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PEMPHREDON

Pemphredon is a Greek feminine adjective (Menke and Bohart, 1979). The names *lethifer*, *mortifer*, *punctifer*, and *rugifer* are both adjectives and nouns, and should be regarded as nouns (Article 31.2.1 of the Code). Therefore, they do not change gender and are invariable.

Pemphredon Latreille, 1796:128 (no species included). Type species: *Pemphredon lugubris* (Fabricius, 1804) [= *Crabro lugubris* Fabricius, 1793], designated by Shuckard, 1837:193 (one of the two species first included by Latreille, 1802b:342).

Cemonus Panzer, 1806:186. Type species: *Sphex unicolor* Panzer, 1798 (junior primary homonym of *Sphex unicolor* Fabricius, 1787) [= *Cemonus rugifer* Dahlbom, 1844], by monotypy.

Cemonus Jurine, 1807:213. Type species: "*Cemonus unicolor* Fabricius" [= *Pelopoeus unicolor* of Fabricius, 1804 = *Sphex unicolor* Panzer, 1798 (junior primary homonym of *Sphex unicolor* Fabricius, 1787) = *Cemonus rugifer* Dahlbom, 1844], designated by Shuckard, 1837:199.

Cenomus Gimmerthal, 1836:436. Lapsus or emendation of *Cemonus* Panzer or Jurine.

Dineurus Westwood, 1837:173. Type species: "*Pemphredon unicolor* Latreille" [= *Pemphredon unicolor* of Latreille, 1809 = *Sphex unicolor* of Jurine, 1807:214 = *Pelopoeus unicolor* of Fabricius, 1804 = *Sphex unicolor* Panzer, 1798 (junior primary homonym of *Sphex unicolor* Fabricius, 1787) = *Cemonus rugifer* Dahlbom, 1844], by original designation.

Ceratophorus Shuckard, 1837:195. Type species: *Pemphredon morio* Vander Linden, 1829, by original designation and monotypy.

Diphlebus Westwood, 1840:81. Type species: *Pelopoeus unicolor* of Fabricius, 1804 [= *Sphex unicolor* Panzer, 1798 (junior primary homonym of *Sphex unicolor* Fabricius, 1787) = *Cemonus rugifer* Dahlbom, 1844], by original designation.

Chevrieria Kohl, 1883e:658. Type species: *Pemphredon unicolor* (Fabricius, 1804) [= *Pelopoeus unicolor* of Fabricius, 1804 = *Sphex unicolor* Panzer, 1798 (junior primary homonym of *Sphex unicolor* Fabricius, 1787) = *Cemonus rugifer* Dahlbom, 1844], by original designation.

Susanowo Tsuneki, 1972b:12. Type species: *Pemphredon sudai* Tsuneki, 1972, by original designation.

Sinostigma Hong, 1984:9. Type species: *Sinostigma spinulata* Hong, 1984a, by monotypy. Synonymized with *Pemphredon* by Zhang, 1989:314.

R. Bohart (1993b) recognized *Cemonus* as a separate genus, ignoring the fact that the first reccurent vein can be received either by the second or third submargical cell in the same species.

Revisions: A. Wagner, 1918 (European species of *Cemonus*); Harttig, 1930a (European species of *Cemonus*), 1931b (differences between subgenus *Pemphredon* s.s. and *Cemonus*); A. Wagner, 1932 (Europe); Dollfuss, 1995 (world species), van der Smissen, 2003 (European species of subgenus *Cemonus*).

Key: Birula, 1914:383 (European species of subgenus *Diphlebus* = *Cemonus*); Valkeila and Leclercq, 1972:700 (European species of *rugifer* group; L. Ma, and Q. Li, 2020b:3 (China); Falk and Early, 2021 (Great Britain).

Review of biology: Kazenas, 2001b:127

1. *austriaca* (Kohl)

Diphlebus austriacus Kohl, 1888b:723, ♀, ♂. Lectotype: ♀, Austria: Wien (NHMW), designated by Merisuo and Valkeila,1990:2 1972:9. – Schirmer, 1912:166 (Germany: Berlin area); A. Wagner, 1918:141 (in key to subgenus *Diphlebus*), 142 (variation, author's specimens are *Diphlebus wesmaeli*); Blüthgen, 1931a:124 (variation in wing venation); Haris, 2016:15 (in list of species described by F. Kohl from Carpathian Basin). – **As *Cemonus austriacus***: Kowalczyk, 1991a:96 (new combination, Poland: Łódź). – **As *Dineurus austriacus***: Bat'a, 1952:167 (new combination, Czech Republic). – **As *Pemphredon austriacus***: Kohl, 1890a:50 (new combination, redescription), 1893a:39 (Austria: Niederösterreich); Krieger, 1894:16 (Germany: Kingdom of Saxony); Dalla Torre, 1897:356 (in catalog of world Hymenoptera); E. Saunders, 1904c:637 (Spain: Barcelona, determination tentative); Kubes, 1905:83 (Czech Republic: Kolín); Graeffe, 1911:50 (Italy: Trieste area); Birula, 1912:537 (Ukraine: Zhytomyr Oblast': Radomyshl'), 1914:382 (Belorussia: Ambrosovichi near Vitebsk, redescription); Schmiedeknecht, 1930:670 (in keys to Hymenoptera of North and Central Europe); Crèvecoeur and Maréchal, 1932:69 (first record from Belgium: Loën); A. Wagner, 1932:226 (in revision of European *Pemphredon* subgenus *Dineurus*); Balles, 1934:18 (Germany: Baden-Württemberg: Hopfengarten); Crèvecoeur and Marechal, 1936:250 (in catalog of Belgian Hymenoptera); Drogoszewski, 1936:129 (Poland: Łowicz); Zavadil, Šustera, and Bat'a, 1937:178 (in catalog of Sphecidae of Czechoslovakia); Maréchal, 1939:341 (Belgium: Loën); Šnoflák, 1944a:143 (Czech Republic: serpentine steppe near Mohelno); Šnoflák *in* Zavadil and Šnoflák, 1948:53, 54 (in key to Sphecidae of Czechoslovakia); de Beaumont, 1950f:410 (Algeria); Nouvel and Ribaut, 1953:180 (France: Haute-Garonne: Saint-Béat); Grandi, 1954:241 (Italy); Steiner, 1955:143 (France: Dordogne); Vogrin, 1955:39 (Yugoslavia); Ceballos, 1956:357 (in catalog of Hymenoptera of Spain); Leclercq, 1956g:325 (Greece); Bajári, 1957a:82, 83 (in key to Hungarian Sphecidae), 1957b:138 (first record from Hungary); Benno, 1958b:12 (in review of Dutch Sphecidae); de Beaumont, 1959a:32 (Italy); Wolf, 1959b:27 (known from Germany, but not from Nassau); Noskiewicz and Puławski, 1960:46 (in key to Polish Sphecidae); Grandi, 1962:59 (nesting in nest of *Byctiscus betulae* L., an attelabid); Babiy, 1964:115 (Austria: Land Salzburg); de Beaumont, 1964a:296 (variation and related taxonomic problems), 1964c:103 (in Sphecid Fauna of Switzerland); 1965a:57 (Greece); Scobiola-Palade, 1965:109 (first record from Romania: Sibiu Region: Cisnădie); Benedek, 1966a:162, 164 (nesting in galls of *Cynips kollari* Htg.); Benno, 1967:37 (in checklist of Sphecidae of Netherlands); de Beaumont, 1967a:342 (Turkey); Gauss, 1967:556 (Germany: Baden-Württemberg); Niedl and Deneš, 1967:78 (Czech Republic: Třeboň area); Scobiola-Palade, 1967b:46 (Romania); J. Heinrich, 1967:77 (Germany: Bayern: Aschaffenburg, Kahl); Lefeber, 1969c:233 (Netherlands: SintPietersberg = Montagne Saint Pierre); Romanova, 1969:134 (Russia: North Caucasus); Zangheri, 1969:1705 (Italy: in catalog of flora and fauna of Romagna Region); Hoop, 1970:60 (Germany: Schleswig-Holstein: Haffkrug); Oehlke, 1970:736 (German Democratic Republic); Hoop, 1971:83 (Germany: Schleswig-Holstein: beach near Haffkrug); Stritt, 1971a:105 (Germany: Baden-Württemberg: Karlsruhe); Balthasar, 1972:216 (in Sphecid Fauna of Czechoslovakia); Merisuo and Valkeila, 1972:9 (redescription); Valkeila and Leclercq, 1972:696 (a species different from *Pemphredon enslini*), 701 (locality records); R. Bohart and Menke, 1976:180 (in checklist of world Sphecidae); Kolesnikov, 1977:319 (Russia: Bryansk Oblast'); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Pagliano, 1980:131 (Italy: Piemonte); Dollfuss and Ressl, 1981:315, 321 (Austria: Niederösterreich: Scheibbs District); Skibińska, 1981:357 (Poland: Warszawa-Białołęka), 1982:122 (Poland: Warszawa area); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Gayubo, 1983d:202 (Spain: Salamanca Province); Mingo and Gayubo, 1984:108 (Spain); Schmidt and Westrich, 1984:240 (Germany: Rheinland-Pfalz: Bad Münster); Schremmer, 1985:397 (nesting exclusively in galls of *Andricus kollari*, both old and living; geographic distribution linked to that of the cynipid); Westrich and Schmidt, 1985b:111 (Germany: endangered in Baden-Württemberg); Józan, 1986:369 (Hungary: Kiskunság National Park); Pádr *in* Šedivy, 1989a:168 (in checklist of Czechoslovakian Sphecidae); Skibińska, 1986b:150, 153 (Poland: suburbs of Warszawa), 160 (gardens), 168 (green areas of housing estates), 173 (various green urban habitats), 1989:204 (Poland: Warszawa area); Kowalczyk, 1990:290 (Poland: Góry Świętokrzyskie); Pádr, 1990:78 (Czech Republic: Praha area);

Pagliano, 1990:115 (in catalog of Italian Sphecidae); Day, 1991:xvii (in summary of European Endangered Hymenoptera Lists); Negrisolo, 1991:317 (Italy: Treviso Province); Delarze, 1992:68 (Switzerland: Valais: Les Follatères); Negrisolo and Pagliano, 1993:95 (Italy: Sardegna); Jansen and Kaluza, 1995:8 (Germany: endangered in Sachsen); Pagliano and Pesarini, 1995:85 (Italy: Ferrara Province); Celary, 1997:57 (in checklist of Animals of Poland); Shlyakhtenok, Blinov, and Belyavskaya, 1997:153 (Belorussia: Pripyatskiy National Park); Majzlan and Deván, 2004:33 (Slovakia: Malacky-Široké); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Cruz-Sánchez, Gayubo, González, and Torres, 2005:221 (Spain: Salamanca: San Martín del Castañar); Straka, 2005a:399 (critically endangered in Czech Republic); Gayubo, González, Tormos, and Asís, 2008:139 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Baños-Picón, Asís, Gayubo, and Tormos, 2009:314 (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); Szczepko and Wiśniowski, 2009:71 (Poland: Spała Landscape Park); Hellrigl, 2012:129 (Italy: Provincia Autonoma di Bolzano-Alto Adige, as Südtirol). – **As *Pemphredon austriaca***: Schmidt, 1984:246 (Germany: Baden-Württemberg); Dollfuss, 1988:10 (Austria: Bisamberg), 1989:11 (lectotype in NHMW); Jacobs and Oehlke, 1990:122 (occurrence in German Democratic Republic questionable), 125 (comparison with *Pemphredon enslini*), 145 (bibliography); Dollfuss, 1991:61 (in key to Sphecidae of North and Central Europe); Dollfuss, 1995:950 (in revision of world *Pemphredon*); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna); Schmid-Egger, Risch, and Niehuis, 1995:203 (summary of records from Germany: Rheinland-Pfalz); Gusenleitner, 1996a:7 (Austria: Steiermark); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: endangered); Voblenko, Gorobchishin, and Nesterov, 1996:14 (Ukraine: Polesye Region); Schmidt and Schmid-Egger, 1997:24 (in checklist of German Sphecidae); F. Burger, Saure, and Oehlke, 1998:29 (Germany: in list of Sphecidae of Brandenburg), 38 (unlikely to be endangered); Dollfuss, Gusenleitner, and Bregant, 1998:511 (Austria: summary of collecting records from Burgenland); Gusenleitner, 1998:498 (Austria: additional locality records from Steiermark); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Pagliano and Scarzmozzino, 1999:164 (Italy: Piemonte: Borgomale); Salzmann-Wandeler and Rezbanyai-Reser, 1999:101 (Switzerland: Tessin: Monte Generoso); Blösch, 2000:168 (in Sphecid Fauna of Germany); Dollfuss, 2001:269 (miscellaneous locality records); Dollfuss and Bitsch *in* Bitsch et al., 2001:73 (in Sphecid Fauna of Western Europe); Ivanov and Ljubomirov, 2001:210 (Bulgaria: Kresna Gorge at 41°48'N 23°10'E); Ohl et al., 2001:141 (distribution in Germany by provinces); Zettel, Gross, and Mazzucco, 2001:69 (Austria: Wien); Amiet and Moretti, 2002:177, 178 (Switzerland: Tessin); Archer, 2002b:123 (Great Britain: Watsonian Yorkshire: distribution map); Deván, 2002a:200 (Slovakia: Kobela Nature Reserve near Nové Mesto); Shlyakhtenok and Skibinska, 2002:33 (Belorussia: no specific locality); Drewes, 2003:140 (Italy: Trentino: Nago-Loppio, Torbole); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); Schmid-Egger, 2003:756 (Italy: Sicilia: Amerina); van der Smissen, 2003:58 (in revision of European species of subgenus *Cemonus*); von der Heide and Metscher, 2003:103 (Germany: Niedersachsen: Emsland area); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: conservation status unknown); Wiśniowski, 2003:187 (Poland: summary of locality records); Deván, 2004:147 (western Slovakia); Dollfuss, 2004a:117 (Czech Republic, Italy, Slovakia, Slovenia, Turkey, Ukraine); Klein and Lefeber *in* Peeters, van Achterberg, et al., 2004:412 (in Wasp and Ant Fauna of Netherlands); Reder, 2004:29 (Germany: Hessen: Groβ-Gerau; Rheinland-Pfalz: Eisenberg); van Achterberg and Peeters, 2004:32 (in checklist of Sphecidae of Netherlands); Wiśniowski, 2004:40 and 58 (in checklist of Polish Sphecidae); Jacobs, 2005:159 (record from Germany: Brandenburg: Gartz in Dollfuss, 1995 refers to *Pemphredon wesmaeli*); Kofler, 2005:168 (Austria: Tirol: Lienz District: Schustertal in Kartitsch Common, Forchach in Lavant Common; Kärnten: Dellach); Pagliano and Negrisolo, 2005:466 (in Sphecid Fauna of Italy); Reder, 2005:952 (Germany: Rheinland-Pfalz: Eisenberg); Kowalczyk, 2006:27 (Poland: Sopot, as *austriacus*); Shlyakhtenok, 2006:110 (Belorussia: Polesye Radiological Nature Reserve); Standfuss and Standfuss, 2006c:303 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Theunert, 2006:36 (comparison with *Pemphredon enslini*, which is probably a synonym); Beavis,

2007:96 (Great Britain: Tunbridge Wells and Central High Weald); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:455 (van der Smissen, 2003, records *austraca* from France: Ardèche, but Theunert, 2006 thinks her species critera are uncertain); Jacobs, 2007:67, 72 (in key to Crabronidae of Germany); G. Turrisi and R. Turrisi, 2007:122 (Italy: Sicilia: Mount Etna: Botanical Garden Nuova Gussonea and vicinity); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia), 214 (first recorded from Slovakia by Deván, 2002a); Blommers, 2008:171 (Netherlands: nesting in abandoned galls of *Andricus kollari*); Haeseler, 2008:308 (Germany: Friesian Islands); Ljubomirov and Yildirim, 2008:181 (in catalog of Crabronidae of Turkey); Theunert, 2008:68 (Germany: map of distribution in Niedersachsen and Bremen); Gayubo, González, Tormos, and Asís, 2009:362 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); Guéorguiev and Ljubomirov, 2009:263 (Bulgaria: Maleshevska Planina); Józan, 2010:254 (Hungary: Somogy County); Mokrousov, 2010a:63 (Russia: Nizhniy Novgorod Oblast': no specific localities), 2010b:100 (Russia: Nizhniy Novgorod Oblast': no specific localities); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: very rare); Shorenko and Konovalov, 2010:26 (Ukraine: Crimea: Karadag Nature Reserve); van der Smissen, 2010b:386 (France: Ardèche: Saint-Thomé); Theunert, 2011a:21 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:92 (Germany: Hessen: conservation status unknown); Boillat, 2012:228 (Switzerland: in checklist of insects of Canton de Genève); Larivière, Chapelin-Viscardi, and Maillet-Mezeray, 2012:296 (France: Essonne: Maisse); Strumia, Pagliano, and Gayubo, 2012:56 (Italy: Toscana: Riserva di San Rossore); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Shlyakhtenok, 2013:147 (in annotated catalog of aculeate wasps of Belorussia); Vieira, Oliveira, Brewster, and Gayubo, 2013:19 (Portugal: Douro International Natural Park and Serras de Aire e Candeeiros Natural Park); Bitsch, 2014:408 (France: Gard: Brignon; Hautes-Pyrénées: Saint-Lary-Soulan; records from Netherland by Blommers, 2008 and from France by van der Smissen, 2010b reported); U. Frommer, 2014:28 (Germany: Hessen: Lorch); Józan, 2014:133 (Croatia: Tribanj Krušćica); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Shorenko, 2015:332 (in list of Sphecidae *sensu lato* of Crimea); Else, Bolton, and Broad, 2016:38 (in checklist of Aculeata of Great Britain and Ireland: England); Mokrousov and Popov, 2016:587 (Russia: Abkhazia, Krasnodarskiy Kray); Yıldırım, Ljubomirov, and Lelej, 2014:10 (distribution in Turkey by biogeographic provinces); Di Giovanni, Mei, and Cerretti, 2017:73 (Italy: Lombardia: Riserva Naturale Bosco della Fontana 5 km from Mantova at 45°12'N 10°44'E, found in canopy); Mokrousov, 2017e:248 (in catalog of Pemphredoninae of Russia); Shorenko, 2017:78 (in Crimea collected in September); Twerd, Krzyżyński, Waldon-Rudzionek, and Olszewski, 2017:7 (Poland: Inowroclaw and Janikowo: nesting in postindustrial soda ash dumping sites); Lett, 2018:203 (France: Loir-et-Cher: Gièvres at 47°16'39"N 1°41'52"E); Shorenko, 2018:129 (Crimea, including localities, habitats, and number of specimens); Carminati, Mora, and Cretin, 2019:23 (France: in list of Sphecidae *sensu lato* of Franche-Comté); Olszewski and Kowalczyk, 2019:107 (northern Poland: Pomorze Gdańskie = Gdańsk Pomerania); Shorenko, 2020:51 (Crimea: Karadag Nature Reserve); Turrisi, Altadonna, Lo Cascio, Nobile, and Selis, 2020:731 (Italy: Aeolian Archipelago: island of Lipari); Cross, Baldock, and Wood, 2021:60 (in catalog of Sphecidae *sensu lato* of Portugal); Kaplan and Yildirim, 2021:85 (in catalog of Crabronidae of Turkey); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:108 (in revision of Sphecidae *sensu lato* of Europe); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen University Botanical Garden and city gardens); Kaplan and Yildirim, 2023:1689 (in checklist of Sphecidae *sensu lato* of Turkey).

Pemphredon coracina Valkeila *in* Merisuo and Valkeila, 1972:20, ♀, ♂ (♂ = *Pemphredon lethifer*) (as *coracinus*, incorrect original termination). Holotype: ♀, Cyprus: Saettas (FSAG). Synonymized with *Pemphredon austriaca* by Dollfuss, 1995:950. – R. Bohart and Menke, 1976:181(in checklist of world Sphecidae); Pagliano, 1990:115 (in catalog of Italian Sphecidae: first record from Italy); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna, presence in Italy needs confirmation).

Pemphredon tenera Valkeila *in* Merisuo and Valkeila, 1972:22, ♀ (as *tener*, incorrect original termination). Holotype: ♀, Algeria: Kabylia: no specific locality (USNM). Synonymized with *Pemphredon austriaca* by Dollfuss, 1995:950. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae).

Pemphredon nescia Merisuo *in* Merisuo and Valkeila, 1972:23, ♀ (as *nescius*, incorrect original termination). Holotype: ♀, Italy: Trieste (NHMW). Synonymized with *Pemphredon austriaca* by Dollfuss, 1995:950. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Dollfuss, 1989:11 (holotype in NHMW); Pagliano, 1990:117 (in catalog of Italian Sphecidae); Dollfuss, 1991:62 (in key to Sphecidae of North and Central Europe); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna).

2. *baltica* Merisuo

Pemphredon baltica Merisuo *in* Merisuo and Valkeila, 1972:13, ♀, ♂ (as *balticus*, incorrect original termination). Holotype: ♀, Finland: Helsinki: Seurasaari (Helsinki). – Lefeber, 1971b:222 (Netherlands: Haelen, Hoge Veluve, nomen nudum), 1974:76 (Netherlands: Grathem; as *balticus* A. Morawitz); Lomholdt, 1975c:97 (in Sphecid Fauna of Fennoscandia and Denmark); R. Bohart and Menke, 1976:180 (in checklist of world Sphecidae); Schmidt, 1977:96 (Germany: Baden-Württemberg: Enzklösterle in Schwarzwald), 1977/78:56 (Germany: Rheinland-Pfalz: Mainzer Sand); Schwammberger, 1978:418 (Germany: Württemberg); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Lefeber, 1985:87 (Netherlands: southern Limburg); Vikberg, 1986b:75 (Finland); van der Smissen, 1991:97 (northwestern Germany); Papp and Józan, 1995:145 (Hungary: Síkfőkút oak forest); Skibińska, 1995:423, 425, 426, 427 (Poland: pine forest in Białowieża Primeval Forest); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae). – **As *Pemphredon baltica***: Schmidt, 1984:247 (Germany: Baden-Württemberg); Schmidt and Westrich, 1987:367 (Germany: Mainz area); Jacobs and Oehlke, 1990:125 and 126 (comparison with *Pemphredon lugubris*), 146 (unknown from German Democratic Republic); Schwammberger and Priesner, 1990:535 (Austria: Kärnten); Dollfuss, 1991:61 (in key to Sphecidae of North and Central Europe), 1995:951 (in revision of world *Pemphredon*); Schmid-Egger, Risch, and Niehuis, 1995:203 (Germany: summary of records from: Rheinland-Pfalz); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: endangered); Woydak, 1996:21 (Germany: Westfalen: summary of distribution and nesting habits); Schmidt and Schmid-Egger, 1997:24 (in checklist of German Sphecidae); F. Burger, Saure, and Oehlke, 1998:29 (Germany: in list of Sphecidae of Brandenburg), 38 (data insufficient to evaluate the endangerment); van der Smissen, 1998:65 (Germany: Schleswig-Holstein: Segrahn); Cölln and Jakubzik, 1999:29 (Germany: Rheinland-Pfalz: Keuper-Scharren southwest of Hungerburg); Kuhlmann, Wolf, and Woydak, 1999:568 (Germany: Nordrhein-Westfalen: endangered because of low population level); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Skibińska, 1999:95 (Poland:previously recorded from Białowieża Primeval Forest,), 96 (dominant sphecid species there); Blösch, 2000:169 (in Sphecid Fauna of Germany); Dressler, 2000:33 (Germany: Hessen: Darmstadt area); Dollfuss, 2001:269 (miscellaneous locality records); Dollfuss and Bitsch *in* Bitsch et al., 2001:74 (in Sphecid Fauna of Western Europe); Ohl et al., 2001:141 (distribution in Germany by provinces); Skibińska, 2001:219 (Poland: Białowieża Primeval Forest); van der Smissen, 2001:62 (Germany: Schleswig-Holstein: extremely rare); Kuhlmann, 2002:66 (Germany: Bayern: National Park Bayerischer Wald); Söderman and Vikberg, 2002:50 (in list of Aculeata of Finland); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); von der Heide and Metscher, 2003:103 (Germany: Niedersachsen: Emsland area); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: probably endangered); Wiśniowski, 2003:187 (Poland: summary of locality records); Wiśniowski and Werstak, 2003:76 (Poland: Pieniny National Park); Bergsten, Nilsson, and Hellquist, 2004:7 (Sweden: Västerbotten: Nordmaling); Buck, 2004:24 (Canada: in checklist of Sphecidae of Ontario); Esser, Jakubzik, Sonnenburg, and Woydak, 2004:263 (Germany: in checklist of Sphecidae of Nordrhein-Westfalen); Klein and Lefeber *in* Peeters, van Achterberg, et al., 2004:412 (in Wasp and Ant Fauna of Netherlands); Kuhlmann, 2004:230 (Germany is responsible for preservation of this species on its territory); van Achterberg and Peeters, 2004:32 (in checklist of Sphecidae of Netherlands); Wiśniowski, 2004:40 and

58 (in checklist of Polish Sphecidae); Burger, 2005:34 (Germany: Thüringen); Saure, 2005:18 (Germany: Berlin); Straka, 2005a:399 (critically endangered in Czech Republic); Theunert, 2005a:18 (Germany: in checklist of Sphecidae of Niedersachsen and Bremen); Venne and Bleidorn, 2005:43 (Germany: Nordrhein-Westfalen: Moosheide Nature Reserve); Gayubo, González, de la Nuez, Asís, and Tormos, 2006:210 (first record from Spain: Cantabria: Liencres); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:455 (recorded from Spain: Cantabria, by Gayubo et al., 2006); Budrys, 2007:63 (first records from Lithuania: Anykščiai District: Šimoni Giria at 55°42'27"N 25°14'14"E; Jurbarkas District: Viešvilė Nature Reserve at 55°07'27"N 22°24'41"E, Kaskalnio Miškas at 55°07'28"N 22°24'40"E; Varėna District: Margionys forestry at 54°00'N 24°17'E, Puvočiai area at 54°06'00"N 24°19'26"E); Jacobs, 2007:65, 71 (in key to Crabronidae of Germany); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Venne, Bleidorn, and Lauterbach, 2007:302 (Germany: Nordrhein-Westfalen: Bielefeld); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia, known from Bohemia and Slovakia only), 214 (Bohemia: Jirni, Praha – Košiře; Slovakia: Lysica, Mikulašov); Theunert, 2008:69 (Germany: map of distribution in Niedersachsen and Bremen); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:28 (known from Norway) 71 (Norway: locality records); Esser, Fuhrmann, and Venne, 2010:37 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Johansson, 2010:121 (Sweden: Småland: upper Emå river valley); Józan, 2010:254 (Hungary: Somogy County); Saure, 2010b:176 (Germany: Berlin-Reinickendorf: airport Tempel and Flughafensee Protected Area); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: very rare); Schmidt, 2010:138 (Germany: Bayern: collected along Main-Donau canal); van der Smissen, 2010a:347 (Germany: Schleswig-Holstein: Segrahn Heideweg); Burger, 2011a:288 (Germany: in red list of Sphecidae *sensu lato* of Thüringen); Theunert, 2011a:21 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:158 (Germany: Hessen: not endangered); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Wiśniowski and Szczepko, 2013:45 (Poland: Kampinos National Park near Warszawa); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Bleidorn, Gerth, Hopfe, et al., 2016:10 (Germany: Sachsen: Trages circa 20 km south of Leipzig); Ratzlaff, 2016:27 (Canada: British Columbia: from Dollfuss, 1995 and Buck, 2004); Jansen, 2017:9 (Germany: Sachsen: Leipzig); Mokrousov, 2017e:248 (in catalog of Pemphredoninae of Russia); Carminati, Mora, and Cretin, 2019:23 (France: in list of Sphecidae *sensu lato* of Franche-Comté); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:108 (in revision of Sphecidae *sensu lato* of Europe).

Pemphredon fennica Merisuo *in* Merisuo and and Valkeila, 1972:14, ♀ (as *fennicus*, incorrect original termination). Holotype: ♀, Finland: Kajaani: Suomussalmi, Ruhtinansalmi (Turku). Synonymized with *Pemphredon baltica* by Dollfuss, 1995:951 – Merisuo, 1972a:93 (description of ♂); Lomholdt, 1975c:94 (in Sphecid Fauna of Fennoscandia and Denmark); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Vikberg, 1986b:75 (Finland); Dollfuss, 1991:61 (in key to Sphecidae of North and Central Europe); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:113 (in revision of Sphecidae *sensu lato* of Europe).

3. *beaumonti* Hellén

Pemphredon beaumonti Hellén, 1955b:65, ♀. Holotype: ♀, Finland: Taipalsaari (Helsinki). – Hellén, 1956:45 (recorded from Finland); de Beaumont, 1964a:295 (taxonomic history, diagnostic characters), 1964c:102 (in Sphecid Fauna of Switzerland); Gauss and Perraudin, 1970:360 (first record from Germany: Baden-Württemberg: Wittental); Oehlke, 1970:736 (not recorded from German Democratic Republic); Merisuo, 1972b:190 (nest, description of ♂); Simon Thomas, 1972:1814 (France: Landes); Lomholdt, 1975c:96 (in Sphecid Fauna of Fennoscandia and Denmark);

R. Bohart and Menke, 1976:180 (in checklist of world Sphecidae); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Schmidt, 1984:247 (Germany: Baden-Württemberg); Vikberg, 1986b:75 (Finland); Jacobs and Oehlke, 1990:146 (unknown from German Democratic Republic); Pagliano, 1990:115 (in catalog of Italian Sphecidae: first record from Italy); Day, 1991:xvii (in summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:61 (in key to Sphecidae of North and Central Europe); Luig, 1993:42 (Estonia); Dollfuss, 1995:953 (in revision of world *Pemphredon*); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna, presence in Italy needs confirmation); Schmid-Egger, Risch, and Niehuis, 1995:203 (Germany: summary of records from: Rheinland-Pfalz); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: probably endangered); Schmidt and Schmid-Egger, 1997:24 (in checklist of German Sphecidae); Luig and Voolma, 1999:176 (Estonia: Lohusalust); Majzlan, Rychlík, and Deván, 1999:146 (first record from Slovakia: Čenkovská Step Nature Reserve); Blösch, 2000:169 (in Sphecid Fauna of Germany); Dollfuss and Bitsch *in* Bitsch et al., 2001:77 (in Sphecid Fauna of Western Europe); Ohl et al., 2001:141 (distribution in Germany by provinces); Söderman and Vikberg, 2002:50 (in list of Aculeata of Finland); Deván, 2004:147 (western Slovakia: Lúka); Kuhlmann, 2004:230 (Germany is responsible for preservation of this species on its territory); Majzlan and Deván, 2004:33 (Slovakia: Malacky-Široké, actually *Pemphredon lugubris*); Gusenleitner, 2005:1204 (first record from Austria: Tirol: Puschin at 47°06'N 10°41'E); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:455 (first recorded from Austria by Gusenleitner, 2005); Jacobs, 2007:65, 71 (in key to Crabronidae of Germany); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia), 214 (records from Slovakia by Majzlan et al, 1999, and Deván, 2004, need confirmation; record by Majzlan and Deván, 2004, is a misidentification); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: very rare); van der Smissen, 2010c:397 (Sweden: Södermanland: Ören)Pankov, 2013:230 (Russia: Ivanovo Oblast'); Bitsch, 2014:408 (France: Alpes-Maritimes: Casterino); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:109 (in revision of Sphecidae *sensu lato* of Europe).

4. *bocae* (R. Bohart)

Cemonus bocae R. Bohart, 1993b:218, ♀, ♂. Holotype: ♀, USA: California: Nevada County: Boca (UCD). – Dollfuss, 1995:954 (in revision of world *Pemphredon*).

5. *borealis* Q. Li and He

Pemphredon borealis Q. Li and He, 1998e:475, ♀. Holotype: ♀, China: Shandong: Mount Tai (Shandong Agricultural University, Shandong, China). – Bashir, L. Ma, and Q. Li, 2020b:4 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

6. *brevirugosa* Q. Li and Yang

Pemphredon brevirugosa Q. Li and Yang *in* Wu, Zhou, Q. Li, and Yang, 2003:810 and 818, ♀. Holotype: ♀, China: Fujian: Guatun: Mount Wuyi (Zhejiang Agricultural University). – Bashir, L. Ma, and Q. Li, 2020b:5 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

7. *chaoi* Q. Li and He

Pemphredon chaoi Q. Li and He, 1997a:111, ♂. Holotype: ♂, China: Yunnan: Lushui (Zool. Inst. Acad. Sinica, Beijing). – Bashir, L. Ma, and Q. Li, 2020b:5 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

8. *confertim* W. Fox

Pemphredon confertim W. Fox, 1892h:311, ♂. Holotype: ♂, USA: Washington: Easton (USNM). – Dalla Torre, 1897:356 (in catalog of world Hymenoptera); Ashmead, 1899d:223 (in checklist of North American Crabronidae); Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera); R. Bohart

and Menke, 1976:181 (in checklist of world Sphecidae); Krombein, 1979b:1603 (in catalog of North American Hymenoptera); Spofford, Kurczewski, and Downes, 1989:259 (summary of previous records for nest parasite *Senotainia trilineata* (Wulp), a miltogrammine fly); Finnamore, 1994:210 (Canada: Alberta: Wagner Natural Area 8 km W Edmonton, as *confirtim*); Dollfuss, 1995:956 (in revision of world *Pemphredon*); Finnamore, 1997:886 (Canada: Yukon, misspelled *confirtim*); Ratzlaff, 2016:27 (Canada: British Columbia: from Dollfuss, 1995).

Pemphredon errans Rohwer, 1917c:99, ♀, ♂. Holotype: ♀, USA: California: Monterey County: no specific locality (USNM). Synonymized with *Pemphredon confertim* by R. Bohart *in* Bohart and Menke, 1976:181. – Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera); F. Parker and R. Bohart, 1966:94 (California: Davis, Nevada: Verdi; nest parasites: *Omalus janus* (Haldeman) and *O. purpuratus* Provancher, Chrysidide, *Anthrax irroratus* Say, Bombyliidae, *Perithous mediator neomexicanus* Viereck, Ichneumonidae, and *Senotainia trilineata* Vanderwump, Sarcophagidae).

9. *diervillae* Iwata

Pemphredon diervillae Iwata, 1933c:45, ♀, ♂. Holotype: ♀, Japan: Honshu: Settsu: Katioji (Entomol. Lab. Kyoto Imper. Univ.). – Iwata, 1937a:138 (nesting habits); Tsuneki, 1951a:189, 190 (in key to *Pemphredon* of Japan and adjacent regions; as *deirvillae*), 204 (in revision of *Pemphredon* of Japan and adjacent regions), 1952a:71 (nesting habits); Iwata, 1955:30 (egg size, number of oocytes), 1960:210 (number of ovarioles and oocytes, egg size); Tsuneki and Shimoyama, 1963:49 (Japan: Towada Prefecture); Haneda, 1964a:39 (Japan: Fukui Prefecture); Tsuneki, 1964e:28, 29 (in key to *Pemphredon* of Japan); Haneda, 1968b:55 (Japan: Nagano Prefecture: Ina District); Itami, 1968a:15 (Japan: Yamagata Prefecture: foot of Mount Iide); Nambu, 1968b:24 (Japan: Saitama Prefecture); Nishino, 1968:25 (Japan); Haneda, 1969:69 (Japan: Yamanashi Prefecture); Itami, 1969:50 (Japan: Niigata Prefecture); Nozaka, 1969:65 (nest parasite: *Omalus punctatus* (Uchida), a chrysidid); Tsuneki, 1969i:60 (Japan: Fukui Prefecture: Taichôdzi temple); Haneda, 1970:12 (Japan: Akita Prefecture); Tsuneki, 1970b:10 (central Japan); Tano, 1971:81 (Japan: Shikoku: Mount Tsurugi); Yamada, 1971:36 (Japan: Aichi Prefecture); Nambu, 1972e:90 (Japan: Saitama Prefecture), 1973a:151 (Japan: Saitama Prefecture); Suda, 1973:122 (Japan: Yamanashi Prefecture); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Nambu, 1975b:65 (Japan: Saitama Prefecture); Tsuneki, 1979d:10 (Japan); Paik, 1985:197 (in list of Sphecidae of Korea, as *dievillae*); Steiner, 1986:99 (references to papers on nesting habits); Hoshiba and Imai, 1993:467 (chromosome number n = 4); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:401, 402 (in key to Sphecidae of Russian Far East); Dollfuss, 1995:957 (in revision of world *Pemphredon*), 2001:270 (Japan: Mount Koya); Kurokawa, 2003:61 (Japan: city of Fukui: Egamichou); Ohl and Linde, 2003:149 (number of ovarioles); Haneda, Nosaka, Tano, Kurokawa, and Murota, 2004:31 (Japan: Gifu Prefecture); Suda, 200438 (Japan: Yamanashi Prefecture); Haneda, Inoue, Nozaka, Tano, Kurokawa, and H. and T. Murota, 2005:65 (Japan: Fukui Prefecture: Mount Monju); Haneda, Nozaka, Tano, Kurokawa, and Murota, 2005:45 (Japan: Gifu Prefecture); Negoro, Haneda, and Tano, 2005:45 (Japan: Toyama Prefecture); Haneda, Nozaka, Tano, Kurokawa and Murota, 2006a:21 (Japan: Toyama Prefecture); Ohkusa, 2006a:24 (Japan: Honshu: Gifu Prefecture); Nambu, 2006:247 (Japan: Tokyo: Imperial Palace garden); S. Takahashi and Haneda, 2008b:44 (Japan: Hokkaido: Sapporo); S. Tanaka, 2008:38 (Japan: Yamaguchi Prefecture); Okhusa and Tajima, 2010:12 (Japan: Island of Honshu: Shiga Prefecture); Terayama, 2012:6, 7 (in key to Pemphredonini of Japan), 12 (description), 19 (in checklist of Pemphredonini of Japan); J.-K. Kim, 2014:441 (in catalog of Sphecidae *sensu lato* of Korean Peninsula), 451 (recorded from Korea but not occurring there).

10. *enslini* Wagner

Dineurus austriacus Rasse *enslini* Wagner, 1932:227, sex not stated. Syntypes: Germany: Bayern: Zirndorf near Fürth and Mecklenburg: Schwerin (originally A. Wagner collection, destroyed during World War II, see Merisuo and Valkeila, 1972:11). − **As *Dineurus enslini***: Blüthgen, 1937:235 (full species status, Germany: Saale River valley: Kunitzburg). – **As *Pemphredon austriaca* f. *enslini***: van Lith, 1947:105 (new combination, new status, Netherlands, as *austriacus*); Babiy, 1964:115 (Austria: Land Salzburg, as *austriacus*); van der Smissen, 1991:97 (nw. Germany,

as *austriaca* f. *enslini*), 1993:129 (northwestern Germany, as *austriaca* f. *enslini*). – **As *Pemphredon enslini***: Wolf, 1959b:27 (full species status, known from Germany, but not from Nassau); Valkeila and Leclercq, 1970:map166 (distribution in Belgium); Merisuo and Valkeila, 1972:11 (full species, redescription); Valkeila and Leclercq, 1972:696 (full species status), 702 (locality records); Lefeber, 1974:76 (Belgium: Gruitrode); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Jacob-Remacle, 1976:239 (Belgium: Liège, nest structure and mortality); Marchal and Leclercq, 1979:9 (Belgium: Gembloux); Jacob-Remacle and Leclercq, 1980:193 (Belgium: gardens in Liège); Richards, 1980:68, 69 (in key to Sphecidae of British Isles); Leclercq, 1982a:124 (Belgium: Liège); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Schmidt, 1984:248 (Germany: Baden-Württemberg); Archer, 1987:111 (Great Britain: Yorkshire); Jacobs, 1989:7 (Germany: Mecklenburg-Vorpommern); Jacobs and Oehlke, 1990:122 (not collected in German Democratic Republic after 1960), 125 (comparison with *Pemphredon austriaca*), 146 (citation of Wagner, 1932); Day, 1991:xviii (in summary of European Endangered Hymenoptera Lists); Dollfuss, 1995:977 (in revision of world *Pemphredon*, as new synonym of *Pemphredon lethifer*); Schmid-Egger, 1995:63 (Germany: northwestern Baden-Württemberg); Schmidt, Schmid-Egger, and Doczkal, 1995:8 (relationship to *Pemphredon lethifer*, *wesmaeli*, *rugifer*, and *mortifer* is unclear); Archer, 1996b:121 (Great Britain: Yorkshire); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: not endangered); Schmidt and Schmid-Egger, 1997:24 (in checklist of German Sphecidae); Pauly, 1999:108 (in catalog of Belgian aculeates); Blösch, 2000:169 (in Sphecid Fauna of Germany); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); van der Smissen, 2003:61 (as valid species, in revision of European species of subgenus *Cemonus*); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: conservation status unknown); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Stolle et al., 2004:372 (Germany: Sachsen-Anhalt: in red list of Sphecidae); Wiśniowski, 2003:188 (first record from Poland: Gorlice), 2004:40 and 58 (in checklist of Polish Sphecidae); Burger, 2005:34 (Germany: Thüringen); Jacobs, 2005b:149 (Germany: Mecklenburg-Vorpommern); Straka, 2005a:402 (endangered in Czech Republic); Theunert, 2006:36 (most likely is a synonym of *Pemphredon austriaca*); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:455 (synonymied with *Pemphredon lethifer* by Dollfuss, but treated as valid species by van der Smissen, 2003, Wiśniowski, 2003, and Jacobs, 2005; France: Alpes-de-Haute-Provence: Saint-Etienne); Jacobs, 2007:67, 72 (in key to Crabronidae of Germany); Jansen and Kaluza, 2007:25 (Germany: northwestern Sachsen); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Venne, Bleidorn, and Lauterbach, 2007:302 (Germany: Nordrhein-Westfalen: Bielefeld); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia), 214 (synonymized with *Pemphredon lethifer* by Dollfuss, 1995, but resurrected by Smissen, 2003; Bohemia: Těchonice, Moravia: Bzenec, Hradec nad Moravici, Slovakia: Domica); Venne, 2009:111 (Germany: Nordrhein-Westfalen: Holte-Stukenbrock, associated with *Frangula alnus* Miller, Rhamnaceae); Esser, Fuhrmann, and Venne, 2010:37 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Mokrousov, 2010a:63 (Russia: Nizhniy Novgorod Oblast', Chuvash Republic: no specific localities), 2010b:100 (Russia: Nizhniy Novgorod Oblast': no specific localities); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Schmidt, 2010:138 (Germany: Bayern: collected along Main-Donau canal); van der Smissen, 2010a:347 (Germany: Schleswig-Holstein and Mecklenburg-Vorpommern: locality records), 2010b:386 (France: Ardèche: Les Reynauds, Saint-Maurice-d'Ibie, Valvignères,); Mokrousov, Berezin, and Egorov, 2011:79 (Russia: Chuvash Republic); Tischendorf, Frommer, Flügel et al., 2011:184 (Germany: not yet found in Hessen); Standfuss and Standfuss, 2012:427 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Wiśniowski and Szczepko, 2013:45 (Poland: Kampinos National Park near Warszawa); Bitsch, 2014:408 (regardes by most German authors as independent species; recorded from France by van der Smissen, 2010b); Stolle and Saure, 2016:924 (Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Jansen, 2017:9 (Germany: Sachsen: Leipzig); Mokrousov, 2017e:248 (in catalog of Pemphredoninae of Russia); Hallqvist, Hellqvist, and Stenmark, 2020:

123 (first record from Sweden: Stockholm); Kejval, Blažej, and Erhart, 2020:113 (western Czech Republic); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:112 (in revision of Sphecidae *sensu lato* of Europe).

