10 May 2025

PALMODES

Palmodes Kohl, 1890:112. Type species: *Chlorion occitanicum* (Lepeletier de Saint Fargeau and Audinet-Serville, 1828) [= *Sphex occitanicus* Lepeletier de Saint Fargeau and Audinet-Serville, 1928], designated by Fernald, 1906:318.

NOTE: *argyrius* and *pseudargyrius* are members of *Chilosphex*.

Key to species: Gussakovskij, 1930c:210 (males of Palearctic species); Roth, 1963 (Palearctic species); Mingo and Gayubo, 1983:148 (Spanish species); Pagliano, 1984:366 (Italian species); Danilov, 2012 (species of Russia and adjacent countries), 2013 (Central Asian species); Danilov and Byvaltsev, 2020 (Palearctic species).

Review of biology: Kazenas: 2001b:80.

1. *californicus* R. Bohart and Menke

Palmodes californicus R. Bohart and Menke, 1961:182, ♀, ♂. Holotype: ♂, USA: California: Los Angeles County: Tanbark Flat in San Gabriel Mountains (CAS). – R. Bohart and Menke, 1963:143 (in revision of Nearctic Sphecini), 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1583 (in catalog of North American Hymenoptera); Rust, Menke, and Miller, 1985:46 (California: Channel Islands); Ratzlaff, 2016:29 (Canada: British Columbia: from Krombein, 1979); Buck and Bennett, 2025:224 (in checklist of Sphecidae sensu lato of Canada, Alaska, and Greenland: Canada: British Columbia: no specific locality).

2. *carbo* R. Bohart and Menke

Sphex morio Kohl, 1890b:321, ♀, ♂, junior primary homonym of *Sphex morio* Fabricius, 1775. Lectotype: ♀, Canada: British Columbia: Spence's Bridge (NHMW), designated by R. Bohart and Menke, 1961:188. – Dalla Torre, 1897:433 (in catalog of world Hymenoptera). – **As *Chlorion morio***: Fernald, 1906:318 (new combination, as synonym of *Chlorion laeviventris*). – **As *Palmodes morio***: Ashmead, 1899d:353 (new combination, in checklist of North American Sphecidae); R. Bohart and Menke, 1961:188 (in revision of Nearctic *Palmodes*); Dollfuss, 1989:11 (lectotype in NHMW); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument).

Palmodes carbo R. Bohart and Menke, 1963:144. Substitute name for *Sphex morio* Kohl. – Evans, 1970:483 (nesting habits); R. Bohart and Menke, 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera); Dodson and Gwynne, 1984:297 (prey: Jerusalem cricket *Stenopelmatus fuscus* Haldeman, Stenopelmatidae); Radović, 1985:64 (sting apparatus analyzed); Steiner, 1986:96 (references to papers on nesting habits); Blades and Maier, 1996:71 (Canada: British Columbia: Osoyoos - Mount Kobau area at 119°40'W 49°05'N); Finnamore, 1997:894 (expected to occur in Yukon); Dollfuss, 2008b:1405 (Colorado: Alamosa); Ratzlaff, 2016:29 (Canada: British Columbia: from Krombein, 1979); Buck and Bennett, 2025:224 (in checklist of Sphecidae sensu lato of Canada, Alaska, and Greenland: Canada: British Columbia, first records from Alberta and Saskatchewan: no specific locality).

3. *dimidiatus* (De Geer)

Sphex dimidiatus De Geer, 1773:589, sex not stated. Holotype or syntypes: ♂, USA: Pennsylvania: no specific locality (Stockholm). – Retzius, 1783:66 (redescription); Kohl, 1890b:442 (original description copied); Dalla Torre, 1897:421 (in catalog of world Hymenoptera); Fernald, 1906:417 (unidentified species). – **As *Palmodes dimidiatus***: Ashmead, 1899d:353 (new combination, in checklist of North American Sphecidae); W. Schulz, 1912:61 (study of type); R. Bohart and Menke, 1961:190 (in review of Nearctic *Palmodes*, study of type); Menke, 1965a:214 (synonymy); R. Bohart and Menke, 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera); Brockmann, 1985b:312 (nest closure summary); Rust, Menke, and Miller, 1985:46 (California: Channel Islands); Steiner, 1986:96 (references to papers on nesting habits); O'Brien, 1989b:206 (distribution in Michigan);

Ahlstrom, 1995:107 (in checklist of insects of North Carolina); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Buck, 2004:24 (Canada: in checklist of Sphecidae of Ontario), 29 (distribution within Ontario), 33 (first record from Canada: Ontario: Pinerey Provincial Park); Horta Vega, Pinson Domínguez, Barrientos Lozano, and Correa Sandoval, 2007:48 (Mexico: Tamaulipas); Dollfuss, 2008b:1405 (Utah: Capitol Reef National Park); Buys, 2020b:80 (in cladistic analysis of larvae of Sphecidae s.s.); Buck and Bennett, 2025:224 (in checklist of Sphecidae sensu lato of Canada, Alaska, and Greenland: Canada: Ontario, first record from Manitoba: no specific locality). **– As *Chlorion dimidiata*** [*sic*]: J.Ch. Bradley, 1928:1011 (new combination, in catalog of New York Sphecidae).

Sphex violaceipennis Lepeletier de Saint Fargeau, 1845:349, ♀. Holotype or syntypes: ♀, USA: Pennsylvania: Philadelphia (type lost: Menke, 1965a:214). Synonymized with *Sphex abdominalis* Cresson by Menke, 1965a:214. – F. Smith, 1856:262 (in catalog of Hymenoptera in British Museum); Cresson, 1863:320 (in catalog of North American Hymenoptera), 1887:276 (in catalog of North American Hymenoptera); Kohl, 1890b:454 (original description copied, possibly a synonym of *Sphex abdominalis*); Fernald, 1906; 419 (may be a synonym of *Chlorion abdominalis*).

Sphex rufiventris Cresson, 1873:11, ♀. Lectotype: ♀, USA: Texas: Bastrop or Travis County: no specific locality (ANSP), designated by Cresson, 1916:94. Synonymized with *Sphex dimidiatus* by R. Bohart and Menke, 1961:190. – Cresson, 1875:715 (New Mexico); Kohl, 1890b:321 (original description copied); Dalla Torre, 1897:439 (in catalog of world Hymenoptera); Murray *in* Muesebeck et al., 1951:974 (in catalog of North American Hymenoptera). – **As *Harpactopus rufiventris***: Patton, 1879d:354 (new combination, USA: northwestern Kansas), 1880a:383 (diagnostic characters of the genus *Harpactopus*); Cresson, 1887:276 (in catalog of North American Hymenoptera); Bridwell, 1899:209 (Kansas: no specific locality); Snow, 1906:7 (Arizona: Oak Creek 20 mi. southwest of Flagstaff, San Bernardino ranch 18 mi. east of Douglas); F. Williams, 1914b:227 (nesting habits). – **As *Palmodes rufiventris***: Ashmead, 1899d:353 (new combination, in checklist of North American Sphecidae). – **As *Chlorion rufiventris***: Fernald, 1906:325 (new combination, in revision of Sphecini of North America and West Indies); Dreisbach, 1944:268 (in key to Sphecinae of Michigan).

Sphex abdominalis Cresson, 1873:211, ♂, junior primary homonym of *Sphex abdominalis* Drury, 1773 and *Sphex abdominalis* Fabricius, 1775. Holotype: ♂, USA: Texas: Bosque County: no specific locality (USNM). Synonymized with *Sphex dimidiatus* by W. Schulz, 1912:61. – Kohl, 1890b:437 (original description copied); W. Fox, 1895c:265 (Mexico: Baja California Sur); Dalla Torre, 1897:413 (in catalog of world Hymenoptera); Cresson, 1916:93 (holotype in USNM). – **As *Harpactopus abdominalis* Say**: Cresson, 1887:276 (new combination, in catalog of North American Hymenoptera); J. Smith, 1900:523 (in list of insects of New Jersey); Adlerz, 1904:138 (known prey: tettigoniids); Snow, 1906:133 (Arizona; Oak Creek 20 mi. southwest of Flagstaff); Piek and Spanjer, 1986:184 (in list of Sphecidae with known prey). – **As *Chlorion abdominalis***: Fernald, 1906:322 (new combination, in revision of Sphecini of North America and West Indies); J. Smith, 1910:677 (in new list of insects of New Jersey); Washburn, 1919:222 (in list of Hymenoptera of Minnesota); Brimley, 1938:444 (North Carolina: Boone, Carolina Beach, Raleigh, Wilmington); Fernald, 1943a286 (Florida); Dreisbach, 1944:268 (in key to Sphecinae of Michigan), 272 (Michigan: locality records); Krombein, 1950a:268 (North Carolina: Dare County), 1951a:143 (Virginia: Dunn Loring; visiting tulip-tree honeydew).

Chlorion rufiventris var. *opuntiae* Rohwer, 1911:557, ♀. Holotype: ♀, USA: Texas: Victoria (USNM). Synonymized with *Sphex dimidiatus* by R. Bohart and Menke, 1961:190. – **As *Sphex rufiventris opuntiae***: Murray *in* Muesebeck et al., 1951:974 (new combination, new status, in catalog of North American Hymenoptera). – **As *Chlorion rufiventris opuntiae:*** Krombein, 1958f:191 (in supplement to catalog of North American Hymenoptera: new combination, original description appeared on p. 557).

Sphex daggyi Murray *in* Muesebeck et al., 1951:974. Substitute name for *Sphex abdominalis* Cresson, 1872. – **As *Chlorion daggyi***: Krombein, 1953a:281 (new combination, nest and prey), 295 (visiting foliage of *Pinus serotina* Michx.), 332 (North Carolina), 1953b:125 (attracted to a grass), 133 (North Carolina: Kill Devil Hills), 1955d:150 (nest, prey, cocoon); Krombein and Evans, 1955:232 (Florida); Krombein, 1958f:191 (in supplement to catalog of North American Hymenoptera: prey, description of larva by Evans and Lin, 1956a, reported); Wray, 1967:123 (North Carolina: Kill Devils Hills); L. Davis, 1978:216 (North Carolina: Kill Devil Hills, data from Krombein, 1953a). – **As *Palmodes***

daggyi: Evans and Lin, 1956a:141 (new combination, description of larva); Wray, 1967:124 (North Carolina: Nags Head).

