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DRYUDELLA

Dryudella Spinola, 1843:135. Type species: *Dryudella ghilianii* Spinola, 1843 [= *Astata tricolor* Vander Linden, 1829], designated by P. Verhoeff, 1951:152 (Pate, 1937c:24, incorrectly regarded *Dryudella* as monotypic. See discussion by Verhoeff, 1951).

Key: Pagliano, 2001:259 (Italian species); Schmid-Egger, 2014:547 (Arabian Peninsula and adjacent areas).

Review of biology: Kazenas, 2001b:1143.

1. *albohirsuta* Kazenas

Dryudella albohirsuta Kazenas, 2000c:187, ♀. Holotype: ♀, Kazakhstan: Ili River Valley: 30 km south of Koktal = Barokhudzir (ZIN). – Esenbekova and Kazenas, 2000:24 (southeast Kazakhstan: 30 km SSW Koktal); Kazenas, 2001:23 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:57 (geographic distribution, collecting localities in Kazakhstan), 2008a:100 (southeastern Kazakhstan: Ili River valley: 30 km SW Koktal, Barokhudzir), 2013b:494 (30 km SSW Koktal).

Dryudella albohirsuta Kazenas, 2000e:222, ♀. Objective synonym of *Dryudella albohirsuta* Kazenas, 2000c:187

2. *amenartais* (Pulawski)

Astata amenartais Pulawski, 1959:397, ♀, ♂. Holotype: ♀, Egypt: Kom Osheim on Cairo - Fayum road (originally W.J. Pulawski collection, now CAS). Paratype: Iraq (Charmina near Mossoul). – Pulawski, 1967a:389 (Turkey). – **As *Dryudella amenartais***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Dollfuss, 1989:9 (paratype in NHMW); Roche, 2007a:54 (in checklist of Egyptian Crabronidae), 2007b:3 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Ljubomirov and Yildirim, 2008:55 (in catalog of Crabronidae of Turkey); Yildirim, Ljubomirov, and Lelej, 2014:5 (distribution in Turkey by biogeographic provinces).

ssp. *elbae* (Pulawski)

Astata amenartais elbae Pulawski, 1959:402, ♂. Holotype: ♂, southeastern Egypt: Gebel Elba (originally W.J. Pulawski coll., now CAS). – **As *Dryudella elbae***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, new status, in checklist of world Sphecidae), 628 (the species status is by F. Parker); Roche, 2007a:52 (in checklist of Egyptian Crabronidae), 2007b:3 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae).

3. *aquitana* (Pulawski)

Astata aquitana Pulawski, 1970:105, ♂. Holotype: France: Landes: Mimizan (BMNH). – **As *Dryudella aquitana***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); K. Schmidt and Bitsch in Bitsch et al., 2001:180 (in Sphecid Fauna of Western Europe); Pagliano, 2011a:111 (two males under *Dryudella cincta* in coll. Spinola, Torino, are *Dryudella aquitana*); Fresno, 2017:149 (first record from Spain: Segovia: Lastras de Cuéllar).

4. *arabica* Schmid-Egger

Dryudella arabica Schmid-Egger, 2014:550, ♀, ♂. Holotype: ♂, United Arab Emirates: north of Ajman at 25.43°N 55.48°E (Ch. Schmid-Egger coll.). – Schmid-Egger, 2014:549, 550 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 550 (color photograph of female), 552 (color photographs of male).

5. *aralensis* Kazenas

Dryudella aralensis Kazenas, 2000c:187, ♂. Holotype: ♂, Kazakhstan: North Aral' Sea Region: 9 km northwest of Zhalanash (ZIN). – Kazenas, 2001:23 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:57 (geo-

graphic distribution, collecting localities in Kazakhstan); Mokrousov and Gromenko, 2015:126 (Uzbekistan: 20 km N village Pamuk at 39°7'49" N, 65°3'4" E).

Dryudella aralensis Kazenas, 2000e:222, ♂. Objective synonym of *Dryudella aralensis* Kazenas, 2000c:187.

6. *beaumonti* (Pulawski)

Astata beaumonti Pulawski, 1959:393, ♀, ♂. Holotype: ♀, Morocco: Marrakech: Oued Tensift (Lausanne). – Morocco, Algeria, Tunisia, Cyrenaica. – **As *Dryudella beaumonti***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Roche, 2007a:54 (in checklist of Egyptian Crabronidae), 2007b:3 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae).

7. *bella* (Cresson)

Astata bella Cresson, 1881:vi, ♂. Holotype: ♂, USA: California: San Diego (ANSP). – Cresson, 1887:276 (in catalog of North American Hymenoptera); Dalla Torre, 1897:651 (in catalog of world Sphecidae); Cresson, 1916:95 (holotype in ANSP); nec Krauss, 1944:93 and F. Williams, 1940a:364 (= *Dryudella immigrans*). – **As *Astata bellus***: Kohl, 1885:447 (new combination, in checklist of world *Astata*); W. Fox, 1892g:235 (in checklist of North American *Astata*), 1894a:548 (in revision of North American Larrinae); Ashmead, 1899d:330 (in checklist of North American Crabronidae); Cockerell, 1899a:144 (New Mexico). – **As *Dryudella bella***: F. Parker, 1969:974 (new combination, in revision of North American *Dryudella*); F. Parker in R. Bohart and Menke, 1976:214 (in checklist of world Sphecidae); Krombein, 1979b:1615 (in catalog of North American Hymenoptera); Amarante, 2002:7 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:663 (in checklist of Mexican Sphecidae).

8. *bidens* Kazenas

Dryudella bidens Kazenas, 2000c:189, ♀. Holotype: Central Kazakhstan: 80 km E Djezkazgan (ZIN). – Kazenas, 2001:23 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:57 (geographic distribution, collecting localities in Kazakhstan).

Dryudella bidens Kazenas, 2000e:225, ♀. Objective synonym of *Dryudella bidens* Kazenas, 2000c:189.

9. *bifasciata* (von Schulthess)

Astata bifasciata von Schulthess, 1926a:150, ♀, ♂. Syntypes: Tunisia: Kairouan (Zurich, NHMW). – von Schulthess, 1926b:213 (Tunisia, redescription); Guiglia, 1929:399 (Libya: Tripolitania: Homs), 1934b:301 (Libya: bibliography and summary of locality records); Maidl and Klima, 1939:11 (in catalog of world Astatinae and Bembicinae); Honoré, 1942:60 (Egypt: Abu Rawash, Gebel Asfar, Saqqara); de Beaumont, 1953g:130 (Morocco); Pulawski, 1959:402 (additional description, Egypt); de Beaumont, 1960:236 (Libya), 1968a:259 (Canary Islands); de Beaumont, Bytinski-Salz and Pulawski, 1973:3 (Israel); Báez and Ortega, 1978:191 (Canary Islands); Wolf, 1980:72 (Canary Islands). – **As *Dryudella bifasciata***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Al-Houty, 1989:160 (Kuwait: Erifjan); Guichard, 1991a:339 (Jordan); Hohmann, La Roche, Ortega, and Barquín, 1993:215 (detailed locality records from Canary Islands); Tormos, Asís, and Gayubo, 1994:188, 202 (Spain: Albacete Province: Fuensanta, first record from Europe); Roche, 2007a:54 (in checklist of Egyptian Crabronidae, redescription), 2007b:3 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); K. Schmidt and Bitsch in Bitsch et al., 2001:180 (in Sphecid Fauna of Western Europe); Al-Houty, 2011:89 (Kuwait: no specific locality); Schmid-Egger, 2014:549 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 553 (United Arab Emirates), 554 (color photographs of female), 555, 556 (color photographs of male).

10. *caerulea* (Cresson)

Astata caerulea Cresson, 1881:iv, ♂. Holotype: ♂, USA: Nevada: no specific locality (ANSP). – Cresson, 1887:276 (in catalog of North American Hymenoptera); Dalla Torre, 1897:653 (in catalog of world Sphecidae); Cresson, 1916:95 (holotype in ANSP); Johnson and Ledig, 1918:24 (California: Claremont); Maidl and Klima, 1939:27 (in catalog of world Astatinae and Bembicinae); Strickland, 1947:129 (Canada: Alberta: Medicine Hat); Townes in

Muesebeck et al., 1951:940 (in catalog of North American Hymenoptera). – **As *Astatus caeruleus***: Kohl, 1885a:447 (new combination, in checklist of world *Astatus*, as *coeruleus*); W. Fox, 1892g:235 (in checklist of North American *Astatus*), 1894a:548 (in revision of North American Larrinae); Ashmead, 1899d:330 (in checklist of North American Crabronidae). – **As *Dryudella caerulea***: F. Parker, 1969:967 (new combination, in revision of North American *Dryudella*); Horning and Barr, 1970:102 (USA: Idaho: Craters of the Moon National Monument); Alcock, 1974a:328 (nesting behavior); F. Parker in R. Bohart and Menke, 1976:214 (in checklist of world Sphecidae); Krombein, 1979b:1615 (in catalog of North American Hymenoptera); Radović, 1985:64 (sting apparatus analyzed); Rust, Menke, and Miller, 1985:46 (California: Channel Islands); Parks, 1986:34 (California: Torrey Pine State Reserve); Frommer, 1988:93 (California: Riverside County: Deep Canyon); Menke, 1994d:15 (California: Monterey County: Parkfield area); Evans, 1996:69 (tumulus, prey); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Amarante, 2002:7 (in catalog of Neotropical Crabronidae); Ruiz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:663 (in checklist of Mexican Sphecidae); Horta Vega, Pinson Domínguez, Barrientos Lozano, and Correa Sandoval, 2007: 45 (Mexico: Tamaulipas); Ratzlaff, 2016:23 (Canada: first record from British Columbia: Georgia Depression, Southern Interior, and Southern Interior Mountains), 30 (British Columbia: locality records).

11. *deserti* Schmid-Egger

Dryudella deserti Schmid-Egger, 2014:553, ♀, ♂. Holotype: ♂, United Arab Emirates: Jebel Hafit at 24.07°N 5575°E (Ch. Schmid-Egger coll.). – Schmid-Egger, 2014:547, 549 (in key to *Dryudella* of Arabian Peninsula and adjacent territories); Jacobs and Grabener, 2017:114 (in key to females of Palearctic *Dryudella* with red gaster base and without yellow maculation).

12. *dichoptica* Kazenas

Dryudella dichoptica Kazenas, 2000c:190, ♂. Holotype: ♂, eastern Kazakhstan: 12 km north of Zharma (ZIN). – Kazenas, 2001:24 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:57 (geographic distribution, collecting localities in Kazakhstan).

Dryudella dichoptica Kazenas, 2000e:225, ♂. Objective synonym of *Dryudella dichoptica* Kazenas, 2000c:190.

13. *elegans* (Cresson)

Astata elegans Cresson, 1881:vi, ♀, ♂. Lectotype: ♀, USA: Washington Territory: no specific locality (ANSP), designated by Cresson, 1916:95. – Cresson, 1887:276 (in catalog of North American Hymenoptera); Ashmead, 1890:33 (in checklist of Hymenoptera of Colorado); Dalla Torre, 1897:653 (in catalog of world Sphecidae); Townes in Muesebeck et al., 1951:940 (in catalog of North American Hymenoptera); Gittins, 1960:135 (Idaho). – **As *Astatus elegans***: Kohl, 1885:448 (new combination, in checklist of world *Astatus*); W. Fox, 1892g:235 (in checklist of North American *Astatus*), 1894a:547 (in revision of North American Larrinae); Ashmead, 1899d:330 (in checklist of North American Crabronidae); Cockerell, 1899a:144 (New Mexico). – **As *Dryudella elegans***: F. Parker, 1969:972 (new combination, in revision of North American *Dryudella*); F. Parker in R. Bohart and Menke, 1976:214 (in checklist of world Sphecidae); Krombein, 1979b:1616 (in catalog of North American Hymenoptera).

14. *erythrosoma* (Pulawski)

Astata erythrosoma Pulawski, 1959:407, ♀, ♂. Holotype: ♀, Morocco: Port Lyautey, now Kenitra (Zool. Mus. Lausanne). Paratype: Spain: Sierra Morena. – **As *Dryudella erythrosoma***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Mingo and Gayubo, 1986:1009 (distribution in Spain); K. Schmidt and Bitsch in Bitsch et al., 2001:181 (in Sphecid Fauna of Western Europe).

15. *esterinae* Pagliano

Dryudella esterinae Pagliano, 2001:257, ♀, ♂. Holotype: ♀, Italy: Sardegna: Calasetta on Isola San Antioco (G. Pagliano coll.). Paratypes: Corsica. – Pagliano, 2001:259, 260 (in key to Italian *Dryudella*); Pagliano and

Negrisol, 2005:105 (in Sphecidae Fauna of Italy); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:458 (species recently described from Sardinia and Corsica, recognition characters); .

16. *femoralis* (Mocsáry)

Astata femoralis Mocsáry, 1877:89, ♂. Holotype or syntypes: ♂, Hungary: regio subalpina, no specific locality but probably current Slovakia (TMB). – Kohl, 1883e:672 (Switzerland); Krieger, 1894:11 (Czech side of Erzgebirge); Gussakovskij, 1927:280 (in revision of Palearctic *Astata*); Zavadil, 1932:96 (Czechoslovakia, as *Astata stigma* var. *femoralis*); Maidl and Klima, 1939:24 (in catalog of world Astatinae and Bembicinae); de Beaumont, 1942:410 (Switzerland: Alpes and Jura; in revision of *Astata* of Switzerland), 415 (French specimens recorded by Berland, 1925, probably are *Astata femoralis*); Zavadil, 1946:8 (first record from Czechoslovakia: Ostrava area); Carl and de Beaumont, 1947:68 (Switzerland: Graubünden = Grisons Canton: Swiss National Park); Šnoflak in Zavadil and Šnoflak, 1948:62, 64 (in key to Sphecidae of Czechoslovakia); Blüthgen, 1949:89 (Germany: Bayern: Schmelz); Noskiewicz and Chudoba, 1949:423 (Poland: Dolny Śląsk: Jagniątków and Sobieszów in Karkonosze Mountains, Legnica area, comparison with *Astata stigma*); Verhoeff, 1951:162 (in revision of European *Dryudella*); Nouvel and Ribaut, 1953:179 (France: Hautes-Pyrénées: Orédon); Puławski, 1956:68 (in revision of European Astatinae); Hellén, 1956:45 (recorded from Finland); Bajári, 1957a:63, 64 (in key to Hungarian Sphecidae, not yet found in Hungary); de Beaumont, 1958c:205 (Swiss National Park), 1959a:26 (Italy: Abruzzi); Wolf, 1959b:23 (known from Germany, but not from Nassau); Noskiewicz and Puławski, 1960:114, 116 (in key to Polish Sphecidae); Babiý, 1964:114 (Austria: Land Salzburg); de Beaumont, 1964c:70 (in Sphecidae Fauna of Switzerland); Wolf, 1971:374 (Italy: Trentino–Alto Adige: Alpi Siusi); Balthasar, 1972:293 (in Sphecidae Fauna of Czechoslovakia); Kofler, 1972:107 (Austria: eastern Tirol); Niedl and Deneš, 1972:153 (Czechoslovakia); Pulawski, 1978:230, 231 (in key to Sphecidae of European part of former USSR); Scobiola-Palade, 1987:65 (Romania: Dobrogea; as *stigma* f. *femoralis*); Schedl, 1982:101 (Austria: Tirol: Ötztaler Alps); Pádr in Šedivý, 1989:168 (in checklist of Czechoslovakian Sphecidae); Haris, 2016:16 (in list of species described by S. Mocsáry from Carpathian Basin). – **As *Astata stigma* var. *femoralis***: Kohl, 1885a:434 (new status, in key to European *Astata*), 441 (new status; as *Astata*), 1888b:728 (Austria: Tirol, now Italy: Alto Adige; as *Astata*); Dalla Torre, 1897:656 (in catalog of world Sphecidae); Mocsáry, 1897:78 (Kingdom of Hungary, localities are in today's Slovakia and Slovenia); Móczár and Henter, 1907:205 (Romania: Caraş-Severin: Mehadia); nec O. Meyer, 1919:150 (Germany: Posen Province, now Poland: Poznań Region), 155 (= *Dryudella pinguis*?). – **As *Dryudella femoralis***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Pagliano, 1980:113 (Italy: Piemonte); Dollfuss, 1983b:9 (in catalog of Sphecidae of Austria), 1987:20 (Austria); Pagliano, 1989:362 (first record from Italy: Piemonte, redescription); Wickl and Wickl, 1989:79 (Germany: northeastern Bayern: Luhe); Pagliano, 1990:65 (in catalog of Italian Sphecidae); Schwammberger and Priesner, 1990:539 (Austria: Kärnten); Dollfuss, 1991:95 (in key to Sphecidae of North and Central Europe); Gayubo, Borsato, and Osella, 1991:400 (Italy: Piemonte: Val Pellice); Gusenleitner, 1991:645 (Austria: Oberösterreich); Wickl and Wickl, 1994:194 (Germany: Bayern: Oberpfalz: Höhengau, Luhe); Gusenleitner, 1995:161 (Austria: Oberösterreich); Negrisol in Minelli, Ruffo, and La Posta, 1995b:3 (in catalog of Italian fauna); H.J. Schulz, 1995:8 (Germany: Saxony: Oberlausitz: mount Lausche); Schmid-Egger, Schmidt, and Doczkal, 1996:376 (Germany: Bayern: endangered because of low population levels); Celary, 1997:58 (in checklist of Animals of Poland); Schmidt and Schmid-Egger, 1997:13 (in checklist of German Sphecidae); Celary, 1998a:106 (Poland: Babia Góra National Park), 1998b:210 (Poland: Babia Góra National Park); Ljubomirov, 1999b:49 (Bulgaria: Mount Vitosha near Sofia); Neumayer, Schwarz, and Bregant, 1999:224 (Austria: in checklist of Sphecidae of Land Kärnten); Blösch, 2000:215 (in Sphecidae Fauna of Germany); Pagliano, 2001:259, 260 (in key to Italian *Dryudella*); K. Schmidt and Bitsch in Bitsch et al., 2001:183 (in Sphecidae Fauna of Western Europe); Ohl et al., 2001:139 (distribution in Germany by provinces); Bieri, 2002:72 (Liechtenstein); Gusenleitner, 2002:1124 (Austria: Oberösterreich: Hochrinnerboden and Offensee); Drewes, 2003:136 (Austria: Tirol: Hintertux); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:65 (in catalog of wasps and