11. *fabricii* (M. Müller)

Cemonus fabricii M. Müller, 1911:107, sex not stated (as *Fabricii*, incorrect original capitalization). Syntypes: Germany: Brandenburg: several unnamed localities (lost: Dollfuss, 1995:977). – A. Wagner, 1918:139 (as new synonym of *Pemphredon lethifer*). – **As *Dineurus fabricii***: Struve, 1937:149 (new combination, Germany: Island of Borkum); Schneid, 1941:1035 (Germany: Bayern: Bamberg area). – **As *Pemphredon fabricii*** (as full species if not stated otherwise): A. Wagner, 1932:229, 230 (new combination, in revision of European *Pemphredon* subgenus *Dineurus*, as form of *Pemphredon lethifer*), 1938a:119 (northwestern Germany, as *lethifer* forma *fabricii*); Paul, 1941:41 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area, as *lethifer* f. *fabricii*); Cavro, 1950:33 (France: Département du Nord); de Beaumont, 1951h:34 (Switzerland: Neuchâtel area; as *lethifer* f. *fabricii*); Tsuneki, 1951a:198 (in revision of *Pemphredon* of Japan and adjacent regions; as *lethifer fabricii*), 1952a:70 (nesting habits; as *lethifer fabricii*); Nouvel and Ribaut, 1953:180 (France: Haute-Garonne: Luchon, Saint-Béat; Hautes-Pyrénées: Cauterets); de Beaumont, 1954e:94 (Italy; as *lethifer fabricii*); Grandi, 1954:241 (Italy; as *lethifer Fabricii*); Aerts, 1955:61 (Germany: Rheinland); Ceballos, 1956:357 (in catalog of Hymenoptera of Spain); Bytinski-Salz, 1956:227 Turkey: Aydın, Finikie, Istanbul, Kemer; as *lethifer* f. *fabricii*); Bajári, 1957a:81, 83 (in key to Hungarian Sphecidae, as *lethifer* var. *fabricii*); Grandi, 1957:390 (Italy; as *lethifer Fabricii*); de Beaumont, 1958c:208 (Swiss National Park; as *lethifer fabricii*); Nouvel and Ribaut, 1958:15 (France: Pyrénées-Orientales: Banyuls-sur-Mer); Compte Sart, 1959:130 (Spain: Mayorca); de Beaumont, 1959a:32 (Italy; as *lethifer* f. *fabricii*); Diniz, 1959:26 (Portugal: seven localities); Wolf, 1959b:27 (Germany: Nassau); Hoop, 1961:64 (Germany: Schleswig Holstein: Kiel-Eichhof and Rosenkranz), 1963b:7 (Germany: Schleswig-Holstein: Wahlstedt); Tsuneki and Shimoyama, 1963:49 (Japan: Towada Prefecture; as *lethifer fabricii*); Ceballos, 1964:86 (in supplement to catalog of Spanish Sphecidae); B. Klug, 1965:134 (Germany: Baden-Württemberg: Freiburg im Breisgau area); Benno, 1967:37 (in checklist of Sphecidae of Netherlands); Lefeber, 1967a:138 (Belgium: Rekem), 1969c:233 (Netherlands: Sint Pietersberg = Montagne Saint Pierre); Schmidt, 1971b:41 (Germany: Rheinland-Pfalz: Gonsenheimer Wald, Mainzer Sand; as *lethifer* f. *fabricii*), 1971c:74 (Germany: Schleswig-Holstein; as *lethifer fabricii*); Balthasar, 1972:213, 214 (in Sphecid Fauna of Czechoslovakia, as *lethifer* form *fabricii*); Herrmann and Zinnert, 2002:26 (Germany: Baden-Württemberg: Bettenberg near Konstanz); van der Smissen, 2003:73 (as *lethifer fabricii*, in revision of European species of subgenus *Cemonus*); Burger, 2005:35 (Germany: Thüringen); Jacobs, 2005b:149 (full species status; Germany: Mecklenburg-Vorpommern: many localities); Herrmann, 2006:2 (nesting exclusively in galls of *Lipara*); Liebig, 2006:39 (Germany: Sachsen: Muskauer Heide); Saure, 2006:133 (Germany: Berlin); Wiesner, 2006:237 (Germany: first record from Brandenburg: widely distributed in Niederlausitz area, is a full species); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:455 (synonymized with *Pemphredon lethifer* by Dollfuss, 1995, but regarded as subspecies of *lethifer* by van der Smissen, 2003, and as full species by Jacobs, 2005a, b); Jacobs, 2007:67, 73 (in key to Crabronidae of Germany); Jansen and Kaluza, 2007:25 (Germany: northwestern Sachsen, recognition character); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Theunert, 2007c:97 (Germany: Niedersachsen: Helstorfer Moor); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia), 215 (valid species, recognition characters, locality records from Bohemia, Moravia, and Slovakia); Theunert, 2008:69 (Germany: map of distribution in Niedersachsen and Bremen); Straka, Dvořak, and Bogusch, 2009:263 (Czech Republic: Jizerské Mountains and Frýdlant region); Esser, Fuhrmann, and Venne, 2010:37 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Mokrousov, 2010a:63 (Russia: Nizhniy Novgorod Oblast': no specific localities); Saure, 2010b:176 (Germany: Berlin-Reinickendorf: airport Tempel and Flughafensee Protected Area); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: rare); Smetana, Roller,

Beneš, Bogusch, Dvořák, Holý, Karas, Macek, Straka, Šima, Tyrner, Vepřek, and Zeman, 2010:102 (Western Slovakia: recorded from Borská Nížina); van der Smissen, 2010a:348 (Germany: Schleswig-Holstein and Mecklenburg-Vorpommern: locality records), 2010b:386 (France: Drôme: Dieulefit); Theunert, 2011a:221 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:159 (Germany: Hessen: not endangered); Ziska and Saure, 2011:109 (Germany: Berlin: Tegeler Flieβ valley); Saure, 2012b:230 (Germany: Berlin-Spandau: Spandauer Forst); Standfuss and Standfuss, 2012:427 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Mokrousov, Ruchin, and Egorov, 2013:203 (Russia: Mordovian Republic: Mordovian State Nature Reserve); Saure, 2013:21 (Berlin: Treptow-Köpenick: Gosener Wiesen); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Tischendorf, 2013:11 (Germany: Hessen: Riedwiesen von Wächterstadt Nature Reserve, Wiesbaden); Wiśniowski and Piotrowski, 2013:22 (Poland: Poleski National Park); Wiśniowski and Szczepko, 2013:45 (Poland: Kampinos National Park near Warszawa); Bitsch, 2014:408 (recorded from France by van der Smissen, 2010b); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Bogusch, Astapenková, and Heneberg, 2015:6 (Czech Republic: reared from galls of *Lipara* sp., Chloropidae), 10 (nest structure), 13 description of larva); Bleidorn, Gerth, Hopfe, et al., 2016:10 (Germany: Sachsen: Trages circa 20 km south of Leipzig); Mokrousov and Popov, 2016:587 (Russia: Krasnodarskiy Kray); Stolle and Saure, 2016:924 (Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Wiśniowski, 2016:129 (Poland: Ojców National Park); Bogusch, Havelka, Astapenková, and Heneberg, 2017:2 (nesting habits); Mokrousov, 2017e:248 (in catalog of Pemphredoninae of Russia); Mokrousov, Proshchalykin, Aliyev, and Maharramov, 2019:15 (Azerbaijan: Nakhichevan Autonomous Republic); Ruchin and Antropov, 2019a:13238 (Russia: Mordovian State Nature Reserve), 2019b:162 (in Mordovian State Nature Reserve known from single specimen); Heneberg, Bogusch, Astapenková, and Řezáč, 2020:unnumbered p. 2 (neonicotinoid insecticides hinder the pupation and metamorphosis into adults); Kejval, Blažej, and Erhart, 2020:113 (western Czech Republic); Falk and Early, 2021:23 (first record from Great Britain: Hempshire: New Forest), 26 (in key to British *Pemphredon*; blunt claws are a unique character); Herb and Schmid-Egger, 2021:9 (Germany: Bayern: Kaufbeuren area); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Saure, 2021:83 (Germany: Brandenburg: Nature Reserve Ferbitzer Bruch near Potsdam); Bogusch and Heneberg, 2022:985 (reared from artificial *Lipara* nests in Czech Republic); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:113 (in revision of Sphecidae *sensu lato* of Europe).

12. *fischeri* Dollfuss

Pemphredon fischeri Dollfuss, 1993b:699, ♂. Holotype: ♂, USA: California: Siskiou County: McBride Springs (CAS). – Dollfuss, 1995:959 (in revision of world *Pemphredon*).

13. *flavistigma* Thomson

Pemphredon flavistigma Thomson, 1874:192, ♀. Holotype: ♀, Sweden: Småland: Sällsynt (Lund). – Ed. André, 1888:198 (in revision of Sphecidae of Europe and Algeria), 15* (bibliographic references); Westerlund, 1896:28 (Finland: no specific locality); Dalla Torre, 1897:356 (in catalog of world Hymenoptera); Aurivillius, 1904:260 (in revision of Swedish Sphecidae); W. Schulz, 1904b:92 (Germany: Nassau); Schmiedeknecht, 1907:207 (in key to Hymenoptera of Central Europe); Hellén, 1926:93 (recorded from Finland); Barovskij, 1929:148 (first record from Russia: near Sankt Petersburg); Schmiedeknecht, 1930:668 (in keys to Hymenoptera of North and Central Europe); Pulkkinen, 1931:90 (in revision of Sphecidae of Finland); Gussakovskij, 1932:8 (Russia: Primorskiy Kray, also Sankt Petersburg area and Kostroma); Forsius *in* Forsius and Hellén, 1935:11 (in checklist of Hymenoptera of Finland); Merisuo, 1936:120 (description of ♂, locality records from Finland), 123 (illustrations of taxonomically important body parts); Šnoflák *in* Zavadil and Šnoflák, 1948:51 (in key to Sphecidae of Czechoslovakia, as *flavostigma*, not yet found in Czechoslovakia); Tsuneki, 1951a:171 (in key to *Pemphredon* of Japan and adjacent regions), 174 (Japan; redescription), 1952a:64 (nesting habits); Kjellander, 1954b:246 (Sweden); Tsuneki, 1954c:54 (true ♂ described); Hellén, 1955a:124 (Finland: Hattula, Luopioinen, Ruokolahti, Suomussalmi); Wolf, 1959b:26 (Germany: Nassau);

Noskiewicz and Puławski, 1960:43, 44 (in key to Polish Sphecidae, not yet found in Poland); Valkeila, 1962b:67 (southwestern Finland); Wengris, 1962:203 (Lithuania: Vilnius area); de Beaumont, 1964c:102 (in Sphecid Fauna of Switzerland, not recorded from Switzerland); Tsuneki, 1964e:28, 29 (in key to *Pemphredon* of Japan), Balthasar, 1972:210 (in Sphecid Fauna of Czechoslovakia: may be expected in the country); Kofler, 1972:110 (Austria: eastern Tirol); Lomholdt, 1975c:92 (in Sphecid Fauna of Fennoscandia and Denmark); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Kazenas, 1980e:86 (Russia: Primorskiy Kray); Tsuneki, 1982b:14 (known from Korea); Dollfuss, 1983a:76 (endangered in Niederösterreich, Austria), 79 (endangered in Kärnten, Austria), 80 (endangered in Tirol, Austria), 1983b:6 (in catalog of Sphecidae of Austria); Kvamme and Axelsson, 1983:58 (Norway); Paik, 1985:197 (in list of Sphecidae of Korea); Nemkov, 1986:95 (Russia: Siberia: Irkutsk Oblast'); Vikberg, 1986b:75 (Finland); Weiffenbach, 1989:105 (Germany: Hessen: Gießen area); Schwammberger and Priesner, 1990:535 (Austria: Kärtnen); Day, 1991:xviii (in summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:61 (in key to Sphecidae of North and Central Europe); Budrys, 1992:24 (in list of Sphecidae of Lithuania); Nilsson, 1992:54 (Sweden); Dollfuss, 1994:99 (endangered in Austria); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:401 (in key to Sphecidae of Russian Far East); Dolfuss, 1995:959 (in revision of world *Pemphredon*); Voblenko, Gorobchishin, and Nesterov, 1996:14 (Ukraine: Polesye Region); Celary, 1997:57 (in checklist of Animals of Poland); Schmidt and Schmid-Egger, 1997:24 (may occur in Germany); Wiśniowski and Kowalczyk, 1998:220 (Poland: Góry Świętokrzyskie: Święty Krzyż); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Dollfuss, 2001:270 (miscellaneous locality records); Dollfuss and Bitsch *in* Bitsch et al., 2001:78 (in Sphecid Fauna of Western Europe); Ohl et al., 2001:142 (recorded from Germany but not occurring there); Skibińska, 2001:219 (Poland: Białowieża Primeval Forest); Shlyakhtenok and Skibinska, 2002:33 (Belorussia: no specific locality); Söderman and Vikberg, 2002:50 (in list of Aculeata of Finland); Wiśniowski, 2002:69 (Poland: Ojców National Park), 2003:188 (Poland: summary of locality records); Wiśniowski *in* Dylewska and Wiśniowski, 2003:138 (Poland: Ojców National Park); Dollfuss, 2004a:117 (Czech Republic: Trisov 20 km S České Budějovice); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Wiśniowski, 2004:40 and 58 (in checklist of Polish Sphecidae); Kofler, 2005:168 (Austria: previous record from Tirol was in error); Nemkov, 2005a:145 (Russia: Island of Sakhalin); Budrys, 2007:63 (Lithuania: Anykščiai District: Skiemonys area at 55°23'38"N 25°16'20"E); Wiśniowski, 2005b:340 (Poland: Ojców National Park, of primary faunistic value); Jacobs, 2007:68, 70 (in key to Crabronidae of Germany); Nemkov, 2007c:997 (in Appendix to Key to identification of Sphecidae of Far East of Russia), 2008b:18 (in catalog of Crabronidae of Asiatic Russia); Wiśniowski, 2008:635 (Poland: Ojców National Park, collected in 1992-1993); Nemkov, 2009b:64 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia), 2009c:235 (Russia: Primorskiy Kray: Lazovsky Nature Reserve); U. Frommer, 2009a:28 (Germany: in checklist of Sphecidae of Hessen, as questionable species), 28 (does not occur in Germany); Johansson, 2010:121 (Sweden: Småland: upper Emå river valley); J. Kim and Yang, 2010:147 (in checklist of Korean Pemphredoninae); Mokrousov, 2010a:63 (Russia: Kirov and Nizhniy Novgorod Oblast's: no specific localities); Rudoiskatel', 2010:154 (Russia: central and southern Ural Mountains); Tischendorf, Frommer, Flügel et al., 2011:184 (Germany: does not occur in Hessen or in Germany); Rudoiskatel', 2011d:241 (Russia: central Ural Mountains); Nemkov, 2012c:437 (in catalog of Crabronidae of Russian Far East); Terayama, 2012:5 (in key to Pemphredonini of Japan), 13 (description), 19 (in checklist of Pemphredonini of Japan); Akulov and Proshchalykin, 2013:113 (Russia: Siberia: Krasnoyarsk Kray: near Lesosibirsk); Shlyakhtenok, 2013:147 (in annotated catalog of aculeate wasps of Belorussia); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); J.-K. Kim, 2014:442 (in catalog of Sphecidae *sensu lato* of Korean Peninsula); Wiśniowski, 2016:129 (Poland: Ojców National Park); Mokrousov, 2017e:248 (in catalog of Pemphredoninae of Russia); Kejval, Blažej, and Erhart, 2020:113 (western Czech Republic); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:114 (in revision of Sphecidae *sensu lato* of Europe).

14. *foxii* Rohwer

Pemphredon foxii Rohwer, 1917c:101, ♀. Holotype: ♀, USA: New Jersey: Camden County: no specific locality (USNM). – Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Krombein, 1979b:1603 (in catalog of North American Hymenoptera); Finnamore, 1994:210 (Canada: Alberta: Wagner Natural Area 8 km W Edmonton); Ahlstrom, 1995:108 (in checklist of insects of North Carolina); Dollfuss, 1995:961 (in revision of world *Pemphredon*); Buck, 2004:24 (Canada: in checklist of Sphecidae of Ontario).

Pemphredon virginiana Rohwer, 1917c:101, ♀, ♂. Holotype: ♀, USA: Virginia: Falls Church (USNM). Synonymized with *Pemphredon foxii* by Dollfuss, 1995:961. – Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (in catalog of North American Hymenoptera); Krombein, 1952b:178 (USA: West Virginia: Lost River State Park), 1958f:189 (in supplement to catalog of North American Hymenoptera: West Virginia, Wisconsin; prey: *Cinara* sp., an aphid); ; R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Krombein, 1979b:1603 (in catalog of North American Hymenoptera).

15. *fuscipennis* (Cameron)

Cemonus fuscipennis Cameron, 1897a:83, ♀. Syntypes: ♀, India: Uttar Pradesh: Mussoorie (OXUM). – Rothney, 1903:105 (India: West Bengal: Barrackpore). – **As *Pemphredon fuscipennis***: Bingham, 1897:265 (new combination, redescription); Paiva, 1907:15 (India: Uttar Pradesh: Mussoorie); Merisuo and Valkeila, 1972:11 (redescription); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Pu, 1986:8 (China); Dollfuss, 1995:962 (in revision of world *Pemphredon*); S. Gupta, 1995:85 (India: Uttar Pradesh), 1997:102 (India: Uttar Pradesh: Nanda Devi Biosphere Reserve); Dollfuss, 2001:270 (India: Uttar Pradesh); Li and He, 1997d:300, 301 (in key to Chinese *Pemphredon*); S. Gupta, 2004:26 (India: Uttaranchal: Uttarkashi District); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Bashir, L. Ma, and Q. Li, 2020b:3, 6 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

16. *grinnelli* (Rohwer)

Ceratophorus grinnelli Rohwer, 1910c:104, ♀ (as *gennelli*, incorrect original spelling because named after F. Grinnell, the collector; Article 32c; Dollfuss, 1995:965, incorrectly claims that the name is not mentioned in the original description). Holotype: ♀, USA: California: Pasadena (USNM). – **As *Pemphredon grinnelli***: Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (new combination, in catalog of North American Hymenoptera); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae), 1976:627 (*grinnelli* is correct spelling); Krombein, 1979b:1604 (in catalog of North American Hymenoptera); Dollfuss, 1995:963 (in revision of world *Pemphredon*, as *gennelli*); Blades and Maier, 1996:72 (Canada: British Columbia: Osoyoos - Mount Kobau area at 119°40'W 49°05'N, as *grinelli*); Ratzlaff, 2016:27 (Canada: British Columbia: from Krombein, 1979 and Blades and Masier, 1992).

Ceratophorus grennelli utahensis Rohwer, 1911b:562, ♀. Holotype: ♀, USA: Utah: Beaver Valley (originally in Museum of Brooklyn Institute, now USNM). Synonymized with *Pemphredon grinneli* by Bohart and Menke, 1976:181. – Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (in catalog of North American Hymenoptera).

Cemonus giffardi Rohwer, 1917a:246, ♀. Holotype: ♀, USA: California: Alameda County: no specific locality (USNM). Synonymized with *Pemphredon grinnelli* by R. Bohart *in* Bohart and Menke, 1976:181. – Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (in catalog of North American Hymenoptera); Evans, 1958c:129 (description of larva); F. Parker and R. Bohart, 1966:94 (California: Davis, Nevada: Verdi; nest parasites: *Habrocytus analis* Ashmead, Pteromalidae, *Eurytoma stigma* Ashmead, Eurytomidae, *Omalus trilobatus* Bohart and Campos and *O. cressoni* Aaron, Chrysididae, *Anthrax irroratus* Say, Bombyliidae).

17. *gusenleitneri* Dollfuss

Pemphredon gusenleitneri Dollfuss, 1993b:700, ♂. Holotype: ♂, Laos: Vientiane Province: Phou Kou Khouei, Ban Van Eue (Bishop Mus.). – Dollfuss, 1995:966 (in revision of world *Pemphredon*).

18. *inornata* Say

Pemphredon inornata Say, 1824:339, sex not stated (as *inornatus*, incorrect original termination). Holotype or syntypes: USA: Pennsylvania: no specific locality (destroyed). – Le Conte, 1859a:229 (original description copied); Cresson, 1862:236 (in catalog of North American Hymenoptera); Kohl, 1890a:52 (in review of *Pemphredon*); W. Fox, 1892h:312 (in revision of North American Pemphredonini); Dalla Torre, 1897:356 (in catalog of world Hymenoptera); Snow, 1906:135 (Arizona: Oak Creek 20 mi. southwest of Flagstaff, as *inordinatus*); H. Smith, 1908b:393 (in revision of Nebraskan Sphecidae); J. Smith, 1910:675 (in new list of insects of New Jersey, as *inoratus*); Rohwer, 1916b:690 (in catalog of Hymenoptera of Connecticut); Mickel, 1918b:428 (in catalog of Nebraskan Sphecidae); Britton, 1920:341 (in checklist of insects of Connecticut); Rohwer *in* Viereck, 1925:690 (in key to Sphecidae of Connecticut: North Haven); J.Ch. Bradley, 1928:1014 (in catalog of New York Sphecidae); Brimley, 1938:446 (North Carolina: Bryson City, Raleigh, Tarboro); Rau, 1949:326 (nesting habits); Strickland, 1947:129 (Canada: Alberta); Rau, 1949:326 (nesting habits); Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (in catalog of North American Hymenoptera); Evans, 1958c:128 (larval description by Packard, 1896); Koerber and Medler, 1958:55 (Wisconsin, nesting in trap-nests); Lomholdt, 1975c:99 (in Sphecid Fauna of Fennoscandia and Denmark); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Guichard, 1977:252 (Great Britain: Surrey); Schmidt, 1977:97 (Germany: Baden-Württemberg: Enzklösterle in Schwarzwald); Haeseler, 1978b:63 (Germany: Niedersachsen: a bog near Oldenburg), 1978c:195 (Germany: Friesian Islands: Island of Borkum); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Schwammberger, 1978:418 (Germany: Württemberg); Haeseler, 1979:10 (Germany: Niedersachsen: 10 km S Oldenburg); Krombein, 1979b:1604 (in catalog of North American Hymenoptera); Marchal and Leclercq, 1979:9 (Belgium: Gembloux); Richards, 1979:400 (British Channel Islands); Schmidt, 1979a:55 (Germany: Ost-Holstein); Schwammberger, 1979:116 (Germany: Nordrhein-Westfalen: Gildehauser Venn Nature Reserve); Tsuneki, 1979d:10 (Japan); Jacob-Remacle and Leclercq, 1980:193 (Belgium: gardens in Liège); Pagliano, 1980:131 (Italy: Veneto); Petit, 1980:42 (Belgium: Aayen); Westrich, 1980:631 (Germany: Baden-Württemberg: Tübingen area); Dollfuss and Ressl, 1981:321 (Austria: Niederösterreich: Scheibbs District); Woydak, 1981:37 (Germany: Westfalen: Hamm); Axelsson, 1982:79 (Sweden); Haeseler, 1982c:63 (Germany: Island of Mellum); Leclercq, 1982a:124 (Belgium: Liège), 1982e:100 (Norway: Sør-Trøndelag: Trondheim); Silvestre de Sacy, 1982:4 (France: Côte-du-Nord: Paimpol area); Tsuneki, 1982b:3 (Korea), 14 (known from Korea); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Jacob-Remacle and Jacob, 1983:242 (Belgium: Liège Province: fagne de Malchamps near Spa); Lefeber, 1983a:84 (Netherlands: Waddendistrict: northern coast sand dunes, islands of Terschelling, Ameland, and Schiermonnikoog); Riemann, 1983:81 (Germany: Bremen-Daverden area); Chevin and Silvestre de Sacy, 1984:6 (France: Yvelines Department); Haack, Tscharntke, and Vidal, 1984:131 (Germany: Hamburg area); Jacob-Remacle, 1984:260 (Belgium: urban center of Liège); Janzon and Svensson, 1984:183 (Sweden: Island of Öland); Lefeber, 1984:29 (Netherlands: Maastricht); Mingo and Gayubo, 1984:108 (Spain); Schmidt and Westrich, 1984:240 (Germany: Rheinland-Pfalz: Bad Münster); Veenendaal, 1984:18 (Netherlands: Amsterdam); Haeseler, 1985a:350 (Germany: Schleswig Holstein), 355 (prey; as *inornatum*), 1985c:571 (Germany: Friesian Islands), 577 (Island of Mellum); Lefeber, 1985:87 (Netherlands: southern Limburg); Jacob-Remacle, 1985:408 (Belgium); Józan, 1985b:56 (Hungary south of Lake Balaton), 77 (floral records), 83 (ecological and zoogeographic characteristics); Islamov, 1985:529 (Uzbekistan: Tashkent Oblast'); Paik, 1985:197 (in list of Sphecidae of Korea); Tyrner, 1985:9 (Czech Republic: Jezerka Nature Reserve in Krušné Hory = Erzgebirge); Gayubo, 1986c:31 (Spain: Zamora Province); Józan, 1986:369 (Hungary: Kiskunság National Park); Nemkov, 1986:95 (Russia: Siberia: Irkutsk Oblast'); Skibińska, 1986b:150, 153 (Poland: suburbs of Warszawa), 157 (rural and suburban parks), 160 (gardens), 162 (urban parks), 164 (streetside green), 168 (green areas of housing estates), 173 (various green urban habitats); Steiner, 1986:99 (references to papers on nesting habits); Vikberg, 1986b:75 (Finland); Haeseler, 1987b:668 (Germany: Ipweger Moor near Oldenburg); Lomholdt, 1987:93 (Denmark: western Jutland: Skallingen Peninsula); Tormos and Jiménez, 1987b:316 (Spain: Valencia Province: Dehesa de El Saler); Chevin, 1988:15 (France: La Manche Department); Haeseler, 1988:211 (Germany: Friesian Islands); Karsai, 1988:99 (Hungary: Kiskunság National Park);

Wolf, 1988b:142 (Germany: Rheinland-Westfalen); Józan, 1989:101 (Hungary: Tihany Nature Reserve); Pádr *in* Šedivy, 1989a:168 (in checklist of Czechoslovakian Sphecidae); Pankevich, Belyavskaya, Molchanova, Shlyakhtenok, and Blinov, 1989:96 (Belorussia: Berezinskiy Nature Reserve); Skibińska, 1989a:204 (Poland: Warszawa area), 1989b:291 (Poland: moist meadow in Warszawa area); Archer, 1990b:136 (Great BritainT. Flte: city of Leicester), 1990c:17 (Great Britain: Leicestershire); Barbier, Rasmont, and Wahis, 1990:32 (Belgium: Hainaut); Kuznetzova, 1990:21 (Russia: Voronezh Oblast': Galich'ya Gora Nature Reserve); Pádr, 1990:78 (Czech Republic: Praha area); Pagliano, 1990:115 (in catalog of Italian Sphecidae); Dollfuss, 1991:61 (in key to Sphecidae of North and Central Europe); Jakubzik, 1991:74 (Germany: Köln); Negrisolo, 1991:317 (Italy: Gorizia and Treviso Provinces); Nilsson, 1991:83 (Sweden: Lake Mälaren); Archer, 1992a:56 (Great Britain: Leicestershire); Józan, 1992a:228 (Hungary: Béda-Karapancsa Protected Area), 1992c:289 (Hungary: Zselic Hills); Nilsson, 1992:54 (Sweden); N. Schneider and Jacob-Remacle, 1992:43 (Luxemburg); Wolf, 1992c:23 (Germany: Nordrhein-Westfalen: Plettenberg: castle Schwarzenberg ruin); Gorobchishin, 1993:46 (Ukraine: Kanev Nature Reserve); Józan, 1993:412 (Hungary: Bükk National Park); Luig, 1993:42 (Estonia); Finnamore, 1994:210 (Canada: Alberta: Wagner Natural Area 8 km west of Edmonton); U. Peters, Sohmen, Stuke, and Prüter, 1994:66 (Germany: Schleswig-Holstein: gardens in Hof Möhr); Theunert, 1994c:47 (Germany: summary of records from Niedersachsen and Bremen); Ahlstrom, 1995:10 8 (in checklist of insects of North Carolina); Archer, 1995a:21 (Great Britain: Yorkshire: Blaxton); Archer and Burn, 1995:59 (Great Britain: Yorkshire: Crow Wood near Finningley); Gorobchishin, 1995:17 (Ukraine: Kanev Nature Reserve); Józan, 1995:104 (Hungary: projected Duna-Dráva National Park); Pagliano and Pesarini, 1995:85 (Italy: Ferrara Province); Papp and Józan, 1995:145 (Hungary: Síkfőkút oak forest); Archer, 1996b:121 (Great Britain: Yorkshire); Blades and Maier, 1996:72 (Canada: British Columbia: Osoyoos - Mount Kobau area at 119°40'W 49°05'N); Archer, 1997a:48 (Great Britain: Yorkshire: Burton Leonard Lime Quarries) and 49 (Great Britain: Yorkshire: Cave Wold); Celary, 1997:57 (in checklist of Animals of Poland); Dörfel, 1997:69 (nesting habits described for general public); Esenbekova, 1997:143 (preying on aphids in southeastern Kazakhstan); Finnamore, 1997:886 (Canada: Yukon); Fowles, 1996:36 (Great Britain: in checklist of aculeates of Wales); Shlyakhtenok, Blinov, and Belyavskaya, 1997:153 (Belorussia: Pripyatskiy National Park); Archer, 1998b:158 (Great Britain: Lincolnshire: Gibraltar Point National Nature Reserve); Gorobchishin, 1998a:48 (Ukraine: Kiev and surroundings), 1998b:54 (Ukraine: Sumy Oblast': Vakalivshchina); Józan, 1998:311 (Hungary: Duna-Dráva National Park); Lefeber, 1998:182 (Netherlands: Limburg: Sint-Pietersberg near Maastricht at 50°50'N 5°41'E); Morgan, 1998:19 (Great Britain: Wales: Carmarthenshire County); Archer, 1999a:9 (Great Britain: Lancashire); Gayubo, García, Torres, and González, 1999:89 (Spain: Soria Province); Ljubomirov, 1999b:47 (Bulgaria: Mount Vitosha near Sofia); Petit, 1999:112 (Netherlands: Nieuw-Namen, Paal); M. 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(Great Britain: Watsonian Yorkshire: Lindrick area), 2011d:187 (Great Britain: Watsonian Yorkshire: Hatfield Moor and Thorne Moor); Pankov, 2013:230 (Russia: Ivanovo Oblast'). – **As *Pemphredon inornata***: Richards, 1980:68, 69 (in key to Sphecidae of British Isles); Finnamore, 1982:70 (in Sphecid Fauna of Southern Quebec); Schmidt and Westrich, 1983:121 (Greece); Schmidt, 1984:248 (Germany: Baden-Württemberg); Brechtel, 1986:63 (Germany: Südpfalz); Schmidt and Westrich, 1987:367 (Germany: Mainz area); Dollfuss, 1988:10, 22 (Austria: Bisamberg near Vienna; Niederösterreich: Oberweiden); Riemann, 1988:223 (Germany: Bremen area); Jacobs, 1989:7 (Germany: Mecklenburg-Vorpommern); Jacobs and Oehlke, 1990:146 (new locality records from German Democratic Republic); Kowalczyk, 1990:290 (Poland: Góry Świętokrzyskie); Rohe, 1990:1049 (Germany: Rheinland-Pfalz: Lenneberg forest); Schwammberger and Priesner, 1990:535 (Austria: Kärtnen); Gayubo, Borsato, and Osella, 1991:398 (Italy: Emilia: Ronzano); von der Heide, 1991:63 (Germany: peat bog near Oldenburg); Budrys, 1992:24 (in list of Sphecidae of Lithuania); Józan, 1992b:172 (Hungary: Boronka-melléki Protected Area); N. 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Weber, 1992:88 (Germany: Bayern: Bamberg District); Archer, 1993c:39 (Great Britain: Yorkshire); Kuhlmann, 1993:76 (Germany: known from Westfalen); Sorg and Wolf, 1993:60 (Germany: Rheinland-Westfalen: Nature Reserve Die Spey); Torregrosa, Gayubo, Tormos, and Asís, 1993:11 (Spain: Alicante Province); Gayubo and Borsato, 1994:205 (Italy: Veneto); Schmid-Egger, 1994a:688 (Germany: Rheinland-Pfalz: Höllenberg near Grünstadt); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:401, 402 (in key to Sphecidae of Russian Far East); Dollfuss, 1995:966 (in revision of world *Pemphredon*); Krasnobayev et al., 1995:139 (Russia: Zhiguli Hills northwest of Samara); Negrisolo, 1995a:23 (Italy: Veneto); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna); Riemann, 1995:52 (Germany: Bremen); Scharrer, 1995:23 (Germany: Bayern: Aschaffenburg, Kahl, Mainfranken, Marktheidenfeld); Schmid-Egger, 1995:63 (Germany: northwestern Baden-Württemberg); Schmid-Egger, Risch, and Niehuis, 1995:203 (summary of records from Germany: Rheinland-Pfalz); Archer, 1996b:37 (Great Britain: Nottinghamshire: Sherwood Forest); Arens, 1996:440 (Germany: Bayern: Bayreuth area); Gorobchishin, 1996:53 (Ukraine: Kanev Nature Reserve); Harvey and Plant, 1996:76 (Great Britain: summary of records from Essex); Jakubzik, 1996:253 (Germany: Köln); Jakubzik and Cölln, 1996b:400 (Germany: Rheinland-Pfalz); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: not endangered); Shlyakhtenok, 1996:304 (Belorussia: Berezinsky Nature Reserve); Voblenko, Gorobchishin, and Nesterov, 1996:14 (Ukraine: Polesye Region); Witt, 1996:106 (Germany: Brandenburg); Woydak, 1996:22 (Germany: Westfalen: summary of distribution and nesting habits); Gauss, 1997:27 (egg of miltogrammatid flies deposited on adult specimens); Li and He, 1997d:300, 301 (in key to Chinese *Pemphredon*); Petit, 1997:351 (Belgium: Liège Province: Lanaye: colonization of new habitat); Riemann, 1997:50 (Germany: Achim 14 km southeast of Bremen); Schmidt and Schmid-Egger, 1997:25 (in checklist of German Sphecidae); F. 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Weber, 1998:146 (Germany: Bayern: Bamberg area); Cölln and Jakubzik, 1999:29 (Germany: Rheinland-Pfalz: Keuper-Scharren southwest of Hungerburg); Dorow, 1999:573 (Germany: Hessen: Niddahänge east of Rudingshain Forest Reserve); Erhardt, 1999:75 (Germany: Niedersachsen: Ammerland area); Esenbekova, 1999:201 (southeastern Kazakhstan: nesting in artificial nests); Herrmann, 1999:8 (Germany: Niedersachsen: Oldenburg area; habitats size); Löhr, 1999:62 (Germany: Hessen: Mücke-Merlau near Gemünden); Luig and Voolma, 1999:176 (Estonia); Mandery, 1999:106 (Germany: Bayern: Coburg area); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Pauly, 1999:108 (in catalog of Belgian aculeates); Salzmann-Wandeler and Rezbanyai-Reser, 1999:101 (Switzerland: Tessin: Monte Generoso); M. 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Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Saure, 2021:83 (Germany: Brandenburg: Nature Reserve Ferbitzer Bruch near Potsdam); Saure and Marten, 2021:135 (Germany: Sachsen-Anhalt: Nationalpark Harz); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:108 (in revision of Sphecidae *sensu lato* of Europe); Jakubzik and Cölln, 2022:11 (Germany: Rheinland-Pfalz: Moselle River valley between Drohn and Kattenes); Japoshvili and Ljubomirov, 2022:278 (Georgia: Lagodekhi Protected Areas); Pytel-Huta, Skyrpan, Tsaryk, Shydlovskyy, and Khamar, 2022:54 (western Ukraine); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen: city gardens); Kaplan and Yildirim, 2023:1689 (in checklist of Sphecidae *sensu lato* of Turkey). – **As *Cemonus inornatus***: F. Smith, 1856:434 (new combination, in catalog of Hymenoptera in British Museum); Packard, 1867:389 (in revision of North American Sphecidae); Provancher, 1883b:645 (in revision of Canadian Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Bridwell, 1899:209 (Kansas: Baldwin); J. Smith, 1900:516 (in list of insects of New Jersey); Harrington, 1902:220 (Canada: Ontario: Ottawa); Stevens, 1917:423 (North Dakota); Kowalczyk, 1991a:89, 93, 96, 99, 101, 104 (Poland: Łódź), 1991b:119 (Poland: Augustów Forest), 1994:72 (Poland: Łagiewniki forest in Łódź). – **As *Passaloecus inornata***: N. Schneider and Wahis, 1998:22 (Luxemburg: sandstone quarries; mistaken new generic combination). – **As *Psenulus inornata***: Shkuratov, 2004a:79 (Russia: Rostov Oblast', mistaken new generic combination).

Cemonus shuckardi A. Morawitz, 18864:460, ♀, ♂ (as Shuckardi, incorrect original capitalization). Syntypes: Russia: Sankt-Petersburg area (ZIN). Synonymized with *Pemphredon inornatus* by R. Bohart in R. Bohart and Menke, 1976:181. – Hallett, 1938:71 (Great Britain: Herefordshire: Mathon, Ross-on Wye, Tarrington). – **As *Diphlebus shuckardi*:** Hamann, 1960:196 (new combination, Austria: Oberösterreich: Mönchgraben at 48°13'N 14°21'E). – **As *Pemphredon shuckardi*:** Szilády, 1914:89 (new combination, Hungary: Ngyenyed, Topánfalva); Nambu, 1968b:25 (Japan: Saitama Prefecture); Dathe, 1980:209 (Russia: northern Caucasus: Teberda).

Cemonus dentatus Puton, 1871:94, ♀. Syntypes: France: Vosges: Remiremont (lost). Synonymized with *Pemphredon shuckardi* by Berland, 1925:139. – Ed. André, 1888:195 (in revision of Sphecidae of Europe and Algeria), 14* (bibliographic references); de Gaulle, 1908:103 (in catalog of French Hymenoptera). – **As *Pemphredon dentatus***: Baldini, 1894:51 (new combination, Italy: Modena area); Kohl, 1890a:52 (in review of *Pemphredon*); Dalla Torre, 1897:356 (in catalog of world Hymenoptera).

Pemphredon tenax W. Fox, 1892h:313, ♀, ♂. Lectotype: ♀, USA: Colorado: no specific locality (ANSP), designated by Cresson, 1928:52. Synonymized with *Pemphredon inornata* by R. Bohart *in* Bohart and Menke, 1976:181. – Dalla Torre, 1897:360 (in catalog of world Hymenoptera); Rohwer, 1916b:690 (in catalog of Hymenoptera of Connecticut); Washburn, 1919:224 (in list of Hymenoptera of Minnesota); Britton, 1920:341 (in checklist of insects of Connecticut); Rohwer *in* Viereck, 1925:690 (in key to Sphecidae of Connecticut; North Haven); J.Ch. Bradley, 1926:175 (New York: Lloyd-Cornell Reservation near McLean); Brues, 1927:82 (Massachusetts: Petersham, nesting in wood); J.Ch. Bradley, 1928:1014 (in catalog of New York Sphecidae); Rau, 1946:10 (nesting in dead wood, nests not shared); Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (in catalog of North American Hymenoptera); Krombein, 1954a:6 (West Virginia: Lost River State Park); Evans, 1958c:128 (description of larva); Koerber and Medler, 1958:55 (Wisconsin, nesting in trap-nests); Krombein, 1963f:275 (Maryland: Plummers Island near Washington, D.C.); Kurczewski and Kurczewski, 1963:146 (Pennsylvania: Presque Isle State Park); Evans, 1970:487 (Wyoming: Jackson Hole). – **As *Cemonus tenax***: Ashmead, 1899d:222 (new combination, in checklist of North American Crabronidae). – **As *Ceratophorus tenax***: Rohwer, 1917a:246 (new combination, California: Oakland and Piedmont); Rau and Rau, 1918:108 (nesting in *Sambucus* stem, preying on *Macrosiphum rudbeckiae* Fitch). – **As *Diphlebus tenax***: Rau, 1928b:272 (new combination, nesting inside roots of fallen tree, prey: aphid *Macrosiphum* sp.). – **As *Psen tenax***: Washburn, 1919:216 (new combination, in list of Hymenoptera of Minnesota).

As *Psen niger* (part): Faull, 1913:384 (Canada: Toronto region), corrected to *Pemphredon inornata* by Buck, 2004:77.

19. *japonica* Matsumura

Pemphredon japonica Matsumura, 1912:179, ♀ (as *japonicum*, incorrect original termination). Holotype or syntypes: Japan: Honshu: Kyoto (lost, Tsuneki, 1951a:174). – Gussakovskij, 1934b:87 (redescription); Iwata, 1937a:136 (nesting habits); Tsuneki, 1951a:171 (in key to *Pemphredon* of Japan and adjacent regions), 172 (in revision of *Pemphredon* of Japan and adjacent regions), 1952a:61 (nesting habits); Iwata, 1955:29 (egg size, number of oocytes), 1963b:196 (Japan: prey record); Tsuneki and Shimoyama, 1963:49 (Japan: Towada Prefecture); Haneda, 1964a:39 (Japan: Fukui Prefecture); Tsuneki, 1964c:10 (Japan: Kyushu), 1964e:28, 29 (in key to *Pemphredon* of Japan); Haneda, 1968a:45 (Japan); Nambu, 1968b:25 (Japan: Saitama Prefecture); Tano, 1968:33 (Japan); Tsuneki, 1968l:50 (South Korea: Island of Quelpart, now Island of Cheju), 1969e:26 (Japan: specimens in Osaka Museum of Natural History), 1970b:10 (central Japan); Nambu, 1973a:151 (Japan: Saitama Prefecture); Suda, 1973:122 (Japan: Yamanashi Prefecture); Nambu, 1975b:65 (Japan: Saitama Prefecture); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Paik, 1985:197 (in list of Sphecidae of Korea, as *japonicus*); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:401 (in key to Sphecidae of Russian Far East); Dollfuss, 1995:973 (in revision of world *Pemphredon*); Takahashi and Shiraishi, 1999:12 (Japan: Ehime Prefecture); Ohl and Linde, 2003:149 (number of ovarioles); Haneda, Nosaka, Tano, Kurokawa, and Murota, 2004:31 (Japan: Gifu Prefecture); Suda, 2004:37 (Japan: Yamanashi Prefecture); Haneda, Inoue, Nozaka, Tano, Kurokawa, and H. and T. Murota, 2005:65 (Japan: Fukui Prefecture: Mount Monju); Haneda, Nozaka, Tano, Kurokawa, and Murota, 2005:46 (Japan: Gifu Prefecture); Nemkov, 2005a:145 (Russia: Island of Sakhalin); Haneda, Nozaka, Tano, Kurokawa and Murota, 2006a:21 (Japan: Toyama Prefecture); Nagase, 2006a:54 (Japan: Kanagawa Prefecture: Mount Komagatake near Hakone, as *montanus*); Nemkov, 2007b:69 (Russia: Kuril Islands: Island of Kunashir), 2007c:997 (in Appendix to Key to identification of Sphecidae of Far East of Russia); Nemkov, 2008b:18 (in catalog of Crabronidae of Asiatic Russia); S. Takahashi and Haneda, 2008b:44 (Japan: Hokkaido: Sapporo); Nemkov, 2009b:65 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); J. Kim and Yang, 2010:147 (in checklist of Korean Pemphredoninae); N. Yamamoto, 2011:12 (Japan: Kyūshyū: mainland Nagasaki Prefecture); Nemkov, 2012c:437 (in catalog of Crabronidae of Russian Far East); Terayama, 2012:5, 6 (in key to Pemphredonini of Japan), 13 (description), 19 (in checklist of Pemphredonini of Japan); J.-K. Kim, 2014:442 (in catalog of Sphecidae *sensu lato* of Korean Peninsula) Mokrousov, 2017e:248 (in catalog of Pemphredoninae of Russia).

20. *kashmirensis* Dollfuss

Pemphredon kashmirensis Dollfuss, 1993b:702, ♀. Holotype: ♀, India: Kashmir: Srinagar (BMNH). – Dollfuss, 1995:974 (in revision of world*Pemphredon*).

21. *koreana* Tsuneki

Pemphredon koreana Tsuneki, 1951a:183, ♀ (as *koreanus*, incorrect original termination). Holotype: ♀, Korea: Shoyozan (originally K. Tsuneki collection, now?). – Tsuneki, 1951a:171 (in key to *Pemphredon* of Japan and adjacent regions), 1964e:28 (in key to *Pemphredon* of Japan), 1982b:14 (known from Korea); Paik, 1985:197 (in list of Sphecidae of Korea, as *koreanus*); Dollfuss, 1995:975 (in revision of world*Pemphredon*); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:400 (in key to Sphecidae of Russian Far East); Q. Li and He, 2001:755 (China: Tianmushan Nature Reserve at 30°22'N 119°26'E), 2004:1107 (in hymenopterous fauna of Zhejiang Province, China); Hua, 2006:281 (in list of Chinese insects, geographic distribution); J. Kim and Yang, 2010:147 (in checklist of Korean Pemphredoninae); J.-K. Kim, 2014:442 (in catalog of Sphecidae *sensu lato* of Korean Peninsula); Bashir, L. Ma, and Q. Li, 2020b:5 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

22. *krombeini* Tsuneki

Pemphredon mandibularis Tsuneki, 1951a:184, ♀, ♂, junior primary homonym of *Pemphredon mandibularis* Cresson, 1865. Holotype: ♀, Japan: Hokkaido: Sapporo (originally K. Tsuneki collection, now?). – Tsuneki, 1951a:170 (in

key to *Pemphredon* of Japan and adjacent regions), 1952a:67 (nesting habits), 1959b:107 (description of ♂); Haneda, 1964a:39 (Japan: Fukui Prefecture); Tsuneki, 1964e:27, 29 (in key to *Pemphredon* of Japan).

Pemphredon krombeini Tsuneki, 1960d:239. Substitute name for *Pemphredon mandibularis* Tsuneki, 1951. – Tsuneki and Shimoyama, 1963:49 (Japan: Towada Prefecture); T. Iida, 1968:21 (Japan); Nambu, 1968b:25 (Japan: Saitama Prefecture); Itami, 1969:50 (Japan: Niigata Prefecture); Nambu, 1975b:65 (Japan: Saitama Prefecture); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Hoshiba and Imai, 1993:467 (chromosome number n = 8); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:400 (in key to Sphecidae of Russian Far East); Dollfuss, 1995:976 (in revision of world *Pemphredon*); Kurokawa, 2003:61 (Japan: city of Fukui: Egamichou); Suda, 2004:37 (Japan: Yamanashi Prefecture); Haneda, Inoue, Nozaka, Tano, Kurokawa, and H. and T. Murota, 2005:65 (Japan: Fukui Prefecture: Mount Monju); Nemkov, 2005a:145 (Russia: Island of Sakhalin), 2008b:18 (in catalog of Crabronidae of Asiatic Russia); S. Takahashi and Haneda, 2008b:44 (Japan: Hokkaido: Sapporo); Nemkov, 2009b:65 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia), 2011:95 (known only from Sakhalin and Japan), 2012c:437 (in catalog of Crabronidae of Russian Far East); Terayama, 2012:5, 6 (in key to Pemphredonini of Japan), 13 (description), 19 (in checklist of Pemphredonini of Japan); Mokrousov, 2017e:248 (in catalog of Pemphredoninae of Russia).

23. *labidentata* Q. Li and He

Pemphredon labidentata Q. Li and He, 1997:301, 303, ♀. Holotype: ♀, China: Zhejiang Province: Tianmushan (Inst. Zool. Acad. Sinica). – Q. Li and He, 1997d:300, 301 (in key to Chinese *Pemphredon*), 2001:755 (China: Tianmushan Nature Reserve at 30°22'N 119°26'E), 2004:1107 (in hymenopterous fauna of Zhejiang Province, China); Bashir, L. Ma, and Q. Li, 2020b:4 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

24. *laotis* Dollfuss

Pemphredon laotis Dollfuss, 1993b:701, ♀. Holotype: ♀, Laos: Sayaboury Province: Sayaboury (Bishop Mus.). – Dollfuss, 1995:977 (in revision of world *Pemphredon*).

