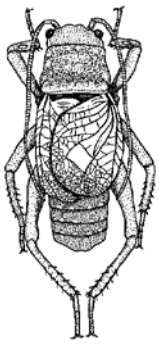

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REVIEW OF THE GENUS *ANAGRUS* HALIDAY, 1833 (HYMENOPTERA: MYMARIDAE) IN RUSSIA, WITH NOTES ON SOME EXTRALIMITAL SPECIES

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Twenty-nine species (three of them unnamed) are reviewed. *Anagrus* (*Anagrus*) *ainu* **sp. n**. (Sakhalin) and *A.* (*A.*) *kvas* **sp. n**. (Primorskii krai, Sakhalin, China) are described and illustrated. A new synonymy is proposed: *A.* (*A.*) *bakkendorfi* Soyka, 1946 = *A. incarnatus fuscus* Botoc, 1963, **syn. n.** Seventeen species are newly recorded from Russia. New data on the distribution, hosts, and taxonomy of five other (extralimital) Palaearctic species of *Anagrus* are provided. A key to the twenty-two species distributed in the Russian Far East is given.

KEY WORDS: Hymenoptera, Mymaridae, *Anagrus*, taxonomy, host associations.

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Дан обзор 29 видов (3 из них без названия). Описаны два новых для науки вида: *Anagrus* (*Anagrus*) *ainu* **sp. n**. (Сахалин) and *A.* (*A.*) *kvas* **sp. n**. (Приморский край, Сахалин, Китай). Предложена новая синонимия *A* (*A.*) *bakkendorfi* Soyka, 1946 = *A. incarnatus fuscus* Botoc, 1963, **syn. n.** Впервые для России указываются 17 видов. Приведены новые сведения о распространении, хозяевах и систематике 5 других палеарктических видов *Anagrus*. Дана определительная таблица 22 видов, распространенных на Дальнем Востоке России.

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INTRODUCTION

The cosmopolitan fairyfly genus *Anagrus* Haliday, 1833 is one of the better known among the large genera of Mymaridae due to its importance for biological control, abundance of host records, and also the recent revisionary work on its taxonomy (Chiappini, 1989; Chiappini et al., 1996; Chiappini & Lin, 1998; Triapitsyn & Beardsley, 2000; Triapitsyn, 2001, 2002). Only two species of this genus were recorded from Russia, both from its northwestern part (Rimsky-Korsakov, 1916, 1925; Hellén, 1974). Most of the trustworthy host records of *Anagrus* are from eggs of Homoptera: (Cixiidae [R. Wharton and S. Triapitsyn, unpublished data], Delphacidae, Cercopidae, and Cicadellidae), and Heteroptera (Miridae, Tingidae); some of these hosts are well-known agricultural pests. Several species develop in eggs of various Odonata (Zygoptera and Anisozygoptera). *Anagrus* species are very common throughout the Palaearctic region. Both sexes of *Anagrus* are usually easily recognizable and can be distinguished from other Palaearctic Mymaridae using the generic key by Triapitsyn & Huber (2000). Due to their minute size (less than 1 mm), proper slide-mounting is almost always required for successful identification of *Anagrus* specimens to the species level.

This review is based mainly upon nearly 750 specimens of *Anagrus* positively identified to species, which are included in "Material Examined". Altogether, more than 1,000 specimens of *Anagrus* collected in Malaise and yellow pan traps in Russia were extracted from bulk samples in ethanol (about 700 of them from the Russian Far East) and card- or point-mounted; about 300 microscopic slides were then prepared. The total number of Palaearctic *Anagrus* examined by the senior author in major museum collections of Mymaridae over the past 10 years was much greater, definitely more than 2,000. Not all of those could be readily identified because many of them are either only point-mounted or slide-mounted rather poorly. The overall enormity of such a task was also a factor. For instance, the Walter Soyka collection of the European *Anagrus* in Naturhistorisches Museum Wien, Vienna, Austria, has several hundred unidentified specimens on slides. Additionally, hundreds, if not thousands, of dry-mounted and ethanol-preserved specimens of European *Anagrus* are available at the Canadian National Collection of Insects, Ottawa, Ontario, Canada, and the Entomology Research Museum, University of California, Riverside, California, USA. Included in this review are only the species that have been already found in Russia as well as five other, extralimital, Palaearctic species for which new distributional data is presented; all other species in this region were listed and keyed by Chiappini et al. (1996). These include a tingid egg parasitoid, *A. takeyanus* Gordh, 1977, in Japan (Tsukada, 1992). A species related to it was recently described from the Palaearctic part of China (Triapitsyn, 2003).

Collecting and preservation methods of the material from Primorskii krai were described by Triapitsyn & Berezovskiy (2001). Terms for morphological features are those of Gibson (1997). All measurements are given in micrometers (μm), as length or, where necessary, as length/width. Abbreviations used are: F = funicle segment of the female antenna or flagellomere of the male antenna; MT = Malaise trap; YPT = yellow pan trap. New distribution records are marked by an asterisk (*).

