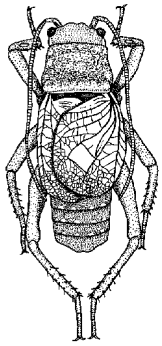

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PHYLOGENY AND CLASSIFICATION OF THE TRIBE DEUTERAGENIINI (HYMENOPTERA, POMPILIDAE: PEPSINAE)

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Phylogenetic analysis of 13 species from seven generic groups with genus *Priocnemis* as outgroup reveals the relationships: *Priocnemis* + **[***Stigmatodipogon* + {(*Deuteragenia* + *Mesagenia*) + [(*Winnemanella* + *Nipponodipogon*) + (*Myrmecodipogon* + *Dipogon*)]}**]**. A tree generated from 13 species of seven generic groups and *Priocnemis* as outgroup based on 24 characters by TNT (new technology search) yielded a length 69 steps, CI of 0.86, RI of 0.84. *Deuteragenia* + *Mesagenia* form joint cluster with one synapomorphy; other groups are monophyletic. New generic classification of the tribe Deuterageniini is proposed: *Deuteragenia* Šustera, 1912, **stat. resurr.** (=*Mesagenia* Haupt, 1959, **syn. n**.), *Dipogon* Fox, 1897, *Myrmecodipogon* Ishikawa, 1965, **stat. n.**, *Nipponodipogon* Ishikawa, 1965, **stat. n.**, *Stigmatodipogon* Ishikawa, 1965, **stat. n.**, and *Winnemanella* Krombein, 1962, **stat. n.** A new synonymy is proposed for *Deuteragenia bokhaica* (Lelej, 1986), **comb. n.** (=*Dipogon antropovi* Lelej, 1995, **syn. n**. A list of 81 species of tribe Deuterageniini by genera *Deuteragenia* (54 species), *Dipogon* (14), *Myrmecodipogon* (3), *Nipponodipogon* (6), *Stigmatodipogon* (3), *Winnemanella* (1) is given. A new combinations are proposed for 56 species. Key to the genera of the tribe Deuterageniini is given.

KEY WORDS: Hymenoptera, Pompilidae, spider wasps, Deuterageniini, phylogeny, classification.

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В результате филогенетического анализа 13 видов из семи родовых групп и рода *Priocnemis*, как внешней группы, выявлены следующие родственные отношения: *Priocnemis* + **[***Stigmatodipogon* + {(*Deuteragenia* + *Mesagenia*) + [(*Winnemanella* + *Nipponodipogon*) + (*Myrmecodipogon* + *Dipogon*)]}**]**. Для 13 видов из 7 родовых групп и внешней группы *Priocnemis* с помощью программы TNT (new technology search) построено филогенетическое древо, основанное на 24 признаках (длина 69 шагов, CI = 0.86, RI = 0.84). *Deuteragenia* + *Mesagenia* образуют общий кластер с одной синапоморфией; другие группы монофилетичные. Предложена новая родовая классификация трибы Deuterageniini: *Deuteragenia* Šustera, 1912, **stat. resurr.** (=*Mesagenia* Haupt, 1959, **syn. n**.), *Dipogon* Fox, 1897, *Myrmecodipogon* Ishikawa, 1965, **stat. n.**, *Nipponodipogon* Ishikawa, 1965, **stat. n.**, *Stigmatodipogon* Ishikawa, 1965, **stat. n.** и *Winnemanella* Krombein, 1962, **stat. n.** Новая синонимия предложена для *Deuteragenia bokhaica* (Lelej, 1986), **comb. n.** (=*Dipogon antropovi* Lelej, 1995, **syn. n**.). Дается список 81 вида трибы Deuterageniini по родам *Deuteragenia* (54 вида), *Dipogon* (14), *Myrmecodipogon* (3), *Nipponodipogon* (6), *Stigmatodipogon* (3), *Winnemanella* (1). Новая комбинация предложена для 56 видов. Дается определительная таблица родов трибы Deuterageniini.

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INTRODUCTION

The tribe Deuterageniini was proposed by O. Šustera (1912) in subfamily Pepsinae for four genera: *Deuteragenia* Šustera, 1912, *Clavelia* Lucas, 1851, *Parapompilus* Smith, 1855 (currently *Clavelia* and *Parapompilus* are junior synonyms of *Ctenocerus* Dahlbom, 1845 from the tribe Ctenocerini of subfamily Ctenocerinae) and *Pseudagenia* Kohl, 1884 (currently *Pseudagenia* is junior synonym of *Auplopus* Spinola, 1841 from the tribe Ageniellini of subfamily Pepsinae). Later Haupt (1959) proposed monotypic genus *Mesagenia* for *Deuteragenia thias* described from the Philippines (Banks, 1934). The subgenera *Myrmecodipogon*, *Nipponodipogon*, and *Stigmatodipogon* of *Dipogon* from East Palaearctic were described by Ishikawa (1965) and subgenus *Winnemanella* from Nearctic by Krombein (1962).

