Rohwer in Viereck, 1925:673, 674 (in key to Sphecidae of Connecticut; Hartford, New Haven). – **As *Anthophilus dubius***: Ashmead, 1899d:297 (new combination, in checklist of North American Crabronidae); J. Smith, 1900:520 (in list of insects of New Jersey); Harrington, 1902:222 (Canada: Ontario: Ottawa).
- Philanthus texanus* Banks, 1913b:421, ♀, ♂. Syntypes: ♂, USA: Texas: Fedor County: Lee (AMNH). Synonymized with *Philanthus politus* by R. Bohart in R. Bohart and Menke, 1976:566. – **As *Philanthus politus texanus***: Strandtmann, 1945b:154 (new status, in review of North American *Philanthus*), 1946:80 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera).

As *Philanthus pulcher* (part): Skevington et al., 2001:128 (Canada: Ontario: Lambton County), corrected to *Philanthus politus* by Buck, 2004:76.

### 89. *promontorii* Arnold

*Philanthus promontorii* Arnold, 1925:147, ♂ (authorship attributed to Brauns). Holotype: ♂, South Africa: Gauteng: Johannesburg (SAM). – Arnold, 1930:10 (in checklist of Afrotropical Sphecidae), 1960a:83 (South Africa: Drakensberg Mountains); R. Bohart and Menke, 1976:56. (in checklist of world Sphecidae).

### 90. *psyche* Dunning

*Philanthus psyche* Dunning, 1896b:287, ♀. Holotype: ♀, USA: New Mexico: Las Cruces (ANSP). – Cockerell, 1899a:141 (New Mexico); Viereck and Cockerell, 1904b:143 (in revision of *Philanthus* of New Mexico); H. Smith, 1908b:355 (in revision of Nebraskan Sphecidae); Mickel, 1918b:387 (in catalog of Nebraskan Sphecidae); Cresson, 1928:49 (holotype in ANSP); Strickland, 1947:128 (Canada: Alberta: Medicine Hat); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); R. Bohart in R. Bohart and Menke, 1976:566 (new status, in checklist of world Sphecidae); Krombein, 1979b:1724 (in catalog of North American Hymenoptera); O'Neill, 1979:19 (territorial behavior in males); Spofford, Kurczewski, and Downes, 1989:258 (reference to publication on nest parasite *Senotainia rufiventris* (Coquillett), a miltogrammine fly); Gwynne and O'Neill, 1980:220-223 (male territoriality results in higher predation by Asilidae); O'Neill and Evans, 1982:798 (major prey: family and genus); Evans and O'Neill, 1988:112 (male behavior, nesting habits, natural enemies); O'Neill and O'Neill, 1988:15 (thermal stress and microhabitat selection); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Matthews and Matthews, 2005:65 (Nebraska: Keith County; nesting habits); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts). – As *Philanthus politus psyche*: Strandtmann, 1945b:154 (new status, in review of North American *Philanthus*), 1946:89 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); G. Bohart, Nye, and Hawthorn, 1970:48 (Utah: Logan, onion pollinator).

*Philanthus punctinudus* Viereck and Cockerell, 1904b:144, B. Holotype: B, USA: New Mexico: San Marcial (ANSP). Synonymized with *Philanthus politus psyche* by Strandtmann, 1945b:154. – Cresson, 1928:49 (holotype in ANSP).

*Philanthus hermosus* Banks, 1913b:421, ♀. Holotype or syntypes: ♀, USA: New Mexico: no specific locality (AMNH). Synonymized with *Philanthus politus psyche* by Strandtmann, 1945b:154.

### 91. *pulchellus* Spinola

*Philanthus pulchellus* Spinola, 1843b:XXXVI, sex not indicated. Holotype or syntypes: Spain and Portugal: no specific localities (ZMHU). – Dalla Torre, 1897:489 (in catalog of world Hymenoptera); de Beaumont, 1951c:313 (as nomen nudum); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae, not nomen nudum); Gayubo, 1982b:50 (Spain: Salamanca: Horcajo de Montemayor, Peromingo, Valdefuentes de Sangusín, Valdelacasa), 1982e:109 (Spain: Cádiz Province), 1983a:125 (prey: *Halictus* sp.), 1983e:236 (Spain: Salamanca Province), 1984c:382 (Portugal: El Algarve Province); Gayubo and Tormos, 1984:23 (Spain: Valencia); Gayubo, 1985c:172 (Spain: Almería: El Alquízar; Valladolid: Traspinedo, 1986a:66 (Spain: Ciudad Real Province), 1986b:41 (Spain: Andalucía), 1986d:121 (Spain: Zamora Province); Gayubo and Sanza, 1986:84 (Spain: Burgos); Gayubo and Tormos, 1986a:14 (Spain: Castellón de la Plana), 1986b:7 (Spain: Valencia); Tormos and Jiménez, 1987a:127 (Spain: Valencia); Asís and Jiménez, 1988:275 (Spain: Castellón Province); Gayubo, 1991a:130 (characteristics of the species and relevant taxonomic problems); Gayubo and Torres, 1991:Table I and p. 81 (Spain: Salamanca; effects of urban pressure); Torregrosa, Gayubo, Tormos, and Asís, 1993:20 (Spain: Alicante Province); Tormos, Asís, and Gayubo, 1994:190, 224 (Spain: Albacete Province); Asís, Tormos, and Gayubo, 1996a:452 (nesting habits, description of mature larva); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:291 (in Sphecid Fauna of Western Europe); González, Gayubo, and Torres, 1998:74, 75 (Spain: Valladolid Province); Gayubo, García, Torres, and González,

1999:91 (Spain: Soria Province); Gayubo, and Torres, 1999:356 (Spain: Valladolid: Viana de Cega); Gayubo, González, and Torres, 2000:187 (Spain: Salamanca Province); Drewes, 2003:141 (Spain: Tarragona); Magdalou, 2006b:110 (France: Pyrénées-Orientales: Mas Larrieu Nature Reserve near Argelès-sur-Mer); Baños-Picón, Asís, Gayubo, and Tormos, 2009:314 (Spain: frequency of specimens collected with hand nets and Malaise traps); Gayubo, González, Tormos, and Asís, 2009:365 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); González, Gayubo, Asís, and Tormos, 2009:625 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Polidori, García, and Nieves-Aldrey, 2012:280 (study of female antennal sensillae); Polidori, Crottini, Della Venezia, Selfa, Saino, and Rubolini, 2013:40 (animal protein as food for larva, unable to manipulate food load, flight muscle ratio, wing loading); Dollfuss, 2017b:1256 (locality records from France, Portugal and Spain); Magdalou, 2017:16 (France: Pyrénées-Orientales: Réserves Naturelles Catalanes: Mas Larrieu).

*Philanthus sieboldti* Dahlbom, 1845:496, ♀, ♂ (as *Sieboldti*, incorrect original capitalization). Syntypes: "Europa meridionalis et Marocco" (Lund). Synonymized with *Philanthus pulchellus* by Bohart and Menke, 1976:566. – nec Eversmann, 1849:399 (= *Philanthus venustus*); nec Costa, 1860:5 (= *Philanthus coarctatus siculus*); Sichel, 1861:752 (Italy: Sicilia, probably *Philanthus coarctatus siculus*); Coulon, 1925:117 (France: Marseille; Spain: as *sieboldi*); de Beaumont, 1951c:313 (in revision of European *Philanthus*); Ceballos, 1956:365 (in catalog of Hymenoptera of Spain); Morel, Nouvel, and Ribaut, 1956:337 (France: Département des Pyrénées-Orientales); Nouvel and Ribaut, 1958:9 (France: Pyrénées-Orientales: Banyuls-sur-Mer area); Ceballos, 1959:228 (in supplement to catalog of Spanish Sphecidae); Diniz, 1959:27 (Portugal: eight localities); Suárez, 1959:54 (Spain: Almería Province); de Beaumont, 1962b:20 (Spain); Ceballos, 1964:88 (in supplement to catalog of Spanish Sphecidae); Diniz, 1966:6 (Portugal: eighteen localities); Balthasar, 1972:383 (in Sphecid Fauna of Czechoslovakia: may be expected in the country); Erlandsson, 1974:61 (France, Spain).

*Philanthus andalusiacus* Kohl, 1888:140, ♀, ♂. Syntypes: Spain: Andalusia: no specific locality (NHMW). Synonymized with *Philanthus sieboldti* by de Beaumont, 1951c:313. – Kohl and Handlirsch, 1889:279 (Turkmenistan, probably a misidentification); Kohl, 1891:363 (in checklist of world *Philanthus*); Dalla Torre, 1897:483 (in catalog of world Hymenoptera); Antiga and Bofill, 1904:22 (Spain: Cataluña Province); Dusmet y Alonso, 1931:7 (Portugal: Mitra, as *andalusicus*); Bischoff, 1933:5 Morocco: Marrakech, Tanger); Giner Marí, 1934:131 (Spain), 1943a:114 (in Sphecid Fauna of Spain); de Andrade, 1949:12 (Portugal).

As *Philanthus venustus* var. *raptor*: Berland, 1925:46 (in Sphecid Fauna of France), corrected to *Philanthus sieboldi* by de Beaumont, 1951c:313.

## 92. *pulcher* Dalla Torre

*Philanthus pulchellus* Cresson, 1865c:93, ♂, junior primary homonym of *Philanthus pulchellus* Spinola, 1842. Lectotype: ♂, USA: Colorado: Rocky Mountains: no specific locality (ANSP), designated by Cresson, 1916:101. – Packard, 1866:55 (in key to North American *Philanthus*), 56 (bibliographic reference, geographic distribution); Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:369 (in checklist of world *Philanthus*); Viereck and Cockerell, 1904b:144 (in revision of *Philanthus* of New Mexico). – As *Anthophilus pulchellus*: Hart, 1907:255 (new combination, Illinois).

*Philanthus pulcher* Dalla Torre, 1897:489. Substitute name for *Philanthus pulchellus* Cresson. – Mickel, 1918b:387 (in catalog of Nebraskan Sphecidae); Strickland, 1947:128 (Canada: Alberta: Medicine Hat, as *pulchrum*); Evans, 1966c:35 (nesting habits, prey), 1970:496 (Wyoming: Jackson Hole, nesting habits, list of prey); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 16 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae; as new status by R. Bohart); Kumar, Lavigne, Lloyd, and Pfadt, 1976:51 (USA: Colorado: Pawnee National Grassland); Evans, 1977d:26 (male behavior), 1978:32 (mating behavior), 1979b:33 (male mating strategies); Krombein, 1979b:1724 (in catalog of North American Hymenoptera, nesting sites, list of parasites and prey); Gwynne and O'Neill, 1980:220-223 (male territoriality results in higher predation by Asilidae); O'Neill and Evans, 1982:798 (major prey: family and genus); Rust, Hanks, and Bechtel,

1983:406 (Nevada: Churchill County: Sand Mountain); O'Neill, 1885:2188 (egg and prey size; sexual dimorphism in size); Evans and O'Neill, 1988:115 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:256, 257, 259 (references to publications on nest parasites *Metopia argyrocephala* (Meigen), *Phrosinella fulvicornis* (Coquillett), *Phrosinella fumosa* Allen, and *Senotainia trilineata* (Wulp), miltogrammine flies); McDaniel, Schmidt, and Howard, 1992:27 (mandibular gland secretion); Finnamore, 1997:894 (expected to occur in Yukon); nec Skevington et al., 2001:128 (= *Philanthus lepidus* and *politus*); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Ratzlaff, 2016:28 (Canada: British Columbia: from R. Bohart and Grissell, 1975); Dollfuss, 2017b:1257 (USA: locality records from Florida and Washington); Ratzlaff, 2018:116 (Canada: first record from Yukon: Pelly Crossing). – **As *Philanthus politus pulcher***: Strandtmann, 1945b:154 (new status, in review of North American *Philanthus*), 1946:81 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera).

*Philanthus clarconis* Viereck, 1906:206, ♀. Holotype: ♀, USA: Kansas: Clark County: no specific locality (Kansas Univ.). Synonymized with *Philanthus politus pulcher* by Strandtmann, 1945b:154. – LaBerge, 1956:527 (holotype in Snow Entomological Museum).

### 93. *pulcherrimus* F. Smith

*Philanthus pulcherrimus* F. Smith, 1856:469, ♀, ♂. Syntypes: India: no specific locality (BMNH). – F. Smith, 1871a:370 (in catalog of Oriental Aculeata); Cameron, 1890b:248 (listed); Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:489 (in catalog of world Hymenoptera); Bingham, 1908:356 (India: Jullundur, Ferozepore, Agra); Dutt, 1912:228 (preying on bees); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Evans and O'Neill, 1988:197 (Dutt 1912 observations reported).

### 94. *punjabensis* Nurse

*Philanthus punjabensis* Nurse, 1902:86, ♀. Syntypes: ♀, India: Punjab: Ferozepore, now Ferozpur (BMNH). – Bingham, 1908:357 (in key separating *Philanthus punjabensis* and *nepalensis*); Ramakrishna Aiyar, 1916:557 (in catalog of Indian aculeates described after Bingham, 1897); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

### 95. *radamae* Arnold

*Philanthus radamae* Arnold, 1945:17, ♀, ♂. (as *Radamae*, incorrect original capitalization). Syntypes: Madagascar: Behara, Bekily (MNH). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Leclercq, 1990b:120 (Madagascar); Hancock, Chahwanda, and Mhlanga, 1995:39 (syntypes in Bulawayo Museum); Pulawski, 2003b:799 (in checklist of Malagasy Sphecidae); Madl, 2014a:1005 (in catalog of Ampulicidae, Crabronidae, and Sphecidae of Madagascar, with synonymy and locality records).

### 96. *ramakrishnae* R. Turner

*Philanthus ramakrishnae* R. Turner, 1918b:361, ♀. Holotype or syntypes: ♀, India: Karnataka: Bababuddin Hills (BMNH). – van der Vecht, 1966:421 (description of ♂); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Dollfuss, 2017b:1257 (India: Tamil Nadu: Pakyra in Nilgiri Hills).

### 97. *reinigi* Bischoff

*Philanthus reinigi* Bischoff, 1930a:217, ♀. Holotype: ♀, Tajikistan: Pamir: Maz (ZMHU). – Gussakovskij, 1940:84 (Tajikistan: Hissar Range), 1952:276 (redescription, description of ♂); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Kazenas, 1978b:46 (in key to Sphecidae of Kazakhstan and Central Asia); Esenbekova and Kazenas, 2000:70 (southeast Kazakhstan: 10 km SW Alma Ata); Kazenas, 2001b:52 (in checklist of Sphecidae of Kazakhstan and Central Asia); Kazenas and Esenbekova, 2001:136 (Kazakhstan: Almatinskiy Nature Reserve);

Kazenas, 2002a:135 (geographic distribution, collecting localities in Kazakhstan); Yildirim and Ljubomirov, 2005:1806 (first record from Turkey: Erzurum: Ilıca. Tortum; Kars: Sarıkamış), 2007:119 (Turkey: Erzurum: Ilıca: Rizekent, and Tortum); Kazenas, 2008a:106 (Southeastern Kazakhstan: Zailiyskiy Alatau: 7-8 km S Talgar, Pravyi Talgar river, 10 km SW Alma Ata), 2008b:115 (Kazakhstan: foothills of Zailiyskiy Alatau: nesting in loess cliffs); Ljubomirov and Yildirim, 2008:127 (in catalog of Crabronidae of Turkey); Yildirim, 2012:77 (Turkey: Erzurum: Tortum: Aksu); Kazenas, 2013a:132, 133 (color photographs of adult wasps, short information on geographic distribution and nesting habits); Yildirim, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Mokrousov and Gromenko, 2015:126 (Uzbekistan: 5 km S village Karlik at 39°2'27"N 65°20'29"E); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:20 (Turkey: Tunceli: Pülümür: Dağyolu); Dollfuss, 2017b:1257 (Kyrgyzstan: Arashan River valley at 42°28'N 78°32'E).

### 98. *rubidus* Arnold (preoccupied)

*Philanthus abyssinicus* Arnold, 1932:7, ♀. Holotype: ♀, Ethiopia: Dire-Daua District (Zool. Mus. Hamburg). Junior primary homonym of *Philanthus dichrous abyssinicus* Arnold, 1925.

*Philanthus rubidus* Arnold, 1946:82. Substitute name for *Philanthus abyssinicus* Arnold, 1932. Junior primary homonym of *Philanthus rubidus* Jurine, 1807, now in *Cerceris*. – Arnold, 1951:100 (Ethiopia: River Errer near Harar); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Dollfuss, 2017b:1257 (locality records from Kenya and Tanzania).

### 99. *rugosifrons* Arnold

*Philanthus rugosifrons* Arnold, 1949:273, ♂. Holotype: ♂, Zambia: Abercorn, now Mbala (SAM). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Hancock, Chahwanda, and Mhlanga, 1995:39 (paratype in Bulawayo Museum).

### 100. *rugosus* Kohl

*Philanthus rugosus* Kohl, 1891:357, ♂, ♀. Syntypes: South Africa: Cape of the Good Hope: no specific locality (ZMHU). – Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Arnold, 1925:167 (in revision of southern African *Philanthus*); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); S. Gess, 1996:273, 280, 281 (floral records); Hancock, Chahwanda, and Mhlanga, 1995:39 (specimens in Bulawayo Museum); S. Gess and F. Gess, 2003:130 (South Africa: visiting flowers of *Athanasia trifurcata* (L.) L., Asteraceae); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Dollfuss, 2017b:1257 (locality records from Ethiopia and South Africa).

### 101. *rutilus* Spinola

*Philanthus rutilus* Spinola, 1839:488, ♀, ♂. Lectotype: ♂, Egypt: no specific locality (Torino), designated by de Beaumont, 1952e:49. – Spinola, 1843b: XXXVI (represented in Berlin Museum under the name *Philanthus byssinus*). – A. Costa, 1875:19 (Egypt: near Ghiza pyramids); Kohl, 1891:356 (redescription), 365 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Morice, 1911:93 (Algeria: Biskra; as *rutilans*); Storey, 1916:107 (Egypt: Maadi, as *rutilans*); Mellor, 1928:129 (Egypt, as *rutilans*); Mochi, 1939a:92 (in revision of Egyptian *Philanthus*); de Beaumont, 1949b:181 (in revision of northwest African *Philanthus*), 1956a:183 (Libya; Chad: Tibesti), 1960b:229 (Libya), 1961a:201 (geographic variation); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Casolari and Casolari Moreno, 1980:122 (specimens in M. Spinola collection, Torino); Guichard, 1994a:209 (Arabian Peninsula); Gadallah, 1996:70 (in revision of Egyptian *Philanthus*); Roche, 2007a:126 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Schmid-Egger, 2011b:569 (United Arab Emirates: north of Ajman, Um al-Quwain), 572 (color photograph of male); Pagliano, 2014:99 (specimens in M. Spinola collection, Torino).

including lectotype, are *Philanthus rutilus*); Dollfuss, 2017b:1257 (Egypt: Gebel Elba; Israel: Nahal Lavan 4 km northwest of Beer Milka at 30°57'33"N 34°22'21"E).

*Philanthus byssinus* Spinola, 1843b:XXXVI, sex not indicated, origin unknown, specimen(s) in Berlin Museum, as junior synonym of *Philanthus rutilus*. Not available: first proposed as a junior synonym (Article 11.6).

*Philanthus pachecoi* Giner Marí, 1945b:370, ♂. Holotype: ♂, Morocco: Western Sahara: Tisla (MNCN). Synonymized with *Philanthus rutilus* by de Beaumont, 1961a:202. – Giner Marí, 1945b:362 (Morocco: Western Sahara: Tisla), 1947:21 (Western Sahara, description of ♀). – **As *Philanthus rutilus pachecoi***: de Beaumont, 1949b:182 (new status, in revision of northwest African *Philanthus*), 1953a:173 (Mauritania); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

### 102. *sanbornii* Cresson

*Philanthus sanbornii* Cresson, 1865c:89, ♀, ♂ (as *Sanbornii*, incorrect original capitalization). Lectotype: ♀, USA: Massachusetts: no specific locality (ANSP), designated by Cresson, 1916:101. – Packard, 1866:54 (in key to North American *Philanthus*), 56 (bibliographic reference, geographic distribution); Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:369 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Dunning, 1897:69 (Massachusetts); H. Smith, 1908b:359 (in revision of Nebraskan Sphecidae), 678 (in new list of insects of New Jersey); Rohwer, 1916b:673, 674 (in catalog of Hymenoptera of Connecticut); Stevens, 1917:421 (North Dakota); Rohwer in Viereck, 1925:673, 674 (in key to Sphecidae of Connecticut; New Haven, Putnam, Waterbury); J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae); Brimley, 1938:447 (North Carolina: Wilmington); Strandtmann, 1945b:152 (in review of North American *Philanthus*), 1946:37 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); Evans, 1955b:47 (preying on honeybees); Krombein, 1958f:197 (list of prey); R. Bohart and Grissell, 1975:5, 7 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Krombein, 1979b:1725 (in catalog of North American Hymenoptera, incorrectly states “south to New Jersey”); O’Neill and Evans, 1982:798 (major prey: family and genus); Kurczewski and Miller, 1983:199-206 (nesting and prey); G. Ferguson, 1984a:294 (in revision of *zebratus* species group); Evans and O’Neill, 1988:70 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:256, 259 (references to publications on nest parasites *Metopia argyrocephala* (Meigen), *Phrosinella fulvicornis* (Coquillett), and *Senotainia trilineata* (Wulp), miltogrammine flies); Stubblefield et al., 1993:397 (prey species heterogeneity); Ahlstrom, 1995:113 (in checklist of insects of North Carolina); Deyrup and Eisner, 2003:522 (Floridian populations are red-marked); Buck, 2004:27 (in checklist of Crabronidae of Ontario, Canada); Dollfuss, 2017b:1257 (Michigan: Gratiot County; New York: Areola). – **As *Epiphilanthus Sandborni*** [sic]: Ashmead, 1899d:294 (new combination, type species of new genus *Epiphilanthus*), 296 (in checklist of North American Crabronidae). – **As *Ococletes sanbornii***: Mickel, 1918b:390 (new combination, in catalog of Nebraskan Sphecidae); Dreisbach, 1947:144 (Michigan: locality records). – **As *Anthophilus sanbornii***: J. Smith, 1900:520 (new combination, in list of insects of New Jersey).

*Philanthus scutellaris* Cresson, 1880a:xxxiv, B. Lectotype: ♂, USA: Kansas: no specific locality (ANSP), designated by Cresson, 1916:101 (Article 74b). Synonymized with *Philanthus sanbornii* by Strandtmann, 1945b:152. – Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:369 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Bridwell, 1899:209 (Kansas: no specific locality). – **As *Ococletes scutellaris***: Mickel, 1918b:390 (new combination, in catalog of Nebraskan Sphecidae).

*Philanthus eurynome* W. Fox, 1890:107, ♀. Holotype: ♀, USA: Florida: no specific locality (ANSP), designated by Cresson, 1928:49. Synonymized with *Philanthus sanbornii* by R. Bohart in R. Bohart and Menke, 1976:566. – Cresson, 1928:49 (holotype in ANSP); Dalla Torre, 1897:485 (in catalog of world Hymenoptera); Strandtmann, 1945b:152 (in review of North American *Philanthus*), 1946:34 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1001 (in catalog of North American Hymenoptera); Evans and Lin, 1959:128 (nesting habits); Krombein, 1967:413 (reference to Evans and Lin, 1959).

*Philanthus trumani* Dunning, 1897:70, ♀, actually ♂ (Dunning, 1898b:152). Holotype: ♂, USA: South Dakota: Brookings County: no specific locality (depository?). Synonymized with *Philanthus sanbornii* by Dunning, 1898b:152.

*Philanthus magdalenae* Strandtmann, 1945:152. Name created in synonymy of *Philanthus sanbornii*, authorship incorrectly attributed to Viereck (a mistake for Magdalena Mountains, the collection locality of Viereck, 1906:240). Not available: first proposed as a junior synonym (Article 11.6). – Strandtmann, 1946:37 (as synonym of *Philanthus sanbornii*). – LaBerge, 1956:527 (holotype of *Philanthus magdalenae* Viereck, 1906, in Snow Entomological Museum).

### 103. *schulthessi* Maidl

*Philanthus schulthessi* Maidl, 1924:242, ♀. Syntypes: ♀, Sudan: Tuti Island near Khartum (NHMW). – de Beaumont, 1956a:184 (Chad: Tibesti; diagnostic characters), 1961a:205 (redescription); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); nec Guichard, 1980:230 (= *Philanthus pallidus*); Dollfuss, 1989:11 (type material in NHMW), 2017b:1258 (Egypt: Marsa Matruh).