Acronyms for depositories of specimens are as follows:AEI, American Entomological Institute, Gainesville, Florida, USA; BCRI, Biological Control Research Institute, Fujian Agricultural University, Fuzhou, Fujian, China; BMNH, Natural History Museum, London, England, UK; CAS, California Academy of Sciences, San Francisco, California, USA; CNCI, Canadian National Collection of Insects, Ottawa, Ontario, Canada; EMEC, Essig Museum of Entomology, University of California, Berkeley, California, USA; IBPV, Institute of Biology and Pedology, Vladivostok, Russia; IEFA, E. Chiappini collection, Istituto di Entomologia e Patologia Vegetale, Università Cattolica del Sacro Cuore, Piacenza, Italy; INHS, Illinois Natural History Survey, Champaign, Illinois, USA; ISNB, Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium; NHMW, Naturhistorisches Museum Wien, Vienna, Austria; SCAC, South China Agricultural University, Wushan (Fuoshan), Guangzhou, Guangdong, China; SPLK, Systematic Parasitoid Laboratory, Plant Protection and Soil Conservation Station of Vas County, Köszeg, Hungary; TAMU, Texas A&M University, College Station, Texas, USA; UCRC, Entomology Research Museum, University of California, Riverside, California, USA; USNM, National Museum of Natural History, Washington, D.C., USA; ZIN, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

The investigative responsibilities have been divided between the authors in such a way that SVT is solely responsible for taxonomic identifications and the entire text of this article, while VVB sorted mymarids from bulk samples, point-, card-, and slide-mounted the specimens, and made line drawings.

Genus *Anagrus* Haliday, 1833

Anagrus Haliday, 1833: 346 [type species: *Ichneumon atomus* Linnaeus, 1767: 941 (Uppsala, Sweden), designated by Westwood, 1840: 78]: Debauche, 1948: 128; Kryger, 1950: 36; Annecke & Doutt, 1961: 7; Viggiani, 1970a: 11; Graham, 1982: 195; Schauff, 1984: 49; Sahad & Hirashima, 1984: 44; Chiappini, 1989: 89; Chiappini et al., 1996: 561; Chiappini & Lin, 1998: 551; Triapitsyn, 2000a: 214; Chiappini & Mazzoni, 2000: 1661; Triapitsyn & Beardsley, 2000: 26; Triapitsyn & Huber, 2000: 613.

Pteratomus Packard, 1864: 137 [type species: *Pteratomus putnamii* Packard, 1864: 138 (Bridport, Vermont, USA), by monotypy]. Synonymized under *Anagrus* by Annecke & Doutt, 1961: 7.

Packardiella Ashmead, 1904: 364 [an unnecessary replacement name for *Pteratomus*]. Synonymized under *Anagrus* by Annecke & Doutt, 1961: 7.

DIAGNOSIS. See Chiappini et al. (1996), Chiappini & Lin (1998), Triapitsyn (2000a), Triapitsyn & Beardsley (2000), and Triapitsyn (2002) for the latest diagnoses of *Anagrus* and its subgenera as well as the species groups within the nominotypical subgenus.

COMMENTS. The position of *Anagrus* within a higher hierarchy of Mymaridae and its relationships with other genera were discussed by Schauff (1984). We agree with his conclusion that *Anagrus* is most closely allied with *Stethynium* Enock, 1909. *Anagrus* has a solid antennal clava in the female, which is a derived feature in Mymaridae, whereas that of *Stethynium* is 3-segmented. The relative scarcity of *Anagrus* species and abundance of *Stethynium* species in Australia and New Zealand (Triapitsyn, 2001) is another indication that *Stethynium* is a basal genus to *Anagrus*.

However, different opinions on this also exist: for instance, Viggiani (1989) placed *Anagrus* in the tribe Anagrini Viggiani, 1989 of the subfamily Mymarinae and *Stethynium* in the tribe *Stethynini* Viggiani, 1989 of the subfamily Lymaenoninae, in both cases based solely on the external male genitalic characters. It is clear that *Stethynium* retained a more primitive structure of male genitalia compared to *Anagrus*.