25. *lethifer* (Shuckard)

Cemonus lethifer Shuckard, 1837a:201, ♀, ♂. Syntypes: Britain: no specific locality (originally W. Shuckard collection, now?). – Dahlbom, 1842a:12 (in review of Scandinavian aculeates), 1844:254 (in revision of Sphecidae and Pompilidae), 1845:507 (in key to European *Cemonus*); F. Smith, 1849a:2373 (Great Britain: Devonshire); Wissmann, 1849:14 (Germany: Kingdom of Hannover: Münden); Tischbein, 1850:6, 9 (Germany: Rheinland-Pfalz: Herrstein in Fürstenthum Birkenfeld); F. Smith, 1851c:35 (Great Britain: no specific locality); Wesmael, 1852:283 (Belgium); Kirschbaum, 1853:47 (Germany: Herzogtum Nassau: Weilburg); F. Smith, 1853:65 (in checklist of British Hymenoptera); Kirchner, 1854:312 (Czech Republic: Kaplitz in Budweiser District, now České Budějovice); Goureau, 1855:VII (nesting in stems of thistle); F. Smith, 1856:433 (in catalog of Hymenoptera in British Museum); Ruthe and Stein, 1857:315 (Germany: Berlin area); Schenck, 1857:134 (Germany: in revision of fossorial wasps of Nassau Region); A. Costa, 1858:20 (Italy: Campania: Monti Partenii in Benevento Region); F. Smith, 1858c:179 (in review of British Aculeata, redescription); Assmuss, 1859:615 (Russia: Moscow Governorate); Funk, 1859:58 (Germany: Bayern: Bamberg); Schenck, 1860:147 (Germany: Nassau Region); Brischke, 1862:104 (Germany: Preussen Province, now Poland: Pomorze Region); A. Costa, 1867c:111 (in revision of Italian Sphecidae); Kirchner, 1867:222 (in catalog of European Hymenoptera); von Aichinger, 1870:316 (Austria: Tirol); Bold, 1870:151 (Great Britain: Northumberland and Durham); A. Costa, 1871b:40 (in revision of Italian Sphecidae); F. Smith, 1871b:19 (in catalog of British Aculeata); Dours, 1874:150 (in catalog of Hymenoptera of France); Taschenberg, 1875:387 (Germany: Halle; Italy: Piemonte); Radoszkowski, 1877:67 (Uzbekistan, Kyrgyzstan); Becker, 1880:151 (Russia: Sarepta, now Krasnoarmeysk S Volgograd); Gribodo, 1881a:146 (Italy: Calabria: altipiano del Poro); A. Costa, 1883:58 (Italy: Sardegna: Cagliari, Oristano); Harwood, 1884:211 (Great Britain: Essex: Colchester area); Brischke, 1888b:99 (Germany: Preussen Province, now Poland: Pomorze Region); Engel,

1894:53 (Germany: Steinbeker Moor near Hamburg); Freke, 1896:40 (Ireland); J. Nielsen, 1901a:270 (nesting habits); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Blüthgen, 1931a:122 (*Dineurus fabricii* is just a variation of *lethifer*); Spooner, 1931:14 (Great Britain: Cambridgeshire); Bondroit, 1932:36 (Belgium: Solbosch, Uccle), 1934:61 (Belgium: Ostende); Richards, 1937b:104 (in checklist of British aculeates); Guichard, 1938:72 (Great Britain: Norfolk coast); Hallett, 1938:71 (Great Britain: Herefordshire: Mathon, Seager Hill, West Malvern); J. Murray, 1938a:172 (Great Britain: Scotland: Dumfriesshire: Gretna); de Graham, 1941:99 (Great Britain: Lincolnshire); Audcent, 1942:25 (parasite: *Oebalia melaleuca* Meigen); Boyd, 1943:163 (Great Britain: eastern Dorset); Spooner, 1943:72 (Great Britain: Caundle Holts, Croxton, Parley Heath); T. Fletcher, 1945:53 (Great Britain: Gloucestershire: Chalford, Rodborough); R. Perkins, 1945:147 (Great Britain: Devon: moorland near Lydford); Spooner, 1946:27 (Britain: Leicestershire: Charnwood Forest); Guichard and Yarrow, 1948:90 (Great Britain: London: Hampstead Heath); Chambers, 1949:225 (Great Britain: Bedfordshire); Aerts, 1955:61 (Germany: Rheinland); Yeo, 1957:19 (Great Britain: Middlesex, now in London); Tonapi, 1958a:509 (spiracular structures), 1958b:250 (respiratory system); Felton, 1963:177 (Great Britain: Kent County); Yarrow, 1967:64 (Great Britain: Cornwall: Isles of Scilly); Danks, 1971a:324 (nesting habits), 1971b:64-73 (Great Britain: Berkshire: Silwood Park), 1971c:80 (nest mortality), 1983:414 (differences in sex ratio between generations); Kowalczyk, 1991a:89, 96, 99, 101, 104 (Poland: Łódź), 1994:73 (Poland: Łagiewniki forest in Łódź). – **As *Diphlebus lethifer***: Schirmer, 1912:166 (new combination, Germany: Berlin area); Harttig, 1930a:231 (in revision of European *Cemonus*); Szulczewski, 1950:105 (Poland: Wielkopolski National Park 15 km S Poznań); Hamann, 1960:196 (Austria: Oberösterreich: Mönchgraben at 48°13'N 14°21'E). – **As *Dineurus lethifer***: Blüthgen, 1937:235 (new combination, Germany: Saale River valley); Schneid, 1941:1036 (Germany: Bayern: Bamberg area); Guiglia, 1942a:61 (Greece: Island of Rhodes: Villanova), 1948c:202 (Italy: Sardegna: Cagliari). – **As *Pemphredon unicolor* var. *lethifer***: Sickmann, 1883:76 (new status, Germany: Niedersachsen: Wellingholthausen); Dubois, 1919:96 (Belgium: Bruxelles: Uccle, as form *lethifer*). – **As *Pemphredon lethifer*** (as *lethifera* in some records): Schenck, 1867a:353 (new combination, Germany: Nassau Region); nec Thomson, 1870:234 (= *Pemphredon rugifer*); Thomson, 1874:189 (in revision of Hymenoptera of Scandinavia); E. Saunders, 1880:260 (in revision of British Aculeata); Siebke, 1880:62 (Norway); Gasperini, 1887:14 (Croatia: Spalato, now Split), 1889:68 (Dalmatia, now Croatia); Kohl, 1890a:52 (in review of *Pemphredon*); V. Perkins, 1892:202 (Great Britain: Gloucestershire: Wotton-under-Edge); Westerlund, 1893:25 (Russia: Karelian Republic: northern shore of Lake Ladoga); Krieger, 1894:16 (Germany: Kingdom of Saxony); E. Saunders, 1896:93 (in revision of British Aculeata); Borries, 1897:96 (nesting habits); 96 (review of known nesting habits); Dalla Torre, 1897:357 (in catalog of world Hymenoptera); Mocsáry, 1897:78 (Kingdom of Hungary, some localities are now in Croatia); Strand, 1898b:92 (Norway); W. Evans, 1900:266 (Great Britain: Scotland: Aberlady, Kinghorn); Nevinson, 1900:62 (Great Britain: Wales: Criccieth, Towyn); A. Carter, 1901a:67 (Great Britain: Scotland: Perthshire: Comrie); Gardner, 1901:377 (Great Britain: abundant in Cheshire and Lancashire); Nevinson, 1902:12 (Great Britain: Cornwall: Newquay); E. Saunders, 1902b:143 (British Channel Islands: islands of Jersey, Guernsey, and Alderney; France: Bretagne: Saint Briac); Antiga and Bofill, 1904:7 (Spain: Cataluña Province); Jourdain 1904:221 (Great Britain: Derbyshire: Chesterfield); E. Saunders, 1904c:606 (Spain: Mayorca); Luff, 1905b:390 (British Channel Islands: Island of Jethou); von Heyden, 1905:82 (Germany: Hessen: Frankfkurt); Móczár and Henter, 1907:205 (Romania: Caraş-Severin: Mehadia); Morley, 1909:304 (Great Britain: Isle of Wight); Strand, 1910d:341 (Germany: Baden Württemberg: Stuttgart); Hallett, 1912:94 (Great Britain: Glamorgan County); Birula, 1913:538 (Ukraine: Zhytomyr Oblast': Radomyshl'); Alfken, 1914:277 (northwestern Germany); Zilahi Kiss, 1915:80 (Hungary: Hadad); O. Meyer, 1919:150 (Germany: Posen Province, now Poland: Poznań Region), 151, 152 (in key to *Pemphredon lethifer*, *shuckardi*, and *wesmaeli*); R. Robertson, 1919:60 (Great Britain: Kent: Faversham area); R. Perkins, 1924:222 (Great Britain: Devon); Berland, 1925d:139 (in Sphecid Fauna of France); R. Perkins, 1925:150 (Great Britain: Gloucestershire and Somersetshire); Schütze, 1925:112 (Germany: Lausitz Region); Bouwman, 1926:279 (in list of Sphecidae of Netherlands); Hellén, 1926:93 (recorded from Finland); Stelfox, 1927:292 (Ireland: list of localities); Bouwman, 1928b:182 (in

revision of Sphecidae of Netherlands); R. Perkins, 1929:54 (in key to British *Pemphredon*);Pulkkinen, 1931:89 (in revision of Sphecidae of Finland); Crèvecoeur and Maréchal, 1932:69 (in catalog of Belgian Hymenoptera, variation in propodeum sculpture); A. Wagner, 1932:228 (in revision of European *Pemphredon* subgenus *Dineurus*); Gussakovskij, 1933b:275 (Iran); Nadig, 1933:103 (Morocco: Asni, Tizi n'Tichka); Routledge, 1933:87 (Great Britain: Cumberland); Spooner, 1933:203 (Great Britain: Bedfordshire); Balles, 1934:18 (Germany: Baden-Württemberg: Gamshurst, Neckarelz, Oberachern, Sasbachwaldlen); Giner Marí, 1934:135 (Spain); Forsius *in* Forsius and Hellén, 1935:11 (in checklist of Hymenoptera of Finland); Vergne, 1935:119 (France: Auvergne: common); Crèvecoeur and Maréchal, 1936:250 (in catalog of Belgian Hymenoptera); Dulac, 1937:15 (France: Saône-et-Loire: Saint-Laurent d'Andenay); Zavadil, Šustera, and Bat'a, 1937:179 (in catalog of Sphecidae of Czechoslovakia); A. Wagner, 1938a:119 (northwestern Germany); Móczár, 1939:5 (Hungary: Jászberény); Leclercq, 1941a:68, 70 (Belgium: Pays de Liège), 1941b:10 (Belgium: Liège area, nest structure); Paul, 1941:41 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area); Balthasar, 1943:41 (Czech Republic: Moravia: Zlin area); Giner Marí, 1943:45 (in Sphecid Fauna of Spain); Šnoflák, 1944a:143 (Czech Republic: serpentine steppe near Mohelno); Carl and de Beaumont, 1947:68 (Switzerland: Graubünden = Grisons Canton: Swiss National Park); de Beaumont, 1947b:397 (Cyprus); Šnoflák *in* Zavadil and Šnoflák, 1948:52, 53 (in key to Sphecidae of Czechoslovakia); Ceballos, 1949:101 (Spain); Noskiewicz and Chudoba, 1949:420 (Poland: Dolny Śląsk: many localities); de Beaumont, 1950f:410 (Algeria); Georgel, 1950:64 (France: Seine-et-Oise: Sucy-en-Brie); Pittioni, 1950:27 (Cyprus); de Beaumont, 1951h:34 (Switzerland: Neuchâtel area); Tsuneki, 1951a:189, 190 (in key to *Pemphredon* of Japan and adjacent regions); Leclercq, 1953a:246 (Belgium: nest parasites, locality records); de Beaumont, 1954e:93 (Italy); Grandi, 1954:241 (Italy); Steiner, 1955:143 (France: Dordogne); Vogrin, 1955:39 (Yugoslavia); Ceballos, 1956:357 (in catalog of Hymenoptera of Spain); Bajári, 1957a:81, 83 (in key to Hungarian Sphecidae); Benno, 1957:144 (Netherlands: Tilburg area, nesting in stems of *Rubus*); de Beaumont, 1957a:150 (Morocco); Grandi, 1957:390 (Italy); Guiglia, 1957:146 (Italy: Isole Pelagie); Zirngiebl, 1957:179 (Germany: Rheinland-Pfalz: Pfalz region); Benno, 1958a:128 (nesting in stems of *Rubus*), 1958b:12 (in review of Dutch Sphecidae); de Beaumont, 1958c:208 (Swiss National Park); Nouvel and Ribaut, 1958:15 (France: Pyrénées-Orientales: Banyuls-sur-Mer); Pulawski, 1958a:186 (Bulgaria: Aitos, Akhtopol, Kniazhevo near Sofia, Makotsevo); de Beaumont, 1959a:31 (Italy) 1959b:90 (gynandromorph); Krombein, 1959c:95 (adventive in eastern USA and Ontario); Suárez, 1959:59 (Spain: Almería Province); de Beaumont, 1960a:22 (Greece: Island of Rhodes); Guiglia, 1960:361 (Italy: Isole Pelagie: Lampedusa); Krombein, 1960a:34 (nest); Noskiewicz and Puławski, 1960:45, 46 (in key to Polish Sphecidae); de Beaumont, 1961c:51 (Greece: Island of Crete), 1961e:5 (Iraq); Hoop, 1961:64 (Germany: Schleswig-Holstein: Rosenkranz); Janvier, 1961a:1 (nesting habits, description of larva); Leclercq, 1961f:157 (Belgium: entering room through open window after temperature raised to 31ºC); de Beaumont, 1962b:27 (Spain); Grandi, 1962:96 (Italy); Tolstova, 1962:287 (Russia: Pushkin, nesting in raspberry stems); Valkeila, 1962b:67 (southwestern Finland); Wengris, 1962:203 (Lithuania: Vilnius area); de Beaumont, 1963c:417 (Afghanistan); Krombein, 1963f:275 (Maryland: Plummers Island near Washington, D.C.); Babiy, 1964:115 (Austria: Land Salzburg); Ceballos, 1964:86 (in supplement to catalog of Spanish Sphecidae); de Beumont, 1964a:295 (variation and related taxonomic problems), 1964c:103 (in Sphecid Fauna of Switzerland); Evans, 1964b:246 (description of larva); Haneda, 1964a:39 (Japan: Fukui Prefecture); Tsuneki, 1964e:28, 29 (in key to *Pemphredon* of Japan); de Beaumont, 1965a:57 (Greece); B. Klug, 1965:134 (Germany: Baden-Württemberg: Freiburg im Breisgau area); Roberti, Frilli, and Pizzaghi, 1965:110 (Italy: Emilia-Romagna: Piacenza, Bobbio and Pianello in Piacenza Province, Casteggio in Pavia Province); F. Parker and R. Bohart, 1966:94 (California: Los Angeles County: Gardenia); Scobiola-Palade, 1966b:392 (Romania: Tulcea District: C.A. Rosetti); Balthasar, Hrubant, and Hrubant, 1967:170 (Bulgaria: Kazanlik and Sozopol); Benno, 1967:37 (in checklist of Sphecidae of Netherlands); de Beaumont, 1967a:342 (Turkey); Gauss, 1967:556 (Germany: Baden-Württemberg); J. Heinrich, 1967:78 (Germany: Bayern: Unterfranken District); Lefeber, 1967c:219 (Netherlands:

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Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Shlyakhtenok, 2013:148 (in annotated catalog of aculeate wasps of Belorussia); Vieira, Oliveira, Brewster, and Gayubo, 2013:19 (Portugal: Douro International Natural Park and Serras de Aire e Candeeiros Natural Park); Wiśniowski and Piotrowski, 2013:22 (Poland: Poleski National Park); Wiśniowski and Szczepko, 2013:46 (Poland: Kampinos National Park near Warszawa); Zettel, Zimmermann, and Wiesbauer, 2013:12 (Austria: Wien: Donaupark); Archer, 2014b:178 (Great Britain: urban and suburban gardens); Baldock, 2014:359 (Spain: Island of Mallorca); Dunford, Turbyville, and Leavengood, 2014:10 (listed as medically important in Afghanistan); Bitsch, 2014:408 (France: Ille-et-Vilaine: Saint-Enorgat); Ebrahimi, 2014:44 (Iran: Alborz, Esfahān, and Tehran provinces); Flügel, 2014:255 (Brandenburg: Hangelsberger Heide); U. Frommer, 2014:28 (Germany: Hessen: Lorch); U. Frommer, M. Niehuis, and O. Niehuis, 2014:1322 (Germany, Hessen: Roβstein); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Józan, 2014:133 (Croatia: Cesarica, Limski kanal, Susanj; as *lethifera*); Kazenas, 2014a:133 (Kazakhstan: Karatau Mountain Range); J.-K. Kim, 2014:442 (in catalog of Sphecidae *sensu lato* of Korean Peninsula); Ruchin and Antropov, 2014:35 (Russia: Republic of Mordovia); Turčinavičienė, Radzevičiūtė, Budrienė, and Budrys, 2014:4 (in DNA analysis); Yıldırım, Ljubomirov, and Lelej, 2014:10 (distribution in Turkey by biogeographic provinces); Archer, 2015:202 (Great Britain: English coastal sand dunes); Atbaei, Fallahzadeh, and Ljubomirov, 2015:20 (Iran: Fars Province); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Lett, 2015:5 (France: Loir-et-Cher: Gièvre); Rezaei and Fallahzadeh, 2015:12 (Iran: Fars: Kaftarak at 29°34′N 52°41′E and Shiraz at 29°36′N 52°28′E); P. Rosa and Pagliano, 2015:104 (Italy: Lombardia and Piemonte: Parco del Ticino); Saure, 2015:15 (Germany: Berlin-Lichterfelde); Shorenko, 2015:332 (in list of Sphecidae *sensu lato* of Crimea); Simon, Lorthiois, and Macé, 2015:54 (France: alluvial terraces in Eure Department: Courcelles-sur-Seine and Seine-Maritime Department: Anneville-Ambourville); Blažej, Macek, and Trýzna, 2016:125 (Czech Republic: České Švýcarsko = Bohemian Switzerland National Park); Bleidorn, Gerth, Hopfe, et al., 2016:10 (Germany: Sachsen: Trages circa 20 km south of Leipzig); Cölln and Jakubzik, 2016:18 (Germany: Rheinland-Pfalz: Vulkaneifel District); Else, Bolton, and Broad, 2016:39 (in checklist of Aculeata of Great Britain and Ireland: England, Scotland, Wales, Ireland, Isle of Man); Le Divelec, Chapelin-Viscardi, and Larivière, 2016:109 (northern France: in agricultural landscapes, as *lethifer* form *lethifer*); Mokrousov and Popov, 2016:588 (Russia: Abkhazia, Krasnodarskiy Kray); Ratzlaff, 2016:27 (Canada: British Columbia: from Dollfuss, 1995); Ruchin and Antropov, 2016:402 (Russia: Mordovian State Nature Reserve); Sadeghi, Fallahzadeh, Ostovan, Ljubomirov, and Hesami, 2016:431 (Iran: Fars Province); Saure, 1916c:205 (Germany: center of Berlin: Groβer Tiergarten Park); Schmid-Egger, Dandria, and Xuereb, 2016:81 (in checklist of Crabronidae of Maltese Islands); Stolle and Saure, 2016:924

(Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Wiśniowski, 2016:129 (Poland: Ojców National Park); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:32 (Turkey: Antalya, Bayburt, Erzurum, Giresun, Karz, Rize, and Trabzon provinces); Burguet and Durand, 2017:9 (France: Puy-de-Dôme: basin of river Crouël); Di Giovanni, Mei, and Cerretti, 2017:73 (Italy: Lombardia: Riserva Naturale Bosco della Fontana 5 km from Mantova at 45°12'N 10°44'E, found in canopy); Durand and Burguet, 2017:2 (France: Puy-de-Dôme: Réserve Naturelle Nationale Chastreix-Sancy); Jahantigh, Rakhshani; Mokhtari, and Ramroodi, 2017:74 (Iran: known from Alborz, Fars, Isfahan, Khorasan, Qazvin, and Tehran provinces); Jansen, 2017:9 (Germany: Sachsen: Leipzig); Magdalou, 2017:20 (France: Pyrénées-Orientales: Réserves Naturelles Catalanes: Forêt de la Massane, Mas Larrieu, Vallée d'Eyne); Mokrousov, 2017e:248 (in catalog of Pemphredoninae of Russia); Shorenko, 2017:78 (in Crimea collected in May through August); Tosser, Chapelin-Viscardi, and Le Divelec**,** 2017:31 (France; found in agricultural landscape); Twerd, Krzyżyński, Waldon-Rudzionek, and Olszewski, 2017:7 (Poland: Inowroclaw and Janikowo: nesting in postindustrial soda ash dumping sites); Franken and Berg, 2018:67 (Netherlands: North Holland: sand dunes); Jacobs and Liebig, 2018:144 (Russia: Buryat Republic: East Sayan: 30 km northwest of Mondy); Kemal and Koçak, 2018:34 (Turkey: in list of pterygot insects of Van Province); Lett, 2018:203 (France: Loir-et-Cher: Gièvres at 47°16'39"N 1°41'52"E); Shorenko, 2018:129 (Crimea, including localities, habitats, and number of specimens); Carminati, Mora, and Cretin, 2019:23 (France: in list of Sphecidae *sensu lato* of Franche-Comté); Ruchin and Antropov, 2019a:13239 (Russia: Mordovian State Nature Reserve), 2019b:162 (in Mordovian State Nature Reserve known from single specimen); Mokrousov, Proshchalykin, Aliyev, and Maharramov, 2019:15 (Azerbaijan: Nakhichevan Autonomous Republic); Olszewski and Kowalczyk, 2019:107 (northern Poland: Pomorze Gdańskie = Gdańsk Pomerania); Sadeghi, Fallahzadeh, Ostovan, Ljubomirov, and Hesami, 2019a:273 (Iran: Fars: Beyza: Berekh, and Noor Abad: Fahlian); Shorenko, 2019:211 (among the most common sphecid species in Crimea); Akulov, Proshchalykin, and Mokrousov, 2020:49 (Russia: central Krasnoyarsk Kray); Bashir, L. Ma, and Q. Li, 2020b:5, 7 (in key to *Pemphredon* of China); Ben Khedher, Yildirim, and Braham, 2020a:107 (Tunisia: Monastir and Nabeul provinces); Kejval, Blažej, and Erhart, 2020:114 (western Czech Republic); Shorenko, 2020:51 (Crimea: Karadag Nature Reserve); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China); Cross, Baldock, and Wood, 2021:60 (in catalog of Sphecidae *sensu lato* of Portugal); Falk and Early, 2021:26 (in key to British *Pemphredon*); Herb and Schmid-Egger, 2021:9 (Germany: Bayern: Kaufbeuren area); Kaplan and Yildirim, 2021:86 (in catalog of Crabronidae of Turkey); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Saure, 2021:83 (Germany: Brandenburg: Nature Reserve Ferbitzer Bruch near Potsdam); Saure and Marten, 2021:135 (Germany: Sachsen-Anhalt: Nationalpark Harz); Terayama, 2021:18 (Japan: Port of Tokyo Wild Bird Park); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:115 (in revision of Sphecidae *sensu lato* of Europe); Jakubzik and Cölln, 2022:11 (Germany: Rheinland-Pfalz: Moselle River valley between Drohn and Kattenes); Embergenov, Akhmedov, and Medetov, 2023:25 (Uzbekistan: southern Lake Aral region); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen University Botanical Garden and city gardens); Kaplan and Yildirim, 2023:1689 (in checklist of Sphecidae *sensu lato* of Turkey); Langfeld, 2023:61 (Germany: Mecklenburg-Vorpommern: Baltic island Greifswalder Oie).

Pemhredon hyalipennis Stephens, 1829a:366, nomen nudum (in catalog of British insects). Synonymized with *Pemphredon lethifer* by F. Smith, 1855:100. – Stephens, 1829b:34 (in checklist of British insects).

Cemonus strigatus Chevrier, 1870:269, ♂. Holotype: ♂, Switzerland: Vaud: Nyon (MHNG). Synonymized with *Pemphredon lethifer* by Blüthgen, 1931a:124. – Girard, 1879:961 (description of this species recorded); de Gaulle, 1908:103 (in catalog of French Hymenoptera). – **As *Pemphredon strigatus***: Kohl, 1883e:659 (new combination, Switzerland), 1890a:56 (in review of *Pemphredon*); Dalla Torre, 1897:360 (in catalog of world Hymenoptera).

Diphlebus fuscatus A. Wagner, 1918:143, ♂, but ♀ according to Wagner, 1931:38. Holotype: ♀, Italy: Torbole (A. Wagner collection, now?). Synonymized with *Cemonus lethifer* by Wagner, 1931:38 and Harttig, 1931b:83. – A. Wagner, 1918:142 (in key to subgenus Diphlebus); Schmiedeknecht, 1930:671 (in keys to Hymenoptera of North and Central

Europe); Blüthgen, 1931a:125 (bibliographic reference). – **As *Pemphredon fuscatus***: Zangheri, 1969:1705 (new combination, Italy: in catalog of flora and fauna of Romagna Region: Pineta di San Vitale).

Diphlebus littoralis A. Wagner, 1918:143, ♀, ♂. Syntypes: Germany: Campow; Italy: Fasano at Lake Garda (A. Wagner collection, now?) Synonymized with *Cemonus lethifer* by Wagner, 1931:38 and with *Cemonus unicolor* by Harttig, 1931b:83. – A. Wagner, 1918:141, 142 (in key to subgenus *Diphlebus*); Blüthgen, 1931a:125 (bibliographic reference). – **As *Pemphredon littoralis***: A. Wagner, 1920:42 (new combination, Germany: Lower Elbe region); Schmiedeknecht, 1930:670, 671 (in keys to Hymenoptera of North and Central Europe); Grandi, 1935a:45 (nesting habits), 109 (Italy); Aerts, 1950a:51 (Germany: Nordrhein-Westfalen: Rheidter Wertchens near Köln), 1955:61 (Germany: Rheinland); Burger, 2005:35 (Germany: Thüringen); Wiesner, 2006:237 (Germany: first record from Brandenburg: more frequent in south of Brandenburg than *P. lethifer*, is a full species); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); van der Smissen, 2010a:348 (Germany: Schleswig-Holstein: locality records), 2010b:386 (France: Ardèche, Drôme, Gard, and Vaucluse: locality records); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Bitsch, 2014:408 (regarded by many auathors as independent species; recorded from France by van der Smissen, 2010b); U. Frommer, 2014:28 (Germany: Hessen: Lorch); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:116 (in revision of Sphecidae *sensu lato* of Europe); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen: city gardens). – **As *Pemphredon lethifer* form *littoralis***: A. Wagner, 1932:229, 230 (new status, in revision of European *Pemphredon* subgenus *Dineurus*), 1938a:119 (northwestern Germany); Paul, 1941:41 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area); Krombein, 1964a:99 (nest, prey, Balthasar, 1972:213, 214 (in Sphecid Fauna of Czechoslovakia); Erlandsson, 1974:78 (Yugoslavia); van der Smissen, 2003:69 (in revision of European species of subgenus *Cemonus*); Le Divelec, Chapelin-Viscardi, and Larivière, 2016:109 (northern France: in agricultural landscapes);. – **As *Pemphredon lethifer littoralis***: Grandi, 1959b:266 (new status, nesting habits and nest parasites), 273 (description of mature larva), 287 (Italy: Bologna), 1961:221 (nesting habits), 516 (description of larva), 1962:96 (Italy); Babiy, 1964:115 (Austria: Land Salzburg).

Diphlebus neglectus A. Wagner, 1918:143, ♂, but ♀ according to Wagner, 1931:38. Holotype: ♀ according to Wagner, 1931:38, Germany: Lockstedt near Hamburg (A. Wagner collection, now?). Synonymized with *Cemonus lethifer* by A. Wagner, 1931:38 and Harttig, 1931b:83. – A. Wagner, 1918:141 (in key to subgenus *Dineurus);* Blüthgen, 1931a:126 (bibliographic reference). – **As *Pemphredon neglectus***: A. Wagner, 1920:42 (new combination, Germany: Lower Elbe region); Schmiedeknecht, 1930:670 (in keys to Hymenoptera of North and Central Europe); A. gevisWagner, 1938:119 (northwestern Germany, as *lethifer* forma *neglectus*).

Diphlebus minutus A. Wagner, 1918:143, ♂. Holotype: ♂, Italy: San Vigilio at Lake Garda (A. Wagner collection, now?). Synonymized with *Cemonus lethifer* by A. Wagner, 1931:38 and with *Pemphredon lethifer by* Harttig, 1931b:83. – A. Wagner, 1918:141 (in key to subgenus *Dineurus*); Schmiedeknecht, 1930:670 (in keys to Hymenoptera of North and Central Europe).

Dineurus lethifer forma *confusa* A. Wagner, 1932:231, ♂. Holotype: ♂, no specific locality; type series: Austria, Italy, Spain, Caucasus (A. Wagner collection, now?). Synonymized with *Pemphredon lethifer* by Wagner, 1938:119 and by Tsuneki, 1951a:203. – **As *Pemphredon lethifer* forma *confusus***: A. Wagner, 1938a:119 (new combination, northwestern Germany); Šnoflák *in* Zavadil and Šnoflák, 1948:54 (in key to Sphecidae of Czechoslovakia); Ceballos, 1956:357 (in catalog of Hymenoptera of Spain); Bajári, 1957a:83 (in key to Hungarian Sphecidae, as *lethifer* var *confusus*); Niedl and Deneš, 1972:153 (Czech Republic: Třeboň area).

Pemphredon brevipetiolata A. Wagner, 1932:232, ♂ (as *brevipetiolatus*, incorrect original termination). Holotype: ♂, Germany: "Berlin?" (ZMHU, now lost: Dollfuss, 1995:977). Synonymized with *Pemphredon lethifer* by A. Wagner, 1938a:119 and 1938c:12 (as *Dineurus lethifer*), and by Leclercq, 1941b:11. – A. Wagner, 1938a:119 and 1938c:13 (northwestern Germany, Netherlands, as *Pemphredon lethifer* forma *brevipetiolatus*); Paul, 1941:41 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area, as *lethifer* f. *brevipetiolatus*);

Bajári, 1957a:82 (in key to Hungarian Sphecidae), 1957b:138 (first record from Hungary); Balthasar, 1972:216 (in Sphecid Fauna of Czechoslovakia: may be expected in the country); Benedek, 1979:233 (Hungary: Bakony Hills); Józan, 1986:369 (Hungary: Kiskunság National Park), 2001:278 (Hungary: Somogy County), 2010:251 (record by Józan, 2001, was misidentification).

Pemphredon platyura Gussakovskij, 1952:214, ♀ (as *platyurus*, incorrect original termination). Lectotype: ♀, Uzbekistan: Aman Kutan (ZIN), designated by Dollfuss, 1995:977. Synonymized with *Pemphredon lethifer* by Dollfuss, 1995:977. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae).

Pemphredon minor Gussakovskij, 1952:213, ♀. Lectotype: ♀, Uzbekistan: Khiva Ravat (ZIN), designated by Dollfuss, 1995:678. Synonymized with *Pemphredon lethifer* by Dollfuss, 1995:978. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Kazenas, 1978b:154 (in key to Sphecidae of Kazakhstan and Central Asia); Nazarova and Shomirsaidov, 1997:23 (Tajikistan: fruit tree orchards in Vakhsh River valley); Islamov, 1986:529 (Uzbekistan: Surkhandarya Oblast'); Nazarova, 1998:40 (Tajikistan: Tigrovaya Balka Nature Reserve), 2004:105 (Tajikistan: Badakhshan Region: Rushan District: village Visav in Bartang River valley).

Pemphredon levinota Merisuo *in* Merisuo and Valkeila, 1972:18, ♀ (as *levinotus*, incorrect original termination). Holotype: ♀, Tajikistan: Mount Alai: Ak-Bosaga (ZMMU). Synonymized with *Pemphredon lethifer* by Dollfuss, 1995:978. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Kazenas, 2001:21 (in checklist of Sphecidae of Kazakhstan and Central Asia).

Pemphredon nannophyes Merisuo *in* Merisuo and Valkeila, 1972:17, ♀. Holotype: ♀, Kazakhstan: Alma Ata (ZMMU). Synonymized with *Pemphredon lethifer* by Dollfuss, 1995:978. – Merisuo, 1972b:192 (correction to original description: the holotype female came from Alma-Ata, Kazakhstan); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae).

Pemphredon dispar Valkeila *in* Merisuo and Valkeila, 1972:17, ♀. Holotype: ♀, Morocco: Daiet Aoua (FSAG). Synonymized with *Pemphredon lethifer* by Dollfuss, 1995:978. – R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae).

Pemphredon gemina Valkeila *in* Merisuo and Valkeila, 1972:18, ♂, ♀ (as *geminus*, incorrect original termination). Holotype: ♂, Russia: Daghestan: "Tuprozsk", a misspelling (FSAG). Synonymized with *Pemphredon lethifer* by Dollfuss, 1995:978. – R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Kazenas, 2001:21 (in checklist of Sphecidae of Kazakhstan and Central Asia); Leclercq, 2007g:195 (holotype in FSAG).

Pemphredon trichogastor Valkeila *in* Merisuo and Valkeila, 1972:19, ♂. Holotype: ♂, Russia: Daghestan: "Tuprozsk," a misspelling (FSAG). Synonymized with *Pemphredon lethifer* by Dollfuss, 1995:978. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Kazenas, 2001:22 (in checklist of Sphecidae of Kazakhstan and Central Asia, as *trichogaster*).

As *Pemphredon coracina*: Valkeila *in* Merisuo and Valkeila, 1972:20, ♂ only, corrected to *Pemphredon lethifer* by Dollfuss, 1995:978.

? *Pemphredon sudaorum* Tsuneki, 1977g:10, ♀, ♂. Holotype: ♀, Japan: Yamanashi Prefecture: Panorama-dai, Kami-Isshiki village (originally K. Tsuneki collection, now Hyogo Mus.). Tentatively synonymized with *Pemphredon lethifer* by Dollfuss, 1995:978. – Tano, 1994b:43 (holotype in K. Tsuneki collection); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:401, 402 (in key to Sphecidae of Russian Far East); Hashimoto and Nakanishi, 1997:26 (holotype and paratype transferred to Hyogo Mus.).

As *Cemonus shuckardi*: Freke, 1895:281 (first record from Ireland: Dublin County: Dundrum) and 1896:40 (Ireland), corrected to *Pemphredon lethifer* by Stelfox, 1924:15.

As *Diphlebus unicolor*: A. Wagner, 1918:141, 142 (in key to subgenus *Diphlebus*), 143 (nesting in galls of *Lipara*, , corrected to *Dineurus lethifer* by Blüthgen, 1931a:125.

26. *lugens* Dahlbom

Pemphredon lugens Dahlbom, 1842:12, ♀, ♂. Syntypes: Sweden: Gotland and Jemtland: no specific localities (Lund). – Dahlbom, 1844:263 (in revision of Sphecidae and Pompilidae), 1845:508 (in key to European *Pemphredon* s.s.); F. Smith, 1856:429 (in catalog of Hymenoptera in British Museum); Ruthe and Stein, 1857:315 (Germany: Berlin area); Kirchner, 1867:222 (in catalog of European Hymenoptera); Schenck, 1867a:353 (known from Germany: Preussen Province); Thomson, 1870:235 (in revision of Swedish wasps), 1874:191 (in revision of Hymenoptera of Scandinavia); Kohl, 1880:136 (Austria: Tirol, and Italy: Trentino–Alto Adige); Siebke, 1880:62 (Norway); Friese, 1883:201 (Germany: Sachsen-Anhalt: Weissenfels; Thüringen: Jena); Kohl, 1883e:659 (Switzerland); von Heyden, 1884:120 (Germany: Frankfurt am Main area); Ed. André, 1888:197 (in revision of Sphecidae of Europe and Algeria), 15* (bibliographic references); Kohl, 1888b:724 (Austria: Tirol, now Italy: Alto Adige), 1890a:52 (in review of *Pemphredon*), 1893a:38 (Austria: Niederösterreich); F. Morawitz, 1893a:110 (Russia: Karelian Isthmus); Westerlund, 1893:25 (Russia: Karelian Republic: northern shore of Lake Ladoga); Baldini, 1894:53 (Italy: Modena area); Krieger, 1894:16 (Germany: Kingdom of Saxony); Dalla Torre, 1897:357 (in catalog of world Hymenoptera); Mocsáry, 1897:78 (Kingdom of Hungary, some localities are in today's Croatia and Romania); Strand, 1898b:92 (Norway); Adlerz, 1904:133 (nesting habits); Aurivillius, 1904:260 (in revision of Swedish Sphecidae); W. Schulz, 1904b:92 (Czechoslovakia, Finland: Terijoki, now Russia: Zelenogorsk); Kubes, 1905:83 (Czech Republic: Obora); Adlerz, 1906:37 (Sweden; nesting habits); Schmiedeknecht, 1907:206, 208 (in key to Hymenoptera of Central Europe); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Dittrich, 1911b:21 (Germany: Niederschlesien Province, now Poland: Dolny Śląsk Region); Graeffe, 1911:50 (Italy: Trieste area); Schirmer, 1912:165 (Germany: Berlin area); Lundblad, 1913:212 (Sweden); Birula, 1914:381 (Belorussia: Luskinopol' near Vitebsk); Noskiewicz, 1918:137 (Galicia, now western Ukraine: Janów, Łyczaków near Lwów); O. Meyer, 1919:150 (Germany: Posen Province, now Poland: Poznań Region); Noskiewicz, 1920a:154 (Poland: Tatry Mountains: Palenica); A. Wagner, 1920:42 (can be expected in Germany: Lower Elbe region); Jansson, 1922:23 (Sweden: Island of Öland); Lundblad, 1924:22 (N Sweden); Berland, 1925d:141 (in Sphecid Fauna of France); Bischoff, 1925:299 (Latvia: Jelowka and Wezkukkul; Poland: Białowieża); Schütze, 1925:111 (Germany: Lausitz Region); Shestakov, 1925:36 (Russia: Yaroslavl' area); Friese, 1926:151 (in key to Sphecidae of Central Europe, short morphological and biological characteristics); Barovskij, 1929:149 (Russia: Sankt Petersburg and north of Sankt Petersburg); Gaunitz, 1929:199 (Sweden: Lapland); Schmiedeknecht, 1930:668, 669 (in keys to Hymenoptera of North and Central Europe); Pulkkinen, 1931:90 (in revision of Sphecidae of Finland); Jansson, 1934:289 (Sweden); Forsius *in* Forsius and Hellén, 1935:11 (in checklist of Hymenoptera of Finland); Grandi, 1935a:109 (Italy); Merisuo, 1936:123 (illustrations of taxonomically important body parts); Zavadil, Šustera, and Bat'a, 1937:177 (in catalog of Sphecidae of Czechoslovakia); A. Wagner, 1938a:119 (northwestern Germany); Móczár, 1939:5 (Hungary: Jászberény); Paul, 1941:40 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area); Schneid, 1941:1035 (Germany: Bayern: Bamberg area); Balthasar, 1942:4 (Czech Republik: Moravia); Giner Marí, 1943:48 (in Sphecid Fauna of Spain); Šnoflák, 1944a:143 (Czech Republic: serpentine steppe near Mohelno); Šnoflák *in* Zavadil and Šnoflák, 1948:52 (in key to Sphecidae of Czechoslovakia); Cavro, 1950:33 (France: Département du Nord); Szulczewski, 1950:105 (Poland: Wielkopolski National Park 15 km S Poznań); Cleu, 1953:51 (France: Ardèche River basin); Nouvel and Ribaut, 1953:180 (France: Haute-Garonne: Saint-Béat, Hautes-Pyrénées: Orédon); Vergne, 1955:5 (France: Auvergne); de Beaumont, 1954e:93 (Italy); Fahlander, 1954:250 (Sweden: Gästrikland Region); Vogrin, 1955:39 (Yugoslavia); Bytinski-Salz, 1956:227 (Turkey: Ulu Dagh); Bajári, 1957a:83, 84 (in key to Hungarian Sphecidae); de Beaumont, 1958c:207 (Swiss National Park); Pulawski, 1958a:186 (Bulgaria: Kniazhevo near Sofia); de Beaumont, 1959a:31 (Italy); Wolf, 1959b:26 (Germany: Nassau); Hamann, 1960:196, 198 (Austria: Niederöstereich: Mönchgraben at 48°13'N 14°21'E); Noskiewicz and Puławski, 1960:43, 44 (in key to Polish Sphecidae); Hoop, 1961:64 (Germany: Schleswig-Holstein: Kronshagen; also Hamburg); Janvier, 1961a:26 (nesting habits, description of larva); Stritt, 1962:50 (Germany: Baden-Württemberg: Wutach area); Valkeila, 1962b:67 (southwestern Finland); Wengris, 1962:203 (Lithuania: Vilnius area); Valkeila, Brander, and Käpylä, 1963:41 (Finland: historical region Lounais-

Hämeen = southwest Häme); Babiy, 1964:115 (Austria: Land Salzburg); de Beaumont, 1964c:102 (in Sphecid Fauna of Switzerland); Evans, 1964b:249 (reference to Janvier's 1961 description of larva); Hüsing and Jäger, 1964:192 (Germany: Sachsen-Anhalt: Nietleben near Halle), 198 (males emerging earlier than females); de Beaumont, 1965a:57 (Greece); Gauss, 1966a:66 (Germany: Baden); de Beaumont, 1967a:342 (Turkey); Gauss, 1967:555 (Germany: Baden-Württemberg); J. Heinrich, 1967:77 (Germany: Bayern: Grossheubach); Niedl and Deneš, 1967:78 (Czech Republic: Třeboň area); Schmidt, 1969:165 (Germany: Rhein-Main area: Bensheim an der Bergstraβe, Frankfurt); Scobiola-Palade, 1967b:45 (Romania); Oehlke, 1970:737 (German Democratic Republic); Tumšs, 1970:72 (Latvia); Valkeila and Leclercq, 1970:map168 (distribution in Belgium); Bonelli, 1971:72 (nesting habits); Dathe, 1971:234 (Germany: Berlin Zoological Garden; phenology), 238 (Germany: Berlin); Gauss, 1971:418 (Germany: Baden-Württemberg: Wutach River area); Schmidt, 1971b:40 (Germany: Rheinland-Pfalz: Gonsenheimer Wald); Balthasar, 1972:208 (in Sphecid Fauna of Czechoslovakia); Haeseler, 1972:156, 175 (Germany: Schleswig-Holstein; anthropogenic habitats); Kofler, 1972:110 (Austria: eastern Tirol); Tumšs, 1972:29 (one female in B. Gimmerthal collection, Zoological Museum, Riga State University, Latvia); Valkeila and Leclercq, 1972:703 (locality records); Erlandsson, 1974:78 (Italy); Lomholdt, 1975c:92 (in Sphecid Fauna of Fennoscandia and Denmark); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Banaszak, 1977:112 (Poland: Rogalin near Poznań); Hoop, 1977:73 (Germany: Schleswig Holstein: Kahlschlag); Kolesnikov, 1977:319 (Russia: Bryansk Oblast'); Kazenas, 1978b:153 (in key to Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Schwammberger, 1978:418 (Germany: Württemberg); Benedek, 1979:233 (Hungary: Bakony Hills); Casolari and Casolari Moreno, 1980:119 (specimens in M. Spinola collection); Dathe, 1980:209 (Russia: northern Caucasus: Teberda); Pagliano, 1980:130 (Italy: Piemonte); Petit, 1980:42 (Belgium: Wéwercé); Westrich, 1980:631 (Germany: Baden-Württemberg: Tübingen area); Dollfuss and Ressl, 1981:321 (Austria: Niederösterreich: Scheibbs District); Skibińska, 1981:357 (Poland: Warszawa-Białołęka); Thiede, 1981:46 (Germany: Baden-Württemberg: Ulm, reared from artificial nest with acrylic tubes); Axelsson, 1982:79 (Sweden); Donath, 1982:214 (Germany: Cottbus Bezirk); Skibińska, 1982:118, 122 (Poland: Mazovian Voivodship: Białołęka, Łomna, Warszawa); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Kvamme and Axelsson, 1983:57 (Norway); Riemann, 1983:81 (Germany: Bremen-Daverden area); Steinmann, 1983:163 (Switzerland: Graubünden Canton, nesting in wood buildings); Mingo and Gayubo, 1984:110 (Spain); Schmidt, 1984:249 (Germany: Baden-Württemberg); Schmidt and Westrich, 1984:240 (Germany: Rheinland-Pfalz: Bad Münster); Józan, 1985b:56 (Hungary south of Lake Balaton), 83 (ecological and zoogeographic characteristics); Tyrner, 1985:9 (Czech Republic: Jezerka Nature Reserve in Krušné Hory = Erzgebirge); Brechtel, 1986:64 (Germany: Südpfalz); Nemkov, 1986:95 (Russia: Irkutsk Oblast'); Skibińska, 1986b:150, 153 (Poland: suburbs of Warszawa); Vikberg, 1986b:75 (Finland); Riemann, 1987b:44 (Germany: Niedersachsen: Nature Reserve Voßberge); Schmidt and Westrich, 1987:368 (Germany: Mainz area); Dollfuss, 1988:11, 22 (Austria: Bisamberg near Vienna; Niederösterreich: Oberweiden); Kowalczyk, 1988b:63 (Poland: environs of Łódź); Riemann, 1988:223 (Germany: Bremen area); Jacobs, 1989:7 (Germany: Mecklenburg-Vorpommern); Pádr *in* Šedivy, 1989a:168 (in checklist of Czechoslovakian Sphecidae); Pankevich, Belyavskaya, Molchanova, Shlyakhtenok, and Blinov, 1989:96 (Belorussia: Berezinskiy Nature Reserve); Weiffenbach, 1989:105 (Germany: Hessen: Gießen area); Jacobs and Oehlke, 1990:148 (new locality records from German Democratic Republic); Kowalczyk, 1990:290 (Poland: Góry Świętokrzyskie); Pádr, 1990:78 (Czech Republic: Praha area); Pagliano, 1990:116 (in catalog of Italian Sphecidae); Rohe, 1990:1049 (Germany: Rheinland-Pfalz: Lenneberg forest); Schwammberger and Priesner, 1990:536 (Austria: Kärtnen); Day, 1991:xviii (in summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:62 (in key to Sphecidae of North and Central Europe); Gayubo and Torres, 1991:Table I (Spain: Salamanca; effects of urban pressure); Jacobs, 1991:46 (Germany: Mecklenburg-Vorpommern: Nature Reserve Elbtaldünen); Kowalczyk, 1991a:89 (Poland: Łódź), 1991b:119 (Poland: Augustów Forest); N. Schneider, 1991:93 (Luxemburg), 108 (nest structure); Sorg and Wolf, 1991:195 (Germany: Koppelstein Reserve southeast of Koblenz); Budrys, 1992:25 (in list of Sphecidae of Lithuania); Delarze, 1992:68 (Switzerland: Valais:

Les Follatères); Józan, 1992b:172 (Hungary: Boronka-melléki Protected Area); K. Weber, 1992:88 (Germany: Bayern: Bamberg District); Jakubzik and Cölln, 1993b:92 (Germany: Nordrhein-Westfalen: raised from artificial nests); Luig, 1993:42 (Estonia); Wiśniowski, 1993a:96 (Poland: in checklist of Sphecidae of Białowieża Primeval Forest); Pádr and Lukáš, 1994:894 (Slovakia: High Tatra Mountains); Theunert, 1994c:48 (Germany: summary of records from Niedersachsen and Bremen); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:400, 401 (in key to Sphecidae of Russian Far East); Dollfuss, 1995:984 (in revision of world *Pemphredon*); Jansen and Kaluza, 1995:8 (Germany: endangered in Sachsen); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna); Papp and Józan, 1995:146 (Hungary: Síkfőkút oak forest); Scharrer, 1995:23 (Germany: Bayern: Karlstadt, Miltenberg); Schmid-Egger, 1995:63 (Germany: northwestern Baden-Württemberg); Schmid-Egger, Risch, and Niehuis, 1995:204 (Germany: summary of records from Rheinland-Pfalz); Shlyakhtenok, 1995:194 (Belorussia: Berezinsky Nature Reserve); Arens, 1996:440 (Germany: Bayern: Bayreuth area); Jakubzik and Cölln, 1996b:400 (Germany: Rheinland-Pfalz); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: not endangered); Voblenko, Gorobchishin, and Nesterov, 1996:14 (Ukraine: Polesye Region); Shlyakhtenok, 1996:304 (Belorussia: Berezinsky Nature Reserve); Witt, 1996:106 (Germany: Brandenburg); Woydak, 1996:23 (Germany: Westfalen: summary of distribution and nesting habits); Celary, 1997:57 (in checklist of Animals of Poland); Schmidt and Schmid-Egger, 1997:25 (in checklist of German Sphecidae); Shlyakhtenok, Blinov, and Belyavskaya, 1997:153 (Belorussia: Pripyatskiy National Park); Stoyanov and Ljubomirov, 1997:26 (Bulgaria: Rila Mountains); Blösch, 1998:168 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); F. Burger, Saure, and Oehlke, 1998:29 (Germany: in list of Sphecidae of Brandenburg); Celary, 1998b:210 (Poland: Babia Góra National Park); Dollfuss, Gusenleitner, and Bregant, 1998:512 (Austria: summary of collecting records from Burgenland); Drewes, 1998:49 (Germany: Niedersachsen: Goldbeck 26 km WSW Hamburg); González, Gayubo, and Torres, 1998:72, 73 (Spain: Valladolid Province); Jakubzik, Schlüter, and Cölln, 1998:1182, 1184 (Germany: Rheinland-Pfalz); Józan, 1998:311 (Hungary: Duna-Dráva National Park); Tscharntke, Gathmann, and Steffan-Deventer, 1998:719 (trap-nesting in Germany); van der Smissen, 1998:66 (Germany: Niedersachsen, Schleswig-Holstein); K. Weber, 1998:147 (Germany: Bayern: Bamberg area); Cölln and Jakubzik, 1999:29 (Germany: Rheinland-Pfalz: Keuper-Scharren southwest of Hungerburg); Ljubomirov, 1999b:47 (Bulgaria: Mount Vitosha near Sofia); Löhr, 1999:62 (Germany: Hessen: Mücke-Merlau near Gemünden); Luig and Voolma, 1999:176 (Estonia); Majzlan, Rychlík, and Deván, 1999:146 (Slovakia: Čenkovská Step Nature Reserve); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Pagliano and Scaramozzino, 1999:164 (Italy: Piemonte: Borgomale); Pauly, 1999:108 (in catalog of Belgian aculeates); M. Schwarz, 1999:85 (Austria: Oberösterreich: city of Linz area); Zehnder and Zettel, 1999:131 (Switzerland: recolonization of flooded area in Valais Canton); Blösch, 2000:174 (in Sphecid Fauna of Germany); Gayubo, González, and Torres, 2000:184 (Spain: Salamanca Province); Gonzáles, Gayubo, and Tormos, 2000:18 (Andorra: Santa Coloma); Jacobs, 2000:9 (Germany: Land Mecklenburg-Vorpommern: not endangered); Kazenas, 2000e:129 (in Sphecid Fauna of Kazakhstan); Mokrousov, 2000b:30 (Russia: Nizhniy Novgorod Oblast'); Schmid-Egger, 2000b:276 (Germany: Baden-Württemberg: shores of Rhine River); Wiśniowski, 2000:161 (Poland: Bieszczady Mountains); Dollfuss, 2001:272 (miscellaneous locality records); Dollfuss and Bitsch *in* Bitsch et al., 2001:81 (in Sphecid Fauna of Western Europe); Józan, 2001:278 (Hungary: Somogy County); Kazenas, 2001:21 (in checklist of Sphecidae of Kazakhstan and Central Asia); Ohl et al., 2001:141 (distribution in Germany by provinces); Skibińska, 2001:219 (Poland: Białowieża Primeval Forest); Szczepko and Kowalczyk, 2001:187 (Poland: Kampinos National Park near Warszawa); van der Smissen, 2001:63 (Germany: Schleswig-Holstein: not endangered); Zettel, Gross, and Mazzucco, 2001:69 (Austria: Wien); Bergsten, Hoffsten, and Hellqvist, 2002:38 (Sweden: Hälsingland: Övre Tälningsån); Bieri, 2002:78 (Liechtenstein); Józan, 2002:53 (Hungary: Mecsek Mountains); Kazenas, 2002a:50 (geographic distribution, collecting localities in Kazakhstan); Kowalczyk, Szczepko, and Świątek, 2002:152 (Poland: Kampinos National Park near Warszawa); Kuhlmann, 2002:66 (Germany: Bayern: National Park Bayerischer Wald); Mokrousov, 2002:148 (Russia: Nizhniy Novgorod Oblast': Kerzhenskiy Nature Reserve); Shlyakhtenok and Skibinska, 2002:33 (Belorussia: no specific locality); Söderman and Vikberg, 2002:50 (in list of