The genus *Dipogon* based on the unique specimen from the Brazil was described by Fox (1897). Probably this genus was unknown to Šustera and not included in his new tribe (Šustera, 1912). Pate (1946) used unpublished Banks' data on *Dipogon* and synonymized Holarctic genus *Deuteragenia* Šustera, 1912 with genus *Dipogon*. The subsequent authors considered *Deuteragenia* as genus (Arnold, 1948, 1955; Haupt, 1959) or subgenus of *Dipogon* (Townes, 1957; Evans, 1974; Day, 1979; Shimizu & Ishikawa, 2002a, b).

TAXA EXAMINED

We selected 13 (from 22) species of seven generic groups for the receiving of morphological characters and their distribution among the tribe Deuterageniini.

1. ***Dipogon*** (two species): *D.* (*D.*) *texanus chapalae* Evans, 1974, 3♀ from Mexico; the data for *D. populator* Fox, 1897 are taken from Fox (1897).

2. ***Dipogon* (*Deuteragenia*)** (ten species): *D.* (*D.*) *albiclypeatus* Lelej, 1986, 5♀, 6♂ (including holotype and paratypes) from the Russian Far East; *D.* (*D.*) *bifasciatus* (Geoffroy, 1785), 88♀, 49♂ from Russia (European part, Far East), Japan, Ukraine, and Georgia; *D.* (*D.*) *bokhaica* (Lelej, 1986), 1♂ (holotype); *D.* (*D.*) *calipterus nubifer* (Cresson, 1869), 4♀ from Mexico; *D.* (*D.*) *immarginatus* (Gussakovskij, 1932), 41♀, 8♂ from Russian Far East and Japan; *D.* (*D.*) *melanocephalus* (Cameron, 1891), 1♀ from Mexico; *D.* (*D.*) *nipponicus* Yasumatsu, 1939, 30♀, 38♂ from Russian Far East and Japan; *D.* (*D.*) *romankovae* Lelej, 1986, 26♀, 4♂ (including holotype and paratypes) from Russian Far East; *D.* (*D.*) *vechti* Day, 1979, 76♀, 47♂ from Russia (East Siberia and Far East); *Dipogon* (*Deuteragenia*) sp.: 4♀ from Mexico.

3. ***Dipogon* (*Myrmecodipogon*)** (two species): *D.* (*M.*) *choii* Lelej, 2001, 1♀ (holotype) from South Korea; *D.* (*M.*) *pannonicus* (Zettel, 1993), 1♀ 1♂ from Poland.

4. ***Dipogon* (*Nipponodipogon*)** (five species): *D.* (*N.*) *iwatai* Ishikawa, 1965, 1♀, 1♂ from Japan; *D.* (*N.*) *nagasei* Ishikawa, 1965, 1♀, 1♂ from Japan; *D.* (*N.*) *bokhaicus* Lelej, 1986, 1♂ (holotype) from Russian Far East; *D.* (*N.*) *kurilensis* Lelej, 1986, 1♀ (holotype) from Russian Far East; *D.* (*N.*) *rossicus* Lelej, 1986, 12♀, 1♂ (including holotype and paratypes) from Russian Far East; *Dipogon* (*Nipponodipogon*) sp., 1♀, 1♂ from Japan.

5. ***Dipogon* (*Stigmatodipogon*)** (one species): *D.* (*S.*) *petiolatus* Lelej, 1986, 30♀, 3♂ (including holotype and paratypes) from Russian Far East.

6. ***Mesagenia*** (one species): *M. antropovi* (Lelej, 1995), 10♀ (including holotype and paratypes) from Russian Far East.

7. ***Winnemanella*** (one species): the data for *W. fulleri* (Krombein, 1962) are taken from Krombein (1962).

For the outgroup we used *Priocnemis* (*Umbripennis*) *japonica* Gussakovskij, 1930, ♀, ♂, common species in East Palaearctic.

MATERIAL AND METHODS

The current paper based on more than 500 specimens of spider wasps of tribe Deuterageniini, originated from Palaearctic (Russia, Japan, South Korea, Ukraine, Georgia, Poland), Nearctic (USA), and Neotropic (Mexico). Material is deposited in the collection of the Institute of Biology and Soil Science (Vladivostok, Russia) and Zoological Institute (St. Petersburg, Russia).

For the analysis we used the TNT program, version 1.1 (Goloboff et al., 2008) and WinClada, version 1.00.08 (Nixon, 2002).

CHARACTERS

Twenty four characters of female were used for the phylogenetic analysis. Additive characters are asterisked (*), other characters are nonadditive. The weight of additive characters are given in the end of character in square brackets. The resulting matrix for 13 species of seven generic groups of Deuterageniini and *Priocnemis* as outgroup is given in Table 1. The genus *Priocnemis* Schiødte, 1837 from tribe Priocnemini is used as outgroup. The polarity is given in round brackets, (0) is the primitive state, (1) or (2) is derived conditions, (?) data missing.