Key to the species of *Anagrus* in the Russian Far East, females

1. F2 very long, more than 3 times as long as F3; ocelli not on a stemmaticum, which is not defined. (Subgenus *Anagrella*) 2
– F2 less than 2 times as long as F3; ocelli on a well-defined triangular stemmaticum 3
2. F5 without longitudinal sensilla . . . . . 1. ***A. hirashimai***
– F5 with a longitudinal sensillum . . . . . 2. ***A. semiglabrus***
3. F1 long, subequal to pedicel; paramedial lobes of posterior scutellum relatively widely separated. (Subgenus *Paranagrus*) . . . . . 5. ***A. optabilis***
– F1 at most 2/3 length of pedicel, usually notably shorter; paramedial lobes of posterior scutellum very close to each other. (Subgenus *Anagrus*) 4
4. Clava with 3 longitudinal sensilla (the ***atomus*** species group) 5
– Clava with 5 longitudinal sensilla (the ***incarnatus*** species group) 11
5. F3 with a longitudinal sensillum 6
– F3 without longitudinal sensilla 7
6. Broadest part of forewing disc with a well-defined bare area near posterior margin (Fig. 2) . . . . . 6. ***A. ainu* sp. n.**
– Broadest part of forewing disc without such bare area, more or less uniformly covered with microtrichia . . . . . 7. ***A. setosus***
7. F4 without longitudinal sensilla . . . . . 8. ***A. ustulatus***
– F4 with 1 or 2 longitudinal sensilla 8
8. F4 with 2 longitudinal sensilla; F2 and F3 each individually much shorter than F4, F5, or F6 . . . . . 9. ***A. japonicus***
– F4 with 1 longitudinal sensillum; F2 and F3 each individually subequal in length to either F4, F5, or F6 9
9. Broadest part of forewing disc with a well-defined bare area near posterior margin 10
– Broadest part of forewing disc without such bare area, more or less uniformly covered with microtrichia (Fig. 5) . . . . . 10. ***A. kvas* sp. n.**
10. Length/width of forewing less than 10; bare area near its posterior margin relatively short . . . . . 11. ***A. atomus***
– Length/width of forewing about 11; bare area near its posterior margin relatively long . . . . . 12. ***A. frequens***
11. Mesoscutum without adnotaular setae 12
– Mesoscutum with adnotaular setae 13
12. Broadest part of forewing disc with a large bare area near posterior margin . . . . . 14. ***A. breviphragma***
– Broadest part of forewing disc without such bare area, more or less uniformly covered with microtrichia (as in fig. 6) (the ***A. incarnatus*** complex) . . . . . 15. ***A. incarnatus***, 16. ***A. fisheri***, 17. ***A. nilaparvatae***

13. F2 with a longitudinal sensillum (Fig. 8) . . . . . 18. ***Anagrus*** sp. A
– F2 without longitudinal sensilla 14
14. F3-F6 with 2 longitudinal sensilla each (Fig. 9) . . . . . 19. ***Anagrus*** sp. B
– At least one funicle segment among F3-F6 with 1 longitudinal sensillum or lacking such sensilla 15
15. F3 without longitudinal sensilla, F4-F6 with 2 longitudinal sensilla each (Fig. 10) . . . . . 20. ***Anagrus*** sp. C
– F3-F6 with a different combination of longitudinal sensilla 16
16. Body mostly light (yellow to light brown) 17
– Body mostly dark (dark brown to black) 18
17. F2 longest of funicle segments . . . . . 21. ***A. nigriceps***
– F2 shorter than F4 or F6 . . . . . 22. ***A. avalae***
18. F3 without longitudinal sensilla . . . . . 23. ***A. brocheri***
– F3 with 1 longitudinal sensillum 19
19. Ovipositor relatively short (ovipositor length/foretibia length ratio less than 2.5:1), barely exserted beyond apex of gaster . . . . . 24. ***A. obscurus***
– Ovipositor relatively long (ovipositor length/foretibia length ratio 3.0 or greater), markedly exserted beyond apex of gaster . . . . . 25. ***A. subfuscus***

Subgenus *Anagrella* Bakkendorf, 1962

Anagrella Bakkendorf, 1962: 372 [type species: *Anagrella mymaricorne* Bakkendorf, 1962: 372 (Geneva, Switzerland), by monotypy and original designation]. Effectively synonymized under *Anagrus* by Viggiani, 1970a: 11 (formally by Viggiani, 1970b: 139); treated as a subgenus of *Anagrus* by Graham, 1982: 197; Chiappini, 1989: 94; Chiappini et al., 1996: 563; Chiappini & Lin, 1998: 554; Triapitsyn, 2000b: 296.

1. *Anagrus* (*Anagrella*) *hirashimai* Sahad, 1982

Anagrus hirashimai Sahad, 1982: 198 (holotype – ♀, Hakozaki, Fukuoka, Japan [Entomol. Lab., Fac. Agric., Kyushu Univ., Fukuoka], not examined); Sahad & Hirashima, 1984: 60.

Anagrus (*Anagrella*) *hirashimai* Sahad: Chiappini et al., 1996: 563; Chiappini & Lin, 1998: 557.

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 23-26.VI 1999, 1♀; 28.VI-4.VII 1999, 4♀; 1-2.VII 1999, 1♀; 11-14.VII 1999, 2♀; 19-20.VII 1999, 1♀; 24.VII-1.VIII 1999, 2♀; 5-11.VIII 1999, 12♀; 12-18.VIII 1999, 10♀; VIII 1999, 1♀; 6-14.IX 1999, 1♀; 22-30.VI 2000, 1♀; 1-10.VII 2000, 3♀; 1-10.VIII 2000, 2♀; 11-12.VIII 2000, 1♀; 12-17.VII 2001, 2♀; 10-19.VII 2002, 3♀ [IBPV, UCRC, ZIN]. Sakhalin, D. Bennett, T. Anderson: 4 km E Sokol, 16.VIII 2001, 2♀. 6 km E Sokol, near Belaya River: 31.VII 2001, 1♀; 16.VIII 2001, 6♀ [CAS]. **Japan**: Hokkaido, 20 km N Akkeshi, Bekanbeushi Marsh, 100 m, 15.VIII 1996, L. Masner, 1♀ [CNCI]. **Republic of Korea**: Gyeonggi-do, Kwangju, Dochek, Taehwasan, 5.VIII 1998, I.-B. Leon, S.-H. Lee, 1♀ [UCRC].