bees of Bayern, Germany); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:197 (Germany: Bayern: probably endangered); Hellrigl, 2004a:173 (Italy: Trentino-Alto Adige, as Südtirol: Vinschgau = Val Venosta: Sulden); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:355 (in catalog of Polish Crabronidae); Wiśniowski, 2004:43 and 60 (in checklist of Polish Sphecidae); Burger, 2005:32 (Germany: Thüringen); Jacobs, 2005a:444 (Bulgaria: Sandanski, Troyanska Planina south of Troyan); Kofler, 2005:172 (Austria: Kärnten: Großkirchenheim Sadnig and Mallnitz Jamnig in Mölltal Common; Tirol: Lienz District: several localities); Pagliano and Negrisolò, 2005:103 (in Sphecid Fauna of Italy); Dvořák, Bogusch, and Smetana, 2006:103 (Czech Republic: Sumava = Bohemian Forest); Dvořák, Straka, Smetana, Halada, Vepřek, and Karas, 2007:168 (Czech Republic: Vyšenské Kopce National Nature Reserve); Jacobs, 2007:90, 91 (in key to Crabronidae of Germany); Vepřek and Straka, 2007:202 (in catalog of Sphecidae of Czech Republic and Slovakia); Dvořák, Bogusch, and Smetana, 2009:81 (Czech Republic: Králický Sněžník National Nature Reserve); Pagliano, 2009:177 (Italy: recorded from Trentino-Alto Adige by Hellrigl, 2004); Straka, Dvořák, and Bogusch, 2009:260 (Czech Republic: Jizerské Mountains and Frýdlant region); Schmid-Egger, 2010a:15 (in red list of Aculeata of Germany: extremely rare); Gogala, 2011:14 (Slovenia); Schmid-Egger, 2011a:37 (France: Parc National du Mercantour: Colde Cayolle, Le Pra, Millefontes; Italy: Parco delle Alpi Marittime: Lago Rovino), 2011c:555 (Austria: Tirol: Tiroler Lech Nature Park); Tischendorf, Frommer, Flügel et al., 2011:182 (Germany: not found in Hessen, but possibly occurring there); Bitsch, Grouet, and Savina, 2013:292 (France: Pyrénées centrales: département d'Ariège: Ascou-Pailhères); Bitsch, 2014:397 (recent records from Bulgaria and France reported; France: Ariège: Ascou-Pailhères).

As *Astata frontalis*: de Gaulle, 1908:121 (in catalog of French Hymenoptera), present correction based on geographic distribution of *frontalis*.

17. *flavoundata* (Arnold)

Astata flavoundata Arnold, 1923c:38, ♂ (as *flavo-undata*, incorrect original hyphenation, as Brauns's manuscript name). Holotype: ♂, South Africa: Eastern Cape Province: Algoa Bay near Port Elizabeth (TMP). – Arnold, 1930:8 (in checklist of Afrotropical Sphecidae); Maidl and Klima, 1939:18 (in catalog of world Astatinae and Bembicinae). – As *Dryudella flavoundata*: F. Parker *in* R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Gess, 1981:19 (South Africa: 18 km westnorthwest of Grahamstown; nesting in friable soils).

Diploplectron africanum Arnold, 1923c:45, ♀. Holotype: ♀, Zimbabwe: Sawmills (SAMC). Synonymized with *Astata flavoundata* by Arnold, 1927:118. – Arnold, 1924:38 (Zimbabwe: Bulawayo area).

Astata flavoundata var. *quadrisignata* Arnold, 1924:36, ♂. Holotype: ♂, Zimbabwe: Bulawayo (SAMC). Synonymized with *Dryudella flavoundata* by F. Parker *in* R. Bohart and Menke, 1976:214. – Maidl and Klima, 1939:19 (in catalog of world Astatinae and Bembicinae); Hancock, Chahwanda, and Mhlanga, 1995:37 (paratypes in Bulawayo Museum).

18. *freygessneri* (Carl)

As *Astata stigma*: Frey-Gessner, 1913:151 (prey: *Palomena prasina* L., a pentatomid), corrected to *Astata freygessneri* by Carl, 1920:100.

Astata freygessneri Carl, 1920:100, ♂, ♀ (as *frey-gessneri*, incorrect original hyphenation). Syntypes: Switzerland: Valais: Vissoie, Sidiers, Evolène (MHNG). – Gussakovskij, 1927:278 (as synonym of *Astata stigma*); de Beaumont, 1942:410 (as *stigma* var. *freygessneri*, in revision of *Astata* of Switzerland); Verhoeff, 1951:162 (in revision of European *Dryudella*); Pulawski, 1956:69 (in revision of European Astatinae); Evans, 1958b:180 (reference to prey record by Verhoeff, 1951); de Beaumont, 1958:205 (Switzerland), 1959a:25 (Italy: Sicilia: Etna); Noskiewicz and Puławski, 1960:114, 115 (in key to Polish Sphecidae, not yet found in Poland); de Beaumont, 1964c:70 (in Sphecid Fauna of Switzerland); Pulawski, 1967a:389 (Turkey); Balthasar, 1972:294 (in Sphecid Fauna of Czechoslovakia: may be expected in the country); Simon-Thomas, 1972:181 (France: Landes; probably a misidentification; as *frey-gessneri*); Steinmann, 1983:164 (Switzerland: Graubünden Canton, nesting next to wood buildings). – As

Dryudella freygessneri: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Pagliano, 1989:362 (Italy: Piemonte, Sicilia; redescription), 1990:65 (in catalog of Italian Sphecidae); Dollfuss, 1991:95 (in key to Sphecidae of North and Central Europe); Negrisolò in Minelli, Ruffo, and La Posta, 1995b:3 (in catalog of Italian fauna); Blösch, 2000:215 (in Sphecid Fauna of Germany); Pagliano, 2001:259, 260 (in key to Italian *Dryudella*); K. Schmidt and Bitsch in Bitsch et al., 2001:183 (in Sphecid Fauna of Western Europe); Gayubo, Özbek, and Yıldırım, 2003:86 (Turkey: Erincan: Bahce; Erzurum: Oltur: Süngübayır); Schmid-Egger, 2003:752 (Italy: Sicilia: Etna, citation after Bitsch et al., 2001:183); Pagliano and Negrisolò, 2005:103 (in Sphecid Fauna of Italy); Jacobs, 2007:90, 91 (in key to Crabronidae of Germany, not yet found in Germany); Ljubomirov and Yıldırım, 2008:55, 56 (in catalog of Crabronidae of Turkey); Schmid-Egger, 2011a:37 (France: Parc National du Mercantour: Mollières); Bitsch, 2014:397 (record from France by Schmid-Egger, 2011a reported; France: Landes: Morcenx); Yıldırım, Ljubomirov, and Lelej, 2014:5 (distribution in Turkey by biogeographic provinces).

19. *frontalis* (Radoszkowski)

Astata frontalis Radoszkowski, 1877:31, ♂. Holotype: ♂, Tajikistan: Varsaminor (ZMMU). – Dalla Torre, 1897:653 (in catalog of world Sphecidae); nec de Gaulle, 1908:121 (= *Dryudella femoralis*); Maidl and Klima, 1939:25 (in catalog of world Astatinae and Bembicinae); Pulawski, 1957:86 (redescription); Kazenas, 1978b:98, 101 (in key to Sphecidae of Kazakhstan and Central Asia). – **As *Astata frontalis***: Kohl, 1885:446 (original description copied), 448 (new combination, in checklist of world *Astata*); Gussakovskij, 1927:277 (description of ♀; in revision of Palearctic *Astata*). – **As *Dryudella frontalis***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Islamov, 1986:524 (Uzbekistan: Tashkent Oblast: Khumsan); Kazenas, 2000e:228 (in Sphecid Fauna of Kazakhstan), 2001:24 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2004b:102 (Kazakhstan: western Tien Shan).

20. *immigrans* (F. Williams)

As *Astata bella*: F. Williams, 1940a:364 (first record from Hawaiian Islands: Oahu) and Krauss, 1944:93 (Hawaii: Island of Molokai), corrected to *Astata immigrans* by F. Williams, 1946:641.
Astata immigrans F. Williams, 1946:641: ♀, ♂. Holotype: Hawaii: Oahu: Honolulu (Bishop Mus.). – Townes in Muesebeck et al., 1951:940 (in catalog of North American Hymenoptera); Evans, 1958b:178 (discussion of behavioral observations by Williams, 1946), 1958c:110 (larva's description by Williams, 1946); Krombein, 1958f:186 (in supplement to catalog of North American Hymenoptera: California); Yoshimoto, 1960:336 (Hawaiian Islands). – **As *Dryudella immigrans***: F. Parker, 1969:974 (new combination, in revision of North American *Dryudella*; western USA south to Chiapas Province of Mexico); F. Parker in R. Bohart and Menke, 1976:214 (in checklist of world Sphecidae); Krombein, 1979b:1616 (in catalog of North American Hymenoptera); Steiner, 1986:100 (references to papers on nesting habits); Amarante, 2002:7 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:663 (in checklist of Mexican Sphecidae); Ratzlaff, 2016:23 (first record from Canada: British Columbia: Southern Interior), 30 (British Columbia: Lillooet, Penticon).

21. *kaplini* Kazenas

Dryudella kaplini Kazenas, 2000b:458, ♀, ♂. Holotype: ♀, Turkmenistan: Repetek (Zool. Inst. Alma-Ata). – Kazenas, 2001:24 (in checklist of Sphecidae of Kazakhstan and Central Asia).

22. *kaszabi* (Tsuneki)

Astata kaszabi Tsuneki, 1971:414, ♂. Holotype: ♂, Mongolia: Central Aymag: Songino (TMB). – **As *Dryudella kaszabi***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae).

23. *kazakhstanica* Kazenas

Dryudella kazakhstanica Kazenas, 2000e:225, ♀. Holotype: ♀, Kazakhstan: Zhanatas in Karatau Range (ZIN). – Esenbekova and Kazenas, 2000:24 (southeast Kazakhstan: 30 km southsouthwest of Koktal, near Zhanatas); Kazenas, 2002a:57 (geographic distribution, collecting localities in Kazakhstan, as name *in litteris*), 2004b:102 (Kazakhstan: western Tien Shan), 2008a:100 (southeastern Kazakhstan: Ili River valley: 30 km southwest of Koktal), 2013b:494 (southeast Kazakhstan: 30 km southsouthwest of Koktal), 2014a:133 (Kazakhstan: Karatau Mountain Range).

Dryudella kazakhstanica Kazenas, 2001c:744, ♀. Objective synonym of *Dryudella kazakhstanica* Kazenas, 2000c:190.

24. *lineata* Mocsáry

Dryudella lineata Mocsáry, 1879:128, ♂. Holotype or syntypes: ♂, Hungary: Grebenáč, now Serbia: Grebenac (TMB). – Kohl, 1885:443 (as synonym of *Astata tricolor*); Balthasar, 1972:292 (in Sphecidae Fauna of Czechoslovakia); F. Parker in R. Bohart and Menke, 1976:215 (as synonym of *Dryudella tricolor*); Józán, 1986:369 (Hungary: Kiskunság National Park); Dollfuss, 1991:96 (in key to Sphecidae of North and Central Europe); Esenbekova and Kazenas, 2000:24 (southeast Kazakhstan: 30 km north of and 12 km west of Almas Ata, near Bakanas, 65 km W Bakanas, 45 km Chinghil'dy, 5-35 km northeast of Kapchagay); Kazenas, 2000e:231 (in Sphecidae Fauna of Kazakhstan), 2001:24 (in checklist of Sphecidae of Kazakhstan and Central Asia); K. Schmidt and Bitsch in Bitsch et al., 2001:184 (in Sphecidae Fauna of Western Europe); Kazenas, 2002a:57 (geographic distribution, collecting localities in Kazakhstan); Lukáš, 2003:73 (Slovakia: Bratislava: old fruit orchard); Vepřek and Straka, 2007:202 (in catalog of Sphecidae of Czech Republic and Slovakia, known from Moravia and Slovakia only), 221 (first recorded from Moravia by Vepřek, 2000); Mokrousov, 2010a:60 (Russia: Nizhniy Novgorod Oblast', Chuvash Republic: no specific localities), 2010b:100 (Russia: Nizhniy Novgorod Oblast' no specific locality), 2010c:107 (Russia: Chuvash Republic: National Park “Chavash varmane”); Smetana, Roller, Beneš, Bogusch, Dvořák, Holý, Karas, Macek, Straka, Šima, Tyrner, Vepřek, and Zeman, 2010:88 (Western Slovakia: Borská Nižina), 101 (Western Slovakia: recorded from Borská Nižina); Mokrousov, Berezin, and Egorov, 2011:66 (Russia: Chuvash Republic); Józán, 2011:180 (in checklist of Sphecidae s.l. of Hungary); Mokrousov, Ruchin, and Egorov, 2013:199 (Russia: Mordovian Republic: Mordovian State Nature Reserve); Haris, 2016:16 (in list of species described by S. Mocsáry from Carpathian Basin); Nemkov, 2017b:218 (in catalog of Astatinae of Russia). – **As *Astata tricolor* var. *lineata***: Zavadil, Šustera, and Bat'a, 1937:206 (new combination, new status, in catalog of Sphecidae of Czechoslovakia). – **As *Astata lineata***: de Beaumont, 1942a:411 (Switzerland: Peney near Geneva; in revision of *Astata* of Switzerland); Šnoflak in Zavadil and Šnoflak, 1948:62, 64 (in key to Sphecidae of Czechoslovakia); Pulawski, 1956:63 (as synonym of *Astata tricolor*); Bajári, 1957a:63, 65 (in key to Hungarian Sphecidae); Balthasar and Hrubant, 1961:14 (Slovakia: Čenkov, Chotín); Benedek, 1968:73 (Hungary, visiting flowers of *Angelica silvestris* L.), 1969a:83 (marshy meadow); Scobiola-Palade, 1985:96 (Romania: delta of Danube); Pádr in Šedivý, 1989:168 (in checklist of Czechoslovakian Sphecidae); Scobiola-Palade, 1989:87 (Romania: delta of Danube); Vepřek, 2000:234 (Czech Republic: Moravia: Bzenec).

