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HOPLAMMOPHILA

Hoplammophila de Beaumont, 1960e:1 (as subgenus of *Ammophila*). Type species: *Ammophila armata* (Illiger, 1807) [= *Sphex armatus* Illiger, 1807], by original designation.

Micadophila Tsuneki, 1962c:28 (as subgenus of *Ammophila*). Type species: *Ammophila aemulans* Kohl, 1901, by original designation.

Key: Menke, 1974d:582 (world species).

Review of biology: Kazenas: 2001b:89.

1. *aemulans* (Kohl)

Ammophila aemulans Kohl, 1901d:144, ♀, ♂. Syntypes: southeastern Siberia, Korea: no specific locality (NHMW). – Kohl, 1906b:314 (in revision of Palearctic *Ammophilini*); Gussakovskij, 1932:4 (Russia: Primorskiy Kray); Yasumatsu, 1937c:68 (Japan: Island of Tsushima); Iwata, 1938c:70 (nesting habits); 35 (visiting flowers of *Ampelopsis heterophylla* Sieb. et Zucc, Vitaceae), 1955:28 (egg size, number of oocytes); de Beaumont, 1960e:1 (in subgenus *Hoplammophila*); Iwata, 1960:210 (number of ovarioles and oocytes, egg size); Tsuneki, 1962b:25 (in key to *Ammophilini* of Japan and Korea), 1962c:28 (in subgenus *Micadophila*); Iwata, 1963b:196 (Japan: prey record); Tsuneki, 1963e:44 (nesting), 1967i:384 (synonymy; Taiwan), 1967j:5 (Taiwan), 9 (in key to *Ammophilini* of East Asia, as *aemulans aemulans*); Haneda, 1968a:45 (Japan); Itami, 1968a:16 (Japan: Yamagata Prefecture: foot of Mount Iide); Nambu, 1968b:26 (Japan: Saitama Prefecture); Tsuneki, 1968i:41 (nesting habits); Itami, 1969:46 (Japan: Niigata Prefecture); Tsuneki, 1969e:24 (Japan: specimens in Osaka Museum of Natural History), 1970b:9 (Central Japan); Yamada, 1971:34 (Japan: Aichi Prefecture); Suda, 1973:123 (Japan: Yamanashi Prefecture); Nambu, 1975b:70 (Japan: Saitama Prefecture); Tsuneki, 1979d:9 (Japan); Piek and Spanjer, 1986:179 (in list of Sphecidae with known prey). – **As *Hoplammophila aemulans***: Menke, 1966a:150 (new combination), 1974d:582 (in key to world *Hoplammophila*); R. Bohart and Menke, 1976:141 (in checklist of world Sphecidae); Kazenas, 1980e:80 (Russia: Far East); Tsuneki, 1982b:14 (known from Korea); Paik, 1985:197 (in list of Sphecidae of Korea); Radović, 1985:64 (sting apparatus analyzed); Steiner, 1986:97 (references to papers on nesting habits); Nemkov in Nemkov, Kazenas, Budrys, and Antropov, 1995:385 (in key to Sphecidae of Russian Far East); Miyatake, 1996:101 (specimens in Hiroshi Aoki collection); Wu and Zhou, 1996a:57 (in revision in Economic Insect Fauna of China); Porter, Stange, and Wang, 1999:5 (in checklist of Sphecidae of Taiwan); Konno, Palma, Hitara, M. Juliano, L. Juliano, and Yasuhara 2002:310 (bradykinins not found in venom); Haneda, 2003:3 (Japan: Nagasaki Prefecture: Tsushima); Tano, Kurokawa, Murota, and Nozaka, 2003:30 (Japan: Nagasaki Prefecture: Tsushima); Ohl and Linde, 2003:149 (number of ovarioles); Li and He, 2004:1122 (China: in hymenopterous fauna of Zhejiang Province); Suda, 2004:36 (Japan: Yamanashi Prefecture); Haneda, Inoue, Nozaka, Tano, Kurokawa, H. Murota, and T. Murota, 2005:64 (Japan: Fukui Prefecture: Mount Monju); Q. Li and L. Yang, 2005:884 (China: Gansu: Quinling Range and South Mountains); Haneda, Nozaka, Tano, Kurokawa and Murota, 2006a:18 (Japan: Toyama Prefecture), 2006b:47 (Japan: Nagasaki Prefecture: Tsushima); Hua, 2006:276 (in list of Chinese insects, geographic distribution); Terayama and Tano, 2006:7, 15, 18 (in key to Japanese Ampulicidae and Sphecidae); Nemkov, 2008b:17 (in catalog of Sphecidae of Asiatic Russia); Ohkusa and Tajima, 2008:74 (Japan: central Honshu: Aichi Prefecture); Nemkov, 2009b:46 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Tajima and Ohkusa, 2009:69 (male-female ratio); Danilov, 2010b:45 (distribution of eastern Palearctic type); Dollfuss, 2010a:537 (Japan: Minoo Milobe and Yamagata Prefecture: Chojoyagahara); N. Yamamoto, 2011:11 (Japan: Kyūshyū: mainland Nagasaki Prefecture); Nemkov, 2012c:434 (in catalog of Sphecidae of Russian Far East); J.-K. Kim, 2014:418 (in catalog of Sphecidae s.l. of Korean Peninsula); Kim, Yeo, and Kim, 2014:281 (in revision of Sphecidae sensu stricto of South Korea); Dollfuss, 2015b:436 (locality records from Laos and Turkey); Danilov, 2017b:213 (in catalog of Sphecidae s.s. of Russia); Jacobs and Liebig, 2018:135 (Russia: Primorskiy Kray: Kalinovka); Danilov, 2020:318 (specimens from