As *Philanthus minor* subsp.: de Beaumont, 1953a:173 (Mauritania), corrected to *Philanthus schulthessi* by de Beaumont, 1956a:184.

### *ssp. nigrinus* Bytinski-Salz

*Philanthus schulthessi nigrinus* Bytinski-Salz in de Beaumont and Bytinski-Salz, 1959:150, ♀. Holotype: ♀, Israel: Revivim (originally H. Bytinski-Salz coll., now Tel Aviv Univ.). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

### 104. *schusteri* R. Bohart

*Philanthus schusteri* R. Bohart, 1972:02, ♀, ♂. Holotype: ♂, USA: California: Imperial County: Palo Verde (UCD). – R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*), 16 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Krombein, 1979b:1725 (in catalog of North American Hymenoptera).

### 105. *scrutator* Nurse

*Philanthus scrutator* Nurse, 1902:87, ♀, ♂. Syntypes: India: Gujarat: Deesa (BMNH). – Ramakrishna Aiyar, 1916:557 (in catalog of Indian aculeates described after Bingham, 1897); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

### 106. *sculpturatus* Gayubo

*Philanthus sculpturatus* Gayubo, 1991a:130, ♀, ♂. Holotype: ♀, Spain: Huelva: Torre de la Higuera (S.F. Gayubo coll.). – Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:292 (in Sphecid Fauna of Western Europe); Gayubo, González, de la Nuez, Asís, and Tormos, 2006:211 (Portugal: Algarve: Quarteira); Bitsch, 2010:117 (in supplement to vol. II of Faune de France, 1997: recent record from Portugal reported)..

### 107. *serrulatae* Dunning

*Philanthus serrulatae* Dunning, 1898b:154, ♀, ♂. Syntypes: USA: Arizona: Phoenix (depository?). – nec R. Bohart and Grissell, 1975:6, 7, 17 (= *Philanthus boharti*); R. Bohart in R. Bohart and Menke, 1976:566 (resurrected status, in checklist of world Sphecidae); Krombein, 1979b:1725 (in catalog of North American Hymenoptera); G. Ferguson, 1983a:56 (synonymy, distribution); O'Neil, 1885:2188 (egg and prey size; sexual dimorphism in size); Evans and O'Neill, 1988:154 (male behavior, nesting habits); Amarante, 2002:64 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae). – As *Philanthus politus serrulatae*: Strandtmann, 1945b:154 (new status, in review of North American *Philanthus*), 1946:83 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera).



As *Philanthus albifrons*: H. Smith, 1908b:356 (in revision of Nebraskan Sphecidae), corrected to *Philanthus siouxensis* by Mickel, 1916a:406.

*Philanthus siouxensis* Mickel, 1916a:406, ♀. Holotype: ♀, USA: Nebraska: Harison (UNL). Synonymized with *Philanthus serrulatae* by R. Ferguson, 1983a:56. – Mickel, 1918a:325 (correction to original description), 1918b:387 (in catalog of Nebraskan Sphecidae); Muma, 1952:22 (holotype in UNL), 28 (paratypes in UNL); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); R. Bohart in R. Bohart and Menke, 1976:566 (new status, in checklist of world Sphecidae); Kumar, Lavigne, Lloyd, and Pfadt, 1976:51 (USA: Colorado: Pawnee National Grassland); Krombein, 1979b:1725 (in catalog of North American Hymenoptera); Amarante, 2002:64 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Amarante, 2005a:13 (correction to his 2002 catalog). – As *Philanthus politus siouxensis*: Strandtmann, 1945b:154 (new status, in review of North American *Philanthus*), 1946:91 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera).

### 108. *sicarius* F. Smith

*Philanthus sicarius* F. Smith, 1856:472, ♀. Holotype or syntypes: ♀, Equatorial Guinea: Fernando Póo, now Bioko: no specific locality (BMNH). – Radoszkowski, 1881:207 (Angola); Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Arnold, 1925:170 (original description copied, description of ♂), 1930:11 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Dollfuss, 2017b:1258 (locality records from Central African Republic, South Arica, and Zambia).

### 109. *soikai* de Beaumont

*Philanthus soikai* de Beaumont, 1961a:206, ♀. Holotype: ♀, Algeria: between Oran and Mostaganem (Lausanne). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Dollfuss, 2017b:1258 (locality records from Morocco and Tunisia).

### 110. *solivagus* Say

*Philanthus solivagus* Say, 1837:383, ♂. Holotype or syntypes: ♂, USA: Indiana: no specific locality (lost). – F. Smith, 1856:473 (in catalog of Hymenoptera in British Museum); Le Conte, 1859b:764 (original description copied); Cresson, 1862:237 (in catalog of North American Hymenoptera), 1865c:103 (original description copied); Packard, 1866:57 (description of ♀); Provancher, 1883b:641 (in revision of Canadian Hymenoptera); Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:369 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Dunning, 1897:69 (redescription); Howard, 1901:... (... as *solidagus*, a lapsus); J. Smith, 1910:678 (in new list of insects of New Jersey); Faull, 1913:384 (Canada: Toronto region); Rohwer, 1916b:673, 675 (in catalog of Hymenoptera of Connecticut); Stevens, 1917:421 (North Dakota, as *solvivagus*); Mickel, 1918b:386 (in catalog of Nebraskan Sphecidae); Rohwer in Viereck, 1925:673, 675 (in key to Sphecidae of Connecticut; Hartford, New Haven, Rockville, Stafford); J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae); A. Brown, 1934:264 (Canada: Ontario: Timagami); Krombein, 1936:98 (New York: Buffalo; floral records); Strandtmann, 1945b:151 (in review of North American *Philanthus*), 1946:24 (in revision of North American *Philanthus*); Dreisbach, 1947:142, 143 (in key to *Philanthus* of Michigan), 145 (Michigan: locality records); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); Ristich, 1956:272 (*Senotainia trilineata* (van der Wulp), a sarcophagid, is nest parasite, eggs are laid on prey carried by wasp); Evans, 1957b:83 (description of larva); Evans and Lin, 1959:120 (nesting habits); Evans, 1963c:112 (prey selection, comparison of behavior with *Philanthus gibbosus* and *politus*); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Krombein, 1979b:1725 (in catalog of North American Hymenoptera, nesting sites, list of parasites and prey); Finnamore, 1982:241 (in Sphecid Fauna of southern Quebec); O'Neill and Evans, 1982:798 (major prey: family and genus); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey); Evans and O'Neill, 1988:179 (male behavior, nesting habits,

natural enemies); Spofford, Kurczewski, and Downes, 1989:257, 259 (nest parasite: *Phrosinella aurifacies* Downes, a miltogrammine fly, references to publications on nest parasites *Phrosinella fulvicornis* (Coquillett) and *Senotainia trilineata* (Wulp), miltogrammine flies); Kurczewski and Acciavatti, 1990:61 (New York: Cayuga County); Spofford and Kurczewski, 1990:747, 748, 751 (nest parasites: *Phrosinella aurifacies* Downes, *Senotainia trilineata* (Van der Wulp), and unknown species of Miltogrammini, Sarcophagidae), 1992:1000 (species of miltogrammine parasites listed), 1002 (counter-cleptoparasitic behavior: freeze-stop and face-off); Kurczewski, 1998d:250 (pine barrens in upstate New York); Wcislo, 1998:181 (proportions of antennae in relations to parasitic/non-parasitic behavior); Buck, 2004:27 (in checklist of Crabronidae of Ontario, Canada). – **As *Epiphilanthus solivagus***: Ashmead, 1899d:296 (new combination, in checklist of North American Crabronidae); Harrington, 1902:222 (Canada: Ontario: Ottawa). – **As *Anthophilus solivagus***: J. Smith, 1900:520 (new combination, in list of insects of New Jersey).

#### 111. *sparsipunctatus* Arnold

*Philanthus sparsipunctatus* Arnold, 1946:80, ♀, ♂. Syntypes: Zambia: Abercorn, now Mbala (SAM). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Hancock, Chahwanda, and Mhlanga, 1995:39 (syntype in Bulawayo Museum).

#### 112. *spiniger* Thunberg

*Philanthus spiniger* Thunberg, 1815:133, sex not indicated. Holotype or syntypes: origin unknown (type lost (W. Schulz, 1912:69; de Beaumont, 1950c:321). – Thunberg, 1815a:128 (diagnostic characters), 1815b:288 (diagnostic characters); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); W. Schulz, 1912:69 (type material lost); de Beaumont, 1950c:321 (type lost, unrecognizable from the description, probably not a *Cerceris*); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae, as tentative member of *Philanthus*).

#### 113. *stecki* W. Schulz

*Philanthus stecki* W. Schulz, 1906:309, ♀. Holotype: ♀, Equatorial Guinea: Fernando Po, now Bioko (depository?). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

#### 114. *strigulosus* R. Turner

*Philanthus strigulosus* R. Turner, 1918c:464, ♀, ♂. Syntypes: South Africa: Gauteng: Johannesburg, and Lesotho: between Matsekuwa and Mafetang (BMNH). – Arnold, 1925:169 (in revision of southern African *Philanthus*), 1930:11 (in checklist of Afrotropical Sphecidae); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

#### 115. *stygius* Gerstaecker

*Philanthus stygius* Gerstaecker in Peters, 1858:509, ♂. Holotype or syntypes: ♂, Mozambique: no specific locality (ZMHU). – Kohl, 1891:365 (in checklist of world *Philanthus*); Gribodo, 1895:351 (Mozambique, redescription); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Bischoff, 1912:225 (description of ♀; Zaire: north of Lake Edward, foothills of Ruwenzori); Arnold, 1925:163 (in revision of southern African *Philanthus*), 1930:11 (in checklist of Afrotropical Sphecidae), 1943:74 (Zaire); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Rodgers and Homewood, 1982:233 (Tanzania: Usambara Mountains); Dollfuss, 2017b:1258 (locality records from Central African Republic, Ghana, Kenya, Nigeria, Tanzania, Zambia, and Zimbabwe).

*Philanthus stygius* Gerstaecker, 1862:472, ♂. Objective synonym of *Philanthus stygius* Gerstaecker, 1858.

#### *ssp. atronitens* Arnold

*Philanthus stygius* race *atronitens* Arnold, 1925:163, ♂, ♀. Syntypes: Zimbabwe: Khami Ruins and Sawmills (SAM). – Arnold, 1930:11 (in checklist of Afrotropical Sphecidae); Guiglia, 1943c:75 (Ethiopia: Gamo Gofa: Sagan–Omo region). – **As *Philanthus stygius* forma *atronitens***: Guiglia, 1950:232 (new status, Ethiopia: Gamo Gofa: Caschei).

– As *Philanthus stygius atronitens*: R. Bohart and Menke, 1976:566 (new status, in checklist of world Sphecidae); Hancock, Chahwanda, and Mhlanga, 1995:39 (syntype in Bulawayo Museum).

#### 116. *subconcolor* (Bingham)

*Trachypus subconcolor* Bingham, 1898a:107, ♀. Holotype or syntypes: ♀, Yemen: Shaikh Othman (BMNH). – As *Philanthus subconcolor*: R. Bohart and Menke, 1976:566 (new combination, in checklist of world Sphecidae).

#### 117. *sulphureus* F. Smith

*Philanthus sulphureus* F. Smith, 1856:469, ♂. Holotype or syntypes: ♂, northern India: no specific locality (BMNH). – F. Smith, 1871a:370 (in catalog of Oriental Aculeata); Walker, 1871:28 (Egypt: Sinai Peninsula: Wadi Feiran); Cameron, 1890b:248 (listed), 298 (redescription); Kohl, 1891:365 (in checklist of world *Philanthus*); Dalla Torre, 1897:490 (in catalog of world Hymenoptera); Innes Bey, 1912:192 (specimens recorded by Walker, 1871, now destroyed by dermestids, were collected at Wadi Feiran, Sinai Peninsula); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection); Gadallah, 1996:75 (in revision of Egyptian *Philanthus*, occurrence in Egypt questionable); Roche, 2007a:141 (Walker, 1871, record from Sinai is questionable); Pagliano, 2014:103 (specimens in M. Spinola collection, Torino, are *Philanthus sulphureus*).

#### 118. *sumptuosus* R. Turner

*Philanthus sumptuosus* R. Turner, 1917e:178, ♀, ♂. Syntypes: India: Bihar: Pusa (BMNH). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

#### 119. *taantes* Gribodo

*Philanthus taantes* Gribodo, 1895:353, ♂ (as *Taantes*, incorrect original capitalization). Holotype: ♂, Mozambique: Lourenço Marquês, now Maputo (MSNG). – Arnold, 1925:175 (unknown to the author); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Penati and Mariotti, 2015:121 (in list of Hymenoptera described by G. Gribodo).

#### 120. *tarsatus* H. Smith

*Philanthus tarsatus* H. Smith, 1908b:356, ♀. Holotype: ♀, USA: Nebraska: Sioux County: Glen (Univ. Nebraska). – Mickel, 1918b:388 (in catalog of Nebraskan Sphecidae); Muma, 1952:22 (holotype in UNL), 28 (paratype in UNL); LaBerge, 1956:528 (paratype in Snow Entomological Museum); R. Bohart and Grissell, 1975:6, 7 (in key to North American *Philanthus*); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae, as new status by R. Bohart); Krombein, 1979b:1725 (in catalog of North American Hymenoptera); Evans and O'Neill, 1988:151 (male behavior); Kaltenpoth et al., 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands). – As *Philanthus politus tarsatus*: Strandtmann, 1945b:154 (new status, in review of North American *Philanthus*), 1946:93 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera).

#### 121. *tenellus* Arnold

*Philanthus tenellus* Arnold, 1925:158, ♂. Holotype: ♂, Zimbabwe: Bulawayo (SAM). – Arnold, 1930:10 (in checklist of Afrotropical Sphecidae), 1932:9 (description of ♀); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Hancock, Chahwanda, and Mhlanga, 1995:39 (syntypes in Bulawayo Museum).

#### 122. *triangulum* (Fabricius)

*Vespa ruspatrix* Linnaeus, 1767:951, sex not indicated. Holotype: ♀, Africa: no specific locality, probably Algeria (Linnean Society, London). Suppressed by International Commission on Zoological Nomenclature, 1990, Opinion 1578. – Gmelin, 1790:2758 (redescription); Christ, 1791:241 (redescription, as *ruspatrix*); de Saussure, 1855:105 (not a vespid); Day, 1979:71 (study of holotype; possibility of suppression of the name in favor of *triangulum*); Day and Fitton, 1978:194 (recuration of Linnean type material); Pulawski, 1988b:34 (petition to ICZN to suppress

the name). – **As *Philanthus ruspatrix***: Menke, 1986b:21 (new combination, quotation of Day, 1979:71); Vikberg, 1986:78 (Finland).

*Vespa triangulum* Fabricius, 1775:373, sex not indicated. Holotype: ♀, Denmark: Hafniae, now Copenhagen (ZMUC), see van der Vecht, 1961a:61. Synonymized with *Philanthus ruspatrix* by Day, 1979:71 and 80. Conserved by International Commission on Zoological Nomenclature, 1990, Opinion 1578. – Fabricius, 1781:469 (redescription), 1787:294 (redescription); Gmelin, 1790:2758 (redescription); Christ, 1791:236 (redescription); van der Vecht, 1961a:61 (study of type); Pulawski, 1988b:34 (petition to ICZN to conserve the name). – **As *Simblephilus triangulum***: Jurine, 1807:188 (new combination, listed). – **As *Philanthus triangulum***: Fabricius, 1790:224 (new combination, redescription), 1793:289 (redescription), 1796:137 (in Index to his Entomologia Systematica, 1793), 1804:302 (redescription); Thunberg, 1815a:127 (diagnostic characters), 131 (redescription), 1815b:288 (diagnostic characters); Germar, 1817:262 (Dalmatia: Spalatro, now Croatia: Split); Vander Linden, 1829:124 (bibliographic references, Belgium: Bruxelles, large part of Europe, discussion of synonymy); Shuckard, 1837a:246 (in revision of British Aculeata); von Siebold, 1839:53 (Germany: Danzig, now Poland: Gdańsk); Herrich-Schaeffer, 1840:296 (Germany: Bayern: Regensburg area); Dufour, 1841a:509 and 1841b:245 (digestive tract), 1841a:511 and 1841b:247 (male reproductive system), 1841a:512 and 1841b:248 (female reproductive system); Dahlbom, 1842a:16 (in review of Scandinavian aculeates), 1844:187 (in revision of Sphecidae and Pompilidae), 1845:XXIII (type material examined), 495 (in key to world *Philanthus*); Lepeletier de Saint Fargeau, 1845:35 (in revision of world Hymenoptera); Eversmann, 1849:398 (Russia: Orenburg province and lower Volga area); von Kiesenwetter, 1849:89 (Germany: Kingdom of Saxony: common everywhere); Wissmann, 1849:13 (Germany: Kingdom of Hannover: Hannover, Hedemünden, Lüneburg, and Munden); F. Smith, 1851c:43 (Great Britain: Byfleet, Heron Court Hants, Isle of Wight, Pegwell Bay, Snaresbrook); Wesmael, 1852:268 (Belgium); Belke, 1853:433 (Ukraine: Kamieniec Podolski); Kirschbaum, 1853:46 (Germany: Herzogtum Nassau: Mainz-Mombach); F. Smith, 1853:66 (in checklist of British Hymenoptera); Kirchner, 1854:312 (Czechoslovakia: Kaplitz in Budweiser District, now České Budějovice); Fabre, 1856a:139 (France: Vaucluse: Avignon area); F. Smith, 1856:468 (in catalog of Hymenoptera in British Museum); Kawall, 1857:24 (Kurland, now Latvia); Ruthe and Stein, 1857:314 (Germany: Berlin area); Schenck, 1857:144 (Germany: in revision of fossorial wasps of Nassau Region); F. Smith, 1857d:41 (Great Britain: Isle of Wight: Sandown Bay), 1858c:187 (in review of British Aculeata, redescription); Taschenberg, 1858:83 (in key to Sphecidae of Germany); Belke, 1859:70 (Ukraine: Kamieniec Podolski); Funk, 1859:58 (Germany: Bayern: Bamberg); Six, 1859:17 (Netherlands: Driebergen); A. Costa, 1860:3 (Italy: in revision of Sphecidae of Kingdom of Naples); Schenck, 1860:147 (Germany: Nassau Region); von Frauentfeld, 1861:103 (Croatia: Dalmatia: no specific locality); Schenck, 1861:142 (Germany: Wiesbaden, rarely collected); Sichel, 1861:752 (Italy: Sicilia); Brischke, 1862:102 (Germany: Preussen Province, now Poland: Pomorze Region); A. Costa, 1863:66 (Italy: Calabria Ulteriore: no specific locality), 1864c:124 (Italy: Campania: Benevento area); Siła-Nowicki, 1864:54 (Poland: Tatry Mountains, Ukraine: Drancza hill near Brody, Pieniaki in Zlochiv District); 1865:54 (western Ukraine: Galicia region: no specific locality); Taschenberg, 1866:191 (in revision of Hymenoptera of Germany); A. Costa, 1867c:96 (in revision of Italian Sphecidae); Jaennicke, 1867:147 (Germany: Hessen: Frankfurt area); Kirchner, 1867:220 (in catalog of European Hymenoptera); Palma, 1867:44 (Italy: Sicilia settentrionale); Schenck, 1867a:354 (Germany: Nassau Region); Dietrich, 1868:363 (Switzerland: Zurich Canton); Jaennicke, 1868:9 (Germany: Hessen: Kelsterbach); Wierzejski, 1868 (Poland: Kraków; Ukraine: Drańcza, Janów, Pieniaki); A. Costa, 1869b:112 (in revision of Italian Sphecidae); von Aichinger, 1870:316 (Austria: Tirol); Thomson, 1870:241 (in revision of Swedish wasps); F. Smith, 1871b:19 (in catalog of British Aculeata); P. Ivanov, 1872:152 (Ukraine: Kharkov Oblast: Kupyansk area); Beletskiy, 1873:80 (Ukraine: vicinity of Khar'kov); Dours, 1874:142 (in catalog of Hymenoptera of France); Martínez y Saez, 1874:31 (specimens from Spain: Madrid area, donated to Léon Dufour); Mocsáry, 1874:120 (Siebenbürgen, now Romania: Transylvania: no specific locality); Thomson, 1874:214 (in revision of Hymenoptera of Scandinavia); Wierzejski, 1874:260 (Poland: Kraków; Ukraine: L'viv and Podole Region); Marquet, 1875:204 (France: Haute-Garonne: Toulouse);

Taschenberg, 1875:404 (Germany: Halle; Italy: La Spezia; Egypt: no specific locality); Beuthin, 1876:231 (Germany: Hamburg area); Frivaldszky, 1876:354 (Hungary: Temes Komitat: Grebenáč, now in Timiș District in Romania); Schlechtendal, 1876:54 (Germany: Sachsen: Zwickau); Schmiedeknecht, 1876:186 (Germany: Thüringen: Rothensteiner Felsen); Radoszkowski, 1877:52 (Uzbekistan: Obburden); Girard, 1878:242 (France: Calvados: Lion-sur-Mer, coastal sand dunes); Girard, 1879:925 (morphology and habits); Kohl, 1880:167 (Austria: Tirol, and Italy: Trentino–Alto Adige); E. Saunders, 1880:277 (in revision of British Aculeata); Magretti, 1881:119 (Italy: Lombardia), 271 (in list of species discussed in this paper); Marquet, 1881:189 (southern France); J. Pérez, 1881:V (hunting habits); E. Saunders, 1881:165 (Portugal: São Marcos de Serra); Yaroshevskiy, 1881:124 (Ukraine: Khar'kiv Oblast': Khar'kiv, Kupyansk); De Stefani Perez, 1882:39 (Italy: Sicilia: Sciacca); Sajó, 1882:5 (Hungary); A. Costa, 1883:57 (Italy: Sardegna: Cagliari); Kohl, 1883e:665 (Switzerland); von Heyden, 1884:119 (Germany: Frankfurt am Main area); Wüstnei, 1886:40 (Germany: Schleswig-Holstein); Gasperini, 1887:16 (Dalmatia: Brusije on Lesina Island and Spalato, now Croatia: Brusje on Hvar Island and Split); Brischke, 1888b:98 (Germany: Preussen Province, now Poland: Pomorze Region); Cuní y Martorell, 1888:164 (Spain: Barcelona); Radoszkowski, 1888a:324 (male genitalia); Kohl, 1891:365 (in checklist of world *Philanthus*); Bezzi, 1892:123 (Italy: Lombardia: Provincia di Pavia: vicinity of Pavia); Radoszkowski, 1892:579 (reference to Radoszkowski, 1888a); C. Verhoeff, 1892c:696 (nesting habits); Kohl, 1893a:35 (Austria: Niederösterreich), 1893e:183 (Egypt: Cairo); F. Morawitz, 1893a:113 (Russia: St. Petersburg: Poklonnaya Gora); Baldini, 1894:61 (Italy: Modena area); De Stefani Perez, 1894:216 (Italy: Sicilia); Kohl, 1894:342 (Congo: Gabun, West Africa (country?): Batta, Kriby); Krieger, 1894:13 (Germany: Kingdom of Saxony); De Stefani Perez, 1895:227 (in catalog of Sicilian Hymenoptera); Meunier, 1896:271 (Belgium: Bruxelles area); Rudow, 1996:329 (Germany: Brandenburg: no specific locality); E. Saunders, 1896:115 (in revision of British Aculeata); Borries, 1897:80 (nesting habits); Cuní y Martorell, 1897:331 (Spain: Cataluña: villa de Calella); Dalla Torre, 1897:491 (in catalog of world Hymenoptera); Kozhevnikov, 1897:15 (Russia: Moscow Government); Lüderwaldt, 1897b:31 (Germany: Gollnow, now Poland: Pomorze Region: Goleniów); Meunier, 1897a:350 (Bulgaria: Sofia area); Mocsáry, 1897:79 (Kingdom of Hungary, some localities are in today's Croatia, Romania, and Slovakia); Flamary, 1898:38 (France: Saône-et-Loire: Mâcon area); Ferton, 1899:336 (stinging prey just behind mouth); Magretti, 1899:609 (Somalia: Lugh at 3°48'N 42°33'E); Bouvier, 1900b:1129 (temporary closure of nests on flat surfaces, absence of closure in cliffs); Freke, 1900:63 (Great Britain: Kent: Folkestone); Schletterer, 1901:219 (Croatia: southern Istria Peninsula); N. Arnold, 1902:89 (Russia: Mohilev Province, now Belarus); Chyzer, 1902:33 (Hungary); Saunders, 1902b:143 (British Channel Islands: Alderney, Guernsey, and Jersey Islands; France: Bretagne: St. Briac); de Cobelli, 1903:109 (Italy: Province of Trentino); Picard, 1903b:17 (killing honey bees to feed on them); Adlerz, 1904:138 (known prey: honey bee); Antiga and Bofill, 1904:22 (Spain: Cataluña Province); Aurivillius, 1904:272 (in revision of Swedish Sphecidae); E. Saunders, 1904c:607 (Spain: Mayorca), 639 (Spain); Zilahi Kiss, 1904:77 (Hungary: Peér, Tasnád); Kohl, 1905c:233 (Turkey: Kayseri: Erciyes Dağı); Kubes, 1905:84 (Czech Republic: Kolín); Mantero, 1905:69 (Italy: Toscana: Isola del Giglio); W. Schulz, 1905b:61 (Tunisia); von Heyden, 1905:82 (Germany: Hessen: Frankfurt); Vángel, 1905:167 (Hungary); Graeffe, 1906:455 (Tunisia: Tunis area); Kohl, 1906a:203 (Yemen: Aden, Makalla); Móczár and Henter, 1907:205 (Hungary: Acsalag, Hatvan, Tiszaalpár); Schmiedeknecht, 1907:236 (in key to Hymenoptera of Central Europe); de Gaulle, 1908:120 (in catalog of French Hymenoptera); Kohl, 1909:373 (Tanzania: Island of Mafia); Morley, 1909:305 (Great Britain: Isle of Wight); Cavro, 1910:685 (France: Département du Nord); Dittrich, 1911b:25 (Germany: Niederschlesien Province, now Poland: Dolny Śląsk Region); Graeffe, 1911:47 (Italy: Trieste area); Mantero, 1911:73 (Italy: Sardegna: Isola dell'Asinara); Morice, 1911:93 (Algeria: abundant everywhere); Birula, 1912:544 (Ukraine: Zhytomyr Oblast': Radomyshl'); Rudow, 1912:67 (nesting in ground, preying on honey bee, in the absence of latter, fly *Volucella* and acridid *Stenobothrus* can be used); Schirmer, 1912:168 (Germany: Berlin area); Kohl, 1913b:15 (Russia: Voronezh Oblast': Valuyki at 50°14'N 38°08'E); Smits van Burgst, 1913a:319 and 1913b:6 (Tunisia: no specific locality); Szilády, 1913:89 (Hungary: eight localities); Torka, 1913:35 (Germany: Provinz Posen, now Poland: Poznań