DIAGNOSIS. See Chiappini et al. (1996) as well as the key to the Holarctic species of the subgenus *Anagrella* by Triapitsyn (2000b).

DISTRIBUTION. *Russia (Primorskii krai, Sakhalin); China (Fujian) (Chiappini & Lin, 1998), Japan (*Hokkaido, Kyushu), *Republic of Korea.

HOSTS. Unknown.

COMMENTS. This is a very common species in our samples from Gornotayozhnoye, Primorskii krai. It is probably widespread in the southeastern Palaearctic region.

2. *Anagrus* (*Anagrella*) *semiglabrus* Chiappini et Lin, 1998

Anagrus (*Anagrella*) *semiglabrus* Chiappini & Lin, 1998: 555 (holotype – ♀, Qianshan, Liaoning, China [BCRI], examined).

Anagrus (*Anagrella*) ?*semiglabrus*: Triapitsyn, 2001: 273.

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 27-28.VIII 1999, 1♀ (YPT near mulberry, *Morus* sp.); 11-16.VII 2003, 2♀ [UCRC].

DIAGNOSIS. See Chiappini & Lin (1998) and also the key to the Holarctic species of the subgenus *Anagrella* by Triapitsyn (2000b). Male of this species is unknown.

DISTRIBUTION. *Russia (Primorskii krai); ?Australia (Triapitsyn 2001), China (Liaoning).

HOSTS. Unknown.

3. *Anagrus* (*Anagrella*) *brevis* Chiappini et Lin, 1998

Anagrus (*Anagrella*) *brevis* Chiappini & Lin, 1998: 554 (holotype – ♀, Nanjing Co., Fujian, China [BCRI], examined).

MATERIAL. **Japan**: Ibaraki Pref., Tsukuba («Expo site»), 24.IX 1989, M. Sharkey, 1♀ [AEI].

DIAGNOSIS. See Chiappini & Lin (1998).

DISTRIBUTION. China (Fujian), *Japan.

HOSTS. Unknown.

4. *Anagrus* (*Anagrella*) *rilensis* Donev, 1996

Fig. 11

Anagrus (*Anagrella*) *rilensis* Donev *in* Chiappini et al., 1996: 564 (holotype – ♀, Bodrost (1200 m), Rila Mountains, Bulgaria [A. Donev coll., Dept. Zool., Univ. Plovdiv "Paisiy Hilendarski", Plovdiv], not examined).

MATERIAL. **Italy**: Lazio, Bosco di Manziana, 42˚07.392'N, 12˚07.314'E, 400 m, 9.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♂ [UCRC].

DESCRIPTION. MALE. Similar to female (Chiappini et al., 1996) except for normal sexually dimorphic characters and the following. Body length about 700. Coloration of body and appendages almost as in female; blades of forewing and hindwing notably infumated. Antenna with F1 markedly shorter and broader than following flagellomeres. Forewing (Fig. 11) 9.6 times as long as wide, with disc mostly bare except for one medial row of microtrichia extending from apex of venation to wing's apex; longest marginal cilia 2.8 times maximum forewing width. Hind wing 26 times as long as wide. Genitalia very similar to those of *A.* (*Anagrella*) *mymaricornis* (Bakkendorf, 1962), as illustrated by Viggiani (1970a, fig. I, 1, p. 13).

DIAGNOSIS. See Chiappini et al. (1996) as well as the key to females of the Holarctic species of the subgenus *Anagrella* by Triapitsyn (2000b).

DISTRIBUTION. Bulgaria, *Italy.

HOSTS. Unknown.

COMMENTS. The association of this male with *A. rilensis*, for which only a single female has been known previously, is made based primarily on the characteristic forewing (Fig. 11).

Subgenus *Paranagrus* Perkins, 1905

Paranagrus Perkins, 1905: 199 [type species: *Paranagrus optabilis* Perkins, 1905: 199 (Bundaberg, Queensland, Australia), designated by Gahan & Fagan, 1923: 106]. Synonymized under *Anagrus* by Annecke & Doutt, 1961: 7; treated as a subgenus of *Anagrus* by Graham, 1982: 197; Chiappini, 1989: 92; Chiappini et al., 1996: 562; Chiappini & Lin, 1998: 557.

5. *Anagrus* (*Paranagrus*) *optabilis* (Perkins, 1905)

Paranagrus optabilis Perkins, 1905: 199 (lectotype – ♀, designated by Triapitsyn & Beardsley, 2000: 28, Bundaberg, Queensland, Australia [B. P. Bishop Mus., Honolulu, Hawaii], examined).