1. **Maxillary cardo:** Without curved bristles (0), with weakly developed, short and soft bristles (1), with well developed, long, strong bristles (2).
*2. **Malar space:** Much shorter than flagellomeres width (0), well developed, as long as flagellomeres width (1). [5].
3. **Anterior border of clypeus:** Without distinct preapical depressed rim (0), with preapical depressed rim (1).
4. **Anterior border of labrum:** Straight or roundish (0), distinct emarginated (1).
*5. **Ratio of length to apical width of flagellomere 1:** 3.0 × and more (0), 2.5 × and less (1). [5].
*6. **Ratio of head width to maximum pronotum width:** 1.3 × and less (0), 1.7 × and more (1). [5].
7. **Ratio of pronotum length to its width:** 0.3 × and less (0), 0.6 × and more (1).
8. **Mid and hind tibia:** Without or with very short spines (0), with distinct long spines (1).
*9. **Dorsal surface of hind tibia:** Never serrate (0), with a longitudinal serrate carina (1). [5].
10. **Ratio of width of *2r-m* cell of fore wing to length of *2r-m* cell:** 2.6 × and more (0), 2.0 × and less (1).
*11. **Ratio of pterostigma width to width of *2r-m* cell of fore wing:** 1.0 × (0), 1.5 × and more (1), 0.5 × and less (2). [5].
12. **Angle between second and third abscissa of *R* of fore wing:** 145° and more (0), 135° and less (1).
13. **Fore wing:** Without any fascia (0), with dark apical fascia (1), with dark basal and apical fasciae (2).
*14. **Ratio of anal lobe length of hind wing to submedial cell width of hind wing:** 0.33 × and more (0), 0.25 × and less (1). [5].
15. **Metasomal segment 1 basally:** Not petiolate (0), petiolate (1).
*16. **Lateral sides of clypeus and pronotum:** Without ivory spots (0), with ivory spots (1). [5].
17. **Propodeum dorsally:** Shortened, swollen (0), elongated, more flat (1).
18. **Mesosoma and propodeum:** Black (0), red with some parts black (1), completely reddish (2).
19. **Mid and hind legs:** Predominantly black (0), predominantly red-brownish (1).
20. **Flagellomere 1:** Black to dark brown (0), light brown (1).

21. **Propodeum dorso-laterally:** Without setae (0), with long erect setae (1).
22. **Crossvein *cu-a* (nervulus) of forewing:** Interstitial (0), postfurcal (1).
23. ***M* of fore wing:** Touch the wing apex (0), not touch to the wing apex (1).
24. **Pronotum posteriorly:** Arcuate (0), angulate (1).

Table 1

Characters matrix for 13 species of 7 generic groups of tribe Deuterageniini and *Priocnemis* as outgroup

Taxa	Characters 111111111122222 123456789012345678901234
Priocnemis japonica Gussakovskij	000100011120100010001111
Deuteragenia vechti (Day)	201100000100200010001100
D. melanocephala (Cameron)	200100000100200012111100
D. caliptera nubifer (Cresson)	200100000100200010011100
Mesagenia antropovi (Lelej)	200000000100100010111100
Dipogon populator Fox	200100000012000?????0??
D. texanus chapalae Evans	200100000001201011011000
Myrmecodipogon choii (Lelej)	200101100100210000111100
M. asahinai (Ishikawa)	200101100100210000111000
Nipponodipogon iwatai (Ishikawa)	100010000100100010000000
N. kurilensis (Lelej)	100010000100100010001000
N. rossicus (Lelej)	100010000100100010001000
Stigmatodipogon petiolatus (Lelej)	200100000111201010001100
Winnemanella fulleri (Krombein)	11???????10?0??1????????

CLADISTIC ANALYSIS

We made analysis of characters using cladistic program TNT "Tree Analysis Using New Technology", version 1.1, by New Technology Search (Goloboff, 2008). When we used unweighted and nonadditive characters we receive weakly differentiated trees which strikingly differ from ones when seven characters (from 24) have been additive and weighted. The following characters are additive with weight 5: No. 2, 5, 6, 9, 11, 14, 16. The monophyly of tribe Deuterageniini is supported by synapomorphy of character No. 1. *Stigmatodipogon* is most basal group with one autapomorphy (character No. 11). *Deuteragenia* and *Mesagenia* are the second basal group and have joint cluster based on synapomorphy of character No. 21. *Mesagenia* has not any autapomorphies within *Deuteragenia* cluster. Among the other four generic group *Winnemanella* and *Myrmecodipogon* are most derived groups and have three or four apomorphies while *Nipponodipogon* and *Dipogon* each have one autapomorphy (Fig. 1). Among the tribe Deuterageniini *Nipponodipogon* has shortenend antennae which are common in cleptoparasite spider wasps (Ceropalinae, *Evagetes* Lepeletier from Pompilini, *Poecilagenia* Haupt from Agenielini). Recently it was discovered (Shimizu et al., 2012) that two *Nipponodipogon* species are brood parasites on *Deuteragenia* and *Auplopus* Spinola species.

CLASSIFICATION

Based on phylogenetic research we propose here to regard each generic group with one or more autapomorphies (synapomorphies) as separate genus. *Mesagenia* only has not autapomorphy but has synapomorphy (character No. 21) with *Deuteragenia* and we regard both of them as one genus.