Region); Zavattari, 1913b:3 (Greece: Island of Rhodes); Alfken, 1914:281 (NW Germany); R. Perkins, 1916:231 (specimens from Isle of Wight in F. Smith collection); Storey, 1916:107 (Egypt: abundant everywhere); Pic, 1917:3 (nest excavation); Strand, 1922:198 (Austria: Niederösterreich: Guntramsdorf); E. Bouvier, 1916:205 (males burrows; gregarious nocturnal sites); R. Turner, 1918c:463 (synonymy, distribution: whole Afrotropical Region); Hallett, 1919:262 (Great Britain: Island of Guernsey); Hedicke, 1918:402 (Germany: Brandenburg: Gross Machnower Weinberg); Honoré, 1919:268 (France: Seine-et-Oise: Bouray); Kerenskiy, 1919:34 (Russia: Penza Government); O. Meyer, 1919:155 (Germany: Posen Province, now Poland: Poznań Region, nesting in towns); Strand, 1920:23 (Germany: Berlin-Dahlem); A. Wagner, 1920:40 (Germany: Lower Elbe region); Dubois, 1921c:213 (in key to Belgian Sphecidae); Morice, 1921:822 (Iran: Enzeli, Talish); Strand, 1921:33 (Germany: Bayern: Kulmbach); Fahringer, 1922:179 (Turkey); Gennerich, 1922:42 (cleaning apparatus); Hedicke, 1922:271 (Germany: Brandenburg: Gross Machnower Weinberg); Maidl, 1922:69 (Albania, Croatia); Shestakov, 1922:82 (Russia: Stavropol' area); Hellén, 1923:60 (recorded from Finland); Alfken, 1924:231 (N Germany); Maidl, 1924:243 (Sudan: Sennar); Berland, 1925d:45 (in Sphecid Fauna of France); Bischoff, 1925:301 (Poland: Białowieża and Grajewo area); Blüthgen, 1925:166 (Germany: Saale River valley: Eulau, Roßbach); Schütze, 1925:113 (Germany: Lausitz Region: Baruther Berg, Rachlau); Shestakov, 1925:37 (Russia: Yaroslavl' area); K. Strohm, 1925:211 (Germany: Baden-Württemberg: Badenweiler, Heidelberg, Isteiner Klotz, Kaiserstuhl); Friese, 1926:156 (in key to Sphecidae of Central Europe, short morphological and biological characteristics); Grandi, 1926:283 (nesting habits); Hémon, 1926:199 (France: Finistère: Fouesnant); K. Strohm, 1926:74 (reference to Baader in Brahm, 1791, and Leininger, 1922); von Schulthess, 1926b:212 (Algeria, Tunisia, Libya); Bouwman, 1927:114 (in revision of Sphecidae of Netherlands); Shestakov, 1927a:4 (Russia: Moskva Oblast'), 5 (Russia: Kostroma and Yaroslavl' oblast's), 10 (Poltava Oblast'); F. Werner, 1927:66 (Austria: Niederösterreich: River Kamp valley); Wouro, 1927:312 (apicultural pest); Berland, 1928b:175 (add Grandi, 1926 to bibliography in Berland, 1925d); Grandi, 1928a:13 (nesting in hard soil, nest entrance closed when female is inside with prey); Mellor, 1928:126 (Egypt: preying at honey bee at Ghiza), 129 (Egypt); Grandi, 1929:266 (homing), 288 (Italy: Toscana: valle della Limentra); Alfken, 1930:10 (Malta); Chevalier, 1930:57 (nesting habits, prey paralyzing); Grandi, 1930:340 (Italy: Toscana: Maremma); Hamm and Richards, 1930:105 (summary of nesting habits), 123 (prey: *Apis mellifera*); A. Müller, 1930:181 (common in former Dobruzha and Bessarabia); Schmiedeknecht, 1930:697 (in keys to Hymenoptera of North and Central Europe); Schouteden, 1930:93 (Zaire); Bischoff, 1931:9 (Spain); Dusmet y Alonso, 1931:7 (Portugal: Mata de Leiria, Mitra); Grandi, 1931:26 (nesting habits), 38 (description of mature larva), 42 (description of first instar larva), 56 (Italy: Toscana: Vallata delle Pozze near Le Mandriole); Pulkkinen, 1931:58 (in revision of Sphecidae of Finland); Vergne, 1931b:132 (nesting habits); Berland, 1932a:23 (France: Var Department; using old charcoal preparation sites for nesting); Bondroit, 1932:38 (Belgium: Solbosch, Uccle); Crèvecoeur and Maréchal, 1932:70 (in catalog of Belgian Hymenoptera); Giordani Soika, 1932a:21 (Italy: Lido di Venezia); Molitor, 1932c:101 (nesting habits); Thiem, 1932:173 (Germany: mass outbreak and threat to apiculture in Werra Valle,); Tinbergen, 1932:305 (nesting habits, homing); Bernard, 1933:61 (France: Drôme: Dieulefit); Dulac, 1933b:40 (France: Saône-et-Loire: Saint-Leu near Le Creusot); Molitor, 1933c:496 (experiments with nest finding and prey substitution); Nadig, 1933:95 (Morocco); E. Nielsen, 1933:300 (summary of nesting habits); Oudemans, 1933:544 (review of nesting habits, selected literature); Saz, 1933:79 (nesting habits); Strohm, 1933:338 (Germany: Baden: Württemberg: Kaiserstuhl); Thiem, 1933:121 (Germany: threat to apiculture in Werra Valley); Tinbergen, 1933:1 (nesting habits, spatial orientation); Balles, 1934:21 (Germany: Baden-Württemberg: Mannheim-Rheinau, Oberachern, Osterburken); Giner Marí, 1934:131 (Spain); Guiglia, 1934b:296 (Libya: bibliography and summary of locality records); Maidl, 1934:64 (Greece: Aegean Islands: Samos, Amorgos); Molitor, 1934b:170 (homing), 174 (preying); Nadig, 1934:33 (France: Corse: Ajaccio, Cap Corse; Italy: Sardegna: Aritzo, Cagliari, Gennargentu); Thiem, 1934:13, 43 (pest control); Beekhuis van Till, 1935:258 (nesting habits); Bernard, 1935:62 (France: Var: Fréjus area); Goetze, 1935:304 (pest control); Hausmann, 1935:150 (Germany: mass outbreak in Düren District); Körner, 1935:274 (mass outbreak and damage

to apiculture); Marchand and Dulac, 1935:60 (France: Saône-et-Loire: Saint Laurent d'Andenay); Minkiewicz, 1935:196 (Poland: Kazimierz on Wisła at 51°20'N 21°58'E), 212 (Poland: Piaski-Gardzienice at 51°05'N 22°50'E); Molitor, 1935a:164 (homing), 1935b:126 (flower visiting); Pelzer, 1935:310 (Germany: mass outbreak in Dinslaken District); Ruediger, 1935:57 (mass outbreak in Germany and Holland); Thiem, 1935a:348 (Germany: end of mass outbreak in Werra Valley), 1935b:112 (apicultural pest); Tinbergen, 1935:699 (analysis of preying behavior); Vergne, 1935:117 (France: Auvergne: common everywhere); Crèvecoeur and Maréchal, 1936:254 (in catalog of Belgian Hymenoptera); Drogoszewski, 1936:130 (Poland: Łowicz, Opatów); Molitor, 1936a:190, 193, 195 (experiments on color recognition); Pattri, 1936:113 (Germany: Hessen; Darmstadt area, on sandy habitats); Pelzer, 1936:41 (morphology and nesting habits); Roller, 1936:315 (Austria: loess cliffs at Bisamberg near Vienna); Dulac, 1937:8 (France: Saône-et-Loire: Saint-Laurent d'Andenay); Goebel, 1937:43 (Poland: Poznań District: Główna, Głuszyna, Poznań-Dębina, Puszczykowo, Strzeszyn); Richards, 1937b:108 (in checklist of British aculeates); Zavadil, Šusterka, and Bařa, 1937:206 (in catalog of Sphecidae of Czechoslovakia); Bott, 1938:291 (nesting habits); Guiglia, 1938b:8 (Italy: Sardegna); Móczár, 1938c:81 (Hungary: Kőszeg Hills); Redikortsev, 1938:144 (Russia: Mordovian State Nature Reserve); Tinbergen and Krut, 1938:292 (study of spatial orientation); Tinbergen and van der Linde, 1938:425 (homing from unknown area); A. Wagner, 1938a:122 (northwestern Germany); Hallett, 1939:17 (Great Britain: once common on Isle of Wight, now extinct there); Móczár, 1939:5 (Hungary: Jászberény); Balthasar, 1941b:112 (Czech Republic: eastern Moravia); Bræstrup and Nielsen, 1941:353 (Denmark: range extended in 1940 owing to favorable weather); Invrea, 1941:115 (nest parasite: *Smicromyrme partica* (Kl.), a mutillid); Leclercq, 1941b:13 (Belgium: Liège area); Paul, 1941:47 (Germany: Pommern: common in Central- and Ostpommern: no specific locality, now Poland: Województwo Zachodniopomorskie); Schneid, 1941:1046 (Germany: Bayern: Bamberg area, large colony); Alfken, 1942:231 (Germany: Niedersachsen: Lüneburger Heide); Audcent, 1942:25 (parasites: *Metopia leucocephala* Rossi, *Sphecapata conica* Fallén); Ander, 1942:10 (southern Sweden); Guiglia, 1942a:55 (Greece: Island of Rhodes: Villanova); Hoop, 1942:87 (Germany: Steinfurth, Süderhastedt); Perkins, 1942:199 (Sweden: Skåne: Kivik); Giner Marí, 1943a:111 (in Sphecid Fauna of Spain); Guiglia, 1943a:46 (corrections to a book by G. Malagóla on apiculture), 1943b:69 (Albania: Koplíku); Spooner, 1943:74 (Great Britain); Timon-David, 1943:29 (France: Bouches-du-Rhône: plage de Fos); Guiglia, 1944a:145 (Cyprus: Limassol), 1944b:10 (Italy); Leclercq, 1944:264 (variation in population levels in Belgium); Arnold, 1945:15 (Madagascar); Deleurance, 1946b:67 (France: Bouche-du-Rhône: Camargue: Bois des Rièges); de Beaumont, 1947b:384 (Cyprus); Guiglia, 1947a:28 (Italy: Piano Maiuri); Móczár, 1947a:60 (Hungary: Bars comitatus: Levél puszta); van Lith, 1947:107 (Netherlands); Balthasar, 1948:143 (Slovakia: Kovačov, Parkan); Blair, 1948:240 (Great Britain: Isle of Wight); Guiglia, 1948c:200 (Italy: Sardegna: Cagliari); van Beusekom, 1948:195 (experiments on visual orientation); Zavadil in Zavadil and Šnoflak, 1948:165 (in key to Sphecidae of Czechoslovakia); de Andrade, 1949:12 (Portugal); Cavro, 1950:37 (France: Département du Nord); Georgel, 1950:63 (France: Seine-et-Oise: Sucy-en-Brie); Niesiołowski, 1950:225 (Poland: Lubasz 40 km N Tarnów); Pittingtoni, 1950:21 (Cyprus); Scobiola, 1950:18 (Romania); de Beaumont, 1951c:302 (in revision of European *Philanthus*), 1951h:32 (Switzerland: Neuchâtel area); Szulczewski, 1950:108 (Poland: Wielkopolski National Park 15 km S Poznań); Leclercq, 1951b:67 (yellow body pigments are pterines); Caruel, 1952a:62 (France: Marne Department); Hirschfelder, 1952a:109 (preying behavior); Valkeila, 1952:48 (Finland: Hattula); Cleu, 1953:50 (France: Ardèche River basin); Głowacki, 1953:520 (Poland: Warszawa area: Podkowa Leśna, Choszczówka); Heldmann, 1953:112 (Germany: Hessen: Eberstädter Düne near Darmstadt, as *jangulum*); Leclercq, 1953a:249 (Belgium: particularly abundant about 1900, but infrequent between 1940 and 1952); Móczár, 1953:309 (Hungary); Nouvel and Ribaut, 1953:177 (France: Haute-Garonne: Saint-Béat); Bischoff and Stadler, 1954:127 (Germany: Bayern: Romberg); Grandi, 1954:236 (Italy); Hertzog, 1954:100 (France: Bouches-du-Rhône: Camargue); Tjeder, 1954:67 (Sweden: eastern Skåne: Löderup, Mälarhusen, Kaseberga, Vitemölla); Aerts, 1955:63 (Germany: Rheinland; nesting habits); Atanassov, 1955:202 (Bulgaria: four localities); Harant and Leclercq, 1955:251 (France: Hérault: Montpellier, Palavas-les-Flots, Verschamps); Lehrer, 1955:262 (Romania: Moldova: Iași); Stei-

ner, 1955:136 (France: Dordogne); Teschner, 1955:57 (Germany: Nordrhein-Westfalen: Hohe Ward near Münster); Bytinski-Salz, 1956:224 (Turkey: Aydın, Elmalı, Finike, Istanbul, İzmir, Kemer); Ceballos, 1956:365 (in catalog of Hymenoptera of Spain); Hirschfelder, 1956:96 (Germany: mass outbreak in Franken Region and its control); Janvier, 1956b:203 (nests destroyed by rainy period); Leclercq, 1956g:325 (Greece); Morel, Nouvel, and Ribaut, 1956:337 (France: Département des Pyrénées-Orientales); Bajári, 1957a:28 (in key to Hungarian Sphecidae); de Beaumont, 1957b:131 (n. Iran); Evans, 1957b:84 (discussion of larval characters); Fahlander, 1957:63 (Sweden: Småland: Ljungby); Grandi, 1957:387 (Italy); Zirngiebl, 1957:183 (Germany: Rheinland-Pfalz: Pfalz region); Benno, 1958b:11 (in review of Dutch Sphecidae); Nouvel and Ribaut, 1958:9 (France: Pyrénées-Orientales: Banyuls-sur-Mer area); Puławski, 1958a:165 (Bulgaria: Aitos, Nesebar, Kniazhevo near Sofia, Sandanski, Sozopol, Varna; diagnostic characters); Compte Sart, 1959:131 (Spain: Mayorca); de Beaumont, 1959a:11 (Italy); Diniz, 1959:27 (Portugal: 18 localities); Grandi, 1959b:287 (Italy: Sardegna: Oristano); Olberg, 1959:24 (photographs of specimens visiting flowers of *Epilobium angustifolium*, *Eupatorium cannabinum*, *Jasione montana*, and *Phacelia tanacetifolia*), 53 (photograph of a tomisid spider devouring *Philanthus triangulum*), 351-352 (photographs of female digging nest), 353 (photograph of female malaxating honeybee prey); Sedova, 1959:20 (detailed study of species biology in Turkmenistan, methods of its control); Suárez, 1959:54 (Spain: Almería Province); van der Vecht, 1959a:67 (*Spheg xanthocephalus* Forster, 1771, is the oldest name for the species [actually, it is a junior synonym of *Cerceris arenaria*]); Wolf, 1959b:31 (Germany: Nassau); de Beaumont, 1960a:6 (Greece: Island of Rhodes); Diniz, 1960:31 (Portugal: S. Marcos da Serra); Hamann, 1960:198 (Austria: Oberösterreich: Mönchgraben at 48°13'N 14°21'E); Leclercq, 1960b:130 (massive expansion in 1930s was followed by regression between 1940 and 1952); Noskiewicz and Puławski, 1960:72 (in key to Polish Sphecidae); de Beaumont, 1961b:273 (Afghanistan), 1961c:45 (Greece: Crete Island), 1961e:3 (Iraq); Grandi, 1961:161 (nesting habits), 477 (description of larva); Hoop, 1961:66 (Germany: Schleswig-Holstein: Wahlstedt near Segeberg, extinct in Steinfurth); Leclercq, 1961d:102 (Madagascar); van der Vecht, 1961a:61 (study of type); Atanassov, 1962:125 (Bulgaria: Petrich area); de Beaumont, 1962b:20 (Spain); Leclercq, 1962b:210 (Madagascar); Erlandsson, 1962:208 (distribution in Scandinavia); Rathmayer, 1962a:462 and 1962b:1148 (process of paralyzing, malaxation, sting anatomy); Valkeila, 1962b:67 (southwestern Finland); Wengris, 1962:204 (Lithuania: Vilnius area); Evans, 1963c:118 (discussion of Tinbergen's experiments); Myartseva, 1963b:60 (Turkmenistan: lower Murgab River); Pohl, 1963:14 (an apicultural pest); Scobiola, 1963:825 (Romania: Periprava); Babiş, 1964:117 (Austria: Land Salzburg); Ceballos, 1964:88 (in supplement to catalog of Spanish Sphecidae); de Beaumont, 1964c:34 (in Sphecid Fauna of Switzerland); Hüsing and Jäger, 1964:192 (Germany: Sachsen-Anhalt: Nietleben near Halle), 199 (in the area found only sporadically); Plavil'shchikov, 1964:122 (Russia: Mordovian State Nature Reserve); Richards, 1964:7 (in Britain an occasional migrant from the continent); Atanassov, 1965:91 (Greece: Thasos Island); de Beaumont, 1965a:18 (Greece); Isensee, Lesemann, and Röseler, 1965:612 (Spain: Gerona: no specific locality); B. Klug, 1965:138 (Germany: Baden-Württemberg: Freiburg im Breisgau area); Myartseva, 1965:92 (Turkmenistan: Akibay, Bayram-Ali district, Murgab district, Sakar-Chagin district); Roberti, Frilli, and Pizzaghi, 1965:109 (Italy: Emilia-Romagna: Piacenza and Castelnovo Fogliani in Piacenza Province); Bonelli, 1966c:217 (Italy: Trentino-Alto Adige: Cavalese, Montagna); Diniz, 1966:6 (Portugal: twenty nine localities); Piek, 1966a:191-198 (effect of venom on excitatory and inhibitory system of locust muscle); Scobiola-Palade, 1966b:391 (Romania: Tulcea District: C.A. Rosetti, Chilia Veche, Periprava); Simon Thomas, 1966:114 (breeding specimens in captivity); Balthasar, Hrubant, and Hrubant, 1967:174 (Bulgaria: Slanchev Bryag near Nessebar); Benno, 1967:35 (in checklist of Sphecidae of Netherlands); de Beaumont, 1967a:277 (Turkey); Gauss, 1967:551 (Germany: Baden-Württemberg); J. Heinrich, 1967:70 (Germany: Bayern: Unterfranken District, prey: *Halictus eurygnthus*); Niedl and Deneš, 1967:84 (Czech Republic: Třeboň area); Scobiola-Palade, 1967a:161 (Romania: Comarova, Hagieni, Mangalia), 1967b:39 (Romania); Benedek, 1968:71 (Hungary; floral records); Parré, 1968:122 (Germany: Sachsen-Anhalt: Staßfurt); Scobiola-Palade, 1968b:141 (Romania: Island of Letea in delta of Danube), 1968c:382 (Romania: Alexandria, Brăneşti, Bucureşti, Budeşti, Comana, Frăteşti, Giurgiu, Grădiştea,