25. *lucinda* (Nurse)

Astata lucinda Nurse, 1904:25, ♂. Syntypes: Pakistan: Quetta (BMNH). – Ramakrishna Aiyar, 1916:551 (in catalog of Indian aculeates described after Bingham, 1897); Maidl and Klima, 1939:20 (in catalog of world Astatinae and Bembicinae); R. Bohart and Menke, 1976:212 (in checklist of world Sphecidae).

NOTE: This species clearly is a *Dryudella*: the original description mentions a yellow frontal spot.

26. *maculifrons* (Cameron)

Astata maculifrons Cameron, 1899c:149, ♂. Holotype or syntypes: ♂, India: Uttarakhand: Mussoorie Hills (OXUM). – Bingham, 1897:183 (redescription); Dalla Torre, 1897:654 (in catalog of world Sphecidae); R. Turner, 1917e:193 (synonymy); Maidl and Klima, 1939:20 (in catalog of world Astatinae and Bembicinae). – **As *Dryudella maculi-***

frons: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); S. Gupta, 1995:85 (India: Uttar Pradesh); Wu and Zhou, 1996a:69 (in revision in Economic Insect Fauna of China); Hua, 2006:279 (in list of Chinese insects, geographic distribution).

27. *maroccana* (Giner Marí)

Astata maroccana Giner Marí, 1946:14, ♀, ♂. Syntypes: Morocco: Mogador (MNCN). – Giner Marí, 1946:8 (in list of Moroccan *Astata* and *Dryudella*). – **As *Dryudella maroccana***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae).

var. *melanica* (Giner Marí)

Astata maroccana var. *melanica* Giner Marí, 1946:15, ♀, ♂. Syntypes: Morocco: Mogador (MNCN). – Giner Marí, 1946:8 (citation). – **As *Dryudella melanica***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, as tentative synonym of *Dryudella maroccana*).

28. *millsi* Cockerell

Dryudella millsi Cockerell, 1914:32, ♀. Holotype: ♀, Colorado: Long's Peak (ANSP). – F. Parker, 1969:970 (in revision of North American *Dryudella*); F. Parker in R. Bohart and Menke, 1976:215 (in checklist of world Sphecidae); Krombein, 1979b:1616 (in catalog of North American Hymenoptera). – ***Astata millsi***: Maidl and Klima, 1939:28 (new combination, in catalog of world Astatinae and Bembicinae); Townes in Muesebeck et al., 1951:940 (in catalog of North American Hymenoptera).

29. *mitjaevi* Kazenas

Dryudella mitjaevi Kazenas, 2000e:231, ♂. Holotype: ♂, Kazakhstan: Ili River valley 15 km east of Ayak-Kalkan (ZIN). – Esenbekova and Kazenas, 2000:25 (southeast Kazakhstan: 15 km east of Ayak-Kalkan, 65 km west of Bakanas, 3 km northeast of Borandysu); Kazenas, 2002a:58 (geographic distribution, collecting localities in Kazakhstan, as name *in litteris*), 2008a:100 (Southeastern Kazakhstan: Ili River valley: 65 km west of Bakanas, 15 km east of Ayak-Kalkan).

Dryudella mitjaevi Kazenas, 2001b:745, ♂. Objective synonym of *Dryudella mitjaevi* Kazenas, 2000e:231.

30. *mongolica* (Tsuneki)

Astata mongolica Tsuneki, 1971l:413, ♂, ♀. Holotype: ♂, Mongolia: Arkhangay Aymag: Khangay Mountains (TMB). – **As *Dryudella mongolica***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Nemkov in Nemkov, Kazenas, Budrys, et Antropov, 1995:408 (as tentative synonym of *Dryudella pinguis*, as *mongolicus*).

31. *montana* (Cresson)

Astata montana Cresson, 1881:v, ♀. Lectotype: ♀, USA: Nevada: no specific locality (ANSP), designated by Cresson, 1916:96. – Cresson, 1887:276 (in catalog of North American Hymenoptera); Ashmead, 1890:33 (in checklist of Hymenoptera of Colorado); Dalla Torre, 1897:654 (in catalog of world Sphecidae); Maidl and Klima, 1939:22 (in catalog of world Astatinae and Bembicinae); Townes in Muesebeck et al., 1951:94? (in catalog of North American Hymenoptera); Gittins, 1960:135 (Idaho). – **As *Astatus montanus***: Kohl, 1885:448 (new combination, in checklist of world *Astatus*); W. Fox, 1892g:235 (in checklist of North American *Astatus*), 1894a:546 (in revision of North American Larrinae); Ashmead, 1899d:330 (in checklist of North American Crabronidae). – **As *Dryudella montana***: Evans, 1963b:236 (new combination, nesting behavior); F. Parker, 1969:968 (in revision of North American *Dryudella*); Evans, 1970:488 (Wyoming: Jackson Hole); Horning and Barr, 1970:102 (USA: Idaho: Craters of the Moon National Monument); Alcock, 1974a:324 (nesting behavior); F. Parker in R. Bohart and Menke, 1976:214 (in checklist of world Sphecidae); Krombein, 1979b:1616 (in catalog of North American Hymenoptera); Spofford, Kurczewski, and Downes, 1989:259 (reference to publication on nest parasite *Senotainia trilineata* (Wulp), a

miltogrammine fly); Finnamore, 1997:887 (Canada: Yukon); Ratzlaff, 2016:23 (first record from Canada: British Columbia: Boreal Plains, Northern Boreal Mountains, Southern Interior), 30 (British Columbia: locality records).

Diploplectron florissantense Rohwer, 1909a:122, ♀ (as *florissantensis*, incorrect original termination). Holotype or syntypes: ♀, USA: Colorado: Teller County: Florissant (USNM). Synonymized with *Dryudella montana* by F. Parker, 1969:968. – Maidl and Klima, 1939:28 (in catalog of world Astatinae and Bembicinae). – **As *Astata florissantensis***: Krombein, 1939:137 (new combination, as *florissantense*); Townes in Muesebeck et al., 1951:940 (in catalog of North American Hymenoptera).

32. *monticola* (Giner Marí)

Astata tricolor var. *monticola* Giner Marí, 1945d:68, ♀, ♂. Syntypes: Spain: Segovia Province: San Rafael and Teruel Province: Bronchales (MNCN). – Ceballos, 1956:374 (in catalog of Hymenoptera of Spain). – **As *Astata monticola***: de Beaumont, 1962b:38 (new status, redescription); F. Parker in R. Bohart and Menke, 1976:214 (as new synonym of *Dryudella tricolor*). – **As *Dryudella monticola***: Gayubo, García, Torres, and González, 1999:89 (new combination, new status, Spain: Soria Province); K. Schmidt and Bitsch in Bitsch et al., 2001:185 (in Sphecidae Fauna of Western Europe); Fresno, 2017:149 (Spain: León: Rodiezmo and Sena de Luna).

33. *nephertiti* (Pulawski)

Astata nephertiti Pulawski, 1959:382, ♀, ♂. Holotype: ♀, Egypt: Abydos (originally W.J. Pulawski coll., now CAS). – **As *Dryudella nephertiti***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Roche, 2007a:56 (in checklist of Egyptian Crabronidae), 2007b:3 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Gadallah, Al Dhafer, Aldryhim, Fadl, and Elgharbawy, 2013:347 (in new catalog of Sphecidae of Saudi Arabia: Hutet Beni Tamim 180 km south of El Riyadh); Schmid-Egger, 2014:547, 549 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 553 (United Arab Emirates), 557 (color photographs of female); Jacobs and Grabener, 2017:114 (in key to males of Palearctic *Dryudella* with black frons and to females of Palearctic *Dryudella* with red gaster base and without yellow maculation).

34. *nuristanica* (Balthasar)

Astata nuristanica Balthasar, 1957b:186, ♀. Holotype: ♀, Afghanistan: Nuristan: Bashgul Valley: Akhmede Devane (originally V. Balthasar coll., now NMPC). – **As *Dryudella nuristanica***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Dunford, Turbyville, and Leavengood, 2014:9 (listed as medically important in Afghanistan).

35. *obo* (Tsuneki)

Astata obo Tsuneki, 1971i:417, ♂. Holotype: ♂: Mongolia: Central Aymag: Songino (TMB). – **As *Dryudella obo***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae).

36. *opaca* (Pulawski)

Astata opaca Pulawski, 1959:412, ♀, ♂. Holotype: ♀, Egypt: Abu Rawash northwest of Cairo (originally W.J. Pulawski coll., now CAS). – **As *Dryudella opaca***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Roche, 2007a:55 (in checklist of Egyptian Crabronidae), 2007b:3 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae); Schmid-Egger, 2014:549 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 558 (United Arab Emirates).

37. *orientalis* (F. Smith)

Astata orientalis F. Smith, 1856:310, ♂. Holotype: India (may be Pakistan): no specific locality (BMNH). – F. Smith, 1871a:366 (in catalog of Oriental Aculeata); Cameron, 1889c:150 (India: Nischindipore); Bingham, 1897:183 (redescription); Maidl and Klima, 1939:20 (in catalog of world Astatinae and Bembicinae); Giner Marí, 1945c:853 (India: Maharashtra: Khandala; redescription); Pulawski, 1975a:320 (diagnostic characters). – **As *Astata orientalis***

is: Kohl, 1885:448 (new combination, in checklist of world *Astata*). – **As *Dryudella orientalis***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae).

Astata interstitialis Cameron, 1907a:1010, "♀" = ♂. Lectotype: ♂, India: Gujarat: Deesa (BMNH), designated by Pulawski, 1975a:321. Synonymized with *Astata orientalis* by Meade Waldo in Meade Waldo, Morley, and Turner, 1915:336, synonymy confirmed by Pulawski, 1975a:321. – Nurse, 1909:511 (holotype is a ♂); Ramakrishna Aiyar, 1916:551 (in catalog of Indian aculeates described after Bingham, 1897); R. Turner, 1917e:193 (as synonym of *Astata maculifrons*).

38. *osiriaca* (Pulawski)

Astata osiriaca Pulawski, 1959:389, ♀. Holotype: ♀, Egypt: Abydos (originally W.J. Pulawski coll., now CAS). – **As *Dryudella osiriaca***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Roche, 2007a:55 (in checklist of Egyptian Crabronidae), 2007b:3 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae).

ssp. ammochtona (Pulawski)

Astata osiriaca ammochtona Pulawski, 1959:391, ♀. Holotype: Egypt: Dakla oasis (originally W.J. Pulawski coll., now CAS). – **As *Dryudella ammochtona***: F. Parker in R. Bohart and Menke, 1976:213 (new combination, new status, in checklist of world Sphecidae), 628 (the species status is by F. Parker); Roche, 2007a:54 (in checklist of Egyptian Crabronidae), 2007b:3 (in checklist of Egyptian Ampulicidae, Sphecidae, and Crabronidae).

39. *paulinae* Jacobs and Grabener

Dryudella paulinae Jacobs and Grabener, 2017:113, ♀, ♂. Holotype: ♂, Morocco: Taojgalt at 31.388°N 6.325°W (DEI). – Jacobs and Grabener, 2017:114 (in key to males of Palearctic *Dryudella* with black frons and to females of Palearctic *Dryudella* with red gaster base and without yellow maculation).

40. *pernix* F. Parker

Dryudella pernix F. Parker, 1969:972, ♀, ♂. Holotype: ♂, USA: California: Imperial County: Glamis (UCD). Paratypes: Arizona, New Mexico, Texas. – F. Parker in R. Bohart and Menke, 1976:215 (in checklist of world Sphecidae); Krombein, 1979b:1616 (in catalog of North American Hymenoptera); Amarante, 2002:7 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:663 (in checklist of Mexican Sphecidae); Amarante, 2005a:8 (in correction to his 2002 catalog of Neotropical Crabronidae and Sphecidae).

41. *picta* (Kohl)

Astata pictus Kohl, 1888a:146, ♂. Holotype or syntypes: ♂, Mexico: Mazatlán: no specific locality (NHMW). – Ashmead, 1899d:330 (in checklist of North American Crabronidae, as *picta*). – **As *Astata picta***: Dalla Torre, 1897:654 (new combination, in catalog of world Sphecidae); Maidl and Klima, 1939:23 (in catalog of world Astatinae and Bembicinae). – **As *Dryudella picta***: F. Parker, 1969:970 (new combination, in revision of North American *Dryudella*); Steiner, 1973:23 (Canada: Northwest Territories); F. Parker in R. Bohart and Menke, 1976:215 (in checklist of world Sphecidae); Krombein, 1979b:1616 (in catalog of North American Hymenoptera); Steiner, 1986:100 (references to papers on nesting habits); Dollfuss, 1989:9 (type material in NHMW); Finnamore, 1997:894 (expected to occur in Yukon); Amarante, 2002:7 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:663 (in checklist of Mexican Sphecidae); Ratzlaff, 2016:23 (Canada: first record from British Columbia: Southern Interior and Southern Interior Mountains), 30 (British Columbia: locality records).

Astata kohli Cameron, 1890a:68, ♀. Holotype: ♀, Mexico: Durango: Ventana (BMNH). Synonymized with *Dryudella picta* by F. Parker, 1969:970. – Dalla Torre, 1897:653 (in catalog of world Sphecidae, as *kohlii*); Maidl and Klima, 1939:22 (in catalog of world Astatinae and Bembicinae). – **As *Astata kohlii***: Ashmead, 1899d:330 (new combination, in checklist of North American Crabronidae).

Astutus asper W. Fox, 1894a:546, ♀, ♂. Lectotype: ♀, USA: Montana: no specific locality (ANSP), designated by Cresson, 1928:43. Synonymized with *Dryudella picta* by F. Parker, 1969:970. – Ashmead, 1899d:329 (in checklist of North American Crabronidae); Cockerell, 1899a:144 (New Mexico); H. Smith, 1908b:336 (in revision of Nebraskan Sphecidae); Mickel, 1918b:426 (in catalog of Nebraskan Sphecidae). – *As Astata aspera*: Dalla Torre, 1897:651 (new combination, in catalog of world Sphecidae); Maidl and Klima, 1939:21 (in catalog of world Astatinae and Bembicinae); Strickland, 1947:129 (Canada: Alberta); Townes in Muesebeck et al., 1951:940 (in catalog of North American Hymenoptera); Gittins, 1960:135 (Idaho). – *As Dryudella aspera*: Horning and Barr, 1970:102 (new combination, USA: Idaho: Craters of the Moon National Monument); S. Frommer, 1988:93 (California: Riverside County: Deep Canyon).

Astata asperiformis Rohwer, 1909f:371, ♂. Syntypes: ♂, USA, Colorado: Boulder and Fort Collins (USNM). Synonymized with *Dryudella picta* by F. Parker, 1969:970. – Maidl and Klima, 1939:21 (in catalog of world Astatinae and Bembicinae); Townes in Muesebeck et al., 1951:940 (in catalog of North American Hymenoptera).

42. *picticornis* (Gussakovskij)

Astutus picticornis Gussakovskij, 1927:277, ♂. Syntypes: ♂, Moldova: Kiili (ZIN). – *As Astata picticornis*: Maidl and Klima, 1939:25 (new combination, in catalog of world Astatinae and Bembicinae); Pulawski, 1956:64 (in revision of European Astatinae based on original description), 1958a:174 (Bulgaria: Varna, redescription); Balthasar, 1972:295 (in Sphecid Fauna of Czechoslovakia: may be expected in the country); Pulawski, 1978:231 (in key to Sphecidae of European part of former USSR);. – *As Dryudella picticornis*: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Esenbekova and Kazenas, 2000:25 (southeast Kazakhstan: 20 km southeast of Chingil'da, near Kapchagay); Kazenas, 2000e:234 (in Sphecid Fauna of Kazakhstan); Ljubomirov, 2000:9 (Bulgaria: Pancharevo near Sofia, a ♀ in N. Nedelkov collection); K. Schmidt and Bitsch in Bitsch et al., 2001:185 (in Sphecid Fauna of Western Europe); Kazenas, 2002a:58 (geographic distribution, collecting localities in Kazakhstan), 2004b:102 (Kazakhstan: western Tien Shan); Shorenko and Konovalov, 2010:13 (first record from Ukraine: Khar'kiv Oblast': Sakhnovshchinsk District: no specific locality); Yildirim, 2012:75 (Turkey: Erzurum: Oltu: Sarisaz); Kazenas, 2014a:134 (Kazakhstan: Karatau Mountain Range); Yildirim, Ljubomirov, and Lelej, 2014:5 (distribution in Turkey by biogeographic provinces); Nemkov, 2017b:218 (in catalog of Astatinae of Russia).