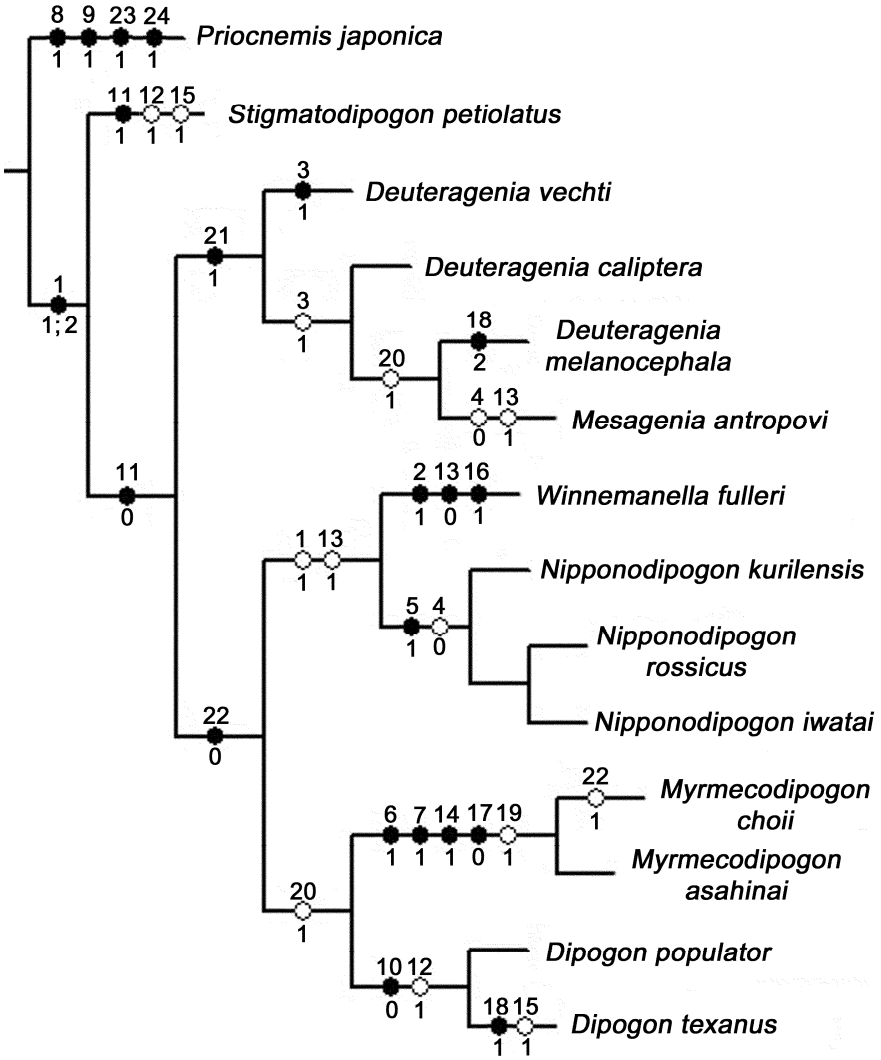


Fig. 1. Cladogram of relationships between the thirteen species of seven generic groups and *Priocnemis* as outgroup received by TNT program (new technology search) based on 24 characters (additive characters No. 2, 5, 6, 9, 11, 14, 16) (69 steps, CI = 86, RI = 84). Black circles = unreversed apomorphies; empty circles = homoplasious apomorphies.

Tribe Deuterageniini Šustera, 1912

Deuteragenini (!) Šustera, 1912: 176; Day, 1981: 5.

Deuterageniini: Engel, Grimaldi, 2006: 360; Lelej, Loktionov, 2012: 413; Loktionov, Lelej, 2012: 251.

Auplopiini (!): Haupt, 1959: 19 (part, *Dipogon*, *Deuteragenia*).

Pepsini: Wolf, 1972: 36 (part., *Dipogon* Fox, 1897); Krombein, 1979: 1533 (part, *Dipogon* (*Deuteragenia*), *Dipogon* (*Dipogon*), *Dipogon* (*Winnemanella*)); Wahis, 1986: 14 (part., *Dipogon* (*Deuteragenia*)); 2012 (part., *Dipogon* (*Deuteragenia*)); Wolf, Sorg, 2007: 8 (part., *Dipogon* Fox, 1897).

Type genus. *Deuteragenia* Šustera, 1912.

Diagnosis. FEMALE. Maxillary cardo with two tufts of curved bristles. MALE. Flagellomeres serrate beneath. Propodeum somewhat swollen, punctate. *3r-m* cell of fore wing usually equal or slightly larger *2r-m* cell. The females of Deuterageniini well differ from ones of the tribes Ageniellini and Priocnemini, while the male characters of Deuterageniini are overlapped with other tribes of subfamily Pepsinae.

Distribution. World-wide (except Australia).