Mogoşoaia, Periş); de Beaumont, 1969:81 (Turkey); Benedek, 1969a:83 (Hungary; marshy meadow); Dathe, 1969:439 (Germany: Berlin Zoological Garden); Lefebvre, 1969c:233 (Netherlands: St. Pietersberg = Montagne Saint Pierre); Romanova, 1969:133 (Russia: North Caucasus); Simon Thomas, 1969b (rearing specimens for venom production); Zangheri, 1969:1700 (Italy: in catalog of flora and fauna of Romagna Region); de Beaumont, 1970a:396 (Afghanistan), 1970c:4 (Iran: Khorassan); Kazenas, 1970b:366 (Kazakhstan); Benedek, 1970:96 (Hungary: Tapolca); Oehlke, 1970:679 (Democratic Germany); Simon Thomas, 1970:169 (methods of individual markings for field observations); Tumšs, 1970:76 (Latvia); Dathe, 1971:234 (Germany: Berlin Zoological Garden; phenology); Hoop, 1971:83 (Germany: Schleswig-Holstein: Segrahner Berg); Kazenas, 1971:161 (Kazakhstan: Zailiyskiy Alatau Range; widely distributed in Kazakhstan); Piek, Mantel, and Engels, 1971:317-331 (venom causing neuromuscular block); Schmidt, 1971b:24 (Germany: Rheinland-Pfalz: Gonsenheimer Wald, Mainzer Sand); Stritt, 1971a:104 (Germany: Baden-Württemberg: Karlsruhe); Valetta, 1971:46 (Malta); Vegter, 1971:229 (Netherlands: Drenthe Province); Zonderwijk, 1971:79 (Netherlands: Tientarij); Atanassov, 1972a:191 (Bulgaria: Stara Planina Mountains), 1972b:32, 48, 53 (Bulgaria: Stara Planina Mountains); Balthasar, 1972:381 (in Sphecidae Fauna of Czechoslovakia); Kazenas, 1972b:123 (Kazakhstan); Myartseva, 1972b:106 (parasite: *Senotainia pygmaea* (Rondani)); Olberg, 1972:53 (habitat, nesting habits), 55 (photograph of female); Scobiola-Palade, 1972a:149 (Romania: delta of Danube: Caraorman), 1972b:251 (Romania); Simon Thomas, 1972:176 (France); Simon Thomas and Poorter, 1972:141 (male behavior); Simon Thomas and Simon Thomas, 1972:123 (female behavior); El-Borollosy, Wafa, and El-Hefny, 1973:287 (nesting habits, preimaginal stages); Leclercq, 1973d:166 (regression in Belgium following cold winter of 1942); Simon Thomas and Simon Thomas Heijmans, 1973:64 (Netherlands; nesting habits); Wolf, 1973:41 (Germany: Siegerländer Hüttensand); Erlandsson, 1974:61 (France, Greece, Italy, Malta, Spain); Esmaili and Rastegar, 1974:46 (Iran); Kazenas, 1974b:109 (feeding on flowers of *Tamarix* sp., *Statice gmelini* Willd., Plumbaginaceae, and *Euphorbia* spp., Euphorbiaceae, in Kazakhstan), 110 (feeding on flowers of *Silaum besseri* L., Apiaceae, and *Melilotus albus* Desr., Fabaceae, in Kazakhstan), 111 (feeding on flowers of *Mentha aquatica* L., Lamiaceae, *Saussurea* sp., Asteraceae, *Lepidium crassifolium* W. et K., and *Barbarea vulgaris* R. Br., Brassicaceae, in Kazakhstan); Simon Thomas, 1974:56 (Netherlands: Limburg: Tienray); Simon Thomas and Veenendaal, 1974b:3 (France); Benedek, 1975:251 (Hungary; onion pollination); Lomholdt, 1975b:31 (Denmark: Island of Anholt), 1975c:183 (in Sphecidae Fauna of Fennoscandia and Denmark); Piek and Nijo, 1975:199-201 (venom causing neuromuscular block in honeybee); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Simon Thomas, 1976:3 (France: Lot-et-Garonne: Forêt de Campet); Simon Thomas and Simon Thomas, 1976:1-23 (Egypt: Dakhla oasis; nesting habits); Georghiou, 1977:191 (Cyprus); Haeseler, 1977a:23 (northwestern Germany), 1977b:289-292 (northwestern Germany); Kolesnikov, 1977:317 (Russia: Bryansk Oblast); Cruysbergh, 1978:97 (Netherlands); Erlandsson, 1978b:131-134 (Sweden); Guichard, 1978:270 (Greece); Haeseler, 1978b:63 (Germany: Niedersachsen: a bog near Oldenburg); Kazenas, 1978b:46 (in key to Sphecidae of Kazakhstan and Central Asia); Leclercq, 1978b:map 1193 (distribution in Belgium); Marion, 1978:86 (France: Nièvre Department); Petit, 1978:86 (Belgium: Knokke); Pulawski, 1978:186 (in key to Sphecidae of European part of former USSR); Simon Thomas and Simon Thomas, 1978:450-456 (nesting habits); Simon Thomas and Veenendaal, 1978:3-8 (underground activity); Schwammler, 1978:416 (Germany: Württemberg); Benedek, 1979:227 (Hungary: Bakony Hills); Islamov and Kazenas, 1979:64 (Uzbekistan: floral records); Lefebvre, 1979:11 (in checklist of Sphecidae of Netherlands), 33 (Netherlands: distribution map); May and Piek, 1979:685 (venom causes neuromuscular block in locust skeletal muscle); Radović and Krunić, 1979:unpaginated foldout (nesting in sand, foreleg structure); Richards, 1979:402 (British Channel Islands); Schmidt, 1979a:54 (Germany: Ost-Holstein), 1979b:298 (Germany: Baden-Württemberg); Schwammler, 1979:114 (Germany: Nordrhein-Westfalen: Gildehauser Venn Nature Reserve); Simon Thomas, 1979:139 (can the species become an apicultural plague in Netherlands?); Borg-Karlson and Tengö, 1980:828 (pyrazines as marking volatiles); Casolari and Casolari Moreno, 1980:122 (specimens in M. Spinola collection); Dathe, 1980:208 (Russia: northern Caucasus: Teberda); Pagliano, 1980:124 (Italy: Piemonte, Sicilia); Piek, Mantel, and Jas, 1980:345 (venom causes ion-

channel block in insect muscle fiber membrane); Richards, 1980:83 (in key to Sphecidae of British Isles); Simon Thomas and Simon Thomas, 1980a:106 (history of outbreaks damaging apiculture in northwestern Europe, nesting habits); 1980b:97 (population outbreak in Dakhla oasis, Egypt), 1980c (nesting habits, methods of protecting honeybee hives); Wollin, 1980:107 (Sweden); Dollfuss and Ressler, 1981:324 (Austria: Niederösterreich: Scheibbs District); Gess, 1981:21 (South Africa: 18 km WNW Grahamstown; nesting in clayey friable soils); Haeseler, 1981:52 (Germany: Friesian Island: Island Amrum); Heath and Leclercq, 1981:map 17 (distribution in Europe); Józán, 1981:304 (Hungary: Hortobágy National Park); Woydak, 1981:39 (Germany: Westfalen: Hamm); Brugge, 1982: (Netherlands: Island of Texel); Clark, Donaldson, Gratton, Lambert, Piek, Ramsey, Spanjer, and Userwood, 1982:105 (block of locust muscle glutamate receptors by  $\delta$ -philanthotoxin); Donath, 1982:212 (Germany: Cottbus Bezirk); Dunbar and Piek, 1982:79-84 (action of venom on insect visceral muscle); Gayubo, 1982b:50 (Spain: Ávila, Cáceres, and Salamanca provinces), 1982e:109 (Spain: Cádiz Province); Leclercq, 1982a:125 (Belgium: Liège); Piek, 1982:311 (effects and components of venom); Piek, Spanjer, Veldsema-Currie, van Groen, de Haan, and Mantel, 1982:159-164 (effect of venom on cockroach abdominal ganglia); Silvestre de Sacy, 1982:4 (France: Côte-du-Nord: Paimpol area); Skibińska, 1982:123 (Poland: Warszawa area); van Marle, Piek, Lind, and van Weeren-Kramer, 1982:343 (venom reducing glutamate uptake in nerve endings of locusts muscles); Dollfuss, 1983a:76 (Austria: endangered in Niederösterreich), 77 (Austria: endangered in Burgenland), 78 (Austria: endangered in Oberösterreich and Salzburg area), 79 (Austria: endangered in Kärnten and Steiermark), 80 (Austria: endangered in Tirol), 1983b:24 (in catalog of Sphecidae of Austria); Gayubo, 1983a:125 (prey: workers of *Apis mellifera* Linnaeus), 1983e:236 (Spain: Salamanca Province); Lefeber, 1983a:85 (Netherlands: Waddendistrict: Texel Island, record deleted in reprint); Piek, Buitenhuis, Veldsema-Currie, and Mantel, 1983:153-159 (venom contains acetylcholine, but no histamine); Riemann, 1983:83 (Germany: Bremen-Daverden area); Schmidt and Westrich, 1983:125 (Greece); Burger, de Goffau, and Ulenberg, 1984:147 (Netherlands); Chevin and Silvestre de Sacy, 1984:10 (France: Yvelines Department); Gayubo, 1984c:382 (Portugal: El Algarve Province); Gayubo and Tormos, 1984:23 (Spain: Valencia); Haack, Tschardtke, and Vidal, 1984:132 (Germany: Hamburg area); Janzon and Svensson, 1984:183 (Sweden: Öland Island); Lefeber, 1984:29 (Netherlands: Maastricht); Piek, Hue, Pelhate, David, Spanjer, and Veldsema-Currie, 1984:297-306 (philanthotoxin blocking postsynaptic membrane); Schmidt and Westrich, 1984:240 (Germany: Rheinland-Pfalz: Bad Münster); Archer, 1985b:156 (Britain: Suffolk); Chevin and Chevin, 1985:39 (France: Aude); de Man, 1985:23 (Netherlands); Eiroa and Novoa, 1985:23 (Spain: Pontevedra: Barra beach near Cangas); Gayubo, 1985a:489 (prey: *Apis mellifera* Linnaeus), 1985c:172 (Spain: four localities; Portugal: Villanova); Haeseler, 1985c:571 (Germany: Friesian Islands); Józán, 1985b:62 (Hungary south of Lake Balaton), 82 (floral records), 85 (ecological and zoogeographic characteristics); Koster, 1985:75 (Netherlands: common along railways); Lefeber, 1985:87 (Netherlands: southern Limburg); Nilsson, 1985:43 (Sweden); Plachter, 1985:60 (Germany: Bayern: lower Brombach valley); Radović, 1985:66 (sting apparatus analyzed); Scobiola-Palade, 1985:95 (Romania: delta of Danube); Brechtel, 1986:57 (Germany: Südpfalz); Gayubo, 1986a:66 (Spain: Ciudad Real Province), 1986b:41 (Spain: Andalucía), 1986d:122 (Spain: Zamora Province), 1986f:1002 (prey); Gayubo and Sanza, 1986:84 (Spain: Burgos, Soria); Gayubo and Tormos, 1986a:19 (Spain: Castellón de la Plana); Islamov, 1986:518 (Uzbekistan: Tashkent Oblast'); Józán, 1986:374 (Hungary: Kiskunság National Park); Piek, 1986b:190 (morphological and physiological differences between *triangulum triangulum* and *triangulum abdelcader*); Piek and Mantel, 1986:433 (differences in venom between Dutch and Egyptian populations); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey), 222 (chemistry of venom), 235 (treatment with high concentration of venom does not change the electrical activity of nerve cord of *Schistocerca gregaria*), 236 (venom very active on locomotor system of honey bee, even when introduced into haemolymph); Steiner, 1986:112 (references to publications on nesting habits); Pagliano, 1987:159 (Italy, in key to Italian Philanthinae); Scobiola-Palade, 1987:65 (Romania: Dobrogea); Schmidt and Westrich, 1987:358 (Germany: Mainz area); Tormos and Jiménez, 1987a:127 (Spain: Valencia Province), 1987b:317 (Spain: Valencia Province: Dehesa de El Saler); Veenendaal, 1987:169 (parasite: *Hedychrum rutilans* Dahlbom); Asís and Jiménez, 1988:276 (Spain: Castellón

Province); Chevin, 1988:16 (France: La Manche Department); Dollfuss, 1988:19, 30 (Austria: Bisamberg near Vienna; Niederösterreich: Oberweiden); Düweke, 1988:689 (Germany: Baden-Württemberg: Kaiserstuhl); Evans and O'Neill, 1988:192 (review of male behavior, nesting habits, and natural enemies); Karsai, 1988:101 (Hungary: Kiskunság National Park); H. Kollar, 1988:23 (nesting at foot of loess cliffs); Kowalczyk, 1988a:45 (Poland: Rogów), 1988b:64 (Poland: environs of Łódź); Pagliano, 1988:138 (in revision of Italian Philanthinae); Pulawski, 1988:34 (petition to ICZN to preserve the name); Riemann, 1988:223 (Germany: Bremen area); Wolf, 1988b:143 (Germany: Rheinland-Westfalen); Al-Houty, 1989:162 (Kuwait); Archer, 1989b:232 (Great Britain: Suffolk); Borsato, 1989:201 (Italy: Lombardia: Busatello marsh); Hamon, 1989:45 (support of petition to ICZN to preserve the name); Jacobs, 1989:28 (Germany: Mecklenburg-Vorpommern); Józán, 1989:102 (Hungary: Tihany Natural Reserve); Lomholdt, 1989:45 (support of petition to ICZN to preserve the name); Pádr *in* Šedivy, 1989a:166 (in checklist of Czechoslovakian Sphecidae); Scobiola-Palade, 1989:87 (Romania: delta of Danube); Spofford, Kurczewski, and Downes, 1989:259, 261 (references to publications on nest parasites *Senotainia trilineata* (Wulp), a miltogrammine fly, and undetermined species of Miltogrammini); Weiffenbach, 1989:107 (Germany: Hessen: Gießen area); Barbier, Rasmont, and Wahis, 1990:32 (Belgium: Hainaut); Gayubo, Asís, and Tormos, 1990b:80 (Spain); Jacobs and Oehlke, 1990:215 (new records from Democratic Germany); Kuznetzova, 1990:18 (Russia: Voronezh Oblast': Galich'ya Gora Nature Reserve); Schmidt, McDaniel, and Simon Thomas, 1990:2135 (chemistry of male mandibular gland secretions); Kowalczyk, 1990:290 (Poland: Góry Świętokrzyskie); Pagliano, 1990:95 (in catalog of Italian Sphecidae); Riemann and Melber, 1990:120 (northwest Germany: *Calluna*-meadows); Rohe, 1990:1049 (Germany: Rheinland-Pfalz: Lenneberg forest); Schwammberger and Priesner, 1990:553 (Austria: Kärnten); Day, 1991:xviii (summary of European Endangered Hymenoptera Lists); Archer, 1991a:34 (Great Britain: Isle of Wight); Chinin, 1991:111 (Russia: Samara Oblast'); Dollfuss, 1991:212 (in key to Sphecidae of North and Central Europe); Gayubo, 1991a:127 (characteristics of species); Gayubo, Borsato, and Osella, 1991:419 (Italy); Gayubo and Torres, 1991:Table I and p. 81 (Spain: Salamanca; effects of urban pressure); Guichard, 1991a:338 (Jordan); Idriss, 1991:95 (action of philanthotoxin on frog and locust muscles); Jacobs, 1991:46 (Germany: Mecklenburg-Vorpommern: Nature Reserve Elbtaldünen); Jakubzik, 1991:74 (Germany: Köln); Józán, 1991:605 (Hungary: Bátorliget Nature Reserve); Karst and Piek, 1991:479 (action of philanthotoxins); Karst, Piek, Van Marle, Lind, and Weeren-Kramer, 1991:471 (action of philanthotoxins); Kowalczyk, 1991a:89, 99, 101 (Poland: Łódź), 1991b:120 (Poland: Augustów Forest); Kuhlmann et al., 1991:92 (Germany: Senne Region); Negrisoló, 1991:323 (Italy: Gorizia, Trieste, and Venezia Provinces); Schembri, 1991:177 (Malta); Benson, Schürmann, Kaufmann, Gsell, and Piek, 1992:267 (action of philanthotoxins); H.-J. Schulz, 1991:30 (Germany: Oberlausitz: 5 km SW Wittichenau); Budrys, 1992:29p (in list of Sphecidae of Lithuania); Delarze, 1992:68 (Switzerland: Valais: Les Follatères); Gayubo, Borsato, and Osella, 1992:290 (Greece, Spain); Gunnardo, 1992:59 (Sweden: Varmländ); Harvey and Payne, 1992:185 (Great Britain: Essex: new sites); Haeseler, 1992:354 (possibly not native on Frisean Islands); Józán, 1992a:230 (Hungary: Béda-Karapanca Protected Area), 1992c:290 (Hungary: Zselic Hills); K. Weber, 1992:88 (Germany: Bayern: Bamberg District); Archer, 1993:46 (Great Britain: Channel Islands); Else, 1993a:163 (southern England); Gorobchishin, 1993:47 (Ukraine: Kanev Nature Reserve); Kuhlmann, 1993:76 (Germany: known from Westfalen); Luchetti, 1993:105 (Italy: Sardegna: Maddalena archipelago); Piek, 1993:104 (venom blocks central neural system of honeybee prey, prey paralysis by peripheral effect on muscle contraction); Schubert and Schönlitzer, 1993:264 (facial fovea not found); Torregrosa, Gayubo, Tormos, and Asís, 1993:20 (Spain: Alicante Province); Wiśniowski, 1993a:98 (Poland: in checklist of Sphecidae of Białowieża Primeval Forest); Archer, 1994b:104 (British Channel Islands); Blagoveshchenskaya, 1994:91 (Russia: Ul'yanovsk Oblast'); Gayubo and Borsato, 1994:219 (Italy: Valle d'Aosta, Liguria, Veneto, Toscana, Sardegna); Gess and Gess, 1994:100 (visiting flowers of *Aspalathus linearis*); Guichard, 1994a:209 (Arabian Peninsula); Schmid-Egger, 1994a:688 (Germany: Rheinland-Pfalz: Höllenberg near Grünstadt); Theunert, 1994c:49 (summary of records from Niedersachsen and Bremen, Germany); Tormos, Asís, and Gayubo, 1994:190, 225 (Spain: Albacete Province); Baumgarten, 1995:35 (parasite: *Hedychrum rutilans*, a chrysidid);

Else, 1995a:24 (records from southern England for 1993), 1995b:205 (records from southern England for 1994); Józán, 1995:105 (Hungary: projected Duna-Dráva National Park); Krasnobayev et al., 1995:139 (Russia: Zhiguli Hills NW Samara); Negrisolo, 1995a:18 (visiting flowers of *Eryngium maritimum* L.), 19 (visiting flowers of *Echinophora spinosa* L.), 22 (Italy: Veneto); Negrisolo in Minelli, Ruffo, and La Posta, 1995b:8 (in catalog of Italian fauna); Pagliano and Pesarini, 1995:92 (Italy: Ferrara Province); Scharrer, 1995:31 (Croatia: Malinska in Island of Krk, misspelled Malinora; France: Gard: Nîmes; Germany: Bayern: Goldbach, Kahl, Lohr, Mainfranken); Schmid-Egger, Risch, and Niehuis, 1995:187 (color photograph), 205 (summary of records from Germany: Rheinland-Pfalz Province); Yeo and Corbet, 1995:41 (in field guide to British solitary wasps); Archer, 1996a:59 (Great Britain: Channel Islands); Arens, 1996:442 (Germany: Bayern: Bayreuth area); Blösch, 1996:7 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); Fowles, 1996:15 (Great Britain: Red Data Book species recorded from Wales), 36 (Great Britain: in checklist of aculeates of Wales); Gadallah, 1996:69 (in revision of Egyptian *Philanthus*); S. Gess, 1996:269, 294 (floral records); Gorobchishin, 1996:53 (Ukraine: Kanev Nature Reserve); Harvey and Plant, 1996:81 (Great Britain: summary of records from Essex); Jakubzik, 1996:253 (Germany: Köln); Jakubzik and Cölln, 1996b:400 (Germany: Rheinland-Pfalz); Kuhlmann, 1996:220 (Portugal: Serra de Estrela); Minoranskiy and Shkuratov, 1996:81 (Russia: Rostov Oblast'); Pawlikowski and Kruszyński, 1996:87 (Poland: Toruń Basin); Ruinet, 1996:109 (nesting and preying, using sun for navigation); Saure, 1996:503 (Germany: Berlin-Pankow: sewage irrigation field); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: not endangered); Voblenko, Gorobchishin, and Nesterov, 1996:15 (Ukraine: Polesye Region); von der Dunk and Amon, 1996:41 (Germany: Bayern: Altdorf sand dunes east of Nürnberg); Witt, 1996:106 (Germany: Brandenburg); Woydak, 1996:98 (Germany: Westfalen: summary of distribution and nesting habits); Wu and Zhou, 1996a:162 (in revision in Economic Insect Fauna of China); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:292 (in Sphecidae Fauna of Western Europe); Celary, 1997:60 (in checklist of Animals of Poland); Dörfel, 1997:71 (nesting habits described for general public); Else in R. Edwards, 1997:86 (Great Britain and Ireland: distribution, status, habitat, flight period, prey, nesting habits, flowers visited, map of distribution in Great Britain by Archer and Roberts); Hansen, 1997:189 (southeastern Norway, first country records); Madl, 1997:821 (Madagascar: Nosy Boraha Island), 822 (in checklist of Nosy Boraha Sphecidae); Nazarova and Shomirsaidov, 1997:24 (Tajikistan: fruit tree orchards in Vakhsh River valley); Petit, 1997:351 (Belgium: Liège Province: Lanaye: colonization of new habitat); Schmidt and Schmid-Egger, 1997:26 (in checklist of German Sphecidae); Strohm and Linsenmair, 1997a:423 (more sons are produced when prey is restricted), 1997b:23 (minimum prey number to produce a daughter is three; smaller females produce more sons); Archer, 1998b:158 (Great Britain: Lincolnshire: Gibraltar Point National Nature Reserve); F. Burger, Saure, and Oehlke, 1998:29 (Germany: in list of Sphecidae of Brandenburg); Dollfuss, Gusenleitner, and Bregant, 1998:525 (Austria: summary of collecting records from Burgenland); Drewes, 1998:49 (Germany: Niedersachsen: Goldbeck 26 km west-southwest of Hamburg); Flügel, 1998:60 (Germany: Brandenburg: Unteres Odertal National Park); Haeseler and Ritzau, 1998:51 (Germany: Bremen: Steller Heide); Jakubzik, Schlüter, and Cölln, 1998:1182, 1184 (Germany: Rheinland-Pfalz); Józán, 1998:312 (Hungary: Duna-Dráva National Park); Lefeber, 1998:182 (Netherlands: Limburg: Sint-Pietersberg near Maastricht at 50°50'N 5°41'E); Nazarova, 1998:42 (Tajikistan: Tigrovaya Balka Nature Reserve); Petit, 1998a:109 (Belgium: Bassenge, visiting flowers of *Polygonum cuspidatum* Siebold and Zucc.); N. Schneider and Wahis, 1998:22 (Luxemburg: sandstone quarries); Strohm and Linsenmair, 1998:330 (females produce more sons than daughters, regardless of weather conditions); van der Smissen, 1998:67 (Germany: Niedersachsen, Schleswig-Holstein); K. Weber, 1998:147 (Germany: Bayern: Bamberg area); Anan'eva and Kochetkov, 1999:6 (Russia: Ryazan Oblast': no specific locality); Gayubo, García, Torres, and González, 1999:91 (Spain: Soria Province); Herrmann, 1999:7 (Germany: Niedersachsen: Oldenburg area; habitats size); Ljubomirov, 1999b:57 (Bulgaria: Mount Vitoshka near Sofia); Mandery, 1999:106 (Germany: Bayern: Coburg area); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Pauly, 1999:111 (in catalog of Belgian aculeates); Petit, 1999:111 (Netherlands: Kruispolder, Nieuw-Namen); Riemann, 1999:835 (Germany: Niedersach-

sen: sand pits near Bremen); H.-J. Schulz, 1999:193 (Germany: Sachsen: city of Görlitz); M. Schwarz, 1999:88 (Austria: Oberösterreich: city of Linz area); Skibińska, 1999:96 (in Białowieża Primeval Forest, Poland, not recorded since Bischoff, 1925); Tüzün, Gülmez, and Bağrıaçık, 1999:385 (Turkey: Aegean Region); Zehnder and Zettel, 1999:131 (Switzerland: recolonization of flooded area in Valais Canton); Blösch, 2000:405 (in Sphecid Fauna of Germany); Cartier, 2000a:74 (France: Hauts-de-Seine: Rueil-Malmaison); Cölln and Jakubzik, 2000:226 (Germany: Rheinland-Pfalz: Gönnersdorf); Dressler, 2000:33 (Germany: Hessen: Darmstadt area); Esenbekova and Kazenas, 2000:70 (southeast Kazakhstan: six localities); Gayubo, González, and Torres, 2000:187 (Spain: Salamanca Province); Giachino, Grosso, Marchetti, Pagliano, Scaramozzino, and Vailati, 2000:110 (Greece); Gibbs, 2000:4, 13 (Great Britain: Bristol: Troopers Hill); Jacobs, 2000:9 (Germany: Land Mecklenburg-Vorpommern: not endangered); R. Jones, 2000:181 (Great Britain: central London); Józán, 2000:113 (Hungary: Bakony Mountains); Kuhlmann, 2000:64 (Germany: Hessen: Diemel River valley); Ljubomirov, 2000:6, 13 (Bulgaria, specimens in N. Nedelkov collection); M. Mader and Chalwatzis, 2000:60 (Germany: Hessen: Oderwald Mountains); Mokrousov, 2000b:32 (Russia: Nizhniy Novgorod Oblast'); Moore, 2000:201 (nest sharing); Nachtigall, 2000:6 (wing bending and folding during flight without or with prey); Neumeyer, 2000:99 (Switzerland: Basel); Pijfers, 2000:5 (Netherlands: Twente Region); Schmalz, 2000:20 (Germany: Hessen: Fulda area); Schmid-Egger, 2000b:276 (Germany: Baden-Württemberg: shores of Rhine River); M. Schwarz, 2000:9 (Austria: Oberösterreich: city of Linz area); Shkuratov, 2000:55 (Russia: Rostov Oblast': Vëshenskaya village area at 49°37'N 41°45'E); Strohm, 2000a:184 (factors affecting body size and fat content), 2000b:52 (preserving prey against fungi); Strohm and Lechner, 2000:183 (male size does not affect territorial behavior and nesting habits traits); Strohm and Linsenmair, 2000:173 (allocation of parental investment); Basset, 2001:85 (France: Département de Gironde); Ivanov and Ljubomirov, 2001:213 (Bulgaria: Kresna Gorge at 41°48'N 23°10'E); Józán, 2001:281 (Hungary: Somogy County); Kazenas, 2001b:52 (in checklist of Sphecidae of Kazakhstan and Central Asia), 244 (review of known biology); Kazenas and Esenbekova, 2001:136 (Kazakhstan: Almatinskiy Nature Reserve); Mazzucco, 2001:203 (Austria: Niederösterreich: Steinfeld); Ohl et al., 2001:141 (distribution in Germany by provinces); Reemer and van der Meer, 2001:16 (Netherlands: along Almelo-Nordhorn canal); Shkuratov, 2001:17 (prey: honey bee); Skibińska, 2001:220 (Poland: Białowieża Primeval Forest); Strohm and Linsenmair, 2001:198 (preserving prey against fungus infestation); Strohm, Laurien-Kehnen, and Bordon, 2001:50 (spatial and temporal strategies against *Hedychrum rutilans* (Dahlbom)); Strømgaard, Andersen, Krogsgaard-Larsen, and Jaroszewski, 2001:317 (structure of the most active fraction of the venom of *Philanthus triangulum*, originally known as  $\delta$ -philanthotoxin, now renamed philanthotoxin-433°); Tüzün, 2001:44 (Turkey); van der Smissen, 2001:63 (Germany: Schleswig-Holstein: not endangered); Zettel, Gross, and Mazzucco, 2001:80 (Austria: Wien); Archer, 2002b:130 (Great Britain: Watsonian Yorkshire: distribution map); Archer and Edwards, 2002:103 (Great Britain: West Sussex: Ambersham and Iping commons); Beavis, 2002:112 (Great Britain: Kent: Tunbridge Wells area); Bieri, 2002:78 (Liechtenstein); Herrmann and Zinnert, 2002:26 (Germany: Baden-Württemberg: Bettenberg near Konstanz); Józán, 2002:54 (Hungary: Mecsek Mountains); Kazenas, 2002a:136 (geographic distribution, collecting localities in Kazakhstan); Kowalczyk, Szczepko, and Świątek, 2002:155 (Poland: Kampinos National Park near Warszawa); Litt, 2002:166 (Belgium); Lukáš, 2002:191 (Slovakia: Hájnica hill near Trenčianske Bohuslavice); Reemer and van der Meer, 2002:Bijlage 5 (Netherlands: Gelderland: Zaltbommel area); C. Schlüter, 2002:141 (Germany: Niedersachsen: anthropogenic habitats in Ammerland District); Shlyakhtenok and Skibinska, 2002:35 (Belarus': no specific locality); Strohm and Marliani, 2002:52 (cost of parental investment); Vischer, 2002:289 (Germany: Sachsen-Anhalt: vineyards in Saale-Unstrut area); von der Dunk and Amos, 2002:159 (Germany: Bayern: Schwaig near Nürnberg); Ziska, 2002:9 (Germany: Berlin-Köpenick: Krumme Lake); Cölln, Esser, and Jakubzik, 2003:63 (Germany: northwestern Rheinland-Pfalz: excavation sites and quarries); Drewes, 2003:141 (Croatia, France, Germany, Italy, Morocco, Spain: miscellaneous locality records); Flügel, 2003:9 (Germany: Hessen: Knüllwald); Generani, Pagliano, Scaramozzino, and Strumia, 2003:65 (Italy: Arcipelago Toscano); S. Gess and F. Gess, 2003:130 (Namibia, South Africa: visiting flowers of *Galenia sarcophylla* Fenzl,