Russia: Primorskiy Kray in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

Ammophila rhinoceros Strand, 1913a:85, ♂. Holotype: ♂, Taiwan: Taihorin (DEI). Synonymized with *Hoplammophila aemulans* by Tsuneki, 1967i:384 and by Menke, 1968f:139 (as new synonym). – Strand, 1927:253 (in list of species described by author); Sonan, 1942:136 (in revision of Ammophilini of Taiwan); Oehlke and Wudowenz, 1974:425 (holotype in DEI). – **As synonym of *Ammophila aemulans***: Tsuneki, 1967i:384 (Taiwan). – **As *Ammophila aemulans rhinoceros***: Tsuneki, 1967j:5 (new status; Taiwan), 9 (in key to Ammophilini of East Asia), 1972c:10 (Taiwan); Murota, 1973b:116 (Taiwan); Tsuneki, 1973f:40 (Taiwan).

2. *anatolica* (de Beaumont)

Ammophila anatolica de Beaumont, 1960e:2, ♀, ♂. Holotype: ♂, Armenia: Yerevan (ZSBS). – de Beaumont, 1967a:265 (Turkey), 1969:80 (Turkey). – **As *Hoplammophila anatolica***: Menke, 1966a:150 (new combination), 1974d:582 (in key to world *Hoplammophila*); R. Bohart and Menke, 1976:141 (in checklist of world Sphecidae); Ljubomirov and Yildirim, 2008:40 (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); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

3. *armata* (Illiger)