Genera included. Currently the tribe includes *Deuteragenia* Šustera, 1912, **stat. resurr.** (=*Mesagenia* Haupt, 1959, **syn. n**.), *Dipogon* Fox, 1897, *Myrmecodipogon* Ishikawa, 1965, **stat. n.**, *Nipponodipogon* Ishikawa, 1965, **stat. n.**, *Stigmatodipogon* Ishikawa, 1965, **stat. n.**, and *Winnemanella* Krombein, 1962, **stat. n.**

Natural history. The majority of the species are wood- and bamboo stem-nesting wasps preferring forest area. They use spiders from families Segestriidae, Dysderidae, Oxyopidae, Agelenidae, Amaurobiidae, Clubionidae, Gnaphosidae, Thomisidae, and Salticidae as a prey for their larvae. Only *Nipponodipogon* species are brood parasites on *Deuteragenia* and *Auplopus* Spinola species (Shimizu et al., 2012).

1. Genus *Deuteragenia* Šustera, 1912, stat. resurr.

Agenia Schiødte, 1837: 321 [type species *Sphex variegata* Linnaeus, 1758, by subsequent designation Westwood, 1840: 82], nom. praeocc., nec Descourtilz, 1825 (Insecta: Hemiptera). Objectively invalid name: junior homonym of *Agenia* Descourtilz, 1825.

Agenia: Dahlbom, 1843: 80–90, divis. 1.

Pogonius Dahlbom, 1845: 453 [type species *Sphex variegata* Linnaeus, 1758, by subsequent designation Pate, 1946: 101], nom. praeocc., nec Leach, 1815 (Aves), nec Jarocki, 1822 (Pisces). Objectively invalid name: junior homonym of *Pogonius* Leach, 1815 and *Pogonius* Jarocki, 1822. Junior objective synonym of *Agenia* Schiødte, 1837. Senior objective synonym of *Deuteragenia* Šustera, 1912 according to Pate, 1946: 101.

Anoplius Lepeletier, 1845: 440 [type species *Anoplius variegatus* Vander Linden, 1827 =*Sphex variegata* Linnaeus, 1758), by subsequent designation Audouin et al., 1846: pl. 120, fig. 7], nom. praeocc., nec Dufour, 1834. Objectively invalid name: junior objective synonym of *Agenia* Schiødte, 1837 according to Pate, 1946: 72. Senior objective synonym of *Deuteragenia* Šustera, 1912 according to Pate, 1946: 72.

Deuteragenia Šustera, 1912: 191, nom. n. for *Agenia* Schiødte, 1837 [type species *Sphex variegata* Linnaeus, 1758, by automatic designation (see *Agenia* Schiødte, 1837) (article 67.8 of Code (ICZN, 1999)]; Haupt, 1927: 128, 132, ♀♂; Gussakovskij, 1932: 41, ♀; Banks, 1934: 68; Arnold, 1934: 367, ♀; 1948: 230; 1955: 745, ♀; Haupt, 1959: 19, 31, 69, ♀ ♂; Lelej, Loktionov, 2012: 413; Loktionov, Lelej, 2012: 251. Junior subjective synonym of *Dipogon* Fox, 1897 according to Pate (1946: 118).

Deuteragenia (as subgenus of *Dipogon* Fox, 1897): Townes, 1957: 116, ♀♂; Ishikawa, 1965a: 89; 1965b: 507, ♀; Evans, 1974: 29, ♀♂; Day, 1979: 8; Krombein, 1979: 1533; Wahis, 1986: 14; Lelej, 1986: 799, 801, ♀♂; 1995: 226, 229, ♀♂; 2000: 622; 2005: 124, ♀♂; Lelej et al., 1994: 140, ♀; Kurzenko et al., 1995: 301, ♀♂; Shimizu, 1996b: 508; Shimizu, Ishikawa, 2002a: 224, ♀♂; 2002b: 361, ♀, ♂.

Adipogon Banks, 1944: 181 (as subgenus of *Dipogon* Fox, 1897) [type species *Pompilus* (*Agenia*) *pulchripennis* Cresson, 1867, by original designation]. Junior subjective synonym of *Deuteragenia* Šustera, 1912 according to Krombein, 1979: 1533.

Mesagenia Haupt, 1959: 8, 68 [type species *Deuteragenia thias* Banks, 1934, by monotype]; Lelej, 2000: 622, ♀. **Syn. n.**