Aizoaceae, *Calicorema capitata* (Moq.) Hook f. and *Hermbstaedtia glauca* (Wendl.) Reichb. ex. Steud., Amaranthaceae, *Deverra denudata* (Viv.) Pfisterer and Podl. and *Foeniculum vulgare* Mill., Apiaceae, *Asclepias buche-naviana* Schinz, Apocynaceae, *Athanasia trifurcata* (L.) L., Asteraceae, *Codon royenii* L., Boraginaceae, *Cleome paxii* (Schinz) Gilg and Ben., *Cleome suffruticosa* Schinz, and *Maerua gilgii* Schinz, Brassicaceae, *Adenolobus garipensis* (E. Mey.) Torre and Hillc., Fabaceae, *Euclia crispa* (Thunb.) Guerke, Ebenaceae, *Acacia karroo* Hayne, *Aspalathus linearis* (Burm. F.) Dahlgren, and *Aspalathus spinescens* Thunb., Fabaceae, *Stachys aurea* Benth., Lamiaceae, *Limeum argute-carinatum* Wawra and Peyr., Molluginaceae, *Zygophyllum prismatocarpum* E. Mey. ex Sond. and *Zygophyllum stapfii* Schinz, Zygophyllaceae); Haeseler, 2003:340 (Germany: Niedersachsen: Island of Harriersand near Bremen); Herzner, Schmitt, Linsenmair, and Strohm, 2003:237 (flagellar sensillae in female and male); Józsan, 2003:228 (Hungary: Látányi Puszta Nature Conservation Area); Lukáš, 2003:73 (Slovakia: Bratislava: old fruit orchard); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); Pulawski, 2003b:799 (in checklist of Malagasy Sphecidae); Reemer, 2003:62 (Netherlands: Gelderland: Zaltbommel area); Schmid-Egger, 2003:756 (Italy: Sicilia: Vendicari; Malta: Ramla); H.-J. Schulz, 2003:8 (Germany: active colony in the city of Görlitz); Strohm and Daniels, 2003:749 (female reproductive success depends on density on inner mitochondrial membranes); Tischen-dorf and Treiber, 2003:121 (Germany: Hessen: 15 km southwest of Frankfurt am Main: nesting under high power lines); von der Dunk and Niedling, 2003:181 (Germany: Bayern: Zeckern north of Erlangen); von der Heide and Metscher, 2003:103 (Germany: Niedersachsen: Emsland area); Archer, 2004:47 (Great Britain: Worcestershire: Devils Spittleful Nature Reserve), 2004e:76 (Great Britain: Yorkshire: Dandall Beat Wood, southern Washlands, Pollington quarry); Esser, Jakubzik, Sonnenburg, and Woydak, 2004:263 (Germany: in checklist of Sphecidae of Nordrhein-Westfalen); Gadallah and Assery, 2004a:218 (in key to Sphecidae of Jeddah Region, Saudi Arabia), 232 (in catalog of Sphecidae of Saudi Arabia: south and west of Jeddah, Obhor), 2004b:1398 (skeletal parts of sting apparatus); Gorobchishin, 2004:34 (Ukraine: Zaporiz'ka Oblast': Obitichna Kosa Nature Reserve); Gorobchishin and Protsenko, 2004:40 (Ukraine: Kherson Oblast': Chernomorskiy Nature Reserve); Hellrigl, 2004a:174 (Italy: Trentino-Alto Adige, as Südtirol: Vahr; Vinschgau = Val Venosta: Sigmundskron near Bozen = Bolzano, Staben); Kaltenpoth, Strohm, and Gadau, 2004:589 (primer sequences for 14 polymorphic microsatellite loci); Kazenas, 2004b:111 (Kazakhstan: western Tien Shan), 2004d:35 (Kazakhstan: shores of Ural River); Klein and Lefebvre in Peeters, van Achterberg, et al., 2004:416 (in Wasp and Ant Fauna of Netherlands); Litt, 2004:222 (Switzerland: Valais: Varone); Majzlan and Deván, 2004:30 (Slovakia: Sekule), 33 (Slovakia: Malacky-Široké); Nazarova, 2004:108 (Tajikistan: Badakhshan Region: Rushan District: villages Dasht and Visav in Bartang River valley); Protsenko and Gorobchishin, 2004:108 (Ukraine: Kiev: floral records); Raemakers, van den Eijnde, and Kleukers, 2004:292 (Netherlands: Tungelerwalle near Weert); Reissmann, 2004:1 (male territorial pheromones); Shkuratov, 2004a:73 (Russia: Rostov Oblast'), 2004b:165 (Russia: Rostov Oblast': Gosudarstvennyi Muzey-Zapovednik M.A. Sholokhova); Skibińska in Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Tannert and von der Dunk, 2004:135 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); Wiśniowski, 2004:52 and 63 (in checklist of Polish Sphecidae); Blösch, 2005:5 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); Burger, 2005:35 (Germany: Thüringen); Cheeseborough, 2005:17 (Great Britain: Shropshire County: Lyth Hill near Shrewsbury); Cruz-Sánchez, Gayubo, González, and Torres, 2005:221 (Spain: Salamanca: San Martín del Castañar); Ebrahimi, 2005:130 (in key to selected Iranian Sphecidae); Fuhrmann, 2005:89 (Germany: Nordrhein-Westfalen: Grubengelände Littfeld Nature Reserve); Haeseler, 2005:629 (Germany: Niedersachsen: Steller Heide near Bremen); Hallin, 2005:16 (Sweden: Örebro County: Hällefors); Herzner, Schmitt, Linsenmair, and Strohm, 2005:1411 (male pheromone contains long-chain alcohol (Z)-11-eicosen-1-ol, also found in cuticle of honeybee); Jacob and Remacle, 2005:62 (Belgium: Luxembourg Province: quarry Haut des Loges in Vance); Jacobs, 2005a:449 (Bulgaria: Arkutino near Burgas, Michurin, Plovidv, Primorsko); Kaltenpoth, 2005:329 (bacteria cultivated in female antennal glands are used to protect honeybee prey from fungal infestation); Kaltenpoth, Göttler, Herzner, and Strohm, 2005:475 (females culti-

vate a new species of bacterium *Streptomyces* in specialized antennal glands and apply them to nest cell prior to oviposition; bacterium protects cocoon from fungal infestation); Kofler, 2005:184 (Austria: Tirol: Lienz District: city of Lienz, Untergaimberg in Gaimberg Common); Kowalczyk and Kurzac, 2005:106 (Poland: Botanical Garden in Łódź); Kraatz, 2005:103 (Germany: Niedersachsen: Bümmerstede near Oldenburg); Landeck, Wöhler, and Landgraf, 2005:18 (Germany: Lausitz Region; visiting flowers of *Reseda luteola* Linnaeus, Resedaceae); Mandery, 2005:174 (Germany: Bayern: Hainberg Nature Reserve near Nürnberg); Mokrousov and Selivanova, 2005:754 (Russia: Voronezh Oblast'); Nazarova, 2005:94 (alfalfa fields in southwestern Tajikistan); Pagliano and Negrisolò, 2005:304 (in Sphecidae Fauna of Italy); Pijfers, 2005:49 (Netherlands: Twente: Noordelijke Manderheide); Riemann and Hohmann, 2005:564 (Germany: Niedersachsen: city of Bremen and adjacent area); Saure, 2005:18 (Germany: Berlin); Schmalz, 2005:58 (references to XIX<sup>th</sup> century authors); Shorenko, 2005a:168 (Ukraine: Crimea), 2005b:99 (Ukraine: Crimea: Karadagh Nature Reserve); Theunert, 2005a:18 (Germany: in checklist of Sphecidae of Niedersachsen and Bremen); Venne and Bleidorn, 2005:44 (Germany: Nordrhein-Westfalen: Moosheide Nature Reserve); Yildirim and Ljubomirov, 2005:1806 (Turkey: many localities); Archer, 2006a:21 (Great Britain: Lincolnshire: Rauceby Warren National Park), 2006b:84 (Great Britain: Yorkshire: Blaxton), 2006c:217 (Great Britain: Staffordshire: Highgate Common), 2006d:76 (Great Britain: Watsonian Yorkshire: Pollington Quarry); Blösch, 2006:57 (males dig their own nocturnal rest galleries), 58 (nocturnal rest galleries are not reused); Bock, 2006:41 (Germany: Bayern: Kelheim District: Abensberg sands); Dathe, 2006:38 (*Philanthus triangulum*, recorded from Plauenscher Grund near Dresden, Germany, by von Block, 1799, has the same name now); Feitz, Gloden, Melchior, and Schneider, 2006:82 (Luxemburg: Baggerweieren area in Haff Réimech Nature Reserve); U. Frommer, 2006:37 (Germany: Hessen: Runkel area); Gadoum and Barbier, 2006:44 (France: départements of Val-d'Oise and Yvelines: Parc Naturel Régional du Vexin Français); S. Gess and F. Gess, 2006:18 (Namibia: Rooibank, visiting flowers of *Adenolobus pechuelii*, Leguminosae), 20 (South Africa: Richtersfeld National Park, visiting flowers of *Cleome paxii* and *Maerua schinzii*, Brassicaceae); Gorobchishin, 2006:143 (Ukraine: many localities); Herzner, Schmitt, Heckel, Schreiber, and Strohm, 2006:433 (male sex pheromones are more similar among brothers than with non-related individuals); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Ljubomirov, 2006:542 (Bulgaria: Rhodope Mountains: previous records summarized; also: six localities); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Kaltenpoth, Poldori, Papadia, Disney, and Andrietti, 2006:1971 (behavior of *Megaselia oxybelorum* Schmitz, a phorid nest parasite, at nest aggregations); Kroiss, Schmitt, Schreier, Strohm, and Herzner, 2006 (male postpharyngeal gland is a source of pheromones used for marking); Kroupa, 2006b:26 (Germany: Bayern: Oberfranken Region); Liebig, 2006:39 (Germany: Sachsen: Muskauer Heide); Magdalou, 2006a:8, 12 (France: Pyrénées-Orientales: Réserve Naturelle de la Massane), 2006b:110 (France: Pyrénées-Orientales: Mas Larrieu Nature Reserve near Argelès-sur-Mer); Peeters, Krekels, and Megens, 2006:22 (Netherlands: Reichswald forest near Nijmegen); N. Schneider, 2006:138, 141 (Luxemburg: anthropogenic habitats); Shlyakhtenok, 2006:113 (Belarus': Polesye Radiological Nature Reserve); Standfuss and Standfuss, 2006a:86 (Germany: Nordrhein-Westfalen: Dortmund), 2006b:99 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Strohm, 2006:1 (age-dependent changes in composition of cephalic gland secretion of male); Tezcan, Yildirim, Anlaş, and Beyaz, 2006:58 (Turkey: Manisa: Alaşehir: Kestanederesi, on flowers of *Origanum* sp.); Vepřek, 2006:511 (Czech Republic: Kokořínsko area); Archer, 2007a:151 (Great Britain: Norfolk: Thetford Warren Lodge); Baghirov, 2007:93 (Russia: southwestern Siberia); Beavis, 2007:98 (Great Britain: Tunbridge Wells and Central High Weald); R. Burger, 2007:18 (short description of morphology and nesting habits: Germany: in Mannheim nests within city limits); Goettler, Kaltenpoth, Herzner, and Strohm, 2007:1 (female antennal gland for cultivating bacteria of genus *Streptomyces*); Guldemond, Pijfers, and den Belder, 2007:203 (Netherlands: Gelderland: dairy farm in de Graafschap); Hallin, 2007b:25 (Sweden: Blekinge County); Herzner, Goettler, Kroiss, Pura, Webb, Jakob, Rössler, and Strohm, 2007:123 (males have a postpharyngeal gland); Herzner, Schmitt, Peschke, Hilpert, and Strohm, 2007:849 (females cover prey with secretion of postpharyngeal gland as protection against microbial degradation); Herrmann,

2007b:95 (Germany: Baden-Württemberg: Fürstenberg in Konstanz); Jacobs, 2007:181 (in key to Crabronidae of Germany); Jansen and Kaluza, 2007:25 (Germany: northwestern Sachsen); Józán, 2007:180 (Hungary: Zselic hills); Kaltenpoth and Strohm, 2007:S66 (bacteria *Candidatus Streptomyces philanthi* cultivated in female antennal glands); Kowalczyk and Nadolski, 2007:284 (Poland: Łódź: railway areas); Lee and Scott, 2007:22 (Great Britain: East Anglian wetlands); Saure, 2007:83 (Germany: in checklist of Aculeata of Brandenburg); Smit and Megens, 2007:17 (Netherlands: Noort Brabant: vicinity of Leende); Strohm, Herzner, and Goettler, 2007:113 (discovery in female of postpharyngeal gland, homologous to that of ants); Vago, 2007:174 (France: départements d'Aisne, Nord, Pas-de-Calais, and Somme), 176 (France: département du Nord: Bugnicourt); Venne, Bleidorn, and Lauterbach, 2007:302 (Germany: Nordrhein-Westfalen: Bielefeld); Vepřek and Straka, 2007:209 (in catalog of Sphecidae of Czech Republic and Slovakia); Vicidomini and Pignataro, 2007:2 (Italy: Salerno: known from Parco Nazionale del Cilento e Vallo di Diano), 15 (Italy: Provincia di Salerno: ubiquitous); Winkler, 2007:30 (Germany: Niedersachsen: eastern Friesland); Yildirim and Ljubomirov, 2007:119 (Turkey: Erzincan, Erzurum, and İçel provinces); Archer, 2008b:145 (Great Britain: South Essex: West Tilbury); Danilov, 2008:352 (Russia: Altayskiy Krai: Barnaul area); Danilov and Tshernyshev, 2008:44 (Russia: Novosibirsk Oblast: Karasuk area); Dvořák, Bogusch, Malenovský, Bezděčka, Bezděčková, Holý, Liška, Macek, Roller, Říha, Smetana, Straka, and Šíma, 2008:67 (Czech Republic: Hády Hill near Brno); Gayubo, González, Tormos, and Asís, 2008:140 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Goettler and Strohm, 2008:363 (detailed structure of male mandibular glands); Haeseler, 2008:309 (Germany: Friesian Islands); Herzner and Strohm, 2008:101 (females cover prey with secretion from postpharyngeal gland that prevents fungal infestation and desiccation); Kazenas, 2008b:114 (Kazakhstan: foothills of Zailiskiy Alatau: commonly found on loess cliffs); Kross, Bordon, and Strohm, 2008:1555 (cuticular hydrocarbons are likely to attract nest parasite *Hedychrum rutilans*); Larnhof, 2008:46 (Austria: Niederösterreich: Nature Reserve “in den Sandbergen” near Drösing); Livory, Chevin, Lair, Sagot, and Baldock, 2008:44 (France: Département de la Manche); Ljubomirov and Yildirim, 2008:128 (in catalog of Crabronidae of Turkey); Nemkov, 2008b:25 (in catalog of Crabronidae of Asiatic Russia), 2008c:11 (Russia: first records from Altay Krai: vicinity of Barnaul, and from Kemerovo Oblast: Yurga); Rudnick, 2008:37 (Germany: Mecklenburg: Schwerin-Großer Dreesch); Strohm, Herzner, Kaltenpoth, Boland, Schreier, Geiselhardt, Peschke, and Schmitt, 2008:575 (chemical composition of female postpharyngeal gland whose secretion delays prey infestation by fungi); Strohm, Kroiss, Herzner, Laurien-Kehnen, Boland, Schreier, and Schmitt, 2008:1 (*Philanthus triangulum* does not detect presence of nest parasite *Hedychrum rutilans* Dahlbom in the dark); Tannert and von der Dunk, 2008:181 (Germany: Bayern: west of Ernhofen and Weissenbrunn); Theunert, 2008:73 (Germany: map of distribution in Niedersachsen and Bremen); Baños-Picón, Asís, Gayubo, and Tormos, 2009:314 (Spain: frequency of specimens collected with hand nets and Malaise traps); Donie, 2009:10 (Germany: Niedersachsen: Oldenburg); Fallahzadeh, Ostovan, and Saghaei, 2009:237 (Iran: Fars: Kavar), 245 (color photograph of imago); Flügel, 2009b:63 (Germany: Hessen: Borken, in inactive open brown coal mine); U. Frommer, 2009a:29 (Germany: in checklist of Sphecidae of Hessen); Gayubo, González, Tormos, and Asís, 2009:365 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); González, Gayubo, Asís, and Tormos, 2009:625 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Guéorguiev and Ljubomirov, 2009:263 (Bulgaria: Maleshevska Planina); Józán, 2009:167 (Croatia); Kowalczyk, Kurzac, and Nadolski, 2009:63 (Poland: between Warta and Widawka rivers); Mokrousov, Antropov, Ruchin, and Bugayev, 2009:79 (Russia: Republic of Mordovia); Nemkov, 2009b:143 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Kaltenpoth, Schmitt, and Strohm, 2009:219 (hydrocarbons in antennal gland secretion of females); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:72 (Norway: locality records); Ruchin, Antropov, and Shibayev, 2009:170 (Russia: Republic of Mordovia); Shorenko, 2009:369 (in list of Sphecidae s.l. of Crimea); van Diemen, 2009:49 (Netherlands: airbase Gilze-Rijen); Archer, 2010a:52 (Great Britain: Watsonian Nottinghamshire: Spalford Warren), 2010b:99 (Great Britain: Watsonian Staffordshire: Cannock Chase Country Park); Bitsch, 2010:117 (in supplement to vol. II of Faune de France, 1997: recent biological observations reported; two



Italian subspecies reported; recent records from France reported); Esser, Fuhrmann, and Venne, 2010:38 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Falk, 2010:94 (Great Britain: heathland sites in West Midlands region); Ghazi-Soltani, Ebrahimi, Iranipour, and Pour Abad, 2010:801 (Iran: East Azerbaijan: several localities); Ghazi-Soltani, Khaghaninia, and Shahim, 2010:638 (Iran: East Azerbaijan: Horand Forests); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Johansson, 2010:121 (Sweden: Småland: upper Emå river valley); Kroiss, Lechner, and Strohm, 2010:295 (male territoriality and mating system); Mokrousov, 2010a:63 (Russia: Nizhny Novgorod Oblast', Chuvash Republic, Republic of Mordovia: no specific localities), 2010c:108 (Russia: Chuvash Republic: State Nature Reserve "Prisurskiy"); Polidori, Bevacqua, and Andrietti, 2010:12 (females prey in mornings and evenings when activity of nest parasite *Hedychrum rutilans* decreases); Rudoiskatel', 2010:147 (Russia: central and southern Ural Mountains); Saure, 2010a:88 (Germany: Berlin-Reinickendorf: Baumberge), 2010b:175 (Germany: Berlin-Reinickendorf: airport Tempel and Flughafensee Protected Area); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Shorenko and Konovalov, 2010:30 (Ukraine: many localities); Smetana, Roller, Beneš, Bogusch, Dvořák, Holý, Karas, Macek, Straka, Šima, Tyrner, Vepřek, and Zeman, 2010:102 (Western Slovakia: recorded from Borská Nížina); Strohm, Kaltenpoth, and Herzner, 2010:285 (evidence of postpharyngeal gland being homologous to that of ants); Treiber, 2010:136 (France: départements du Bas-Rhin and du Haut-Rhin); Tüzün and Yüksel, 2010:4474 (Turkey: Niğde Province); van der Smissen, 2010a:349 (Germany: Schleswig-Holstein and Mecklenburg-Vorpommern: locality records), 2010b:386 (France: Ardèche and Vaucluse: locality records), 2010c:397 (Sweden: Öland: Byrums Sandvik; Södermanland: Jordbro); Wurdack and Gack, 2010:153 (Germany: Baden-Württemberg: Kaiserstuhl); Archer, 2011b:54 (Great Britain: North Norfolk sand dunes); Baghirov, 2011b:155 (Russia: Altayskiy Krai: Savvushka; Altay Republic: Kosh-Agach); Cruz-Sánchez, Asís, Gayubo, Tormos, and González, 2011:500 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park: effects of wildfire); Gogala, 2011:31 (Slovenia); Józán, 2011:184 (in checklist of Sphecidae s.l. of Hungary); Mokrousov, Berezin, and Egorov, 2011:83 (Russia: Chuvash Republic); Murai and Amr, 2011:114, 120 (first record from Syria: Al Thawrah Nature Reserve at 35°51'N 28°38'E); Omran, Hussein, Kodairy, and Awad, 2011:80 (impact on honeybee populations in Egypt); Protsenko and Drozdovskaya, 2011:91 (Ukraine: Mikolaiv Oblast': Bugskiy Guard National Park); Saure, 2011a:6 (Germany: Berlin: former airport Tempelhof), 2011c:199 (Germany: Berlin-Spandau: Fort Hahneberg), 2011d:200 (Germany: Sachsen-Anhalt: conservation area "Heide südlich Burg"); Schmid-Egger, 2011a:39 (France: Parc National du Mercantour: Saorge, Tende; Italy: Parco delle Alpi Marittime: Valle Maira: Macra), 2011b:569 (United Arab Emirates: many localities), 573 (color photographs of male and female); Schwarz, Link, Pöll, Ambach, and Rabitsch, 2011:256 (Austria: Oberösterreich: Welser Heide); Shlyakhtenok, 2011:95 (Belarus: city of Minsk); Theunert, 2011a:21 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:163 (Germany: Hessen: not endangered); von der Dunk, 2011:184 (Germany: Bayern: Kaiserburg in Nürnberg); Ziska and Saure, 2011:109 (Germany: Berlin: Tegeler Fließ valley); Amolin, 2012:28 (Ukraine: Donetsk); Archer, 2012:183 (Great Britain: urban York); Boillat, 2012:228 (Switzerland: in checklist of insects of Canton de Genève); Cölln, Jakubzik, and Kinkler, 2012:25 (Germany: Nordrhein-Westfalen: Leverkusen); Franzén, Molander, Norén, and Nilsson, 2012:26 (Sweden: Skåne: Kullaberg Peninsula); Gerth, Mayer, Hering, Wolf, Schaffer, and Bleidorn, 2012:9 (Germany: Sachsen: Bienitz in Leipzig, as *trinagulum*); Hellrigl, 2012:129 (Italy: Provincia Autonoma di Bolzano-Alto Adige, as Südtirol); Kaltenpoth, Showers Corneli, Dunn, Weiss, Strohm, and Seger, 2012:2 (accelerated evolution of mitochondrial genome); Polidori, García, and Nieves-Aldrey, 2012:280 (study of female antennal sensillae); Prisniy, 2012:52 (Russia: Belgorod Oblast'); Saure, 2012b:230 (Germany: Berlin-Spandau: Spandauer Forst); Shibayev and Polumordvinov, 2012:278 (Russia: Penza Oblast'); Strumia, Pagliano, and Gayubo, 2012:57 (Italy: Toscana: Riserva di San Rossore); Tripotin, 2012:23 (France: Seine-Maritime: estuary of Seine river); Yildirim, 2012:77 (Turkey: Adana, Bayburt, and Erzurum provinces); Zettel, 2012:78 (Austria: Niederösterreich: Golitsch, Mittelberg, and Windmühle); Akulov and Proshchalykin, 2013:118 (Russia: Siberia: Krasnoyarsk Krai: Krasnoyarsk, Minusinsk, and 12 km east of