Aculeata of Finland); Wiśniowski, 2002:69 (Poland: Ojców National Park); Bergsten, Ekerholm, Hellquist, Hilszczanski, Nilsson, Pettersson, and Werner, 2003:71 (Sweden: Västerbotten: Island of Romelsön); Cölln, Esser, and Jakubzik, 2003:62 (Germany: northwestern Rheinland-Pfalz: excavation sites and quarries); Drewes, 2003:141 (France, Germany, Italy: miscellaneous locality records); Kuhlmann and Quest, 2003:51 (Germany: Bayern: Bayerischer Wald National Park); Kula and Tyrner, 2003a:150 (Czech Republic: Děčin Sandstone Uplands: forest district Snežnik: birch stands in air-polluted area), 2003b:203 (Northern Czech Republic: spruce stands in air-pollution region); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); Schmid-Egger, 2003:756 (Italy: Sicilia: Randazzo); Steffan-Dewenter and Leschke, 2003:1966 (Germany: Niedersachsen: orchard meadows); Wiśniowski, 2003:189 (Poland: summary of locality records); Wiśniowski *in* Dylewska and Wiśniowski, 2003:139 (Poland: Ojców National Park); Wiśniowski and Werstak, 2003:76 (Poland: Pieniny National Park); Aistleitner, 2004:59 (Austria: Vorarlberg: Nentzing-Latz); Bergsten, Nilsson, and Hellquist, 2004:7 (Sweden: Västerbotten: Nordmaling); Budrienė, Budrys, and Nevronytė, 2004:22 (Lithuania: nesting in trap nests); Deván, 2004:147 (western Slovakia); Dollfuss, 2004a:118 (Czech Republic); Esser, Jakubzik, Sonnenburg, and Woydak, 2004:263 (Germany: in checklist of Sphecidae of Nordrhein-Westfalen); Gayubo**,** Nieves-Aldrey, González, Tormos, Rey del Castillo, and Asís, 2004:108 (Spain: Madrid: Monte de El Pardo); Jakubzik, Niehuis, and Cölln, 2004:458 (Germany: Rheinland-Pfalz: Roβstein in Rhein valley at 50°06'42"N 7°43'87"E); Klein and Lefeber *in* Peeters, van Achterberg, et al., 2004:413 (in Wasp and Ant Fauna of Netherlands); Majzlan and Deván, 2004:30 (Slovakia: Sekule), 33 (Slovakia: Malacky-Široké); Salzmann-Wandeler and Rezbanyai-Reser, 2004:27 (central Switzerland); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Szczepko and Kowalczyk, 2004:125 (Poland: Kampinos National Park near Warszawa); van Achterberg and Peeters, 2004:32 (in checklist of Sphecidae of Netherlands); Wiśniowski, 2004:40 and 58 (in checklist of Polish Sphecidae); Bergsten, Ekerholm, Gabrielsson, Hellquist, Petersson, Werner, Ström, Chauvet, and Dalecky, 2005:16 (Sweden: Västerbotten: Bjuröklubbs Nature Reserve); Burger, 2005:35 (Germany: Thüringen); Hallin, 2005:16 (Sweden: Örebro County: Hällefors); Kofler, 2005:169 (Austria: Tirol: Lienz District: several localities); Pagliano and Negrisolo, 2005:469 (in Sphecid Fauna of Italy); Quest and Kuhlmann, 2005:33 (Germany: Bayern: Bayerischer Wald National Park); Riemann and Hohmann, 2005:563 (Germany: Niedersachsen: city of Bremen and adjacent area); Saure, 2005:18 (Germany: Berlin); Schmalz, 2005:58 (references to XIXth century authors); Theunert, 2005a:18 (Germany: in checklist of Sphecidae of Niedersachsen and Bremen); Venne and Bleidorn, 2005:43 (Germany: Nordrhein-Westfalen: Moosheide Nature Reserve); Liebig, 2006:39 (Germany: Sachsen: Muskauer Heide); Magdalou, 2006a:6, 10 (France: Pyrénées-Orientales: Réserve Naturelle de la Massane); N. Schneider, 2006:140, 142 (Luxemburg: anthropogenic habitats); Shlyakhtenok, 2006:110 (Belorussia: Polesye Radiological Nature Reserve); Vepřek, 2006:511 (Czech Republic: Kokořínsko area); Baños-Picón, Gayubo, Asís, and González, 2007:257, 259 (Spain: Zamora: Cabañas de Aliste); Cungs, Jakubzik, and Cölln, 2007:140 (Luxemburg: Haardt Nature Reserve); Dvořák, Straka, Smetana, Halada, Vepřek, and Karas, 2007:169 (Czech Republic: Vyšenské Kopce National Nature Reserve); Guldemond, Pijfers, and den Belder, 2007:203 (Netherlands: Gelderland: dairy farm in de Graafschap); Hallin, 2007b:24 (Sweden: Blekinge County); Jacobs, 2007:64, 70 (in key to Crabronidae of Germany); Jansen and Kaluza, 2007:25 (Germany: northwestern Sachsen); Józan, 2007:173. 179 (Hungary: Zselic hills); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Shlyakhtenok, 2007a:299 (Belorussia: Berezinsky Nature Reserve), 2007b:364 (Ukraine: Chernobyl area); G. Turrisi and R. Turrisi, 2007:123 (Italy: Sicilia: Mount Etna: Botanical Garden Nuova Gussonea and vicinity); Vago, 2007:174 (France: département du Nord); Venne, Bleidorn, and Lauterbach, 2007:302 (Germany: Nordrhein-Westfalen: Bielefeld); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia); Danilov, 2008:351 (Russia: Altayskiy Kray: Barnaul area); Gayubo, González, Tormos, and Asís, 2008:139 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Ljubomirov and Yildirim, 2008:183 (in catalog of Crabronidae of Turkey); Nemkov, 2008b:18 (in catalog of Crabronidae of Asiatic Russia); Theunert, 2008:71 (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); Debuyser and Vago, 2009:4 (in list of Sphecidae *sensu lato* of northern France); Donie, 2009:10 (Germany: Niedersachsen: Oldenburg); U. Frommer, 2009a:28 (Germany: in checklist of Sphecidae of Hessen); Gayubo, González, Tormos, and Asís, 2009:362 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); González, Gayubo, Asís, and Tormos, 2009:622 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Guéorguiev and Ljubomirov, 2009:263 (Bulgaria: Maleshevska Planina); Holzschuh, Steffan-Deventer, and Tscharntke, 2009:127 (Germany: Niedersachsen: near Göttingen at 51°30'N 9°54'E, nesting in grass strip corridors in agricultural landscape); Livory, Chevin, Lair, Sagot, and Baldock, 2009:18 (France: Département de la Manche: Quinéville); Mokrousov, Antropov, Ruchin, and Bugayev, 2009:78 (Russia: Republic of Mordovia); Nemkov, 2009b:66 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:71 (Norway: locality records); Pagliano, 2009:188 (Italy: Friuli-Venezia Giulia: Ugovizza; Toscana: San Rossore); Straka, Dvořak, and Bogusch, 2009:264 (Czech Republic: Jizerské Mountains and Frýdlant region); Szczepko and Wiśniowski, 2009:71 (Poland: Spała Landscape Park); Ermilov and Mokrousov: 2010:91 (phoretic mites *Calvolia* sp., *Probonomoia pini*, and *Tortonia intermedia* in Middle Volga Region of Russia); Esser, Fuhrmann, and Venne, 2010:38 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Hable, von der Dunk, and Knipfer, 2010:66 (Germany: Bayern: vicinity of Dietfurt); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Jakubzik and Cölln, 2010:1187 (Germany: Rheinland-Pfalz: Bruchertseifen near Altenkirchen); Johansson, 2010:121 (Sweden: Småland: upper Emå river valley); Mokrousov, 2010a:63 (Russia: Kirov, Nizhniy Novgorod, and Yaroslavl' Oblast's, Mordovian Reublic: no specific localities), 2010c:108 (Russia: Chuvash Republic: State Nature Reserve "Prisurskiy"); Rudoiskatel', 2010:154 (Russia: central and southern Ural Mountains); Saure, 2010a:88 (Germany: Berlin-Reinickendorf: Baumberge), 2010b:176 (Germany: Berlin-Reinickendorf: airport Tegel and Flughafensee Protected Area); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Schmidt, 2010:138 (Germany: Bayern: collected along Main-Donau canal); van der Smissen, 2010a:348 (Germany: Schleswig-Holstein and Mecklenburg-Vorpommern: locality records), 2010c:397 (Sweden: Öland: Byrums Sandvik, Gårdby; Södermanland: Ören); Baghirov, 2011b:152 (Russia: recorded from Altay by Nemkov *in* Nemkov, Kazenas, Budrys, and Antropov, 1995); Cruz-Sánchez, Asís, Gayubo, Tormos, and González, 2011:497 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park: effects of wildfire); Feoktistov, 2011:85 (Russia: Mordovian Nature Reserve); Gogala, 2011:11 (Slovenia); Mokrousov, Berezin, and Egorov, 2011:79 (Russia: Chuvash Republic); Pagliano, 2011a:158 (specimen in collection Spinola, Torino, is *Pemphredon lugens*); Rudoiskatel', 2011d:241 (Russia: central Ural Mountains); Schmid-Egger, 2011c:556 (Austria: Tirol: Tiroler Lech Nature Park); Shlyakhtenok, 2011:95 (Belorussia: city of Minsk); Theunert, 2011a:21 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:161 (Germany: Hessen: not endangered); Boillat, 2012:228 (Switzerland: in checklist of insects of Canton de Genève); Burguet *in* Durand and Burguet, 2012:4, fiche 18 (France: Puy-de-Dôme: sands Girauts-Faures in Orléat commune); Franzén, Molander, Norén, and Nilsson, 2012:26 (Sweden: Skäne: Kullaberg Peninsula); Hellrigl, 2012:129 (Italy: Provincia Autonoma di Bolzano-Alto Adige, as Südtirol); Nemkov, 2012c:437 (in catalog of Crabronidae of Russian Far East); Shlyakhtenok, 2012a:172 (Belorussia, and Russia: Kirov Oblast': Arkhangelskoye: collected in private plots), 2012b:92 (Belorussia: Beresina National Reserve: overgrowing dry meadow); Strumia, Pagliano, and Gayubo, 2012:57 (Italy: Toscana: Riserva di San Rossore); Akulov and Proshchalykin, 2013:113 (Russia: Siberia: Krasnoyarsk Kray: near Minusinsk); Bayındır, Gürbüz, Ljubomirov, and Pohl, 2013:146 (Turkey: Isparta: Kasnak Oak Forest Nature Reserve); Ma, X. Li, Chen, and Q. Li, 2013:579 (first record from China: Nei Mongol: Helan Mountains); Pankov, 2013:230 (Russia: Ivanovo Oblast'); Saure, 2013:21 (Berlin: Treptow-Köpenick: Gosener Wiesen); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Shlyakhtenok, 2013:149 (in annotated catalog of aculeate wasps of Belorussia); Vieira, Oliveira, Brewster, and Gayubo, 2013:19 (Portugal: Douro International Natural Park); Wiśniowski and Szczepko, 2013:46 (Poland: Kampinos National Park near Warszawa); U. Frommer, 2014:28 (Germany: Hessen: Lorch); U. Frommer, M. Niehuis, and O. Niehuis, 2014:1322 (Germany, Hessen: Roβstein); Hellqvist, Abenius, and Norén, 2014:93 (in

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As *Pemphredon podagrica* (♀ only): Chevrier, 1870:268, corrected to *Pemphredon lugens* by Kohl, 1890a:55 (in review of *Pemphredon*).

As *Pemphredon lugubris* partim: Pagliano, 2011a:158 (specimen in collection Spinola, Torino, is *Pemphredon lugens*).

27. *lugubris* (Fabricius)

Crabro lugubris Fabricius, 1793:302, sex not stated. Lectotype: ♀, Germany: Halae Saxonum, now Sachsen-Anstalt: Halle (ZMUC), designated by van der Vecht, 1961a:28. – Fabricius, 1796:51 (in Index to his Entomologia Systematica, 1793). – **As *Vespa lugubris***: Turton, 1802:533 (new combination, Germany: Halle). – **As *Cemonus lugubris***: Jurine, 1807:214 (new combination, in checklist of European *Cemonus*); Lepeletier de Saint Fargeau, 1845:94 (in revision of world Hymenoptera); Belke, 1859:70 (Ukraine: Kamieniec Podolski); A. Morawitz, 1864:460 (Russia: Sankt Petersburg); Acloque, 1897:85 (in Sphecid Fauna of France and Algeria); Spooner, 1931:14 (Great Britain: Cambridgeshire); Hallett, 1938:71 (Great Britain: Herefordshire: Mathon, Ross-on-Wye, West Malvern, Tarrington). – **As *Pemphredon lugubris***: Fabricius, 1804:315 (new combination, redescription); Latreille, [1805]:325 (redescription), 1806:pl. XIII, fig. 10 (illustration), 1825:48 (in review of genus); Guérin-Méneville, 1828a:170 (in Dictionnaire classique d'histoire naturelle); Stephens, 1829a:366 (in catalog of British insects, as *lugubre*), 1829b:34 (in checklist of British insects, as *lugubre*);Vander Linden, 1829:82 (bibliographic references, redescription, Belgium: Bruxelles, France: Paris,); Zetterstedt, 1838:441 (in revision of insects of Lapland); Herrich-Schaeffer, 1840:291 (Germany: Bayern: Regensburg area, Italy); Haliday, 1833:516 (Ireland: eastern coast north of Dublin); Shuckard, 1837a:196 (in revision of British Aculeata); Dufour, 1841b:243 (digestive tract), 244 (male reproductive system), 245 (female reproductive system); Dahlbom, 1842a:12 (in review of Scandinavian aculeates), 1844:259 (in revision of Sphecidae and Pompilidae), 1845:XXV (study of type material), 508 (in key to European *Pemphredon* s.s.); Eversmann, 1849:413 (Russia: Ural Mountains foothills, Kazan' and Orenburg provinces); Wissmann, 1849:14 (Germany: Kingdom of Hannover: Hannover, Münden); Tischbein, 1850:9 (Germany: Rheinland-Pfalz: Herrstein in Fürstenthum

Birkenfeld); F. Smith, 1851c:34 (Great Britain: no specific locality); Wesmael, 1852:281 (Belgium: Bruxelles); Kirschbaum, 1853:47 (Germany: Herzogtum Nassau: Dillenburg); F. Smith, 1853:64 (in checklist of British Hymenoptera); Kirchner, 1854:312 (Czechoslovakia); F. Smith, 1856:428 (in catalog of Hymenoptera in British Museum); Kawall, 1857:25 (Kurland, now Latvia); Ruthe and Stein, 1857:315 (Germany: Berlin area); Schenck, 1857:133 (Germany: in revision of fossorial wasps of Nassau Region); F. Smith, 1858c:175 (in review of British Aculeata, redescription); Jaennicke, 1868:8 (Germany: Hessen: Frankfurt and Offenbach area); Taschenberg, 1858:93 (in key to Sphecidae of Germany); Assmuss, 1859:615 (Russia: Moscow Governorate); Funk, 1859:58 (Germany: Bayern: Bamberg); Schenck, 1860:147 (Germany: Nassau Region); Brischke, 1862:104 (Germany: Preussen Province, now Poland: Pomorze Region); Brown, 1863:181 (Great Britain: Burton-on-Trent); Siła-Nowicki, 1864:54 (Poland: Kraków), 1865:54 (western Ukraine: Galicia region: no specific locality); Taschenberg, 1866:185 (in revision of Hymenoptera of Germany); A. Costa, 1867c:109 (in revision of Italian Sphecidae); Jaennicke, 1867:147 (Germany: Hessen: Frankfurt area); Kirchner, 1867:222 (in catalog of European Hymenoptera); Schenck, 1867a:353 (Germany: Nassau Region); Dietrich, 1868:363 (Switzerland: Zurich Canton); Wierzejski, 1868:117 (Poland: Kraków area); von Aichinger, 1870:315 (Austria: Tirol); Bold, 1870:151 (Great Britain: Northumberland and Durham); Thomson, 1870:235 (in revision of Swedish wasps); A. Costa, 1871b:38 (in revision of Italian Sphecidae); F. Smith, 1871b:18 (in catalog of British Aculeata); Schlechtendal, 1872:36 (Germany: Sachsen: Zwickau); Dours, 1874:145 (in catalog of Hymenoptera of France); Thomson, 1874:190 (in revision of Hymenoptera of Scandinavia); Wierzejski, 1874:260 (Ukraine: L'viv, Podole Region: Janów, Kalinowce, Sinków); Taschenberg, 1875:387 (specimen in Halle University collection); Radoszkowski, 1877:67 (e. Uzbekistan); Daly, 1878:46 (Great Britain: Dorset: Glanville's Wootton); Roebuck, 1878:48 (Great Britain: recorded from Yorkshire county: Wakefield, by F. Smith, 1858); Girard, 1879:941 (morphology and habits); Kohl, 1880:136 (Austria: Tirol, and Italy: Trentino–Alto Adige); E. Saunders, 1880:259 (in revision of British Aculeata); Siebke, 1880:62 (Norway); Magretti, 1881:122 (Italy: Lombardia: Cassina Amata), 271 (in list of species discussed in this paper); Marquet, 1881:183 (southern France); Friese, 1883:201 (Germany: Sachsen-Anhalt: Weissenfels); Kohl, 1883e:659 (Switzerland); Sickmann, 1883:77 (Germany: Niedersachsen: Wellingholthausen); Harwood, 1884:211 (Great Britain: Essex: Colchester area); von Heyden, 1884:120 (Germany: Frankfurt am Main area); Wüstnei, 1886:38 (Germany: Schleswig-Holstein: Emmelsbüll, Husum, Kollund, Sonderburg); Ed. André, 1888:198 (in revision of Sphecidae of Europe and Algeria), 15* (bibliographic references); Brischke, 1888b:100 (Germany: Preussen Province, now Poland: Pomorze Region); Kohl, 1888b:723 (Austria: Tirol, now Italy: Alto Adige), 1890a:53 (in review of *Pemphredon*); C. Verhoeff, 1891b:19 (nesting habits); Assmuss, 1892:53 (Russia: earlier record from Moscow Governorate repeated); V. Perkins, 1892:202 (Great Britain: Gloucestershire: Wotton-under-Edge); Radoszkowski, 1892:588 (male genitalia); Kohl, 1893a:38 (Austria: Niederösterreich); F. Morawitz, 1893a:110 (Russia: Karelian Isthmus); Sickmann, 1893:77 (Germany: Niedersachsen: Iburg); Westerlund, 1893:25 (Russia: Karelian Republic: northern shore of Lake Ladoga); Baldini, 1894:53 (Italy: Modena area); Engel, 1894:53 (Germany: Uhlenhorst near Hamburg); Krieger, 1894:15 (Germany: Kingdom of Saxony); De Stefani Perez, 1895:227 (in catalog of Sicilian Hymenoptera); Freke, 1896:40 (Ireland); Meunier, 1896:270 (Belgium: Bruxelles area); E. Saunders, 1896:92 (in revision of British Aculeata); Borries, 1897:97 (nesting habits); Dalla Torre, 1897:357 (in catalog of world Hymenoptera); Mocsáry, 1897:78 (Kingdom of Hungary, some localities are in today's Croatia and Romania); Flamary, 1898:38 (France: Saône-et-Loire: Mâcon area); Lange, 1898:70 (Germany: Sachsen: Annaberg-Buchholz); Strand, 1898b:92 (Norway); Gardner, 1901:377 (Great Britain: well distributed in Cheshire and Lancashire); Nevinson, 1900:62 (Great Britain: Wales: Criccieth, Towyn); N. Arnold, 1902:88 (Russia: Mohilev Province, now Belorussia); Chyzer, 1902:34 (Hungary); Friese, 1902:477 (Norway: Maalselven at 69°N, Saltdalen at 67°N); Nevinson, 1902:12 (Great Britain: Cornwall: Newquay); E. Saunders, 1902b:143 (British Channel Islands: Island of Alderney); de Cobelli, 1903:106 (Italy: Province of Trentino); Antiga and Bofill, 1904:7 (Spain: Cataluña Province); Aurivillius, 1904:260 (in revision of Swedish Sphecidae); Jourdain 1904:221 (Great Britain: Derbyshire: Little Eaton, Willington); W. Schulz, 1904b:92 (Czechoslovakia); Zilahi Kiss, 1904:77 (Hungary: Tasnád); Adlerz, 1906:38 (Sweden; nesting habits); Schmiedeknecht, 1907:207, 208 (in key to Hymenoptera of Central Europe); de

Gaulle, 1908:103 (in catalog of French Hymenoptera); Morley, 1909:304 (Great Britain: Isle of Wight); Sparre Schneider, 1909:104 (Norway: Nordlands and Tromsø areas); Cavro, 1910:684 (France: Département du Nord); Dittrich, 1911b:21 (Germany: Niederschlesien Province, now Poland: Dolny Śląsk Region); Morley, 1911:24 (Western Ireland: Old Head); Hallett, 1912:94 (Great Britain: Glamorgan County); Schirmer, 1912:166 (Germany: Berlin area); Alfken, 1914:277 (northwestern Germany); Birula, 1914:368 (Ukraine: Zhytomyr Oblast': Radomyshl'), 380 (Belorussia: Ambrosovichi near Vitebsk, comparison with *Pemphredon montana*); Szilády, 1914:88 (Hungary: Nagyenyedm, Pareng-havas); Dusmet, 1915:87 (Spain: Aragón); J.Ch. Bradley, 1919a:70 (*Pemphredon lugubris* is the type species of *Pemphredon*); Dubois, 1919:96 (Belgium: Bruxelles: Uccle); O. Meyer, 1919:150 (Germany: Posen Province, now Poland: Poznań Region); A. Wagner, 1920:42 (Germany: Lower Elbe region); Berland, 1921:533 (Greece); Chevalier, 1922:46 (nest parasite: *Pachyophtalmus signatus* (Meigen), a calliphorid); Dubois, 1922:195 (in key to Belgian Sphecidae); Jansson, 1922:23 (Sweden: Island of Öland); Maidl, 1922:65 (Albania: Kula Lyums); Lundblad, 1924:22 (Sweden: Lappland: Lycksele); R. Perkins, 1924:222 (Great Britain: Devon); Berland, 1925d:141 (in Sphecid Fauna of France); Bischoff, 1925:299 (Latvia; Poland: Białowieża and Grajewo area); Chevalier, 1925b:69 (nesting habits); R. Perkins, 1925:150 (Great Britain: Gloucestershire and Somersetshire); Schütze, 1925:111 (Germany: Lausitz Region); Shestakov, 1925:36 (Russia: Yaroslavl' area); Bouwman, 1926:279 (in list of Sphecidae of Netherlands); Chevalier, 1926d:83 (female opening new entrance to her nest when original entrance was blocked by observer); Soot-Ryen, 1927:7 (Norway: Raavand); Hémon, 1926:199 (France: Finistère: Fouesnant); F. Werner, 1927:66 (Austria: Niederösterreich: River Kamp valley); Stelfox, 1927:291 (Ireland: list of localities); Bouwman, 1928b:179 (in revision of Sphecidae of Netherlands); Eidmann, 1928:486 (nesting in tree trunks); Crèvecoeur and Maréchal, 1929:168 (Belgium: Liège); Gaunitz, 1929:199 (Sweden: Lapland); Grandi, 1929:268 (nesting habits), 271 (description of larva), 288 (Italy: Toscana: valle della Limentra); van der Vecht, 1928:93 (Netherlands: Meijendel sand dunes); Grandi, 1930:330 (nest parasite: *Perithous mediator* L., an ichneumonid); Schmiedeknecht, 1930:669 (in keys to Hymenoptera of North and Central Europe); Pulkkinen, 1931:89 (in revision of Sphecidae of Finland); Bondroit, 1932:35 (Belgium: Solbosch, Uccle); Hobby, 1932b:5 (preying on aphids *Pterochloros longipes* Rondani); Zavadil, 1932:95 (Czechoslovakia); Merisuo, 1933a:60 (Finland: city of Turku); E. Nielsen, 1933:313 (nesting in birch tree branch on earth); Jansson, 1934:289 (Sweden); Forsius *in* Forsius and Hellén, 1935:11 (in checklist of Hymenoptera of Finland); Vergne, 1935:119 (France: Auvergne: common); Callan, 1936:128 (nesting in dead willow); Crèvecoeur and Maréchal, 1936:251 (in catalog of Belgian Hymenoptera); Merisuo, 1936:123 (illustrations of taxonomically important body parts); Goebel, 1937:40 (Poland: Poznań District: Łęczyca); Richards, 1937b:104 (in checklist of British aculeates); Struve, 1937:149 (Germany: Island of Borkum); Zavadil, Šustera, and Bat'a, 1937:177 (in catalog of Sphecidae of Czechoslovakia); J. Murray, 1938a:172 (Great Britain: Scotland: Dumfriesshire: Gretna); A. Wagner, 1938a:119 (northwestern Germany); Guichard, 1939b:77 (Great Britain: Surrey: Limpsfield Common, as *lugubus*); Móczár, 1939:5 (Hungary: Jászberény); Balthasar, 1941b:112 (Czech Republic: eastern Moravia); de Graham, 1941:99 (Great Britain: Lincolnshire); Kloet, 1941:235 (Great Britain: Wales: Fairbourne and Wilmslow); Leclercq, 1941b:11 (Belgium: Liège area); Paul, 1941:40 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area); Schneid, 1941:1035 (Germany: Bayern: Bamberg area); Audcent, 1942:25 (nest parasites: *Oebalia cylindrica* Fallén, *Amobia signata* Meigen); J. Perkins, 1942:198 (Sweden: Skåne: Höör and Skäralid); Spooner, 1942:110 (Great Britain: Bedfordshire); Giner Marí, 1943:48 (in Sphecid Fauna of Spain); Spooner, 1943:72 (Great Britain); Guiglia, 1944b:31 (Italy); Šnoflák, 1944a:143 (Czech Republic: serpentine steppe near Mohelno); T. Fletcher, 1945:53 (Great Britain: Gloucestershire: Rodborough, Stroud); R. Perkins, 1945:147 (Great Britain: Devon: moorland near Lydford); Deleurance, 1946b:67 (France: Bouche-du-Rhône: Camargue: Bois des Rièges); Guiglia, 1946:26 (Britain: Leicestershire: Charnwood Forest); Villiers, 1946:12 (France-Haute-Savoie: Samoëns area); Dulac, 1947:54 (France: Saône-et-Loire Department: Creusot area); Móczár, 1947b:90 (Hungary: Siebenbürgen: Székelykeresztúr, now Romania: Transylvania: Cristuru Secuiese); de Hennin and Anciaux, 1948:76 (Belgium: between Sambre and Meuse rivers); Guichard and Yarrow, 1948:90 (Great Britain: London: Hampstead Heath); Šnoflák *in* Zavadil and Šnoflák, 1948:52 (in key to Sphecidae

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Schwarz, 1999:85 (Austria: Oberösterreich: city of Linz area); Blösch, 2000:176 (in Sphecid Fauna of Germany); Dressler, 2000:33 (Germany: Hessen: Darmstadt area); Esenbekova and Kazenas, 2000:19 (southeast Kazakhstan: 2-8 km S and 2 km SW of Alma Ata); Gonzáles, Gayubo, and Tormos, 2000:18 (Andorra: Santa Coloma); Jacobs, 2000:9 (Germany: Land Mecklenburg-Vorpommern: not endangered); Józan, 2000:106 (Hungary: Bakony Mountains); Kazenas, 2000e:130 (in Sphecid Fauna of Kazakhstan); Ljubomirov, 2000:9 (Bulgaria, specimens in N. Nedelkov collection); Mokrousov, 2000b:30 (Russia: Nizhniy Novgorod Oblast'); Pagliano and Scaramozzino, 2000:28 (nest parasite: *Gasteruption jaculator* (Linnaeus)); Schmid-Egger, 2000b:276 (Germany: Baden-Württemberg: shores of Rhine River); Vicidomini, 2000b:26 (Italy: previously recorded from Campania); Archer, 2001a:107 (Great Britain: Watsonian Yorkshire), 2001b:14 (Great Britain: Watsonian Yorkshire); Dollfuss, 2001:272 (miscellaneous locality records); Dollfuss and Bitsch *in* Bitsch et al., 2001:81 (in Sphecid Fauna of Western Europe); Dorow, 2001:136 (Germany: Hessen: Schönbuche Forest Reserve); Ivanov and Ljubomirov, 2001:211 (Bulgaria: Kresna Gorge at 41°48'N 23°10'E); Józan, 2001:278 (Hungary: Somogy County); Kazenas, 2001:21 (in checklist of Sphecidae of Kazakhstan and Central Asia); Kazenas and Esenbekova, 2001:134 (Kazakhstan: Almatinskiy Nature Reserve); Ohl et al., 2001:141 (distribution in Germany by provinces); Reemer and van der Meer, 2001:18 (Netherlands: along Almelo-Nordhorn canal); Salzmann-Wandeler and Rezbanyai-Reser, 2001:157 (Switzerland: Tessin Canton: Meride area); Shlyakhtenok and Agunovich, 2001:144 (Belorussia: Berezinskiy Nature Reserve); Skibińska, 2001:219 (Poland: Białowieża Primeval Forest); Szczepko and Kowalczyk, 2001:187 (Poland: Kampinos National Park near Warszawa); van der Smissen, 2001:63 (Germany: Schleswig-Holstein: not endangered); Zettel, Gross, and Mazzucco, 2001:69 (Austria: Wien); Archer, 2002b:124 (Great Britain: Watsonian Yorkshire: distribution map), 2002c:38 (Great Britain: Watsonian Yorkshire), 2002e:42 (Great Britain: Watsonian Yorkshire); Archer and Edwards, 2002:102 (Great Britain: West Sussex: Ambersham and Iping commons); Beavis, 2002:110 (Great Britain: Kent: Tunbridge Wells area); Bergsten, Hoffsten, and Hellqvist, 2002:38 (Sweden: Hälsingland: Övre Tälningsån); Deván, 2002a:200 (Slovakia: Kobela Nature Reserve near Nové Mesto); Herrmann and Zinnert, 2002:26 (Germany: Baden-Württemberg: Bettenberg near Konstanz); Józan, 2002:53 (Hungary: Mecsek Mountains, as *lugurbis*); Kazenas, 2002a:50 (geographic distribution, collecting localities in Kazakhstan); Kowalczyk, Szczepko, and Świątek, 2002:153 (Poland: Kampinos National Park near Warszawa); Kuhlmann, 2002:66 (Germany: Bayern: National Park Bayerischer Wald); Litt, 2002:166 (Belgium); Martínez de Murguia, Vázquez, and Nieves Aldrey, 2002:202 (Spain: Navarra: Artikutza Forest Reserve at 43°09'28"–43°14'52"N 0°1'45'35"–01°49'30"E); Mokrousov, 2002:148 (Russia: Nizhniy Novgorod Oblast': Kerzhenskiy Nature Reserve); Reemer and van der Meer, 2002:Bijlage 5 (Netherlands: Gelderland: Zaltbommel area); Shlyakhtenok and Skibinska, 2002:33 (Belorussia: no specific locality); Söderman and Vikberg, 2002:50 (in list of Aculeata of Finland); van der Meer, 2002:15 (Netherlands: costal dunes at Meijendel); Vischer, 2002:289 (Germany: Sachsen-Anhalt: vineyards in Saale-Unstrut area); von der Dunk and Amos, 2002:158 (Germany: Bayern: Schwaig near Nürnberg); Wiśniowski, 2002:69 (Poland: Ojców National Park); Archer, 2003a:58 (Great Britain: Watsonian Yorkshire); Bergsten, Ekerholm, Hellquist, Hilszczanski, Nilsson, Pettersson, and Werner, 2003:71 (Sweden: Västerbotten: Island of Romelsön); Cölln, Esser, and Jakubzik, 2003:62 (Germany: northwestern Rheinland-Pfalz: excavation sites and quarries); Drewes, 2003:141 (Austria, Croatia, Germany, Hungary, Italy: miscellaneous locality records); Esenbekova and Kazenas, 2003:6, 14, and 54 (Kazakhstan: foothills of Zailiyskiy Alatau: nesting in artificial nests), 66 (nesting in rotten tree trunk); Esser and Jakubzik, 2003:291 (Germany: Nordrhein-Westfalen: Niederrheinisches Tiefland); González, Flügel, 2003:9 (Germany: Hessen: Knüllwald); Gayubo, Asís, Tormos, and García, 2003:62 (Spain: Soria: Chavaler); Haeseler, 2003:340 (Germany: Niedersachsen: Island of Harriersand near Bremen); Kula and Tyrner, 2003a:150 (Czech Republic: Děčin Sandstone Uplands: forest district Snežnik: birch stands in air-polluted area),

2003b:203 (Northern Czech Republic: spruce stands in air-pollution region); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); Nieves-Aldrey, Fontal-Cazalla, Garrido-Torres, and Rey del Castillo, 2003:42 (Spain: Madrid: Estación Biogeológica de El Ventorrillo in Sierra de Guadarrama); Reemer, 2003:62 (Netherlands: Gelderland: Zaltbommel area); Schmid-Egger, 2003:756 (Italy: Sicilia: Randazzo); von der Heide and Metscher, 2003:103 (Germany: Niedersachsen: Emsland area); Wiśniowski, 2003:189 (Poland: summary of locality records); Wiśniowski *in* Dylewska and Wiśniowski, 2003:140 (Poland: Ojców National Park); Wiśniowski and Werstak, 2003:76 (Poland: Pieniny National Park); Archer, 2004a:47 (Great Britain: Worcestershire: Devils Spittleful Nature Reserve), 2004f:153 (Great Britain: Watsonian Yorkshire: Victorian cemetery); Bergsten, Nilsson, and Hellquist, 2004:7 (Sweden: Västerbotten: Nordmaling); Buck, 2004:25 (Canada: in checklist of Sphecidae of Ontario); Deván, 2004:147 (western Slovakia); Dollfuss, 2004a:118 (Kyrgyzstan: Kashkasi at Ala-Archa River); Dorow, 2004a:127 (Germany: Hessen: Schönbuche Nature Reserve); Esser, Jakubzik, Sonnenburg, and Woydak, 2004:263 (Germany: in checklist of Sphecidae of Nordrhein-Westfalen); Gayubo et al. 2004:132 (Spain: Madrid: Estación Biogeológica de El Ventorrillo in Sierra de Guadarrama); Jakubzik, Niehuis, and Cölln, 2004:458 (Germany: Rheinland-Pfalz: Roβstein in Rhein valley at 50°06'42"N 7°43'87"E); Kazenas, 2004b:101 (Kazakhstan: western Tien Shan); Klein and Lefeber *in* Peeters, van Achterberg, et al., 2004:414 (in Wasp and Ant Fauna of Netherlands); Majzlan and Deván, 2004:30 (Slovakia: Sekule), 33 (Slovakia: Malacky-Široké); Salzmann-Wandeler and Rezbanyai-Reser, 2004:27 (central Switzerland); Schneider and Carrières, 2004:98 (Luxemburg: Bon-Pays Region); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Szczepko and Kowalczyk, 2004:125 (Poland: Kampinos National Park near Warszawa); van Achterberg and Peeters, 2004:32 (in checklist of Sphecidae of Netherlands); Wiśniowski, 2004:40 and 58 (in checklist of Polish Sphecidae); Archer, 2005b:92 (Great Britain: Watsonian Yorkshire); Beavis, 2005:195 (Great Britain: Islands of Scilly); Bergsten, Ekerholm, Gabrielsson, Hellquist, Petersson, Werner, Ström, Chauvet, and Dalecky, 2005:16 (Sweden: Västerbotten: Bjuröklubbs Nature Reserve); Cruz-Sánchez, Gayubo, González, and Torres, 2005:221 (Spain: Salamanca: San Martín del Castañar); Gayubo and Özbek, 2005:36 (Turkey: Bitlis: Tatvan: Erzurum: University campus; Kars: Karakurt at 40°07'5"N 42°29'9"E); Haeseler, 2005:629 (Germany: Niedersachsen: Steller Heide near Bremen); Haneda, Nozaka, Tano, Kurokawa, and Murota, 2005:46 (Japan: Gifu Prefecture); Jacobs, 2005a:449 (Bulgaria: Rila Monastery); Kofler, 2005:169 (Austria: Tirol: Lienz District: many localities); Kowalczyk and Kurzac, 2005:106 (Poland: Botanical Garden in Łódź); Kraatz, 2005:103 (Germany: Niedersachsen: Bümmerstede near Oldenburg); Nemkov, 2005a:146 (Russia: Island of Sakhalin); Pagliano and Negrisolo, 2005:470 (in Sphecid Fauna of Italy); Quest and Kuhlmann, 2005:33 (Germany: Bayern: Bayerischer Wald National Park); Riemann and Hohmann, 2005:563 (Germany: Niedersachsen: city of Bremen and adjacent area); Robinson, 2005:37 (Great Britain: Cumbria County); Saure, 2005:18 (Germany: Berlin); Schmalz, 2005:58 (references to XIXth century authors); Shorenko, 2005a:166 (Ukraine: Crimea); Theunert, 2005a:18 (Germany: in checklist of Sphecidae of Niedersachsen and Bremen); Venne and Bleidorn, 2005:43 (Germany: Nordrhein-Westfalen: Moosheide Nature Reserve); Wiśniowski, 2005a:312 (Poland: Ojców National Park; occurring only in forest and on wooden buildings); Archer, 2006a:21 (Great Britain: Lincolnshire: Rauceby Warren National Park); Liebig, 2006:39 (Germany: Sachsen: Muskauer Heide); Ljubomirov, 2006:542 (Bulgaria: Rhodope Mountains: previous records summarized; also: Kritchim, Persenk Hut); Peeters, Krekels, and Megens, 2006:22 (Netherlands: Reichswald forest near Nijmegen); N. Schneider, 2006:136, 140, 142 (Luxemburg: anthropogenic habitats); Shlyakhtenok, 2006:110 (Belorussia: Polesye Radiological Nature Reserve); Standfuss and Standfuss, 2006a:86 (Germany: Nordrhein-Westfalen: Dortmund), 2006c:303 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Vepřek, 2006:511 (Czech Republic: Kokořínsko area); Archer, 2007a:151 (Great Britain: Norfolk: Thetford Warren Lodge); Baghirov, 2007:93 (Russia: southwestern Siberia); Baños-Picón, Gayubo, Asís, and González, 2007:257, 259 (Spain: Zamora: Cabañas de Aliste); Beavis, 2007:95 (Great Britain: Tunbridge Wells and Central High Weald); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:455 (France: first record from département Calvados: Honfleur); Burguet, 2007:unnumbered p. 32 (France: Puy-de-Dôme: sands Girauds-Faures in Orléat commune);

Cungs, Jakubzik, and Cölln, 2007:140 (Luxemburg: Haardt Nature Reserve); Dorow, 2007:263 (Germany: Hessen: Niddahänge and Schönbuche Forest Reserves); Guldemond, Pijfers, and den Belder, 2007:203 (Netherlands: Gelderland: dairy farm in de Graafschap); Herrmann, 2007b:95 (Germany: Baden-Württemberg: Fürstenberg in Konstanz); Jacobs, 2007:65, 70 (in key to Crabronidae of Germany); Jansen and Kaluza, 2007:25 (Germany: northwestern Sachsen); Józan, 2007:179 (Hungary: Zselic hills); Kowalczyk and Nadolski, 2007:284 (Poland: Łódź: railway areas); Nemkov, 2007b:69 (Russia: Kuril Islands: Island of Kunashir); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Shlyakhtenok, 2007a:299 (Belorussia: Berezinsky Nature Reserve); Venne, Bleidorn, and Lauterbach, 2007:302 (Germany: Nordrhein-Westfalen: Bielefeld); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia); K. Alexander, 2008:149 (Great Britain: Norfolk: Sheringham Park); Gayubo, González, Tormos, and Asís, 2008:139 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Haeseler, 2008:308 (Germany: Friesian Islands); Ljubomirov and Ban-Calefariu, 2008:204 (Romania: Maramureş District: Repedea); Ljubomirov and Yildirim, 2008:183 (in catalog of Crabronidae of Turkey); Nemkov, 2008b:18 (in catalog of Crabronidae of Asiatic Russia); Theunert, 2008:71 (Germany: map of distribution in Niedersachsen and Bremen); Archer, 2009a:24 (Great Britain: Yorkshire: Sheffield); Baños-Picón, Asís, Gayubo, and Tormos, 2009:314 (Spain: frequency of specimens collected with hand nets and Malaise traps); Burguet, 2009:15 (France: Département de Puy-de-Dôme: Bois de la Comté); Debuyser and Vago, 2009:4 (in list of Sphecidae *sensu lato* of northern France); Donie, 2009:10 (Germany: Niedersachsen: Oldenburg); Dvořák, Bogusch, and Smetana, 2009:82 (Czech Republic: Králický Sněžnik National Nature Reserve); U. Frommer, 2009a:28 (Germany: in checklist of Sphecidae of Hessen); Gayubo, González, Tormos, and Asís, 2009:362 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); González, Gayubo, Asís, and Tormos, 2009:622 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Guéorguiev and Ljubomirov, 2009:263 (Bulgaria: Maleshevska Planina); Humala and Polevoi, 2009:63 (Russia: Republic of Karelia east of Lake Onega); Livory, Chevin, Lair, Sagot, and Baldock, 2009:18 (France: Département de la Manche); Mokrousov, 2009:292 (Russia: Republic Mari El); Mokrousov, Antropov, Ruchin, and Bugayev, 2009:78 (Russia: Republic of Mordovia); Nemkov, 2009b:66 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:71 (Norway: locality records); Ruchin, Antropov, and Shibayev, 2009:169 (Russia: Republic of Mordovia); Straka, Dvořak, and Bogusch, 2009:264 (Czech Republic: Jizerské Mountains and Frýdlant region); Szczepko and Wiśniowski, 2009:71 (Poland: Spała Landscape Park); Venne, 2009:111 (Germany: Nordrhein-Westfalen: Holte-Stukenbrock, associated with *Frangula alnus* Miller, Rhamnaceae); Archer, 2010b:99 (Great Britain: Watsonian Staffordshire: Cannock Chase Country Park); Ermilov and Mokrousov: 2010:91 (phoretic mite *Calvolia* sp. in Middle Volga Region of Russia); 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); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Jakubzik and Cölln, 2010:1187 (Germany: Rheinland-Pfalz: Bruchertseifen near Altenkirchen); Johansson, 2010:121 (Sweden: Småland: upper Emå River valley); J. Kim and Yang, 2010:147 (in checklist of Korean Pemphredoninae); Mokrousov, 2010a:63 (Russia: Kirov, Kostroma, Nizhniy Novgorod, Vladimir, and Yaroslavl' Oblast's, Chuvash Republic, Mari El Republic, Mordovian Republic, Tatarstan: no specific localities); Rudoiskatel', 2010:154 (Russia: central and southern Ural Mountains); Saure, 2010b:176 (Germany: Berlin-Reinickendorf: airport Tegel and Flughafensee Protected Area); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Schmidt, 2010:138 (Germany: Bayern: collected along Main-Donau canal); Shorenko and Konovalov, 2010:26 (Ukraine: Crimea: Feodosiya; Ekaterinoslav Governorate, now Dnepropetrovsk Oblast': Dnepropetroovsk; Khar'kov Oblast': Khar'kov); van der Smissen, 2010a:349 (Germany: Schleswig-Holstein and Mecklenburg-Vorpommern: locality records); Archer, 2011a:42 (Great Britain: Yorkshire: Strensall Common), 2011d:187 (Great Britain: Watsonian Yorkshire: Hatfield Moor); Baghirov, 2011b:152 (Russia: Altay Republic: Artybash); Falk, 2011:68 (Great Britain: Sussex: South Downs); Feoktistov, 2011:85 (Russia: Mordovian Nature Reserve); Gogala, 2011:11 (Slovenia); Mokrousov, Berezin, and Egorov, 2011:80 (Russia: Chuvash Republic); Pagliano, 2011a:158 (specimens in collection Spinola, Torino, are *Pemphredon*

lugubris and *P. lugens*); Rudoiskatel', 2011b:68 (Russia: Republic of Bashkortostan, as *lugubris* Latreille), 2011d:241 (Russia: central Ural Mountains); Saure, 2011a:6 (Germany: Berlin: former airport Tempelhof); Shlyakhtenok, 2011:95 (Belorussia: city of Minsk); Theunert, 2011a:21 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:161 (Germany: Hessen: not endangered); Archer, 2012a:130 (Great Britain: Watsonian Yorkshire: Allerthorpe Common), 2012b:183 (Great Britain: urban York); Boillat, 2012:228 (Switzerland: in checklist of insects of Canton de Genève); Burguet *in* Durand and Burguet, 2012:4 (France: Puy-de-Dôme: sands Girauts-Faures in Orléat commune); Franzén, Molander, Norén, and Nilsson, 2012:26 (Sweden: Skäne: Kullaberg Peninsula); Nemkov, 2012c:437 (in catalog of Crabronidae of Russian Far East); Prisniy, 2012:47 (Russia: Belgorod Oblast'); Shlyakhtenok, 2012a:172 (Belorussia, and Russia: Kirov Oblast': Arkhangelskoye, and Krasnaya Polana near Sochi: collected in private plots), 2012b:92 (Belorussia: Beresina National Reserve: overgrowing dry meadow); Standfuss and Standfuss, 2012:428 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E: addition to flight period); Strumia, Pagliano, and Gayubo, 2012:57 (Italy: Toscana: Riserva di San Rossore); Terayama, 2012:5, 6 (in key to Pemphredonini of Japan), 14 (description), 19 (in checklist of Pemphredonini of Japan); Akulov and Proshchalykin, 2013:113 (Russia: Siberia: Krasnoyarsk Kray); Archer, 2013a:148 (Great Britain: Watsonian Yorkshire: Manor Farm), 2013b:119 (Great Britain: Leicestershire: suburban garden in Leicester); Bitsch, Grouet, and Savina, 2013:291 (France: Pyrénées centrales: département d'Ariège: col de Pailhères and Ascou-Pailhères); Dyuzhaeva, 2013:117 (Russia: Samara Oblast': Zhiguli Nature Reserve); Ma, X. Li, Chen, and Q. Li, 2013:579 (China: Nei Mongol: Helan Mountains); Pankov, 2013:230 (Russia: Ivanovo Oblast'); Saure, 2013:21 (Berlin: Treptow-Köpenick: Gosener Wiesen); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Shlyakhtenok, 2013:150 (in annotated catalog of aculeate wasps of Belorussia); Vieira, Oliveira, Brewster, and Gayubo, 2013:19 (Portugal: Douro International Natural Park and Paúl do Boquilobo Nature Reserve); Wiśniowski and Szczepko, 2013:47 (Poland: Kampinos National Park near Warszawa); Archer, 2014b:178 (Great Britain: urban and suburban gardens); Bitsch, 2014:408 (France: locality records from départements of Ariège, Aveyron, Bas-Rhin, Hautes-Alpes, Haut-Rhin, and Meurthe-et-Moselle); U. Frommer, 2014:28 (Germany: Hessen: Lorch); U. Frommer, M. Niehuis, and O. Niehuis, 2014:1322 (Germany, Hessen: Roβstein); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Jakovlev, Polevoi, and Humala, 2014:302 (Russia: Republic of Karelia: Zaonezhye Peninsula in Lake Onega); Józan, 2014:133 (Croatia: Žuta Lokva); J.-K. 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Scholz, 2016:72 (Germany: Sachsen: Kleinraschützer Heide); Stolle and Saure, 2016:924 (Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Wiśniowski, 2016:130 (Poland: Ojców National Park); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:32 (Turkey: Bayburt, Erzurum, and Kars provinces); Di Giovanni, Mei, and Cerretti, 2017:73 (Italy: Lombardia: Riserva Naturale Bosco della Fontana 5 km from Mantova at 45°12'N 10°44'E, found in canopy and understory); Durand and Burguet, 2017:2 (France: Puy-de-Dôme: Réserve Naturelle Nationale Chastreix-Sancy); Flügel, 2017:5 (Germany: Hessen: Doline and Eschkopf near Rockensüß); Jansen, 2017:9 (Germany: Sachsen: Leipzig); Magdalou,

2017:16 (France: Pyrénées-Orientales: Réserves Naturelles Catalanes: Julols); Mokrousov, 2017e:249 (in catalog of Pemphredoninae of Russia); Shorenko, 2017:78 (in Crimea collected in July); Franken and Berg, 2018:67 (Netherlands: North Holland: sand dunes); Lett, 2018:203 (France: Loir-et-Cher: Gièvres at 47°16'39"N 1°41'52"E); L. Ma, Q. Li, Wang, Jiang, and Lu, 2018:843 (China: Shanxi: Qinling Mountains); Nicolas and Vago, 2018:14 (France: Pas-de-Calais: Mont Saint-Frieux); Shorenko, 2018:129 (Crimea, including localities, habitats, and number of specimens); Akulov, 2019:44 (recorded from Krasnoyarskiy Kray but omitted from there in Annotated catalogue of the Hymenoptera of Russia); Carminati, Mora, and Cretin, 2019:23 (France: in list of Sphecidae *sensu lato* of Franche-Comté); Ruchin and Antropov, 2019a:13239 (Russia: Mordovia State Nature Reserve); Bashir, L. Ma, and Q. Li, 2020b:5, 6 (in key to *Pemphredon* of China); Kejval, Blažej, and Erhart, 2020:114 (western Czech Republic); Saure, 2020:277 (Germany: Sachsen-Anhalt: sand dunes); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China); Cross, Baldock, and Wood, 2021:61 (in catalog of Sphecidae *sensu lato* of Portugal); Falk and Early, 2021:24 (in key to British *Pemphredon*); Herb and Schmid-Egger, 2021:9 (Germany: Bayern: Kaufbeuren area); Kaplan and Yildirim, 2021:86 (in catalog of Crabronidae of Turkey); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Saure, 2021:83 (Germany: Brandenburg: Nature Reserve Ferbitzer Bruch near Potsdam); Saure and Marten, 2021:136 (Germany: Sachsen-Anhalt: Nationalpark Harz); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:118 (in revision of Sphecidae *sensu lato* of Europe); Japoshvili and Ljubomirov, 2022:278 (Georgia: Lagodekhi Protected Areas); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen University Botanical Garden and city gardens); Kaplan and Yildirim, 2023:1689 (in checklist of Sphecidae *sensu lato* of Turkey).