43. *pinguis* (Dahlbom)

Larra pinguis Dahlbom, 1832:50, ♀. Lectotype: ♀, Sweden: Island of Öland: no specific locality (Lund), designated by Verhoeff, 1951:156. – Zetterstedt, 1838:436 (in revision of insects of Lapland). – *As Astutus pinguis*: Kohl, 1885:440 (new combination, as new synonym of *Astutus stigma*). – *As Astata pinguis*: Dahlbom, 1943:139 (new combination, as new synonym of *Astata stigma*); Blüthgen, 1951:232 (a species distinct from *Astata stigma*, diagnostic characters, distribution); Verhoeff, 1951:161 (in revision of European *Dryudella*), 163 (Netherlands); Fahlander, 1953:64 (Sweden), 1954:252 (Sweden: Gästrikland Region, prey: *Holcostethus vernalis* Wolff, a pentatomid, now *Peribalus strictus vernalis*); Kjellander, 1954b:247 (Sweden); Valkeila, 1954:87 (Finland: Lappeenranta; prey: *Trapezonotus arenarius* Linnaeus, a lygaeid); Hellén, 1956:45 (recorded from Finland); Pulawski, 1956:66 (in revision of European Astatinae); Yeo, 1957:19 (England: Middlesex, now London); Benno, 1958b:11 (in review of Dutch Sphecidae); Evans, 1958b:180 (reference to prey record by Verhoeff, 1951); Wolf, 1959b:23 (known from Germany, but not from Nassau); Noskiewicz and Puławski, 1960:114, 115 (in key to Polish Sphecidae); Valkeila, 1962b:66 (southwestern Finland); Erlandsson, 1963:66 (Denmark: Island of Bornholm); Hoop, 1963b:7 (Germany: Schleswig-Holstein: Kronshagen); de Beaumont, 1964:70 (in Sphecid Fauna of Switzerland, not recorded from Switzerland); Richards, 1964:25 (heath-lands in southern England); Valkeila, Brander, and Käpylä, 1964:75 (Finland: southern Finland: Forssa, Tammela); Benno, 1967:35 (in checklist of Sphecidae of Netherlands); Nouvel, 1969:338 (first record from France: Finistère Department); Haeseler, 1970:74 (Germany: Schleswig-Holstein: Kiesgrube near Russee); Oehlke, 1970:709 (first record from Democratic Germany); Lomholdt, 1971:123 (first

record from Denmark); Schmidt, 1971b:33 (Germany: Rheinland-Pfalz: Mainzer Sand); Balthasar, 1972:294 (in Sphecidae Fauna of Czechoslovakia: may be expected in the country); Haeseler, 1972:155, 170, 200 (Germany: Schleswig-Holstein; anthropogenic habitats); Lomholdt, 1972:122 (Denmark: Island of Laesø); Haeseler, 1973:54 (Schleswig-Holstein: 12 km SW Neumünster, Segrahner Berg 12 km southeast of Mölln, Willenshaven); Lefeber, 1973:152 (Netherlands: Amsterdam, Grathem, Laren); Lomholdt, 1975b:31 (Denmark: Island of Anholt); Haeseler, 1976b:63, 72 (Germany: Friesian Islands: Island of Amrum); Lefeber, 1976:151 (Netherlands: Posbank); Lomholdt, 1976:237 (in Sphecidae Fauna of Fennoscandia and Denmark); Guichard, 1977:252 (Great Britain: Surrey); Haeseler, 1977a:24 (northwestern Germany); Kolesnikov, 1977:318 (Russia: Bryansk Oblast'); Haeseler, 1978c:193 (Germany: Friesian Islands: Island of Borkum); Lefeber, 1978:137 (Netherlands: Zuidsløe); Pulawski, 1978:230, 232 (in key to Sphecidae of European part of former USSR); Edwards, 1979:70 (Great Britain: Sussex County); Lefeber, 1979:11 (in checklist of Sphecidae of Netherlands), 64 (Netherlands: distribution map); Schwammberger, 1979:115 (Germany: Nordrhein-Westfalen: Gildehauser Venn Nature Reserve); Preuss, 1980a:23 (Germany; endangered, nesting in dry soils); Richards, 1980:41 (in key to Sphecidae of British Isles); Haeseler, 1981:50 (Germany: Friesian Island: Island of Amrum); Schmidt, 1981:217 (Germany: first record from Baden-Württemberg: Graben, Karlsruhe); Nilsson, 1986:87 (Sweden); Kowalczyk, 1988b:65 (Poland: environs of Łódź); Archer, 1989a:131, 133 (Great Britain: York: found before and after coniferization); Nilsson, 1989:48 (Sweden); Archer, 1991b:76 (England); van der Smissen, 1993:128 (northwestern Germany); Archer, 1994b:104 (British Channel Islands; Archer and Burn, 1995:58 (Great Britain: Yorkshire: Crow Wood near Finningley); Yeo and Corbet, 1995:38 (in field guide to British solitary wasps); Archer, 1996a:58 (Great Britain: Channel Islands); Harvey and Plant, 1996:68 (Great Britain: summary of records from Essex); Vepřek, 1998:118 (first record from Czech Republic: Moravia: Moravský Písek); Archer, 1999a:9 (Great Britain: Lancashire), 2000c:115 (Great Britain: Lincolnshire); Vepřek, 2000:234 (Czech Republic: Moravia: Moravský Písek); Robinson, 2005:34 (Great Britain: Cumbria County). – *Dryudella pinguis*: F. Parker, 1969:968 (new combination, in revision of North American *Dryudella*; Alaska to Colorado); F. Parker in R. Bohart and Menke, 1976:214 (in checklist of world Sphecidae); Krombein, 1979b:1616 (in catalog of North American Hymenoptera); Leclercq, Gaspar and Verstraeten, 1979:map 1410 (Belgium); Richards, 1979:397 (British Channel Islands); Lefeber, 1983a:84 (Netherlands: Waddendistrict: islands of Vlieland and Ameland); Haeseler, 1984:108 (Germany: Oldenburg, Baltrum, Wangerooge); Veenendaal, 1984:19 (Netherlands: Amsterdam); Haeseler, 1985c:571 (Germany: Friesian Islands); Brechtel, 1986:60 (Germany: Südpfalz: Sandbuckel); Nemkov, 1986:96 (Russia: Siberia: Irkutsk Oblast'); Riemann, 1987b:38 (Germany: Niedersachsen: Nature Reserve Voßberge); Vikberg, 1986:76 (Finland); Schmidt and Westrich, 1987:362 (Germany: Mainz area); Jacobs, 1989:11 (Germany: Mecklenburg-Vorpommern); Jacobs and Oehlke, 1990:160 (new records from Democratic Germany); Nemkov, 1990c:79 (Russia: Kamchatka: Kozyrevsk); Day, 1991:xiv (summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:96 (in key to Sphecidae of North and Central Europe); Kowalczyk, 1991a:99, 101 (Poland: Łódź); Budrys, 1992:26 (in list of Sphecidae of Lithuania); Luig, 1993:43 (Estonia); Theunert, 1994c:39 (summary of records from Niedersachsen and Bremen, Germany); Nemkov in Nemkov, Kazenas, Budrys, et Antropov, 1995:408 (in key to Sphecidae of Russian Far East); Schmid-Egger, Risch, and Niehuis, 1995:177 (summary of records from Germany: Rheinland-Pfalz State); Arens, 1996:441 (Germany: Bayern: Bayreuth area); Blösch, 1996:4 (Germany: Bayern: city of Erlangen, Tennenloher Forst Nature Reserve near Erlangen); Harvey, 1996:25 (Great Britain: Essex); Schmid-Egger, Schmidt, and Doczkal, 1996:376 (Germany: Baden-Württemberg: endangered); Voblenko, Gorobchishin, and Nesterov, 1996:14 (Ukraine: Polesye Region); Witt, 1996:106 (Germany: Brandenburg), 108 (locality records); Woydak, 1996:36 (Germany: Westfalen: summary of distribution and nesting habits); Celary, 1997:58 (in checklist of Animals of Poland); Finnamore, 1997:888 (Canada: Yukon); Schmidt and Schmid-Egger, 1997:13 (in checklist of German Sphecidae); Schnee, 1997 (Germany: Sachsen); Flügel, 1998:59 (Germany: Brandenburg: Unteres Odertal National Park); Haeseler and Ritzau, 1998:50 (Germany: Bremen: Island of Harriersand in Weser River); Lefeber, 1998:182, 183 (Netherlands: Limburg: Sint-Pietersberg near Maastricht at 50°50'N 5°41'E); van der Smissen, 1998:58 (Germany: Niedersachsen, Schleswig-

Holstein); K. Weber, 1998:138 (Germany: Bayern: Bamberg area); Herrmann, 1999:7 (Germany: Niedersachsen: Oldenburg area; habitats size); Kuhlmann, Wolf, and Woydak, 1999:569 (threatened with extinction in Nordrhein-Westfalen State of Germany); Pauly, 1999:109 (in catalog of Belgian aculeates); Blösch, 2000:215 (in Sphecidae Fauna of Germany); Esenbekova and Kazenas, 2000:25 (southeast Kazakhstan: 7 km S Talgar, 25 km S village Turghen'); Jacobs, 2000:7, 16 (Germany: Land Mecklenburg-Vorpommern: close to extinction); Kazenas, 2000e:235 (in Sphecidae Fauna of Kazakhstan); Mokrousov, 2000b:30 (Russia: Nizhniy Novgorod Oblast'); Zettel, 2000:27 (first record from Austria: Marchfeld); Kazenas, 2001:24 (in checklist of Sphecidae of Kazakhstan and Central Asia), 143 (review of known biology); K. Schmidt and Bitsch *in* Bitsch et al., 2001:186 (in Sphecidae Fauna of Western Europe); Ohl et al., 2001:139 (distribution in Germany by provinces); van der Smissen, 2001:60 (Germany: Schleswig-Holstein: not endangered); Archer, 2002b:111 (Great Britain: Watsonian Yorkshire: distribution map); Shlyakhtenok and Skibinska, 2002:33 (Belarus': no specific locality); Drewes, 2003:136 (Germany: Bayern: Karlstadt am Main); Haeseler, 2003:339, 345 (Germany: Niedersachsen: Island of Harriersand near Bremen); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:65 (in catalog of wasps and bees of Bayern, Germany); von der Heide and Metscher, 2003:102 (Germany: Niedersachsen: Emsland area); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:196 (Germany: Bayern: strongly endangered); Abenius, 2004:40 (Sweden: Norrbottens: Luleå area); Esser, Jakubzik, Sonnenburg, and Woydak, 2004:262 (in checklist of Sphecidae of Nordrhein-Westfalen State of Germany); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:355 (in catalog of Polish Crabronidae); Stolle et al., 2004:371 (Germany: Sachsen-Anhalt: in red list of Sphecidae); Straka, Bogusch, Tyrner, and Vepřek, 2004:147 (Czech Republic: Jenštejn); van Achterberg and Peeters, 2004:31 (in checklist of Sphecidae of Netherlands); Wiśniowski, 2004:43 and 60 (in checklist of Polish Sphecidae); Bergsten, Ekerholm, Gabrielsson, Hellquist, Petersson, Werner, Ström, Chauvet, and Dalecky, 2005:16 (Sweden: Västerbotten: Bjuröklubbs Nature Reserve); Blösch, 2005:4 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); Haeseler, 2005:628 (Germany: Niedersachsen: Steller Heide near Bremen); Hallin, 2005:16 (Sweden: Örebro County: Hällefors); Kraatz, 2005:102 (Germany: Niedersachsen: Bümmerstede near Oldenburg); Mandery, 2005:173 (Germany: Bayern: Hainberg Nature Reserve near Nürnberg); Nemkov, 2005a:147 (Russia: Island of Sakhalin); Pijfers, 2005:50 (Netherlands: Twente: Noordelijke Manderheide); Riemann and Hohmann, 2005:554 (Germany: Niedersachsen: city of Bremen and adjacent area); Saure, 2005:15 (Germany: Berlin); Shlyakhtenok, 2006:111 (Belarus': Polesye Radiological Nature Reserve); Theunert, 2005a:17 (Germany: in checklist of Sphecidae of Niedersachsen and Bremen); Liebig, 2006:38 (Germany: Sachsen: Muskauer Heide); Archer, 2007a:151 (Great Britain: Norfolk: Thetford Warren Lodge); Herrmann, 2007:52 (Germany: Niedersachsen: Ostfriesland); Jacobs, 2007:90, 91 (in key to Crabronidae of Germany); Jansen and Kaluza, 2007:23 (Germany: northwestern Sachsen); Nemkov, 2007c:997 (in Appendix to Key to identification of Sphecidae of Far East of Russia); Saure, 2007:81 (Germany: in checklist of Aculeata of Land Brandenburg); Vepřek and Straka, 2007:202 (in catalog of Sphecidae of Czech Republic and Slovakia, known from Bohemia and Moravia only), 221 (Vepřek summarized first records from Moravia; Bohemia: Srní u České Lipy. Vlkov nad Lužnicí); Archer, 2008a:144 (Great Britain: Cumbria: Sandscale Haws and Lindisfarne Nature Reserve); Haeseler, 2008:308 (Germany: Friesian Islands); Nemkov, 2008b:19 (in catalog of Crabronidae of Asiatic Russia); Theunert, 2008:32 (Germany: map of distribution in Niedersachsen and Bremen); Nemkov, 2009b:77 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:71 (Norway: locality records); Esser, Fuhrmann, and Venne, 2010:36 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Falk, 2010:93 (Great Britain: heathland sites in West Midlands region); Howe, Knight, and Clee, 2010:99 (Great Britain: occurring on coastal sand dunes); Johansson, 2010:121 (Sweden: Småland: upper Emå river valley); Mokrousov, 2010a:60 (Russia: Kirov, Nizhniy Novgorod, and Vladimir Oblast's: no specific localities); Saure, 2010a:87 (Germany: Berlin-Reinickendorf: Baumberge); Schmid-Egger, 2010a:15 (in red list of Aculeata of Germany: rare); Stolle, 2010:75 (Germany: Mecklenburg-Vorpommern: 4 km north of Boek); van der Smissen, 2010a:339 (Germany: Schleswig-Holstein: locality records); Baghirov, 2011b:140 (Russia: Altay Republic: Kosh-Agach); Saure,

2011a:6 (Germany: Berlin: former airport Tempelhof), 2011c:198 (Germany: Berlin-Spandau: Fort Hahneberg); Shlyakhtenok, 2011:95 (Belarus: city of Minsk); Theunert, 2011a:19 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:51 (Germany: Hessen: threatened with extinction); Wiesbauer and Zettel, 2011:269 (Austria: Niederösterreich: March = Morava lowland); Nemkov, 2012c:438 (in catalog of Crabronidae of Russian Far East); Pankov, 2013:228 (Russia: Ivanovo Oblast'); Shlyakhtenok, 2013:163 (in annotated catalog of aculeate wasps of Belarus'); Wiśniowski and Szczepko, 2013:32 (Poland: Kampinos National Park near Warszawa); Bitsch, 2014:397 (recent records from Austria and Germany reported); Hellqvist, Abenius, and Norén, 2014:90 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Saure, 2015:13 (Germany: Berlin-Lichterfelde); Else, Bolton, and Broad, 2016:8 (in checklist of Aculeata of Great Britain and Ireland: England, Scotland, Wales); Stolle and Saure, 2016:922 (Germany: in list of Sphecidae s.l. of Sachsen-Anhalt); Nemkov, 2017b:218 (in catalog of Astatinae of Russia).