Minusinsk); Flügel, 2013a:120 (Germany: Brandenburg: Pimpinellenberg near Oderberg); Gadallah, Al Dhafer, Aldryhim, Fadl, and Elgharbawy, 2013:359 (in new catalog of Sphecidae of Saudi Arabia); Kazenas, 2013a:135, 136 (color photographs of adult wasps, short information on geographic distribution and nesting habits); Koehler, Doubský, and Kaltenpoth, 2013:1 (symbiont-mediated antibiotic production provides efficient long-term protection of offspring); Mokrousov, Ruchin, and Egorov, 2013:203 (Russia: Republic of Mordovia: Mordovian State Nature Reserve); Pankov, 2013:231 (Russia: Ivanovo Oblast'); Polidori, Crottini, Della Venezia, Selfa, Saino, and Rubolini, 2013:40 (animal protein as food for larva, unable to manipulate food load, flight muscle ratio, wing loading); Saure, 2013:21 (Berlin: Treptow-Köpenick: Gosener Wiesen); Shlyakhtenok, 2013:238 (in annotated catalog of aculeate wasps of Belarus'); Vieira, Oliveira, Brewster, and Gayubo, 2013:20 (Portugal: Douro International Natural Park); Wiśniowski and Szczepko, 2013:47 (Poland: Kampinos National Park near Warszawa); Zettel, Zimmermann, and Wiesbauer, 2013:14 (Austria: Wien: Donaupark); Baldock, 2014:360 (Spain: Island of Mallorca); Dunford, Turbyville, and Leavengood, 2014:10 (listed as medically important in Afghanistan); Ebrahimi, 2014:48 (Iran: Alborz, Ardebil, Āzarbāijān-e Gharbi, Āzarbāijān-e Sharghi, Esfāhān, Fārs, Gilān, Golestān, Hormozgān, Markazi, Māzandarān, and Tehrān provinces); U. Frommer, 2014:28 (Germany: Hessen: Lorch); Ghahari, Hayat, Lavigne, and Ostovan, 2014:1385 (prey of asilid fly *Aneomochtheus macropygus* Tsakas), 1408 (prey of asilid fly *Saropogon platynotus* (Loew)); Hellqvist, Abenius, and Norén, 2014:94 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Kazenas, 2014a:138 (Kazakhstan: Karatau Mountain Range); Madl, 2014a:1006 (in catalog of Ampulicidae, Crabronidae, and Sphecidae of Madagascar, with synonymy and locality records); Mokrousov and Vafin, 2014:60 (Russia: Republic of Tatarstan); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Pagliano, 2014:99, 100 (specimens in M. Spinola collection, Torino, are *Philanthus tiangulum*); Protsenko, Fateryga, and Ivanov, 2014:39 (Crimea: many localities); Ruchin and Antropov, 2014:38 (Russia: Republic of Mordovia); Schmid-Egger, 2014:591 (United Arab Emirates); Yıldırım, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Atbaei, Fallahzadeh, and Ljubomirov, 2015:20 (Iran: Fars Province, as *triangulum triangulum*); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Mokrousov and Egorov, 2015:426 (Russia: Republic of Mordovia: Nature State Reserve Priskuskiy); Rezaei and Fallahzadeh, 2015:14 (Iran: Fars: Kaftarak at 29°34'N 52°41'E); P. Rosa and Pagliano, 2015:105 (Italy: Lombardia and Piemonte: Parco del Ticino); Samin, Bagriacik, and Monaem, 2015:197 (Iran: Ilam: Abdanan; Kermanshah: Kermanshah; and Khorasan: Sabzevar); Saure, 2015:15 (Germany: Berlin-Lichterfelde); Schedl, 2015:948 (Austria: Tirol: Innsbruck: Botanical Garden); Simon, Lorthiois, and Macé, 2015:54 (France: alluvial terraces in Eure Department: Courcelles-sur-Seine and Seine-Maritime Department: Anneville-Ambourville); Else, Bolton, and Broad, 2016:49 (in checklist of Aculeata of Great Britain and Ireland: England, wales); Engl, Bodenstein, and Strohm, 2016:271 (fungi, particularly *Aspergillus flavus*, are constant threat to larval provision); Kemal and Koçak, 2016:33 (Turkey: Van: in list of Pterygota of Artos Mountain); Mokrousov and Popov, 2016:593 (Russia: Abkhazia, Adygea, Krasnodarskiy Krai); Reemer and Peeters, 2016:10 (Netherlands: Hulshorsterzand); Sadeghi, Fallahzadeh, Ostovan, Ljubomirov, and Hesami, 2016:431 (Iran: Fars Province); Stolle and Saure, 2016:925 (Germany: in list of Sphecidae s.l. of Sachsen-Anhalt); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:21 (Turkey: Adıyaman, Aydın, Bayburt, Erzurum, Ordu, Şanlı, Trabzon, and Tunceli provinces); Danilov and Mokrousov, 2017b:255 (in catalog of Philanthinae of Russia); Dollfuss, 2017b:1258 (locality records from Afrotropical Region: Benin, Cameroon, Central African Republic, Ethiopia, Guinea, Kenya, Madagascar, Malawi, Mali, Mozambique, Namibia, Senegal, South Africa, Tanzania, Zambia, and Zimbabwe; and Palearctic Region: Albania, Algeria, Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iran, Iraq, Israel, Italy, Jordan, Kyrgyzstan, Montenegro, Morocco, Oman, Pakistan, Portugal, Romania, Saudi Arabia, Slovakia, Spain, Sudan, Switzerland, Syria, Tajikistan, Tunisia, Turkey, Ukraine, and Yemen); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:82 (Iran: known from Alborz, Ardabil, East Azerbaijan, Fars, Golestan, Guilan, Hormozgan, Isfahan, Kermanshah, Lorestan, Markazi, Mazandaran, Qazvin, South

Khorasan, Tehran, and West Azerbaijan provinces); Magdalou, 2017:16 (France: Pyrénées-Orientales: Réserves Naturelles Catalanes: Forêt de la Massane, Julols, Mas Larrieu); Shorenko, 2017:81 (in Crimea collected in May through November); Jacobi and Suárez, 2018:20 (Canary Islands: first record from Island of Fuerteventura); Kemal and Koçak, 2018:34 (Turkey: in list of pterygot insects of Van Province); Shorenko, 2018:131 (Crimea, including localities, habitats, and number of specimens); Ruchin and Antropov, 2019:13245 (Russia: Mordovia State Nature Reserve).

*Vespa fasciata* Fourcroy, 1785:...

*Sphex apifalco* Christ, 1791:270, [♀]. Syntypes: ♀, Germany: one region mentioned is Elevische, currently unused name, located in Nordrhein-Westfalen near Kleve (destroyed). New synonym based on the description of damage to apiculture.

*Sphex scutellatus maculatus* Christ, 1791:287, ♀, ♂ (as *scutellata maculata*, incorrect original termination). Syntypes: Germany: no specific locality (lost). Synonymized with *Philanthus triangulum* by ... – Turton, 1801:483, 492 (redescription).

*Vespa limbata* Olivier, 1792:... Synonymized with *Philanthus triangulum* by Vander Linden, 1829:124 (or an earlier author?).

*Crabro androgynus* Rossi, 1792:138, sex not indicated. Holotype or syntypes: Italy: Toscana: Pisa area (destroyed). Synonymized with *Philanthus apivorus* by Spinola, 1806:96. – Curtis, 1829:pl.273 (illustration); Guérin-Méneville, 1835:pl. 71, Fig. 8 (illustrations of various morphological details), 1844:442 (explanations of his 1835 figure, *androgynus* is a junior synonym of *triangulum*).

*Philanthus pictus* Panzer, 1797, Heft 47:23, [♂]. Holotype or syntypes: ♂, Austria: Carinthia [= Kärnten]: no specific locality (depository ?). Synonymized with *Philanthus apivorus* by Panzer, 1806:173 and with *Philanthus triangulum* by Herrich-Schaeffer, 1840:296. – Fabricius, 1804:302 (redescription); Thunberg, 1815b:289 (diagnostic characters), 295 (redescription); Dahlbom, 1845:XXIV (specimens in collection Fabricius examined). – **As *Simblephilus pictus***: Jurine, 1807:188 (new combination, listed).

*Philanthus discolor* Panzer, 1799, Heft 63:18, [♂]. Holotype or syntypes: ♂, Germany: Bayern: Nürnberg: “Horti nostri botanici” (depository?). Synonymized with *Philanthus apivorus* by Panzer, 1806:173. – von Siebold, 1839:53 (Germany: Danzig, now Poland: Gdańsk). – **As *Philanthus triangulum* var. *discolor***: Kirschbaum, 1853:46 (new status, Germany: Herzogtum Nassau: Mainz-Mombach and Weilburg). – **As *Simblephilus discolor***: Jurine, 1807:188 (new combination, listed).

*Philanthus apivorus* Latreille, 1799:50, sex not indicated. Syntypes: France: Paris area (lost). Synonymized with *Philanthus pictus* by Fabricius, 1804:302 and with *Philanthus triangulum* by Lepeletier de Saint Fargeau, 1845:34. – Latreille, [1805]:314 (redescription); Spinola, 1806:95 (Italy: Liguria); Guérin-Méneville, 1828a:367 (in Dictionnaire classique d’histoire naturelle); Ghiliani, 1842:25 (listed from Italy: Sicilia after Fabricius); de Saussure, 1854:8 (belongs to a section with sessile gaster); Lucas, 1867:288 (nesting habits); Pérez, 1880:V (preying on honey bee); Laboulbène, 1895:180 (preying on *Apis mellifera*); Acloque, 1897:82 (in Sphecid Fauna of France and Algeria); Dusmet y Alonso, 1906:7 (Spain); Ferton, 1910:15t5 (sand closure of nest cell); Dusmet y Alonso, 1915:87 (Spain: Aragón); Coulon, 1925:117 (France, Spain, Romania); Lhéritier, 1946:28 (Morocco: Marrakech, preying on honeybee, nocturnal resting sites); Diniz, 1959:27 (Portugal: Porto); Casolari and Casolari Moreno, 1980:122 (specimens in M. Spinola collection, Torino); Pagliano, 2014:99, 100 (specimens in M. Spinola collection, Torino, are *Philanthus triangulum*).

*Philanthus allionii* Dahlbom, 1845:495, ♀ (as *Allionii*, incorrect original capitalization). Holotype or syntypes: ♀, Prussia: no specific locality (depository?). Synonymized with *Philanthus triangulum* by Kohl, 1891:366. – von Kiesenwetter, 1849:89, footnote (Spain); Gasperini, 1887:16 (Dalmatia: Island of Lissa, now Croatia: Island of Vis); Dalla Torre, 1897:492 (in catalog of world Hymenoptera, as *allwini*); de Beaumont, 1953h:197 (type material not represented in Dahlbom’s collection in Lund). – **As *Philanthus triangulum* var. *allionii***: Sichel, 1861:752 (new status, Italy: Sicilia).

**ssp. *abdelcader* Lepeletier**

*Philanthus abdelcader* Lepeletier, 1845:33, ♀, ♂ (as *Abdelcader*, incorrect original capitalization). Syntypes: Algeria: Oran (MNHN?). – Lucas, 1849:257 (Algeria: Alger, Bône, now Annaba, Constantine, La Calle, now El Kala, Oran; original description copied with modifications; as *A'bd-el-K'âder*); Belke, 1859:70 (Ukraine: Kamieniec Podolski, as *abdelender*); Walker, 1871:28 (Egypt: Heliopolis; and Hor Tamanib; as *abdelcader*); A. Costa, 1875:13 (Egypt, as *abdelcader*), 18 (Egypt: between Fayum and Nile, as *abdelcader*); Lucas, 1880:CXXXVII (Egypt: Ramlé near Alexandria); Girard, 1881:CXXVIII (Algeria: Palestro; pest of honeybee); Kohl, 1891:366 (as synonym of *Philanthus triangulum*); Acloque, 1897:82 (in Sphecidae Fauna of France and Algeria, as *abd-el-kader*); Innes Bey, 1912:102 (specimens recorded by Walker, 1871, now destroyed by dermestids, were collected at Heliopolis, Egypt, as *Abd el Kader*); Roth, 1917:63 (nesting habits, as *abdelcader*), 1924:124 (Algeria: Nemours, now Ghazaouet); Lhéritier, 1946:28 (Morocco: Marrakech, prey, nocturnal resting sites, as *Abd-el-Kader*); Bradley, 1957:49 (Lepeletier's specimens in Turin); Al-Ali, 1977:100 (Iraq: Baghdad); Casolari and Casolari Moreno, 1980:122 (specimens in M. Spinola collection, as *abdel-kader*); Pagliano, 2014:100 (specimens in M. Spinola collection, Torino, are *Philanthus triangulum abdelcader*). – **As *Trachypus abdel-kader***: Casolari and Casolari Moreno, 1980:122 (new combination, specimens in M. Spinola collection); Pagliano, 2014:99 (specimen in M. Spinola collection, Torino, is *Philanthus triangulum abdelcader*). – **As *Philanthus diadema* var. *abdelcader***: Gribodo, 1880:400 (new status, Tunisia); A. Costa, 1893b:8 (Tunisia); Graeffe, 1906:455 (Tunisia: Tunis area); von Schulthess in Friederichs, 1918a:48 (Madagascar: Antananarivo). – **As *Philanthus triangulum* var. *abdelcader***: von Schulthess, 1909:441 (Libya: Dernah); Mochi, 1939a:90 (in revision of Egyptian *Philanthus*). – **As *Philanthus triangulum* f. *abdelcader***: Balthasar, 1954b:279 (new status, Palestine: Jerusalem and Jericho). – **As *Philanthus triangulum abdelcader***: von Schulthess, 1914:286 (new status, Cameroon, as *Philanthus triangulum* var. *Abdelkader*); Guiglia, 1934b:295 (Libya: bibliography and summary of locality records, as *abdelcader*); de Beaumont, 1949b:180 (in revision of northwest African *Philanthus*), 1950f:396 (Algeria, Morocco), 1953g:118 (Morocco), 1956a:183 (Libya); Guiglia, 1957:144 (Italy: Isole Pelagie); de Beaumont and Bytinski-Salz, 1959:141 (Israel); de Beaumont, 1960b:229 (Libya); Guiglia, 1960:360 (Italy: Isole Pelagie: Lampedusa); Derwesh, 1965:71 (Iraq: no specific locality); de Beaumont, 1966:211 (Egypt: Abukir); Krombein, 1969a:8 (preying on honeybee in Egypt); Myartseva, 1972a:91 (Turkmenistan); Abdul Rassoul, 1976:31 (Iraq: Sulaimaniya: Sitak, as *abdelcader*); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Guichard, 1980:230; Roche and Zalat, 1994:117 (Egypt: Sinai Peninsula); Pagliano, 1990:95 (in catalog of Italian Sphecidae: Island of Lampedusa); Negrisolino in Minelli, Ruffo, and La Posta, 1995b:8 (in catalog of Italian fauna: Sicilia); Pagliano and Scaramozzino, 1995:730 (Italy: Island of Lampedusa); Pagliano, 2003b:129 (Italy: Island of Pantelleria); Roche, 2007a:125 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Smit and de Boer, 2008:897 (first record from Canary Islands: Tenerife: Costa Adeje near Los Christians).

**ssp. *bimaculatus* Magretti**

*Philanthus triangulum* var. *bimaculatus* Magretti, 1908:188, ♂ (as *bimaculatum*, incorrect original termination). Syntypes: Kenya: Nairobi and Lumbwa (MNHN). – **As *Philanthus triangulum bimaculatus***: R. Bohart and Menke, 1976:566 (new status, in checklist of world Sphecidae).

**ssp. *diadema* (Fabricius)**

*Crabro diadema* Fabricius, 1781:471, sex not indicated. Holotype or syntypes: South Africa: Cape of Good Hope (BMNH, Banks coll.). – Fabricius, 1787:297 (redescription), 1790:225 (redescription); Olivier, 1792:517 (redescription); Fabricius, 1793:289 (redescription). – **As *Sphex diadema***: Thunberg, 1791:126 (new combination, specimens donated to Academia Upsaliensis). – **As *Simblephilus diadema***: Jurine, 1807:188 (new combination, listed) and pl. 10, Fig. 18 (illustration of habitus); Frei-Gessner, Kohl, and Kriechbaumer, 1882:393 (Jurine's specimens are *Philanthus triangulum*). – **As *Philanthus diadema***: Fabricius, 1790:224 (new combination, redescription),

1793:289 (redescription), 1796:137 (in Index to his Entomologia Systematica, 1793), 155 (here incorrectly in *Sphex*); Coquebert, 1804:96 (original description copied), pl. XXII, Fig. 1 (Fabrician type illustrated); Fabricius, 1804:302 (redescription); Panzer, 1806:173 (is probably a variety of *Philanthus pictus*); Thunberg, 1815a:127 (diagnostic characters), 129 (redescription), 1815b:287 (diagnostic characters); Dahlbom, 1845:XXIV (study of type material), 495 (in key to world *Philanthus*); von Kiesenwetter, 1849:88, footnote (Italy: Sicilia); F. Smith, 1856:471 (in catalog of Hymenoptera in British Museum); Walker, 1871:28 (Egypt: Cairo, Heliopolis); Radoszkowski, 1876b:137 (Egypt); Girard, 1879:928 (morphology and habits); Gribodo, 1884a:8 (Egypt: Cairo); de Saussure, 1892:534 (Madagascar); Friese, 1900:268 (Madagascar: Nosy-Be); W. Schulz, 1911b:170 (Gribodo's specimen from Somalia is *Philanthus triangulum*); Innes Bey, 1912:102 (specimens recorded by Walker, 1871, now destroyed by dermestids, were collected at Cairo, Egypt); Schouteden, 1930:93 (Zaire); Skaife, 1953:335 (preying on honey bee); Casolari and Casolari Moreno, 1980:122 (specimens in M. Spinola collection); Pagliano, 2014:99, 100 (specimens in M. Spinola collection, Torino, are *Philanthus triangulum diadema*). – **As *Philanthus triangulum* var. *diadema***: Taschenberg, 1875:404 (new status, Egypt); Gribodo, 1894c:129 (Mozambique: Magnarra River), 1895:351 (Mozambique); Dalla Torre, 1897:493 (in catalog of world Hymenoptera); Magretti, 1898:52 (Somalia: Daua); Bingham, 1902:212 (South Africa, Malawi); Cameron, 1908a:269 (Tanzania: Mount Kilimanjaro and Mount Meru), 1910:145 (South Africa: Transvaal); Bischoff, 1912:225 (Zaire: Kassenge at Lake Edward); Gribodo, 1924b:48 (Libya: Cirene); Arnold, 1925:144 (in revision of southern African *Philanthus*); Zanon, 1926:90 (Libya: Fueihat 15 km S Benghazi, as *triangolum*); Guiglia, 1928:499 (Somalia), 1929:396 (Libya: Cirenaica: Cirene); Guiglia, 1932:125 (Eritrea: Cheren); Arnold, 1930:10 (in checklist of Afrotropical Sphecidae); Scott in Arnold, 1933a:369 (Ethiopia: Harar District); Bischoff, 1933:5 (Morocco); Guiglia, 1938b:8 (Italy: Sardegna); Giordani Soika, 1939c:101 (Eritrea: Adi Caie); Guiglia, 1939a:199 (Ethiopia, Eritrea), 1939b:90 (Ethiopia: Lake Tana: Bahar-Dar), 1940b:287 (Somalia), 1943c:75 (Ethiopia: Gamo Gofa: Sagan – Omo region), 1944a:145 (Cyprus: Cherkas), 1950:232 (Ethiopia: Gamo Gofa: Asile); Pittioni, 1950:21 (Cyprus); Leclercq, 1955i:408 (Burundi); I. Robertson, 1969:480 (Tanzania: Ukiriguru). – **As *Philanthus triangulum diadema***: Guiglia, 1934b:296 (new status, Libya: bibliography and summary of locality records); van der Vecht, 1961a:61 (discussion of type material); de Beaumont, 1967b:505 (South Africa: KwaZulu-Natal); Bonelli, 1976:228 (nesting habits); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Rodgers and Homewood, 1982:233 (Tanzania: Usambara Mountains); Steiner, 1986:112 (references to publications on nesting habits); Pagliano, 1990:95 (in catalog of Italian Sphecidae: Sardegna?); Negrisolò in Minelli, Ruffo, and La Posta, 1995b:8 (in catalog of Italian fauna); van Vondel, 1995:25 (specimens from Cameroon in Natuurmuseum Rotterdam); S. Gess, 1996:280 (floral records); Kaltenpoth et al., 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts).

*Philanthus frontalis* Gerstaecker in Peters, 1858:509, ♀. Holotype or syntypes: ♀, Mozambique: no specific locality (ZMHU). Synonymized with ... by ... – Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:486 (in catalog of world Hymenoptera); Magretti, 1906:20 (Eritrea).

*Philanthus frontalis* Gerstaecker, 1862:473, ♀. Objective synonym of *Philanthus frontalis* Gerstaecker, 1858.

*Philanthus transversus* Cameron, 1910:147, ♂. Holotype or syntypes: ♂, South Africa: Transvaal: no specific locality (TMP). Synonymized with *Philanthus triangulum diadema* by Brauns, 1917:241.

### **ssp. *obliteratus* Pic**

*Philanthus triangulum* v. nov. *obliteratus* Pic, 1917:2, sex not indicated. Syntypes: Algeria and Egypt: no specific localities (originally M. Pic collection, now MNHN?). – **As *Philanthus triangulum obliteratus***: R. Bohart and Menke, 1976:566 (new status, in checklist of world Sphecidae); Gadallah, 1996:70 (in revision of Egyptian *Philanthus*, unknown to the author); Roche, 2007a:126 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae).

**123. *tricinctus* Gimmerthal (preoccupied)**

*Philanthus tricinctus* Gimmerthal, 1836:448, sex not indicated (as *tri-cincus*, incorrect original hyphenation), junior primary homonym of *Philanthus tricinctus* Spinola, 1805, and of *Philanthus tricinctus* Thunberg, 1815 (both now in *Cerceris*). Holotype or syntypes: Liefland, now Latvia: no specific locality (depository unknown). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

**124. *tricolor* Fairmaire**

*Philanthus tricolor* Fairmaire, 1858:265, sex not indicated. Holotype or syntypes: Gabon: no specific locality (depository unknown, MNHN?). – Dalla Torre, 1897:493 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Pagliano, 2014:101 (specimens in M. Spinola collection, Torino, are *Philanthus tricolor*).

**125. *turneri* Arnold**

*Philanthus turneri* Arnold, 1925:155, ♀, ♂ (as *Turneri*, incorrect original capitalization). Syntypes: South Africa: Western Cape Province: Ceres (BMNH). – Arnold, 1930:10 (in checklist of Afrotropical Sphecidae); de Beaumont, 1967b:505 (South Africa: Western Cape Province: Swartberpas); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); S. Gess and F. Gess, 2003:131 (determination tentative, Namibia: visiting flowers of *Limeum argute-carinatum* Wawra and Peyr., Molluginaceae).