As *Pemphredon unicolor*: Jurine, 1807:214 (as new synonym of *Pemphredon lugubris*, nomenclatural history) and pl. 11, Fig. 25 (illustration of habitus), corrected to *Pemphredon lugubris* by Frei-Gessner, Kohl, and Kriechbaumer, 1882:395.

Pemphredon concolor Say, 1824:339, sex not stated. Holotype or syntypes: USA: Northwest Territory (now area around Great Lakes and between the Ohio and Mississippi Rivers): no specific locality (destroyed). Synonymized with *Pemphredon lugubris* by Dollfuss, 1995:987. – F. Smith, 1856:429 (in catalog of Hymenoptera in British Museum); Le Conte, 1859a:229 (original description copied); Cresson, 1862:236 (in catalog of North American Hymenoptera); Packard, 1867:391 (in revision of North American Sphecidae); Provancher, 1883b:646 (in revision of Canadian Hymenoptera); Ashmead, 1890:32 (in checklist of Hymenoptera of Colorado); Kohl, 1890a:51 (in review of *Pemphredon*); W. Fox, 1892h:309 (in revision of North American Pemphredonini), 314 (Provancher's description translated into English, his species is different from Say's); Dalla Torre, 1897:356 (in catalog of world Hymenoptera); Ashmead, 1899d:222 (in checklist of North American Crabronidae); J. Smith, 1900:516 (in list of insects of New Jersey); Harrington, 1902:220 (Canada: Ontario: Ottawa); J. Smith, 1910:675 (in new list of insects of New Jersey); Rohwer *in* Viereck, 1925:690 (in key to Sphecidae of Connecticut; not yet found in the State); Reinhard, 1929a:194 (nesting habits, nest parasites); Brimley, 1938:446 (North Carolina: Swannanoa); Britton, 1938:149 (in addition to checklist of insects of Connecticut); Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera); Evans, 1958c:130 (description of larva); Krombein, 1958f:189 (in supplement to catalog of North American Hymenoptera, synonymy with *provancheri* recorded); R. Bohart and Menke, 1976:181 (in checklist of world Sphecidae); Krombein, 1979b:1603 (in catalog of North American Hymenoptera); Finnamore, 1982:69 (Canada: in Sphecid Fauna of Southern Quebec); Radović, 1985:64 (sting apparatus analyzed); Ahlstrom, 1995:108 (in checklist of insects of North Carolina); Finnamore, 1997:886 (Canada: Yukon). – **As *Cemonus concolor***: Ashmead, 1899d:222 (new combination, in checklist of North American Crabronidae).

Pemphredon fuscipennis Stephens, 1829a:367, nomen nudum (in catalog of British insects). Synonymized with *Pemphredon lugubris* by F. Smith, 1855:100. – Stephens, 1829b:34 (in checklist of British insects).

Pemphredon nitida Stephens, 1829a:366, nomen nudum (in catalog of British insects). Synonymized with *Pemphredon lugubris* (Fabricius, 1793) by F. Smith, 1855:100. – Stephens, 1829b:34 (in checklist of British insects)

Pemphredon ocellaris Gimmerthal, 1836:448, sex not stated. Holotype or syntypes: Liefland, now Latvia: no specific locality (depository unknown). Neotype: ♀, Austria: Niederösterreich: Mannersdorf (NHMW), designated by Dollfuss, 1995:987. Synonymized with *Pemphredon lugubris* by Dollfuss, 1995:987 – Kohl, 1890a:55 (in review of *Pemphredon*); Dalla Torre, 1897:359 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae).

Pemphredon luctuosa Shuckard, 1937:197, ♂ (as *luctuosus*, incorrect original termination). Holotype: ♂, Britain: Battersea Fields (BMNH); designation of lectotype by Dollfuss, 1995:987, was unnecessary. Synonymized with *Pemphredon lugubris* by ... – Dahlbom, 1842a:12 (in review of Scandinavian aculeates), 1844:258 (original description copied); Tischbein, 1850:9 (Germany: Rheinland-Pfalz: Herrstein in Fürstenthum Birkenfeld); F. Smith, 1851c:35 (Great Britain: London district), 1853:64 (in checklist of British Hymenoptera), 1856:428 (in catalog of Hymenoptera in British Museum); Kohl, 1890a:52 (in review of *Pemphredon*); Sickmann, 1893:76 (Germany: Niedersachsen: Iburg, determination uncertain); Dalla Torre, 1897:357 (in catalog of world Hymenoptera); Mocsáry, 1897:78 (Kingdom of Hungary, one localities is in today's Romania); Vángel, 1905:166 (Hungary); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Zilahy Kiss, 1915:80 (Hungary: Boksánbánya); Berland, 1925d:141 (in Sphecid Fauna of France); R. Perkins, 1929:55 (recognition characters); Noskiewicz, 1930:93 (Poland: Kołomyja, now Ukraine); Giner Marí, 1943:48 (in Sphecid Fauna of Spain); Šnoflák *in* Zavadil and Šnoflák, 1948:51 (in key to Sphecidae of Czechoslovakia, not yet found in Czechoslovakia); Cleu, 1953:51 (France: Ardèche River basin); Vergne, 1955:5 (France: Auvergne); Bajári, 1957a:84, 85 (in key to Hungarian Sphecidae, not yet found in Hungary); Benno, 1958b:12 (in review of Dutch Sphecidae); Janvier, 1961a:30 (nesting habits, description of larva); Evans, 1964b:249 (reference to Janvier's 1961 description of larva); Hüsing and Jäger, 1964:192 (Germany: Sachsen-Anhalt: Nietleben near Halle), 197 (provisioning nest with aphids, nesting in wood); Benno, 1967:37 (in checklist of Sphecidae of Netherlands); Balthasar, 1972:210 (in Sphecid Fauna of Czechoslovakia: previous records from the country are in error). – **As *Pemphredon lugubris* var. *luctuosa***: E. Saunders, 1880:259 (new status, in revision of British Aculeata). – **As *Cemonus luctuosus***: Dahlbom, 1845:507 (new combination, in key to European *Cemonus*); von Kiesenwetter, 1849:90 (Germany: Kingdom of Saxony: Oberlausitz area); Wissmann, 1849:14 (Germany: Kingdom of Hannover: Hannover); Kirschbaum, 1853:47 (Germany: Herzogtum Nassau: Mombach and Weilburg); Kirchner, 1854:312 (Czechoslovakia: Kaplitz in Budweiser District, now České Budějovice; as *lactuosus*).

Pemphredon morio Cresson, 1865b:486, ♀ (as *Morio*, incorrect original capitalization), junior primary homonym of *Pemphredon morio* Vander Linden, 1829. Holotype: ♀: USA: no specific locality (ANSP). Synonymized with *Pemphredon concolor* by Packard, 1867:391. – Kohl, 1890a:54 (in review of *Pemphredon*); Cresson, 1916:102 (holotype in ANSP).

As *Pemphredon concolor* Say: Provancher, 1882:7 (Canada: Quebec: Cap Rouge), not identical with *Pemphredon concolor* of Say: W. Fox, 1892h:314. – J.Ch. Bradley, 1928:1014 (in catalog of New York Sphecidae).

Pemphredon cressoni Dalla Torre, 1897:356. Substitute name for *Pemphredon morio* Cresson, 1865.

Pemphredon provancheri Dalla Torre, 1897:359. Substitute name for *Pemphredon concolor* of Provancher, 1882. Lectotype: sex not stated, Canada: Quebec: Cape Rouge (Musée de la Province de Quebec), designated by Krombein, 1955b:80. Synonymized with *Pemphredon concolor* by Krombein, 1955b:80. – Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (in catalog of North American Hymenoptera); Krombein, 1958f:190 (in supplement to catalog of North American Hymenoptera: is a synonym of *Pemphredon concolor*).

Pemphredon provancheri Ashmead, 1899d:223 (as *Provancheri*, incorrect original capitalization), junior primary homonym of *Pemphredon provancheri* Dalla Torre, 1897. Substitute name for *Pemphredon concolor* of Provancher, 1882.

Pemphredon tinctipennis Cameron, 1908c:234, ♀. Holotype or syntypes: ♀, USA: Arizona: no specific locality (BMNH). Synonymized with *Pemphredon lugubris* by Dollfuss, 1995:987. – Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Krombein, 1979b:1603 (in catalog of North American Hymenoptera).

As *Pemphredon montanus*: Birula, 1913:537 (Ukraine: Zhytomyr Oblast': Radomyshl'), corrected to *Pemphredon lugubris* by Birula, 1914:368; Pagliano, 2011a:158 (specimen in collection Spinola, Torino, is *Pemphredon lugubris*).

Pemphredon shawii Rohwer, 1917c:100, ♂. Holotype: ♂, USA: New Hampshire: Hampton (USNM). Synonymized with *Pemphredon concolor* by R. Bohart *in* Bohart and Menke, 1976:181. – Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera).

Pemphredon pacifica Gussakovskij, 1932:8, ♀, ♂ (as *pacificus*, incorrect original termination). Syntypes: Russia: Kamchatka: Elisovo (Stockholm) and Primorskiy Kray: Khabarovsk (ZIL). Synonymized with *Pemphredon lugubris* by Lomholdt, 1975:89. – Tsuneki, 1951a:171 (in key to *Pemphredon* of Japan and adjacent regions), 179 (in revision of *Pemphredon* of Japan and adjacent regions), 1952a:63 (nesting habits). – **As *Pemphredon lugubris pacificus***: Tsuneki, 1964e:28, 29 (new status, in key to *Pemphredon* of Japan), 1967e:10 (China: Heilongjiang: Harbin); Itami, 1969:50 (Japan: Niigata Prefecture); Tsuneki, 1974a:367 (Korea); Kazenas, 1980e:86 (Russia: Primorskiy Kray); Tsuneki, 1982b:14 (known from Korea); Paik, 1985:197 (in list of Sphecidae of Korea); Tsuneki, 1992:201 (Korea); Haneda, Nozaka, Tano, Kurokawa and Murota, 2006a:21 (Japan: Toyama Prefecture, as *pacifica*); S. Takahashi and Haneda, 2008b:44 (Japan: Hokkaido: Sapporo, as *pacifica*).

28. *maurusia* Valkeila

Pemphredon maurusia Valkeila *in* Merisuo and Valkeila, 1972:21, ♀, ♂ (as *maurusius*, incorrect original termination). Holotype: ♀, Morocco: Marrakech (Helsinki). – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae). – **As *Pemphredon maurusia***: Dollfuss, 1995:991 (in revision of world *Pemphredon*), 2001:272 (miscellaneous locality records); Fresno, 2018:227 (first record from Europe and from Spain: Madrid: Cercedilla); L. Ma, Q. Li, Wang, Jiang, and Lu, 2018:843 (first record from China: Shanxi: Qinling Mountains); Bashir, L. Ma, and Q. Li, 2020b:4, 6 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

29. *menkei* R. Bohart

Pemphredon menkei R. Bohart, 1993b:220, ♀, ♂. Holotype: ♀, USA: Maryland: Montgomery County: Colesville (UCD). – Dollfuss, 1995:992 (in revision of world *Pemphredon*); Buck, 2004:25 (Canada: in checklist of Sphecidae of Ontario).

30. *montana* Dahlbom

Pemphredon montana Dahlbom, 1845:262, ♀, ♂ (as *montanus*, incorrect original termination). Lectotype: ♀, Sweden: Faxälven (Lund), designated by Dollfuss, 1995:994. – Dahlbom, 1844:262 (in revision of Sphecidae and Pompilidae), 1845:508 (in key to European *Pemphredon* s.s.); F. Smith, 1856:428 (in catalog of Hymenoptera in British Museum); Ruthe and Stein, 1857:315 (Germany: Berlin area); Brischke, 1862:104 (Germany: Preussen Province, now Poland: Pomorze Region), 1864:209 (to be deleted from Preussen Province list); A. Costa, 1867c:109 (in revision of Italian Sphecidae); Kirchner, 1867:222 (in catalog of European Hymenoptera); Thomson, 1870:235 (in revision of Swedish wasps); A. Costa, 1871b:38 (in revision of Italian Sphecidae); Thomson, 1874:191 (in revision of Hymenoptera of Scandinavia); Kohl, 1880:136 (Austria: Tirol); Siebke, 1880:62 (Norway); Schøyen, 1881:11 (correction to Siebke, 1880); Ed. André, 1888:197 (in revision of Sphecidae of Europe and Algeria), 15* (bibliographic references); Brischke, 1888b:100 (Germany: Preussen Province, now Poland: Pomorze Region); Kohl, 1888b:724 (Austria: Tirol, now Italy: Alto Adige), 1890a:54 (in review of *Pemphredon*); W. Fox, 1892h:314 (Kohl's description translated into English); Kohl, 1893a:38 (Austria: Niederösterreich); F. Morawitz, 1893a:110 (Russia: Karelian Isthmus); Krieger, 1894:16 (Germany: Kingdom of Saxony); Dalla Torre, 1897:358 (in catalog of world Hymenoptera); Kozhevnikov, 1897:15 (Russia: Moscow Governorate); Strand, 1898b:92 (Norway); Ashmead, 1899d:223 (in checklist of North American Crabronidae); de Cobelli, 1903:107 (Italy: Province of Trentino); Aurivillius, 1904:260 (in revision of Swedish Sphecidae); W. Schulz, 1904b:92 (Austria: Steiermark); Schmiedeknecht, 1907:207, 208 (in key to Hymenoptera of Central Europe); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Sparre Schneider, 1909:105 (Norway: Finmarken area; citation of Zetterstedt); Dittrich, 1911b:21 (Germany: Niederschlesien Province, now Poland: Dolny Śląsk Region); nec Birula, 1912:537 (= *Pemphredon lugubris*); Schirmer, 1912:166 (Germany: Berlin

area); Alfken, 1914:277 (northwestern Germany); Birula, 1914:381 (Belorussia: Luskinopol' near Vitebsk); Noskiewicz, 1918:137 (Galicia, now western Ukraine: Łanczyn); O. Meyer, 1919:150 (Germany: Posen Province, now Poland: Poznań Region, as *montanus*); Noskiewicz, 1920a:154 (Poland: Tatry Mountains: Gubałówka, road to Dolina Koscieliska); A. Wagner, 1920:42 (Germany: Lower Elbe region); Noskiewicz, 1922a:8 (Ukraine: Lviv area); Lundblad, 1924:21 (Sweden: Lappland: Lycksele); Berland, 1925d:141 (in Sphecid Fauna of France); Bischoff, 1925:299 (Latvia: Wezkukkul; Poland: Białowieża); Coulon, 1925:113 (France: Evreux); Schütze, 1925:111 (Germany: Lausitz Region); Shestakov, 1925:36 (Russia: Yaroslavl' area); K. Strohm, 1925:211 (Germany: Baden-Württemberg: Sasbach); Benoist, 1928:410 (France: Basses-Alpes: Certamussat); Eidmann, 1928:486 (nesting in tree trunks); Gaunitz, 1929:199 (Sweden: Lapland); Schmiedeknecht, 1930:668, 669 (in keys to Hymenoptera of North and Central Europe); Bischoff, 1931:8 (Spain); Pulkkinen, 1931:89 (in revision of Sphecidae of Finland); Zavadil, 1932:95 (Czechoslovakia); Jansson, 1934:289 (Sweden); Forsius *in* Forsius and Hellén, 1935:11 (in checklist of Hymenoptera of Finland); Merisuo, 1936:123 (illustrations of taxonomically important body parts); Zavadil, Šustera, and Bat'a, 1937:177 (in catalog of Sphecidae of Czechoslovakia); Móczár, 1938c:81 (Hungary: Kőszeg Hills); A. Wagner, 1938a:119 (northwestern Germany); Paul, 1941:40 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area); Schneid, 1941:1035 (Germany: Bayern: Bamberg area, as *montanus*); Carl and de Beaumont, 1947:68 (Switzerland: Graubünden = Grisons Canton: Swiss National Park); Šnoflák *in* Zavadil and Šnoflák, 1948:51 (in key to Sphecidae of Czechoslovakia, as *montanus*); Szulczewski, 1950:105 (Poland: Wielkopolski National Park 15 km S Poznań); de Beaumont, 1951h:33 (Switzerland: Neuchâtel area); Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (British Columbia); Tsuneki, 1951a:171 (in key to *Pemphredon* of Japan and adjacent regions), 181 (in revision of *Pemphredon* of Japan and adjacent regions), 1952a:66 (nesting habits); Nouvel and Ribaut, 1953:180 (France: Haute-Garonne: Saint-Béat, Hautes-Pyrénées: Cauterets, Orédon); de Beaumont, 1954e:93 (Italy); Fahlander, 1954:250 (Sweden: Gästrikland Region); Aerts, 1955:61 (Germany: Rheinland); Ceballos, 1956:357 (in catalog of Hymenoptera of Spain); Bajári, 1957a:84 (in key to Hungarian Sphecidae, not yet found in Hungary); de Beaumont, 1958c:207 (Swiss National Park); Krombein, 1958f:189 (in supplement to catalog of North American Hymenoptera: California, New Mexico, Colorado, West Virginia, Maine); Wolf, 1959b:26 (known from Germany but not from Nassau); Noskiewicz and Puławski, 1960:43, 44 (in key to Polish Sphecidae); Stritt, 1962:50 (Germany: Baden-Württemberg: Wutach area); Valkeila, 1962b:67 (southwestern Finland); Valkeila, Brander, and Käpylä, 1963:41 (Finland: historical region Lounais-Hämeen = southwest Häme); Babiy, 1964:115 (Austria: Land Salzburg); de Beaumont, 1964c:102 (in Sphecid Fauna of Switzerland, as *montanus*); Tsuneki, 1964e:28, 29 (in key to *Pemphredon* of Japan); Bonelli, 1966c:219 (Italy: Trentino–Alto Adige: Chiusa, Val Cadino, as *montanus*); Gauss, 1966a:66 (Germany: Baden-Württemberg), 1967:555 (Germany: Baden-Württemberg); J. Heinrich, 1967:77 (Germany: Bayern: Karlstadt); Hoop, 1967a:39 (Germany: Schleswig-Holstein: Osterau); Niedl and Deneš, 1967:78 (Czech Republic: Třeboň area); Scobiola-Palade, 1967b:45 (Romania); Haneda, 1968a:45 (Japan); T. Iida, 1968:21 (Japan); Haeseler, 1970:74 (Germany: Schleswig-Holstein: Kahlschlag on Schierensee near Kiel); Oehlke, 1970:739 (German Democratic Republic); Tumšs, 1970:72 (Latvia); Gauss, 1971:418 (Germany: Baden-Württemberg: Wutach River area); Kazenas, 1971:161 (in Kazakhstan found only in southeastern mountains); Wolf, 1971:375 (Italy: Trentino–Alto Adige: Alpi Siusi); Balthasar, 1972:209 (in Sphecid Fauna of Czechoslovakia, as *montanus*); Haeseler, 1972:156 (Germany: Schleswig-Holstein; anthropogenic habitats); Kazenas, 1972b:117 (Kazakhstan); Kofler, 1972:110 (Austria: eastern Tirol); Niedl and Deneš, 1972:152 (Czech Republic: Třeboň area); Scobiola-Palade, 1972b:254 (Romania); Tumšs, 1972:29 (one female in B. Gimmerthal collection, Zoological Museum, Riga State University, Latvia); Valkeila and Leclercq, 1972:704 (locality records); Haeseler, 1973:54 (Germany: Schleswig-Holstein: Rodenbeck 10 km southwest of Kiel, Welmbüttel 10 km E Heide); Hoop, 1973:47 (Germany: Schleswig-Holstein: Kahlschlag near Rodenbeck); Steiner, 1973:25 (Canada: Northwest Territories); Suda, 1973:122 (Japan: Yamanashi Prefecture); Lomholdt, 1975c:90 (in Sphecid Fauna of Fennoscandia and Denmark); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Kolesnikov, 1977:319 (Russia: Bryansk Oblast'); Schmidt, 1977:96 (Germany: Baden-Württemberg: Enzklösterle in Schwarzwald); Kazenas, 1978b:153 (in key to

Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Schwammberger, 1978:418 (Germany: Württemberg); Krombein, 1979b:1603 (in catalog of North American Hymenoptera); Casolari and Casolari Moreno, 1980:119 (specimens in M. Spinola collection); Dathe, 1980:209 (Russia: northern Caucasus: Teberda, as *montanus*); Kazenas, 1980e:86 (Russia: Primorskiy Kray: Island of Kunashir); Pagliano, 1980:131 (Italy: Trentino Alto Adige); Westrich, 1980:631 (Germany: Baden-Württemberg: Tübingen area, as *montanus*); Dollfuss and Ressl, 1981:321 (Austria: Niederösterreich: Scheibbs District); Skibińska, 1981:357 (Poland: Warszawa-Białołęka); Axelsson, 1982:79 (Sweden); Donath, 1982:214 (Germany: Cottbus Bezirk); Leclercq, 1982e:100 (Norway: Nord-Trøndelag: Stod); Schedl, 1982:101 (Austria: Tirol: Ötztaler Alps); Skibińska, 1982:118, 122 (Poland: Mazovian Voivodship: Białołęka, Ursynów, Warszawa, Wola Mrokowska); Tsuneki, 1982b:14 (known from Korea); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Kvamme and Axelsson, 1983:63 (Norway); Riemann, 1983:81 (Germany: Bremen-Daverden area); Steinmann, 1983:163 (Switzerland: Graubünden Canton, nesting in wood buildings); Haack, Tscharntke, and Vidal, 1984:132 (Germany: Hamburg area); Janzon and Svensson, 1984:183 (Sweden: Island of Öland); Lomholdt, 1984b:51 (first record from Denmark: East Jutland, prey: *Cinara pinea* Mordvilko, an aphid); Sagvolden, 1984:19 (Norway: Buskerud: Rollag); Haeseler, 1985a:350 (Germany: Schleswig Holstein); Paik, 1985:197 (in list of Sphecidae of Korea); Nemkov, 1986:95 (Russia: Irkutsk Oblast'); Nilsson, 1986:87 (Sweden); Skibińska, 1986b:150, 153 (Poland: suburbs of Warszawa); Vikberg, 1986b:75 (Finland); Pádr *in* Sedivy, 1989a:168 (in checklist of Czechoslovakian Sphecidae); Pankevich, Belyavskaya, Molchanova, Shlyakhtenok, and Blinov, 1989:96 (Belorussia: Berezinskiy Nature Reserve); Weiffenbach, 1989:105 (Germany: Hessen: Gießen area); Pádr, 1990:78 (Czech Republic: Praha area); Pagliano, 1990:116 (in catalog of Italian Sphecidae); Kuhlmann et al., 1991:91 (Germany: Senne Region); Luig, 1993:42 (Estonia); Pádr and Lukáš, 1994:894 (Slovakia: High Tatra Mountains); Theunert, 1994c:48 (Germany: summary of records from Niedersachsen and Bremen), 1994d:278 (Germany: Niedersachsen: Galgenberg near Neubrück); Ahlstrom, 1995:108 (in checklist of insects of North Carolina); Celary, 1997:57 (in checklist of Animals of Poland); Finnamore, 1997:886 (Canada: Yukon); Esenbekova and Kazenas, 2000:19 (southeast Kazakhstan: 3 km west-norhwest of Medeo, 7 km S Talgar); Kazenas and Esenbekova, 2001:134 (Kazakhstan: Almatinskiy Nature Reserve); Kazenas, 2002:50 (geographic distribution, collecting localities in Kazakhstan); Krivonogova and Rudoiskatel', 2004:109 (Russia: Sverdlovsk Oblast': near Gari village); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Suda, 2004:37 (Japan: Yamanashi Prefecture); Szczepko and Kowalczyk, 2004:125 (Poland: Kampinos National Park near Warszawa); Negoro, Haneda, and Tano, 2005:45 (Japan: Toyama Prefecture); Baghirov, 2007:93 (Russia: southwestern Siberia); Kowalczyk, Kurzac, and Nadolski, 2009:63 (Poland: between Warta and Widawka rivers); Rudoiskatel', 2011b:68 (Russia: Republic of Bashkortostan), 2011d:241 (Russia: central Ural Mountains). – **As *Pemphredon montana***: Finnamore, 1982:69 (in Sphecid Fauna of Southern Quebec); Schmidt, 1984:250 (Germany: Baden-Württemberg); Jacobs, 1989:8 (Germany: Mecklenburg-Vorpommern); Jacobs and Oehlke, 1990:(new locality records from German Democratic Republic); Kowalczyk, 1990:290 (Poland: Góry Świętokrzyskie); Schwammberger and Priesner, 1990:536 (Austria: Kärtnen); Dollfuss, 1991:62 (in key to Sphecidae of North and Central Europe); Nilsson, 1991:83 (Sweden: Lake Mälaren); Budrys, 1992:25 (in list of Sphecidae of Lithuania); Leclercq, 1992d:285 (first record from Belgium, nesting in polystyrene panels); K. Weber, 1992:88 (Germany: Bayern: Bamberg District); Kuhlmann, 1993:76 (Germany: known from Westfalen); Wiśniowski, 1993a:96 (Poland: in checklist of Sphecidae of Białowieża Primeval Forest); Felton and Schneider, 1994:290 (Luxemburg); Finnamore, 1994:210 (Canada: Alberta: Wagner Natural Area 8 km W Edmonton); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:400, 401 (in key to Sphecidae of Russian Far East); Dollfuss, 1995:994 (in revision of world *Pemphredon*); Jansen and Kaluza, 1995:8 (Germany: endangered in Sachsen); Krasnobayev et al., 1995:139 (Russia: Zhiguli Hills northwest of Samara); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna); Scharrer, 1995:23 (Austria: Niederösterreich: Bucklige Welt); Arens, 1996:440 (Germany: Bayern: Bayreuth area); Cölln, Hembach, and Jakubzik, 1996:166 (Germany: Rheinland-Pfalz); Jakubzik and Cölln, 1996b:400 (Germany: Rheinland-Pfalz); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: probably endangered); Voblenko, Gorobchishin,

and Nesterov, 1996:14 (Ukraine: Polesye Region); Witt, 1996:106 (Germany: Brandenburg), 110 (locality records); Woydak, 1996:25 (Germany: Westfalen: summary of distribution and nesting habits); Li and He, 1997b:259 (first records from China); Schmid-Egger and Niehuis, 1997:14 (Germany: Rheinland-Pfalz); Standfuss and Woydak, 1997:20 (Germany: Dortmund); Schmidt and Schmid-Egger, 1997:25 (in checklist of German Sphecidae); F. Burger, Saure, and Oehlke, 1998:29 (Germany: in list of Sphecidae of Brandenburg); Dollfuss, Gusenleitner, and Bregant, 1998:512 (Austria: summary of collecting records from Burgenland); Drewes, 1998:49 (Germany: Niedersachsen: Goldbeck 26 km west-southwest of Hamburg); van der Smissen, 1998:66 (Germany: Mecklenburg-Vorpommern, Niedersachsen, Schleswig-Holstein); K. Weber, 1998:147 (Germany: Bayern: Bamberg area); Dorow, 1999:533, 573 (Germany: Hessen: Niddahänge east of Rudingshain Forest Reserve); Herrmann, 1999:8 (Germany: Niedersachsen: Oldenburg area; habitats size); Kuhlmann, Wolf, and Woydak, 1999:568 (Germany: Nordrhein-Westfalen: endangered because of low population level); Löhr, 1999:62 (Germany: Hessen: Mücke-Merlau near Gemünden); Luig and Voolma, 1999:176 (Estonia); Majzlan, Rychlík, and Deván, 1999:146 (Slovakia: Čenkovská Step Nature Reserve); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Pauly, 1999:108 (in catalog of Belgian aculeates); Saure, 1999:37 (Berlin-Köpenick; in Berlin known only from study area); M. Schwarz, 1999:85 (Austria: Oberösterreich: city of Linz area); Sörensen, Mauss, and Schindler, 1999:504 (Germany: Schleswig-Holstein); Wiering, 1999:142 (first record from Netherlands: De Hoogte); Zehnder and Zettel, 1999:131 (Switzerland: recolonization of flooded area in Valais Canton); Blösch, 2000:177 (in Sphecid Fauna of Germany); Kazenas, 2000e:132 (in Sphecid Fauna of Kazakhstan); Mokrousov, 2000b:30 (Russia: Nizhniy Novgorod Oblast'); Dollfuss, 2001:272 (Bulgaria: Popina Luka); Dollfuss and Bitsch *in* Bitsch et al., 2001:82 (in Sphecid Fauna of Western Europe); Jacobs, 2000:9 (Germany: Land Mecklenburg-Vorpommern: not endangered); Kazenas, 2001:21 (in checklist of Sphecidae of Kazakhstan and Central Asia), 131 (review of known biology); Ohl et al., 2001:141 (distribution in Germany by provinces); Skibińska, 2001:219 (Poland: Białowieża Primeval Forest); Szczepko and Kowalczyk, 2001:187 (Poland: Kampinos National Park near Warszawa); van der Smissen, 2001:63 (Germany: Schleswig-Holstein: not endangered); Zettel, Gross, and Mazzucco, 2001:69 (Austria: Wien); Bergsten, Hoffsten, and Hellqvist, 2002:38 (Sweden: Hälsingland: Övre Tälningsån); Bieri, 2002:78 (Liechtenstein); Kowalczyk, Szczepko, and Świątek, 2002:152 (Poland: Kampinos National Park near Warszawa); Kuhlmann, 2002:66 (Germany: Bayern: National Park Bayerischer Wald); Mokrousov, 2002:148 (Russia: Nizhniy Novgorod Oblast': Kerzhenskiy Nature Reserve); Shlyakhtenok and Skibinska, 2002:33 (Belorussia: no specific locality); Söderman and Vikberg, 2002:50 (in list of Aculeata of Finland); Wiśniowski, 2002:69 (Poland: Ojców National Park); Bergsten, Ekerholm, Hellquist, Hilszczanski, Nilsson, Pettersson, and Werner, 2003:71 (Sweden: Västerbotten: Island of Romelsön); Kuhlmann and Quest, 2003:51 (Germany: Bayern: Bayerischer Wald National Park); Kula and Tyrner, 2003a:150 (Czech Republic: Děčin Sandstone Uplands: forest district Snežnik: birch stands in air-polluted area), 2003b:203 (northern Czech Republic: spruce stands in air-pollution region); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); Wiśniowski, 2003:190 (Poland: summary of locality records); Wiśniowski *in* Dylewska and Wiśniowski, 2003:140 (Poland: Ojców National Park); Wiśniowski and Werstak, 2003:77 (Poland: Pieniny National Park); Aistleitner, 2004:59 (Austria: Vorarlberg: Sonntag); Bergsten, Nilsson, and Hellquist, 2004:7 (Sweden: Västerbotten: Nordmaling); Buck, 2004:25 (Canada: in checklist of Sphecidae of Ontario); Dollfuss, 2004a:118 (Czech Republic); Esser, Jakubzik, Sonnenburg, and Woydak, 2004:263 (Germany: in checklist of Sphecidae of Nordrhein-Westfalen); Haneda, Nosaka, Tano, Kurokawa, and Murota, 2004:32 (Japan: Gifu Prefecture); Hellrigl, 2004a:174 (Italy: Trentino-Alto Adige, as Südtirol: Vinschgau = Val Venosta: Sulden, as *montanus*); Klein and Lefeber *in* Peeters, van Achterberg, et al., 2004:414 (in Wasp and Ant Fauna of Netherlands); Stolle et al., 2004:372 (Germany: Sachsen-Anhalt: in red list of Sphecidae); van Achterberg and Peeters, 2004:32 (in checklist of Sphecidae of Netherlands); Wiśniowski, 2004:40 and 58 (in checklist of Polish Sphecidae); Bergsten, Ekerholm, Gabrielsson, Hellquist, Petersson, Werner, Ström, Chauvet, and Dalecky, 2005:16 (Sweden: Västerbotten: Bjuröklubbs Nature Reserve); Cölln and Jakubzik, 2005:806 (Germany: in synthesis of records from northwestern Rheinland-Pfalz); Fuhrmann, 2005:89 (Germany: Nordrhein-Westfalen: Grubengelände

Littfeld Nature Reserve); Haneda, Nozaka, Tano, Kurokawa, and Murota, 2005:46 (Japan: Gifu Prefecture); Kofler, 2005:169 (Austria: Tirol: Lienz District: Klammbrücke in Amlach Common, Lienser Klause in Leisach Common, Lavant, Lengberg and road to Plon in Nikolsdorf Common, Nuβdorf-Debant, Saint Jakob); Kraatz, 2005:103 (Germany: Niedersachsen: Bümmerstede near Oldenburg); Nemkov, 2005a:146 (Russia: Island of Sakhalin); Pagliano and Negrisolo, 2005:470 (in Sphecid Fauna of Italy); Reder, 2005:952 (Germany: Rheinland-Pfalz: Maxdorf); Riemann and Hohmann, 2005:563 (Germany: Niedersachsen: city of Bremen and adjacent area); Saure, 2005:18 (Germany: Berlin); Straka, 2005a:404 (vulnerable in Czech Republic); Theunert, 2005a:18 (Germany: in checklist of Sphecidae of Niedersachsen and Bremen); Wiśniowski, 2005a:312 (Poland: Ojców National Park; occurring only in forest and on wooden buildings); Burger, 2005:35 (Germany: Thüringen); Dvořák, Bogusch, and Smetana, 2006:103 (Czech Republic: Sumava = Bohemian Forest); Haneda, Nozaka, Tano, Kurokawa and Murota, 2006a:21 (Japan: Toyama Prefecture); Liebig, 2006:39 (Germany: Sachsen: Muskauer Heide); Ljubomirov, 2006:542 (Bulgaria: Rhodope Mountains: Golyam Beglik dump); N. Schneider, 2006:133 (Luxemburg: anthropogenic habitats); Shlyakhtenok, 2006:110 (Belorussia: Polesye Radiological Nature Reserve); Standfuss and Standfuss, 2006a:86 (Germany: Nordrhein-Westfalen: Dortmund); Vepřek, 2006:511 (Czech Republic: Kokořínsko area); Dorow, 2007:263 (Germany: Hessen: Schönbuche Forest Reserve); Jacobs, 2007:65, 70 (in key to Crabronidae of Germany); Nemkov, 2007b:69 (Russia: Kuril Islands: Island of Kunashir); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Shlyakhtenok, 2007a:299 (Belorussia: Berezinsky Nature Reserve); Venne, Bleidorn, and Lauterbach, 2007:302 (Germany: Nordrhein-Westfalen: Bielefeld); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia); Nemkov, 2008b:18 (in catalog of Crabronidae of Asiatic Russia); Shcherbakov, 2008:211 (Russia: Moscow Oblast': near Ramenskoye); S. Takahashi and Haneda, 2008b:44 (Japan: Hokkaido: Sapporo); Theunert, 2008:72 (Germany: map of distribution in Niedersachsen and Bremen); Donie, 2009:10 (Germany: Niedersachsen: Oldenburg); U. Frommer, 2009a:28 (Germany: in checklist of Sphecidae of Hessen); Mokrousov, 2009:292 (Russia: Republic Mari El); Nemkov, 2009b:66 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:72 (Norway: locality records); Straka, Dvořak, and Bogusch, 2009:264 (Czech Republic: Jizerské Mountains and Frýdlant region); Venne, 2009:111 (Germany: Nordrhein-Westfalen: Holte-Stukenbrock, associated with *Frangula alnus* Miller, Rhamnaceae); Ermilov and Mokrousov: 2010:91 (phoretic mites *Acarus psenuli* and *Calvolia* sp. in Middle Volga Region of Russia); Esser, Fuhrmann, and Venne, 2010:38 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Johansson, 2010:121 (Sweden: Småland: upper Emå river valley); J. Kim and Yang, 2010:147 (in checklist of Korean Pemphredoninae); Mokrousov, 2010a:63 (Russia: Kirov, Nizhniy Novgorod, Vladimir, and Yaroslavl' Oblast's, Mari El Republic,Tatarstan: no specific localities), 2010c:108 (Russia: Chuvash Republic: State Nature Reserve "Prisurskiy"); Rudoiskatel', 2010:154 (Russia: central and southern Ural Mountains, as *montanus*); Saure, 2010b:176 (Germany: Berlin-Reinickendorf: airport Tempel and Flughafensee Protected Area); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Schmidt, 2010:138 (Germany: Bayern: collected along Main-Donau canal); van der Smissen, 2010a:349 (Germany: Schleswig-Holstein and Mecklenburg-Vorpommern: locality records); Burger, 2011a:288 (Germany: in red list of Sphecidae *sensu lato* of Thüringen); Gogala, 2011:11 (Slovenia); Mokrousov, Berezin, and Egorov, 2011:80 (Russia: Chuvash Republic); Pagliano, 2011a:158 (specimen in collection Spinola, Torino, is *Pemphredon lugubris*); Rudoiskatel', 2011d:242 (Russia: central Ural Mountains); Theunert, 2011a:21 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:162 (Germany: Hessen: not endangered); Boillat, 2012:228 (Switzerland: in checklist of insects of Canton de Genève); Nemkov, 2012c:437 (in catalog of Crabronidae of Russian Far East); Shlyakhtenok, 2012a:172 (Russia: Kirov Oblast': Arkhangelskoye: collected in private plots), 2012b:92 (Belorussia: Beresina National Reserve: overgrowing dry meadow); Terayama, 2012:5 (in key to Pemphredonini of Japan), 14 (description), 19 (in checklist of Pemphredonini of Japan); Akulov and Proshchalykin, 2013:113 (Russia: Siberia: Krasnoyarsk Kray: Krasnoyarsk); Dyuzhaeva, 2013:117 (Russia: Samara Oblast': Zhiguli Nature Reserve); Ma, X. Li, Chen, and Q. Li, 2013:580 (China: Nei Mongol: Helan Mountains);

Saure, 2013:21 (Berlin: Treptow-Köpenick: Gosener Wiesen); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Shlyakhtenok, 2013:151 (in annotated catalog of aculeate wasps of Belorussia); Wiśniowski and Szczepko, 2013:47 (Poland: Kampinos National Park near Warszawa); Bitsch, 2014:408 (France: Alpes-Maritimes: Casterino; Haut-Rhin: Munster, Turkheim); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); J.-K. Kim, 2014:443 (in catalog of Sphecidae *sensu lato* of Korean Peninsula); Mokrousov and Vafin, 2014:59 (Russia: Republic of Tatarstan); Paukkunen and Kozlov, 2015:63 (Russia: Murmansk Oblast'); Blažej, Macek, and Trýzna, 2016:125 (Czech Republic: České Švýcarsko = Bohemian Switzerland National Park); Cölln and Jakubzik, 2016:18 (Germany: Rheinland-Pfalz: Vulkaneifel District); Ratzlaff, 2016:27 (Canada: British Columbia: from Krombein, 1979); A. Scholz, 2016:72 (Germany: Sachsen: Kleinraschützer Heide); Olszewski and Kowalczyk, 2019:108 (northern Poland: Pomorze Gdańskie = Gdańsk Pomerania); Ma, and Q. Li, 2020b:5, 6 (in key to *Pemphredon* of China); Kejval, Blažej, and Erhart, 2020:114 (western Czech Republic); Saure, 2020:277 (Germany: Sachsen-Anhalt: sand dunes); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China); Herb and Schmid-Egger, 2021:9 (Germany: Bayern: Kaufbeuren area); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Saure and Marten, 2021:136 (Germany: Sachsen-Anhalt: Nationalpark Harz); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:119 (in revision of Sphecidae *sensu lato* of Europe); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen University Botanical Garden). – **As *Cemonus montanus***: A. Morawitz, 1864:460 (new combination, Russia: Sankt-Petersburg).

Pemphredon angularis W. Fox, 1892h:310, ♀, ♂. Lectotype: ♀, USA: New Hampshire: no specific localitn (ANSP), designated by Cresson, 1928:51. Synonymized with *Pemphredon montanus* by R. Bohart *in* Bohart and Menke, 1976:182. – Dalla Torre, 1897:355 (in catalog of world Hymenoptera); Ashmead, 1899d:222 (in checklist of North American Crabronidae); J. Smith, 1910:675 (in new list of insects of New Jersey); Rohwer, 1916b:690 (in catalog of Hymenoptera of Connecticut), 1917c:100 (Colorado: Boulder); Rohwer *in* Viereck, 1925:690 (in key to Sphecidae of Connecticut; not yet found in the State); Brues, 1927:82 (Massachusetts: Petersham, nesting in wood); J.Ch. Bradley, 1928:1014 (in catalog of New York Sphecidae); A. Brown, 1934:264 (Canada: Ontario: Timagami); Brimley, 1938:446 (North Carolina: Raleigh); Strickland, 1947:129 (Canada: Alberta: Waterton); Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera).

31. *montanella* Dollfuss

Pemphredon montanella Dollfuss, 1993b:698, ♀. Holotype: ♀, USA: Arizona: Cochise County: South West Research Station near Portal (AMNH). – Dollfuss, 1995:997 (in revision of world *Pemphredon*).