4. *garamantis* (Roth)

Sphex garamantis Roth, 1959b:47, ♂. Holotype: ♂, Algeria: Hoggar: Adrar Amezeroul (Inst. Aclimatac. Almería). – **As *Palmodes garamantis***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*).

5. *hesperus* Bohart and Menke

Palmodes hesperus Bohart and Menke, 1961:184, ♀, ♂. Holotype: ♂, USA: Nevada: Humboldt County: Golconda (CAS). – Evans, 1970:484 (nesting habits); Horning and Barr, 1970:104 (USA: Idaho: Craters of the Moon National Monument); R. Bohart and Menke, 1963:145 (in revision of Nearctic Sphecini), 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera); Ratzlaff, 2016:29 (Canada: British Columbia: from Krombein, 1979); Buck and Bennett, 2025:224 (in checklist of Sphecidae sensu lato of Canada, Alaska, and Greenland: Canada: British Columbia: no specific locality).

6. *hissaricus* Danilov

Palmodes hissaricus Danilov *in* Danilov and Byvaltsev, 2020:405, ♀, ♂. Holotype: ♂, Tajikistan: Varzob District: Kvak near Kondara at 38°48'N 68°46'E (ZIN). Paratypes: Iran, Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan. – Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*); Danilov, 2020:319 (specimens from Iran, Kazakhstan, Kyrgyzstan, and Tajikistan in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia).

7. *insularis* Bohart and Menke

Palmodes insularis Bohart and Menke, 1961:186, ♀, ♂. Holotype: ♂, USA: California: Los Angeles County: Island of San Clemente (CAS). – R. Bohart and Menke, 1963:146 (in revision of Nearctic Sphecini), 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera); Rust, Menke, and Miller, 1985:46 (California: Channel Islands).

8. *intermedius* Arens

Palmodes intermedius Arens, 2017a:628, ♂. Holotype: ♂, Greece: Peloponnesus: Old Corinth (W. Arens personal collection, Bad Hersfeld, Germany). – Bitsch, Barbier, and Jacobs *in* Bitsch, Barbier, Gayubo, Jacobs, Leclercq, and Schmidt, 2020:130 (in Sphecid Fauna of Europe); Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*).

9. *laeviventris* (Cresson)

Sphex laeviventris Cresson, 1865b:463, ♀, ♂. Lectotype: ♀, USA: "Colorado Territory": no specific locality (ANSP), designated by Cresson, 1916:94, and also by R. Bohart and Menke, 1961:187. – Cresson, 1875:714 (Nevada), 1876:208 (Utah: Spring Lake); Kohl, 1890b:442 (original description copied); Dalla Torre, 1897:428 (in catalog of world Hymenoptera, as *leviventris*); Murray *in* Muesebeck et al., 1951:974 (in catalog of North American Hymenoptera). – **As *Harpactopus laeviventris***: Cresson, 1887:276 (new combination, in catalog of North American Hymenoptera); Ashmead, 1890:33 (in checklist of Hymenoptera of Colorado), 1899d:353 (, in checklist of North American Sphecidae). – **As *Chlorion laeviventris***: Fernald, 1906:318 (new combination, in revision of Sphecini of North America and West Indies); H. Smith, 1908b:332 (in revision of Nebraskan Sphecidae); Stevens, 1917:420 (North Dakota); Mickel, 1918b:397 (in catalog of Nebraskan Sphecidae); Dreisbach, 1944:267 (in key to Sphecinae of Michigan); La Rivers, 1945:743 (natural control of Mormon cricket, *Anabrus simplex* Haldeman, Tettigoniidae); Spencer and Wellington, 1948:10 (British Columbia); Piek and Spanjer, 1986:183 (in list of Sphecidae with known prey). – **As *Palmodes laeviventris***: F. Williams, 1914b:227 (new combination, nesting habits); Rohwer, 1917a:240 (California: Santa Barbara); R. Bohart and Menke, 1961:187 (in review of Nearctic *Palmodes*), 1963:147 (in revision of Nearctic Sphecini), 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera); Gwynne and Dodson, 1983:434 (prey size correlated with female size; prey: *Anabrus simplex* Haldeman, Tettigoniidae);

Brockmann, 1985b:312 (nest closure summary); Steiner, 1986:96 (references to papers on nesting habits); Spofford, Kurczewski, and Downes, 1989:260 (reference to publication on nest parasite *Sphenometopa tergata* (Coquillett), a miltogrammine fly); Ratzlaff, 2016:29 (Canada: British Columbia: from Spencer and Wellington, 1948); Srygley and Lorch, 2016:2 (Utah: Furnar Valley; reduced numbers of mass migrating Mormon crickets, *Anabrus simplex* Haldeman, a tettigoniid, by 42% for females and by 8% for males).

10. *lissus* Bohart and Menke

Palmodes lissus Bohart and Menke, 1961:187, ♀, ♂. Holotype: ♂, USA: California: Inyo County: Surprise Canyon in Panamint Mountains (CAS). – R. Bohart and Menke, 1963:148 (in revision of Nearctic Sphecini), 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera); Frommer, 1988:94 (California: Riverside County: Deep Canyon); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae).

11. *mandarinius* (F. Smith)

12. *Sphex mandarinius* F. Smith, 1856:256, ♀ (as *Mandarinia*, incorrect original capitalization and termination). Holotype or syntypes: ♀, China: Shanghai (BMNH). – Kohl, 1885b:205 (original description copied), 1890b:447 (original description copied, as *mandarina*); Dalla Torre, 1897:430 (in catalog of world Hymenoptera); Uchida, 1925:332 (Korea), corrected to *Sphex occitanicus* by Tsuneki, 1971m:1; Tomari, 1930:55 (China: southern Manchuria), corrected to *Sphex occitanicus* by Tsuneki, 1971m:1; Piel, 1935:295 (as new synonym of *Sphex occitanicus*); Hua, 2006:276 (in list of Chinese insects, geographic distribution). – **As *Palmodes mandarinius***: Danilov, 2019:77 (new combination, in review of Palearctic Prionychini, is a full species), 2020:319 (specimens from Kazakhstan, Kyrgyzstan, Tajikistan, and Russia: Altai Republic, Tyva Republic, and Zabaikalskiy Kray in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia); Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*), 410 (resurrected from synonymy, in revision of Central Asian *Palmodes*; China, Kazakhstan, Mongolia, Russia, Tajikistan).

Sphex montanus F. Morawitz, 1889a:128, ♀. Holotype: ♀, China: Mountain Yan-Myn-Guan [= China: Shanxi: Xinzhou Prefecture: Yanmenguan at 39°11'N 112°52'E] (ZIN). Synonymized with *Sphex occitanicus* by Kohl, 1890:317, synonymy confirmed in 1895:45, and with *Palmodes mandarinius* by Danilov and Byvaltsev, 2020:410. – F. Morawitz, 1891b:235 (not identical with *Sphex occitanicus*); Danilov, 2016:344 (holotype preserved in Zoological Institute, Sankt Petersburg, Russia), 2019:77 (in review of Palearctic Prionychini, is a junior synonym of *Palmodes mandarinius*).

13. *melanarius* (Mocsáry)

Sphex melanarius Mocsáry, 1883:32, ♂. Holotype or syntypes: ♂, Georgia: Tiflis, now Tbilisi (TMB). – Kohl, 1885b:178 (in revision of Palearctic *Sphex*); Ed. André, 1888:152 (in revision of Sphecidae of Europe and Algeria), 9* (bibliographic references); Kohl, 1890b:324 (in revision of world Sphecini); Dalla Torre, 1897:432 (in catalog of world Hymenoptera); Dusmet and Mercet, 1906:505, 513 (in key to Spanish Sphecini); Morice, 1921:822 (Iraq: Shahroban); Coulon, 1925:116 (Spain: El Escorial); Roth, 1925:378 (in revision of North African Sphecini); Berland, 1926b:166 (Spain: Escorial; Algeria); Gussakovskij, 1930c:210 (in key to Palearctic *Palmodes*); Giner Marí, 1934:130 (Spain), 1943a:80 (in Sphecid Fauna of Spain), 1945b:359 (eastern Morocco: Muley Rechid), 1959:388 (Morocco); de Beaumont, 1951e:267 (Morocco); Leclercq, 1955h:28 (bibliographic references, faunal records from Africa); Ceballos, 1956:364 (in catalog of Hymenoptera of Spain); de Beaumont, 1956a:180 (Libya); Giner Marí, 1959:388 (as first record from Morocco); Roth, 1963:146 (in revision of Palearctic *Palmodes*); Ceballos, 1964:87 (in supplement to catalog of Spanish Sphecidae); de Beaumont, 1965a:12 (Greece), 1962b:19 (Spain); Myartseva, 1965:82 (Turkmenistan: lower Murgab River); Roth *in* de Beaumont, 1967a:370 (Turkey); Kazenas, 1969a:21 (Kazakhstan: Chilik, Mangyshlak Peninsula), 1972b:110 (Kazakhstan), 1978b:43 (in key to Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:184 (in key to Sphecidae of European part of USSR). – **As *Chlorion melanarius***: Derwesh, 1965:70 (new combination, Iraq: no specific locality). – **As *Palmodes melanarius***: Myartseva, 1972a:83 (new combination, Turkmenistan); R. Bohart and Menke, 1976:127 (in checklist of world Sphecidae); Esenbekova and Kazenas, 2000:8