**126. *variegatus* Spinola**

*Philanthus variegatus* Spinola, 1839:484, ♀, ♂. Lectotype: ♀, Egypt: no specific locality (Torino), designated by de Beaumont, 1952e:49. – Spinola, 1843b:XXXVI (represented in Berlin Museum under the name *Philanthus mystacinus*). – Magretti, 1884a:250 (Sudan), 1884c:594 (Sudan: Sawakin); Radoszkowski, 1888a:325 (male genitalia); Kohl, 1891:360 (redescription), 366 (in checklist of world *Philanthus*); Radoszkowski, 1892:579 (reference to Radoszkowski, 1888a); Vachal, 1893:CCLXV (Algeria: Biskra); Dalla Torre, 1897:493 (in catalog of world Hymenoptera); Longstaff, 1911:125 (Sudan: Khartum); Morice, 1911:93 (Algeria: Biskra); Mercet, 1914:447 (in revision of Spanish Philanthinae); von Schulthess, 1926b:212 (Algeria, Tunisia, Libya); Kruger, 1929a:21 and 1929b:56 (Libya: Cyrenaica: Bardia); Guiglia, 1934b:296 (Libya: bibliography and summary of locality records), 1936:4 (Libya: Fezzan: Gatron); Mochi, 1939a:94 (in revision of Egyptian *Philanthus*); Guiglia, 1940a:280 (Libya: Garian), 1942b:230 (Libya); de Beaumont, 1949b:183 (in revision of northwest African *Philanthus*), 1957b:131 (northern Iran); de Beaumont and Bytinski-Salz, 1959:143 (Israel); de Beaumont, 1961a:202 (geographic variation), 1962c:221 (Arabia: El Riyadh); Myartseva, 1963b:61 (Turkmenistan: lower Murgab River), 1965:92 (Turkmenistan: Akibay and Murgab district); de Beaumont, 1967a:278 (Turkey; variation); Kazenas, 1970b:366 (Kazakhstan), 1972b:124 (Kazakhstan: Ayak-Kalkan on Ili River in Alma Ata Oblast'); Myartseva, 1972a:91 (Turkmenistan); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Kazenas, 1978b:48 (in key to Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:187 (in key to Sphecidae of European part of former USSR); Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Guichard, 1980:230 (Oman); Al-Houty, 1989:162 (Kuwait: Abdelli, Al-Wafra, Sulabiya, as *variegatus* Dufour); Kazenas, 1992c:28 (Turkmenistan: Repetek Nature Reserve); Guichard, 1994a:210 (Arabian Peninsula); Gadallah, 1996:74 (in revision of Egyptian *Philanthus*); Nazarova, 1998:42 (Tajikistan: Tigrovaya Balka Nature Reserve); Esenbekova and Kazenas, 2000:71 (southeastern Kazakhstan: 5-8 km east of Bakanas, Borandysu, 3 km northeast of Borandysu, 10 km northwest of Chundzha, near landing place Dubun' on Ili River); Kazenas, 2001b:52 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:136 (geographic distribution, collecting localities in Kazakhstan); Gadallah and Assery, 2004a:219 (in key to Sphecidae of Jeddah Region, Saudi Arabia), 232 (in catalog of Sphecidae of Saudi Arabia: Hadasham 120 km E Jeddah); Kazenas, 2004b:111 (Kazakhstan: western Tien Shan); Yildirim and Ljubomirov, 2005:1806 (Turkey: Erzurum: Horasan, Tortum; Kars: Sarikamis); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Roche, 2007a:127 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae, as *variegatus variegatus*), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae, as

*variegatus variegatus*); Ljubomirov and Yildirim, 2008:129 (in catalog of Crabronidae of Turkey); Murai and Amr, 2011:114, 120 (first record from Syria: Al Thawrah Nature Reserve at 35°51'N 28°38'E); Sakenin, Samin, Bagriacik, and Rastegar, 2011:3 (Iran: East Azerbaijan: Arasbaran); Schmid-Egger, 2011b:574 (United Arab Emirates: Jebel Hafit S al-Ain, Wadi Bih, Wadi Hayl, Wadi Shawkah), 575 (color photographs of male and female); Gadallah, Al Dhafer, Aldryhim, Fadl, and Elgharbawy, 2013:359 (in new catalog of Sphecidae of Saudi Arabia); Kazenas, 2013b:499 (southeast Kazakhstan: Borandysu 30 km east of Chilik, 10 km northwest of Chilik, landing place Dubun' on Ili River); Ebrahimi, 2014:49 (Iran: Ardebil, Kermān, and Māzandarān provinces); Kazenas, 2014a:138 (Kazakhstan: Karatau Mountain Range); Pagliano, 2014:101 (specimens in M. Spinola collection, Torino, including lectotype, are *Philanthus variegatus* and *Philanthus* sp.) Schmid-Egger, 2014:591 (United Arab Emirates); Yıldırım, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:150 (in checklist of Hymenoptera of Turkey); Danilov and Mokrousov, 2017b:255 (in catalog of Philanthinae of Russia); Dollfuss, 2017b:1265 (locality records from Algeria, Iran, Kazakhstan, Kyrgyzstan, Mali, Morocco, Syria, Tunisia, Turkey, and Turkmenistan); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:83 (Iran: known from Ardabil, East Azerbaijan, Kerman, Mazandaran, and Qazvil provinces).

*Philanthus mystacinus* Spinola, 1843b: XXXVI, sex not indicated, origin unknown, specimen(s) in Berlin Museum, as junior synonym of *Philanthus variegatus*. Not available: first proposed as a junior synonym (Article 11.6).

*Philanthus osbecki* Dahlbom, 1845:496, ♀ (as *Osbecki*, incorrect original capitalization). Syntypes: ♀, Egypt: no specific locality (Stockholm). Synonymized with *Philanthus variegatus* by Kohl, 1891:366, synonymy confirmed by de Beaumont, 1949b:183.

*Philanthus kizilkumi* Radoszkowski, 1876b (as *Kizilkumi*, incorrect original capitalization). Nomen nudum.

*Philanthus kizilkumi* Radoszkowski, 1877:53, ♀, ♂ (as *Kizilkumi*, incorrect original capitalization). Syntypes: Kazakhstan: Bairakum, Karak, and Syr-Daria steppe (ZMMU). Synonymized with *Philanthus variegatus* by Pulawski, 1978:187. – Radoszkowski, 1886a:35 (Turkmenistan), 1888a:324 (male genitalia); Kohl, 1891:364 (in checklist of world *Philanthus*); F. Morawitz, 1891a:229 (Russia: Astrakhan Government); Radoszkowski, 1892:579 (reference to Radoszkowski, 1888a); Dalla Torre, 1897:487 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:565 (in checklist of world Sphecidae); Kazenas, 2001b:51 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:135 (geographic distribution, collecting localities in Kazakhstan).

*Philanthus distinguendus* Kohl, 1891:361, ♂. Syntypes: ♂, Egypt: no specific locality (NHMW). Synonymized with *Philanthus variegatus* by de Beaumont, 1949b:183. – Kohl, 1891:364 (in checklist of world *Philanthus*); Dalla Torre, 1897:485 (in catalog of world Hymenoptera); Dollfuss, 1989:11 (type material in NHMW).

*Philanthus palestinensis* Balthasar, 1954b:279, ♂. Holotype: ♂, Israel: Yarkon Esser Torchanot near Tel-Aviv (originally V. Balthasar coll., now NMPC). Synonymized with *Philanthus variegatus* by Bytinski-Salz in de Beaumont and Bytinski-Salz, 1959:143.

### **ssp. *ecoronatus* Dufour**

*Philanthus ecoronatus* Dufour, 1854a:380, ♂. Syntypes: ♂, Algeria: Pontéba, now Oumm ed Drou (MNHN). – Dalla Torre, 1897:485 (in catalog of world Hymenoptera). – As *Philanthus variegatus ecoronatus*: de Beaumont, 1949b:185 (new status, in revision of northwest African *Philanthus*), 1950f:396 (Algeria), 1953g:119 (Morocco); Balthasar, 1954b:280 (Palestine: Jericho); de Beaumont, 1956a:184 (Libya; Chad: Tibesti), 1960b:229 (Libya; variation); van der Zanden, 1967:176 (Algeria: Biskra; as *variegatus coronatus*); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Gadallah, 1996:74 (in revision of Egyptian *Philanthus*, first record from Egypt).

*Philanthus sepтрalis* Radoszkowski, 1888a:323, ♀, ♂ (as *sepтрalis* Dufour). Syntypes: Algeria: no specific locality (Kraków?). Synonymized with *Philanthus variegatus* by Kohl, 1891:366, and with *variegatus ecoronatus* by de Beaumont, 1949b:184. – Radoszkowski, 1890b:507 (Armenia: Mount Ararat), 1892:579 (reference to Radoszkowski, 1988a); De Stefani Perez, 1895:227 (in catalog of Sicilian Hymenoptera, as *sepтрalis* Duf.).

**ssp. nabataeus Bytinski-Salz**

*Philanthus variegatus nabataeus* Bytinski-Salz in de Beaumont and Bytinski-Salz, 1959:144, ♀, ♂. Holotype: ♂, Israel: Revivim (originally coll. H. Bytinski-Salz, now Tel-Aviv Univ.). – Pulawski, 1967c:387 (Sudan: Khor Musa Pasha S Wadi Halfa); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae).

**127. variolosus Arnold**

*Philanthus variolosus* Arnold, 1932:8, ♀. Holotype: ♀, Ethiopia: Dire-Daua District (Zool. Mus. Hamburg, destroyed in World War II). – R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Dollfuss, 2017b:1265 (locality records from Etiopia and Kenya, description of ♂).

**128. ventilabris Fabricius**

*Philanthus ventilabris* Fabricius, 1798:268, sex not indicated. Holotype or syntypes: USA: Carolina (North or South?): no specific locality (probably the specimens in ZMUC, see van der Vecht, 1961a:62). – Coquebert, 1799:96 (original description copied), pl. XXII, Fig. 2 (Fabrician type illustrated); Fabricius, 1799:29 (in Index to his Supplementum, 1798), 1804:303 (redescription, as *ventilabris*); Thunberg, 1815b:288 (diagnostic characters, as *ventilabris*), 292 (redescription, as *ventilabris*); Say, 1828:112 (redescription); Dahlbom, 1845:XXIV (study of type material, as *ventilabris*); Klug, 1846:42 (belongs to subsection *Anthophilus* of *Philanthus*; as *ventilabris*); F. Smith, 1856:474 (in catalog of Hymenoptera in British Museum); Le Conte, 1859a:112 (reprint of Say, 1823); Cresson, 1862:237 (in catalog of North American Hymenoptera, as *ventilabris*), 1865c:98 (in revision of North American Philanthinae); Packard, 1866:55 (in key to North American *Philanthus*), 57 (bibliographic references, geographic distribution); Cresson, 1873:227 (Texas), 1875:717 (Colorado, New Mexico); Snow, 1881:95 (in checklist of Hymenoptera of Kansas: Wallace County: no specific locality); Cresson, 1887:281 (in catalog of North American Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Cameron, 1891a:131 (listed, as *ventilabris*); Kohl, 1891:370 (in checklist of world *Philanthus*); C. Robertson, 1892:108 (visiting flowers of *Pycnanthemum lanceolatum* and *linifolium*); W. Fox, 1894c:106 (Mexico: Baja California); Robertson, 1894:454 (visiting flowers of *Solidago missouriensis* Nutt.), 1896:73 (visiting flowers of *Polygonum hydropiperoides* Michx.); Dalla Torre, 1897:494 (in catalog of world Hymenoptera, as *ventilabris*); Dunning, 1897:69 (Illinois); Bridwell, 1899:209 (Kansas: no specific locality); Cockerell, 1899a:141 (New Mexico); Howard, 1901:p. 3, fig. 33 (... as *ventralis*, a lapsus); Viereck, 1903d:120 (Maryland: Chestertown); Viereck and Cockerell, 1904b:144 (in revision of *Philanthus* of New Mexico); G. Peckham and E. Peckham, 1905:166 (preying on bees); H. Smith, 1908b:358 (in revision of Nebraskan Sphecidae, as *ventilabris*); J. Smith, 1910:678 (in new list of insects of New Jersey, as *ventilabris*); Rohwer, 1916b:673 (in catalog of Hymenoptera of Connecticut); Stevens, 1917:421 (North Dakota, as *ventilabris*); Mickel, 1918b:389 (in catalog of Nebraskan Sphecidae, as *ventilabris*); Rohwer in Viereck, 1925:673 (in key to Sphecidae of Connecticut, not yet found in the State); J.Ch. Bradley, 1928:1016 (in catalog of New York Sphecidae, as *ventilabris*); Krombein, 1936:94 (New York: Buffalo, gregarious nesting, as *ventilabris*), 99 (floral records); Dakota); Brimley, 1938:447 (North Carolina: Raleigh to Anson County east and south, as *ventilabris*); Strandtmann, 1945b:151 (in review of North American *Philanthus*), 1946:26 (in revision of North American *Philanthus*); Dreisbach, 1947:142, 143 (in key to *Philanthus* of Michigan, as *ventilabris*), 145 (Michigan: locality records); Strickland, 1947:128 (Canada: Alberta: Lethbridge, as *ventilabris*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); Krombein, 1953b:124 (visiting flowers of *Pluchea* sp.), 133 (North Carolina: Kill Devil Hills); Krombein and Evans, 1954:235 (Florida: Miami), 1955:234 (Florida); Evans and Lin, 1959:127 (nesting habits); Wray, 1967:124 (North Carolina: Kill Devils Hills); Alcock, 1975e:541 (male mating strategies); Alcock and Gamboa, 1975b:163 (nesting habits); R. Bohart and Grissell, 1975:5, 7 (in key to North American *Philanthus*), 17 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae); Kumar, Lavigne, Lloyd, and Pfadt, 1976:51 (USA: Colorado: Pawnee National Grassland); L. Davis, 1978:217 (North Carolina: Kill Devil Hills, data from Krombein, 1953b); Krombein, 1979b:1725 (in catalog of North American Hymenoptera, nesting sites, list of prey); Casolari and Casolari Moreno, 1980:123



(specimens in M. Spinola collection Torino, , as *ventilabris*); Finnamore, 1982:242 (in Sphecid Fauna of Southern Quebec); Radović, 1985:66 (sting apparatus analyzed); Evans and O'Neill, 1988:165 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:256 (reference to publication on nest parasite *Metopia argyrocephala* (Meigen), a miltogrammine fly); Kurczewski and Acciavatti, 1990:61 (New York: Cayuga County); Ahlstrom, 1995:113 (in checklist of insects of North Carolina); Kurczewski, 1998d:250 (pine barrens in upstate New York); Amarante, 2002:64 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Ohl and Linde, 2003:151 (number of ovarioles); Buck, 2004:27 (in checklist of Crabronidae of Ontario, Canada); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Pagliano, 2014:104 (specimens in M. Spinola collection, Torino, as *ventilabris*, are *Philanthus ventilabris*); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Ratzlaff, 2016:28 (Canada: British Columbia: from R. Bohart and Grissell, 1975 and Krombein, 1979); Dollfuss, 2017b:1266 (Florida: Leon County: Tallahassee). – **As *Simblephilus ventilabris***: Jurine, 1807:188 (new combination, listed). – **As *Anthophilus ventilabris* [sic]**: Dahlbom, 1845:XXIV (new combination, study of type material, new combination), 497 (in key to *Anthophilus*). – **As *Pseudanthophilus ventilabris***: Ashmead, 1899d:294 (new combination, type species of new genus *Pseudanthophilus*), 296 (in checklist of North American Crabronidae, as *ventralis* Fabricius); J. Smith, 1900:520 (in list of insects of New Jersey); Rau and Rau, 1918:116 (nesting habits, as *ventilabris*).

*Philanthus frontalis* Cresson, 1865c:99, ♂, junior primary homonym of *Philanthus frontalis* Gerstaecker, 1858. Lectotype: ♂, USA: Colorado: Rocky Mountains: no specific locality (ANSP), designated by Cresson, 1916:100. Synonymized with *Philanthus ventilabris* by Burks in Muesebeck et al., 1951:1002. – Packard, 1866:5 (in key to North American *Philanthus*), 57 (bibliographic reference, geographic distribution); Cresson, 1876:207 (Utah: Spring Lake); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1891:367 (in checklist of world *Philanthus*); Strickland, 1947:128 (Canada: Alberta: Lethbridge, Medicine Hat). – **As *Philanthus ventilabris* var. *frontalis***: Patton, 1879d:355 (new status, USA: nw. Kansas); Dalla Torre, 1897:494 (in catalog of world Hymenoptera); Bridwell, 1899:209 (Kansas: no specific locality); Cockerell, 1899a:141 New Mexico), 1901:43 (visiting flowers of *Melilotus albus* Desv.). – **As *Philanthus ventilabris frontalis***: Mickel, 1918b:389 (new status, in catalog of Nebraskan Sphecidae). – **As *Pseudanthophilus frontalis***: Ashmead, 1899d:297 (tentative new combination, in checklist of North American Crabronidae).

*Liris rugosus* Provancher, 1895:130, ♂ (as *rugosa*, incorrect original termination), junior secondary homonym of *Philanthus rugosus* Kohl, 1891). Lectotype: ♂, USA: California: Los Angeles (Laval Univ.), designated by Gahan and Rohwer, 1918:29. Synonymized with *Philanthus ventilabris* by Krombein, 1958f:197.

*Philanthus ventilabris* [sic] var. *completus* Banks, 1915:406, ♂. Holotype or syntypes: ♂, USA: California: San Diego (depository?). Synonymized with *Philanthus ventilabris* by Strandtmann, 1945:152.

### 129. *ventralis* (Mickel)

*Ococletes ventralis* Mickel, 1918a:329, ♀. Holotype: ♀, California: Sacramento (UNL). – Muma, 1952:21 (holotype in UNL). – **As *Philanthus ventralis***: Strandtmann, 1945b:152 (new combination, in review of North American *Philanthus*), 1946:43 (in revision of North American *Philanthus*); R. Bohart and Grissell, 1975:5, 6 (in key to North American *Philanthus*), 18 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:566 (in checklist of world Sphecidae; as new status); Krombein, 1979b:1726 (in catalog of North American Hymenoptera); Rust, Hanks, and Bechtel, 1983:406 (Nevada: Churchill County: Sand Mountain); G. Ferguson, 1984a:295 (in revision of *zebratus* species group); Ratzlaff, 2016:28 (Canada: British Columbia: from R. Bohart and Grissell, 1975).

*Philanthus strandtmanni* Burks in Muesebeck et al., 1951:1002. Unnecessary substitute name for *Philanthus ventralis* Mickel, 1918, nec *Philanthus ventralis* (a lapsus) of Howard, 1901:pl. 3, fig. 33.

**130. *venustus* (Rossi)**

*Crabro venustus* Rossi, 1790:94, sex not indicated. Holotype or syntypes: Italy: Etruria, now Toscana: no specific locality (destroyed). – Illiger, 1807b:131 (synonymy, redescription, is not a *Crabro*). – **As *Philanthus venustus***: Lepeletier de Saint Fargeau, 1845:37 (new combination, in revision of world Hymenoptera); F. Smith, 1856:468 (in catalog of Hymenoptera in British Museum); A. Costa, 1867c:97 (in revision of Italian Sphecidae); Palma, 1867:44 (Italy: Sicilia settentrionale); A. Costa, 1869b:113 (in revision of Italian Sphecidae), 1872a:32 (Italy: in revision of Sphecidae of Kingdom of Naples); Dours, 1874:143 (in catalog of Hymenoptera of France); Frivaldsky, 1876:354 (Hungary: Temes Komitat: Grebenáč, now in Timiș District, Romania); Girard, 1879:928 (geographic distribution); Marquet, 1881:189 (southern France); Sajó, 1882:5 (Hungary); Kohl, 1888b:727 (Austria: Tirol, now Italy: Alto Adige), 1891:366 (in checklist of world *Philanthus*); F. Morawitz, 1891a:229 (Russia: Astrakhan); Acloque, 1897:82 (in Sphecid Fauna of France and Algeria); Dalla Torre, 1897:493 (in catalog of world Hymenoptera); Mocsáry, 1897:80 (Kingdom of Hungary, some localities are in today's Romania); Antiga and Bofill, 1904:22 (Spain: Cataluña Province); W. Schulz, 1904b:94 (Greece: Tinos; Turkey: Amasia); Ferton, 1905:66 (nesting habits); Móczár and Henter, 1907:205 (Hungary: Hatvan, Tiszaalpár); Schmiedeknecht, 1907:236 (in key to Hymenoptera of Central Europe); de Gaulle, 1908:120 (in catalog of French Hymenoptera); Ferton, 1910:154 (sand closure of nest cell); Dittrich, 1911b:25 (Germany: Niederschlesien: Heidelgebirge, now Czech Republic: Javoří hory, record questionable for zoogeographic reasons, see Noskiewicz and Chudoba, 1949:410); Szilády, 1913:89 (Hungary: Fugad); Mercet, 1914:447 (in revision of Spanish Philanthinae); Fahringer, 1922:179 (Turkey); Maidl, 1922:69 (Albania, Croatia); Berland, 1925d:46 (in Sphecid Fauna of France); Coulon, 1925:117 (Spain); Grandi, 1928a:13 (habits of adults, prey), 1930:340 (Italy: Toscana: Maremma); Schmiedeknecht, 1930:697 (in keys to Hymenoptera of North and Central Europe); Grandi, 1931:58 (Italy: Emilia-Romagna: Cervia); Giordani Soika, 1932a:21 (Italy: Lido di Venezia); Zavadil, 1932:96 (Czechoslovakia); Bernard, 1933:61 (France: Drôme: Dieulefit, list of prey); Nadig, 1934:33 (France: Corse: Golfe de Sagone; Italy: Sardegna: Cagliari); Zavadil, 1934:188 (Slovakia); Bernard, 1935:62 (France: Var: Fréjus area); Zavadil, Šusterka, and Baťa, 1937:206 (in catalog of Sphecidae of Czechoslovakia); Móczár, 1938c:81 (Hungary: Kőszeg Hills), 1939:5 (Hungary: Jászberény); Zavadil, 1939:121 (Czech Republic: Morava: Mutěnice); Giner Marí, 1943a:113 (in Sphecid Fauna of Spain); Timon-David, 1943:29 (France: Bouches-du-Rhône: plage de Fos); Guiglia, 1944b:10 (Italy); Deleurance, 1946b:67 (France: Bouche-du-Rhône: Camargue: Bois des Rièges); Zavadil in Zavadil and Šnoflak, 1948:165 (in key to Sphecidae of Czechoslovakia); de Beaumont, 1950a:70 (first record from Switzerland); Scobiola, 1950:19 (first record from Romania: Agigea, Mangalia); de Beaumont, 1951c:309 (in revision of European *Philanthus*); Grandi, 1954:236 (Italy); Atanassov, 1955:202 (Bulgaria: six localities); Vogrin, 1955:32 (Yugoslavia); Bytinski-Salz, 1956:224 (Turkey: Finike, Kemer); Ceballos, 1956:366 (in catalog of Hymenoptera of Spain); Morel, Nouvel, and Ribaut, 1956:337 (France: Département des Pyrénées-Orientales); Bajári, 1957a:28 (in key to Hungarian Sphecidae); Balthasar, 1958:337 (Slovakia: Čenkov); Pulawski, 1958a:165 (Bulgaria: Nesebar, mouth of Ropotamo River, Varna); de Beaumont, 1959a:12 (Italy); de Beaumont and Bytinski-Salz, 1959:151 (Israel); de Beaumont, 1960a:6 (Greece: Island of Rhodes); Noskiewicz and Puławski, 1960:73 (in key to Polish Sphecidae, not yet found in Poland); de Beaumont, 1961a:209 (geographic variation); Grandi, 1961:167 (nesting habits); Atanassov, 1962:124 (Bulgaria: Petrich area); Lehrer and Scutaru, 1963:287 (Romania: Moldova: Valea David in Iași District); Ceballos, 1964:88 (in supplement to catalog of Spanish Sphecidae); de Beaumont, 1964c:34 (in Sphecid Fauna of Switzerland), 1965a:18 (Greece); Roberti, Frilli, and Pizzaghi, 1965:109 (Italy: Emilia-Romagna: Bobbio in Piacenza Province); Diniz, 1966:6 (Portugal: Coimbra); Scobiola-Palade, 1966b:391 (Romania: Tulcea District: C.A. Rosetti, Periprava); Balthasar, Hrubant, and Hrubant, 1967:174 (Bulgaria: Slanchev Bryag near Nesebar); de Beaumont, 1967a:279 (Turkey; variation); Scobiola-Palade, 1967a:161 (Romania: Constanța District: Comarova, Mangalia), 1967b:39 (Romania), 1968b:141 (Romania: Island of Letea in delta of Danube); de Beaumont, 1969:82 (Turkey); Zangheri, 1969:1700 (Italy: in catalog of flora and fauna of Romagna Region); Kazenas, 1970b:366 (Kazakhstan); Tsuneki, 1971:417 (Mongolia); Balthasar, 1972:382 (in Sphecid Fauna of Czechoslovakia); Kazenas,