Anagrus (*Paranagrus*) *optabilis* (Perkins): Sahad & Hirashima, 1984: 60, 73; Chiappini et al., 1996: 564; Baquero & Jordana, 1999: 47; Triapitsyn & Beardsley, 2000: 28; Triapitsyn, 2001: 273.

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, 11-15.VIII 2003, M. Michailovskaya, 1♀ [UCRC]. **Indonesia**: Java, Cianjur, Mekansari, 4.VIII 1993, 1♀ («ex. *Nilaparvata lugens* on rice"). **Japan**: Kochi Pref., Nangoku City, Monobe, 8.IX 1981, K. Miura, 2♀ («ex. *Nilaparvata lugens* on rice»). Shimame Pref., Yasugi City, Nakao, 27.VII 1985, K. Miura, 2♀, 1♂ [CNCI]. **Malaysia**: East Malaysia (Sarawak, Borneo Island), Sibu, 14.XIII 1967, G. Rothschild, 2♀ («ex. *Sogatella furcifera* on rice») [EMEC]. **Philippines**: Luzon Island, Los Baños, IRRI, 1982, 1♀ [BMNH]. **Taiwan** (China): Antei, 25.VII 1981, T. Miura, 1♀ («ex. *Nilaparvata lugens* on rice») [CNCI].

DIAGNOSIS. See Chiappini et al. (1996) for the diagnosis, Sahad & Hirashima (1984) and Triapitsyn & Beardsley (2000) for the illustrations, and Triapitsyn (2001) for the most updated list of synonyms of *A.* (*Paranagrus*) *optabilis*.

DISTRIBUTION. *Russia (Primorskii krai); common throughout the Australasian, Oriental, and southeastern Palaearctic regions (Triapitsyn & Beardsley, 2000; Triapitsyn, 2001); also occurs in Spain (Baquero & Jordana, 1999).

HOSTS. Various planthoppers (Delphacidae), listed by Sahad & Hirashima (1984), Chiappini et al. (1996), Triapitsyn & Beardsley (2000) and Noyes (2002).

COMMENTS. Presence of *A.* (*Paranagrus*) *optabilis*, a well-known egg parasitoid of the rice planthoppers in Japan, Republic of Korea (Sahad & Hirashima, 1984), China (Triapitsyn, 2001) and elsewhere (Triapitsyn & Beardsley, 2000), in paddies of southern Primorskii krai is quite likely. Also possible is occurrence in southern or southwestern Russia of another Palaearctic species of this subgenus, *A.* (*Paranagrus*) *unilinearis* Soyka, 1950, which in Europe is known from Bulgaria and Greece (Chiappini et al., 1996; Donev, 1998) as well as from Italy (Viggiani, 1970a). We have identified one female specimen of *A. unilinearis* recently collected in Italy, with the following label data: Campania, Avellino Province, Piana d. Dragone, 3 km E Volturara, 40˚52.553'N, 14˚58.375'E, 760 m, 6.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto [UCRC].

Subgenus *Anagrus* Haliday, 1833 s. str.

The *atomus* species group

6. *Anagrus* (*Anagrus*) *ainu* S. Triapitsyn et Berezovskiy, sp. n.
Figs 1, 2

MATERIAL. Holotype – ♀ (on slide) [CAS]: Russia, Sakhalin, 6 km E Sokol, near Belaya River, 24.VII 2001, D. Bennett, T. Anderson, MT. Paratypes – **Russia**: same locality and collectors as the holotype (all collected in a MT): 31.VII 1999, 4♀ on slides and 1♀ on card; 16.VIII 1999, 7♀ on slides and 5♀ on points [CAS, CNCI, UCRC, ZIN].

DESCRIPTION. FEMALE (holotype and paratypes). Color. Body and appendages mostly light brown except head, antennal clava, mesoscutum, and basal metasomal terga slightly darker (brown); posterior scutellum pale; eye and ocelli dirty pink.

Head. A little wider than mesosoma. Mandible with 3 teeth. Antenna (Fig. 1) sparsely setose; scape about 3.2 times as long as wide and 2.1-2.2 times longer than pedicel; F1 oval, much shorter than pedicel and shortest of funicle segments; F2 a little shorter than following funicle segments, which are subequal in length; longitudinal sensilla on F3 (1), F4 (1), F5 (2) and F6 (2); clava about 3.3 times as long as wide and almost as long as two preceding segments combined, with 3 longitudinal sensilla.

Mesosoma: Shorter than metasoma. Mesoscutum finely longitudinally striate, without adnotaular setae. Wings. Forewing (Fig. 2) 7.8-8.2 times as long as wide; hypochaeta reaching past posterior margin, distal macrochaeta 2.8-3.5 times length of proximal macrochaeta; forewing blade hyaline, with distinct bare area in broadest part near posterior margin, discal microtrichia arranged in 3 or 4 irregular rows; longest marginal cilia 2.9-3.0 times maximum forewing width. Hind wing 24-26 times as long as wide, hyaline, with a row of microtrichia along each margin.