As *Astata stigma* (present correction based on geographic distribution): F. Smith, 1851:20 (Great Britain: Surrey: Weybridge), 1853:63 (in checklist of British Hymenoptera), 1857a:35 (England), 1858c:80 (in review of British Aculeata, redescription), 1871:11 (in catalog of British Aculeata); E. Saunders, 1880:253 (in revision of British Aculeata), 1896:79 (in revision of British Aculeata); Gardner, 1900:242 (Great Britain: Wales: Criccieth), 2901:375 (Great Britain: Cheshire: Wollasey and Lancashire: Southport); Nevinson, 1900:62 (Great Britain: Wales: Towyn); Sladen, 1900:265 (Great Britain: Kent: Deal coastal sandhills); Nevinson, 1901:72 (Great Britain: Wales: Criccieth); Carr, 1901:15 (Great Britain: Lincolnshire: Skegness); Thornley, 1901:63 (England: Lincolnshire: Skegness); Bradley, 1902:267 (Great Britain: North Wales); Friese, 1902:478 (occurring in Lapland according to Zetterstedt, 1838 who called it *Astata pinguis*); E. Saunders, 1902b:143 (Great Britain: Island of Jersey); Arnold, 1905:262 (Great Britain: Hampshire: Brockenhurst); E. Saunders, 1907b:67 (Great Britain: West Suffolk and Eastbourne); Morley, 1909:304 (Great Britain: Isle of Wight, as *Astata stigma*); Hallett, 1914:56 (Great Britain: Cardiff County, in *Astata*), 1916:221 (Great Britain: South Wales: Porthcawl, in *Astata*); Stelfox, 1927:309 (Ireland: list of localities); Crèvecoeur and Maréchal, 1932:70 and 1936:252 (in catalog of Belgian Hymenoptera), corrected to *Astata pinguis* by Verhoeff, 1951:161; Richards, 1937b:104 (in checklist of British aculeates); Hallett, 1939:17 (Great Britain: Wales: no specific locality); Spooner, 1943:70 (Great Britain: Croxton); Chambers, 1949:223 (Great Britain: Bedfordshire).

Larra pinguis Zetterstedt, 1838:436, ♀, junior primary homonym of *Larra pinguis* Dahlbom, 1832. Lectotype: ♀, Sweden: Calix (Lund), designated by P. Verhoeff, 1951:156. Synonymized with *Larra pinguis* Dahlbom by P. Verhoeff, 1951:156.

Astata jaculator F. Smith, 1845:1157, ♀. Holotype: ♀, England: Weybridge (Oxford). Synonymized with *Astata stigma* by F. Smith, 1855:97 and 1856:309, and with *Astata pinguis* by Verhoeff, 1951:161.

44. *pseudofemoralis* Nemkov

Dryudella pseudofemoralis Nemkov, 1990c:80, ♀. Holotype: ♀, Russia: Chita Oblast': Durbachi 42 km southwest of Borzi (ZIN). – Nemkov in Nemkov, Kazenas, Budrys, et Antropov, 1995:408 (in key to Sphecidae of Russian Far East); Nemkov, 2008b:19 (in catalog of Crabronidae of Asiatic Russia), 2009a:65 (is an endemic of Transbaicalia); Nemkov, 2009b:75 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia), 2017b:218 (in catalog of Astatinae of Russia).

45. *pulawskii* Schmid-Egger

Dryudella pulawskii Schmid-Egger, 2014:558, ♀, ♂. Holotype: ♂, United Arab Emirates: Wadi Wurayah at 25.40°N 46.28°E (Ch. Schmid-Egger coll.). – Schmid-Egger, 2014:549, 550 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 559, 560 (color photographs of male and female).

46. *quadripunctata* (Radoszkowski)

Astata quadripunctata Radoszkowski, 1877:32, ♂. Holotype: Uzbekistan: Kyzil-Kum desert: no specific locality (ZMMU). – Magretti, 1884c:589 (Sudan: Kassala); Kohl, 1885:443 (as synonym of *Astata tricolor*); Dalla Torre,

1897:655 (in catalog of world Sphecidae); Gussakovskij, 1927:275 (in revision of Palearctic *Astatus*; as *quadripunctatus*); Maidl and Klima, 1939:25 (in catalog of world Astatinae and Bembicinae); Myartseva, 1972a:77 (Turkmenistan). – **As *Dryudella quadripunctata***: F. Parker in R. Bohart and Menke, 1976:215 (new combination, in checklist of world Sphecidae); Kazenas, 2000e:236 (in Sphecid Fauna of Kazakhstan), 2001:24 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:58 (geographic distribution, collecting localities in Kazakhstan).

47. *rasnitsyni* Kazenas

Dryudella rasnitsyni Kazenas, 2000b:460, ♀. Holotype: ♀, Turkmenistan: Badhyz Nature Reserve: Kyzyl-Djar (Zool. Inst. Alma-Ata). – Kazenas, 2001:25 (in checklist of Sphecidae of Kazakhstan and Central Asia); Mokrousov and Gromenko, 2015:126 (Uzbekistan: Sundukli Desert at 38°57'45" N, 64°32'26" E).

48. *rhimpa* F. Parker

Dryudella rhimpa F. Parker, 1969:970, ♀, ♂. Holotype: ♂, USA: California: Yolo County: Davis (UCD). – F. Parker in R. Bohart and Menke, 1976:215 (in checklist of world Sphecidae); Krombein, 1979b:1616 (in catalog of North American Hymenoptera); Rust, Menke, and Miller, 1985:46 (California: Channel Islands), 52 (prey: a pentatomid); Finnamore, 1997:888 (Canada: Yukon); Weissmann and Kondratieff, 1999:78 (Colorado: Great Sand Dunes National Monument); Amarante, 2002:7 (in catalog of Neotropical Crabronidae); Ruíz Cancino, Coronado Blanco, Varela Fuente, and Horta Vega, 2002:663 (in checklist of Mexican Sphecidae); Ratzlaff, 2016:23 (Canada: British Columbia, after F. Parker, 1969).

49. *sepulchralis* (de Beaumont)

Astata sepulchralis de Beaumont, 1968a:259, ♀, ♂. Holotype: ♂, Canary Islands: Island of Lanzarote: Arrecife (BMNH). – Báez and Ortega, 1978:191 (Canary Islands). – **As *Dryudella sepulchralis***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Hohmann, La Roche, Ortega, and Barquín, 1993:216 (detailed locality records from Canary Islands); Jacobs and Grabener, 2017:114 (in key to males of Palearctic *Dryudella* with black frons).

50. *similis* (Gussakovskij)

Astata similis Gussakovskij, 1927:274, ♀, ♂. Syntypes: China: Gashun-Gobi: Suleihe near Sachzhou (ZIN). – **As *Astata similis***: Maidl and Klima, 1939:25 (new combination, in catalog of world Astatinae and Bembicinae); Kazenas, 1972b:158 (Kazakhstan: Alma-Ata Oblast': near Ili), 1978b:97, 101 (in key to Sphecidae of Kazakhstan and Central Asia). – **As *Dryudella similis***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae); Esenbekova and Kazenas, 2000:25 (southeastern Kazakhstan: near Bakanas, 5-8 km E Bakanas); Kazenas, 2000e:237 (in Sphecid Fauna of Kazakhstan), 2001:25 (in checklist of Sphecidae of Kazakhstan and Central Asia), 2002a:58 (geographic distribution, collecting localities in Kazakhstan); Hua, 2006:279 (in list of Chinese insects, geographic distribution); Mokrousov and Vafin, 2014:55 (Russia: Republic of Tatarstan: Antonovka in Kamsko-Ust'inskiy District); Mokrousov, Shlyakhtenok, and Grebennikov, 2016:19 (Russia: Volgograd Oblast': 16 km NNE Kalach-on-Don at 48.838°N 43.603°E); Nemkov, 2017b:218 (in catalog of Astatinae of Russia).

51. *stigma* (Panzer)

Dimorpha stigma Panzer, [1807-1809], Heft 107:13, [♂]. Holotype or syntypes: ♂, Germany: Berolini = Berlin (lost). Neotype: ♂, Europe: no specific locality, probably Berlin area (ZMHU), designated by Verhoeff, 1951:155. – **As *Astata stigma***: Kohl, 1885a: 434 (new combination, in key to European *Astata*), 440 (in revision of European *Astata*), 449 (in checklist of world *Astata*), 1893:33 (Austria: Niederösterreich); F. Morawitz, 1893a:112 (Russia: Karelian Isthmus); nec E. Saunders, 1902b:143 and 1907b:67 (= *Dryudella pinguis*); nec Morley, 1909:304 (= *Dryudella pinguis*); Gussakovskij, 1927:278 (in revision of Palearctic *Astata*). – **As *Astata stigma***: Vander Linden, 1829:31 (new combination, bibliographic references, Germany: Berlin); Dahlbom, 1843:139 (in revision of

Sphecidae and Pompilidae), 1845:473 (in key to European *Astata*); nec F. Smith, 1851:20 and 1853:63 (= *Dryudella pinguis*); F. Smith, 1856:309 (in catalog of Hymenoptera in British Museum); nec F. Smith, 1857a:35 (= *Dryudella pinguis*); Ruthe and Stein, 1857:313 (Germany: Berlin area); nec F. Smith, 1858c:80 (= *Dryudella pinguis*); Taschenberg, 1858:85 (in key to Sphecidae of Germany); Assmus, 1859:611 (Russia: Moscow Oblast'); Funk, 1859:59 (Germany: Bayern: Bamberg); Brischke, 1862:100 (Germany: Preussen Province, now Poland: Pomorze Region); Giraud, 1863a:14 (France: Hautes-Alpes: Vallouise near Briançon, may be *Dryudella femoralis* or *freygessneri*); Taschenberg, 1866:199 (in revision of Hymenoptera of Germany); Kirchner, 1867:216 (in catalog of European Hymenoptera); Schenck, 1867a:356 (known from Germany: Halle); Taschenberg, 1870:16 (Germany: Halle); Thomson, 1870:240 (in revision of Swedish wasps); nec F. Smith, 1871:11 (= *Dryudella pinguis*); P. Ivanov, 1872:152 (Ukraine: Khar'kiv Oblast': Kupyansk area); Dours, 1874:140 (in catalog of Hymenoptera of France); Thomson, 1874:212 (in revision of Hymenoptera of Scandinavia); Wierzejski, 1874:258 (Poland: Tatry Mts., may actually be *Dryudella femoralis*); Beuthin, 1876:231 (Germany: Hamburg area); Schmiedeknecht, 1876:186 (Germany: Thüringen: Rothensteiner Felsen); Girard, 1879:952 (morphology); nec E. Saunders, 1880:253 (= *Dryudella pinguis*); Siebke, 1880:64 (Norway); Yaroshevskiy, 1881:125 (Ukraine: Khar'kiv Oblast': Kupyansk); Friese, 1883:202 (Germany: Sachsen-Anhalt: Kösen); Brischke, 1888b:97 (Germany: Preussen Province, now Poland: Pomorze Region), 1889:204 (Germany: Steegen E Danzig, now Poland: Stegna E Gdańsk); Westerlund, 1893:25 (Russia: Karelian Republic: northern shore of Lake Ladoga); nec E. Saunders, 1896:79 (= *Dryudella pinguis*); Borries, 1897:68 (nesting habits unknown); Dalla Torre, 1897:655 (in catalog of world Sphecidae); Lüderwaldt, 1897b:29 (Germany: Gollnow, now Poland: Pomorze Region: Goleniów); Strand, 1898b:93 (Norway); nec Gardner, 1900:242 (= *Dryudella pinguis*); Ferton, 1901a:104 (Algeria: prey; determination certainly incorrect: the species does not occur in North Africa); nec Gardner, 1900:242 and 1901:375 (= *Dryudella pinguis*); nec Nevinson, 1900:62 and 1901:72 (= *Dryudella pinguis*); nec Sladen, 1900:265 (= *Dryudella pinguis*); nec Bradley, 1902:267 (= *Dryudella pinguis*); nec Carr, 1901:16 (= *Dryudella pinguis*); Strand, 1903:7 (Norway: Sireosen); Adlerz, 1904:53 (nesting habits); Aurivillius, 1904:265 (in revision of Swedish Sphecidae); nec Arnold, 1905:262 (= *Dryudella pinguis*); Kubes, 1905:84 (Czech Republic: Kolín); nec E. Saunders, 1907b:67 (= *Dryudella pinguis*); Schmiedeknecht, 1907:235, 236 (in keys to Hymenoptera of North and Central Europe); de Gaulle, 1908:121 (in catalog of French Hymenoptera); Dittrich, 1911b:25 (Germany: Niederschlesien Province, now Poland: Dolny Śląsk Region); Zavattari, 1911:3 (Italy: Piemonte: Valle del Maira, may be *Dryudella femoralis* or *freygessneri*); Adlerz, 1912:54 (nesting habits); Rudow, 1912:46 (visiting flowers of *Achillea*, *Artemisia*, and *Tanacetum*); Schirmer, 1912:167 (Germany: Berlin area); nec Frey-Gessner, 1913:151 (= *Dryudella freygessneri*); Alfken, 1914:281 (northwestern Germany); nec Hallett, 1914:56 and 1916:221 (= *Dryudella pinguis*); Hedicke, 1918:402 (Germany: Brandenburg: Gross Machnower Weinberg); O. Meyer, 1919:155 (Germany: Posen Province, now Poland: Poznań Region); A. Wagner, 1920:34 (Germany: Lower Elbe region); Dubois, 1921c:209 (in key to Belgian Sphecidae); Jansson, 1922:24 (Sweden: Island of Öland); Berland, 1925d:109 (in Sphecid Fauna of France); Bischoff, 1925:301 (Latvia: Wezkukkul); Schütze, 1925:113 (Germany: Lausitz Region: Baruth, Lömichau); Shestakov, 1925:36 (Russia: Yaroslavl' area); Friese, 1926:162 (in key to Sphecidae of Central Europe, short morphological and biological characteristics); Bouwman, 1927:50 (in revision of Sphecidae of Netherlands); nec Stelfox, 1927:309 (= *Dryudella pinguis*); Benoist, 1928:409 (France: Hautes-Alpes: Aiguilles and Saint-Véran, possibly *Dryudella freygessneri*); Berland, 1928b:177 (observations by Frey-Gessner, 1913 actually report to *Astata freygessneri* according to Carl, 1920); van der Vecht, 1928:93 (Netherlands: Meijendel sand dunes, prey: *Sciocoris terreus* (Schrank), a pentatomid); Bischoff, 1931:9 (Spain); Pulkkinen, 1931:73 (in revision of Sphecidae of Finland); nec Crèvecoeur and Maréchal, 1932:70 and 1936:252 (= *Dryudella pinguis*); E. Nielsen, 1933:295 (summary of nesting habits); Stelfox, 1933:52 (Ireland: Wexford County: Ballyteige Burrows, probably *Dryudella pinguis*); Jansson, 1934:290 (Sweden); Forsius in Forsius and Hellén, 1935:11 (in checklist of Hymenoptera of Finland); Minkiewicz, 1935:195 (Poland: Kazimierz on Wisła, 51°20'N 21°58'E); Drogoszewski, 1936:130 (Poland: Lowicz); Goebel, 1937:42 (Poland: Poznań District: Puszczykowo, Splawie); nec Richards, 1937b:104 (=