(southeastern Kazakhstan: near Bakanas, 10 km northwest of Chemolgan, 22 km west of Furmanovka, near Kapchagay); Gayubo, 1981a:135 (northern Spain: Sierra de Béjar), 1983c:231 (Spain: Salamanca Province: Campillo de Salvatierra, Peralejos de Abajo); Mingo and Gayubo, 1983:150 (Spain); Gayubo, Asís, and Tormos, 1990a:10 (Spain); Gayubo, Borsato, and Osella, 1992:276 (Greece); Kuhlmann, 1996:220 (Portugal: Serra de Estrela); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:54 (in Sphecid Fauna of Western Europe); Nazarova and Shomirsaidov, 1997:23 (Tajikistan: fruit tree orchards in Vakhsh River valley); Kazenas, 1998b:97 (in Sphecid Fauna of Kazakhstan); Nazarova, 1998:39 (Tajikistan: Tigrovaya Balka Nature Reserve); Gayubo, González, and Torres, 2000:184 (Spain: Salamanca Province); Kazenas, 2001b:14 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:26 (geographic distribution, collecting localities in Kazakhstan); Shkuratov, 2002a:383 (Russia: Rostov Oblast'); Shorenko, 2003:96 (Ukraine: Crimea: Kerch and Solenoye Ozero in Dzankoysk district); Gayubo**,** Nieves-Aldrey, González, Tormos, Rey del Castillo, and Asís, 2004:108 (Spain: Madrid: Monte de El Pardo); Kazenas, 2004b:98 (Kazakhstan: western Tien Shan Mountains); Shkuratov, 2004a:73 (Russia: Rostov Oblast'); Cruz-Sánchez, Gayubo, González, and Torres, 2005:219 (Spain: Salamanca: San Martín del Castañar); Gülmez and Tüzün, 2005:46 (Turkey: Ankara Province); Nazarova, 2005:93 (alfalfa fields in southwestern Tajikistan); Dollfuss, 2008b:1405 (locality records from Kazakhstan, Kyrghyzstan, Syria, and Turkmenistan); Gayubo, González, Tormos, and Asís, 2008:136 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Ljubomirov and Yildirim, 2008:23 (in catalog of Sphecidae of Turkey); Baños-Picón, Asís, Gayubo, and Tormos, 2009:310 (Spain: frequency of specimens collected with hand nets and Malaise traps); González, Gayubo, Asís, and Tormos, 2009:622 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Shorenko, 2009:366 (in list of Sphecidae *sensu lato* of Crimea); Danilov, 2010b:44 (distribution of western Palearctic type); Cruz-Sánchez, Asís, Gayubo, Tormos, and González, 2011:497 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park: effects of wildfire); Murai and Amr, 2011:119 (recorded from Syria by Dollfuss, 2008b); Danilov, 2012:161 (in key to *Palmodes* of Russia and adjacent countries); Protsenko, Fateryga, Ivanov, and Puzanov, 2012:57 (Ukraine: Crimea: Opukskiy Nature Reserve); Danilov, 2013:49 (in key to *Palmodes* of Central Asia); Kazenas, 2013a:17 (color photograph of female, short information on geographic distribution and nesting habits); Danilov, 2014b:514 (in key to Sphecidae s.s. of Siberia, not yet found in Siberia); Ebrahimi, 2014:16 (Iran: no specific locality); Kazenas, 2014a:131 (Kazakhstan: Karatau Mountain Range); Yildirim, 2014:29 (Turkey: distribution by biogeographic provinces); Koçak and Kemal, 2015:278 (in checklist of Hymenoptera of Turkey); Mokrousov and Gromenko, 2015:126 (Uzbekistan: Talimardzhan water reservoir at 38°26'3" N 65°35'37" E); Shorenko, 2015:316 (in list of Sphecidae *sensu lato* of Crimea); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:5 (Turkey: Aksaray: Ağaçören); Arens, 2017a:628 (Greece: Peloponnesus: Old Corinth); Danilov, 2017b:214 (in catalog of Sphecidae s.s. of Russia); Danilov and Mokrousov, 2017a:108 (Russia: Astrakhan Oblast', Chechnya, Dagestan, Kalmykia, Saratov Oblast', Volgograd Oblast'); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:24 (Iran: known from no specific locality); Shorenko, 2017:76 (in Crimea collected in June and August), 2018:127 (Crimea, including localities, habitats, and number of specimens); Augul, 2019:496 (recorded from Iraq by Morice, 1921 and de Beaumont, 1961); Gülmez, 2019:3 (Turkey: Ankara Province: no specific locality); Augul, 2019:496 (recorded from Iraq by Morice, 1921, and de Beaumont, 1967); Bitsch, Barbier, and Jacobs *in* Bitsch, Barbier, Gayubo, Jacobs, Leclercq, and Schmidt, 2020:132 (in Sphecid Fauna of Europe); Danilov, 2020:319 (specimens from Kazakhstan, Kyrgyzstan, Tajikistan, and Russia: Astrakhan' Oblast', Dagestan, and Kalmykia in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia); Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*), 413 (in revision of Central Asian *Palmodes*; Algeria, Azerbaijan, China: Xinjiang, Georgia, Greece, India: Kashmir and Jammu, Iran: Sistan and Baluchestan, Iraq, Kazakhstan, Kyrgyzstan, Libya, Morocco, Portugal, Russia, Spain, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan); Cross, Baldock, and Wood, 2021:18 (in catalog of Sphecidae *sensu lato* of Portugal); Ghaderipour, Khayrandish, Madjdzadeh, Ebrahimi, and Schmid-Egger, 2021:505 (Iran: Kerman Province); Embergenov, Akhmedov, and Medetov, 2023:23 (Uzbekistan: southern Lake Aral region); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

Sphex anatolicus Kohl, 1888a:152, ♀. Holotype or syntypes: ♀, Turkey: Ephesus (NHMW). Synonymized with *Sphex melanarius* by Gussakovskij, 1930:210. – Kohl, 1890b:323 (in revision of World Sphecini); Dalla Torre, 1897:414 (in catalog of world Hymenoptera); Kokujev, 1902:10 (Turkmenistan: Pereval); Zanon, 1926:90 (Libya: Fueihat 15 km south of Benghazi, as *anatholicus*); Guiglia, 1934b:293 (Libya: bibliography and summary of locality records). – **As *Palmodes anatolicus***: Dollfuss, 1989:11 (new combination, type material in NHMW).

Sphex picicornis F. Morawitz, 1890:571, ♀. Holotype or syntypes: ♀, Transcaspia: no specific locality (ZIN). Synonymized with *Sphex melanarius* by Kohl, 1890b:324, synonymy confirmed in 1895:45.

Sphex pusillus Gussakovskij, 1930c:209, ♂. Holotype: ♂, Turkmenistan: Firyuza at 37°54'N 58°5'E (ZIN). Synonymized with *Palmodes melanarius* by Danilov and Byvaltsev, 2020:414. – Roth, 1963:147 (in revision of Palearctic *Palmodes*); Kazenas, 1978b:43 (in key to Sphecidae of Kazakhstan and Central Asia). – **As *Palmodes pusillus***: Myartseva, 1972a:84 (new combination, Turkmenistan); R. Bohart and Menke, 1976:127 (in checklist of world Sphecidae); Kazenas, 2001b:14 (in checklist of Sphecidae of Kazakhstan and Central Asia); Dollfuss, 2008b:1407 (Kazakhstan: Fabrichnyi 40 km east of Almaty); Danilov, 2016:353 (holotype preserved in Zoological Institute, Sankt Petersburg, Russia).

14. *minor* (F. Morawitz)

Sphex minor F. Morawitz, 1890:573, ♀. Lectotype: ♀, Turkmenistan: Krasnovodsk, now Türkmenbaşy, at 40°01'N 52°58'E (ZIN), designated by Danilov and Byvaltsev, 2020:416. – Kohl, 1890:320 (original description copied); F. Morawitz, 1893b:405 (description of ♂); Kohl, 1895:46 (F. Morawitz's description of ♂ copied); Dalla Torre, 1897:432 (in catalog of world Hymenoptera); Gussakovskij, 1930b:209 (description of ♂; Turkmenistan: Firyuza, Krasnovodsk, now Türkmenbaşy); Kuznetzov-Ugamskij, 1927:249 (Uzbekistan: Aktash Mountains 55 km northeast of Tashkent; Khumsan; Kizil Valley in western Tien-Shan on upper Ugam River); Gussakovskij, 1930c:211 (in key to Palearctic *Palmodes*); Myartseva, 1963b:59 (Turkmenistan: lower Murgab River); Roth, 1963:153 (in revision of Palearctic *Palmodes*); Roth *in* de Beaumont, 1967a:371 (Turkey); Kazenas, 1969a:21 (Kazakhstan: Mangyshlak Peninsula), 1978b:43 (in key to Sphecidae of Kazakhstan and Central Asia); Eroğlu and Yüksel, 2019:5230 (recorded from Niğde Province of Turkey by de Beaumont, 1967, but not rediscovered since then). – **As *Palmodes minor***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Esenbekova and Kazenas, 2000:8 (southeastern Kazakhstan: Ili River valley, foothills of Zailiyskiy Alatau); Islamov, 1986:517 (Uzbekistan: Surkhandarya Oblast'); Kazenas, 1998b:99 (in Sphecid Fauna of Kazakhstan); Nazarova, 1998:39 (Tajikistan: Tigrovaya Balka Nature Reserve); Kazenas, 2001b:14 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:27 (geographic distribution, collecting localities in Kazakhstan), 2004b:98 (Kazakhstan: western Tien Shan Mountains); Dollfuss, 2008b:1405 (locality records from Kazakhstan, Kyrgyzstan, and Uzbekistan); Ljubomirov and Yildirim, 2008:23 (in catalog of Sphecidae of Turkey); Danilov, 2010b:44 (distribution of Tethyan type), 2012:161 (in key to *Palmodes* of Russia and adjacent countries), 2013:49 (in key to *Palmodes* of Central Asia); Yildirim, 2014:30 (Turkey: distribution by biogeographic provinces); Koçak and Kemal, 2015:278 (in checklist of Hymenoptera of Turkey); Danilov, 2016:343 (syntypes preserved in Zoological Institute, Sankt Petersburg, Russia), 2020:319 (specimens from Iran, Kazakhstan, Kyrgyzstan, and Tajikistan in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia); Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*), 416 (in revision of Central Asian *Palmodes*; Iran, Kazakhstan, Kyrgyzstan, Tajikistan, Turkey, Turkmenistan, Uzbekistan); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

Sphex parvulus Roth *in* de Beaumont, 1967a:372, ♀, ♂. Holotype: ♀, Turkey: Ankara: Ravli (BMNH). Synonymized with *Palmodes minor* by Danilov and Byvaltsev, 2020:416 – **As *Palmodes parvulus***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Ljubomirov and Yildirim, 2008:24 (in catalog of Sphecidae of Turkey); Yildirim, 2014:30 (Turkey: distribution by biogeographic provinces); Koçak and Kemal, 2015:278 (in checklist of Hymenoptera of Turkey); Ghaderipour, Khayrandish, Madjdzadeh, Ebrahimi, and Schmid-Egger, 2021:505 (first record

from Iran: Kerman Province: Bam and Jiroft counties); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