Spheg armatus Illiger, 1807b:91, ♂ (as *Sphecis armatae*, genitive case). Holotype or syntypes: Italy: Etruria, now Toscana: no specific locality (ZMHU). – A. Costa, 1864b:95 (specimen from Toscana, Italy, in Napoli Museum). – **As *Ammophila armata***: Vander Linden, 1827:355 (synonymy, distribution); Dufour, 1838b:291 (first record from France: Landes: Mont-de-Marsan, comparison with *Ammophila sabulosa*); Lepelletier de Saint Fargeau, 1845:371 (in revision of world Hymenoptera); Dahlbom, 1845:431 (in key to *Ammophila*); Kiesenwetter, 1849:87, footnote (unknown from Germany; Austria: Südtirol, now Italy: Trentino–Alto Adige); F. Smith, 1856:209 (in catalog of Hymenoptera in British Museum); Taschenberg, 1858:61 (in key to Sphecidae of Germany; Austria: Südtirol, now Italy: Trentino–Alto Adige); Schenck, 1861:162 (redescription, Austria: Südtirol, now Italy: Alto Adige); A. Costa, 1864b:111 (two specimens from France in Museo Zoologico di Napoli); Taschenberg, 1866:208 (in revision of Hymenoptera of Germany, occurs in Südtirol, now Italy: Trentino–Alto Adige); A. Costa, 1867b:77 and 1867c:21 (in revision of Italian Sphecidae); Kirchner, 1867:217 (in catalog of European Hymenoptera); Schenck, 1867a:355 (Germany: South Tirol, now Italy: Trentino–Alto Adige); Dours, 1874:141 (in catalog of Hymenoptera of France); Kohl, 1880:183 (Italy: Trentino–Alto Adige; Bozen, now Bolzano); Konow, 1887:137 (in key to *Parapsammophila*); Schletterer, 1894:30 (Istria Peninsula, now part of Croatia, Slovenia, and Italy); Acloque, 1897:96 (in Sphecid Fauna of France and Algeria); Dalla Torre, 1897:395 (in catalog of world Hymenoptera); Mocsáry, 1897:79 (Hungary: Čavle, now in Croatia); Antiga and Bofill, 1904:4 (Spain: Cataluña Province); Kohl, 1906b:311 (in revision of Palearctic Ammophilini); Schmiedeknecht, 1907:245 (in key to Hymenoptera of Central Europe); de Gaulle, 1908:104 (in catalog of French Hymenoptera); Graeffe, 1911:48 (Italy: Trieste area); Berland, 1925d:31 (in Sphecid Fauna of France); Coulon, 1925:115 (France: Var: Le Beausset); Friese, 1926:165 (in key to Sphecidae of Central Europe, short morphological characteristics, observed in Bozen, Austria, now Italy: Bolzano); Schmiedeknecht, 1930:706 (in keys to Hymenoptera of North and Central Europe); Gussakovskij, 1933b:274 (Iran, Transcaucasia, Turkmenistan); Bernard, 1935:61 (France: Var: Fréjus area); Guiglia, 1944b:5 (Italy); Šnoflak in Zavadil and Šnoflak, 1948:99 (in key to Sphecidae of Czechoslovakia, not yet found in Czechoslovakia); Cleu, 1953:50 (France: Ardèche River basin); Ceballos, 1956:359 (in catalog of Hymenoptera of Spain); Bajári, 1957a:12 (in key to Hungarian Sphecidae, not yet found in Hungary); de Beaumont, 1958a:290 (illustration of genitalia), 1959a:6 (Italy); Čingovski, 1960:5 (Macedonia: Gradsko); de Beaumont, 1960e:1 (in subgenus *Hoplammophila*); Tsuneki, 1962c:29 (systematic position); de Beaumont, 1967a:265 (Turkey), 1969:80 (Turkey); Balthasar, 1972:429 (in Sphecid Fauna of Czechoslovakia: not yet found in the country); Kazenas, 1978b:34 (in key to Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:181 (in key to Sphecidae of European part of USSR); Casolari and Casolari Moreno, 1980:100, 101 (specimens in M. Spinola collection, Torino); Pagliano, 2008:511, 516