1972b:124 (Kazakhstan); Krombein, 1972b:385 (Greece; nesting habits); Scobiola-Palade, 1972a:149 (Romania: delta of Danube: Caraorman); Simon Thomas, 1972:177 (France: Landes); Erlandsson, 1974:61 (Italy); Kazenas, 1974b:109 (feeding on flowers of *Tamarix* sp. and *Euphorbia* spp., Euphorbiaceae in Kazakhstan), 111 (feeding on flowers of and *Lepidium crassifolium* W. et K., Brassicaceae, in Kazakhstan); R. Bohart and Menke, 1976:567 (in checklist of world Sphecidae); Guichard, 1978:270 (Greece); Kazenas, 1978b:49 (in key to Sphecidae of Kazakhstan and Central Asia); Marion, 1978:86 (France); Pulawski, 1978:187 (in key to Sphecidae of European part of former USSR); Radović and Krunić, 1979:unpaginated foldout (nesting in sand, foreleg structure); Pagliano, 1980:124 (Italy: Basilicata); Dollfuss, 1983b:24 (in catalog of Sphecidae of Austria: Niederösterreich: Oberweiden); Gayubo, 1983e:237 (Spain: Salamanca Province); Schmidt and Westrich, 1983:125 (Greece); Gayubo and Tormos, 1984:24 (Spain: Valencia); Chevin and Chevin, 1985:39 (France: Aude); Radović, 1985:66 (sting apparatus analyzed); Scobiola-Palade, 1985:95 (Romania: delta of Danube); Piek and Spanjer, 1986:187 (in list of Sphecidae with known prey); Steiner, 1986:112 (references to publications on nesting habits); Pagliano, 1987:159 (Italy, in key to Italian Philanthini); Asís and Jiménez, 1988:276 (Spain: Castellón Province); Dollfuss, 1988:30 (Austria: Niederösterreich: Oberweiden); Evans and O'Neill, 1988:196 (review of nesting habits); Pagliano, 1988:137 (in revision of Italian Philanthinae); Pádr in Šedivý, 1989a:166 (in checklist of Czechoslovakian Sphecidae); Pagliano, 1990:95 (in catalog of Italian Sphecidae); Dollfuss, 1991:212 (in key to Sphecidae of North and Central Europe); Gayubo, 1991a:130 (characteristics of the species); Gayubo, Borsato, and Osella, 1991:419 (Italy); Negrisol, 1991:323 (Italy: Venezia Province); Gayubo, Borsato, and Osella, 1992:290 (Greece); Blagoveshchenskaya, 1994:91 (Russia: Ul'yanovsk Oblast'); Gayubo and Borsato, 1994:220 (Italy: Toscana); Roche and Zalat, 1994:116 (Egypt: Sinai Peninsula); Gorobchishin, 1995:19 (Ukraine: Kanev Nature Reserve); Negrisol, 1995a:18 (visiting flowers of *Eryngium maritimum* L.), 19 (visiting flowers of *Echinophora spinosa* L.), 22 (Italy: Veneto); Negrisol in Minelli, Ruffo, and La Posta, 1995b:8 (in catalog of Italian fauna); Pagliano and Pesarini, 1995:92 (Italy: Ferrara Province); Gadallah, 1996:73 (in revision of Egyptian *Philanthus*, occurrence in Egypt possible); Gorobchishin, 1996:53 (Ukraine: Kanev Nature Reserve); Minoranskiy and Shkuratov, 1996:81 (Russia: Rostov Oblast'); Voblenko, Gorobchishin, and Nesterov, 1996:15 (Ukraine: Polesye Region); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:295 (in Sphecid Fauna of Western Europe); Celary, 1997:60 (in checklist of Animals of Poland, in error); Esenbekova and Kazenas, 2000:71 (southeast Kazakhstan: 10 km northwest of Chundzha, near landing place Dubun', near village Kazakhstan, 5-12 km southwest of village Kazakhstn, 30 km south-southwest of Koktal); Ljubomirov, 2000:13 (Bulgaria, specimens in N. Nedelkov collection); Shkuratov, 2000:55 (Russia: Rostov Oblast': Vëshenskaya village area at 49°37'N 41°45'E); Basset, 2001:85 (France: Département de Gironde); Józán, 2001:281 (Hungary: Somogy County); Kazenas, 2001b:52 (in checklist of Sphecidae of Kazakhstan and Central Asia); Shkuratov, 2000:17 (prey: *Lasioglossum* sp.); Kazenas, 2002a:136 (geographic distribution, collecting localities in Kazakhstan); Drewes, 2003:141 (Spain: Tarragona); Schmid-Egger, 2003:756 (Italy: Sicilia: Armerina, Ragusa); Gorobchishin and Protsenko, 2004:40 (Ukraine: Kherson Oblast': Chernomorskiy Nature Reserve); Kazenas, 2004d:36 (Kazakhstan: Khar'kino); Shkuratov, 2004a:73 (Russia: Rostov Oblast'), 2004b:165 (Russia: Rostov Oblast': Gosudarstvennyi Muzei-Zapovednik M.A. Sholokhova); Skibińska in Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae, in error); Wiśniowski, 2004:52 (in checklist of Polish Sphecidae: recorded from Poland by Dittrich, 1911, almost certainly in error); Jacobs, 2005a:449 (Bulgaria: Arkutino, Michurin, Plovdiv, Primorsko); Shorenko, 2005a:168 (Ukraine: Crimea), 2005b:99 (Ukraine: Crimea: Karadagh Nature Reserve); Ljubomirov, 2006:543 (Bulgaria: Rhodope Mountains: previous records summarized); Kaltenpoth, Göttler, Herzner, and Strohm, 2005:478 (presence of streptomycetes bacteria in female antennal glands); Pagliano and Negrisol, 2005:303 (in Sphecid Fauna of Italy); Gorobchishin, 2006:144 (Ukraine: Cherkasy Oblast': Kaniv Nature Reserve, villages Keleberda and Prokhorovka); Standfuss and Standfuss, 2006b:99 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Roche, 2007a:127 (in catalog of Egyptian Ampulicidae, Sphecidae, and Crabronidae), 2007b:8 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Vepřek and Straka, 2007:209 (in catalog of Sphecidae of Czech Republic and Slovakia, known from Moravia)

and Slovakia only); Yildirim and Ljubomirov, 2007:119 (Turkey: Erzurum and Kars provinces); Ljubomirov and Yildirim, 2008:129 (in catalog of Crabronidae of Turkey); Baños-Picón, Asís, Gayubo, and Tormos, 2009:314 (Spain: frequency of specimens collected with hand nets and Malaise traps); Shorenko, 2009:369 (in list of Sphecidae s.l. of Crimea); Bitsch, 2010:117 (in supplement to vol. II of Faune de France, 1997: recent records from Bulgaria, Greece, and Sicilia reported); Rudoiskatel', 2010:147 (Russia: southern Ural Mountains); Shorenko and Kononov, 2010:31 (Ukraine: several localities); Tüzün and Yüksel, 2010:4474 (Turkey: Niğde Province); van der Smissen, 2010b:386 (France: Vaucluse: Bédoin); Józán, 2011:184 (in checklist of Sphecidae s.l. of Hungary); Murai and Amr, 2011:114, 120 (first record from Syria: Al Thawrah Nature Reserve at 35°51'N 28°38'E); Prismaniy, 2012:52 (Russia: Belgorod Oblast'); Yildirim, 2012:77 (Turkey: Erzurum: Oltu); Kazenas, 2013b:499 (southeast Kazakhstan: 10 km NW Chundzha on Sharyn River, near landing place Dubun' on Ili River, 30 km SSW Koktal); Shlyakhtenok, 2013:238 (in annotated catalog of aculeate wasps of Belarus'); Protsenko, Fateryga, and Ivanov, 2014:40 (Crimea: several localities); Ruchin and Antropov, 2014:38 (Russia: Republic of Mordovia); Yıldırım, Ljubomirov, and Lelej, 2014:8 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:150 (in checklist of Hymenoptera of Turkey); Mokrousov and Popov, 2016:593 (Russia: Krasnodarskiy Krai); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:21 (Turkey: Erzurum and Tunceli provinces); Danilov and Mokrousov, 2017b:256 (in catalog of Philanthinae of Russia); Dollfuss, 2017b:1266 (locality records from Austria, Bulgaria, Czech Republic, Croatia, France, Greece, Hungary, Iran, Italy, Kazakhstan, Montenegro, Slovakia, Spain, Syria, and Turkey); Shorenko, 2017:81 (in Crimea collected in June through August); Shorenko, 2018:131 (Crimea, including localities, habitats, and number of specimens).

*Philanthus melliniformis* F. Smith, 1856:469, ♂. Holotype or syntypes: ♂, Italy: Sicilia: no specific locality (BMNH). Synonymized with *Philanthus venustus* by Kohl, 1891:366. – A. Costa, 1864c:124 (Italy: Campania: Benevento area); Kirchner, 1867:220 (in catalog of European Hymenoptera); Walker, 1871:28 (Harkeko, Djibuti: Tadjurah, Egypt: Sinai: Wadi Feiran and Mount Sinai); nec Morice, 1911:... and von Schulthess, 1926b:212 (= *Philanthus raptor*); Innes Bey, 1991:102 (specimens recorded by Walker, 1871, now destroyed by dermestids, were collected in Sinai Peninsula and in Djibuti: Tadjurah).

As *Philanthus Siboldtii* [sic]: Eversmann, 1849:399 ("in campis Kirgisorum", now Kazakhstan), present correction based on geographic distribution.

As *Philanthus venustus raptor*: Guiglia, 1941c:160 (Italy: Calabria: Grande Sila), 1944b:11 (Italy: Calabria; as var. *raptor*); Grandi, 1954:236 (Italy: Venezia).

### 131. *walteri* Kohl

*Philanthus walteri* Kohl, 1891:361, ♂ (as *Walteri*, incorrect original capitalization). Holotype: ♂, Transcaspia: no specific locality (NHMW?). – Kohl, 1891:366 (in checklist of world *Philanthus*); Dalla Torre, 1897:494 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:567 (in checklist of world Sphecidae); Kazenas, 2001b:52 (in checklist of Sphecidae of Kazakhstan and Central Asia).

### 132. *weneri* Moidl

*Philanthus weneri* Moidl, 1933:122, ♀, ♂ (as *Weneri*, incorrect original capitalization). Syntypes: ♀, ♂, Morocco: Casablanca and Maarif near Casablanca (NHMW). – de Beaumont, 1949b:186 (in revision of northwestern African *Philanthus*), 1953g:119 (Morocco); R. Bohart and Menke, 1976:567 (in checklist of world Sphecidae); Dollfuss, 1989:11 (holotype in NHMW).

### 133. *yerburyi* Bingham

*Philanthus yerburyi* Bingham, 1898a:106, ♀. Syntypes: ♀, Yemen: Aden (BMNH). – R. Bohart and Menke, 1976:567 (in checklist of world Sphecidae).

**134. zebratus Cresson**

*Philanthus zebratus* Cresson, 1880a:xxxiii, ♂. Holotype: ♂, USA: Nevada: no specific locality (ANSP). – Cresson, 1887:281 (in catalog of North American Hymenoptera); Kohl, 1891:370 (in checklist of world *Philanthus*); Dalla Torre, 1897:494 (in catalog of world Hymenoptera); Cresson, 1916:101 (holotype in ANSP); Strandtmann, 1945b:152 (in review of North American *Philanthus*), 1946:46 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera); R. Bohart and Grissell, 1975:5, 6 (in key to North American *Philanthus*), 18 (in revision of *Philanthus* of California); R. Bohart and Menke, 1976:576 (in checklist of world Sphecidae); Evans, 1977d:25 (male and female behavior), 1978:32 (mating strategy); Evans and O'Neill, 1978:1901 (alternative mating strategies); Evans, 1979b:34 (male mating strategies); Krombein, 1979b:1726 (in catalog of North American Hymenoptera, nesting sites, list of parasites and prey); Gwynne and O'Neill, 1980:220-223 (male territoriality results in higher predation by Asilidae); O'Neill and Evans, 1982:798 (major prey: family and genus), 1983:175 (body size and alternative mating tactics); Rust, Hanks, and Bechtel, 1983:406 (Nevada: Churchill County: Sand Mountain); G. Ferguson, 1984a:297 (in revision of *zebratus* species group); O'Neil, 1885:2188 (egg and prey size; sexual dimorphism in size); Evans and O'Neill, 1988:57 (male behavior, nesting habits, natural enemies); Spofford, Kurczewski, and Downes, 1989:256, 257, 259 (references to publications on nest parasites *Metopia argyrocephala* (Meigen), *Phrosinella fulvicornis* (Coquillett), *Phrosinella fumosa* Allen, and *Senotainia trilineata* (Wulp), miltogrammine flies); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Kaltenpoth et al, 2006:1405 (presence of *Streptomyces philanthi* in female antennal glands); Nechitaylo, Westermann, and Kaltenpoth, 2014:206, 207 (physiological diversity among defensive '*Streptomyces philanthi*' symbionts); Ratzlaff, 2016:28 (Canada: British Columbia: from Banks, 1913 and Krombein, 1979); Dollfuss, 2017b:1268 (Colorado:Alamosa County: Alamosa). – **As *Ococletes zebratus*** Banks, 1913b:423 (new combination; British Columbia: Princeton); Burks in Muesebeck et al., 1951:1002 (new combination, in catalog of North American Hymenoptera):.

*Ococletes nitens* Banks, 1913b:423, ♂ (actually ♀: G. Ferguson, 1984a:291). Holotype: ♀, Canada: British Columbia: Princeton (MCZ). Synonymized with *Philanthus zebratus* by R. Bohart and Grissell, 1975:19 and by R. Bohart in R. Bohart and Menke, 1976:567 (as new synonym). – **As *Philanthus nitens***: Strandtmann, 1945b:152 (new combination, in review of North American *Philanthus*), 1946:42 (in revision of North American *Philanthus*); Burks in Muesebeck et al., 1951:1002 (in catalog of North American Hymenoptera). – **As *Philanthus zebratus nitens***: Evans, 1966c:38 (new status, nesting habits, prey), Evans, 1970:494 (Wyoming: Jackson Hole, nesting habits, list of prey).

*Ococletes illustris* Mickel, 1918a:327, ♀. Holotype: ♀, California: Placer County: American River (UNL). Synonymized with *Philanthus nitens* by Strandtmann, 1945b:152 (in review of North American *Philanthus*). – Muma, 1952:21 (holotype in UNL), 27 (paratype in UNL).

**sp.**

Cockerell, 1901:41 (visiting flowers of *Fallugia paradoxa acuminata* Wooton), 41 (visiting flowers of *Fallugia micrantha* Cockerell); von Schulthess, 1914:286 (Cameroon); Storey, 1916:108 (Egypt); Mellor, 1928:129 (Egypt); Nadig, 1933:97 (Morocco); de Beaumont, 1970c:4 (Iran: Baluchistan); Horning and Barr, 1970:106 (USA: Idaho: Craters of the Moon National Monument); Kumar, Lavigne, Lloyd, and Pfadt, 1976:51 (USA: Colorado: Pawnee National Grassland); van Vondel, 1995:25 (specimens from Malawi in Natuurmuseum Rotterdam); Ruíz Cancino, Coronado Blanco, and Horta Vega, 2005:170 (Mexico: recorded from Tamaulipas State); Ljubomirov and Yildirim, 2008:130 (in catalog of Crabronidae of Turkey).

**FOSSIL PHILANTHUS**

**annulatus Theobald**

*Philanthus annulatus* Theobald, 1937:... France: Oligocene. – R. Bohart and Menke, 1976:567 (in checklist of world Sphecidae).

**saxigenus Rohwer**

*Philanthus saxigenus* Rohwer, 1909h:535, sex not indicated. Holotype: Colorado: Florissant (Colorado Univ.). Age: Oligocene. – R. Bohart and Menke, 1976:567 (in checklist of world Sphecidae).

**NOMINA NUDA IN PHILANTHUS**

*Philanthus cruentatus*: Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Pagliano, 2014:100 (specimens in M. Spinola collection, Torino, are *Philanthus* sp.).

*Philanthus dregei*: Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Pagliano, 2014:100 (specimens in M. Spinola collection, Torino, are *Philanthus* sp.).

*Philanthus duponti*: Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Pagliano, 2014:104 (specimens in M. Spinola collection, Torino, are *Philanthus* sp.).

*Philanthus egregius* Kohl: Kohl, 1891:364 (in checklist of world *Philanthus*); Dollfuss, 1989:11 (type material in NHMW).

*Philanthus erratus* Harris. Catalogue of the insects of Massachusetts, 2<sup>nd</sup> edition. – Cresson, 1962:236 (in catalog of North American Hymenoptera).

*Philanthus facialis*: Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Pagliano, 2014:100 (specimens in M. Spinola collection, Torino, are *Philanthus* sp.).

*Philanthus honestus*: Casolari and Casolari Moreno, 1980:122 (specimens in M. Spinola collection, Torino); Pagliano, 2014:100 (specimens in M. Spinola collection, Torino, are *Philanthus* sp.).

*Philanthus* [sic] *hystrix* Klug: A. Costa, 1864a:61 (one specimen from Cape of Good Hope, South Africa, in Napoli Museum).

*Philanthus impunctuatus* Harris. Catalogue of the insects of Massachusetts, 2<sup>nd</sup> edition. – Cresson, 1962:236 (in catalog of North American Hymenoptera).

*Philanthus latreillei*: Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Pagliano, 2014:103 (specimens in M. Spinola collection, Torino, are *Philanthus* sp.).

*Philanthus maculigerus* Dufour: Martinez y Saez, 1874:3 (specimens from Spain, Madrid area, donated to Leon Dufour); Ceballos, 1956:365 (in catalog of Hymenoptera of Spain).

*Philanthus mexicanus* Spinola: Pagliano, 2014:103 (specimens in M. Spinola collection, Torino, are *Philanthus* sp.).

*Philanthus mystacinus* Spinola, 1843b:XXXVI (specimens in Berlin Museum).

*Philanthus obsoletus* Harris. Catalogue of the insects of Massachusetts, 2<sup>nd</sup> edition. – Cresson, 1962:236 (in catalog of North American Hymenoptera).

*Philanthus pulchellus* Klug in Waltl, 1835:88 (in list of Hymenoptera of Andalusia).

*Philanthus regulus*: Casolari and Casolari Moreno, 1980:123 (specimens in M. Spinola collection, Torino); Pagliano, 2014:101 (specimens in M. Spinola collection, Torino, are *Philanthus* sp.).

*Philanthus viatus* Harris. Catalogue of the insects of Massachusetts, 2<sup>nd</sup> edition. – Cresson, 1862:237 (in catalog of North American Hymenoptera).

**SPECIES DESCRIBED IN PHILANTHUS AND TRANSFERRED TO OTHER GENERA**

*abdominalis* Fabricius, 1804 = *Cerceris*

*albofasciatus* Thunberg, 1815 = *Cerceris albofasciata* (Rossi, 1815)

- algiricus* Thunberg, 1815 = *Cerceris sabulosa algirica* (Thunberg)  
*analis* Fabricius, 1804 = *Hylaeus variegatus* (Fabricius, 1798), Apidae (W. Schulz, 1912:90).  
*angelae* Kohl, 1891 = *Pseudoscolia*  
*araxis* Kohl, 1891 = *Pseudoscolia*  
*asuncionis* Strand, 1910 = *Trachypus elongatus* (Fabricius, 1804)  
*ater* Fabricius, 1793 = *Panurgus calcaratus* (Scopoli, 1763), Apidae, in Dalla Torre, 1896  
 Fabricius, 1793:292, sex not indicated. Holotype or syntypes: Italy: no specific locality (depository?).  
 – Fabricius, 1796:137 (in Index to his Entomologia Systematica, 1793); Thunberg, 1815a:127 (diagnostic characters, 128 (redescription), 1915b:237 (diagnostic characters), 238 (reference to *Myrmosa* of Panzer (perhaps identical to *Myrmosa atra* Panzer, 1801 = *Mutilla melanocephala* Fabricius, 1793 nec Schrank, 1781; see Richards, 1935:159 for nomenclature).  
*auritus* Fabricius, 1794 = *Cerceris arenaria* (Linnaeus, 1758)  
*bicolor* Thunberg, 1815a:131 = *Ceramius*, Vespoidea (W. Schulz, 1912:68).  
*biguttatus* Thunberg, 1815 = *Cerceris rybyensis* (Linnaeus, 1771)  
*canaliculatus* Say, 1823 = *Eucerceris canaliculata*  
*circularis* Fabricius, 1804 = *Cerceris*  
*colon* Thunberg, 1815 = *Cerceris rybyensis* (Linnaeus, 1771)  
*clypeatus* Thunberg, 1815 = *Lestica clypeata* (Schreber, 1759)  
*dewitzi* Kohl, 1889 = *Pseudoscolia*  
*dissectus* Fabricius, 1804 = *Cerceris*  
*diversicornis* F. Morawitz, 1894 = *Pseudoscolia*  
*egregius* Taschenberg, 1875: = *Trachypus patagonensis* (de Saussure, 1854)  
*elegans* F. Smith, 1856 = *Trachypus petiolatus* Spinola, 1842  
*emarginatus* Panzer, 1799 = *Cerceris sabulosa* (Panzer, 1799)  
*eximius* F. Morawitz, 1894 = *Philanthinus quattuordecimpunctatus* (F. Morawitz, 1888)  
*flavidus* Taschenberg, 1875 = *Trachypus*  
*flavipes* Fabricius, 1787:295, sex not indicated. Holotype or syntypes: Italy: no specific locality (depository?). – Fabricius, 1793:290 (redescription), 1796:137 (in Index to his Entomologia Systematica, 1793), 1804:304 (redescription); Thunberg, 1815a:127 (diagnostic characters), 131 (redescription), 1815b:289 (diagnostic characters), 298 (redescription) = ?  
*frigidus* F. Smith, 1856 = *Aphilanthops*  
*gomezi* Strand, 1910 = *Trachypus elongatus* (Fabricius, 1804)  
*indicus* Thunberg, 1815 = *Cerceris*  
*harringtoni* Provancher, 1888 = *Hoplisoides placidus nebulosus* (Packard, 1867)  
*hortorum* Panzer, 1799 = *Cerceris rybyensis hortorum* (Panzer)  
*indicus* Thunberg, 1815 = *Cerceris*  
*interruptus* Panzer, 1799 = *Cerceris*  
*interstinctus* Fabricius, 1798 = *Cerceris*  
*laetus* Fabricius, 1793 = *Cerceris laeta* (Fabricius)  
*laticinctus* Cresson, 1865 = *Clypeadon*  
*lyautei* von Schulthess, 1924 = *Pseudoscolia*  
*lunulatus* Thunberg, 1815 = *Cerceris bucculata* A. Costa, 1860  
*macula* Fabricius, 1804 = *Cerceris*  
*marginipennis* Cameron, 1890 = *Eucerceris canaliculata* (Say, 1823)  
*mendozae* Dalla Torre, 1897 = *Trachypus petiolatus* (Spinola, 1842)  
*minimus* von Schulthess, 1924 = *Pseudoscolia dewitzi* Kohl, 1889

- nigriceps* Bingham, 1896 = *Psaenythia* (Apidae), probably from Brazil and not India (Vardy *in* Menke, 1993, Sphecos 25:22).
- ornatus* Fabricius, 1790 = *Cerceris rybyensis* (Linnaeus, 1771)
- patagonensis* de Saussure, 1854 = *Trachypus*
- punctifrons* Cameron, 1890 = *Eucerceris*
- pygmaeus* Thunberg, 1815 = *Cerceris* ? *sabulosa* (Panzer, 1799)
- quadricinctus* Panzer, 1799 = *Cerceris*
- quadrifasciatus* Panzer, 1799 = *Cerceris*
- quadrifasciatus* Thunberg, 1815 = *Cerceris quadrifasciata* (Panzer, 1799)
- quinquemaculatus* Fabricius, 1793 = *Mellinus arvensis* (Linnaeus, 1758)
- rubidus* Jurine, 1807 = *Cerceris*
- ruficornis* Fabricius, 1793 = *Cerceris*
- sabulosus* Panzer, 1799 = *Cerceris*
- semicinctus* Panzer, 1797 = *Cerceris rybyensis* (Linnaeus, 1771)
- sexpunctatus* Fabricius, 1793 = *Cerceris fimbriata* (Rossi, 1790)
- simplicicornis* F. Morawitz, 1894 = *Pseudoscolia*
- sinaiticus* Mochi, 1939 = *Pseudoscolia*
- soikae* Mochi, 1939 = *Pseudoscolia*
- spiniger* Thunberg, 1815 = currently included in *Cerceris*, but interpretation questionable
- terminalis* Taschenberg, 1875 = *Trachypus terminalis* (Fabricius, 1804)
- tricinctus* Spinola, 1805 = *Cerceris*
- tricinctus* Thunberg, 1815 = *Cerceris quadrifasciata* (Panzer, 1799)
- trifidus* Fabricius, 1804 = *Cerceris ruficornis* (Fabricius, 1793)
- variegatus* F. Morawitz, 1889 (as *Anthophilus*), junior secondary homonym of *Philanthus variegatus* Spinola, 1839 = *Pseudoscolia simplicicornis* F. Morawitz, 1894.
- ventilabris* Fabricius, 1804 = misspelling of *ventilabris* Fabricius, 1798
- zonatus* Say, 1823 = *Eucerceris zonata*

#### UNRECOGNIZABLE NAME IN *PHILANTHUS*

*Philanthus cornutus*: Gistel, 1848:142 (Germany, description).