15. *occitanicus* (Lepeletier de Saint Fargeau and Audinet-Serville)

Sphex occitanicus Lepeletier de Saint Fargeau and Audinet-Serville, 1828:462, ♂ (as *occitanica*, incorrect original termination). Syntypes: ♂, France: Hérault: Montpellier area (M. Spinola collection, Torino). – F. Smith, 1856:242 (in catalog of Hymenoptera in British Museum); Kirchner, 1867:218 (in catalog of European Hymenoptera); Dours, 1874:146 (in catalog of Hymenoptera of France); Kohl, 1885b:176 (in revision of Palearctic species); Gasperini, 1887:18 (recorded as *Sphex fera* from Dalmatia, now Croatia, by Dahlbom, 1845); Ed. André, 1888:136 (in revision of Sphecidae of Europe and Algeria), 7* (bibliographic references); Kohl, 1890b:317 (in revision of world Sphecini); F. Morawitz, 1891a:204 (Russia: Astrakhan Government), 1893b:405 (Tajikistan: Varzaminor), 1894:339 (Turkmenistan: Askhabad); De Stefani Perez 1895:226 (in catalog of Sicilian Hymenoptera); Laboulbène, 1895:179 (reference to Fabre's, 1879 observation on prey); Acloque, 1897:96 (in Sphecid Fauna of France and Algeria); Dalla Torre, 1897:434 (in catalog of world Hymenoptera); Mocsáry, 1897:79 (Hungary); Adlerz, 1904:139 (known prey: tettigoniids); Antiga and Bofill, 1904:4 (Spain: Cataluña Province); Mantero, 1905:68 (Italy: Toscana: Isola del Giglio); Vángel, 1905:166 (Hungary); Dusmet and Mercet, 1906:506, 513 (in key to Spanish Sphecini); W. Schulz, 1906:193 (correct authorship); Móczár and Henter, 1907:205 (Hungary: Tiszaalpár); Coulon, 1925:115 (France: Béziers); de Gaulle, 1908:104 (in catalog of French Hymenoptera); Ferton, 1909:412 (France: Corse: Bonifacio: nesting habits); Mantero, 1911:72 (Italy: Sardegna: Isola dell'Asinara); Zavattari, 1912:3 (Italy: Sardegna: Sulcis and Isola di Antiogus, as *occitanus*); Szilády, 1914:89 (Hungary: Nagyenyed); Strand, 1916b:108 (China: Tsingtau, now Qingdao); Berland, 1921:533 (Greece); Ferton, 1923:320 (captures *Tettigonia viridissima* L., Tettigoniidae, when preferred *Ephippigera* is in short supply); Berland, 1925d:36 (in Sphecid Fauna of France); Roth, 1925:377 (in revision of North African Sphecini); Berland, 1926b:166 (miscellaneous locality records); Kokujev, 1927:71 (Russia: Siberia: Lake Baikal); Berland, 1928b:175 (add Berland, 1926 to bibliography in Berland, 1925d); G. Carpenter, 1930b:294 (nest closure); Gussakovskij, 1930c:211 (in key to Palearctic *Palmodes*); A. Müller, 1930:181 (Romania: Movila); Berland, 1932a:22 (France: Var Department; visiting old charcoal preparation sites, as *occitanus*); Nadig, 1933:103 (Morocco: Ifrane, Tizi n'Tichka); Grandi, 1934:130 (Italy: Toscana: San Vincenzo); Gussakovskij, 1934a:2 (China: Inner Mongolia, Szechuan); Maidl, 1934:64 (Greece: Aegean Islands: Samos); Nadig, 1934:33 (Italy: Sardegna: Aritzo, Gennargentu, Macomer); Bernard, 1935:61 (France: Var: Fréjus area); Dusmet y Alonso, 1935:88 (Spain: Huesca: Barbastro); Gussakovskij, 1935:412 (Tajikistan); Piel, 1935:294 (nesting habits); Vergne, 1935:117 (France: Auvergne: Champeix, Chanturgue); Berland, 1938:195 (nesting habits); Gussakovskij, 1938:2 (China: Kiangsu Province); Yasumatsu, 1938c:79 (Korea, China: Manchuria; in revision of East Asian Sphecini); Deleurance, 1943:61 (France: Dordogne: Montignac; nest and prey); Giner Marí, 1943a:79 (in Sphecid Fauna of Spain); Guiglia, 1943b:68 (Albania: Kopliku), 1944b:7 (Italy: Toscana); Honoré, 1944a:60 (in revision of Egyptian Sphecini: probably not occurring in Egypt); Chaudoir, 1947:142 (France: Gard: Roquemaure); Guiglia, 1948c:200 (Italy: Sardegna: Laconi, Villasalto); Zavadil *in* Zavadil and Šnoflák, 1948:167 (in key to Sphecidae of Czechoslovakia, not yet found in Czechoslovakia); de Andrade, 1949:8 (Portugal: Mata de Leiria); Berland and Bernard, 1949:2 (in revision of French *Sphex sensu lato*), 8 (review of biological data); Thomas, 1949:305 (prey capture in France: Alpes-de-la-Haute-Provence: Asprement); de Beaumont, 1950f:396 (Algeria); Pittioni, 1950:20 (Cyprus); Thomas, 1952:118 (cephalic malaxation of prey); Cleu, 1953:50 (France: Ardèche River basin); de Beaumont, 1954e:86 (Italy); de Beaumont and Bytinski-Salz, 1955:40 (Israel); Harant and Leclercq, 1955:250 (France: Hérault: Carnon, Castries, Palavas-les-Flots); Leclercq, 1955h:28 (bibliographic references, faunal records from Africa); Steiner, 1955:134 (France: Dordogne); Vergne, 1955:4 (France: Auvergne); Vogrin, 1955:31 (Yugoslavia); Ceballos, 1956:364 (in catalog of Hymenoptera of Spain); Morel, Nouvel, and Ribaut, 1956:337 (France: Département des Pyrénées-Orientales); Bajári, 1957a:8, 10 (in key to Hungarian Sphecidae); Morel, Nouvel, and Ribaut, 1958:9 (France: Pyrénées-Orientales: Banyuls-sur-Mer); de Beaumont, 1959a:9 (Italy); Diniz, 1959:27 (Portugal: Mata de Leiria); Čingovski, 1960:7 (Macedonia: Pchinya, Vodno); de

Beaumont, 1960a:5 (Greece: Rhodes Island), 1960b:227 (Libya); Scobiola-Palade, 1960b:232 (Romania: Cristuru Săsesc Region: Nicoleni); de Beaumont, 1962b:19 (Spain); Kocourek, 1963:295 (Slovakia: Šturovo); Myartseva, 1963b:59 (Turkmenistan: lower Murgab River); Roth, 1963:158 (in revision of Palearctic *Palmodes*), 165 (*occitanicus occitanicus*); Tsuneki, 1963b:54 (nesting habits); Ceballos, 1964:87 (in supplement to catalog of Spanish Sphecidae); de Beaumont, 1965a:12 (Greece); Myartseva, 1965:83 (Turkmenistan: Akibay); Roth *in* de Beaumont, 1967a:373 (Turkey); Scobiola-Palade, 1967b:36 (Romania); Kazenas, 1969a:21 (Kazakhstan: Podgornoye, Ketmen' Range, Zailiyskiy Alatau, Malaysary Range, as *occidentalis occidentalis*); Islamov, 1970:63, 64 (Uzbekistan: Chirchik Basin); Tsuneki, 1971k:140 (Mongolia), 1971m:1 (China: Beijing: Tiendang); Balthasar, 1972:423 (in Sphecid Fauna of Czechoslovakia); Kazenas, 1972b:110 (Kazakhstan); Simon Thomas, 1972:176 (France); Erlandsson, 1974:57 (Italy, Spain); Esmaili and Rastegar, 1974:45 (Iran); Simon Thomas, 1976:3 (France: Lot-et-Garonne: Forêt de Campet); Georghiou, 1977:192 (Cyprus); Kazenas, 1978b:43 (in key to Sphecidae of Kazakhstan and Central Asia); Radović and Krunić, 1979:unpaginated foldout (nesting in sand, foreleg structure); Bonelli, 1988:87 (prey); Marion, 1978:85 (France: Ardèche Department); Pulawski, 1978:184 (in key to Sphecidae of European part of USSR); Casolari and Casolari Moreno, 1980:103 (specimens in M. Spinola collection, as *occitanica*); Piek and Spanjer, 1986:190 (in list of Sphecidae with known prey); Hua, 2006:276 (in list of Chinese insects, geographic distribution); Pagliano, 2008:531 (specimens in M. Spinola collection, Torino, including probable holotype, some specimens are *Sphex flavipennis*, and *Prionyx viduatus*). – **As *Palmodes occitanicus***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Esenbekova and Kazenas, 2000:8 (southeast Kazakhstan: near Biylikul, 35 km northwest of Suzak); Kazenas, 1980e:81 (Siberia: Chita Oblast'); Pagliano, 1980:110 (Italy: Molise); Mingo and Gayubo, 1983:151 (Spain); Pagliano, 1984:366 (Italy), 1985:7 (Italy); Tsuneki, 1982b:14 (known from Korea); Piek, Buitenhuis, Veldsema-Currie, and Mantel, 1983:153-159 (venom contains histamine, but no acetylcholine); Chevin and Chevin, 1985:38 (France: Aude); Józan, 1985b:55 (citation of Bajári's 1957 record from Nagyhar sány), 83 (ecological and zoogeographic characteristics); Paik, 1985:197 (in list of Sphecidae of Korea); Radović, 1985:64 (sting apparatus analyzed); Islamov, 1986:516 (Uzbekistan: Tashkent Oblast); Józan, 1986:367 (Hungary: Kiskunság National Park); Nemkov, 1986:92 (Russia: Siberia: Irkutsk Oblast'); Piek and Spanjer, 1986:221 (venom does not contain acetylcholine but a histamine-like activity); Steiner, 1986:96 (references to papers on nesting habits); Gayubo, Asís, and Tormos, 1990a:10 (Spain); Pagliano, 1990:57 (in catalog of Italian Sphecidae); Dollfuss, 1991:28 (in key to Sphecidae of North and Central Europe); Gayubo, Borsato, and Osella, 1991:393 (Italy: Toscana, Sicilia); Hamon, Fonfria, and Tussac, 1991:128 and 130 (in key to French Sphecini), 132 (in France extending from Mediterranean to southern Atlantic shores); Kazenas and Nasyrova, 1991:38 (Kazakhstan: preying on *Tettigonia viridissima* L., Tettigoniidae); Gayubo, Borsato, and Osella, 1992:276 (France: Corsica); Teulou and Caumont, 1992:283 (France: Isère and Charente-Maritime); Gayubo and Borsato, 1994:200 (Italy: Toscana, Sardegna; as *occitanicus occitanicus*); Kazenas *in* Nemkov, Kazenas, Budrys, and Antropov, 1995:384 (in key to Sphecidae of Russian Far East); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:2 (in catalog of Italian fauna); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:55 (in Sphecid Fauna of Western Europe); Nazarova and Shomirsaidov, 1997:23 (Tajikistan: fruit tree orchards in Vakhsh River valley, as *occitanicus occitanicus*); Kazenas, 1998b:101 (in Sphecid Fauna of Kazakhstan); Nazarova, 1998:40 (Tajikistan: Tigrovaya Balka Nature Reserve); Gonzáles, Gayubo, and Torres, 1999:354 (Spain: Valladolid: Viana de Cega); Basset, 2001:79 (France: Département de Gironde); Kazenas, 2001b:14 (in checklist of Sphecidae of Kazakhstan and Central Asia), 80 (review of nesting habits); Kazenas and Esenbekova, 2001:133 (Kazakhstan: Almatinskiy Nature Reserve); Kazenas, 2002a:27 (geographic distribution, collecting localities in Kazakhstan); Shkuratov, 2002a:383 (Russia: Rostov Oblast'); Generani, Pagliano, Scaramozzino, and Strumia, 2003:64 (Italy: Arcipelago Toscano); Schmid-Egger, 2003:756 (Italy: Sicilia: Bronte, Castelammare, Randazzo); Shorenko, 2003:97 (Ukraine: Crimea); Kazenas, 2004b:98 (Kazakhstan: western Tien Shan Mountains), 2004d:26 (Kazakhstan: northern Caspian region); Nazarova, 2004:104 (Tajikistan: Badakhshan Region: Ridzef village in Tusen District); Shkuratov, 2004a:73 (Russia: Rostov Oblast'), 2004b:164 (Russia: Rostov Oblast': Gosudarstvennyi Muzey-Zapovednik M.A. Sholokhova); Gülmez and Tüzün, 2005:46 (Turkey: Ankara Province); Pagliano and Negrisolo, 2005:51 (in Sphecid Fauna of Italy); Shorenko, 2005a:162