(specimens in M. Spinola collection, Torino). – **As *Parapsammophila armata***: Ed. André, 1886:90 (new combination, in revision of Sphecidae of Europe and Algeria), 1888:5* (bibliographic references); Baldini, 1894:49 (Italy: Modena area). – **As *Hoplammophila armata***: Menke, 1966a:150 (new combination), 1974d:582 (in key to world *Hoplammophila*); R. Bohart and Menke, 1976:141 (in checklist of world Sphecidae); Pagliano, 1980:111 (Italy: Abruzzo); Mingo and Gayubo, 1983:159 (Spain); Pagliano, 1984:368 (Italy), 1985:16 (Italy), 1990:62 (in catalogue of Italian Sphecidae); Gayubo, Borsato, and Osella, 1991:395 (Italy: Toscana, Puglia); Gayubo, Borsato, and Osella, 1992:277 (Turkey); Hamon, Tussac, and Fonfria, 1992:405, 411 (in key to French Ammophilini), 412 (distribution in France); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:2 (in catalog of Italian fauna); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:92 (in Sphecidae Fauna of Western Europe); Vicedomini, 2000b:24 (Italy: previously recorded from Campania); Kazenas, 2001b:16 (in checklist of Sphecidae of Kazakhstan and Central Asia); Pagliano and Negrisolo, 2005:70 (in Sphecidae Fauna of Italy); Yildirim and Ljubomirov, 2005:1787 (Turkey: Konya: Güneysınır); Ljubomirov and Yildirim, 2008:40 (in catalog of Sphecidae of Turkey); Guéorguiev and Ljubomirov, 2009:262 (Bulgaria: Maleshevska Planina); Józán, 2009:165 (Croatia: Devičić Draga); Bitsch, 2010:107 (in supplement to vol. II of Faune de France, 1997: recent records from Bulgaria reported); Burguet *in* Durand and Burguet, 2010:25 (France Département d'Ardèche: Ardèche Gorges); Dollfuss, 2010a:537 (locality records from France, Greece, and Turkey); Field, Ohl, and Kennedy, 2011:734 (in molecular cladistic analysis of Ammophilini); Bitsch, 2014:395 (France: Ariège: Forêt de la Massane); Ebrahimi, 2014:9 (Iran: Golestān: Golestān National Park); Yildirim, 2014:30 (Turkey: distribution by biogeographic provinces); Dollfuss, 2015b:436 (locality records from Greece and Iran); Koçak and Kemal, 2015:278 (in checklist of Hymenoptera of Turkey); Gülmez and Dizer, 2016:60 (Turkey: Tokat Province); Arens, 2017a:634 (Greece: Peloponnesus); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:18 (Iran: known from Golestan Province); Can, Gülmez, and Aydın, 2016a: 2629 (venom active against human malignant tumors, but less so than venom of *Sphex flavipennis*); Magdalou, 2017:15 (France: Pyrénées-Orientales: Réserves Naturelles Catalanes: Forêt de la Massane); Gülmez, 2019:3 (Turkey: Sivas and Tokat provinces: no specific localities); Mokrousov, Shorenko, and Shlyakhtenok, 2019:11 (first record from Russia: Dagestan: five localities); Bitsch, Barbier, and Jacobs *in* Bitsch, Barbier, Gayubo, Jacobs, Leclercq, and Schmidt, 2020:100 (in Sphecidae Fauna of Europe); Can and Gülmez, 2021b:309 (Turkey: Sivas: Suşehri: Çamlığöze); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).

Ammophila grandis Gistel, 1857:45, sex not stated. Holotype or syntypes: Italy: Tergestum, now Trieste (depository unknown, possibly ZSBS?). Synonymized with *Hoplammophila armata* by Pagliano, 1985:16. – Strand, 1916c:98 (in review of Gistel, 1857); Menke, 1964b:153 (the name should be suppressed as nomen oblitum); R. Bohart and Menke, 1976:152 (in checklist of world Sphecidae).

4. *clypeata* (Mocsáry)

Ammophila clypeata Mocsáry, 1883:27, ♂. Holotype or syntypes: ♂, Greece: Epirus: no specific locality (TMB). – Ed. André, 1886:64 (in revision of Sphecidae of Europe and Algeria), 1888:2* (bibliographic references); Kohl, 1889a:20 (as new synonym of *Ammophila armata*); Dalla Torre, 1897:398 (in catalog of world Hymenoptera); Kohl, 1901:145 (redescription), 1906b:312 (in revision of Palearctic Ammophilini); Maidl, 1922:67 (Albania); Roth, 1928:185 (in revision of North African Ammophilini); Berland, 1930a:321 (first record from France: Var: Caillan, diagnostic characters); Šnoflak *in* Zavadil and Šnoflak, 1948:99 (in key to Sphecidae of Czechoslovakia, not yet found in Czechoslovakia); Bajári, 1957a:14 (in key to Hungarian Sphecidae, not yet found in Hungary); de Beaumont, 1959a:6 (Italy), 1960e:1 (belongs to subgenus *Hoplammophila*), 1965a:11 (Greece); Tsuneki, 1962c:29 (systematic position); de Beaumont, 1967a:265 (Turkey), 1969:80; de Groot, 1974:24 (France: Vaucluse: Mollans; nest and prey); Balthasar, 1972:429 (in Sphecidae Fauna of Czechoslovakia: not yet found in the country); Guichard, 1978:269 (Greece); Marion, 1978:85 (France: Bouche-du Rhône); Pulawski, 1978:181 (in key to Sphecidae of European part of USSR). – **As *Hoplammophila clypeata***: Menke, 1966a:150 (new combination), 1974d:582 (in key to world *Hoplammophila*); R. Bohart and Menke, 1976:141 (in checklist of world Sphecidae); Pagliano, 1980:111 (Italy: Lazio), 1984:368 (Italy),