Metasoma. Ovipositor not or barely reaching mesophragma anteriorly and practically not exserted beyond apex of gaster posteriorly; ratio of total ovipositor length to length of its exserted part about 20:1 or more. External plate of ovipositor with 1 seta. Ovipositor length/foretibia length ratio 2.0-2.2:1.

Measurements (holotype): Body: 829; head: 147; mesosoma: 288; metasoma: 394; ovipositor: 309. Antenna: scape: 97; pedicel: 46; F1: 20; F2: 52; F3: 61; F4: 61; F5: 64; F6: 64; clava: 121. Forewing: 621/76; longest marginal cilia: 221. Hind wing: 575/24; longest marginal cilia: 176. Legs (given as femur, tibia, tarsus): fore: 145, 142, 188; middle: 137, 200, 176; hind: 142, 227, 197.

MALE. Unknown.

DIAGNOSIS. This species is related to *A. flaviapex* Chiappini et Lin, 1998 and *A. longitibialis* Donev, 1996, which also have a longitudinal sensillum on F3 of the female antenna and a distinct bare area in the broadest part of the forewing. *A. flaviapex* is a darker species which has two longitudinal sensilla on F4 of the female antenna (Chiappini & Lin, 1998). Female of *A. longitibialis* has only one longitudinal sensillum on F5 and a shorter ovipositor (ovipositor length/foretibia length ratio 1.5-1.6:1) (Chiappini et al., 1996).

DISTRIBUTION. Known only from the type locality in Russia (Sakhalin).

HOSTS. Unknown.

ETYMOLOGY. This new species is named after the Ainu, the indigenous inhabitants of Sakhalin Island. The specific name is a noun (plural).

7. *Anagrus* (*Anagrus*) *setosus* Chiappini et Lin, 1998

Fig. 3

Anagrus (*Anagrus*) *setosus* Chiappini & Lin, 1998: 562 (holotype – ♀, Longxishan Nature Reserve, Jiangle, Fujian, China [BCRI], examined).

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 1-2.VII 1999, 1♀; 11-14.VII 1999, 1♀; 12-17.VIII 1999, 1♀; 28.VIII-5.IX 1999, 1♀; 21-24.X 1999, 1♀; 1-10.VIII 2000, 1♀; 1-10.X 2001, 1♀ [UCRC, ZIN]. **Nepal**: Khumal Tal near Lalitpur, 20-21.VI 1981, G. Gordh, 1♀. **Taiwan** (China): Nantou, Forestry Station, 7.V 1997, V. Berezovskiy, 1♀ [UCRC].

DIAGNOSIS. See Chiappini & Lin (1998).

DISTRIBUTION. *Russia (Primorskii krai); China (Fujian, *Taiwan), *Nepal.

HOSTS. Unknown.

COMMENTS. Two specimens from Primorskii krai, both captured by M. Michailovskaya (one from Gornotayozhnoye, collected 29.VI-1.VII 2001 and the other from Mel'nichnyi, collected 21.VI 2000 [UCRC]), may turn out to be the males of *A. setosus* based on the similarities in the forewing shape and chaetotaxy and other morphological features that are not normally sexually dimorphic. A hooked digitus makes their genitalia very distinctive (Fig. 3).

8. *Anagrus* (*Anagrus*) *ustulatus* Haliday, 1833

Anagrus ustulatus Haliday, 1833: 347 (lectotype – ♂, designated by Graham, 1982: 201, type locality unknown, possibly in England (UK) [Nat. Hist. Division, National Mus. Ireland, Dublin], not examined); Graham, 1982: 201 (reinstatement as a valid taxon).

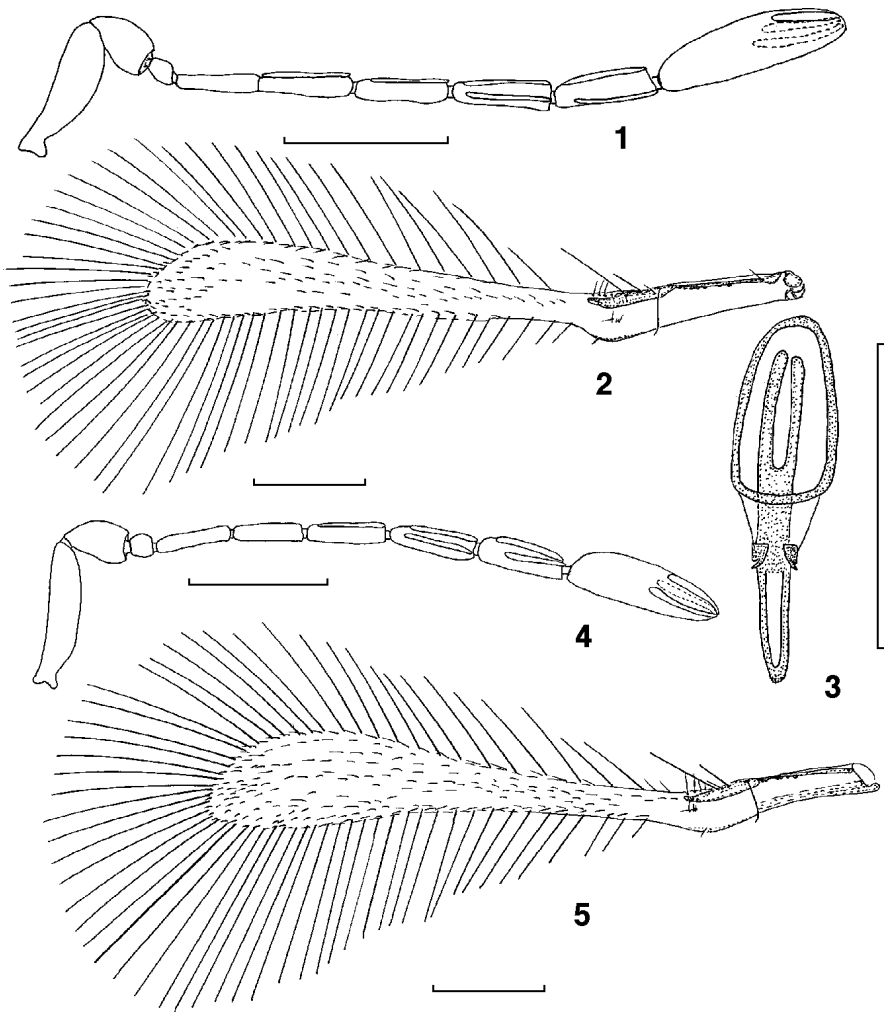
Anagrus atomus: Debauche, 1948: 137 (part., incorrect synonymy).