(Ukraine: Crimea, as *occitanicus occitanicus*), 2005b:97 (Ukraine: Crimea: Karadagh Nature Reserve, as *occitanicus occitanicus*); Yildirim and Ljubomirov, 2005:1787 (Turkey: Erzurum Province, as *occitanicus occitanicus*); Hua, 2006:276 (in list of Chinese insects, geographic distribution); Magdalou, 2006b:109 (France: Pyrénées-Orientales: Mas-Larrieu Nature Reserve near Argelès-sur-Mer), 2006c:7 (France: Pyrénées-Orientales: Réserve Naturelle du Mas-Larrieu); Standfuss and Standfuss, 2006c:307 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Kazenas, 2007a:89 (Kazakhstan: Akmala Oblast': Kurgandzhin Nature Reserve and vicinity); G. Turrisi and R. Turrisi, 2007:115 (Italy: Sicilia: Mount Etna: Botanical Garden Nuova Gussonea and vicinity); Vepřek and Straka, 2007:199 (in catalog of Sphecidae of Czech Republic and Slovakia), 211 (only record from Slovakia by Kocourek, 1963, is unreliable, voucher specimen cannot be located, does not occur in the area); Danilov, 2008:347 (Russia: Altayskiy Kray: Barnaul area, as *occitanicus occitanicus*); Dollfuss, 2008b:1405 (locality records from Croatia, Greece, Hungary, Iran, Italy, Jordan, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Spain, Syria, Turkey, Turkmenistan, and Uzbekistan); Gayubo, González, Tormos, and Asís, 2008:136 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Kazenas, 2008b:111 (Kazakhstan: foothills of Zailiskiy Alatau: rarely found on loess cliffs); Ljubomirov and Yildirim, 2008:24 (in catalog of Sphecidae of Turkey); Nemkov, 2008b:17 (in catalog of Sphecidae of Asiatic Russia); Baños-Picón, Asís, Gayubo, and Tormos, 2009:310 (Spain: frequency of specimens collected with hand nets and Malaise traps); Danilov, 2009:53 (Russia: Western Siberia: Kulundinskaya Steppe); Guéorguiev and Ljubomirov, 2009:262 (first record from Bulgaria: Maleshevska Planina); Józan, 2009:165 (Croatia: Brseč, 3 km north of Koromačno); Nemkov, 2009b:45 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Shorenko, 2009:366 (in list of Sphecidae *sensu lato* of Crimea); Bitsch, 2010:105 (in supplement to vol. II of Faune de France, 1997: new record from France: Alpes-Maritimes: Sospel); Burguet *in* Durand and Burguet, 2010:21 (France Département d'Ardèche: Ardèche Gorges); Danilov, 2010b:44 (distribution of Tethyan type); Shorenko and Konovalov, 2010:11 (Ukraine: Crimea); van der Smissen, 2010b:385 (France: Ardèche: Saint-Thomé, Valvignères-Saint-Thomé); Cruz-Sánchez, Asís, Gayubo, Tormos, and González, 2011:497 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park: effects of wildfire); Baghirov, 2011b:139 (Russia: Altayskiy Kray: Savvushka, and Republic Altay: Ongudai); Danilov, 2011b:201 (Russia: Zabaikal'skiy Kray: Daurskiy Nature Reserve, as *occitanicus occitanicus*); Gogala, 2011:5 (Slovenia); Gros, 2011:429 (nesting habits); Józan, 2011:179 (in checklist of Sphecidae *sensu lato* of Hungary); Murai and Amr, 2011:109, 119 (first record from Syria: Al Thawrah Nature Reserve at 35°51'N 28°38'E); Schmid-Egger, 2011a:42 (France: Parc National du Mercantour); Kazenas, 2012b:168 (Kazakhstan: Korgalzhin State Nature Reserve); Protsenko, Fateryga, Ivanov, and Puzanov, 2012:57 (Ukraine: Crimea); Strumia, Pagliano, and Gayubo, 2012:55 (Italy: Toscana: Riserva di San Rossore); Danilov, 2013:49 (in key to *Palmodes* of Central Asia); Kazenas, 2013a:16 (color photograph of adult male, short information on geographic distribution and nesting habits); Bitsch, 2014:396 (papers by Schmid-Egger, 2011, and Gros, 2011, reported; *Palmodes occitanicus syriacus* of Nouvel and Ribaut, 1958, is actually *occitanicus ibericus*); Danilov, 2014a:424 (Russia: Siberia: widely distributed), 2014b:514 (in key to Sphecidae s.s. of Siberia); Dunford, Turbyville, and Leavengood, 2014:10 (listed as medically important in Afghanistan); Ebrahimi, 2014:16 (Iran: Alborz, Āzarbāijān-e Sharghi, Māzandarān, Tehrān provinces); Kazenas, 2014a:131 (Kazakhstan: Karatau Mountain Range); J.-K. Kim, 2014:419 (in catalog of Sphecidae *sensu lato* of Korean Peninsula); Kim, Yeo, and Kim, 2014:285 (in revision of Sphecidae sensu stricto of South Korea); Yildirim, 2014:30 (Turkey: distribution by biogeographic provinces, as *occitanicus occitanicus*); Koçak and Kemal, 2015:278 (in checklist of Hymenoptera of Turkey); Shorenko, 2015:316 (in list of Sphecidae *sensu lato* of Crimea); Gülmez and Dizer, 2016:58 (Turkey: Tokat Province); Levărdă and Matache, 2016:42 (in catalog of Sphecidae s.s. of Romania); Mokrousov and Popov, 2016:563 (Russia: Krasnodarskiy Kray); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:5 (Turkey: Antalya, Erzurum, Kars, and Tunceli provinces); Arens, 2017a:628 (Greece: Peloponnesus); Danilov, 2017b:214 (in catalog of Sphecidae s.s. of Russia); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:24 (Iran: known from Alborz, East Azerbaijan, Fars, Mazandaran, Sistan-o Baluchestan, and Tehran provinces); Danilov and Mokrousov, 2017a:109 (Russia: Amur Oblast', Dagestan, Kalmykia, Volgograd Oblast', Yaroslavl Oblast'); Magdalou, 2017:16 (France: Pyrénées-Orientales: Réserves Naturelles Catalanes: Mas Larrieu); Shorenko, 2017:76 (in Crimea collected in June through August); Jacobs

and Liebig, 2018:135 (Russia: Irkutsk Oblast': Bol'shoye Goloustnoye); Shorenko, 2018:127 (Crimea, including localities, habitats, and number of specimens); Danilov, 2019:77 (in review of Palearctic Prionychini); Gülmez, 2019:3 (Turkey: Ankara and Tokat provinces: no specific localities); Bitsch, Barbier, and Jacobs *in* Bitsch, Barbier, Gayubo, Jacobs, Leclercq, and Schmidt, 2020:132 (in Sphecid Fauna of Europe); Danilov, 2020:319 (specimens from Iran, Kazakhstan, Kyrgyzstan, Tajikistan, and Russia: Altay Kray, Dagestan, Tyva in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia); Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*); Maharramov, Mokrousov, and Proshchalykin, 2020:46 (Azarbaijan: Nakichivan Autonomous Republic); Shorenko, 2020:47 (Crimea: Karadag Nature Reserve); Can and Gülmez, 2021a:3012 (Turkey: Giresun: Alucra: Mesudiye); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey, as *occitanicus occitanicus*).

Sphex proditor Lepeletier de Saint Fargeau, 1845:354, ♀. Holotype or syntypes: ♀, France: Corse: no specific locality (originally Audinet-Serville coll., now M. Spinola collection, Torino). Synonymized with *Sphex argyrius* by Kohl, 1885c:165 and with *Sphex occitanicus* by Kohl, 1890:317. – F. Smith, 1856:242 (in catalog of Hymenoptera in British Museum); Kirchner, 1867:218 (in catalog of European Hymenoptera); Dours, 1874:146 (in catalog of Hymenoptera of France); Marquet, 1875:207 (France: Haute-Garonne: Toulouse), 1881:178 (France: Hérault: Cette, now Sète); Acloque, 1897:96 (in Sphecid Fauna of France and Algeria); Casolari and Casolari Moreno, 1980:102 (specimens in M. Spinola collection); Pagliano, 2008:525 (unpublished lectotype in M. Spinola collection, Torino).