Species included (54). *Deuteragenia albiclypeata* (Lelej, 1986), **comb. n.**; *D. alastor* (Banks, 1946), **comb. n.**; *D. albithrix* (Shimizu et Ishikawa, 2002), **comb. n.**; *D. amamiensis* (Shimizu, 2006), **comb. n.**; *D. ariel* (Banks, 1946), **comb. n.**; *D. austriaca* (Wolf, 1964), **comb. n.**; *D. aztecus* (Evans, 1974), **comb. n.**; *D. bicolor* Arnold, 1934; *D. bifasciata* (Geoffroy, 1785), **comb. n.**; *D. bokhaica* (Lelej, 1986), **comb. n.** [=*Dipogon* (*Deuteragenia*) *antropovi* Lelej, 1995, **syn. n.**]; *D. caliptera* (Cresson, 1869), **comb. n.**; *D. carychocera* (Shimizu et Ishikawa, 2002), **comb. n.**; *D. chirindensis* Arnold, 1934; *D. conspersa* (Pérez, 1905), **comb. n.**; *D. cubensis* (Genaro, 2002), **comb. n.**; *D. dorni* (Wolf, 1981), **comb. n.**; *D. dregei* Arnold 1934; *D. erythrepa* (Kohl, 1888), **comb. n.**; *D. fenchihuensis* (Tsuneki, 1989), **comb. n.**; *D. geronimo* (Evans, 1974), **comb. n.**; *D. granulifrons* (Shimizu et Ishikawa, 2002), **comb. n.**; *D. hondurensis* (Dreisbach, 1955), **comb. n.**; *D. hurdi* (Evans, 1974), **comb. n.**; *D. immaculata* (Ishikawa, 1965), **comb. n.**; *D. immarginata* Gussakovskij, 1932; *D. inconspersa* (Shimizu et Ishikawa, 2002), **comb. n.**; *D. iracunda* (Townes, 1957), **comb. n.**; *D. marlowei* (Waichert et Pitts, 2012), **comb. n.**; *D. melanocephala* (Cameron, 1891), **comb. n.**; *D. monticola* (Wahis, 1972), **comb. n.**; *D. neotropica* (Kohl, 1886), **comb. n.**; *D. nipponica* Yasumatsu, 1939; *D. ochraceipes* Arnold, 1955; *D. ogasawarensis* (Shimizu, 2006), **comb. n.**; *D. papago* Banks, 1933; *D. pempuchiana* (Tsuneki, 1989), **comb. n.**; *D. philippinense* (Tsuneki, 1988), **comb. n.**; *D. polita* Haupt, 1929; *D. pulchripennis* (Cresson, 1867), **comb. n.**; *D. romankovae* (Lelej, 1986), **comb. n.**; *D. sayi* (Banks, 1941), **comb. n.**; *D. sericea* (Banks, 1944), **comb. n.**; *D. siliventris* (Wolf, 1998), **comb. n.**; *D. sinan* (Wolf, 1999), **comb. n.**; *D. spangleri* (Evans, 1972), **comb. n.**; *D. sperconsa* (Shimizu et Ishikawa, 2002), **comb. n.**; *D. subintermedia* (Magretti, 1886), **comb. n.**; *D. taiwana* (Ishikawa, 1965), **comb. n.**; *D. thoracica* (Townes, 1957), **comb. n.**; *D. thias* Banks, 1934; *D. turneri* Arnold, 1934; *D. ugandensis* Arnold, 1960; *D. variegata* (Linnaeus, 1758), **comb. n.**; *D. vechti* (Day, 1979), **comb. n.**

Remarks. The male of *D. bokhaica* has been described from Ussurijskij reserve by holotype only (Lelej, 1986) and placed in the subgenus *Nipponodipogon*. It has rather long antennae, wide hypopygium, long volsellae, which are the characters of *Deuteragenia* males. In other hand the female of *Dipogon* (*Deuteragenia*) *antropovi* Lelej, 1995 has been collected by the same collector in the same restricted place (in another date) of Ussurijskij reserve and we regard both species as the opposite sexes of the same species.

Distribution. World-wide (except Australia).

2. Genus *Dipogon* Fox, 1897

Dipogon Fox, 1897: 241 [type species *Dipogon populator* Fox, 1897, by original designation]; Townes, 1957: 115, 131, ♀♂; Haupt, 1959: 19, 36, ♀; Ishikawa, 1965a: 87, ♀♂; 1965b: 507; Wolf, 1972: 26, 34, 68, ♀♂; Evans, 1974: 29, ♀♂; Tobias, 1978: 85, 91, ♀♂; Day, 1979: 8; Krombein, 1979: 1533, 1535; Wahis, 1986: 14; Lelej, 1986: 799, ♀♂; 1995: 212, 217, 226, ♀♂; Shimizu, 1996a: 319, 325, ♀♂; 1996b: 508; Shimizu, Ishikawa, 2002: 220, ♀♂; Loktionov, Lelej, 2012: 251.

Agriogenia Banks, 1919: 83 [type species *Pompilus* (*Agenia*) *brevis* Cresson, 1867, by original designation]. Junior subjective synonym of *Dipogon* Fox, 1897 according to Pate, 1946: 118.

Species included (14). *Dipogon anasazi* Evans, 2000; *D. brevis* (Cresson, 1867); *D. diablo* Wasbauer, 1960; *D. graenicheri* Banks, 1939; *D. kiowa* Evans, 2000; *D. konza* Evans, 2000; *D. leechi* Wasbauer, 1960; *D. lignicolus* Evans, 1987; *D. moctezuma* Evans, 1974; *D. paludis* Townes, 1957; *D. parkeri* Wasbauer, 1966; *D. populator* Fox, 1897; *D. pygmaeus* Townes, 1957; *D. texanus* Banks, 1944; *D. t. texanus* Banks, 1944; *D. t. chapalae* Evans, 1974.

Distribution. From North Argentina in South America to South Canada in North America. (Evans, 1974; Krombein, 1979; Roig Alsina, 2005).