Anagrus parvus Soyka, 1956: 24 (holotype – ♀, Valkenburg, Netherlands [NHMW], examined); synonymized under *A. ustulatus* by Chiappini, 1989: 104.

Anagrus sp.: Chiappini, 1987: 83, 88, 93.

Anagrus (*Anagrus*) *ustulatus*: Chiappini, 1989: 104; Donev, 1998: 73; Triapitsyn, 1998a: 144; Triapitsyn, 2000a: 214; Triapitsyn, 2001: 277; Triapitsyn & Teulon, 2002: 91.

MATERIAL. **Russia**: Moscow region: Fryazevo, 24.VII 2000, M. Tretiakov, 1♀. Mamontovka, E. Shouvakhina: 10-20.VII 2000, 1♀; 20-30.VII 2000, 1♀. Primorskii krai, Gornotayozhnoye, 22-28.VIII 1999, M. Michailovskaya, 1♀ [UCRC, ZIN]. Sakhalin, 6 km E Sokol, near Belaya River, 31.VII 2001, D. Bennett, T. Anderson, 1♀ [CAS]. Tambov region, Talinka (7 km S Pavlovka), 26-27.V 2000, M. Tretiakov, 2♀ [UCRC, ZIN]. **France**: Département Gironde, Sainte Colombe, 44˚54'N, 00˚02'W, M. van Helden: 9.VII 1999, 1♀; 17.VIII 2000, 1♀. **Israel**: Sefad, Halat Matityahu Fruit Crops Exp. Sta., 700 m, 28.V-10.VI 1995, L. Shaltiel, 1♀, 1♂ (ex. *Edwardsiana rosae* (Linnaeus, 1758) eggs on apple). **Italy**: Calabria, Camigliatello Silano, 26.VI 1988, J. Pinto, 1♀. Lazio, Castel Porziano, 41˚45.42'N, 12˚23.85'E,



Figs 1-5. 1, 2) *Anagrus ainu* sp. n., holotype, ♀; 3) *A.* ?*setosus* (Mel'nichnyi, Primorskii krai); 4, 5) *A. kvas* sp. n., ♀ (4 – holotype, 5 – paratype from Gornotayozhnoye, Primorskii krai). 1, 4) antennae, 2, 5) forewings, 3) male genitalia. Scale bars = 0.1 mm.

80 m, 11-12.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀ [UCRC]. **Kyrgyzstan**: Dzhalal-Abad, S coast of Toktogul Reservoir, 41˚46'54"N, 72˚59'30"E, 927 m, 18.VIII 1998, C. Dietrich, 1♀. Talas: Kara Buura Ravine, 20 km S Kyzyl-Adyr, 42˚26'23"N, 71˚33'16"E, 1300 m, 15.VI 1999, C. Dietrich, 1♀. Talas Valley, Kirov Reservoir, 42˚39'19"N, 71˚35'44"E, 930 m, 15.VI 1999, C. Dietrich, 1♀ [INHS, UCRC]. **Netherlands**: Limburg, Valkenburg, 7.X 1931, W. Soyka, 1♀, 1♂ [EMEC]. **Spain**: Alicante, 19.V 1953, J. Holloway, 2♀, 2♂ [EMEC]. **Sweden**: Uppsala, Hågadalen, F. Ronquist: 10-17.VIII 1990, 1♀; 26.VIII-5.IX 1990, 2♀ [CNCI].