Sphex confinis Dahlbom, 1845:437, sex not stated. Lectotype: ♀, Dalmatia: now coastal Croatia and Montenegro: no specific locality (Lund), designated by de Beaumont, 1953h:195. Treated as synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:419. – Dahlbom, 1845:437 (in key to world *Sphex*); F. Smith, 1856:243 (in catalog of Hymenoptera in British Museum); Kirchner, 1867:218 (in catalog of European Hymenoptera); Kohl, 1881:38 (redescription of type material).

? *Sphex solieri* Lepeletier de Saint Fargeau. – F. Smith, 1856:243 (in catalog of Hymenoptera in British Museum), 256 (tentative senior synonym of *Sphex mandarinius*); Dalla Torre, 1897:440 (in catalog of world Hymenoptera); Roth, 1963:174 (tentative synonym of *Sphex occitanicus perplexus*); R. Bohart and Menke, 1976:127 (tentative synonym of *Palm*, 1845:354, ♀ (as *Solieri*, incorrect original capitalization). Holotype or syntypes: ♀, origin unknown (depository?). Treated as tentative synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:419*odes occitanicus perplexus*).

Sphex perplexus F. Smith, 1856:255, ♂ (as *perplexa*, incorrect original termination). Holotype or syntypes: ♂, China: Shanghai (BMNH). Treated as synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:419. – Kohl, 1885b:205 (original description copied), 1890b:450 (original description copied); Dalla Torre, 1897:437 (in catalog of world Hymenoptera); Piel, 1935:294 (as synonym de *Sphex occitanicus*). – **As *Sphex occitanicus perplexus***: Roth, 1963:174 (new status, in revision of Palearctic *Palmodes*). – **As *Palmodes occitanicus perplexus***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Li and Yang, 1995b:573 (China: Zhejiang Province: Baishanzu Mountain); Wu and Zhou, 1996a:39 (in revision in Economic Fauna of China); Li and He, 2004:1125 (in hymenopterous fauna of Zhejiang Province, China); Hua, 2006:276 (in list of Chinese insects, geographic distribution); Q. Li, 2006:142 *in* X. Chen and J. He (description, habits, distribution, illustration of habitus); Danilov, 2019:77 (in review of Palearctic Prionychini).

Sphex syriacus Mocsáry, 1881b:237, ♂, ♀ (as *Syriaca*, incorrect original capitalization and termination). Syntypes: Lebanon: Beirut (TMB). Treated as synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:419. – Kohl, 1890:317 (as synonym of *Sphex occitanicus*); Tsuneki, 1971k:140 (Mongolia). – **As *Sphex occitanicus* var. *syriacus***: Ed. André, 1888:146 (new status, in revision of Sphecidae of Europe and Algeria); Dalla Torre, 1897:435 (in catalog of world Hymenoptera); nec Dusmet and Mercet, 1906:506, 513 (= *Palmodes occitanicus ibericus*); Zavattari, 1913b:3 (Greece: Island of Rhodes, as *occitanus*); nec von Schulthess, 1926b:209 (= *Palmodes occitanicus gaetulus*); Gussakovskij, 1933b:271 (Iran); Guiglia, 1942a:59 (Greece: Island of Rhodes: Villanova); Ceballos, 1956:364 (in catalog of Hymenoptera of Spain); nec Nouvel and Ribaut, 1958:9 (= *Palmodes occitanicus ibericus*); Myartseva, 1972a:83 (Turkmenistan). – **As *Sphex occitanicus syriacus***: nec W. Schulz, 1905b:34 (= *Palmodes occitanicus gaetulus*); Guiglia, 1934b:294 (new status, Libya: bibliography and summary of locality records); nec Dusmet y Alonso,

1935:65 (= *Sphex occitanicus ibericus*); nec de Andrade, 1949:9 (= *Palmodes occitanicus ibericus*); Roth, 1963:171 (new status, in revision of Palearctic *Palmodes*); de Beaumont, 1969:81 (Turkey), 1970a:391 (Afghanistan), 1970c:4 (Iran: Baluchistan). – **As *Palmodes occitanicus* var. *syriaca***: Myartseva, 1966:48 (new status, preying on orthopterans). – **As *Palmodes occitanicus syriacus***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Ljubomirov and Yildirim, 2008:24 (in catalog of Sphecidae of Turkey); Danilov, 2019:77 (in review of Palearctic Prionychini); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

Sphex puncticollis Kohl, 1888a:151, ♂, ♀. Syntypes: Turkmenistan: Krasnovodsk, now Türkmenbaşy (NHMW). Treated as synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:419. – Kohl and Handlirsch, 1889:274 (Turkmenistan, redescription); Kohl, 1890b:319 (in revision of world Sphecini); F. Morawitz, 1893b:405 (Tajikistan: Takfan in Yagnob valley); Dalla Torre, 1897:438 (in catalog of world Hymenoptera); Roth, 1925:379 (in revision of North African Sphecini); Berland, 1926b:166 (Turkestan, Morocco: Tanger); Yasumatsu, 1940:31 (China: Inner Mongolia: Kunshan-tagh Desert); Leclercq, 1955h:28 (bibliographic references, locality records from Africa). – **As *Sphex occitanicus puncticollis***: Roth, 1963:171 (new status, in revision of Palearctic *Palmodes*); Kazenas, 1978b:43 (in key to Sphecidae of Kazakhstan and Central Asia). – **As *Palmodes occitanicus puncticollis***: R. Bohart and Menke, 1976:127(new combination, in checklist of world Sphecidae); Kazenas, 1969a:21 (Kazakhstan: Mangyshlak Peninsula); Dollfuss, 1989:11 (type material in NHMW); Kazenas, 2001b:14 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:27 (geographic distribution, collecting localities in Kazakhstan); Yildirim and Ljubomirov, 2005:1787 (Turkey: Konya Çumra: and Güneysınır); Ghahari, Hayat, Tabari, Ostovan, and Imani, 2008:739 (first record from Iran: Guilan: Rasht); Ljubomirov and Yildirim, 2008:24 (in catalog of Sphecidae of Turkey); Danilov, 2012:161 (in key to *Palmodes* of Russia and adjacent countries), 2013:49 (in key to *Palmodes* of Central Asia); Ghahari, Hayat, Lavigne, and Ostovan, 2014:1415 (prey of asilid fly *Laphystia sabulicola* Loew); Yildirim, 2014:30 (Turkey: distribution by biogeographic provinces); Danilov, 2019:77 (in review of Palearctic Prionychini); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

Sphex cyrenaicus Gribodo, 1924a:263, ♂ (as *cyrenaica*, incorrect original termination). Lectotype: ♂, Libya: Cyrenaica: Benghazi (Mus. Zool. Univ. Bologna), designated by Menke *in* R. Bohart and Menke, 1976:127. Treated as synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:419. – Gribodo, 1924b:49 (Libya: Benghazi, Merg, Tolmetta); Grandi, 1925a:95 (sleeping aggregations); Guiglia, 1934b:294 (Libya: bibliography and summary of locality records); Leclercq, 1955h:29 (bibliographic references); Tommasini and Marini, 1984:42 (type in Mus. Zool. Univ. Bologna); Pennati and Mariotti, 2015:40 (in list of Hymenoptera described by G. Gribodo). – **As *Sphex occitanicus cyrenaicus***: Roth, 1963:169 (new status, in revision of Palearctic *Palmodes*). – **As *Palmodes occitanicus cyrenaicus***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Roche, 2007a:36 (in checklist of Egyptian Sphecidae, redescription), 2007b:2 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Danilov, 2019:77 (in review of Palearctic Prionychini).

Sphex occitanicus barbarus Roth, 1963:166, ♀, ♂. Syntypes: Morocco, Algeria (MNHN). Treated as synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:420. – **As *Palmodes occitanicus barbarus***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Danilov, 2019:77 (in review of Palearctic Prionychini); Ben Khedher, Yildirim, Braham, and Ljubomirov, 2020a:314 (in list of Tunesian Sphecidae *sensu stricto*).

Sphex occitanicus gaetulus Roth, 1963:169, ♀, ♂. Syntypes: Algeria: Goriana, Maafa; Tunisia: Gafsa (MNHN). Treated as synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:420. – **As *Palmodes occitanicus gaetulus***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Danilov, 2019:77 (in review of Palearctic Prionychini). – As *Sphex occitanicus syriacus* (present correction based on geographic distribution): W. Schulz, 1905b:34 (Algeria: Biskra); von Schulthess, 1926b:209 (Libya); Bischoff, 1933:5 (Morocco); Ben Khedher, Yildirim, Braham, and Ljubomirov, 2020a:314 (in list of Tunesian Sphecidae *sensu stricto*).