3. Genus *Myrmecodipogon* Ishikawa, 1965, stat. n.

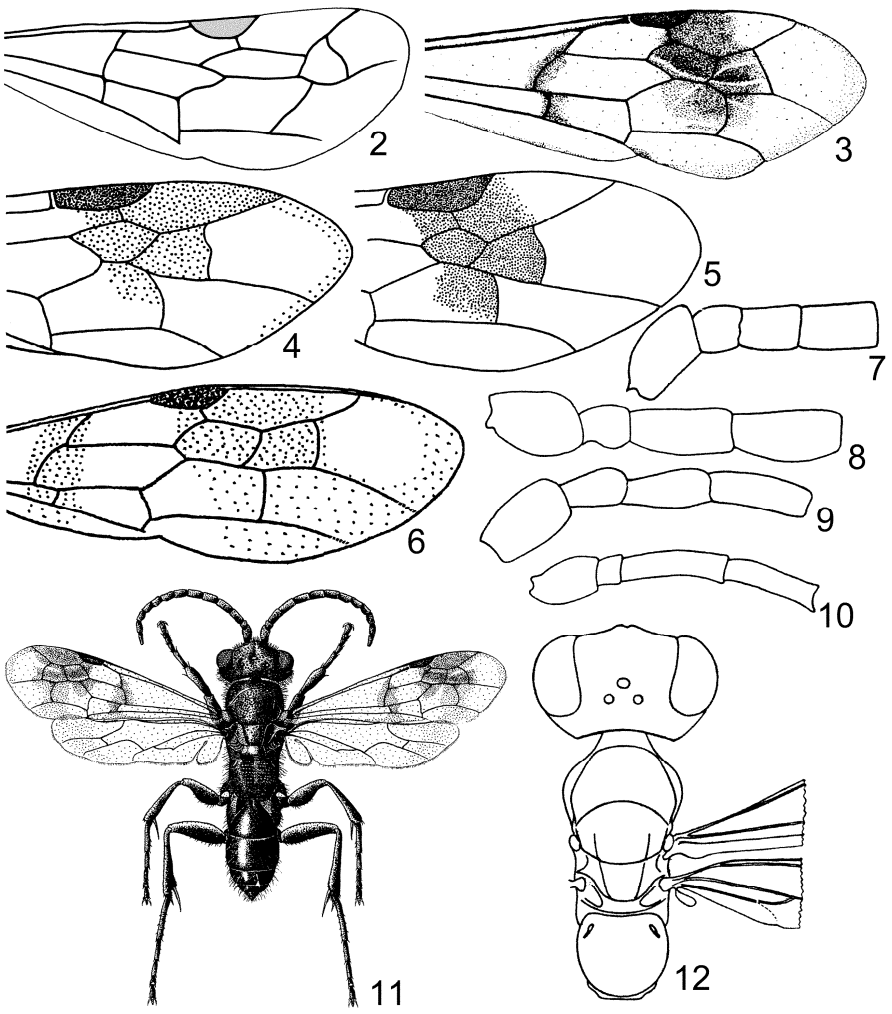
Myrmecodipogon Ishikawa, 1965a: 89, 98 (as subgenus of *Dipogon* Fox, 1897) [type species *Dipogon* (*Myrmecodipogon*) *asahinai* Ishikawa, 1965, by original designation]; Shimizu, 1996b: 508; Lelej, 2001: 6, ♀; Shimizu, Ishikawa, 2002: 219.

Myrmecodipogon: Loktionov, Lelej, 2012: 251.

Dipogon: Wiśniowski, 2009: 147 (part.).

Species included (3). *Myrmecodipogon asahinai* (Ishikawa, 1965), **comb. n.** (Japan: Honshu); *M. choii* (Lelej, 2001), **comb. n.** (Korea), *M. pannonicus* (Zettel, 1993), **comb. n.** (=*Dipogon fonfriai* Wahis, 2004) (South France, Lower Austria, Poland). The synonymy of *Dipogon fonfriai* Wahis under *Dipogon bifasciatus pannonicus* Zettel follows Wahis (2006), not Wiśniowski (2009).

Distribution. Palaearctic region: Japan (Honshu) (Ishikawa, 1965a), Korea (Lelej, 2001), Lower Austria, southern France and Poland (Wiśniowski, 2009).



Figs 2–12. Spider wasps of the tribe Deuterageniini (Fig. 2 – by Fox, 1897; Figs. 3, 11 – by Wolf, 1972; Figs. 4–10 – by Lelej, 1995, 2001; fig. 12 – by Ishikawa, 1965). 2) *Dipogon populator* (♀): fore wing; 3) *Deuteragenia bifasciata* (♀): forewing; 4, 7, 9) *Nipponodipogon rossicus*: 4) fore wing (♀), 7) 1–4 antennal segments (♂), 9) 1–4 antennal segments (♀); 5) *Stigmatodipogon petiolatus* (♀): fore wing; 6) *Myrmecodipogon choii* (♀): fore wing; 8, 10) *Deuteragenia romankovae*: 8) 1–4 antennal segments (♂), 10) 1–4 antennal segments (♀); 12) *Myrmecodipogon asahinai* (♀): head, metasoma and basal part of wings; 11) *Deuteragenia variegata* (♂): habitus.