32. *morio* Vander Linden

Pemphredon morio Vander Linden, 1829:84, ♀. Holotype: ♀: Belgium Bruxelles (lost: Dollfuss, 1995:998). – Shuckard, 1837a:198 (in revision of British Aculeata); Wesmael, 1852:281 (Belgium); Sickmann, 1883:77 (Germany: Niedersachsen: Wellingholthausen); Kohl, 1880:137 (Italy: Trentino–Alto Adige), 1890a:54 (in review of *Pemphredon*); E. Saunders, 1896:94 (in revision of British Aculeata); Borries, 1897:94 (Denmark); Dalla Torre, 1897:359 (in catalog of world Hymenoptera); Mocsáry, 1897:78 (Kingdom of Hungary, localities are in today's Romania and Slovakia); Antiga and Bofill, 1904:7 (Spain: Cataluña Province); Aurivillius, 1904:260 (in revision of Swedish Sphecidae); Arnold, 1905:262 (Great Britain: Hampshire: Brockenhurst); Morley, 1909:304 (Great Britain: Isle of Wight); Dubois, 1922:195 (in key to Belgian Sphecidae); Haines, 1922:12 (Great Britain: Dorset: Parley Heath); Berland, 1925d:140 (in Sphecid Fauna of France); Bouwman, 1926:279 (in list of Sphecidae of Netherlands); Crèvecoeur and Maréchal, 1927:139 (Belgium: Saint-André-lez-Bruges); Stelfox, 1927:292 (records from Ireland are erroneous); Berland, 1928b:178 (France: Finistère: Fouesnant, and Haute-Loire: Tence); Bouwman, 1928b:180 (in revision of Sphecidae of Netherlands); Grandi, 1929:288 (Italy: Toscana: valle della Limentra); Crèvecoeur and Maréchal, 1929:168 (Belgium: Wépion); Jansson, 1934:289 (Sweden); Crèvecoeur and Maréchal, 1936:251 (in catalog of Belgian Hymenoptera); Leclercq, 1941b:11 (Belgium: Liège area); Balthasar, 1942:4 (Czech Republic: Moravia); Giner

Marí, 1943:46 (in Sphecid Fauna of Spain); Guiglia, 1944b:31 (Italy); Šnoflák *in* Zavadil and Šnoflák, 1948:54 (in key to Sphecidae of Czechoslovakia); Cavro, 1950:33 (France: Département du Nord); Hellén, 1955a:124 (male characters, Finland: seven localities); Ceballos, 1956:357 (in catalog of Hymenoptera of Spain); Bajári, 1957a:80 (in key to Hungarian Sphecidae, not yet found in Hungary); Benno, 1958b:12 (in review of Dutch Sphecidae); Pulawski, 1958a:186 (Bulgaria: Kniazhevo near Sofia); Noskiewicz and Puławski, 1960:45, 47 (in key to Polish Sphecidae); Janvier, 1961a:37 (nesting habits, description of larva); Evans, 1964b:249 (reference to Janvier's 1961 description of larva); Leclercq, 1965b:387 (Belgium: city of Liège); Benno, 1967:37 (in checklist of Sphecidae of Netherlands); Niedl and Deneš, 1967:79 (Czech Republic: Třeboň area); Lefeber, 1969a:79 (Netherlands: Vaals), 1969c:233 (Netherlands: Sint Pietersberg = Montagne Saint Pierre); Tumšs, 1970:73 (first record from Latvia); Valkeila and Leclercq, 1970:map170 (distribution in Belgium); Balthasar, 1972:217 (in Sphecid Fauna of Czechoslovakia); Valkeila and Leclercq, 1972:704 (locality records); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Eck, 1976:93 (German Democratic Republic); Leclercq, Gaspar, Lajoinie, and Thirion, 1976:178 (Belgium: Chaumont-Gistoux); Lefeber, 1976:151 (Belgium: Wouterbron-As, as *morio* Thomson); Kolesnikov, 1977:319 (Russia: Bryansk Oblast'); Schmidt, 1979a:55 (Germany: Ost-Holstein); Schwammberger, 1978:418 (Germany: Württemberg); Jacob-Remacle and Leclercq, 1980:193 (Belgium: gardens in Liège); Richards, 1980:69 (in key to Sphecidae of British Isles); Dollfuss and Ressl, 1981:321 (Austria: Niederösterreich: Scheibbs District); Skibińska, 1981:357 (Poland: Warszawa-Białołęka); Leclercq, 1982a:124 (Belgium: Liège); Skibińska, 1982:118, 122 (Poland: Mazovian Voivodship: Białołęka, Warszawa); Dollfuss, 1983a:76 (Austria: endangered in Niederösterreich), 77 (Austria: endangered in Burgenland), 78 (Austria: endangered in Oberösterreich), 79 (Austria: endangered in Salzburg area and Kärnten), 80 (Austria: endangered in Steiermark), 80 (Austria: endangered in Tirol), 1983b:7 (in catalog of Sphecidae of Austria); Jacob-Remacle and Jacob, 1983:242 (Belgium: Liège Province: fagne de Malchamps near Spa); Mingo and Gayubo, 1984:110 (Spain); Schmidt, 1984:250 (Germany: Baden-Württemberg); Garland, Gibbs, Lee, and Whiteley, 1985:54 (Great Britain: Derbyshire); Lefeber, 1985:87 (Netherlands: southern Limburg); Paik, 1985:197 (in list of Sphecidae of Korea); Islamov, 1986:529 (Uzbekistan: Tashkent Oblast'); Vikberg, 1986b:75 (Finland); Pádr *in* Šedivy, 1989a:168 (in checklist of Czechoslovakian Sphecidae); Haeseler, 1985a:350 (Germany: Schleswig Holstein), 1985c:571 (Germany: Friesian Islands); Skibińska, 1986b:153 (Poland: suburbs of Warszawa); Jacobs, 1989:8 (Germany: Mecklenburg-Vorpommern); Weiffenbach, 1989:106 (Germany: Hessen: Gießen area); Archer, 1990c:17 (Great Britain: Leicestershire); Pádr, 1990:79 (Czech Republic: Praha area); Pagliano, 1990:116 (in catalog of Italian Sphecidae); Schwammberger and Priesner, 1990:536 (Austria: Kärtnen); Yeo, 1990:101 (Great Britain: Cambridge); Day, 1991:xviii (in summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:62 (in key to Sphecidae of North and Central Europe); Nilsson, 1991:83 (Sweden: Lake Mälaren); Wiśniowski, 1993a:94 (Poland: Białowieża Primeval Forest); Archer, 1992a:56 (Great Britain: Leicestershire); Nilsson, 1992:54 (Sweden); Sorg and Cölln, 1992:132 (Germany: Rheinland-Pfalz: Gönnersdorf); K. Weber, 1992:88 (Germany: Bayern: Bamberg District); Archer, 1993c:39 (Great Britain: Yorkshire); Sorg and Wolf, 1993:60 (Germany: Rheinland-Westfalen: Nature Reserve Die Spey); Wiśniowski, 1993a:96 (Poland: in checklist of Sphecidae of Białowieża Primeval Forest); Archer, 1994a:73 (Great Britain: Yorkshire); Schmid-Egger, 1994a:688 (Germany: Rheinland-Pfalz: Höllenberg near Grünstadt); Theunert, 1994c:48 (Germany: summary of records from Niedersachsen and Bremen); Dollfuss, 1995:998 (in revision of world *Pemphredon*); Jansen and Kaluza, 1995:8 (Germany: endangered in Sachsen); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna); Pagliano and Pesarini, 1995:85 (Italy: Ferrara Province); Riemann, 1995:52 (Germany: Bremen); Schmid-Egger, 1995:63 (Germany: northwestern Baden-Württemberg); Schmid-Egger, Risch, and Niehuis, 1995:204 (summary of records from Germany: Rheinland-Pfalz); Schmidt, Schmid-Egger, and Doczkal, 1995:8 (relationship to *Pemphredon clypealis* is unclear); Shlyakhtenok, 1995:194 (Belorussia: Berezinsky Nature Reserve); Skibińska, 1995:423, 425 (Poland: pine forest in Białowieża Primeval Forest); Archer, 1996c:121 (Great Britain: Yorkshire); Arens, 1996:440 (Germany: Bayern: Bayreuth area); Chaubet, 1996:115 (France: Bretagne: Corps-Nuds); Fowles, 1996:36 (Great Britain: in checklist of aculeates of Wales); Harvey and Plant, 1996:76 (Great Britain: summary of records from Essex); Schmid-Egger, Schmidt, and Doczkal,

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(western Slovakia); Dollfuss, 2004a:118 (Czech Republic, Kyrgyzstan, Ukraine); Dorow, 2004a:127 (Germany: Hessen: Schönbuche Nature Reserve); Esser, Jakubzik, Sonnenburg, and Woydak, 2004:263 (Germany: in checklist of Sphecidae of Nordrhein-Westfalen); Gayubo**,** Nieves-Aldrey, González, Tormos, Rey del Castillo, and Asís, 2004:108 (Spain: Madrid: Monte de El Pardo); Jakubzik, Niehuis, and Cölln, 2004:458 (Germany: Rheinland-Pfalz: Roβstein in Rhein valley at 50°06'42"N 7°43'87"E); Kula and Tyrner, 2003a:150 (Czech Republic: Děčin Sandstone Uplands: forest district Snežnik: birch stands in air-polluted area); Klein and Lefeber *in* Peeters, van Achterberg, et al., 2004:415 (in Wasp and Ant Fauna of Netherlands); Majzlan and Deván, 2004:33 (Slovakia: Malacky-Široké); Schneider and Carrières, 2004:98 (Luxemburg: Bon-Pays Region); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); van Achterberg and Peeters, 2004:32 (in checklist of Sphecidae of Netherlands); Wiśniowski, 2004:40 and 60 (in checklist of Polish Sphecidae); Bergsten, Ekerholm, Gabrielsson, Hellquist, Petersson, Werner, Ström, Chauvet, and Dalecky, 2005:16 (Sweden: Västerbotten: Bjuröklubbs Nature Reserve); Burger, 2005:35 (Germany: Thüringen); Kofler, 2005:169 (Austria: Tirol: Lienz District: Lesach in Kals Common, Lavant, Burgfrieden in Leisach Common, Lublas in Matrei Common, Lengberg in Nikolsdorf Common, Tschule Alm in Thurn Common); Kowalczyk and Kurzac, 2005:106 (Poland: Botanical Garden in Łódź); Kraatz, 2005:103 (Germany: Niedersachsen: Bümmerstede near Oldenburg); Mandery, 2005:174 (Germany: Bayern: Hainberg Nature Reserve near Nürnberg); Pagliano and Negrisolo, 2005:477 (in Sphecid Fauna of Italy); Quest and Kuhlmann, 2005:33 (Germany: Bayern: Bayerischer Wald National Park); Robinson, 2005:37 (Great Britain: Cumbria County); Saure, 2005:18 (Germany: Berlin); Theunert, 2005a:18 (Germany: in checklist of Sphecidae of Niedersachsen and Bremen); Liebig, 2006:39 (Germany: Sachsen: Muskauer Heide); N. 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Frommer, 2009a:28 (Germany: in checklist of Sphecidae of Hessen); Gayubo, González, Tormos, and Asís, 2009:362 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); González, Gayubo, Asís, and Tormos, 2009:622 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Livory, Chevin, Lair, Sagot, and Baldock, 2009:19 (France: Département de la Manche: Agon, Boleville); Nemkov, 2009b:67 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:72 (Norway: locality records); Straka, Dvořak, and Bogusch, 2009:264 (Czech Republic: Jizerské Mountains and Frýdlant region); Szczepko and Wiśniowski, 2009:71 (Poland: Spała Landscape Park); 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); Hable, von der Dunk, and Knipfer, 2010:66 (Germany: Bayern: vicinity of Dietfurt); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Jakubzik, Kinkler, and Cölln, 2010:155 (Germany: Rheinland-Pfalz: Leverkusen-Steinbüchel); Johansson, 2010:121 (Sweden: Småland: upper Emå river valley); Rudoiskatel', 2010:154 (Russia: recorded from Ural Mountains); Saure, 2010a:88 (Germany: Berlin-Reinickendorf: Baumberge), 2010b:176 (Germany: Berlin-

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Ma, and Q. Li, 2020b:3, 5 (in key to *Pemphredon* of China); Cross, Baldock, and Wood, 2021:61 (in catalog of Sphecidae *sensu lato* of Portugal); Falk and Early, 2021:24 (in key to British *Pemphredon*); Herb and Schmid-Egger, 2021:9 (Germany: Bayern: Kaufbeuren area). – **As *Ceratophorus morio***: Dahlbom, 1842a:12 (new combination, in review of Scandinavian aculeates), 1844:256 (new combination, in revision of Sphecidae and Pompilidae), 1845:507 (in key to European *Cemonus*); Eversmann, 1849:413 (Russia: Ural Mountains foothills); Tischbein, 1850:9 (Germany: Rheinland-Pfalz: Herrstein in Fürstenthum Birkenfeld, as *morio* Wismann); F. Smith, 1851c:35 (Great Britain: London district), 1853:64 (in checklist of British Hymenoptera), 1856:433 (in catalog of Hymenoptera in British Museum); Ruthe and Stein, 1857:315 (Germany: Berlin area); F. Smith, 1858c:177 (in review of British Aculeata, redescription); Taschenberg, 1858:93 (in key to Sphecidae of Germany), 1866:185 (in revision of Hymenoptera of Germany); A. Costa, 1867c:112 (in revision of Italian Sphecidae); Kirchner, 1867:222 (in catalog of European Hymenoptera); A. Costa, 1871b:41 (in revision of Italian Sphecidae); F. Smith, 1871b:18 (in catalog of British Aculeata); Dours, 1874:145 (in catalog of Hymenoptera of France); E. Saunders, 1880:260 (in revision of British Aculeata); Ed. André, 1888:222 (in revision of Sphecidae of Europe and Algeria), 21* (bibliographic references); R. Bradley, 1900:13 (Great Britain: Birmingham); J. Nielsen, 1901a:272 (nesting

habits); von Heyden, 1905:82 (Germany: Hessen: Lorsch; as *morio* Shuckard); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Dubois, 1921a:19 (Belgium: Liège); R. Perkins, 1924:222 (Great Britain: Devon), 1925:150 (Great Britain: Bristol, Gloucestershire: Wotton); Hémon, 1926:199 (France: Finistère: Fouesnant); Bondroit, 1932:36 (Belgium: Solbosch, Uccle), 1933:31 (Belgium: Bruxelles, Uccle), 1934:61 (Belgium: Forêt de Soignes, Watermael); Richards, 1937b:105 (in checklist of British aculeates); de Graham, 1941:99 (Great Britain: Lincolnshire); Kloet, 1941:235 (Great Britain: Wales: Wilmslow); Schneid, 1941:1036 (Germany: Bayern: Bamberg area); Spooner, 1943:72 (Great Britain); T. Fletcher, 1945:53 (Great Britain: Gloucestershire: Redland, Wotton); Spooner, 1946:27 (Britain: Leicestershire: Charnwood Forest); Aerts, 1955:61 (Germany: Rheinland); Lomholdt, 1975b:31 (Denmark: Island of Anholt), 1975c:103 (in Sphecid Fauna of Fennoscandia and Denmark); Schmidt, 1977:97 (Germany: Baden-Württemberg: Enzklösterle in Schwarzwald); Petit, 1980:42 (Luxemburg: Welscheid); Westrich, 1980:631 (Germany: Baden-Württemberg: Tübingen area); Woydak, 1981:37 (Germany: Westfalen: Hamm); Axelsson, 1982:79 (Sweden); Kvamme and Axelsson, 1983:57 (Norway); Riemann, 1983:81 (Germany: Bremen-Daverden area); Skibińska, 1986b:164 (Poland: Warszawa: streetside green), 173 (various green urban habitats); Riemann, 1987b:32 (Germany: Niedersachsen: Nature Reserve Dünengebiet near Neumühlen); Skibińska, 1989a:204 (Poland: Warszawa area); Jakubzik, 1991:74 (Germany: Köln); Kuhlmann et al., 1991:87 (Germany: Senne Region); Budrys, 1992:24 (in list of Sphecidae of Lithuania); Kuhlmann, 1993:75 (Germany: known from Westfalen); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:402 (in key to Sphecidae of Russian Far East); Jakubzik, 1996:251 (Germany: Köln); Jakubzik and Cölln, 1996b:398 (Germany: Rheinland-Pfalz); Shlyakhtenok**,** Blinov, and Belyavskaya, 1997:153 (Belorussia: Pripyatskiy National Park); Jakubzik**,** Schlüter, and Cölln, 1998:1181, 1183 (Germany: Rheinland-Pfalz); Cölln and Jakubzik, 1999:28 (Germany: Rheinland-Pfalz: Keuper-Scharren southwest of Hungerburg); Kazenas, 2000e:140 (in Sphecid Fauna of Kazakhstan); van der Smissen, 2001:58 (Germany: Schleswig-Holstein: degree of endangerement unknown); Kazenas, 2008a:100 (southeastern Kazakhstan: Zailiyskiy Alatau Mountains and near Alma Ata); Burguet *in* Durand and Burguet, 2010:45 (France Département d'Ardèche: Ardèche Gorges); Mokrousov, 2010a:63 (Russia: Kostroma, Nizhniy Novgorod, and Yaroslavl' Oblast's: no specific localities); van der Smissen, 2010a:333 (Germany: Schleswig-Holstein: locality records), 2010c:395 (Sweden: Södermanland: Ören); Blažej, Macek, and Trýzna, 2016:126 (Czech Republic: České Švýcarsko = Bohemian Switzerland National Park); Le Divelec, Chapelin-Viscardi, and Larivière, 2016:109 (northern France: in agricultural landscapes); Mokrousov and Popov, 2016:586 (Russia: Krasnodarskiy Kray); Saure, 1916c:205 (Germany: center of Berlin: Groβer Tiergarten Park); Burguet and Durand, 2017:9 (France: Puy-de-Dôme: basin of river Crouël); Mokrousov, 2017e:247 (in catalog of Pemphredoninae of Russia); Olszewski and Kowalczyk, 2019:108 (northern Poland: Pomorze Gdańskie = Gdańsk Pomerania); Kejval, Blažej, and Erhart, 2020:115 (western Czech Republic); Saure, 2020:277 (Germany: Sachsen-Anhalt: sand dunes); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China); Kaplan and Yildirim, 2021:86 (in catalog of Crabronidae of Turkey); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:119 (in revision of Sphecidae *sensu lato* of Europe); Japoshvili and Ljubomirov, 2022:279 (Georgia: Lagodekhi Protected Areas); Kaplan and Yildirim, 2023:1689 (in checklist of Sphecidae *sensu lato* of Turkey). – **As *Cemonus morio***: A. Morawitz, 1864:461 (new combination, Russia: Sankt Petersburg).

Ceratophorus anthracinus F. Smith, 1851b:cxxvi, ♀. Holotype: ♀, Great Britain: Devonshire: no specific locality (OXUM); designation of lectotype by Dollfuss, 1995:998, was unnecessary. Synonymized with *Ceratophorus morio* by R. Perkins, 1917:231. – F. Smith, 1851c:35 (Great Britain: Devonshsire: no specific locality), 1853:64 (in checklist of British Hymenoptera), 1855:97 (Great Britain, Devonshsire);, 1856:433 (in catalog of Hymenoptera in British Museum), 1858c:177 (in review of British Aculeata, redescription); Kirchner, 1867:222 (in catalog of European Hymenoptera); R. Perkins, 1916:231 (specimens in F. Smith collection); Hoop, 1961:64 (Germany: Schleswig-Holstein: Rosenkranz; also Hamburg). – **As *Pemphredon anthracinus***: Daly, 1878:46 (new combination, Great Britain: Dorset: Glanville's Wootton); Kohl, 1890a:50 (in review of *Pemphredon*, may be identical to *carinatus* or *clypealis*);

Dalla Torre, 1897:356 (in catalog of world Hymenoptera); Wolf, 1959b:27 (known from Germany, but not from Baden); Valkeila, 1962b:67 (southwestern Finland); Oehlke, 1970:742 (German Democratic Republic).

Pemphredon carinata Thomson, 1870:236, ♀ (as *carinatus*, incorrect original termination). Lectotype: ♀, Sweden: Sällsyut (Lund), designated by Dollfuss, 1995:998. Synonymized with *Pemphredon anthracina* by Fæster, 1951:452. – Thomson, 1874:192 (in revision of Hymenoptera of Scandinavia); Kohl, 1883e:659 (Switzerland); Schøyen, 1887:10 (Norway: Kristiania, now Oslo); Kohl, 1888b:724 (Austria: Tirol, now Italy: Alto Adige), 1890a:51 (in review of *Pemphredon*), 1893a:39 (Austria: Niederösterreich); Krieger, 1894:15 (Germany: Kingdom of Saxony); Dalla Torre, 1897:356 (in catalog of world Hymenoptera); Strand, 1898b:92 (Norway); Schmiedeknecht, 1907:208 (in key to Hymenoptera of Central Europe); Hallett, 1916:221 (Great Britain: South Wales: Porthcawl); O. Meyer, 1919:150 (Germany: Posen Province, now Poland: Poznań Region); Stöckhert, 1919:39 (Germany: Franken); A. Wagner, 1920:42 (Germany: Lower Elbe region); Eidmann, 1928:486 (nesting in tree trunks); Schmiedeknecht, 1930:671 (in keys to Hymenoptera of North and Central Europe); Pulkkinen, 1931:90 (in revision of Sphecidae of Finland); Balles, 1934:18 (Germany: Baden-Württemberg: Oberachern); Forsius *in* Forsius and Hellén, 1935:11 (in checklist of Hymenoptera of Finland); Goebel, 1937:40 (Poland: Poznań District: Strzeszynek); Zavadil, Šustera, and Bat'a, 1937:179 (in catalog of Sphecidae of Czechoslovakia); A. Wagner, 1938a:120 (northwestern Germany); Paul, 1941:42 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area); Šnoflák, 1944a:143 (Czech Republic: serpentine steppe near Mohelno); Vogrin, 1955:39 (Yugoslavia); Grandi, 1962:96 (Italy); Babiy, 1964:116 (Austria: Land Salzburg); de Beaumont, 1964a:297 (variation and related taxonomic problems), 1964c:104 (in Sphecid Fauna of Switzerland); Gauss, 1967:556 (Germany: Baden-Württemberg); J. Heinrich, 1967:78 (Germany: Bayern: Romberg near Lohr); Stritt, 1969:131 (Germany: Baden-Württemberg: Karlsruhe), 1971:105 (Germany: Karlsruhe); Wolf, 1971:375 (Italy: Trentino–Alto Adige: Alpi Siusi; as *carinatum*); Kofler, 1972:110 (Austria: eastern Tirol); Erlandsson, 1974:78 (Italy); Kazenas, 1978b:154 (in key to Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Tyrner, 1985:9 (Czech Republic: Jezerka Nature Reserve in Krušné Hory = Erzgebirge); Kowalczyk, 1988a:44 (Poland: Rogów), 1988b:63 (Poland: environs of Łódź); Pankevich, Belyavskaya, Molchanova, Shlyakhtenok, and Blinov, 1989:96 (Belorussia: Berezinskiy Nature Reserve); Kowalczyk, 1990:290 (Poland: Góry Świętokrzyskie); Shlyakhtenok, 1996:304 (Belorussia: Berezinsky Nature Reserve); Rudoiskatel', 2010:154 (Russia: central and southern Ural Mountains), 2011d:241 (Russia: central Ural Mountains); Pankov, 2013:230 (Russia: Ivanovo Oblast', as *carinatus*). – **As *Cemonus carinatus***: de Gaulle, 1908:103 (new combination, in catalog of French Hymenoptera); Schirmer, 1912:166 (Germany: Berlin area). – **As *Ceratophorus carinatus***: Noskiewicz, 1918:137 (FnwGalicia, now western Ukraine: Brzuchowice near Lwów); Spooner, 1931:14 (Great Britain: Cambridgeshire); Kowalczyk, 1991a:89, 93, 99, 101, 104 (Poland: Łódź), 1994:72 (Poland: Łagiewniki forest in Łódź).

Pemphredon clypealis Thomson, 1870:236, ♀, ♂. Lectotype: ♀, Sweden: Äfven (Lund), designated by Dollfuss, 1995:998. Synonymized with *Pemphredon morio* by Dollfuss, 1991:62, synonymy questioned by Norén, 2000:11. – Thomson, 1874:193 (in revision of Hymenoptera of Scandinavia); Kohl, 1888b:724 (Austria: Tirol, now Italy: Alto Adige), 1890a:51 (in review of *Pemphredon*), 1893a:39 (Austria: Niederösterreich); Dalla Torre, 1897:356 (in catalog of world Hymenoptera); Mocsáry, 1897:78 (Kingdom of Hungary, localities are in today's Romania and Slovakia); Aurivillius, 1904:260 (in revision of Swedish Sphecidae); Schmiedeknecht, 1907:208 (in key to Hymenoptera of Central Europe); Dittrich, 1911b:21 (Germany: Niederschlesien Province, now Poland: Dolny Śląsk Region); Alfken, 1914:275 (northwestern Germany); Stöckhert, 1919:39 (Germany: Franken); A. Wagner, 1920:42 (can be expected in Germany: Lower Elbe region); Dubois, 1922:195 (in key to Belgian Sphecidae); Bouwman, 1926:279 (in list of Sphecidae of Netherlands), 1928b:181 (in revision of Sphecidae of Netherlands); Eidmann, 1928:486 (nesting in tree trunks); Schmiedeknecht, 1930:671 (in keys to Hymenoptera of North and Central Europe); Pulkkinen, 1931:91 (in revision of Sphecidae of Finland, not yet found in Finland); Jansson, 1934:289 (Sweden); Zavadil, Šustera, and Bat'a, 1937:186 (in catalog of Sphecidae of Czechoslovakia); A. Wagner, 1938a:120 (northwestern Germany); Paul, 1941:42 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin

area); Šnoflák, 1944a:143 (Czech Republic: serpentine steppe near Mohelno); Šnoflák *in* Zavadil and Šnoflák, 1948:54 (in key to Sphecidae of Czechoslovakia); de Beaumont, 1951h:33 (Switzerland: Neuchâtel area); Kjellander, 1954b:246 (Sweden); Vogrin, 1955:39 (Yugoslavia); Bajári, 1957a:80 (in key to Hungarian Sphecidae); Grandi, 1957:390 (Italy: Abruzzi); Benno, 1958b:12 (in review of Dutch Sphecidae, as *clypeatus*); Wolf, 1959b:27 (Germany: Nassau); Noskiewicz and Puławski, 1960:46 (in key to Polish Sphecidae); Valkeila, 1962b:67 (southwestern Finland); Babiy, 1964:116 (Austria: Land Salzburg); de Beaumont, 1964a:297 (variation and related taxonomic problems), 1964c:102 (in Sphecid Fauna of Switzerland); Benno, 1967:37 (in checklist of Sphecidae of Netherlands); Gauss, 1967:556 (Germany: Baden-Württemberg); J. Heinrich, 1967:78 (Germany: Bayern: Pflochsbach south of Lohr); Niedl and Deneš, 1967:79 (Czech Republic: Třeboň area); Lefeber, 1968b:95 (Netherlands: South Limburg); Stritt, 1968:110 (Germany: Baden-Württemberg); Lefeber, 1969:79 (Netherlands: Hierden, Schinveld); Schmidt, 1969:165 (Germany: Rhein-Main area: specimen from Monheim recorded by Aerts, 1955, is actually *Pemphredon carinatus*); Stritt, 1969:131 (Germany: Baden-Württemberg: Karlsruhe); Haeseler, 1970:74 (Germany: Schleswig-Holstein: Kahlschlag on Schierensee near Kiel, Kiesgrube near Russee); Oehlke, 1970:742 (German Democratic Republic); Valkeila and Leclercq, 1970:map165 (distribution in Belgium); Lefeber, 1971b:223 (Belgium: Bassenge); Schmidt, 1971b:42 (Germany: Rheinland-Pfalz: Gonsenheimer Wald); Stritt, 1971a:105 (Germany: Baden-Württemberg: Karlsruhe); Vegter, 1971:230 (Netherlands: Drenthe Province); Balthasar, 1972:218 (in Sphecid Fauna of Czechoslovakia); Haeseler, 1972:156 (Germany: Schleswig-Holstein; anthropogenic habitats); Valkeila and Leclercq, 1972:702 (kocality records); Lefeber, 1975b:156 (Belgium), 1976:152 (Netherlands: Overzande); R. Bohart and Menke, 1976:180 (in checklist of world Sphecidae); Eck, 1976:92 (German Democratic Republic); Guichard, 1977:252 (Great Britain: Surrey); Haeseler, 1978b:63 (Germany: Niedersachsen: a bog near Oldenburg); Pulawski, 1978:244 (in key to Sphecidae of European part of USSR); Schmidt, 1979a:55 (Germany: Ost-Holstein); Richards, 1980:69 (in key to Sphecidae of British Isles); Dollfuss and Ressl, 1981:315,321 (Austria: Niederösterreich: Scheibbs District); Skibińska, 1981:357 (Poland: Warszawa-Białołęka), 1982:122 (Poland: Warszawa area); Dollfuss, 1983a:76 (Austria : endangered in Niederösterreich), 78 (Austria: endangered in Oberösterreich), 79 (Austria: endangered in Salzburg area), 80 (Austria: endangered in Tirol), 1983b:7 (in catalog of Sphecidae of Austria); Lefeber, 1984:29 (Netherlands: Maastricht); Schmidt, 1984:247 (Germany: Baden-Württemberg); Jacob-Remacle, 1985:408 (Belgium; second occupant in a composite nest); Józan, 1985b:56 (Hungary south of Lake Balaton), 68 (map of distribution in Hungary), 77 (floral records), 83 (ecological and zoogeographic characteristics); Vikberg, 1986b:75 (Finland); Archer, 1987:111 (Great Britain: Yorkshire); Chevin, 1988:15 (France: La Manche Department); Dollfuss, 1988:10 (Austria: Bisamberg); Pádr *in* Šedivy, 1989a:168 (in checklist of Czechoslovakian Sphecidae); Axelsson, 1982:79 (Sweden); Haeseler, 1985a:350 (Germany: Schleswig Holstein), 1985c:571 (Germany: Friesian Islands); Lefeber, 1985:87 (Netherlands: southern Limburg); Schmidt and Westrich, 1987:367 (Germany: Mainz area); Nilsson, 1985:43 (Sweden); Pankevich, Belyavskaya, Molchanova, Shlyakhtenok, and Blinov, 1989:96 (Belorussia: Berezinskiy Nature Reserve); Archer, 1990c:17 (Great Britain: Leicestershire); Kowalczyk, 1990:290 (Poland: Góry Świętokrzyskie); Pagliano, 1990:115 (in catalog of Italian Sphecidae); Day, 1991:xviii (in summary of European Endangered Hymenoptera Lists); Nilsson, 1991:83 (Sweden: Lake Mälaren), 88 (distribution in Sweden); Wiśniowski, 1993a:94 (Poland: Białowieża Primeval Forest); N. Schneider, 1992:178 (Luxemburg); Luig, 1993:42 (Estonia); Wiśniowski, 1993a:96 (Poland: in checklist of Sphecidae of Białowieża Primeval Forest); Schmidt, Schmid-Egger, and Doczkal, 1995:8 (relationship to *Pemphredon morio* is unclear); Arens, 1996:440 (Germany: Bayern: Bayreuth area); Fowles, 1996:36 (Great Britain: in checklist of aculeates of Wales); Lefeber, 1998:182 (Netherlands: Limburg: Sint-Pietersberg near Maastricht at 50°50'N 5°41'E, as *clypeata*); Kuhlmann, Wolf, and Woydak, 1999:568 (Germany: endangered in Nordrhein-Westfalen because of low population level, as *clypealis* Foerster); Pauly, 1999:108 (in catalog of Belgian aculeates); Blösch, 2000:169 (in Sphecid Fauna of Germany); Józan, 2000:106 (Hungary: Bakony Mountains, as *clipealis*), 2001:278 (Hungary: Somogy County); Mokrousov, 2002:148 (Russia: Nizhniy Novgorod Oblast': Kerzhenskiy Nature Reserve); Cölln, Esser, and Jakubzik, 2003:62 (Germany: northwestern Rheinland-Pfalz: excavation sites and quarries); Mandery, Kraus, Voith, Wickl, Scheuchl,

Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: conservation status unknown); Wiśniowski, 2003:187 (Poland: summary of locality records); Schneider and Carrières, 2004:98 (Luxemburg: Bon-Pays Region); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Wiśniowski, 2004:40 and 58 (in checklist of Polish Sphecidae); Burger, 2005:34 (Germany: Thüringen); Saure, 2005:18 (Germany: Berlin); Saure, 2006:133 (Germany: Berlin); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:455 (synonymized with *Pemphredon morio* by Dollfuss, 1995, but treated as valid species bySchmidt and Schmid-Egger, 1995, Jakubzik et al., 1998, Norén, 2000, and Wiśniowski, 2003); Jacobs, 2007:64, 69 (in key to Crabronidae of Germany); Józan, 2007:173, 179 (Hungary: Zselic hills); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia), 214 (synonymized with *Pemphredon morio* by Dollfuss, 1991, but easy to distinguish from the latter); Esser, Fuhrmann, and Venne, 2010:37 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Tischendorf, Frommer, Flügel et al., 2011:93 (Germany: Hessen: insufficient data to evaluate degree of endangerment); Ziska and Saure, 2011:109 (Germany: Berlin: Tegeler Flieβ valley); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces). – **As *Ceratophorus clypealis***: Ed. André, 1888:222 (new combination, in revision of Sphecidae of Europe and Algeria), 21* (bibliographic references); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Schirmer, 1912:166 (Germany: Berlin area); Blüthgen, 1929:82 (Germany: Saale River valley: Naumburg); Noskiewicz, 1936:158 (Poland: Podole Region: Trembowla, now Ukraine); Richards, 1937b:105 (in checklist of British aculeates); Struve, 1940:823 (Germany: Island of Borkum); Schneid, 1941:1036 (Germany: Bayern: Bamberg area); Chambers, 1949:225 (Great Britain: Bedfordshire); Bat'a, 1952:166 (Czech Republic); Głowacki, 1953:519 (Poland: Podkowa Leśna near Warszawa); Aerts, 1955:61 (Germany: Rheinland); Lomholdt, 1973a:106 (first record from Denmark: Hellerup and Virum north of Copenhagen, Funen, and Purreskov), 1975c:104 (in Sphecid Fauna of Fennoscandia and Denmark); Haack, Tscharntke, and Vidal, 1984:124 (Germany: Hamburg area); Riemann, 1983:81 (Germany: Bremen-Daverden area); Skibińska, 1986b:150, 153 (Poland: suburbs of Warszawa), 160 (gardens), 173 (various green urban habitats), 1989:204 (Poland: Warszawa area); Rohe, 1990:1048 (Germany: Rheinland-Pfalz: Lenneberg forest); Kowalczyk, 1991a:89, 104 (Poland: Łódź); Józan, 1992b:172 (Hungary: Boronka-melléki Protected Area); N. Schneider and Jacob-Remacle, 1992:42 (Luxemburg); Wolf, 1992c:21 (Germany: Nordrhein-Westfalen: Plettenberg: castle Schwarzenberg ruin); Kuhlmann, 1993:76 (Germany: known from Westfalen); Kowalczyk, 1994:72 (Poland: Łagiewniki forest in Łódź); Józan, 1995:104 (Hungary: projected Duna-Dráva National Park); Schmid-Egger, 1995:58 (Germany: northwestern Baden-Württemberg); Schmid-Egger, Risch, and Niehuis, 1995:203 (summary of records from Germany: Rheinland-Pfalz); Harvey and Plant, 1996:76 (Great Britain: summary of records from Essex); Jakubzik, 1996:251 (Germany: Köln); Jakubzik and Cölln, 1996b:398 (Germany: Rheinland-Pfalz); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: not endangered); Schmidt and Schmid-Egger, 1997:24 (in checklist of German Sphecidae); Shlyakhtenok, Blinov, and Belyavskaya, 1997:153 (Belorussia: Pripyatskiy National Park); Jakubzik, Schlüter, and Cölln, 1998:1181, 1183 (Germany: Rheinland-Pfalz); Józan, 1998:306, 311 (Hungary: Duna-Dráva National Park); Norén, 2000:11 (*Ceratophorus clypealis* is a species different from *morio*; recognition features); van der Smissen, 2001:58 (Germany: Schleswig-Holstein: degree of endangerement unknown); Wiśniowski *in* Dylewska and Wiśniowski, 2003:138 (Poland: Ojców National Park); Mokrousov, 2010a:63 (Russia: Nizhniy Novgorod Oblast': no specific localities); van der Smissen, 2010a:332 (Germany: Schleswig-Holstein: locality records); Pankov, 2013:230 (Russia: Ivanovo Oblast'); U. Frommer, 2014:28 (Germany: Hessen: Lorch); Saure, 1916c:205 (Germany: center of Berlin: Groβer Tiergarten Park); Stolle and Saure, 2016:924 (Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Wiśniowski, 2016:129 (Poland: Ojców National Park); Mokrousov, 2017e:247 (in catalog of Pemphredoninae of Russia, as *clypeata*); U. Frommer, 2020:158

(Germany: Hessen: Lahn River area); Herb and Schmid-Egger, 2021:9 (Germany: Bayern: Kaufbeuren area); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:111 (in revision of Sphecidae *sensu lato* of Europe); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen: city gardens).

Pemphredon intermedia Tsuneki, 1951a:186, ♀, ♂ (as *intermedius*, incorrect original termination). Holotype: ♀, Japan: Sapporo (originally K. Tsuneki collection, now USNM). Synonymized with *Pemphredon morio* by R. Bohart *in* Bohart and Menke, 1976:182. – Tsuneki, 1952a:68 (nesting habits), 1964e:27, 29 (in key to *Pemphredon* of Japan); Nuhn and Menke, 1994:25 (holotype transferred to USNM).

33. *mortifer* Valkeila

Pemphredon mortifer Valkeila *in* Valkeila and Leclercq, 1972:697, ♀, ♂. Holotype: ♀, Russia: Karelian Isthmus: Metsäpirtti, now Zaporozhskoye 75 km northwest of Sankt Petersburg (Zool. Mus. Turku). – Valkeila and Leclercq, 1970:map171 (distribution in Belgium, nomen nudum); Lefeber, 1971b:222 (Netherlands: Amby, Epen, Helenaveen, Kannerbos, Maastricht, Sint Pietersberg; Belgium: Bassenge; nomen nudum); Valkeila and Leclercq, 1972:701 (in key to European *Pemphredon* of *rugifer* group), 704 (locality records); Lefeber, 1975b:156 (Belgium); Lomholdt, 1975c:97 (in Sphecid Fauna of Fennoscandia and Denmark); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Eck, 1976:92 (German Democratic Republic); Guichard, 1977:252 (Great Britain: Surrey); Haeseler, 1978c:195 (Germany: Friesian Islands: Island of Borkum); Lefeber, 1978:138 (Netherlands: Holten, Lintelo, Vogelenzang); Marchal and Leclercq, 1979:9 (Belgium: Gembloux); Jacob-Remacle and Leclercq, 1980:193 (Belgium: gardens in Liège); Richards, 1980:68, 69 (in key to Sphecidae of British Isles); Westrich, 1980:631 (Germany: Baden-Württemberg: Tübingen area); Dollfuss and Ressl, 1981:321 (Austria: Niederösterreich: Scheibbs District); Gayubo, 1981a:146 (northern Spain: Sierra de Béjar); Axelsson, 1982:79 (Sweden); Gayubo, 1982f:248 (Spain: Cádiz Province: Los Barrios, Torre de Melganejo); Leclercq, 1982a:124 (Belgium: Liège); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Janzon, 1983:171 (Sweden: Öland); Gayubo, 1984a:168 (Spain: Salamanca Province); Haack, Tscharntke, and Vidal, 1984:132 (Germany: Hamburg area); Lefeber, 1984:29 (Netherlands: Maastricht); Mingo and Gayubo, 1984:110 (Spain); Schmidt, 1984:250 (Germany: Baden-Württemberg); Haeseler, 1985c:571 (Germany: Friesian Islands); Lefeber, 1985:87 (Netherlands: southern Limburg); Paik, 1985:198 (in list of Sphecidae of Korea); Gayubo, 1986b:38 (Spain: Andalucía), 1986c:31 (Spain: Zamora Province); Gayubo and Sanza, 1986:37 (Spain: Burgos); Gayubo, 1987:109 (Spain: Ciudad Real Province); Wolf, 1988b:143 (Germany: Rheinland-Westfalen); Gayubo, Asís, and Tormos, 1990a:14 (Spain); Jacobs and Oehlke, 1990:125 (comparison with *Pemphredon rugifer* and *wesmaeli*), 149 (new locality records from German Democratic Republic); Pagliano, 1990:116 (in catalog of Italian Sphecidae); Day, 1991:xviii (in summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:62 (as new synonym of *Pemphredon rugifer*); N. Schneider, 1991:93 (Luxemburg), 108 (nest structure); Nilsson, 1992:54 (Sweden); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:402 (in key to Sphecidae of Russian Far East); Schmidt, Schmid-Egger, and Doczkal, 1995:8 (relationship to *Pemphredon lethifer*, *enslini*, *wesmaeli*, and *rugifer* is unclear); Harvey and Plant, 1996:76 (Great Britain: summary of records from Essex); Kuhlmann, 1996:220 (Portugal: Serra de Estrela); Schmidt and Schmid-Egger, 1997:25 (in checklist of German Sphecidae); K. Weber, 1998:147 (Germany: Bayern: Bamberg area); Pauly, 1999:108 (in catalog of Belgian aculeates); Blösch, 2000:178 (in Sphecid Fauna of Germany); van der Smissen, 2001:63 (Germany: Schleswig-Holstein: data on endangerment missing); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); van der Smissen, 2003:78 (in revision of European species of subgenus *Cemonus*, as valid species); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: conservation status unknown); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Stolle et al., 2004:372 (Germany: Sachsen-Anhalt: in red list of Sphecidae); Wiśniowski, 2004:40 and 60 (in checklist of Polish Sphecidae); Burger, 2005:35 (Germany: Thüringen); Jacobs, 2005b:150 (Germany: Mecklenburg-

Vorpommern: Ranzin); Saure, 2005:18 (Germany: Berlin); Ziska and Saure, 2005:81 (Germany: Berlin: Biesenhorster Sand); Gadoum and Barbier, 2006:42 (France: départements of Val-d'Oise and Yvelines: Parc Naturel Régional du Vexin Français: Gommécourt); N. Schneider, 2006:140 (Luxemburg: anthropogenic habitats); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:455 (synonymized with *Pemphredon rugifer* by Dollfuss, 1991, 1995, but treated as valid species by Schmidt and Schmid-Egger, 1997, van der Smissen, 2003, Wiśniowski, 2003, and Jacobs, 2005a); Herrmann, 2007b:95 (Germany: Baden-Württemberg: Fürstenberg in Konstanz); Jacobs, 2007:69, 73 (in key to Crabronidae of Germany); Jansen and Kaluza, 2007:25 (Germany: first record from Sachsen); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia), 215 (valid species, locality records from Bohemia, Moravia, and Slovakia); Winkler, 2007:30 (Germany: Niedersachsen: eastern Friesland); Gayubo, González, Tormos, and Asís, 2008:139 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Ljubomirov and Yildirim, 2008:184 (in catalog of Crabronidae of Turkey); Gayubo, González, Tormos, and Asís, 2009:362 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); Burguet *in* Durand and Burguet, 2010:45 (France Département d'Ardèche: Ardèche Gorges); Esser, Fuhrmann, and Venne, 2010:38 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); J. Kim and Yang, 2010:147 (in checklist of Korean Pemphredoninae); Mokrousov, 2010a:63 (Russia: Nizhniy Novgorod and Yaroslavl' Oblast's, Mari El Republic: no specific localities); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Schmidt, 2010:138 (Germany: Bayern: collected along Main-Donau canal); van der Smissen, 2010a:349 (Germany: Schleswig-Holstein: locality records), 2010b:386 (France: Ardèche, and Vaucluse: localiy records), 2010c:397 (Sweden: Öland: Gårdby); Cruz-Sánchez, Asís, Gayubo, Tormos, and González, 2011:497 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park: effects of wildfire), 501 (exclusive species of burned areas); Gogala, 2011:11 (Slovenia); Saure, 2011a:6 (Germany: Berlin: former airport Tempelhof); Tischendorf, Frommer, Flügel et al., 2011:93 (Germany: Hessen: insufficient data to evaluate degree of endangerement); Gerth, Mayer, Hering, Wolf, Schaffer, and Bleidorn, 2012:9 (Germany: Sachsen: Bienitz in Leipzig); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Bitsch, 2014:408 (France:Ardèche: Saint-Remèze; recorded from France by Gadoum and Barbier, 2006 and van der Smissen, 2010b); U. Frommer, 2014:28 (Germany: Hessen: Lorch); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Yıldırım, Ljubomirov, and Lelej, 2014:10 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Pärn, Soon, Vallisoo, Hovi, and Luig, 2015:94 (Estonia: no specific locality); Mokrousov and Popov, 2016:588 (Russia: Krasnodarskiy Kray); A. Scholz, 2016:72 (Germany: Sachsen: Kleinraschützer Heide); Stolle and Saure, 2016:924 (Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Flügel, 2017:6 (Germany: Hessen: Eschkopf near Rockensüß); Mokrousov, 2017e:249 (in catalog of Pemphredoninae of Russia); Jacobs and Liebig, 2018:144 (Russia: Buryat Republic: Irkutsk Oblast': Bol'shoye Goloustnoye); Carminati, Mora, and Cretin, 2019:23 (France: in list of Sphecidae *sensu lato* of Franche-Comté); Akulov, Proshchalykin, and Mokrousov, 2020:49 (Russia: central Krasnoyarsk Kray); Kejval, Blažej, and Erhart, 2020:115 (western Czech Republic); Cross, Baldock, and Wood, 2021:61 (in catalog of Sphecidae *sensu lato* of Portugal); Herb and Schmid-Egger, 2021:9 (Germany: Bayern: Kaufbeuren area). – **As *Pemphredon mortifera***: Jacobs, 1989:8 (Germany: Mecklenburg-Vorpommern); Schwammberger and Priesner, 1990:536 (Austria: Kärtnen); Wolf, 1992c:23 (Germany: Nordrhein-Westfalen: Plettenberg: castle Schwarzenberg ruin); Schmid-Egger, 1995:63 (Germany: northwestern Baden-Württemberg); Schmid-Egger, Risch, and Niehuis, 1995:204 (summary of records from Germany: Rheinland-Pfalz); Arens, 1996:440 (Germany: Bayern: Bayreuth area); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: not endangered); Wiśniowski, 2003:190 (first record from Poland: Ojców National Park: Iwiny); Wiśniowski *in* Dylewska and Wiśniowski, 2003:141 (Poland: Ojców National Park); Wiśniowski, 2005b340 (in Poland known only from Ojców National Park); N. Schneider, 2006:133, 142 (Luxemburg: anthropogenic habitats); Baños-Picón, Asís, Gayubo, and Tormos, 2009:314 (Spain: frequency of specimens collected with hand nets and

Malaise traps); Standfuss and Standfuss, 2012:427 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Le Divelec, Chapelin-Viscardi, and Larivière, 2016:109 (northern France: in agricultural landscapes); Wiśniowski, 2016:130 (Poland: Ojców National Park); Kaplan and Yildirim, 2021:86 (in catalog of Crabronidae of Turkey); Lett, 2018:203 (France: Loir-et-Cher: Gièvres at 47°16'39"N 1°41'52"E); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:120 (in revision of Sphecidae *sensu lato* of Europe); Kaplan and Yildirim, 2023:1689 (in checklist of Sphecidae *sensu lato* of Turkey).

34. *nearctica* Kohl

Pemphredon nearctica Kohl, 1890:55, ♀, ♂ (as *nearcticus*, incorrect original termination). Lectotype: ♀, USA: Nevada: no specific locality (NHMW), designated by Dollfuss, 1995:1000 (Morrison, the collector's name, given as type locality). – W. Fox, 1892h:311 (in revision of North American Pemphredonini); Dalla Torre, 1897:359 (in catalog of world Hymenoptera); Ashmead, 1899d:222 (in checklist of North American Crabronidae); Rohwer, 1917a:246 (California: Tahoe); Strickland, 1947:129 (Canada: Alberta: Edmonton); Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera); Krombein, 1956b:154 (West Virginia: Lost River State Park); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Krombein, 1979b:1603 (in catalog of North American Hymenoptera); Ratzlaff, 2016:27 (Canada: British Columbia: from Dollfuss, 1995). – **As *Pemphredon nearctica***: Dollfuss, 1989:11 (lectotype in NHMW); Dollfuss, 1995:1000 (in revision of world *Pemphredon*); Finnamore, 1997:886 (Canada: Yukon).