Sphex occitanicus ibericus Roth, 1963:168, ♀, ♂. Syntypes: Spain, Portugal (MNCN, Mus. Barcelona, NHMW). Treated as synonym of *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:420. – Ceballos, 1964:87 (in supplement to catalog of Spanish Sphecidae, as *iberus*). – **As *Palmodes occitanicus ibericus***: Diniz, 1965:2 (new combination, Portugal:

Massorra, Mata de Leiria); R. Bohart and Menke, 1976:127 (in checklist of world Sphecidae); Gayubo, 1981a:136 (northern Spain: Sierra de Béjar), 1983c:231 (Spain: Salamanca Province: Villarino de los Aires); Mingo and Gayubo, 1983:151 (Spain); Gayubo and Tormos, 1984:9 (Spain: Valencia); Gayubo, 1986b:35 (Spain: Andalucía); Gayubo and Heras, 1986:28 (Spain: Provincia de Valladolid; floral records); Gayubo and Tormos, 1986a:8 (Spain: Castellón de la Plana); Tormos and Jiménez, 1987a:122 (Spain: Valencia), 1987b:316 (Spain: Valencia Province: Dehesa de El Saler); Gayubo, Asís, and Tormos, 1990a:10 (Spain); Hamon, Fonfria, and Tussac, 1991:128 and 130 (in key to French Sphecini), 132 (in France known only from limited area in Pyrénées-Orientales); Tormos, Asís, and Gayubo, 1994:187, 194 (Spain: Albacete Province); González, Gayubo, and Torres, 1998:72, 73 (Spain: Valladolid Province); Gayubo**,** Nieves-Aldrey, González, Tormos, Rey del Castillo, and Asís, 2004:108 (Spain: Madrid: Monte de El Pardo); Cruz-Sánchez, Gayubo, González, and Torres, 2005:219 (Spain: Salamanca: San Martín del Castañar); González, Gayubo, Asís, and Tormos, 2009:622 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Danilov, 2019:77 (in review of Palearctic Prionychini); Cross, Baldock, and Wood, 2021:18 (in catalog of Sphecidae *sensu lato* of Portugal). – **As *Sphex syriacus***: Antiga and Bofill, 1904:5 (Spain: Cataluña Province; as var. *syriacus*); Dusmet y Alonso, 1915:86 (Spain: Aragón), 1935:65 (Spain: Avila: Las Navas del Marqués; as var. *syriacus*), 69 (Spain: Segovia: San Rafael), corrected to *Sphex occitanicus ibericus* by Roth, 1963:168; Giner Marí, 1943a:79 (in Sphecid Fauna of Spain, as var. *syriacus*); de Andrade, 1949:9 (Portugal), present correction. – **As *Sphex occitanicus syriacus***: Dusmet and Mercet, 1906:506, 513 (in key to Spanish Sphecini); de Andrade, 1949:9 (Portugal); and Diniz, 1959:27 (Portugal: Lisboa, Massorra, Sintra), present correction based on geographic distribution. – **As *Sphex occitanicus* var. *syriacus***: Nouvel and Ribaut, 1958:9 (France: Pyrénées-Orientales: Banyuls-sur-Mer area), corrected to *Palmodes occitanicus syriacus* by Bitsch, 2014:396.

Sphex palmetorum Roth, 1963:175, ♀, ♂. Holotype: ♀, Algeria: Laghouat (MNHN). Synonymized with *Palmodes occitanicus* by Danilov and Byvaltsev, 2020:420. – **As *Palmodes palmetorum***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Ben Khedher, Yildirim, Braham, and Ljubomirov, 2020a:314 (in list of Tunesian Sphecidae *sensu stricto*).

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Le Sphex languedocien: Fabre, 1879:134 (nesting habits), 147 (prey capture, prey paralysis).

16. *orientalis* (Mocsáry)

Sphex orientalis Mocsáry, 1883:31, ♀. Holotype or syntypes: ♀, southern Russia or Caucasus: no specific locality (TMB). – Kohl, 1985b:177 (in revision of Palearctic *Sphex*); Ed. André, 1888:136 (in revision of Sphecidae of Europe and Algeria), 7* (bibliographic references); Kohl, 1890b:320 (in revision of world Sphecini); F. Morawitz, 1891a:202 (Russia: Astrakhan Government); Dalla Torre, 1897:435 (in catalog of world Hymenoptera); Roth, 1963:150 (in revision of Palearctic *Palmodes*); Kazenas, 1969a:21 (Kazakhstan: Mangyshlak Peninsula), 1978b:43 (in key to Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:184 (in key to Sphecidae of European part of USSR). – **As *Palmodes orientalis***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Kazenas, 1998b:103 (in Sphecid Fauna of Kazakhstan); Esenbekova and Kazenas, 2000:8 (southeastern Kazakhstan: Aksu-Zhabagly, 60-70 km N Furmanovka); Kazenas, 2001b:14 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:27 (geographic distribution, collecting localities in Kazakhstan), 2004b:98 (Kazakhstan: western Tien Shan Mountains), 2004d:26 (Kazakhstan: northern Caspian region); Shorenko, 2005a:162 (Ukraine: Crimea); Dollfuss, 2008b:1406 (locality records from Kazakhstan, Mongolia, and Uzbekistan, also questionable record from Russia: Tyva Republic); Danilov, 2009:54 (Russia: Western Siberia: Kulundinskaya Steppe); Shorenko, 2009:366 (in list of Sphecidae *sensu lato* of Crimea); Danilov, 2010b:45 (distribution of Tethyan type); Shorenko and Konovalov, 2010:12 (Ukraine: Crimea: Feodosiya); Danilov, 2011b:201 (Russia: Zabaikal'skiy Kray: Daurskiy Nature Reserve), 2012:161 (in key to *Palmodes* of Russia and adjacent countries); Bayındır, Gürbüz, Ljubomirov, and Pohl, 2013:146 (first record from Turkey: Isparta: Kasnak Oak Forest Nature Reserve); Danilov, 2013:47 (redescription, locality records from European Russia, Siberia, Kazakhstan, Uzbekistan, and Mongolia), 49 (in key to *Palmodes* of Central Asia), 2014a:424 (Russia: Siberia),

2014b:514 (in key to Sphecidae s.s. of Siberia); Nemkov, 2014c:286 (Russia: Krasnoyarsk Kray, Buryatiya); Shorenko, 2015:316 (in list of Sphecidae *sensu lato* of Crimea); Mokrousov and Popov, 2016:563 (Russia: Krasnodarskiy Kray); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:6 (Turkey: Burdur and Kars provinces); Danilov, 2017b:215 (in catalog of Sphecidae s.s. of Russia); Shorenko, 2017:76 (in Crimea collected in June through August), 2018:127 (Crimea, including localities, habitats, and number of specimens); Danilov, 2020:319 (specimens from Kazakhstan and Russia: Buryat Republic, Orenburg Oblast', Tyva, and Zabaikalskiy Kray in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia); Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*), 423 (in revision of Central Asian *Palmodes*; China, Iran, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

17. *pacificus* R. Bohart and Menke

Palmodes pacificus R. Bohart and Menke, 1961:188, ♀, ♂. Holotype: ♂, USA: California: Santa Barbara County: 3 mi west of Cachuma Lake (CAS). – R. Bohart and Menke, 1963:148 (in revision of Nearctic Sphecini), 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera); Parks, 1986:34 (California: Torrey Pines State Reserve).

18. *praestans* (Kohl)

Sphex praestans Kohl, 1890b:323, ♀. Holotype or syntypes: ♀, USA: California: no specific locality (Mus. Hamburg, destroyed in World War II). – Dalla Torre, 1897:437 (in catalog of world Hymenoptera); Murray *in* Muesebeck et al., 1951:974 (in catalog of North American Hymenoptera).– **As *Chlorion praestans***: Fernald, 1906:328 (new combination, in revision of Sphecini of North America and West Indies). – **As *Palmodes praestans***: Ashmead, 1899d:353 (new combination, in checklist of North American Sphecidae); R. Bohart and Menke, 1963:149 (in revision of Nearctic Sphecini), 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:669 (in checklist of Mexican Sphecidae); Alcock and Kemp, 2005:2809 (scramble competition mating system).

19. *sagax* (Kohl)

Sphex sagax Kohl, 1890b:325, ♂. Holotype or syntypes: ♂, New Holland, now Australia: island of Woodlark East of New Guinea (originally Dresden Museum, destroyed in World War II), a mislabeled Palearctic species according to Roth, 1963:180. – Dalla Torre, 1897:440 (in catalog of world Hymenoptera); van der Vecht, 1973:352, footnote (probably mislabeled); Danilov and Byvaltsev, 2020:402 (Roth's 1963 opinion repeated). – **As *Palmodes sagax***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae).

20. *strigulosus* (A. Costa)

Sphex ferus Dahlbom, 1843:26, ♀, ♂ (as *fera*, incorrect original termination, authorship attributed to Klug), junior primary homonym of *Sphex ferus* Drury, 1782. Lectotype: ♂, Greece: no specific locality (Lund), designated by de Beaumont, 1953h:154. – Dahlbom, 1845:437 (in key to world *Sphex*); Eversmann, 1849:367 (Russia: Astrakhan, Orenburg, Saratov provinces; Kazakhstan); F. Smith, 1856:242 (in catalog of Hymenoptera in British Museum); A. Costa, 1858b:8 (Italy: in revision of Sphecidae of Kingdom of Naples), 1867b:69 and 1867c:13 (in revision of Italian Sphecidae); Kirchner, 1867:218 (in catalog of European Hymenoptera); Palma, 1867:38 (Italy: Sicilia settentrionale); Taschenberg, 1869:417 (Dalmatia, now Croatia; as *fera* Klug); Radoszkowski, 1871:199 (Iran: Astrabad, now Gorgan); Becker, 1880:153 (Russia: Sarepta, now Krasnoarmeysk south of Volgograd); Kohl, 1881:37 (redescription of type material); A. Costa, 1883:57 (Italy: Sardegna: Nuovo; as *fera* Klug), 1884b: (Italy: Sardegna: Aritzo, as *fera* Klug); Casolari and Casolari Moreno, 1980:103 (specimens in M. Spinola collection, Torino, as *fera*); Pagliano, 2008:530 (specimens in M. Spinola collection, Torino).