Dryudella pinguis); Struve, 1937:150 (Germany: Island of Borkum); Zavadil, Šusterka, and Bat'a, 1937:205 (in catalog of Sphecidae of Czechoslovakia); A. Wagner, 1938a:122 (northwestern Germany); nec Hallett, 1939:17 (= *Dryudella pinguis*); Maidl and Klima, 1939:25 (in catalog of world Astatinae and Bembicinae); Paul, 1941:47 (Germany: Pommern: common in Central- and Ostpommern: no specific locality, now Poland: Województwo Zachodniopomorskie); Schneid, 1941:1046 (Germany: Bayern: Bamberg area); de Beaumont, 1942a:410 (Switzerland; in revision of *Astata* of Switzerland), 415 (French specimens recorded by Berland, 1925, probably are *Astata femoralis*); Balthasar, 1942:5 (Czech Republic: Moravia); J. Perkins, 1942:200 (Sweden: Skåne: Kivik and Löderup); Yasumatsu, 1942c:112 (China: Nei Mongol: Apaka at 44°N 114.96°E); Giner Marí, 1943a:119 (in Sphecidae Fauna of Spain); nec Spooner, 1943:70 (= *Dryudella pinguis*); Guiglia, 1944b:25 (Italy: Piemonte); Dupuis, 1947:113 (list of known heteropteran prey); Šnoflak in Zavadil and Šnoflak, 1948:62, 64 (in key to Sphecidae of Czechoslovakia); nec Chambers, 1949:223 (= *Dryudella pinguis*); Cavro, 1950:35 (France: Département du Nord); Szulczewski, 1950:108 (Poland: Wielkopolski National Park 15 km S Poznań); Leininger, 1951:118 (Germany: Baden-Württemberg: Sandhausen); Scobiola, 1951:272 (first record from Romania: Sibiu Region: Venchiu); Townes in Muesebeck et al., 1951:940 (Alaska: Matanuska); Verhoeff, 1951:151 (group characters), 159 (in revision of European *Dryudella*), 163 (Netherlands); Cleu, 1953:50 (France: Ardèche River basin); Głowacki, 1953:520 (Poland: Podkova Leśna); Tjeder, 1954:67 (Sweden: eastern Skåne: Löderup); Teschner, 1955:57 (Germany: Nordrhein-Westfalen: Hohe Ward near Münster); Ceballos, 1956:373 (in catalog of Hymenoptera of Spain); Puławski, 1956:65 (in revision of European Astatinae); Zirngiebl, 1957:183 (Germany: Rheinland-Pfalz: Leistadt); Balthasar, 1958:337 (Czech Republic); Benno, 1958b:11 (in review of Dutch Sphecidae); Evans, 1958b:180 (reference to prey record by Verhoeff, 1951); Wolf, 1959b:23 (Germany: Nassau); Noskiewicz and Puławski, 1960:114, 117 (in key to Polish Sphecidae); Valkeila, 1962b:66 (southwestern Finland); de Beaumont, 1964c:70 (in Sphecidae Fauna of Switzerland, not recorded from Switzerland); Fæster, 1965:192 (Denmark: Hansted Nature Reserve); Bonelli, 1966c:216 (Italy: Trentino–Alto Adige: Alpe di Siusi, may actually be *Dryudella femoralis*); Benno, 1967:35 (in checklist of Sphecidae of Netherlands); Gauss, 1967:553 (Germany: Baden-Württemberg: Nördliches Rheinvorland); J. Heinrich, 1967:74 (Germany: Bayern: Unterfranken District); Lefeber, 1969a:78 (Netherlands: Laren); Zangheri, 1969:1703 (Italy: in catalog of flora and fauna of Romagna Region); Oehlke, 1970:710 (Democratic Germany); Tumšs, 1970:82 (Latvia); Dathe, 1971:234 (Germany: Berlin Zoological Garden; phenology), 237 (Germany: Berlin); Lefeber, 1971a:17 (Netherlands: Laren, Udenhout); Lomholdt, 1971:123 (Denmark: Skagen); Schmidt, 1971b:33 (Germany: Rheinland-Pfalz: Mainzer Sand); Tsuneki, 1971m:20 (China: Inner Mongolia: Apaka); Balthasar, 1972:293 (in Sphecidae Fauna of Czechoslovakia); Oehlke, 1972:136 (Germany: Island of Hiddensee); Haeseler, 1973:53 (Germany: Niedersachsen: Pevestorf 72 km southeast of Lauenburg); Lefeber, 1974:77 (Belgium: Maasmechelen); Lomholdt, 1976:236 (in Sphecidae Fauna of Fennoscandia and Denmark); Simon Thomas and Wiering, 1976:109 (Netherlands: IJsselmeer Polders); Haeseler, 1977a:24 (northwestern Germany); Kolesnikov, 1977:318 (Russia: Bryansk Oblast'); Kazenas, 1978b:98, 101 (in key to Sphecidae of Kazakhstan and Central Asia); Lefeber, 1978:137 (Netherlands: Drunense Duinen); Pulawski, 1978:230, 232 (in key to Sphecidae of European part of former USSR); Lefeber, 1979:11 (in checklist of Sphecidae of Netherlands), 65 (distribution in Netherlands); Petit, 1980:42 (Belgium: Aayen); Skibińska, 1982:123 (Poland: Warszawa area); Riemann, 1983:84 (Germany: Bremen-Daverden area); Haack, Tschartke, and Vidal, 1984:124 (Germany: Hamburg area); Kowalczyk, 1988b:65 (Poland: environs of Łódź); Pádr in Šedivý, 1989:168 (in checklist of Czechoslovakian Sphecidae); Kowalczyk, 1990:291 (Poland: Góry Świętokrzyskie); Blagoveshchenskaya, 1994:87 (Russia: Ul'yanovsk Oblast'); Hallin, 2007b:25 (Sweden: Blekinge Province). – **As *Dryudella stigma***: Heinrich 1967:74 (new combination, Germany: Niederfranken); F. Parker in R. Bohart and Menke, 1976:215 (in checklist of world Sphecidae); Leclercq, Gaspar and Verstraeten, 1979:map 1411 (Belgium); Mityaev, Matesova, Kulenova, Kazenas, and Zhdanko, 1980:119 (Russia: Siberia: Altayskiy Kray: basin of Aley River); Schmidt, 1981:217 (Germany: Baden-Württemberg); Dollfuss, 1983b:9 (in catalog of Sphecidae of Austria); Lefeber, 1983a:84 (Netherlands: Waddendistrict: northern coast sand dunes, islands of Texel, Vlieland, Terschelling, and Schiermonnikoog); Haeseler, 1985c:571 (Germany: Frie-

sian Islands); Riemann, 1985:21 (Germany: Niedersachsen); Westrich and Schmidt, 1985b:111 (Germany: endangered in Baden-Württemberg); Mingo and Gayubo, 1986:1009 (cited from Spain by Bischoff, 1931); Nemkov, 1986:96 (Russia: Siberia: Irkutsk Oblast'); Vikberg, 1986:76 (Finland); Dollfuss, 1987:20 (Austria); Riemann, 1987b:38 (Germany: Niedersachsen: Nature Reserve Voßberge); Schmidt and Westrich, 1987:363 (Germany: Mainz area); Pagliano, 1989:360 (Italy: citation of Guiglia, 1944, redescription); Jacobs, 1989:11 (Germany: Mecklenburg-Vorpommern); Jacobs and Oehlke, 1990:161 (new locality records from Democratic Germany); Pagliano, 1990:65 (in catalog of Italian Sphecidae); Day, 1991:xiv (summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:96 (in key to Sphecidae of North and Central Europe); Jacobs, 1991:46, 47 (Germany: Mecklenburg-Vorpommern: Nature Reserve Elbtalidünen); Kowalczyk, 1991a:90, 93, 97, 99, 101, 107 (Poland: Łódź); K. Weber, 1992:87 (Germany: Bayern: Bamberg District); Kuhlmann, 1993:76 (Germany: recorded from Westfalen by Teschner, 1955); Luig, 1993:43 (Estonia); Dollfuss, 1994:99 (endangered in Austria); Kowalczyk, 1994:74 (Poland: Łagiewniki forest in Łódź); Theunert, 1994c:38 (summary of records from Niedersachsen and Bremen, Germany); Gorobchishin, 1995:17 (Ukraine: Kanev Nature Reserve); Krasnobayev et al., 1995:138 (Russia: Zhiguli Hills northwest of Samara); Negrisolo *in* Minelli, Ruffo, and La Posta, 1995b:3 (in catalog of Italian fauna); Nemkov *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:408 (in key to Sphecidae of Russian Far East); Saure and Dürrenfeld, 1995:29 (Germany: Brandenburg: Gabower Hänge near Bad Freienwalde); Scharrer, 1995:24 (Germany: Bayern: Kahl); Schmid-Egger, Risch, and Niehuis, 1995:177 (Germany: summary of records from: Rheinland-Pfalz); Arens, 1996:441 (Germany: Bayern: Bayreuth area); Blösch, 1996:4 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); Gorobchishin, 1996:53 (Ukraine: Kanev Nature Reserve); Pawlikowski and Kruszyński, 1996:86 (Poland: Toruń Basin); Saure, 1996:503 (Germany: Berlin-Pankow: sewage irrigation field); Schmid-Egger, Schmidt, and Doczkal, 1996:376 (Germany: Baden-Württemberg: endangered); Voblenko, Gorobchishin, and Nesterov, 1996:14 (Ukraine: Polesye Region); Witt, 1996:106 (Germany: Brandenburg), 108 (locality records); Celary, 1997:58 (in checklist of Animals of Poland); Schmidt and Schmid-Egger, 1997:13 (in checklist of German Sphecidae); Shlyakhtenok, Blinov, and Belyavskaya, 1997:152 (Belarus: Pripyatskiy National Park); Flügel, 1998:59 (Germany: Brandenburg: Unteres Odertal National Park); Haeseler and Ritzau, 1998:51 (Germany: Bremen: Steller Heide); van der Smissen, 1998:58 (Germany: Niedersachsen); K. Weber, 1998:138 (Germany: Bayern: Bamberg area); Witt, 1998:80 (the species is able to colonize new habitats, but after a few years population levels decline); Herrmann, 1999:7 (Germany: Niedersachsen: Oldenburg area; habitats size); Pauly, 1999:109 (in catalog of Belgian aculeates); Blösch, 2000:218 (in Sphecid Fauna of Germany); Dressler, 2000:32 (Germany: Hessen: Darmstadt area); Esenbekova and Kazenas, 2000:25 (southeast Kazakhstan: no specific locality); Jacobs, 2000:7 (Germany: Land Mecklenburg-Vorpommern: not endangered); Kazenas, 2000e:238 (in Sphecid Fauna of Kazakhstan), 2001:25 (in checklist of Sphecidae of Kazakhstan and Central Asia), 144 (review of known biology); Mokrousov, 2000b:30 (Russia: Nizhniy Novgorod Oblast'); Kazenas and Esenbekova, 2001:134 (Kazakhstan: Almatinskiy Nature Reserve); Ohl et al., 2001:139 (distribution in Germany by provinces); Pagliano, 2001:259, 260 (in key to Italian *Dryudella*); K. Schmidt and Bitsch *in* Bitsch et al., 2001:186 (in Sphecid Fauna of Western Europe); Szczepko and Kowalczyk, 2001:188 (Poland: Kampinos National Park near Warszawa); van der Smissen, 2001:60 (Germany: Schleswig-Holstein: threatened with extinction); Zettel, Gross, and Mazzucco, 2001:71 (Austria: Wien); Kazenas, 2002a:58 (geographic distribution, collecting localities in Kazakhstan); Kowalczyk, Szczepko, and Świątek, 2002:153 (Poland: Kampinos National Park near Warszawa); Shlyakhtenok and Skibinska, 2002:33 (Belarus: no specific locality); Vischer, 2002:288 (Germany: Sachsen-Anhalt: vineyards in Saale-Unstrut area); Haeseler, 2003:339, 345 (Germany: Niedersachsen: Island of Harriersand near Bremen); Mandery, Kraus, Voith, Wickl, Scheuchl, Schubert, and Warncke, 2003:65 (Germany: in catalog of wasps and bees of Bayern); von der Heide and Metscher, 2003:102 (Germany: Niedersachsen: Emsland area); Wickl, Voith, Mandery, Weber, Kraus, Bausenwein, and Blösch, 2003:194, 196 (Germany: Bayern: endangered); Abenius, 2004:40 (Sweden: Norrbottens: Luleå area); Kazenas, 2004b:102 (Kazakhstan: western Tien Shan); Skibińska *in* Bogdanowicz, Chudzicka, Pilipiuk, and Skibińska, 2004:355 (in catalog of Polish Crabronidae); Stolle et al., 2004:371 (Germany: in

red list of Sphecidae of Sachsen-Anhalt); Szczepko and Kowalczyk, 2004:125 (Poland: Kampinos National Park near Warszawa); van Achterberg and Peeters, 2004:31 (in checklist of Sphecidae of Netherlands); Wiśniowski, 2004:43 and 60 (in checklist of Polish Sphecidae); Blösch, 2005:4 (Germany: Bayern: Tennenloher Forst Nature Reserve near Erlangen); Burger, 2005:32 (Germany: Thüringen); Haeseler, 2005:628 (Germany: Niedersachsen: Steller Heide near Bremen); Kowalczyk and Kurzac, 2005:105 (Poland: Botanical Garden in Łódź); Kraatz, 2005:103 (Germany: Niedersachsen: Bümmerstede near Oldenburg); Mandery, 2005:173 (Germany: Bayern: Hainberg Nature Reserve near Nürnberg); Pagliano and Negrisolo, 2005:103 (in Sphecid Fauna of Italy); Pijfers, 2005:50 (Netherlands: Twente: Noordelijke Manderheide); Riemann and Hohmann, 2005:554 (Germany: Niedersachsen: city of Bremen and adjacent area); Saure, 2005:15 (Germany: Berlin); Theunert, 2005a:17 (Germany: in checklist of Sphecidae of Niedersachsen and Bremen); Bock, 2006:41 (Germany: Bayern: Kelheim District: Abensberg sands); Budrys, 2006:80 (Lithuania: Šalčininkai District at 54°10'28"N 25°43'54"E); Liebig, 2006:38 (Germany: Sachsen: Muskauer Heide); Jacobs, 2007:90, 92 (in key to Crabronidae of Germany); Jansen and Kaluza, 2007:23 (Germany: northwestern Sachsen); Kowalczyk and Nadolski, 2007:283 (Poland: Łódź: railway areas); Saure, 2007:81 (in checklist of Aculeata of Brandenburg Land, Germany); Vepřek and Straka, 2007:202 (in catalog of Sphecidae of Czech Republic and Slovakia); Danilov, 2008:348 (Russia: Altayskiy Krai: Barnaul area); Haeseler, 2008:308 (Germany: Friesian Islands); Larnhof, 2008:45 (Austria: Niederösterreich: Nature Reserve "in den Sandbergen" near Drösing); Nemkov, 2008b:19 (in catalog of Crabronidae of Asiatic Russia); Theunert, 2008:32 (Germany: map of distribution in Niedersachsen and Bremen); Donie, 2009:9 (Germany: Niedersachsen: Oldenburg); Kowalczyk, Kurzac, and Nadolski, 2009:62 (Poland: between Warta and Widawka rivers); Nemkov, 2009b:76 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Ødegaard, Sverdrup-Thygeson, Hansen, Hanssen, and Öberg, 2009:71 (Norway: locality records); Esser, Fuhrmann, and Venne, 2010:36 (Germany: in checklist of aculeates of Nordrhein-Westfalen); Mokrousov, 2010a:60 (Russia: Nizhniy Novgorod Oblast': no specific localities); Saure, 2010a:87 (Germany: Berlin-Reinickendorf: Baumberge), 2010b:175 (Germany: Berlin-Reinickendorf: airport Tempel and Flughafensee Protected Area); Schmid-Egger, 2010a:15 (in red list of Aculeata of Germany: rare); Shorenko and Konovalov, 2010:13 (Ukraine: Khar'kiv Oblast': Kupyansk; locality record "Kuryazh" in Gussakovskij, 1927 should read "Kupyansk"); van der Smissen, 2010a:339 (Germany: Schleswig-Holstein and Mecklenburg-Vorpommern: locality records), 2010c:396 (Sweden: Öland: Byrums Sandvik, Gårdbý, Rönnerum); Mokrousov, Berezin, and Egorov, 2011:66 (Russia: Chuvash Republic); Baghirov, 2011b:140 (Russia: recorded from Altay by Nemkov *in* Nemkov, Kazenas, Budrys, et Antropov, 1995:408); Saure, 2011a:6 (Germany: Berlin: former airport Tempelhof), 2011c:198 (Germany: Berlin-Spandau: Fort Hahneberg); Theunert, 2011a:19 (Germany: in checklist of aculeates of Niedersachsen including city of Bremen); Tischendorf, Frommer, Flügel et al., 2011:52 (Germany: Hessen: threatened with extinction); Wiesbauer and Zettel, 2011:269 (Austria: Niederösterreich: March = Morava lowland); Ziska and Saure, 2011:108 (Germany: Berlin: Tegeler Fließ valley); Nemkov, 2012c:438 (in catalog of Crabronidae of Russian Far East); Akulov and Proshchalykin, 2013:114 (Russia: Siberia: Krasnoyarsk Krai: Minusinsk); Dyuzhaeva, 2013:117 (Russia: Samara Oblast': Zhiguli Nature Reserve); Mokrousov, Ruchin, and Egorov, 2013:199 (Russia: Mordovian Republic: Mordovian State Nature Reserve); Pankov, 2013:228 (Russia: Ivanovo Oblast'); Saure, 2013:18 (Berlin: Treptow-Köpenick: Gosener Wiesen); Shlyakhtenok, 2013:163 (in annotated catalog of aculeate wasps of Belarus'); Wiśniowski and Szczepko, 2013:32 (Poland: Kampinos National Park near Warszawa); Hellqvist, Abenius, and Norén, 2014:90 (in catalog of Ampulicidae, Sphecidae, and Crabronidae of Sweden, by provinces); Saure, 2015:13 (Germany: Berlin-Lichterfelde); Stolle and Saure, 2016:922 (Germany: in list of Sphecidae s.l. of Sachsen-Anhalt); Nemkov, 2017b:218 (in catalog of Astatinae of Russia, as *stigma stigma*).