Pemphredon cockerelli Rohwer, 1909a:103, ♀ (actually ♂: Rohwer, 1917c:100). Holotype: ♂, USA: Colorado: Florissant (USNM). Synonymized with *Pemphredon nearctica* by R. Bohart *in* Bohart and Menke, 1976:182. – Rohwer, 1917c:100 (holotype is a ♂); Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera).

35. *oreades* Valkeila

Pemphredon oreades Valkeila *in* Merisuo and Valkeila, 1972: 12, ♀. Holotype: ♀, Pakistan: Murree: Patriata (FSAG). – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Dollfuss, 1995:1002 (in revision of world *Pemphredon*); Leclercq, 2007g:195 (holotype in FSAG).

36. *orientalis* Valkeila

Pemphredon orientalis Valkeila *in* Merisuo and Valkeila, 1972:19, ♀. Holotype: ♀, China: Guangdong: Guangzhou (USNM). – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Dollfuss, 1995:1003 (in revision of world *Pemphredon*); Q. Li and He, 1997d:300, 301 (in key to Chinese *Pemphredon*); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Bashir, L. Ma, and Q. Li, 2020b:4 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

37. *podagrica* Chevrier

Pemphredon podagrica Chevrier, 1870:268, ♀, ♂ (as *podagricus*, incorrect original termination, ♀ = *Pemphredon lugens*). Lectotype: ♂, Switzerland: Vaud: Nyon (MHNG), designated by Dollfuss, 1995:1004. – Girard, 1879:961 (description of this species recorded); Kohl, 1883e:659 (Switzerland); André, 1888:16* (as new synonym of *Pemphredon lugens*); Kohl, 1889a:28 (valid species), 1890a:55 (in review of *Pemphredon*), 1893a:38 (Austria: Niederösterreich); Dalla Torre, 1897:359 (in catalog of world Hymenoptera); Schmiedeknecht, 1907:207, 208 (in key to Hymenoptera of Central Europe); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Kohl, 1912a:63 (Austria: Tirol: Innsbruck); Schmiedeknecht, 1930:668, 669 (in keys to Hymenoptera of North and Central Europe); Zavadil, Šustera, and Bat'a, 1937:178 (in catalog of Sphecidae of Czechoslovakia); Kuntze and Noskiewicz, 1938:377 (in Poland known only from Podole region, now Ukraine); Blüthgen, 1944:29 (Germany: Kaiserstuhl, Naumburg); Leininger, 1951:117 (as first record from Germany: Baden-Württemberg: Kaiserstuhl), 1953:20 (Germany: Baden-Württemberg: Karlsruhe); Aerts, 1955:60 (Germany: Rheinland); Wolf, 1959b:26 (known from Germany, but not from

Nassau); Babiy, 1964:115 (Austria: Land Salzburg); de Beaumont, 1964c:102 (in Sphecid Fauna of Switzerland); B. Klug, 1965:134 (Germany: Baden-Württemberg: Freiburg im Breisgau area, as first record from Germany); Gauss, 1966a:66 (Germany: Baden-Württemberg: Witental), 1967:555 (Germany: Baden-Württemberg); Oehlke, 1970:739 (German Democratic Republic); Kofler, 1972:110 (Austria: eastern Tirol); Valkeila and Leclercq, 1972:705 (Austria: Wien); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Eck, 1976:92 (German Democratic Republic); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Westrich and Schmidt, 1985a:117 (Germany: Baden-Würtemberg); Schwammberger and Priesner, 1990:536 (Austria: Kärtnen); Jansen and Kaluza, 1995:8 (Germany: endangered in Sachsen); Schmid-Egger, 2000b:276 (Germany: Baden-Württemberg: shores of Rhine River); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Suda, 2004:37 (Japan: Yamanashi Prefecture); Rudoiskatel', 2011d:241 (Russia: central Ural Mountains). – **As *Pemphredon podagrica***: Schmidt, 1984:251 (Germany: Baden-Württemberg); Jacobs and Oehlke, 1990:123 (population regress in German Democratic Republic after 1960), 150 (new record from German Democratic Republic); Day, 1991:xviii (in summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:62 (in key to Sphecidae of North and Central Europe), 1994:100 (endangered in Austria), 1995:19004 (in revision of world *Pemphredon*); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna); Schmid-Egger, Risch, and Niehuis, 1995:204 (summary of records from Germany: Rheinland-Pfalz); Gusenleitner, 1996a:6 (Austria: Steiermark: Graz); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: not endangered); Schmidt and Schmid-Egger, 1997:25 (in checklist of German Sphecidae); Schmidt and Schmid-Egger, 1997:19 (in checklist of German Sphecidae); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Pauly, 1999:108 (Luxemburg; likely to be found in Belgium); M. Schwarz, 1999:85 (Austria: Oberösterreich: city of Linz area); Blösch, 2000:178 (in Sphecid Fauna of Germany); Dollfuss, 2001:272 (miscellaneous locality records); Dollfuss and Bitsch *in* Bitsch et al., 2001:85 (in Sphecid Fauna of Western Europe); Feitz, Schneider, and Pauly, 2001:132 (Luxemburg: Remich); Ohl et al., 2001:141 (distribution in Germany by provinces); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: probably endangered); Wiśniowski, 2003:191 (in Poland known only from Pieniny Mountains); Wiśniowski and Werstak, 2003:77 (first record from Poland: Pieniny National Park); Dollfuss, 2004a:118 (Czech Republic: Chlum near Třeboň); Haneda, Nosaka, Tano, Kurokawa, and Murota, 2004:32 (Japan: Gifu Prefecture); Salzmann-Wandeler and Rezbanyai-Reser, 2004:27 (central Switzerland); Stolle et al., 2004:372 (Germany: Sachsen-Anhalt: last collected in 1946); Wiśniowski, 2004:41 and 60(in checklist of Polish Sphecidae); Burger, 2005:35 (Germany: Thüringen); Kofler, 2005:169 (Austria: Tirol: Lienz District: no new records); Lukáš and Liška, 2005:550 (first record from Slovakia: Horna Súča); Nemkov, 2005a:146 (Russia: Island of Sakhalin); Pagliano and Negrisolo, 2005:471 (in Sphecid Fauna of Italy); Reder, 2005:953 (Germany: Rheinland-Pfalz: Aufwald south of Worms); Haneda, Nozaka, Tano, Kurokawa and Murota, 2006a:21 (Japan: Toyama Prefecture); Ljubomirov, 2006:542 (Bulgaria: Rhodope Mountains: Yurukovo village); Jacobs, 2007:66, 70 (in key to Crabronidae of Germany); Nemkov, 2007c:997 (in Appendix to Key to identification of Sphecidae of Far East of Russia); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia), 216 (Bohemia: Praha, Moravia: Grygov, Slovakia: Horná Súča in Biele Karpaty Range); Nemkov, 2008b:18 (in catalog of Crabronidae of Asiatic Russia), 2009b:67 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Shorenko and Konovalov, 2010:26 (Ukraine: Lugansk Oblast': village D'yakovo); van der Smissen, 2010a:349 (Germany: Schleswig-Holstein: Müggenbach/Gemünda); Burger, 2011a:288 (Germany: in red list of Sphecidae *sensu lato* of Thüringen); Boillat, 2012:228 (Switzerland: in checklist of insects of Canton de Genève); Nemkov, 2012c:437 (in catalog of Crabronidae of Russian Far East); Terayama, 2012:5 (in key to Pemphredonini of Japan), 14 (description), 19 (in checklist of Pemphredonini of Japan); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); U. Frommer, 2014:28 (Germany: Hessen: Lorch); Stolle and Saure, 2016:924 (Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Mokrousov, 2017e:249 (in catalog

of Pemphredoninae of Russia); Carminati, Mora, and Cretin, 2019:23 (France: in list of Sphecidae *sensu lato* of Franche-Comté); Herb and Schmid-Egger, 2021:9 (Germany: Bayern: Kaufbeuren area); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:121 (in revision of Sphecidae *sensu lato* of Europe); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen University Botanicafrugiferl Garden).

Pemphredon laeviceps Gussakovskij, 1932:7, ♀. Holotype: ♀, Russia: Primorskiy Kray: Tigrovaya (Stockholm). Synonymized with *Pemphredon podagrica* by Dollfuss, 1995:1004. – Tsuneki, 1951a:170, 171 (in key to *Pemphredon* of Japan and adjacent regions; possibly a synonym of *Pemphredon podagricus*), 176 (in revision of *Pemphredon* of Japan and adjacent regions), 1952a:66 (nesting habits); Haneda, 1964a:39 (Japan: Fukui Prefecture); Tsuneki, 1964e:28, 29 (in key to *Pemphredon* of Japan), 1970b:10 (central Japan); Nambu, 1972e:90 (Japan: Saitama Prefecture), 1973a:151 (Japan: Saitama Prefecture), 1975b:65 (Japan: Saitama Prefecture); Kazenas, 1980e:86 (Russia: ***Primorskiy Kray); Budrys in Nemkov, Kazenas, Budrys***, et Antropov, 1995:400, 401 (in key to Sphecidae of Russian Far East).

38. *pulawskii* Dollfuss

Pemphredon pulawskii Dollfuss, 1993b:696, ♀, ♂. Holotype: ♀, USA: Virginia: Fairfax County: near Annandale (USNM). – Dollfuss, 1995:1006 (in revision of world *Pemphredon*); Buck, 2004:25 (Canada: in checklist of Sphecidae of Ontario).

39. *rileyi* W. Fox

Pemphredon rileyi W. Fox, 1892h:310, ♀, ♂. Syntypes: ♀, USA: California: Monterey, Placer, and San Mateo Counties: no specific locality (USNM). – Dalla Torre, 1897:359 (in catalog of world Hymenoptera); Ashmead, 1899d:223 (in checklist of North American Crabronidae); Rohwer, 1917c:100 (in revision of North American *Pemphredon*); Carter, 1925:132 (Canada: Alberta: Waterton); Strickland, 1947:129 (Canada: Alberta: Waterton); Krombein *in* Muesebeck, Krombein and Townes, 1951:965 (in catalog of North American Hymenoptera); Evans, 1970:487 (Wyoming: Jackson Hole); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Krombein, 1979b:1603 (in catalog of North American Hymenoptera); Dollfuss, 1995:1007 (in revision of world *Pemphredon*); Ratzlaff, 2016:27 (Canada: British Columbia: from Dollfuss, 1995).

40. *rugidorsalis* Bashir and L. Ma

Pemphredon rugidorsalis Bashir and L. Ma *in* Bashir, L. Ma, and Q. Li, 2020b:7 (authorship given in Abstract and Captions for Figures 1-3). Holotype: ♀, China: Ningxia: Guyuan: Liupanshan: Laolongtan Forest Farm at 35°23'N 106°20'E (Yunnan Agricultural University, Kunming, Yunnan, China). Paratypes: China: Gansu, Hebei, and Henan provinces. – Bashir, L. Ma, and Q. Li, 2020b:5 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

41. *rugifer* (Dahlbom)

Sphex unicolor Panzer, 1798:Heft 52:24, [♀] (as *Crabro unicolor* in the legend for illustration), junior primary homonym of *Sphex unicolor* Fabricius, 1787. Holotype: ♀, Germany: Norimbergae = Nürnberg (depository ?). Synonymized with *Pemphredon lugubris* (Fabricius, 1793) by Panzer, 1806:187 and with *Pemphredon rugifer* by Dahlbom, 1844:256. – Peets, 1909-1911:67 (*Sphex unicolor*of Panzer = *Pemphredon lugubris*); Blüthgen, 1931a:121 (identity of species = *Pemphredon rugifer*). – **As *Chevrieria unicolor***: C. Verhoeff, 1891b:12 (new combination, nesting habits), 1892b:362 (male cocoons are closer to nest entrance), 364 (nest may include progeny of one sex only), 1892c:730 (nesting habits); 1893:415 (description of pupa); Höppner, 1904:168 (nest parasite: *Eurytoma rubicola* Gir.), 1908:177 (mixed nest of *Chevrieria unicolor* and of *Trypoxylon figulus*), 179 (mixed nest of *Chevrieria unicolor* and of *Trypoxylon attenuatum*). – **As *Cemonus unicolor***: – Panzer, 1806:187 (new combination, in critical review of his previous work); nec Jurine, 1807:214 pl. 11, Fig. 25 (= *Pemphredon lugubris*); Billberg, 1820:106 (specimens from

Germany in collection Billberg); Shuckard, 1837a:200 (in revision of British Aculeata); von Siebold, 1839:51 (Germany: Danzig, now Poland: Gdańsk); Dahlbom, 1842a:12 (in review of Scandinavian aculeates), 1844:255 (in revision of Sphecidae and Pompilidae), 1845:507 (in key to European *Cemonus*); Lepeletier de Saint Fargeau, 1845:94 (in revision of world Hymenoptera); Eversmann, 1849:413 (Russia: Ural Mountains to Volga area); von Kiesenwetter, 1849:90 (Germany: Kingdom of Saxony: Oberlausitz area); F. Smith, 1849b:2551 (nesting in bramble twigs, preying on caterpillars, obviously in error); Wissmann, 1849:14 (Germany: Kingdom of Hannover: Hannover, Münden); Tischbein, 1850:6, 9 (Germany: Rheinland-Pfalz: Herrstein in Fürstenthum Birkenfeld); F. Smith, 1851c:35 (Great Britain: no specific locality); Wesmael, 1852:282 (Belgium); Belke, 1853:433 (Ukraine: Kamieniec Podolski); Kirschbaum, 1853:47 (Germany: Herzogtum Nassau: Dillenburg and Wiesbaden); F. Smith, 1853:65 (in checklist of British Hymenoptera); Kirchner, 1854:312 (Czechoslovakia: Kaplitz in Budweiser District, now České Budějovice; as *unicolor* Dahlbom); F. Smith, 1856:433 (in catalog of Hymenoptera in British Museum, as *unicolor* Latreille); Kawall, 1857:25 (Kurland, now Latvia); Ruthe and Stein, 1857:315 (Germany: Berlin area); Schenck, 1857:134 (Germany: in revision of fossorial wasps of Nassau Region); F. Smith, 1858c:178 (in review of British Aculeata, redescription); Goureau, 1858:XL (nesting in dry stems of *Rubus*); F. Smith, 1865b:86 (Great Britain: Dorset County: Bournemouth); Jaennicke, 1868:8 (Germany: Hessen: Schwanheim); Taschenberg, 1858:92 (in key to Sphecidae of Germany; as *unicolor* F.); Funk, 1859:58 (Germany: Bayern: Bamberg); Schenck, 1860:147 (Germany: Nassau Region); Brischke, 1862:104 (Germany: Preussen Province, now Poland: Pomorze Region, as *unicolor* Fbr.); Brown, 1863:181 (Great Britain: Burton-on-Trent; as *unicolor* Jurine); A. Costa, 1863:66 (Italy: Calabria Ulteriore: no specific locality); Siła-Nowicki, 1864:54 (Ukraine: L'viv), 1865:54 (western Ukraine: Galicia region: no specific locality); Giraud, 1866:471 (nesting habits); Taschenberg, 1866:185 (in revision of Hymenoptera of Germany); A. Costa, 1867c:110 (in revision of Italian Sphecidae); Kirchner, 1867:222 (in catalog of European Hymenoptera); Dietrich, 1868:363 (Switzerland: Zurich Canton); Wierzejski, 1868:117 (Poland: Kraków area; and Ukraine: L'viv and Podole Region; common; as *unicolor* Fabr.); von Aichinger, 1870:315; as *unicolor*, Fabr., Jur.); Bold, 1870:151 (Great Britain: Northumberland and Durham); A. Costa, 1871b:39 (in revision of Italian Sphecidae); F. Smith, 1871b:18 (in catalog of British Aculeata); P. Ivanov, 1872:152 (Ukraine: Khar'kov Oblast': Kupyansk area; as *unicolor* Lep.), Schlechtendal, 1872:36 (Germany: Sachsen: Zwickau; as *unicolor* Fb.); Dours, 1874:150 (in catalog of Hymenoptera of France); Laboulbène, 1874:CXXVIII (nesting in twigs of *Rosa canina*); Lichtenstein, 1874:CLII (nesting in twigs, preying on apids, prepupa yellow); Mocsáry, 1874:120 (Siebenbürgen, now Romania: Transylvania: no specific locality, as *unicolor* Fabr.); Wierzejski, 1874:260 (Poland: Kraków; Ukraine: Podole Region; as *unicolor* Fabr.); Laboulbène, 1875:303 (damage to wild rose stems used as understock for grafts); Marquet, 1875:209 (France: Haute-Garonne: Toulouse); Taschenberg, 1875:387 Germany: Halle); Frivaldszky, 1876:356 (Hungary: Temes Komitat: Grebenácz, now in Timiş District in Romania; as *unicolor* Jur.); Radoszkowski, 1877:66 (Uzbekistan: Sokh River); Daly, 1878:47 (Great Britain: Dorset: Glanville's Wootton); Roebuck, 1878:48 (Great Britain: recorded from Yorkshire county: Wakefield, by F. Smith, 1858); Beuthin, 1879:240 (Germany: Hamburg area); Becker, 1880:151 (Russia: Sarepta, now Krasnoarmeysk S Volgograd); Kohl, 1880:135 (Austria: Tirol, and Italy: Trentino–Alto Adige); Magretti, 1881:121 (Italy: Lombardia), 271 (in list of species discussed in this paper); Marquet, 1881:183 (southern France); Yaroshevskiy, 1881:123 (Ukraine: Khar'kiv Oblast': Khar'kiv area, Kupyansk); A. Costa, 1882b:23 (Italy: Sardegna; as *unicolor* Fabr.); Fabre, 1882:227 (nesting in bramble stems); Magretti, 1882a:383 (Italy: Pisa Province: Lavaiano, as *unicolor* Fab.); A. Costa, 1883:58 (Italy: Sardegna: Porto Torres, as *unicolor* Fab.); Friese, 1883:201 (Germany: Sachsen-Anhalt: Weissenfels); Magretti, 1884b:106 (Italy: Firenze area; as *unicolor* Fabricius); De Stefani Perez, 1886:171 (Italy: Sicilia: monte di Renda near Palermo, as *unicolor* Tur.); Wüstnei, 1886:38 (Germany: Schleswig-Holstein: Blankenese, Sonderburg, as *unicolor* Fabr.); Ed. André, 1888:195 (in revision of Sphecidae of Europe and Algeria), 14* (bibliographic references); Brischke, 1888b:99 (Germany: Preussen Province, now Poland: Pomorze Region, as *unnicolor* Fbr.); Cuní y Martorell, 1888:164 (Spain: Barcelona); Riggio and De Stefani-Perez, 1888:149 (Italy: Island of Ustica); Kohl, 1889a:28 (*Cemonus unicolor* of André, 1888, includes *lethifer*, *shuckardi*, and *wesmaeli*); Brogniart, 1890 (nesting in galls of

Lipara lucens); Laboulbène, 1890:CV (nesting in twigs of *Rosa canina*); Radoszkowski, 1892:588 (male genitalia, as *unicolor* Latr.); Baldini, 1894:52 (Italy: Modena area; as *unicolor* Fabricius); De Stefani Perez, 1894:216 (Italy: Sicilia; as *unicolor* Jurine); Medina, 1894a:260 (Spain: Sevilla, Huévar, Pozuelo de Calatrava); Pérez, 1894:232 (nest parasite: ichneumonid *Ephialtes marginellus* Gravenhorst); De Stefani Perez, 1895:227 (in catalog of Sicilian Hymenoptera, as *unicolor* Fabr.); Meunier, 1896:271 (Belgium: Bruxelles area); Acloque, 1897:85 (in Sphecid Fauna of France and Algeria); Cuní y Martorell, 1897:331 (Spain: Cataluña: villa de Calella); Flamary, 1898:38 (France: Saône-et-Loire: Mâcon area); J. Nielsen, 1901a:270 (nesting habits); N. Arnold, 1902:88 (Russia: Mohilev Province, now Belorussia); Chyzer, 1902:33 (Hungary); de Cobelli, 1903:106 (Italy: Province of Trentino, as *nicolor* Fabricius); W. Wagner, 1907:131 (nesting in old galls of *Lipara lucens* Meigen, Chloropidae);de Gaulle, 1908:103 (in catalog of French Hymenoptera, as *unicolor* F.); Mantero, 1911:71 (Italy: Sardegna: Isola dell'Asinara); Rudow, 1912:66 (nesting in galls caused by *Lipara lucens* Meigen on *Phragmites*, as *unicolor* Fbr.); Chevalier, 1922:46 (nest parasite: *Pachyophtalmus signatus* (Meigen), a calliphorid, as *unicolor* F.); Coulon, 1925:113 (France, Morocco: Tanger); Bouwman, 1926:279 (in list of Sphecidae of Netherlands, as *unicolor* Fabricius); Dusmet y Alonso, 1927:25 (Spain: Cataluña: Tarragona, as *unicolor* F.); Benoist, 1928:410 (France: Hautes-Alpes: col du Lautaret); Maréchal, 1929c:39 (Belgium: Pepinster, description of nest in bramble twig); Bischoff, 1931:8 (Spain, as *unicolor* F.); Grandi, 1931:48 (*Cemonus* should be recognized as genus); Bondroit, 1932:36 (Belgium: common in Bruxelles area); Giordani Soika, 1933a:213 (coloration of nymph; as *unicolor* F.); Marchand and Dulac, 1935:61 (France: Saône-et-Loire: Saint Laurent d'Andenay, as *unicolor* Fabricius); Benoist, Berland, and Blüthgen, 1936:10 (Azores); Giordani Soika, 1939b:74 (Italy: Venezia); Balthasar, 1948:141 (Slovakia: Kovačov, Parkan); Cleu, 1953:50 (France: Ardèche River basin; as *unicolor* F.); Hüsing and Jäger, 1964:192 (Germany: Sachsen-Anhalt: Nietleben near Halle), 197 (visiting flowers of umbellifers, nesting in wood of cherry trees); Levi, Sysoletina, and Shernin, 1974:269 (Russia: Kirov Oblast': Klimkovka, as *unicolor* F.); Casolari and Casolari Moreno, 1980:119 (specimens in M. Spinola collection); Kowalczyk, 1991a:89, 93 (Poland: Łódź); Pagliano, 2011a:158, 159 (specimens in collection Spinola, Torino, are *Pemphredon rugifer*). – **As *Dineurus unicolor***: Blüthgen, 1937:235 (new combination, Germany: Saale River valley); Struve, 1937:149 (Germany: Island of Borkum); Guiglia, 1948c:202 (Italy: Sardegna: Cagliari). – **As *Diphlebus unicolor***: Schirmer, 1912:166 (new combination, Germany: Berlin area, as *unicolor* F.); A. Wagner, 1918:139 (study of Fabricius's specimen); nec A. Wagner, 1918:141, 142 (= *Pemphredon lethifer*); Dubois, 1919:96 (Belgium: Bruxelles: Uccle); Fahringer, 1922:175 (Turkey); F. Werner, 1927:66 (Austria: Niederösterreich: River Kamp valley, determination tentative); Harttig, 1930a:231 (in revision of European *Cemonus*); Giordani Soika, 1944:8 (Italy: Sicilia: Fiumetorto; as *unicolor* F.); Głowacki, 1953:519 (Poland: Podkowa Leśna near Warszawa; as *unicolor* F.); Hamann, 1960:199 (Austria: Oberösterreich: Mönchgraben at 48°13'N 14°21'E). – **As *Pemphredon unicolor***: Spinola, 1806:106 (new combination, as new synonym of *Pemphredon lugubris* Fabricius, 1793), 1808:175 (diagnostic characters); Latreille, 1825:48 (in review of genus); Guérin-Méneville, 1828a:170 (in Dictionnaire classique d'histoire naturelle); Stephens, 1829a:366 (in catalog of British insects), 1829b:34 (in checklist of British insects); Vander Linden, 1829:85 (bibliographic references, redescription, Belgium: Bruxelles, France: Paris, Italy: Genova); Haliday, 1833:516 (Ireland: eastern coast N Dublin); Shuckard, 1936:57 (preying on aphids); Curtis, 1837:pl.632 (illustration of habitus); Zetterstedt, 1838:441 (in revision of insects of Lapland); Dufour and Perris, 1840:36 (is a nest parasite of *Trypoxylon* and of *Osmia parvula*); Herrich-Schaeffer, 1840:291 (Germany: Bayern: Regensburg area); Dufour, 1841b:243 (digestive tract), 244 (male reproductive system), 245 (female reproductive system); Schenck, 1867a:353 (Germany: Nassau Region); Thomson, 1870:233 (in revision of Swedish wasps, as *unicolor* Fabricius), 1874:188 (in revision of Hymenoptera of Scandinavia); E. Saunders, 1880:260 (in revision of British Aculeata); Siebke, 1880:62 (Norway); Kohl, 1883e:658 (Switzerland); Sickmann, 1883:76 (Germany: Niedersachsen: Wellingholthausen); Harwood, 1884:211 (Great Britain: Essex: Colchester area); Sickmann, 1886:280 (Germany: Friesian Islands: Island of Spiekeroog); Gasperini, 1887:14 (Croatia: Split, Island of Lesina, now Hvar); von Dalla Torre, 1889:47 (Germany: islands of Helgoland and Spiekerooge); Kohl, 1890a:56 (in review of *Pemphredon*); V. Perkins, 1892:202 (Great Britain: Gloucestershire: Wotton-under-Edge); Westerlund, 1893:25 (Russia:

Karelian Republic: northern shore of Lake Ladoga); Schletterer, 1894:31 (Istria Peninsula, now part of Croatia, Slovenia, and Italy); Borries, 1897:94 (nesting habits); Dalla Torre, 1897:360 (in catalog of world Hymenoptera); Mocsáry, 1897:78 (Kingdom of Hungary, some localities are in today's Croatia, Romania, and Slovakia); Strand, 1898b:92 (Norway; as *unicolor* Latr.); Baer, 1901:161 (description of nest, prey); Friese, 1902:477 (in Lapland according to Zetterstedt, 1838); Antiga and Bofill, 1904:7 (Spain: Cataluña Province); Aurivillius, 1904:260 (in revision of Swedish Sphecidae, *shuckardi* regarded as synonym); Zilahi Kiss, 1904:77 (Hungary: Tasnád, as *unicolor* Fabr.); Kubes, 1905:83 (Czech Republic: Kolín); Mantero, 1905:66 (Italy: Toscana: Isola del Giglio); von Heyden, 1905:82 (Germany: Hessen: Frankfkurt; as *unicolor* Latr.); Adlerz, 1906:39 (Sweden; nesting habits; as *unicolor* Fab.); Graeffe, 1906:456 (Tunisia: Tunis area, as *unicolor* F.); Móczár and Henter, 1907:205 (Romania: Caraş-Severin: Mehadia); Cavro, 1910:684 (France: Département du Nord); Zavattari, 1910:3 (Italy: Isola d'Elba: Portoferraio); Dittrich, 1911b:21 (Germany: Niederschlesien Province, now Poland: Dolny Śląsk Region); Graeffe, 1911:50 (Italy: Trieste area, as *unicolor* Fabricius); Zavattari, 1911:3 (Italy: Piemonte: Valle del Maira), 1913b:3 (Greece: Island of Rhodes); Alfken, 1914:277 (northwestern Germany); Szilády, 1914:89 (Hungary: Hadrév, Miroszló, Nagyenyed, Tövis); A. Wagner, 1920:42 (Germany: Lower Elbe region); Dubois, 1922:195 (in key to Belgian Sphecidae); Jansson, 1922:23 (Sweden: Island of Öland); Maidl, 1922:66 (Croatia, Montenegro); Lundblad, 1924:21 (Sweden: Lappland: Lycksele; as *unicolor* Fabr.); Maréchal, 1924:6 (Belgium: Chaudfontaine; as *unicolor* Fabr.); Berland, 1925d:139 (in Sphecid Fauna of France); Schütze, 1925:111 (Germany: Lausitz Region); Berland, 1928b:178 (add Höppner, 1908 to bibliography in Berland, 1925d); Bouwman, 1928b:182 (in revision of Sphecidae of Netherlands); Gaunitz, 1929:199 (Sweden: Lapland); Grandi, 1929:274 (description of larva, identification tentative), 1929:288 (Italy: Toscana: common in Valle della Limentra); Grandi, 1930:331 (reference to Micheli, 1930, his own identification of 1929 confirmed); Micheli, 1930:60 (nesting habits, description of larva); Schmiedeknecht, 1930:670 (in keys to Hymenoptera of North and Central Europe); Giordani Soika, 1932a:22 (Italy: Lido di Venezia; as *unicolor* F.); A. Wagner, 1932:223 (in revision of European *Pemphredon* subgenus *Dineurus*); Dulac, 1933a:38 (France: Saône-et-Loire: Savianges); E. Nielsen, 1933:317 (summary of nesting habits); Balles, 1934:18 (Germany: Baden-Württemberg: Achern, Oberachern); Giner Marí, 1934:135 (Spain); Grandi, 1934:36 (identification of 1929 confirmed; as *unicolor* F.); Jansson, 1934:289 (Sweden, as *unicolor* F.); Bernard, 1935:66 (France: Var: Fréjus area; as *unicolor* F.); Grandi, 1935a:109 (Italy); Vergne, 1935:119 (France: Auvergne: common); Crèvecoeur and Maréchal, 1936:250 (in catalog of Belgian Hymenoptera); Diakonoff, 1936:241 (reared from galls of *Lipara lucens* Linnaeus); Dulac, 1937:15 (France: Saône-et-Loire: Saint-Laurent d'Andenay, Savianges); Goebel, 1937:40 (Poland: Poznań District: Spławie); Zavadil, Šustera, and Bat'a, 1937:178 (in catalog of Sphecidae of Czechoslovakia); Móczár, 1938c:81 (Hungary: Kőszeg Hills); A. Wagner, 1938a:119 (northwestern Germany); Móczár, 1939:5 (Hungary: Jászberény); Paul, 1941:40 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area); Balthasar, 1943:41 (Czech Republic: Moravia: Zlin area); Giner Marí, 1943:45 (in Sphecid Fauna of Spain); Hardouin, 1943:46 (nesting habits); Šnoflák, 1944a:143 (Czech Republic: serpentine steppe near Mohelno); Deleurance, 1946b:67 (France: Bouche-du-Rhône: Camargue: Bois des Rièges); Piet, 1947:508 (surviving inundation because of gall nesting); Šnoflák *in* Zavadil and Šnoflák, 1948:53, 54 (in key to Sphecidae of Czechoslovakia); Tsuneki, 1948d:52 (nesting habits); de Andrade, 1949:3 (Portugal; as *unicolor* Fab.); Georgel, 1950:64 (France: Seine-et-Oise: Sucy-en-Brie); Tsuneki, 1951a:189, 190 (in key to *Pemphredon* of Japan and adjacent regions); Caruel, 1952b:101 (France: Marne Department; as *unicolor* F.); Tsuneki, 1952a:69 (nesting habits); Nouvel and Ribaut, 1953:180 (France: Hautes-Pyrénées: Cauterets); de Beaumont, 1954e:93 (Italy); Janvier, 1955:608 (50 aphids per cell as prey, paralyzing by thoracic constriction); Lehrer, 1955:264 (Romania: Moldova: Dealul Seaca in Iaşi District); Hertzog, 1956:182 (keeping prey by entire body with mandibles); Janvier, 1960:282 (nesting habits, description of larva); Móczár, 1953:310 (Hungary; as *unicolor* F.); Grandi, 1954:242 (Italy; as *unicolor* F.); Vogrin, 1955:39 (Yugoslavia); Bajári, 1957a:81, 83 (in key to Hungarian Sphecidae); de Beaumont, 1958c:208 (Swiss National Park); Nouvel and Ribaut, 1958:15 (France: Pyrénées-Orientales: Banyuls-sur-Mer); Scobiola-Palade, 1959:499 (Romania Constanţa Region: Mangalia); Wolf, 1959b:26 (Germany: Nassau); Noskiewicz and Puławski, 1960:45, 46 (in key to Polish

Sphecidae); Wengris, 1962:203 (Lithuania: Vilnius area); Babiy, 1964:115 (Austria: Land Salzburg); de Beaumont, 1964a:296 (variation and related taxonomic problems); Evans, 1964b:248 (reference to Janvier's 1960 description of larva); Tsuneki 1964e:29 (in key to *Pemphredon* of Japan; as *unicolor* A. Morawitz); Roberti, Frilli, and Pizzaghi, 1965:110 (Italy: Emilia-Romagna: Pianello in Piacenza Province; as *unicolor* F.); Bonelli, 1966c:219 (Italy: Trentino–Alto Adige: Fiemme); Scobiola-Palade, 1966b:392 (Romania: Tulcea District: C.A. Rosetti), 1967a:162 (Romania: Constanţa District: Mangalia); Niedl and Deneš, 1967:79 (Czech Republic: Třeboň area); Scobiola-Palade, 1967b:46 (Romania), 1968b:143 (Romania: Island of Letea in delta of Danube), 1968c:385 (Romania: Brăneşti, Budeşti, Căldăruşani, Comana, Mogoşoaia); Tumšs, 1970:73 (Latvia); Balthasar, 1972:215 (in Sphecid Fauna of Czechoslovakia); Scobiola-Palade, 1972a:149 (Romania: delta of Danube: Caraorman); Schwammberger, 1979:116 (Germany: Nordrhein-Westfalen: Gildehauser Venn Nature Reserve); Józan, 1981:305 (Hungary: Hortobágy National Park); Skibińska, 1981:357 (Poland: Warszawa-Białołęka), 1982:118, 122 (Poland: Mazovian Voivodship: Hamernia, Warszawa); Radović, 1985:64 (sting apparatus analyzed); Scobiola Palade, 1985:97 (Romania: delta of Danube); Kowalczyk, 1988a:44 (Poland: Rogów), 1988b:63 (Poland: environs of Łódź); Pawlikowski and Kruszyński, 1996:87 (Poland: Toruń Basin); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: not endangered); Woydak, 1996:25 (Germany: Westfalen: summary of distribution and nesting habits).

Sphex unicolor Panzer, 1798:Heft 52, no. 24 (different original generic combination for *Crabro unicolor*), junior primary homonym of *Sphex unicolor* Fabricius, 1787. Synonymized with *Crabro unicolor* Panzer, 1798, by von Roth von Schreckenstein, 1802:32 (first reviser).

Cenomus [*sic*] *pilosus* Gimmerthal, 1836:436, sex not stated. Nomen oblitum (Article 23.9.1). Holotype or syntypes: Liefland, now Latvia: no specific locality (lost). Neotype: ♀, Austria: Niederösterreich: Purgstall (NHMW), designated by Dollfuss, 1995:1009. Synonymized with *Pemphredon rugifer* by Dollfuss, 1885:1009. – **As *Pemphredon pilosus***: Kohl, 1890a:55 (new combination, in review of *Pemphredon*); Dalla Torre, 1897:359 (in catalog of world Hymenoptera); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae).

Cemonus rugifer Dahlbom, 1844:256 ♀, ♂, protected name (Article 23.9.1). Lectotype: ♀, Germany: Silesia: Glogavia, now Poland: Głogów (Lund), designated by Blüthgen, 1931:128. – F. Smith, 1856:433 (in catalog of Hymenoptera in British Museum); von Aichinger, 1850:316 (Austria: Tirol); Wesmael, 1852:282 (Belgium); Schenck, 1857:135 (Germany: in revision of fossorial wasps of Nassau Region); Assmuss, 1859:615 (Russia: Moscow Governorate); Funk, 1859:58 (Germany: Bayern: Bamberg); Schenck, 1860:147 (Germany: Nassau Region); Brischke, 1862:104 (Germany: Preussen Province, now Poland: Pomorze Region); A. Costa, 1867c:111 (in revision of Italian Sphecidae); Jaennicke, 1867:147 (Germany: Hessen: Frankfurt area); Kirchner, 1867:222 (in catalog of European Hymenoptera); Jaennicke, 1868:8 (Germany: Hessen: Königsbrunnen); A. Costa, 1871b:40 (in revision of Italian Sphecidae); Dours, 1874:150 (in catalog of Hymenoptera of France); Lichtenstein, 1874:CLII (nesting in twigs, preying on apids, prepupa orange); A. Costa, 1884a:33 (Italy: Sardegna), 1884b:33 (Italy: Sardegna: Scala di Giocca); Brischke, 1888a:54 (Germany: Hela Peninsula, now Poland: Hel Peninsula), 1888b:99 (Germany: Preussen Province, now Poland: Pomorze Region); Assmuss, 1892:53 (Russia: earlier record from Moscow Governorate repeated); Baldini, 1894:52 (Italy: Modena area); Engel, 1894:53 (Germany: Bahrenfeld near Hamburg); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Harttig, 1930a:231 (in revision of European *Cemonus*); Blüthgen, 1931a:123 (the specimen treated by Harttig, 1930, as type of *rugifer* is actually a *Pemphedon* s.s.); Bondroit, 1932:35 (Belgium: Jette, Solbosch, Uccle), 1934:61 (prey: *Aphis cardui* L.); Marchand and Dulac, 1935:61 (France: Saône-et-Loire: Saint Laurent d'Andenay); Richards, 1935a:165 (review of synonymy proposed by Blüthgen, 1931), 1937b:104 (in checklist of British aculeates); Aerts, 1955:61 (Germany: Rheinland); Kowalczyk, 1991a:89, 99, 101, 104 (Poland: Łódź), 1994:72 (Poland: Łagiewniki forest in Łódź).– **As *Cemonus unicolor* var. *rugifer***: J. Perkins, 1942:198 (new status, Sweden: Degaberga). – **As *Pemphredon unicolor* var. *rugifer***: Kohl, 1880:136 (new combination, Austria: Tirol, and Italy: Trentino–Alto Adige); Sickmann, 1883:77 (Germany: Niedersachsen: Wellingholthausen). – **As *Diphlebus rugifer***: A. Wagner, 1918:140, 142 (new combination, in key to subgenus *Diphlebus*),

142 (is perhaps only a variety of *Diphlebus wesmaeli*); Dubois, 1919:96 (Belgium: Bruxelles: Uccle). – **As *Pemphredon rugifer***: Schenck, 1867a:353 (new combination, full species status, Germany: Nassau Region); Kohl, 1890a:55 (in review of *Pemphredon*); Dalla Torre, 1897:359 (in catalog of world Hymenoptera); Aurivillius, 1904:260 (in revision of Swedish Sphecidae); Dittrich, 1911b:21 (Germany: Niederschlesien Province, now Poland: Dolny Śląsk Region); Lundblad, 1913:212 (Sweden); A. Wagner, 1920:42 (Germany: Lower Elbe region); Dubois, 1922:194, 195 (in key to Belgian Sphecidae); Lundblad, 1924:22 (Sweden: Lappland: Lycksele); Berland, 1925d:140 (in Sphecid Fauna of France); Schütze, 1925:111 (Germany: Lausitz Region); Dusmet y Alonso, 1927:25 (Spain: Cataluña: Poblet); R. Perkins, 1929:54 (in key to British *Pemphredon*); Schmiedeknecht, 1930:669, 670 (in keys to Hymenoptera of North and Central Europe); Pulkkinen, 1931:88 (in revision of Sphecidae of Finland, not yet found in Finland); Jansson, 1934:289 (Sweden); Grandi, 1935a:109 (Italy); Dulac, 1937:16 (France: Saône-et-Loire: Saint-Laurent d'Andenay); Móczár, 1938a:162 (Hungary: Jászbéreny); Giner Marí, 1943:46 (in Sphecid Fauna of Spain); Carl and de Beaumont, 1947:68 (Switzerland: Graubünden = Grisons Canton: Swiss National Park); Leclercq, 1948:205 (*Cemonus rugifer* is the correct name, not *unicolor*); Ceballos, 1949:101 (Spain, as *rugifex*); Aerts, 1950a:51 (Germany: Nordrhein-Westfalen: Rheidter Wertchens near Köln); Cavro, 1950:32 (France: Département du Nord); de Beaumont, 1950f:410 (Algeria), 1951h:34 (Switzerland: Neuchâtel area); Koornneef, 1951:247 (Netherlands: Rhenen); Caruel, 1953:101 (France: Marne Department); Leclercq, 1953a:246 (Belgium: prey and locality records); de Beaumont, 1954e:93 (Italy: Alto Adige: Appiano, Prags; Toscana: Livorno); Grandi, 1954:242 (Italy); Hellén, 1955a:123 (valid name for the species, Finland: north to Jakobstad); Steiner, 1955:143 (France: Dordogne); Vogrin, 1955:39 (Yugoslavia); Ceballos, 1956:357 (in catalog of Hymenoptera of Spain); Benno, 1957:144 (Netherlands: Tilburg area, nesting in stems of *Rubus*); Grandi, 1957:390 (Italy: Abruzzi); Zirngiebl, 1957:179 (Germany: Rheinland-Pfalz: Birkenheide, Leistadt); Benno, 1958b:12 (in review of Dutch Sphecidae); de Beaumont, 1958c:208 (Swiss National Park); Evans, 1958c:130 (larval description by Grandi, 1929); de Beaumont, 1959a:31 (Italy); Grandi, 1961:520 (description of larva); Hoop, 1961:64 (Germany: Schleswig-Holstein: Eggstedt, Kiel, Rosenkranz); Janvier, 1961a:11 (nesting habits, description of larva); de Beaumont, 1962b:27 (Spain: Madrid: Manzanares Real); Valkeila, 1962b:67 (southwestern Finland); Valkeila, Brander, and Käpylä, 1963:41 (Finland: historical region Lounais-Hämeen = southwest Häme); de Beaumont, 1964c:103 (in Sphecid Fauna of Switzerland); Evans, 1964b:249 (reference to Janvier's 1961 description of larva); de Beaumont, 1965a:57 (Greece); Benno, 1967:37 (in checklist of Sphecidae of Netherlands); de Beaumont, 1967a:342 (Turkey); Gauss, 1967:556 (Germany: Baden-Württemberg); J. Heinrich, 1967:77 (Germany: Niederfranken); Benedek, 1968:74 (Hungary, visiting flowers of *Angelica silvestris* L. and *Pastinaca sativa* L.); Leclercq, 1968d:109 (Belgium: city of Liège); Lefeber, 1968b:95 (Netherlands: Kannerbos, Sint Pietersberg); Parré, 1968:123 (Germany: Sachsen-Anhalt: Staβfurt); Benedek, 1969a:84 (Hungary; marshy meadow); Wolf, 1968:12 (Germany: Nordrhein-Westfalen: Siegen, inhabitant of forest edge); Lefeber, 1969b:99 (Netherlands: Sint Pietersberg), 1969c:233 (Netherlands: Sint Pietersberg = Montagne Saint Pierre); Zangheri, 1969:1705 (Italy: in catalog of flora and fauna of Romagna Region); Benedek, 1970:100 (Hungary: Tapolca); Gauss and Perraudin, 1970:360 (Germany: Baden-Württemberg: Bodensee area); Oehlke, 1970:740 (German Democratic Republic); Valkeila and Leclercq, 1970:map172 (distribution in Belgium); Lefeber, 1971b:223 (Belgium: Eben, Gellik); Schmidt, 1971b:41 (Germany: Rheinland-Pfalz: Gonsenheimer Wald, Mainzer Sand); Stritt, 1971a:105 (Germany: Baden-Württemberg: Karlsruhe); Torossian, 1971:147 (France: Toulouse area; nesting in oak galls); Haeseler, 1972:156 (Germany: Schleswig-Holstein; anthropogenic habitats); Kofler, 1972:110 (Austria: eastern Tirol); Simon Thomas, 1972:184 (France: Gironde); Valkeila and Leclercq, 1972:700, 701 (in key to European *Pemphredon* of *rugifer* group), 705 (locality records); Lefeber, 1974:76 (Netherlands: Sint-Pietersberg); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Kolesnikov, 1977:319 (Russia: Bryansk Oblast'); Guichard, 1978:271 (Greece); Pulawski, 1978:242, 244 (in key to Sphecidae of European part of USSR); Schwammberger, 1978:418 (Germany: Württemberg); Benedek, 1979:233 (Hungary: Bakony Hills); Marchal and Leclercq, 1979:9 (Belgium: Gembloux); Schmidt, 1979a:55 (Germany: Ost-Holstein); Dathe, 1980:209 (Russia: northern Caucasus: Teberda); Kazenas, 1980e:85 (Russia: Far East); Pagliano, 1980:131 (Italy:

Piemonte); Westrich, 1980:631 (Germany: Baden-Württemberg: Tübingen area); Woydak, 1981:37 (Germany: Westfalen: Hamm); Leclercq, 1982a:124 (Belgium: Liège); Dollfuss, 1983b:6 (in catalog of Sphecidae of Austria); Józan, 1985b:56 (Hungary south of Lake Balaton), 77 (floral records), 83 (ecological and zoogeographic characteristics); Lefeber, 1985:87 (Netherlands: southern Limburg); Gayubo, 1986c:31 (Spain: Zamora Province); Nemkov, 1986:95 (Russia: Siberia: Irkutsk Oblast'); Karsai, 1988:99 (Hungary: Kiskunság National Park); Borsato, 1989:201 (Italy: Lombardia: Busatello marsh); Józan, 1989:101 (Hungary: Tihany Nature Reserve); Pádr *in* Šedivy, 1989a:168 (in checklist of Czechoslovakian Sphecidae); Pankevich, Belyavskaya, Molchanova, Shlyakhtenok, and Blinov, 1989:96 (Belorussia: Berezinskiy Nature Reserve); Gayubo, Asís, and Tormos, 1990a:14 (Spain); Pádr, 1990:79 (Czech Republic: Praha area); Kowalczyk, 1990:290 (Poland: Góry Świętokrzyskie); Pagliano, 1990:117 (in catalog of Italian Sphecidae); Day, 1991:xviii (in summary of European Endangered Hymenoptera ListsBudrys, 1992:25p (in list of Sphecidae of Lithuania); Delarze, 1992:68 (Switzerland: Valais: Les Follatères); Józan, 1992b:172 (Hungary: Boronka-melléki Protected Area), 1992c:289 (Hungary: Zselic Hills); Józan, 1995:104 (Hungary: projected Duna-Dráva National Park); Dollfuss, 1995:1009 (in revision of world Pemphredon); Schmidt, Schmid-Egger, and Doczkal, 1995:8 (relationship to *Pemphredon lethifer*, *enslini*, *wesmaeli*, and *mortifer* is unclear); Strumia, 1996a:248 (nest parasite: *Pseudomalus triangulifer* Abeille, Chrysididae); Celary, 1997:57 (in checklist of Animals of Poland); Esenbekova, 1997:143 (preying on aphids in southeastern Kazakhstan); Li and He, 1997d:300, 301 (in key to Chinese *Pemphredon*); K. Schmidt and Schmid-Egger, 1997:25 (in checklist of German Sphecidae); Shlyakhtenok, Blinov, and Belyavskaya, 1997:153 (Belorussia: Pripyatskiy National Park); Stoyanov and Ljubomirov, 1997:26 (Bulgaria: Rila Mountains); F. Burger, Saure, and Oehlke, 1998:29 (Germany: in list of Sphecidae of Brandenburg); Celary, 1998b:210 (Poland: Babia Góra National Park); Dollfuss, Gusenleitner, and Bregant, 1998:512 (Austria: summary of collecting records from Burgenland); Flügel, 1998:60 (Germany: Brandenburg: Unteres Odertal National Park); Salzmann-Wandeler, 1998b:102 (Switzerland: Schwyz Canton: Gersau-Oberholz); van der Smissen, 1998:66 (Germany: Schleswig-Holstein); K. Weber, 1998:147 (Germany: Bayern: Bamberg area); Erhardt, 1999:75 (Germany: Niedersachsen: Ammerland area); Gusenleitner, 1999:598 (Austria: Vorarlberg: Tufers south of Rankweil); Ljubomirov, 1999b:47 (Bulgaria: Mount Vitosha near Sofia); Luig and Voolma, 1999:177 (Estonia); Mandery, 1999:105 (Germany: Bayern: Coburg area); Neumayer, Schwarz, and Bregant, 1999:225 (Austria: in checklist of Sphecidae of Land Kärnten); Pauly, 1999:108 (in catalog of Belgian aculeates); Podgorbunskikh and Rudoiskatel', 1999:142 (Russia: Chelyabinsk Oblast': Il'men Nature Reserve); M. Schwarz, 1999:85 (Austria: Oberösterreich: city of Linz area); Blösch, 2000:179 (in Sphecid Fauna of Germany); Esenbekova and Kazenas, 2000:20 (southeast Kazakhstan: Alma Ata, 6 km southeast of village Saty in Kunghei Alatau, 4-5 km S Talgar); Gayubo, González, and Torres, 2000:184 (Spain: Salamanca Province); Gonzáles, Gayubo, and Tormos, 2000:18 (Andorra: Santa Coloma); Jacobs, 2000:9 (Germany: Land Mecklenburg-Vorpommern: not endangered); Józan, 2000:106 (Hungary: Bakony Mountains); Kazenas, 2000e:134 (in Sphecid Fauna of Kazakhstan); Ljubomirov, 2000:9 (Bulgaria, specimens in N. 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(Czech Republic: Děčin Sandstone Uplands: forest district Snežnik: birch stands in air-polluted area); Kula and Tyrner, 2003b:203 (Northern Czech Republic: spruce stands in air-pollution region); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); Nieves-Aldrey, Fontal-Cazalla, Garrido-Torres, and Rey del Castillo, 2003:42 (Spain: Madrid: Estación Biogeológica de El Ventorrillo in Sierra de Guadarrama); van der Smissen, 2003:84 (in revision of European species of subgenus *Cemonus*); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: conservation status unknown); von der Heide and Metscher, 2003:103 (Germany: Niedersachsen: Emsland area); Buck, 2004:25 (Canada: in checklist of Sphecidae of Ontario); Dollfuss, 2004a:118 (Croatia: Istria: Vodnjan area, Italy: Lazio: Todi 100 km north of Roma); Esser, Jakubzik, Sonnenburg, and Woydak, 2004:263 (Germany: in checklist of Sphecidae of Nordrhein-Westfalen); 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Frommer, 2009a:28 (Germany: in checklist of Sphecidae of Hessen); Guéorguiev and Ljubomirov, 2009:263 (Bulgaria: Maleshevska Planina); González, Gayubo, Asís, and Tormos, 2009:622 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Livory, Chevin, Lair, Sagot, and Baldock, 2009:20 (France: Département de la Manche: Les Moitiers d'Allonne); Mokrousov, 2009:293 (Russia: Republic Mari El); Nemkov, 2009b:67 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Ruchin, Antropov, and Shibayev, 2009:169 (Russia: Republic of Mordovia); Straka, Dvořak, and Bogusch, 2009:264 (Czech Republic: Meandry Smědé Nature Reserve); Szczepko and Wiśniowski, 2009:71 (Poland: Spała Landscape Park); Ermilov and Mokrousov: 2010:91 (phoretic mites *Acarus psenuli*, *Calvolia* sp., *Ensliniella kostylevi*, *Histiogaster bacchus*, *Histiostoma dudichi*, *Imparipes haeseleri*, *Schulzea caucasica*, and *Tortonia intermedia* in Middle Volga Region of Russia); Esser, Fuhrmann, and Venne, 2010:38 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Jakubzik, Kinkler, and Cölln, 2010:155 (Germany: Rheinland-Pfalz: Leverkusen-Steinbüchel); J. 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Schmidt, 2010:139 (Germany: Bayern: collected along Main-Donau canal); Shorenko and Konovalov, 2010:26 (Ukraine); Tüzün and Yüksel, 2010:4470 (Turkey: Niğde Province); van der Smissen, 2010a:349 (Germany: Schleswig-Holstein: locality records); Baghirov, 2011b:152 (Russia: Altayskiy Kray: Biysk, Savvushka; Altay Republic: Chemal); Gogala, 2011:11 (Slovenia); Pagliano, 2011b:21 (Italy: Island of Lampedusa); Rudoiskatel', 2011c:230 (Russia: Sverdlovsk Oblast': Natural Park «Chusovaya River»), 2011d:241 (Russia: central Ural Mountains); Shlyakhtenok, 2011:95 (Belorussia: 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); Tripotin, 2011:23 (France: Seine-Maritime: artificial sand site near Sandouville); Ziska and Saure, 2011:109 (Germany: Berlin: Tegeler Flieβ valley); Bayındır, Gürbüz, Ljubomirov, and Pohl, 2013:146 (Turkey: Isparta: Kasnak Oak Forest Nature Reserve); Boillat, 2012:228 (Switzerland: in checklist of insects of Canton de Genève); Burguet *in* Durand and Burguet, 2012:4 (France: Puy-de-Dôme: sands Girauts-Faures in Orléat commune); Nemkov, 2012c:437 (in catalog of Crabronidae of Russian Far East); Shlyakhtenok, 2012a:172 (Belorussia: collected in private plots); Standfuss and Standfuss, 2012:427 (Greece: to be removed from list of sphecids of Magnisia Peninsula); Strumia, Pagliano, and Gayubo, 2012:57 (Italy: Toscana: Riserva di San Rossore); Terayama, 2012:6 (in key to Pemphredonini of Japan), 14 (description), 19 (in checklist of Pemphredonini of Japan); Tripotin, 2012:23 (France: Seine-Maritime: estuary of Seine river); Akulov and Proshchalykin, 2013:113 (Russia: Siberia: Krasnoyarsk Kray); Dyuzhaeva, 2013:117 (Russia: Samara Oblast': Zhiguli Nature Reserve); Ma, X. Li, Chen, and Q. Li, 2013:581 (China: Nei Mongol: Helan Mountains); Pankov, 2013:230 (Russia: Ivanovo Oblast'); Saure, 2013:21 (Berlin: Treptow-Köpenick: Gosener Wiesen); Shlyakhtenok, 2013:152 (in annotated catalog of aculeate wasps of Belorussia); A. Scholz and Liebig, 2013:24 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Vieira, Oliveira, Brewster, and Gayubo, 2013:19 (Portugal: Douro International Natural Park); Bitsch, 2014:408 (France: Ariège: Carla-Bayle; Haut-Rhin:Munster); Flügel, 2014:255 (Brandenburg: Hangelsberger Heide); U. Frommer, 2014:28 (Germany: Hessen: Lorch); J.-K. Kim, 2014:443 (in catalog of Sphecidae *sensu lato* of Korean Peninsula); Mokrousov and Vafin, 2014:59 (Russia: Republic of Tatarstan); Yıldırım, Ljubomirov, and Lelej, 2014:10 (distribution in Turkey by biogeographic provinces); Koçak and Kemal, 2015:149 (in checklist of Hymenoptera of Turkey); Lett, 2015:5 (France: Loir-et-Cher: Gièvre); Simon, Lorthiois, and Macé, 2015:54 (France: alluvial terraces in Seine-Maritime Department: Anneville-Ambourville); Bleidorn, Gerth, Hopfe, et al., 2016:10 (Germany: Sachsen: Trages circa 20 km south of Leipzig);

Else, Bolton, and Broad, 2016:40 (in checklist of Aculeata of Great Britain and Ireland: England, Scotland); Mokrousov and Popov, 2016:588 (Russia: Abkhazia, Krasnodarskiy Kray); Reemer and Peeters, 2016:10 (Netherlands: Hulshorsterzand); Saure, 2016b:50 (Germany: Sachsen-Anhalt: fruit orchards); Stolle and Saure, 2016:924 (Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Wiśniowski, 2016:130 (Poland: Ojców National Park); Yildirim, Ljubomirov, Özbek, and Yüksel, 2016:32 (Turkey: Bitlis, Iğdır, Kars, and Tunceli provinces); Astapenková, Heneberg, and Bogusch, 2017: 7 (reared from galls of *Lipara* sp., Chloropidae); Magdalou, 2017:16 (France: Pyrénées-Orientales: Réserves Naturelles Catalanes: Julols); Mokrousov, 2017e:249 (in catalog of Pemphredoninae of Russia); L. Ma, Zhang, Ch. Li, Ji, and Q. Li, 2018:488 (China: Shanxi: Lishan National Nature Reserve); Carminati, Mora, and Cretin, 2019:24 (France: in list of Sphecidae *sensu lato* of Franche-Comté); Mokrousov, Proshchalykin, Aliyev, and Maharramov, 2019:15 (Azerbaijan: Nakhichevan Autonomous Republic); Ruchin and Antropov, 2019a:13239 (Russia: Mordovia State Nature Reserve); Bashir, L. Ma, and Q. Li, 2020b:4, 7 (in key to *Pemphredon* of China).– **As *Pemphredon rugifera***: K. Schmidt, 1984:251 (Germany: Baden-Württemberg); Brechtel, 1986:64 (Germany: Südpfalz); Jacobs, 1989:8 (Germany: MecklenburgVorpommern); Jacobs and Oehlke, 1990:125 (comparison with *Pemphredon mortifer* and *P. wesmaeli*), 150 (new locality records from German Democratic Republic); Dollfuss, 1991:62 (in key to Sphecidae of North and Central Europe); Gayubo, Borsato, and Osella, 1991:398 (Italy); K. Weber, 1992:88 (Germany: Bayern: Bamberg District); Kuhlmann, 1993:76 (Germany: known from Westfalen); Sorg and Wolf, 1993:60 (Germany: Rheinland-Westfalen: Nature Reserve Die Spey); Theunert, 1994c:48 (Germany: summary of records from Niedersachsen and Bremen); Negrisolo in Minelli, Ruffo, and La Posta, 1995b:11 (in catalog of Italian fauna); Schmid-Egger, 1995:63 (Germany: northwestern Baden-Württemberg); Schmid-Egger, Risch, and Niehuis, 1995:205 (Germany: summary of records from: Rheinland-Pfalz); Shlyakhtenok, 1995:194 (Belorussia: Berezinsky Nature Reserve); von der Dunk and Amon, 1995:52 (Germany: Nürnberg: Birkenlach forest); Arens, 1996:440 (Germany: Bayern: Bayreuth area); Jakubzik, 1996:253 (Germany: Köln); Menke, 1996b:11 (distribution is Holarctic); Jakubzik and Cölln, 1996b:400 (Germany: Rheinland-Pfalz); Tischendorf, 1996:47 (Germany: Hessen: near Bensheim); Voblenko, Gorobchishin, and Nesterov, 1996:14 (Ukraine: Polesye Region); Riemann, 1997:50 (Germany: Achim 14 km southeast of Bremen); Gorobchishin, 1998a:48 (Ukraine: Kiev and surroundings), 1998b:54 (Ukraine: Sumy Oblast': Vakalivshchina, as *rugifera*); N. Schneider and Wahis, 1998:22 (Luxemburg: sandstone quarries); Cölln and Jakubzik, 1999:29 (Germany: Rheinland-Pfalz: Keuper-Scharren southwest of Hungerburg); Herrmann, 1999:8 (Germany: Niedersachsen: Oldenburg area; habitats size); Riemann, 1999:835 (Germany: Niedersachsen: sand pits near Bremen); Cölln and Jakubzik, 2000:226 (Germany: Rheinland-Pfalz: Gönnersdorf); Dressler, 2000:33 (Germany: Hessen: Darmstadt area); M. Mader and Chalwatzis, 2000:60 (Germany: Hessen: Oderwald Mountains); Bieri, 2002:78 (Liechtenstein); Wiśniowski, 2002:69 (Poland: Ojców National Park); Drewes, 2003:141 (Croatia, Germany, Hungary, Italy: miscellaneous locality records); Esenbekova and Kazenas, 2003:15 and 67 (Kazakhstan: foothills of Zailiyskiy Alatau: nesting in artificial nest); Esser and Jakubzik, 2003:291 (Germany: Nordrhein-Westfalen: Niederrheinisches Tiefland); Generani, Pagliano, Scaramozzino, and Strumia, 2003:66 (Italy: Arcipelago Toscano); Wiśniowski, 2003:191 (Poland: summary of locality records); Wiśniowski in Dylewska and Wiśniowski, 2003:141 (Poland: Ojców National Park); Deván, 2004:147 (western Slovakia); Jakubzik, Niehuis, and Cölln, 2004:458 (Germany: RheinlandPfalz: Roβstein in Rhein valley at 50°06'42"N 7°43'87"E); Kofler, 2005:168 (Austria: Tirol: Lienz District: Godnach near Faschingbauern in Dölsach Common, Nikolsdorf, Ort in Saint Johann Common, Tschule in Thurn Common); Venne and Bleidorn, 2005:44 (Germany: Nordrhein-Westfalen: Moosheide Nature Reserve); Wiśniowski, 2005a:319 (Poland: Ojców National Park; occurring only in forest and on wooden buildings); Giles and Ascher, 2006:231 (New York: Black Rock Forest Preserve); Standfuss and Standfuss, 2006c:303 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Shlyakhtenok, 2007b:364 (Ukraine: Chernobyl area); Józan, 2009:165 (Croatia: Stanišovi); Cölln, Jakubzik, and Kinkler, 2012:25 (Germany: NordrheinWestfalen: Leverkusen); Standfuss and Standfuss, 2012:427 (Greece: to be removed from list of sphecids of Magnisia Peninsula, Greece); Zettel, Zimmermann, and Wiesbauer, 2013:12 (Austria: Wien: Donaupark); Blažej, Macek, and Trýzna, 2016:126 (Czech

Republic: České Švýcarsko = Bohemian Switzerland National Park); Le Divelec, Chapelin-Viscardi, and Larivière, 2016:109 (northern France: in agricultural landscapes); Olszewski and Kowalczyk, 2019:108 (northern Poland: Pomorze Gdańskie = Gdańsk Pomerania); Kejval, Blažej, and Erhart, 2020:115 (western Czech Republic); Shorenko, 2020:51 (Crimea: Karadag Nature Reserve); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China); Cross, Baldock, and Wood, 2021:61 (in catalog of Sphecidae *sensu lato* of Portugal); Falk and Early, 2021:24 (in key to British *Pemphredon*); Kaplan and Yildirim, 2021:86 (in catalog of Crabronidae of Turkey); Olszewski, Wiśniowski, and Ljubomirov, 2021:98 (in commented list of Sphecidae *sensu lato* of Poland); Saure, 2021:83 (Germany: Brandenburg: Nature Reserve Ferbitzer Bruch near Potsdam); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:122 (in revision of Sphecidae *sensu lato* of Europe); U. Frommer and Bahmer, 2023:195 (Germany: Hessen: Giessen: city gardens); Kaplan and Yildirim, 2023:1689 (in checklist of Sphecidae *sensu lato* of Turkey).

As *Pemphredon lethifer* Shuckard: Thomson, 1870:234 (in revision of Swedish wasps), corrected to *Pemphredon rugifer* by Dollfuss, 1995:1009.

Pemphredon bipartior W. Fox, 1892h:313, ♀. Holotype: USA: Texas: no specific locality (USNM). Synonymized with *Pemphredon rugifer* by Dollfuss, 1995:1009. – Dalla Torre, 1897:356 (in catalog of world Hymenoptera); J. Smith, 1910:675 (in new list of insects of New Jersey); J.Ch. Bradley, 1928:1014 (in catalog of New York Sphecidae); Peckham, 1934b:259 (twig nesting); Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (in catalog of North American Hymenoptera); Krombein, 1956b:154 (West Virginia: Lost River State Park), 1958f:189 (in supplement to catalog of North American Hymenoptera: West Virginia); Steiner, 1973:25 (Canada: Northwest Territories); R. Bohart and Menke, 1976:180 (in checklist of world Sphecidae); Krombein, 1979b:1603 (in catalog of North American Hymenoptera); Finnamore, 1997:894 (expected to occur in Yukon). – **As *Cemonus bipartior***: Ashmead, 1899d:222 (new combination, in checklist of North American Crabronidae). – **As *Diphlebus biparitor*** [*sic*]: Rau, 1928b:369 (new combination, nesting in large twigs, with cells branching off main gallery, preying on aphid *Schizoneura* probably *lunigera* Hausmann).

Pemphredon harbecki Rohwer, 1910b:170, ♀. Holotype: ♀, USA: New Jersey: Trenton (USNM). Synonymized with *Pemphredon bipartior* by R. Bohart *in* R. Bohart and Menke, 1976:180. – J. Smith, 1910:675 (in new list of insects of New Jersey); Krombein *in* Muesebeck, Krombein and Townes, 1951:966 (in catalog of North American Hymenoptera); Krombein, 1960a:34 (nest, prey), 1963f:275 (Maryland: Plummers Island near Washington, D.C.).

Pemphredon scotica Perkins, 1929:55, ♀ (as *scoticus*, incorrect original termination). Syntypes: ♀, Great Britain: Scotland: no specific locality (BMNH?). Synonymized with *Pemphredon unicolor* by Blüthgen, 1931a:126 and with *Pemphredon wesmaeli* by Valkeila and Leclercq, 1972:696, as interpreted by these authors. – R. Perkins, 1929:55 (in key to British *Pemphredon*); Blüthgen, 1931a:126 (locality records, diagnostic characters); A. Wagner, 1938a:119 (northwestern Germany, as *unicolor* forma *scoticus*); Paul, 1941:41 (Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area, as *unicolor* f. *scoticus*); de Beaumont, 1951h:34 (Switzerland: Neuchâtel area; as *rugifer* f. *scotica*); Nouvel and Ribaut, 1953:180 (France: Haute-Garonne: Saint-Béat, Hautes-Pyrénées: Cauterets, Orédon); de Beaumont, 1954e:93 (Italy; as *rugifer* f. *scotica*); Bajári, 1957a:82 (in key to Hungarian Sphecidae, as *unicolor* var. *scoticus*); Wolf, 1959b:27 (Germany: Nassau; as *unicolor scoticus*); Babiy, 1964:115 (Austria: Land Salzburg, as *rugifer* f. *scotica*); de Beaumont, 1962b:27 (Spain; as *rugifer* f. *scotica*); Ceballos, 1964:86 (in supplement to catalog of Spanish Sphecidae, as *rugifer* f. *scotica*); Erlandsson, 1974:78 (Italy). – **As *Cemonus scoticus***: Richards, 1937b:104 (new combination, in checklist of British aculeates).

Cemonus solivagus Bondroit, 1932:35, ♀. Holotype: ♀, Belgium: Uccle (depository?). Synonymized with *Pemphredon unicolor* forme *scoticus* by Crèvecoeur and Maréchal, 1936:250, and with *Pemphredon rugifer* by Valkeila and Leclercq, 1974:696.

Pemphredon bucharica Gussakovskij, 1952:215, ♀ (as *bucharicus*, incorrect original termination). Holotype: ♀, Tajikistan: Sagyr-Dasht in Darvaza Range (ZIN). Synonymized with *Pemphredon rugifer* by Dollfuss, 1995:1009. – R.

Bohart and Menke, 1976:180 (in checklist of world Sphecidae); Kazenas, 2001:21 (in checklist of Sphecidae of Kazakhstan and Central Asia).

As *Pemphredon wesmaeli* (as interpreted by Valkeila *in* Valkeila and Leclercq, 1972:697): Kohl, 1888b:723 (Austria: Tirol, now Italy: Alto Adige); Freke, 1896:40 (Ireland); E. Saunders, 1896:93 (in revision of British Aculeata); Westerlund, 1896:28 (Finland: no specific locality); Aurivillius, 1904:260 (in revision of Swedish Sphecidae, *lethifer* regarded as synonym); de Cobelli, 1903:107 (Italy: Province of Trentino); W. Schulz, 1904b:92 (Russia: Pargola, now Pargolovo, Olonets); Adlerz, 1906:40 (Sweden; nesting habits); de Gaulle, 1908:103 (in catalog of French Hymenoptera); Birula, 1912:537 (Ukraine: Zhytomyr Oblast': Radomyshl'); Schirmer, 1912:166 Germany: Berlin area); Lundblad, 1924:21 (Sweden: Lappland: Lycksele); Bouwman, 1928b:183 (in revision of Sphecidae of Netherlands); Schmiedeknecht, 1930:670 (in keys to Hymenoptera of North and Central Europe); Balthasar, 1942:4 (Czech Republik: Moravia); de Andrade, 1949:3 (Portugal); Noskiewicz and Chudoba, 1949:420 (Poland: Dolny Śląsk: many localities); Caruel, 1951:100 (France: Marne Department); de Beaumont, 1951h:34 (Switzerland: Neuchâtel area; as *rugifer* f. *wesmaeli*); Tsuneki, 1951a:194 (in revision of *Pemphredon* of Japan and adjacent regions; as *unicolor wesmali*); Móczár, 1953:310 (Hungary); de Beaumont, 1954e:93 (Italy; as *rugifer* f. *wesmaeli*); Grandi, 1954:242 (Italy); Vergne, 1955:5 (France: Auvergne); Bajári, 1957a:81, 83 (in key to Hungarian Sphecidae, as *unicolor* var. *wesmaeli*); Nouvel and Ribaut, 1958:15 (France: Pyrénées-Orientales: Banyuls-sur-Mer); Suárez, 1959:59 (Spain: Almería Province; as *rugifer* f. *wesmaeli*); Wolf, 1959b:27 (Germany: Nassau; as *unicolor wesmaeli*); Janvier, 1960:312 (nesting habits, description of larva); Babiy, 1964:116 (Austria: Land Salzburg, as *rugifer* f. *wesmaeli*); Ceballos, 1964:86 (in supplement to catalog of Spanish Sphecidae, as *rugifer* f. *wesmaeli*); Tsuneki, 1964e:28 (in key to *Pemphredon* of Japan; as *unicolor wesmaeli*); Valkeila and Leclercq, 1972:700 (in key to European *Pemphredon* of *rugifer* group), 706 (locality records); Tsuneki, 1974a:367 (Korea; as *rugifer wesmaeli*); Pagliano, 1980:131 (Italy: Lazio); Dollfuss and Ressl, 1981:321 (Austria: Niederösterreich: Scheibbs District); Tsuneki, 1982b:14 (known from Korea; as *rugifer wesmaeli* = *unicolor*); Skibińska, 1989a:204 (Poland: Warszawa area). – **As *Pemphredon rugifer wesmaeli***: Paik, 1985:198 (new status, in list of Sphecidae of Korea); Tsuneki, 1991:201 (Korea). – **As *Cemonus wesmaeli***: Spooner, 1931:14 (new combination, Great Britain: Cambridgeshire); Richards, 1937b:104 (in checklist of British aculeates); Kloet, 1941:235 (Great Britain: Wales: Wilmslow); Spooner, 1942:110 (Great Britain: Bedfordshire), 1943:72 (Great Britain: G. Wotton); Chambers, 1949:225 (Great Britain: Bedfordshire); Aerts, 1955:61 (Germany: Rheinland). – **As *Dineurus wesmaeli***: Struve, 1940:823 (new combination, Germany: Island of Borkum; as *unicolor* var. *wesmaeli*); Schneid, 1941:1035 (Germany: Bayern: Bamberg area).

Pemphredon scythica Valkeila *in* Merisuo and Valkeila, 1972:15, ♀, ♂ (as *scythicus*, incorrect original termination). Holotype: ♀, Russia: Taganrog (Helsinki). Synonymized with *Pemphredon rugifer* by Dollfuss, 1995:1009. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae).

Pemphredon punctifer Merisuo *in* Merisuo and Valkeila, 1972:16, ♀. Holotype: ♀, Russia: Khabarovsk District: south Sakhalin: Aleksandrovsk (ZMMU). Synonymized with *Pemphredon rugifer* by Dollfuss, 1995:1009. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae).

42. *shirozui* Tsuneki

Pemphredon shirozui Tsuneki, 1966c:14, ♂. Holotype: ♂, Taiwan: Nantou Prefecture: Sungkang (Kyushu Univ.). – Tsuneki, 1968d:56 (Taiwan), 1982e:20 (Taiwan); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Dollfuss, 1995:1012 (in revision of world *Pemphredon*); Li and He, 1997d:300, 301 (in review of Chinese *Pemphredon*); Porter, Stange, and Wang, 1999:6 (in checklist of Sphecidae of Taiwan); Hua, 2006:281 (in list of Chinese insects, geographic distribution); Bashir, L. Ma, and Q. Li, 2020b:6 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

43. *spielleitneri* Dollfuss

Pemphredon spielleitneri Dollfuss, 1995:1013, ♂. Holotype: ♂, USA: District of Columbia: Washington (USNM).

44. *sudai* Tsuneki

Pemphredon sudai Tsuneki, 1972b:12, ♀. Holotype: ♀, Japan: Yamanashi Prefecture: Mount Kanayama (originally K. Tsuneki collection, now Hyogo Mus.). – Tsuneki, 1972b:12 (type of subgenus *Susanowo*); Itami, 1973:12 (Japan: new locality record); Suda, 1973:122 (Japan: Yamanashi Prefecture); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Dollfuss, 1995:1014 (in revision of world *Pemphredon*); Tano, 1994a:4 (holotype in K. Tsuneki collection); Budrys *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:401 (in key to Sphecidae of Russian Far East); Hashimoto and Nakanishi, 1997:26 (holotype transferred to Hyogo Mus.); Suda, 2004:37 (Japan: Yamanashi Prefecture); Haneda, Inoue, Nozaka, Tano, Kurokawa, and H. and T. Murota, 2005:65 (Japan: Fukui Prefecture: Mount Monju); Haneda, Nozaka, Tano, Kurokawa, and Murota, 2005:46 (Japan: Gifu Prefecture), 2006a:21 (Japan: Toyama Prefecture); S. Takahashi and Haneda, 2008b:44 (Japan: Hokkaido: Sapporo); Terayama, 2012:4 (in key to Pemphredonini of Japan), 15 (description), 19 (in checklist of Pemphredonini of Japan); Komeda, 2021b:64 (Japan: Honshu: Yamanashi Prefecture).

45. *tridentata* Gussakovskij

Pemphredon tridentata Gussakovskij, 1952:212, ♀, ♂ (as *tridentatus*, incorrect original termination). Syntypes: Tajikistan: Mikoyanabad, now Kabadian, and Kanibadam area; Uzbekistan: Tashkent, Khiva (ZIN). – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Kazenas, 1978b:154 (in key to Sphecidae of Kazakhstan and Central Asia); Islamov, 1986:528 (Uzbekistan: Tashkent Oblast'); Dollfuss, 1995:1015 (in revision of world *Pemphredon*), 2001:273 (Kyrgyzstan); Q. Li and He, 1997d:300, 301 (in key to Chinese *Pemphredon*); Nazarova, 1998:40 (Tajikistan: Tigrovaya Balka Nature Reserve); Esenbekova and Kazenas, 2000:20 (southeast Kazakhstan: 10 km northwest and 45 km southwest of Chundzha, Chinghil'su 30 km E Chilik, Zhabagly); Kazenas, 2000e:135 (in Sphecid Fauna of Kazakhstan), 2001:22 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:50 (geographic distribution, collecting localities in Kazakhstan); Dollfuss, 2004a:118 (Kyrgyzstan: Kuzu-Tegerek in Sandelashky Mountains); Kazenas, 2004b:101 (Kazakhstan: western Tien Shan); Nazarova, 2005:93 (alfalfa fields in southwestern Tajikistan, as *tridentatus*); Kazenas, 2013b:494 (southeast Kazakhstan: 10 km northwest and 45 km southwest of Chundzha); Bashir, L. Ma, and Q. Li, 2020b:4, 6 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China); Embergenov, Akhmedov, and Medetov, 2023:25 (Uzbekistan: southern Lake Aral region).

Pemphredon sedula Merisuo *in* Merisuo and Valkeila, 1972:16, ♀ (as *sedulus*, incorrect original termination). Holotype: ♀, Tajikistan: Ramit (ZMMU). Synonymized with *Pemphredon tridentata* by Dollfuss, 1995:1015. – R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae).

46. *verugosa* Li and He

Pemphredon verugosa Li and He, 1997b:259, ♀. Holotype: ♀, China: Szechuan: Emeishan: Juilaodong (Zool. Inst., Acad. Sinica, Beijing). – Bashir, L. Ma, and Q. Li, 2020b:5 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

47. *wesmaeli* (A. Morawitz)

Cemonus wesmaeli A. Morawitz, 1864:459, ♀, ♂ (as *Wesmaeli*, incorrect original capitalization). Lectotype: ♀, Russia: Sankt Petersburg (ZIN), designated by Valkeila and Leclercq, 1972:696. – Brischke, 1864:209 (Germany: Preussen Province, now Poland: Pomorze Region), Kirchner, 1867:222 (in catalog of European Hymenoptera); Maneval, 1929b:290 (nest and prey, individual variation of adults); Blüthgen, 1931a:123 (is a variety of *Dineurus unicolor*); . – **As *Diphlebus wesmaeli***: A. Wagner, 1918:141, 142 (new combination, in key to subgenus *Diphlebus*, 142 (Austria: Tirol; Germany); Blüthgen, 1925:166 (Germany: Saale River valley: Eulau); Shestakov, 1925:36 (Russia: Yaroslavl' area); Harttig, 1930a:230 (in revision of European *Cemonus*); Móczár, 1947b:90 (Hungary: Siebenbürgen: Székelykeresztúr, now Romania: Transylvania: Cristuru Secuiese); Szulczewski, 1950:105 (Poland: Wielkopolski National Park 15 km S Poznań); Fahlander, 1954:250 (Sweden: Gästrikland Region). – **As *Pemphredon wesmaeli***:

Kohl, 1883e:658 (new combination, Switzerland), 1890a:56 (in review of *Pemphredon*), 1893a:39 (Austria: Niederösterreich); F. Morawitz, 1893a:110 (Russia: Karelian Isthmus); Sickmann, 1893:76 (Germany: Niedersachsen: Iburg); Krieger, 1894:16 (Germany: Kingdom of Saxony); Dalla Torre, 1897:360 (in catalog of world Hymenoptera); Mocsáry, 1897:78 (Kingdom of Hungary, some localities are in today's Romania); Kubes, 1905:83 (Czech Republic: Kolín, Obora, Sušice); Móczár and Henter, 1907:205 (Hungary: Budapest); Graeffe, 1911:50 (Italy: Trieste area); Birula, 1914:381 (Belorussia: Luskinopol' near Vitebsk, redescription); O. Meyer, 1919:150 (Germany: Posen Province, now Poland: Poznań Region), 151, 152 (in key to *Pemphredon lethifer*, *shuckardi*, and *wesmaeli*); A. Wagner, 1920:42 (Germany: Lower Elbe region); Stelfox, 1924:15 (Freke's 1895 record from Ireland, actually refers to *Pemphredon shuckardi*); Berland, 1925d:139 (in Sphecid Fauna of France); Schütze, 1925:112 (Germany: Lausitz Region); Stelfox, 1927:291 (records from Ireland are erroneous); R. Perkins, 1929:54 (in key to British *Pemphredon*); Jones, 1931:98 (Great Britain: Coventry); Pulkkinen, 1931:88 (in revision of Sphecidae of Finland); Crèvecoeur and Maréchal, 1932:69 (in catalog of Belgian Hymenoptera); Masi, 1933:196 (Italy: Toscana: Isola di Capraia, determination tentative); Balles, 1934:18 (Germany: Baden-Württemberg: Baden-Baden, Heilbronn, Hopfengarten); Jansson, 1934:289 (Sweden); Forsius *in* Forsius and Hellén, 1935:11 (in checklist of Hymenoptera of Finland); Grandi, 1935a:109 (Italy); Vergne, 1935:119 (France: Auvergne: Pont-du-Chateau); Móczár, 1938c:81 (Hungary: Kőszeg Hills), 1939:5 (Hungary: Jászberény), 1941:95 (Hungary: Sajóvárkony); Giner Marí, 1943:44 (in Sphecid Fauna of Spain); de Andrade, 1949:3 (Portugal: Lisboa); Cavro, 1950:32 (France: Département du Nord); Georgel, 1950:64 (France: Seine-et-Oise: Sucy-en-Brie); Nouvel and Ribaut, 1953:180 (France: Haute-Garonne: Saint-Béat); Vogrin, 1955:39 (Yugoslavia); Diniz, 1959:26 (Portugal: Lisboa, Massorra); Evans, 1964b:248 (reference to Janvier's 1960 description of larva); Benno, 1967:37 (in checklist of Sphecidae of Netherlands); Lefeber, 1969c:233 (Netherlands: Sint Pietersberg = Montagne Saint Pierre); Valkeila and Leclercq, 1970:map174 (distribution in Belgium), 1972:700, 701 (in key to European species of *rugifer* group), 706 (geographic distribution); Lefeber, 1974:76 (Netherlands: Ede, Mesch; Belgium: Opoeteren); Lomholdt, 1975c:98 (in Sphecid Fauna of Fennoscandia and Denmark); R. Bohart and Menke, 1976:182 (in checklist of world Sphecidae); Eck, 1976:92 (German Democratic Republic); Schmidt, 1977:97 (Germany: Baden-Württemberg: Enzklösterle in Schwarzwald); Lefeber, 1978:138 (Netherlands: Helden); Petit, 1980:42 (Belgium: Raeren); Richards, 1980:68, 69 (in key to Sphecidae of British Isles); Axelsson, 1982:79 (Sweden); Dollfuss, 1983b:7 (in catalog of Sphecidae of Austria); Janzon, 1983:171 (Sweden: Öland); Kvamme and Axelsson, 1983:57 (Norway); Lefeber, 1983a:84 (Netherlands: Waddendistrict: northern coast sand dunes); Riemann, 1983:81 (Germany: Bremen-Daverden area); Lefeber, 1984:29 (Netherlands: Maastricht); Mingo and Gayubo, 1984:110 (Spain); Schmidt, 1984:252 (Germany: Baden-Württemberg); Sagvolden, 1984:19 (Norway: Buskerud: Rollag); Haeseler, 1985c:571 (Germany: Friesian Islands); Lefeber, 1985:87 (Netherlands: southern Limburg); Skibińska, 1986b:153 (Poland: suburbs of Warszawa), 160 (gardens), 173 (various green urban habitats); Vikberg, 1986b:75 (Finland); Schmidt and Westrich, 1987:368 (Germany: Mainz area); Weiffenbach, 1989:106 (Germany: Hessen: Gießen area); Gayubo, Asís, and Tormos, 1990a:14 (Spain); Jacobs and Oehlke, 1990:125 (comparison with *Pemphredon mortifer* and *rugifer*); Pagliano, 1990:117 (in catalog of Italian Sphecidae); Schwammberger and Priesner, 1990:537 (Austria: Kärtnen); Day, 1991:xviii (in summary of European Endangered Hymenoptera Lists); Nilsson, 1992:54 (Sweden); K. Weber, 1992:88 (Germany: Bayern: Bamberg District); Luig, 1993:42 (Estonia); Dollfuss, 1991:62 (in revision of world *Pemphredon*, as new synonym of *Pemphredon rugifer*); Schmid-Egger, Risch, and Niehuis, 1995:205 (Germany: summary of records from: Rheinland-Pfalz); Schmidt, Schmid-Egger, and Doczkal, 1995:8 (relationship to *Pemphredon lethifer*, *enslini*, *rugifer*, and *mortifer* is unclear); Arens, 1996:440 (Germany: Bayern: Bayreuth area); Blösch, 1996:3 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); Schmid-Egger, Schmidt, and Doczkal, 1996:378 (Germany: Baden-Württemberg: possibly endangered); Schmidt and Schmid-Egger, 1997:25 (in checklist of German Sphecidae); K. Weber, 1998:147 (Germany: Bayern: Bamberg area); Mandery, 1999:105 (Germany: Bayern: Coburg area); Pauly, 1999:108 (in catalog of Belgian aculeates); Blösch, 2000:180 (in Sphecid Fauna of Germany); Kazenas, 2000e:137 (in Sphecid Fauna of Kazakhstan); Basset, 2001:80 (France: Département de Gironde); van der Smissen, 2001:63 (Germany: Schleswig-Holstein: data

on endangerment missing); Bergsten, Hoffsten, and Hellqvist, 2002:38 (Sweden: Hälsingland: Övre Tälningsån); Kazenas, 2002a:51 (geographic distribution, collecting localities in Kazakhstan); Söderman and Vikberg, 2002:50 (in list of Aculeata of Finland); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:69 (Germany: in catalog of wasps and bees of Bayern); van der Smissen, 2003:88 (as valid species, in revision of European species of subgenus *Cemonus*); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: conservation status unknown); Wiśniowski, 2003:191 (Poland: summary of locality records); Wiśniowski *in* Dylewska and Wiśniowski, 2003:141 (Poland: Ojców National Park); Wiśniowski and Werstak, 2003:77 (Poland: Pieniny National Park); Bergsten, Nilsson, and Hellquist, 2004:7 (Sweden: Västerbotten: Nordmaling); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:357 (in catalog of Polish Crabronidae); Stolle et al., 2004:372 (Germany: Sachsen-Anhalt: last collected in 1951); Wiśniowski, 2004:41 and 60 (in checklist of Polish Sphecidae); Blösch, 2005:3 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); Burger, 2005:35 (Germany: Thüringen); Jacobs, 2005b:150 (Germany: Mecklenburg-Vorpommern: Paske); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:456 (synonymized with *Pemphredon rugifer* by Dollfuss, 1991, 1995, but treated as valid species by Schmidt and Schmid-Egger, 1997, van der Smissen, 2003, Wiśniowski, 2003, and Jacobs, 2005a); Herrmann, 2007a:52 (Germany: Niedersachsen: Ostfriesland); Jacobs, 2007:68, 74 (in key to Crabronidae of Germany); Saure, 2005:18 (Germany: Berlin); Hallin, 2007b:24 (Sweden: Blekinge County); Herrmann, 2007b:95 (Germany: Baden-Württemberg: Fürstenberg in Konstanz); Saure, 2007:83 (Germany: in checklist of Aculeata of Land Brandenburg); Venne, Bleidorn, and Lauterbach, 2007:302 (Germany: Nordrhein-Westfalen: Bielefeld); Vepřek and Straka, 2007:200 (in catalog of Sphecidae of Czech Republic and Slovakia), 217 (numerous locality records); U. Frommer, 2009a:28 (Germany: in checklist of Sphecidae of Hessen), 39 (locality records from Hessen); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:72 (Norway: locality records); Esser, Fuhrmann, and Venne, 2010:38 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Hable, Krauss, von der Dunk, and Wickl, 2010:28 (Germany: Bayern: Sulz- and Ottmaringer Tal); Johansson, 2010:121 (Sweden: Småland: upper Emå river valley); Mokrousov, 2010a:63 (Russia: Nizhniy Novgorod Oblast': Chuvash Republic, Tatarstan: no specific localities), 2010c:108 (Russia: Chuvash Republic: State Nature Reserve "Prisurskiy); Schmid-Egger, 2010a:18 (in red list of Aculeata of Germany: relatively common); Schmidt, 2010:139 (Germany: Bayern: collected along Main-Donau canal); Smetana, Roller, Beneš, Bogusch, Dvořák, Holý, Karas, Macek, Straka, Šima, Tyrner, Vepřek, and Zeman, 2010:102 (Western Slovakia: recorded from Borská Nížina); van der Smissen, 2010a:349 (Germany: Schleswig-Holstein: locality records), 2010c:397 (Sweden: Öland: Gårdby; Gogala, 2011:12 (Slovenia); Mokrousov, Berezin, and Egorov, 2011:79 (Russia: Chuvash Republic); Tischendorf, Frommer, Flügel et al., 2011:94 (Germany: Hessen: conservation status, insufficient data to evaluate degree of endangerment); Hellrigl, 2012:129 (Italy: Provincia Autonoma di Bolzano-Alto Adige, as Südtirol); Standfuss and Standfuss, 2012:427 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); A. Scholz and Liebig, 2013:26 (Germany: Sachsen: in list of Sphecidae *sensu lato*); Hellqvist, Abenius, and Norén, 2014:93 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Jakovlev, Polevoi, and Humala, 2014:302 (Russia: Republic of Karelia: Zaonezhye Peninsula in Lake Onega); Mokrousov and Vafin, 2014:59 (Russia: Republic of Tatarstan); Bleidorn, Gerth, Hopfe, et al., 2016:10 (Germany: Sachsen: Trages circa 20 km south of Leipzig); Stolle and Saure, 2016:924 (Germany: in list of Sphecidae *sensu lato* of Sachsen-Anhalt); Wiśniowski, 2016:130 (Poland: Ojców National Park); Mokrousov, 2017e:249 (in catalog of Pemphredoninae of Russia); Lett, 2018:203 (France: Loir-et-Cher: Gièvres at 47°16'39"N 1°41'52"E); Carminati, Mora, and Cretin, 2019:24 (France: in list of Sphecidae *sensu lato* of Franche-Comté); Kejval, Blažej, and Erhart, 2020:115 (western Czech Republic); Cross, Baldock, and Wood, 2021:61 (in catalog of Sphecidae *sensu lato* of Portugal); Olszewski, Wiśniowski, and Ljubomirov, 2021:99 (in commented list of Sphecidae *sensu lato* of Poland); Dollfuss, Bitsch, and K. Schmidt *in* Bitsch, Antropov, Bouček, Dollfuss, Fernández Gayubo, and K. Schmidt, 2022:122 (in revision of Sphecidae *sensu lato* of Europe). – **As *Dineurus unicolor* var. *wesmaeli***: Blüthgen, 1937:235 (new combination, new status, Germany: Saale River valley); Maréchal, 1939:341 (Belgium: Loën). – **As *Pemphredon unicolor* var. *wesmaeli***: Goebel, 1937:40 (Poland: Środa District: Tulce); Poll,

1938 (Belgium: Campthout); A. Wagner, 1938a:119 (northwestern Germany); Lehrer and Scutaru, 1963:286 (Romania: Moldova: Bicaz in Bacău District, Ciric, Huşi, and Surăneşti in Iaşi District); Balthasar, Hrubant, and Hrubant, 1967:170 (Bulgaria: Slanchev Bryag near Nessebar). – **As *Pemphredon unicolor* f. *wesmaeli***: Paul, 1941:40 (new status, Germany: Pommern: Stettin area, now Poland: Województwo Zachodniopomorskie: Szczecin area). – **As *Pemphredon unicolor wesmaeli***: Haneda, 1964a:39 (new status, Japan: Fukui Prefecture).

48. *xinjiangana* Q. Li and He

Pemphredon xinjiangana Q. Li and He, 1997c:161, ♂. Holotype: ♂, China: Xinjiang: Miquan (Zhejiang Agricultural University). – Bashir, L. Ma, and Q. Li, 2020b:7 (in key to *Pemphredon* of China); Bashir, Yue, Jiang, L. Ma, and Q. Li, 2021:1063 (in list of *Pemphredon* of China).

sp.

Koornneef, 1925:362 (Netherlands: Gelderland: Dieren); van der Vecht, 1928:93 (Netherlands: Meijendel sand dunes); Bischoff, 1933:4 (Morocco, as *Dineurus*); Hertzog, 1954:101 (France: Bouches-du-Rhône: Camargue, *unicolor* or *lethifer fabricii*); Krombein, 1963f:275 (Maryland: Plummers Island near Washington, D.C.); Fye, 1965:736 (trap nest); Käpylä, 1974:64 (Finland: diurnal activity); Danks, 1971b:67 (Great Britain: Berkshire: Silwood Park); Sielfeld, 1980b:72 (in checklist of Chilean Sphecidae); Parks, 1986:34 (California: Torrey Pines State Reserve); Spahr, 1987:74 (in addition to Keilbach, 1982 catalog of amber Hymenoptera); González, Gayubo, and Torres, 1998:72, 73 (Spain: Valladolid Province); Kurczewski, 1998d:250 (pine barrens Kurczewski and Acciavatti, 1990:60 (New York: Cayuga County); Gonzáles, Gayubo, and Tormos, 2000:18 (Andorra: Santa Coloma); González, Gayubo, Asís, Tormos, and García, 2003:62 (Spain: Soria: Chavaler); Nieves-Aldrey, Fontal-Cazalla, Garrido-Torres, and Rey del Castillo, 2003:42 (Spain: Madrid: Estación Biogeológica de El Ventorrillo in Sierra de Guadarrama; sp. aff. *rugifer*); Gayubo et al. 2004:132 (Spain: Madrid: Estación Biogeológica de El Ventorrillo in Sierra de Guadarrama sp. aff. *rugifer*); Pagliano, 2011a:158 (specimens in collection Spinola, Torino).

FOSSIL *PEMPHREDON*

spinalata (Hong)

Sinostigma spinalata Hong, 1984a:9. Holotype: China: Shandong Province: Shanwang, Linqu: Xiejahe village (depository?). Age: Miocene. – As *Pemphredon spinulata*: Zhang, 1989:313 (new combination, redescription, as *spinalatum*).

SPECIES OF *PEMPHREDON* THAT REQUIRE CLARIFICATION

Pemphredon jurinii Stephens, 1829a:366 (in catalog of British insects), by indication, Article 12.2.1 (reference to Jurine, 1807:plate 11). Replacement name for *Cemonus unicolor* of Jurine, 1807:Pl. 11, Fig. 28. – Stephens, 1829b:34 (in checklist of British insects).

Pemphredon minutus Latreille, 1809:84. France: near Paris (lost). – Guérin-Méneville, 1828a:170 (in Dictionnaire classique d'histoire naturelle).

NOMINA NUDA IN *PEMPHREDON*

assimilis Stephens, 1829a:366 (in catalog of British insects). – Stephens, 1829b:34 (in checklist of British insects).

caliginosa Stephens, 1829a:366 (in catalog of British insects). – Stephens, 1829b:34 (in checklist of British insects).

fuscipennis Stephens, 1829a:367 (in catalog of British insects) = *Pemphredon lugubris* (Fabrivius, 1793). – Stephens, 1829b:34 (in checklist of British insects).

geniculata Stephens, 1829a:366 (in catalog of British insects, as *geniculatus*, incorrect original termination). – Stephens, 1829b:34 (in checklist of British insects).

hyalipennis Stephens, 1829a:366 (in catalog of British insects) = *Pemphredon lethifer* (Shuckard, 1837). – Stephens, 1829b:34 (in checklist of British insects).

nitida Stephens, 1829a:366 (in catalog of British insects) = *Pemphredon lugubris* (Fabricius, 1793). – Stephens, 1829b:34 (in checklist of British insects).

SPECIES DESCRIBED IN *PEMPHREDON* AND TRANSFERRED TO OTHER GENERA

annulata Say, 1837 = *Passaloecus*
insignis Vander Linden, 1829 = *Passaloecus*
mandibularis Cresson, 1865 = *Passaloecus*
marginatus Say, 1837 = *Passaloecus*
oraniensis Lepeletier de Saint Fargeau, 1845 = *Diodontus*
tristis vander Linden, 1829 = *Diodontus*