4. Genus *Nipponodipogon* Ishikawa, 1965, stat. n.

Nipponodipogon Ishikawa, 1965a: 88, 89 (as subgenus of *Dipogon* Fox, 1897) [type species *Dipogon iwatai* Ishikawa, 1965, by original designation]; 1968: 115, ♀; Lelej, 1986: 799, 800, 805, ♀♂; 1995: 226, 229, ♀♂; Shimizu, 1996b: 508; Shimizu, Ishikawa, 2002: 219.
Nipponodipogon: Lelej, Loktionov, 2012: 413; Loktionov, Lelej, 2012: 251.

Species included (6). *Nipponodipogon hayachinensis* (Ishikawa, 1968), **comb. n.**; *N. iwatai* (Ishikawa, 1965), **comb. n.**; *N. kurilensis* (Lelej, 1986), **comb. n.**; *N. mandibularis* (Ishikawa, 1965), **comb. n.**; *N. nagasei* (Ishikawa, 1965), **comb. n.**; *N. rossicus* (Lelej, 1986), **comb. n.**

Distribution. Eastern Palaearctic region (Lelej, 1995; Tadauchi, 2009).

5. Genus *Stigmatodipogon* Ishikawa, 1965, stat. n.

Stigmatodipogon Ishikawa, 1965a: 89, 98 (as subgenus of *Dipogon* Fox, 1897) [type species *Dipogon* (*Stigmatodipogon*) *macrostigmatus* Ishikawa, 1959, by original designation]; 1968: 115, ♀; Lelej, 1986: 799, 801, 805, ♀♂; 1995: 227, 229, ♀♂; 2005: 124; Shimizu, 1996b: 508; Shimizu, Ishikawa, 2002: 219.
Stigmatodipogon: Lelej, Loktionov, 2012: 414; Loktionov, Lelej, 2012: 251.

Species included (3). *Stigmatodipogon macrostigmatus* (Ishikawa, 1959), **comb. n.**; *S. petiolatus* (Lelej, 1986), **comb. n.**; *S. tanakai* (Ishikawa, 1965), **comb. n.**

Distribution. Eastern Palaearctic region (Lelej, 2005; Tadauchi, 2009).

6. Genus *Winnemanella* Krombein, 1962, stat. n.

Winnemanella Krombein, 1962: 7 (as subgenus of *Dipogon* Fox, 1897) [type species *Dipogon* (*Winnemanella*) *fulleri* Krombein, 1962, by original designation]; Krombein, 1979: 1536.
Winnemanella: Loktionov, Lelej, 2012: 251.

Species included (1). *Winnemanella fulleri* (Krombein, 1962), **comb. n.**

Distribution. Nearctic region (Krombein, 1979).

KEY TO THE GENERA OF TRIBE DEUTERAGENIINI (females and males)

1. Malar space is developed, its length as long as flagellomere width. Clypeus and pronotum with ivory spots (♀). Forewing without any fascia . . . . . 6. ***Winnemanella*** (♂ unknown)
– Malar space is not developed or very short. Clypeus and pronotum completely black, without ivory spots (♀). Forewings with basal or apical fascia (Figs 3–6) 2

2. Ratio of maximum width to maximum length of second radio-medial cell 2.6 × and more (Fig. 2). Inner side of mandible (♀) with four teeth . . . . . 2. ***Dipogon***
– Ratio of maximum width to maximum length of second radio-medial cell 2.0 × and less (Figs 3–6). Inner side of mandible (♀) with 2 or 3 teeth 3
3. Anal lobe of hind wing is small, it's length 0.25 × as long as submedial cell (Fig. 12). Pronotum elongated (Fig. 12) . . . . . 3. ***Myrmecodipogon***
– Anal lobe of hind wing is usual, it's length 0.33 × submedial cell width (Fig. 11). Pronotun short (Fig. 11) 4
4. Third antennal segment 3.5 × (♀), 3.0 × (♂) its width (Fig. 8, 10) 5
– Third antennal segment 2.5 × (♀), 2.0 × (♂) its width (Figs 7, 9) . . . . . 4. ***Nipponodipogon***
5. Pterostigma very large, its width almost 1.5 × second submarginal cell width (Fig. 5) . . . . . 5. ***Stigmatodipogon***
– Pterostigma normal, its width as width of second submarginal cell (usually narrowly) (Fig. 11) . . . . . 1. ***Deuteragenia* (=*Mesagenia*)**

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divers groupes et les modifications de structure sur lesquelles repose cette classification; par une réunion de disciples de Cuvier, MM. Audouin, Blanchard, Deshayes, Alcide d'Orbigny, Doyère, Dugès, Duvernoy, Laurillard, Milne Edwards, Roulin et Valenciennes. Paris: Fortin, Masson et Cie, Libraires. Plates 76–182 + 236 unnumbered pages, including 118 pages with explanation of each plate. [Pompilidae – pl. 120 (1846)]. [Dating after Evenhuis, 1997].

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