Astata intermedia Dahlbom, 1843:140, ♂. Holotype: ♂, Germany: Glogau, now Poland: Głogów (Lund). Synonymized with *Astata stigma* by Kohl, 1885:440, synonymy confirmed by Verhoeff, 1951:159. – F. Smith, 1856:310 (in catalog of Hymenoptera in British Museum); Ruthe and Stein, 1857:313 (Germany: Berlin area); Kirchner, 1867:216 (in catalog of European Hymenoptera).

Astata stigma forma *major* Grönblom, 1946:40, ♀, ♂ (sex after Verhoeff, 1951:160). Syntypes: Finland: Island of Seiskari (Helsinki?). Synonymized with *Astata stigma* by Verhoeff, 1951:160. Prey: *Phimodera humeralis* Dalman, a scutellerid.

ssp. *bajanica* (Tsuneki)

Astata stigma bajanica Tsuneki, 1971:412, ♀, ♂. Holotype: ♂, Mongolia: Dundgov Aymag: Somon Bayan-nuur (TMB). – As *Dryudella stigma bajanica*: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae).

52. *tegularis* (F. Morawitz)

Astata tegularis F. Morawitz, 1889a:134, ♂. Syntypes: Mongolia: "Yelissyn-Kure" (ZIN). – Dalla Torre, 1897:656 (in catalog of world Sphecidae); Gussakovskij, 1927:276 (in revision of Palearctic *Astata*); Maidl and Klima, 1939:26 (in catalog of world Astatinae and Bembicinae). – As *Dryudella tegularis*: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae).

53. *tobiasi* Kazenas

Dryudella tobiasi Kazenas, 2000b:460, ♀. Holotype: ♀, Kyrgyzstan: 13 km N Suusambar near Tuz-Ashu Pass (Zool. Inst. Alma-Ata). – Kazenas, 2001:25 (in checklist of Sphecidae of Kazakhstan and Central Asia).

54. *tricolor* (Vander Linden)

Astata tricolor Vander Linden, 1829:31, ♂. Holotype or syntypes: ♂: Spain: no specific locality (originally Dejean coll., now lost). Neotype: ♂, Portugal: Setubal (Lausanne), designated by Verhoeff, 1951:153. – Dahlbom, 1843:139 (in revision of Sphecidae and Pompilidae), 1845:473 (in key to European *Astata*); Kirchner, 1867:216 (in catalog of European Hymenoptera); Kohl, 1893a:33 (Austria: Niederösterreich); F. Morawitz, 1893b:416 (Tajikistan: Iskander-kul in Zeravshan River valley); Schmiedeknecht, 1896:149 (Algeria: Oran Province, as *Astata*); Dalla Torre, 1897:656 (in catalog of world Sphecidae); Dominique, 1901a:506 (France: Loire-Inférieure, now Loire-Atlantique: Le Pouliguen); Ferton, 1901a:104 (prey); Antiga and Bofill, 1904:8 (Spain: Cataluña Province); Schmiedeknecht, 1907:235 (in key to Hymenoptera of Central Europe); de Gaulle, 1908:121 (in catalog of French Hymenoptera); Ferton, 1908:558 (prey); Mercet, 1910b:163 (listed from Spain); Mantero, 1911:74 (Italy: Sardegna: Isola dell'Asinara); Szilády, 1913:88 (Hungary: Csepel); Gribodo, 1924b:51 (Libya: Tolmetta); Berland, 1925d:109 (in Sphecid Fauna of France), 1928b:177 (France: Charente-Inférieure: Saintes and Var: Callian); Schmiedeknecht, 1930:697 (in keys to Hymenoptera of North and Central Europe); Zavadil, 1932:96 (Czechoslovakia); Bischoff, 1933:5 (Morocco: Casablanca); Nadig, 1933:86 (Morocco: Agadir, Tanger); Giner Marí, 1934:133 (Spain); Grandi, 1934:129 (Italy: Lazio: Acilia); Guiglia, 1934b:301 (Libya: bibliography and summary of locality records); Nadig, 1934:32 (Italy: Sardegna: Cagliari); Bernard, 1935:64 (France: Var: Fréjus area); Zavadil, 1937a:73 (eastern Slovakia); Zavadil, Šusterka, and Bat'a, 1937:205 (in catalog of Sphecidae of Czechoslovakia); Maidl and Klima, 1939:26 (in catalog of world Astatinae and Bembicinae); de Beaumont, 1942:415 (southern France: Vaucluse: Carpentras; Pyrénées-Orientales: Banyuls-sur-Mer; also Cavalaire; redescription); Giner Marí, 1943a:120 (in Sphecid Fauna of Spain), 1945d:66 (Spain; in revision of Spanish *Astata*); Deleurance, 1946b:67 (France: Bouche-du-Rhône: Camargue: Bois des Rièges); Giner Marí, 1946:8 (Morocco: Mogador); Dupuis, 1947:113 (list of known heteropteran prey); Guiglia, 1948c:201 (Italy: Sardinia: Cagliari); Šnoflak in Zavadil and Šnoflak, 1948:62, 64 (in key to Sphecidae of Czechoslovakia); Verhoeff, 1951:152 (group characters); de Beaumont, 1953g:129 (Morocco; complex of similar phenotypes recorded); Hertzog, 1954:101 (France: Bouches-du-Rhône: Camargue); Ceballos, 1956:373 (in catalog of Hymenoptera of Spain); Morel, Nouvel, and Ribaut, 1956:338 (France: Département des Pyrénées-Orientales); Pulawski, 1956:63 (in revision of European Astatinae); Bajári, 1957a:63, 65 (in key to Hungarian Sphecidae); de Beaumont, 1957b:136 (n. Iran); Evans, 1958b:180 (discussion of known prey); Nouvel and Ribaut, 1958:12 (France: Pyrénées-Orientales: Banyuls-sur-Mer); Compte Sart, 1959:132 (Spain: Majorca); de Beaumont, 1959a:26 (Italy); Suárez, 1959:56 (Spain: Almería Province); nec de Beaumont, 1960a:13 (= *tricolor*)

eurygnatha); de Beaumont 1960b:236 (Libya); Noskiewicz and Puławski, 1960:114, 115 (in key to Polish Sphecidae, not yet found in Poland); Scobiola, 1960a:171 (Romania: Calafat Region: Golintî); nec de Beaumont, 1961c:49 (= *tricolor eurygnatha*); de Beaumont, 1962b:25 (Spain); Ceballos, 1964:89 (in supplement to catalog of Spanish Sphecidae); nec de Beaumont, 1965a:45 (= *tricolor eurygnatha*); Balthasar, Hrubant, and Hrubant, 1967:172 (Bulgaria: Slanchev Bryag near Nessebar); Pulawski, 1967a:393 (*Astata tricolor* ssp., Turkey); Balthasar, 1972:292 (in Sphecid Fauna of Czechoslovakia); Scobiola-Palade, 1972a:150 (Romania: delta of Danube: Caraorman); Kazenas, 1974b:110 (feeding on flowers of *Euphorbia* spp., Euphorbiaceae, in Kazakhstan); Scobiola-Palade, 1974:144 (Romania: Sărăturile sandbank in delta of Danube); Kazenas, 1978b:98, 101 (in key to Sphecidae of Kazakhstan and Central Asia); Pulawski, 1978:230, 231 (in key to Sphecidae of European part of former USSR); Benedek, 1979:231 (Hungary: Bakony Hills); Józán, 1981:305 (Hungary: Hortobágy National Park); Scobiola-Palade, 1985:96 (Romania: delta of Danube); Kuznetzova, 1990:21 (Russia: Voronezh Oblast': Galich'ya Gora Nature Reserve); Scobiola-Palade, 1991:220 (Romania: delta of Danube). – **As *Astata tricolor***: Kohl, 1885a: 434 (new combination, in key to European *Astata*), 443 (in revision of European *Astata*), 449 (in checklist of world *Astata*); Gussakovskij, 1927:272 (in revision of Palearctic *Astata*). – **As *Dryudella tricolor***: Gribodo, 1919:858 (new combination, Italy: Piemonte: Susa); F. Parker in R. Bohart and Menke, 1976:214 (in checklist of world Sphecidae); Mityaev, Matesova, Kulenova, Kazenas, and Zhdanko, 1980:119 (Russia: Siberia: Altayskiy Kray: basin of Aley River); Pagliano, 1980:113 (Italy: Lazio); Gayubo, 1982a:96 (northern Spain: Sierra de Béjar), 1982f:249 (Spain: Cádiz Province); 1984b:82 (Spain: Salamanca Province), 1984c: (Portugal: El Algarve Province); Dollfuss, 1983a:77 (endangered in Burgenland, Austria), 1983b:9 (in catalog of Sphecidae of Austria); Gayubo, 1983a:122 (prey: a nymph of Lygaeidae); Józán, 1985b:56 (recorded from Simontornya by Bajári, 1957), 83 (ecological and zoogeographic characteristics); Gayubo, 1986c:32 (Spain: Zamora Province); Gayubo and Sanza, 1986:41 (Spain: Burgos, Segovia); Mingo and Gayubo, 1986:1009 (distribution in Spain); Asís and Jiménez, 1987:26 (Spain: Castellón Province); Dollfuss, 1987:20 (Austria: Bisamberg near Wien); Gayubo, 1987a:110 (Spain: Ciudad Real Province); Dollfuss, 1988:12 (Austria: Bisamberg); Karsai, 1988:99 (Hungary: Kiskunság National Park); Al-Houty, 1989:160 (Kuwait: Abdelli, Al-Wafra, Erifjan, Sulabiya); Pagliano, 1989:359 (Italy, redescription); Gayubo, Asís, and Tormos, 1990a:15 (Spain); Pagliano, 1990:66 (in catalog of Italian Sphecidae); Day, 1991:xiv (summary of European Endangered Hymenoptera Lists); Dollfuss, 1991:96 (in key to Sphecidae of North and Central Europe); Gayubo and Torres, 1991:Table I and p. 81 (Spain: Salamanca; effects of urban pressure); Józán, 1992b:173 (Hungary: Boronka-melléki Protected Area); Gayubo, Tormos, and Asís, 1993b:308 (specimen with deformed antenna); Negrisoló and Pagliano, 1993:91 (Italy: Sardegna); Torregrosa, Gayubo, Tormos, and Asís, 1993:18 (Spain: Alicante Province); Dollfuss, 1994:100 (endangered in Austria); Tormos, Asís, and Gayubo, 1994:188, 202 (Spain: Albacete Province); Gorobchishin, 1995:17 (Ukraine: Kanev Nature Reserve); Negrisoló in Minelli, Ruffo, and La Posta, 1995b:3 (in catalog of Italian fauna); Nemkov in Nemkov, Kazenas, Budrys, et Antropov, 1995:408 (in key to Sphecidae of Russian Far East); Gorobchishin, 1996:53 (Ukraine: Kanev Nature Reserve); Kuhlmann, 1996:220 (Portugal: Serra de Estrela); Voblenko, Gorobchishin, and Nesterov, 1996:14 (Ukraine: Polesye Region); Dollfuss, Gusenleitner, and Bregant, 1998:514 (Austria: summary of collecting records from Burgenland); Gusenleitner, 1998:498 (Austria: Burgenland: Nickelsdorf); González, Gayubo, and Torres, 1998:72, 73 (Spain: Valladolid Province); Shkuratov, 1998:97 (Russia: Rostov Oblast'); Gayubo, García, Torres, and González, 1999:89 (Spain: Soria Province); Generani, Pagliano, Scaramozzino, and Strumia, 1999:79 (Italy: Toscana: Isola di Montecristo); González, Gayubo, and Torres, 1999:354 (Spain: Valladolid: Viana de Cega); Canovai et al., 2000:78 (Italy: Toscana: Isola di Montecristo); Esenbekova and Kazenas, 2000:25 (southeast Kazakhstan: 20 km west of Alma Ata, near Kapchagay, 70 km northwest of Kapchagay, 2 km northwest of Zhabagly); Gayubo, González, and Torres, 2000:185 (Spain: Salamanca Province); Giachino, Grosso, Marchetti, Pagliano, Scaramozzino, and Vailati, 2000:106 (Greece); Kazenas, 2000e:240 (in Sphecid Fauna of Kazakhstan); Shkuratov, 2000:58 (Russia: Rostov Oblast': Vëshenskaya village area at 49°37'N 41°45'E); Basset, 2001:80 (France: Département de Gironde); Józán, 2001:278 (Hungary: Somogy County); Kazenas, 2001:25 (in checklist of Sphecidae of