Sphex strigulosus A. Costa, 1861:29, ♀ (as *strigulosa*, incorrect original termination). Holotype or syntypes: ♀, Italy: Reggio di Calabria: Brancaleone (Napoli). Synonymized with *Sphex ferus* by de Beaumont, 1953h:194. – A. Costa, 1863:65 (Italy: Calabria Ulteriore: Brancaleone), 1867b:69 and 1867c:13 (in revision of Italian Sphecidae); Kirchner,

1867:218 (in catalog of European Hymenoptera); Kohl, 1885b:177 (in revision of Palearctic *Sphex*); Ed. André, 1888:138 (in revision of Sphecidae of Europe and Algeria), 7* (bibliographic references); Kohl and Handlirsch, 1889:275 (Turkmenistan: Chuli); Kohl, 1890b:326 (in revision of world Sphecini); F. Morawitz, 1893b:405 (Uzbekistan: Pyanjikent); De Stefani Perez, 1895:226 (in catalog of Sicilian Hymenoptera); Dalla Torre, 1897:442 (in catalog of world Hymenoptera); Kohl, 1905c:232 (Turkey: Kayseri: Erciyes Dağı); Dusmet and Mercet, 1906:506, 513 (in key to Spanish Sphecini); W. Schulz, 1906:44 (Greece: Crete); Graeffe, 1911:49 (Italy: Trieste area); Dusmet y Alonso, 1915:86 (Spain: Aragón); Strand, 1915:90 (Spain: Málaga); Maidl, 1922:67 (Albania: Durazzo, Durrres); Coulon, 1925:116 (Spain: Montario); Berland, 1930b:163 (first record from France: Bouche-du-Rhône Department); Gussakovskij, 1930c:211 (in key to Palearctic *Palmodes*); Bernard, 1939:167 (first record from France: Var: Fréjus); Chaudoir, 1947:142 (France: Gard: Roquemaure); Berland and Bernard, 1949:2 (in revision of French *Sphex sensu lato*); de Beaumont and Bytinski-Salz, 1955:40 (Israel); Harant and Leclercq, 1955:250 (France: Hérault: Montblanc); Bytinski-Salz, 1956:224 (Turkey: Bileuh); Ceballos, 1956:364 (in catalog of Hymenoptera of Spain); Bajári, 1957a:7, 10 (in key to Hungarian Sphecidae, not yet found in Hungary); Scobiola, 1960b:229 (first record from Romania: Negru Voda Region: Movila, redescription); Roth, 1963:149 (in revision of Palearctic *Palmodes*); Ceballos, 1964:88 (in supplement to catalog of Spanish Sphecidae); de Beaumont, 1965a:12 (Greece); Roth *in* de Beaumont, 1967a:371 (Turkey); Scobiola-Palade, 1967b:36 (Romania: Movilă-Techirgiol); de Beaumont, 1969:81 (Turkey); Kazenas, 1969a:21 (Kazakhstan: Alma Ata, Kyzylagash, Malaysady Range, Arkharly Range, Konyrolen, Otar); Balthasar, 1972:423 (in Sphecid Fauna of Czechoslovakia: may occur in the country); Kazenas, 1972b:110 (Kazakhstan), 1974b:112 (feeding on flowers of *Salsola* sp., Chenopodiaceae, in Kazakhstan); 1978b:43 (in key to Sphecidae of Kazakhstan and Central Asia); Marion, 1978:85 (France: Bouche-du-Rhône); Pulawski, 1978:184 (in key to Sphecidae of European part of USSR). – **As *Palmodes strigulosus***: R. Bohart and Menke, 1976:127 (new combination, in checklist of world Sphecidae); Guichard, 1978:270 (Greece); Mingo and Gayubo, 1983:150 (Spain); Chevin and Chevin, 1985:38 (France: Aude); Islamov, 1986:517 (first record from Uzbekistan: Tashkent Oblast': Khumsan); Gayubo, 1987:107 (Spain: Ciudad Real Province); Pagliano, 1990:58 (in catalogue of Italian Sphecidae); Gayubo, Borsato, and Osella, 1991:393 (Italy: Toscana; wing venation similar as in *Chilosphex*); Hamon, Fonfria, and Tussac, 1991:128 and 129 (in key to French Sphecini), 132 (in France along Mediterranean coast); Gayubo, Borsato, and Osella, 1992:276 (Greece); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:2 (in catalog of Italian fauna); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:56 (in Sphecid Fauna of Western Europe); Kazenas, 1998b:105 (in Sphecid Fauna of Kazakhstan); Shkuratov, 1998:97 (Russia: Rostov Oblast'); Esenbekova and Kazenas, 2000:8 (southeastern Kazakhstan: 2 km southwest of Eltay, 1-6 km northwest of Zhabagly); Kazenas, 2001b:14 (in checklist of Sphecidae of Kazakhstan and Central Asia), 81 (nesting habits), 2002a:27 (geographic distribution, collecting localities in Kazakhstan); Shkuratov, 2002a:383 (Russia: common in Rostov Oblast'), 2002b:139 (Russia: Rostov Oblast': Rostovskiy Nature Reserve at 46°27'N 42°41'E); Kazenas, 2004b:98 (Kazakhstan: western Tien Shan Mountains); Shkuratov, 2004a:73 (Russia: Rostov and Volgograd Oblast's, Ukraine: Donetsk Oblast'); Gayubo and Özbek, 2005:8 (Turkey: Kars: Karakurt at 40°07'N 42°30'E); Gülmez and Tüzün, 2005:46 (Turkey: Ankara Province); Pagliano and Negrisolo, 2005:51 (in Sphecid Fauna of Italy); Shorenko, 2005a:162 (Ukraine: Crimea), 2005b:97 (Ukraine: Crimea: Karadagh Nature Reserve); Yildirim and Ljubomirov, 2005:1786 (Turkey: Ankara: Şereflikoçhisar; Bingöl: Başakköy; Konya: Sille); Standfuss and Standfuss, 2006c:307 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Danilov, 2008:347 (Russia: Altayskiy Kray: Barnaul area); Dollfuss, 2008b:1407 (locality records from Bulgaria, France, Greece, Kazakhstan, Kyrgyzstan, Tajikistan, and Turkey); Ljubomirov and Yildirim, 2008:24 (in catalog of Sphecidae of Turkey); Danilov, 2009:54 (Russia: Western Siberia: Kulundinskaya Steppe); Gayubo, González, Tormos, and Asís, 2009:362 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); Guéorguiev and Ljubomirov, 2009:262 (Bulgaria: Maleshevska Planina); Shorenko, 2009:366 (in list of Sphecidae *sensu lato* of Crimea); Bitsch, 2010:105 (in supplement to vol. II of Faune de France, 1997: recorded from Bulgaria by Dollfuss, 2008, new record from France: Landes: 7 km south of Castets); Danilov, 2010b:44 (distribution of western Palearctic type); Shorenko and Konovalov, 2010:12 (Ukraine: Crimea); Tüzün and Yüksel, 2010:4468 (Turkey: Niğde Province); van der Smissen, 2010b:385 (France: Vaucluse: Le Beaucet-Venasque);

Baghirov, 2011b:140 (Russia: Altayskiy Kray: Barnaul); Murai and Amr, 2011:109, 119 (first record from Syria: Al Thawrah Nature Reserve at 35°51'N 28°38'E); Danilov, 2012:161 (in key to *Palmodes* of Russia and adjacent countries); Protsenko, Fateryga, Ivanov, and Puzanov, 2012:57 (Ukraine: Crimea); Strumia, Pagliano, and Gayubo, 2012:55 (Italy: Toscana: Riserva di San Rossore); Yildirim, 2012:74 (Turkey: Bayburt: Kopdağı, Şehitler Çeşmesi; Kars: Sarıkamış: Karakurt); Danilov, 2013:49 (in key to *Palmodes* of Central Asia), 2014b:514 (in key to Sphecidae s.s. of Siberia, not yet found in Siberia); Nemkov, 2014c:286 (recorded from Asiatic Russia by several authors); Yildirim, 2014:30 (Turkey: distribution by biogeographic provinces); Koçak and Kemal, 2015:278 (in checklist of Hymenoptera of Turkey); Samin and Bagriacik, 2015:70 (Iran: Kurdistan: Kamyaran at 34°55'N 46°55'E); Samin, Bagriacik, and Monaem, 2015:195 (Iran: West Azarbaijan: Ourmieh); Shorenko, 2015:316 (in list of Sphecidae *sensu lato* of Crimea); Gülmez and Dizer, 2016:58 (Turkey: Tokat Province); Mokrousov and Popov, 2016:564 (Russia: Krasnodarskiy Kray); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:6 (Turkey: Kars Province); Arens, 2017a:628 (Greece: Peloponnesus); Danilov, 2017b:215 (in catalog of Sphecidae s.s. of Russia); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:25 (Iran: known from Golestan, Kordestan, North Khorasan, and West Azerbaijan provinces); Shorenko, 2017:76 (in Crimea collected in May through August), 2018:127 (Crimea, including localities, habitats, and number of specimens); Gülmez, 2019:3 (Turkey: Ankara and Tokat provinces: no specific localities); Bitsch, Barbier, and Jacobs *in* Bitsch, Barbier, Gayubo, Jacobs, Leclercq, and Schmidt, 2020:133 (in Sphecid Fauna of Europe); Danilov, 2020:319 (specimens from Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, and Russia: Dagestan and Krasnodar Kray in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia); Danilov and Byvaltsev, 2020:404 (in key to Palearctic *Palmodes*), 426 (in revision of Central Asian *Palmodes*; Albania, Armenia, Bulgaria, France, Georgia, Greece, Iran, Israel, Italy, Kazakhstan, Kyrgyzstan, Romania, Russia, Spain, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan); Maharramov, Mokrousov, and Proshchalykin, 2020:46 (Azarbaijan: Nakichivan Autonomous Republic); Örgel, Anlaş, and Tezcan, 2020:638 (Turkey: Mersin Province); Shorenko, 2020:47 (Crimea: Karadag Nature Reserve); Can and Gülmez, 2021a:3012 (Turkey: Erzincan: Refahiye: Çat); Cross, Baldock, and Wood, 2021:18 (in catalog of Sphecidae *sensu lato* of Portugal); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

Sphex straboni Berland, 1926b:166, ♀. Holotype: ♀, Turkey: Amasya (MNHN). Synonymized with *Sphex strigulosus* by Berland and Bernard, 1949:2.

As *Sphex continis* (a manuscript name): Pagliano, 2008:530 (specimens in M. Spinola collection, Torino).

21. *stygicus* Bohart and Menke

Palmodes stygicus Bohart and Menke, 1961:191, ♀,♂. Holotype: ♂, USA: Utah: Delta (CAS). – R. Bohart and Menke, 1963:149 (in revision of Nearctic Sphecini), 1976:127 (in checklist of world Sphecidae); Krombein, 1979b:1584 (in catalog of North American Hymenoptera).

sp.

von Schulthess, 1935:305 (Australia: Northern Territory: Burnside); Roth in de Beaumont, 1967a:374 (Turkey; sp. aff. *minor*) and 375 (Turkey; sp. aff. *occitanicus syriacus*); Gayubo and Özbek, 2005:8 (Turkey); Ljubomirov and Yildirim, 2008:26 (in catalog of Sphecidae of Turkey); Cope, Campbell, Grodsky, and Ellis, 2019:6 (Florida: collected in emergence traps).

SPECIES RECENTLY REMOVED FROM *PALMODES*

australis de Saussure, 1867 (described in *Harpactopus*) returned to *Prionyx*