1985:17 (Italy), 1990:62 (in catalogue of Italian Sphecidae); Hamon, Tussac, and Fonfria, 1992:405, 410 (in key to French Ammophilini), 412 (distribution in France); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:2 (in catalog of Italian fauna); Risch, and Niehuis, 1995:189 (Bettag's, 1989 record most likely refers to an introduction); Bitsch, Barbier, Gayubo, Schmidt, and Ohl, 1997:93 (in Sphecidae Fauna of Western Europe); Schmidt and Schmid-Egger, 1997:16 (does not occur in Germany); Ljubomirov, 1999b:44 (Bulgaria: Mount Vitosha near Sofia); Ivanov and Ljubomirov, 2001:210 (Bulgaria: Kresna Gorge at 41°48'N 23°10'E); Ohl et al., 2001:142 (recorded from Germany but not occurring there); Jacobs, 2005a:437 (Bulgaria: Arkutino near Burgas); Pagliano and Negrisolo, 2005:71 (in Sphecidae Fauna of Italy); Standfuss and Standfuss, 2006c:308 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Ljubomirov and Yildirim, 2008:41 (in catalog of Sphecidae of Turkey); Guéorguiev and Ljubomirov, 2009:262 (Bulgaria: Maleshevska Planina); Józán, 2009:165 (Croatia); Dollfuss, 2010a:537 (locality records from Croatia, Greece, and Turkey); Field, Ohl, and Kennedy, 2011:734 (in molecular cladistic analysis of Ammophilini); Schmid-Egger, 2011a:42 (France: Parc National du Mercantour); Józán, 2014:131 (Croatia: 5 km east of Karlobag, Lukovo, Načinovići); Yildirim, 2014:30 (Turkey: distribution by biogeographic provinces); Dollfuss, 2015b:436 (locality records from Albania, Bulgaria, Greece, and Macedonia); Field, Shreeves, Kennedy, Brace, and Gilbert, 2015:1899 (sex-biased parental care and sexual size dimorphism); Koçak and Kemal, 2015:278 (in checklist of Hymenoptera of Turkey); Gülmez and Dizer, 2016:60 (Turkey: Tokat Province); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:8 (Turkey: Tunceli: Pülümür: Akdik); Arens, 2017a:634 (Greece: Peloponnesus); Gülmez, 2019:3 (Turkey: Tokat Province: no specific locality); Bitsch, Barbier, and Jacobs *in* Bitsch, Barbier, Gayubo, Jacobs, Leclercq, and Schmidt, 2020:101 (in Sphecidae Fauna of Europe); Danilov, 2020:318 (specimen from Bulgaria in Institute of Systematics and Ecology of Animals, Novosibirsk, Russia); Field, Gonzalez-Voyer, and Boulton, 2020:7 (evolution of parental care); Can and Gülmez, 2021b:310 (Turkey: Giresun: Alucra: Gürbülak); Kaplan and Yildirim, 2022a:56 (Turkey: Bingöl: Çeltiksuyu at 38°52'16.89"N 40°33'45.63"E); Kaplan and Yildirim, 2023:1692 (in checklist of Sphecidae *sensu lato* of Turkey).