- Kazakhstan and Central Asia), 144 (review of known biology); Kazenas and Esenbekova, 2001:134 (Kazakhstan: Almatinskiy Nature Reserve); K. Schmidt and Bitsch *in* Bitsch et al., 2001:187 (in Sphecidae Fauna of Western Europe); Pagliano, 2001:259, 260 (in key to Italian *Dryudella*); Zettel, Gross, and Mazzucco, 2001:71 (Austria: Wien); Kazenas, 2002a:59 (geographic distribution, collecting localities in Kazakhstan); Shlyakhtenok and Skibinskaya, 2002:33 (Belarus: no specific locality); Drewes, 2003:136 (Spain: Tarragona); Generani, Pagliano, Scaramozzino, and Strumia, 2003:64 (Italy: Arcipelago Toscano); Schmid-Egger, 2003:752 (Italy: Sicilia: Armerina, Castellammare, Madonie, Ragusa); Gayubo, Nieves-Aldrey, González, Tormos, Rey del Castillo, and Asís, 2004:108 (Spain: Madrid: Monte de El Pardo); Gorobchishin and Protsenko, 2004:39 (Ukraine: Kherson Oblast: Chernomorskiy Nature Reserve); Kazenas, 2004b:102 (Kazakhstan: western Tien Shan); Shkuratov, 2004a:78 (Russia: Rostov Oblast'), 2004b:167 (Russia: Rostov Oblast': Gosudarstvennyi Muзей-Zapovednik M.A. Sholokhova); Cruz-Sánchez, Gayubo, González, and Torres, 2005:219 (Spain: Salamanca: San Martín del Castañar); Pagliano and Negrisolo, 2005:104 (in Sphecidae Fauna of Italy); Shoreenko, 2005a:166 (Ukraine: Crimea), 2005b:99 (Ukraine: Crimea: Karadagh Nature Reserve); Magdalou, 2006a:7, 10 (France: Pyrénées-Orientales: Réserve Naturelle de la Massane); Standfuss and Standfuss, 2006b:96 (Greece: Thessalia: Magnisia Peninsula at 39°N 23°E); Bitsch, Dollfuss, Bouček, Schmidt, Schmid-Egger, Gayubo, Antropov, and Barbier, 2007:458 (France: first records from département du Lot: Arcambal and Catus); Jacobs, 2007:90, 91 (in key to Crabronidae of Germany, not yet found in Germany); Sipos and Móczár, 2007:204 (Hungary: vicinity of Foktő); Vepřek and Straka, 2007:202 (in catalog of Sphecidae of Czech Republic and Slovakia, known from Moravia and Slovakia only); Gayubo, González, Tormos, and Asís, 2008:136 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Nemkov, 2008b:19 (in catalog of Crabronidae of Asiatic Russia); Gayubo, González, Tormos, and Asís, 2009:363 (Spain: Valladolid: Reserva Natural Riberas de Castronuño – Vega del Duero); González, Gayubo, Asís, and Tormos, 2009:623 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park); Nemkov, 2009b:76 (in new catalog of Sphecidae and Crabronidae of Asiatic Russia); Shoreenko, 2009:368 (in list of Sphecidae s.l. of Crimea); Shoreenko and Konovalov, 2010:13 (Ukraine: Khar'kiv Oblast': Skripay; Lugansk Oblast': Trekhizbenka); Smetana, Roller, Beneš, Bogusch, Dvořák, Holý, Karas, Macek, Straka, Šima, Tyrner, Vepřek, and Zeman, 2010:88 (western Slovakia: Borská Nížina), 101 (recorded from western Slovakia: Borská Nížina); Baghirov, 2011b:140 (Russia: Altay Republic: Kosh-Agach, Ongudai); Cruz-Sánchez, Asís, Gayubo, Tormos, and González, 2011:498 (Spain: Salamanca and Zamora provinces: Arribes del Duero Natural Park: effects of wildfire); Gogala, 2011:14 (Slovenia: Podčetrtek); Józán, 2011:180 (in checklist of Sphecidae s.l. of Hungary); Boillat, 2012:225 (Switzerland: in checklist of insects of Canton de Genève); Prisniy, 2012:47 (Russia: Belgorod Oblast'); Strumia, Pagliano, and Gayubo, 2012:56 (Italy: Toscana: Riserva di San Rossore); Kazenas, 2013b:494 (southeastern Kazakhstan: valley of Sharyn River); Shlyakhtenok, 2013:164 (in annotated catalog of aculeate wasps of Belarus); Vieira, Oliveira, Brewster, and Gayubo, 2013:15 (Portugal: Douro International Natural Park and Serras de Aire e Candeeiros Natural Park); Baldock, 2014:353 (Spain: Island of Mallorca: Cala Millor and Ca'n Picafort., as *tricolor tricolor*); Ebrahimi, 2014:29 (Iran: Tehrān: Varāmin); Protsenko, Fateryga, and Ivanov, 2014:26 (Crimea: Krasnoarmeyskoye in Krasnoperekop District); Zettel, Ockermüller, and Wiesbauer, 2014:163 (Austria: Wien-Lobau); Simon, Lorthiois, and Macé, 2015:53 (France: alluvial terraces in Eure Department: Courcelle-sur-Seine); Mokrousov and Popov, 2016:566 (Russia: Krasnodarskiy Krai); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:32 (Iran: known from Fars, Qazvin, and Tehran provinces); Magdalou, 2017:15 (France: Pyrénées-Orientales: Réserves Naturelles Catalanes: Forêt de la Massane); Nemkov, 2017b:219 (in catalog of Astatinae of Russia).
- Dryudella ghilianii* Spinola, 1843a:135, ♀ (as *Ghilianii*, incorrect original capitalization). Holotype: Spain: no specific locality (Torino). Synonymized with *Astata tricolor* by Kohl, 1885:443, synonymy confirmed by Verhoeff, 1951:154. – Verhoeff, 1951:154 (holotype discussed). – **As *Astata ghilianii***: Kirchner, 1867:216 (new combination, in catalog of European Hymenoptera). – **As *Astata tricolor* var. *ghilianii***: Kohl *in* Dalla Torre, 1897:656 (new status, in catalog of world Sphecidae); Maidl and Klima, 1939:27 (in catalog of world Astatinae and Bembicinae); Ceballos, 1956:374 (in catalog of Hymenoptera of Spain).

Dimorpha cincta Spinola, 1834:135, ♀ (authorship attributed to Perris). Lectotype: ♂, southern France: no specific locality (Torino), designated by Verhoeff, 1951:153. Synonymized with *Astata tricolor* by Verhoeff, 1951:154. – **As *Dryudella cincta***: Casolari and Casolari Moreno, 1980:113 (new combination, specimens in M. Spinola collection); Pagliano, 2011a:111 (specimens in coll. Spinola, Torino, are *Dryudella tricolor*, one was designated as lectotype of *Dryudella cincta* by Verhoeff, 1951, and also *Dryudella aquitana*).

Dryudella spinolae A. Costa, 1867b:92, ♂ (as *Spinolae*, incorrect original capitalization). Holotype or syntypes: ♂, Italy: Sardegna: no specific locality (Torino). Synonymized with *Astata tricolor* by Kohl, 1885:443. – A. Costa, 1871c:93 (description of ♂), pl. III fig 1 (color illustration), 1883:57 (Italy: Sardegna: Oristano), 1884b:32 (Italy: Sardegna: montagne di Desulo). – **As *Astata tricolor* var. *spinolae***: Zavattari, 1912:3 (new combination, new status, Italy: Sardegna: Monte Santa Nirra).

Dryudella spinolae A. Costa, 1867c:36 (as *Spinolae*, incorrect original capitalization). Objective synonym of *Dryudella spinolae* A. Costa, 1867b:92.

Astata calopteryx Gussakovskij, 1952:226, ♀. Syntypes: ♀, Tajikistan: Ayvadj; Kazakhstan: Tartugay near Kzyl-Orda (ZIN). Synonymized with *Dryudella tricolor* by Kazenas, 2001:24.– Pulawski, 1956:63 (as synonym of *Astata tricolor*); F. Parker in R. Bohart and Menke, 1976:214 (as synonym of *Dryudella tricolor*); Kazenas, 1978b:97 (in key to Sphecidae of Kazakhstan and Central Asia).

As *Dimorpha abdominalis*: Pagliano, 2011a:112 (some specimens in coll. Spinola, Torino, are *Dryudella tricolor*).

ssp. *anatolica* (Pulawski)

Astata tricolor anatolica Pulawski, 1967b:392, ♀, ♂. Holotype: ♂, Turkey: Sereflikohisar (BMNH). – Ljubomirov and Yildirim, 2008:56 (in catalog of Crabronidae of Turkey). – **As *Dryudella tricolor anatolica***: Yildirim, Ljubomirov, and Lelej, 2014:5 (distribution in Turkey by biogeographic provinces). – **As *Dryudella anatolica***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, new status, in checklist of world Sphecidae), 628 (the species status is by F. Parker); Yildirim, Ljubomirov, and Lelej, 2014:5 (distribution in Turkey by biogeographic provinces), 19 (is an endemic of Turkey).

ssp. *emeryana* A. Costa

Dryudella emeryana A. Costa, 1867b:91, ♂ (as *Emeryana*, incorrect original capitalization). Syntypes: ♂, Italy: Campania: Capodimonte and Portici near Napoli (Napoli). – **As *Astata emeryana***: Kohl, 1885:443 (new combination, as synonym of *Astata tricolor*); de Beaumont, 1954e:90 (Italy; determination?). – **As *Astata tricolor* var. *emeryana***: Kohl in Dalla Torre, 1897:656 (new status, in catalog of world Sphecidae); de Gaulle, 1908:121 (in catalog of French Hymenoptera); Zavادل, Šusterá, and Bat'a, 1937:206 (in catalog of Sphecidae of Czechoslovakia); Maidl and Klima, 1939:27 (in catalog of world Astatinae and Bembicinae).

Dryudella dimidiata A. Costa, 1867b:92, ♀. Syntypes: Italy: Campania: Capodimonte and Portici near Napoli (Napoli). Synonymized with *Dryudella tricolor emeryana* by Kohl, 1885:443 — de Beaumont, 1953i:2 (study of syntypes). – **As *Astata tricolor* var. *dimidiata***: Kohl in Dalla Torre, 1897:656 (new combination, new status, in catalog of world Sphecidae); Maidl and Klima, 1939:27 (in catalog of world Astatinae and Bembicinae).

Dryudella emeryana A. Costa, 1867c:35 (as *Emeryana*, incorrect original capitalization). Objective synonym of *Dryudella emeryana* A. Costa, 1867b:91.

Dryudella dimidiata A. Costa, 1867c:36. Objective synonym of *Dryudella dimidiata* A. Costa, 1867b:92

As *Astata tricolor*: Grandi, 1934:129 (Italy); de Beaumont, 1954e:90 (Italy: Lazio: Acilia); Grandi, 1954:231 (Italy); Erlandsson, 1974:70 (Italy); de Beaumont, 1959a:26 (Italy); Zangheri, 1969:1703 (Italy: in catalog of flora and fauna of Romagna Region).

ssp. *eurygnatha* (Pulawski)

Astata tricolor eurygnatha Pulawski, 1967b:390, ♀, ♂. Holotype: ♀, Bulgaria: Varna (originally W.J. Pulawski coll., now CAS). Paratypes: Turkey, Island of Rhodes. – **As *Astata tricolor*** (present correction based on geographic distribution): de Beaumont, 1957:136 (Iran); Pulawski, 1958a:178 (Bulgaria: Aitos, Kniazhevo near Sofia, mouth of

Ropotamo River, Sandanski, Sozopol, Varna); de Beaumont, 1960a:13 (Greece: Island of Rhodes); Scobiola, 1960a:171 (Romania); de Beaumont, 1961:49 (Island of Crete), 1965:45 (Greece); Scobiola-Palade, 1965:112 (Romania), 1967a:161 (Romania: Constanța District: Comarova), 1968b:142 (Romania: Island of Letea in delta of Danube); Kazenas, 1972b:158 (Kazakhstan); Scobiola-Palade, 1972:150 (Romania), 1974:144 (Romania); Kolesnikov, 1977:318 (Russia: Bryansk Oblast'); Guichard, 1978:271 (Greece, as *Dryudella tricolor*); Dollfuss, 1989:12 (type material in NHMW, as *qurygnatha*); K. Schmidt and Bitsch in Bitsch et al., 2001:189 (in Sphecidae Fauna of Western Europe); Gayubo, Özbek, and Yıldırım, 2003:86 (Turkey: many localities); Yıldırım and Ljubomirov, 2005:1789 (Turkey: Balıkesir, Erzurum, Konya, and Nevşehir provinces), 2007:117 (Turkey: Erzurum: Hımis: Söylemez and İlica: Sorkunlu; Konya: Çumra: Dinlendik); Ljubomirov and Yıldırım, 2008:56 (in catalog of Crabronidae of Turkey); Guéorguiev and Ljubomirov, 2009:262 (Bulgaria: Maleshevska Planina). – **As *Dryudella tricolor eurygnatha***: Schmidt and Westrich, 1983:122 (Greece); Yıldırım, 2012:75 (Turkey: Erzurum and Kars provinces); Yıldırım, Ljubomirov, and Lelej, 2014:5 (distribution in Turkey by biogeographic provinces); Schmid-Egger, 2014:549 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 558 (specimens from south Israel need further revision); Atbaei, Fallahzadeh, and Ljubomirov, 2015:10 (Iran: Fars Province); Yıldırım, Ljubomirov, Özbek, and Yüksel, 2016:10 (Turkey: Tunceli Province). – **As *Dryudella eurygnatha***: F. Parker in R. Bohart and Menke, 1976:214 (new combination, new status, in checklist of world Sphecidae), 628 (the species status is by F. Parker).

ssp. *modesta* Mocsáry

Dryudella modesta Mocsáry, 1879:127, ♂. Holotype or syntypes: ♂, Hungary: Budapest (TMB). – Kohl, 1885:443 (as synonym of *Astata tricolor*); Mocsáry, 1897:78 (Hungary, as synonym of *Astata tricolor*); F. Parker in R. Bohart and Menke, 1976:215 (in checklist of world Sphecidae), 628 (the species status is by F. Parker); Haris, 2016:16 (in list of species described by S. Mocsáry from Carpathian Basin). – **As *Astata tricolor modesta***: Pulawski, 1967b:391 (new combination, new status, redescription); K. Schmidt and Bitsch in Bitsch et al., 2001:189 (in Sphecidae Fauna of Western Europe).

As *Astata tricolor*: Józán, 1986:369 (Hungary: Kiskunság National Park), present correction to *Dryudella tricolor modesta* based on geographic distribution.

sp. *monochroma* (Pulawski)

Astata tricolor monochroma Pulawski in de Beaumont, Bytinski-Salz and Pulawski, 1973:3, ♀, ♂. Holotype: ♂, Israel: Ramat Gan (originally H. Bytinski-Salz coll., now Tel-Aviv Univ.). – **As *Dryudella tricolor monochroma***: F. Parker in R. Bohart and Menke, 1976:215 (new combination, in checklist of world Sphecidae); Schmid-Egger, 2014:547 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 558 (specimens from south Israel need further revision).

55. *unicolor* Schmid-Egger

Dryudella unicolor Schmid-Egger, 2014:560, ♂. Holotype: ♂, Israel: Negev: En Zin (Ch. Schmid-Egger coll.). – Schmid-Egger, 2014:547 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 561 (color photographs of male); Jacobs and Grabener, 2017:114 (in key to males of Palearctic *Dryudella* with black frons).

56. *vanharteni* Schmid-Egger

Dryudella vanharteni Schmid-Egger, 2014:562, ♀, ♂. Holotype: ♂, United Arab Emirates: Wadi Shawkah at 27.13°N 56.02°E (Ch. Schmid-Egger coll.). – Schmid-Egger, 2014:549 (in key to *Dryudella* of Arabian Peninsula and adjacent territories), 563 (color photographs of female and male).

57. *veronikae* Kazenas

Dryudella veronikae Kazenas, 2000e:242, ♂. Holotype: ♂, Kazakhstan: Ili River valley 65 km W Bakanas (ZIN). – Esenbekova and Kazenas, 2000:25 (southeast Kazakhstan: 65 km W Bakanas, 35 km NE Kapchagay); Kazenas,

2002a:59 (geographic distribution, collecting localities in Kazakhstan, as name *in litteris*), 2008a:100 (Southeastern Kazakhstan: 65 km W Bakanas in Ili River valley).

Dryudella veronikae Kazenas, 2001c:745, ♂. Objective synonym of *Dryudella veronikae* Kazenas, 2000e:242,

58. *xanthocera* (Pulawski)

Astata xanthocera Pulawski, 1961b:94, ♂. Holotype: ♂, Lebanon: Cedars (originally W.J. Pulawski coll., now CAS).

– As *Dryudella xanthocera*: F. Parker in R. Bohart and Menke, 1976:214 (new combination, in checklist of world Sphecidae).

sp.

Kohl, 1880:231 (sp. near *Astata stigma*, description); de Beaumont, 1950f:405 (Algeria; in *Astata*), 1961b:275 (Afghanistan; sp. near *Dryudella amenartais*); Pulawski, 1967a:389 (Turkey, sp. near *similis*); Kumar, Lavigne, Lloyd, and Pfadt, 1976:51 (USA: Colorado: Pawnee National Grassland); Kazenas, 1992c:25 (Turkmenistan: Repetek Nature Reserve, sp. aff. *frontalis*); González, Gayubo, and Torres, 1998:72, 73 (Spain: Valladolid Province), 1999:354 (Spain: Valladolid: Viana de Cega); S. Gupta, 2004:27 (India: Uttaranchal: Uttarkashi District); Kazenas, 2007a:90 (Kazakhstan: Akmala Oblast': Kurgandzhin Nature Reserve and vicinity); Gayubo, González, Tormos, and Asís, 2008:136 (Spain: Salamanca: Parque Natural de Las Batuecas – Sierra de Francia); Ljubomirov and Yildirim, 2008:57 (in catalog of Crabronidae of Turkey); Ghazi-Soltani, Ebrahimi, Iranipour, and Pour Abad, 2010:799 (Iran: East Azarbaijan: Tabriz: Khalatpouschan); Kazenas, 2012b:169 (Kazakhstan: Korgalzhin State Nature Reserve); Jahantigh, Rakhshani, Mokhtari, and Ramroodi, 2017:32 (Iran: East Azerbaijan)

NOMINA NUDA IN DRYUDELLA

Dryudella boetica: Casolari and Casolari Moreno, 1980:113 (specimens in M. Spinola collection); Pagliano, 2011a:111 (specimens in coll. Spinola, Torino, are *Dryudella tricolor*).

Dryudella quartinae Gribodo: Penati and Mariotti, 2015:13 (reference to unpublished manuscript by Gribodo).