United Kingdom: England: Berkshire Co., Ascot, Silwood Park, 27.VI-4.VII 1984, J. Waage, M. Matthews, 1♀. Cambridgeshire Co., Duxford, 26.VI-3.VII 1979, R. George, 1♀ [BMNH]. Scotland, Edinburgh, 6-9.VIII 1991, R. Wharton, 1♀ [TAMU]. Wales, West Glamorgan Co., Oxwich NNR, 8.VI 1982, J. Noyes, 1♀ [BMNH].

DIAGNOSIS. See Chiappini (1989). This species is very similar, and possibly conspecific, to the North American *A. erythroneurae* S. Trjapitzin et Chiappini, 1994 (Triapitsyn, 1998b).

DISTRIBUTION. *Russia (Moscow region, Tambov region, Primorskii krai, Sakhalin); Argentina (Triapitsyn, 2000a), Belgium (Triapitsyn, 1998a), Bulgaria (Donev, 1998), Chile (Triapitsyn, 2000a), France, *Israel, Italy, *Kyrgyzstan, Netherlands, New Zealand (Triapitsyn, 2001); *Spain, *Sweden, UK (England, *Scotland, *Wales).

HOSTS. Cicadellidae: *Edwardsiana rosae* (Linnaeus, 1758) (Chiappini, 1987), *E. froggatti* (Baker, 1925) (Triapitsyn, 2001; Triapitsyn & Teulon, 2002 [as *E. crataegi* (Douglas, 1876)]), and *Ribautiana tenerrima* (Herrich-Schaeffer, 1834) (Triapitsyn, 2001).

COMMENTS. Chiappini (1989) synonymized "*A. debilis* Foerster, 1947 sensu Soyka", 1956 under *A. ustulatus*; however, that was unnecessary because Soyka's lectotype designation of *A. debilis* was invalid and his two specimens did not represent the real *A. debilis*, but rather were misidentifications of *A. ustulatus* and *A. obscurus* Förster, 1861 (Chiappini, 1989). *A. debilis* should be considered as a valid, although doubtful (its type material is lost from NHMW), species, and was listed as such in the checklist by Chiappini et al. (1996).

9. *Anagrus* (*Anagrus*) *japonicus* Sahad, 1982

Anagrus japonicus Sahad, 1982: 201 (holotype – ♀, Hakozaki, Fukuoka, Japan [Entomol. Lab., Fac. Agric., Kyushu Univ., Fukuoka], not examined); Sahad & Hirashima, 1984: 50.

Anagrus (*Anagrus*) *japonicus*: Chiappini et al., 1996: 571; Triapitsyn, 2001: 278.

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 12-17.VIII 1999, 1♀; 28.VIII-5.IX 1999, 1♀ [UCRC, ZIN]. Sakhalin, 6 km E Sokol, near Belaya River, 16.VIII 2001, D. Bennett, T. Anderson, 1♀ [CAS].

DIAGNOSIS. See Chiappini et al. (1996). Male of *A. japonicus* is unknown.

DISTRIBUTION. *Russia (Primorskii krai, Sakhalin); Australia (Northern Territory, Christmas Island) (Triapitsyn, 2001), Japan (Honshu, Kyushu), Papua New Guinea (Triapitsyn, 2001).

HOSTS. Unknown.

10. *Anagrus* (*Anagrus*) *kvas* S. Triapitsyn et Berezovskiy, sp. n.

Figs 4, 5

MATERIAL. Holotype – ♀ (on slide) [ZIN]: Russia, Primorskii krai, Ussuriysk district, Gornotayozhnoye, M. Michailovskaya, 28.VIII-5.IX 1999, MT. Paratypes – **Russia**: same locality and collector as the holotype: 10-14.VI 1999, 1♀ on slide; 11-14.VII 1999, 1♀ on card; 24.VII-1.VIII 1999, 1♀ on slide; 15-26.IX 1999, 3♀ on slides; 25-26.IX 1999, 1♀ on slide; 21-24.X 1999, 1♀ on slide; 5-8.X 2000, 1♀

on slide; 9-12.X 2000, 2♀ on slides [CNCI, IBPV, IEFA, UCRC, ZIN]. Sakhalin, ca. 6 km E Sokol, D. Bennett, T. Anderson: 12.VIII 2001, 1♀ on card and 2♀ on slides; 16.VIII 2001, 1♀ on slide [CAS]. **China**: Beijing, Fragrant Hills, 23-24.VII 2002, M. Buffington, 2♀ on points and 1♀ on slide [UCRC].

DESCRIPTION. FEMALE (holotype and paratypes). Color. Head, mesoscutum, and metasoma mostly brown except eye and ocelli dirty pink; remainder of mesosoma pale to light brown; appendages light brown except F2-F6 and clava brown.

Head. A little wider than mesosoma. Mandible with 3 teeth. Antenna (Fig. 4) sparsely setose; scape about 4.5 times as long as wide and 2.4-2.5 times longer than pedicel; F1 oval, much shorter than pedicel and shortest of funicle segments; F2 a little longer than F3 and slightly shorter than F4, F5 and F6 subequal in length and longest of funicle segments; longitudinal sensilla on F4 (1), F5 (2) and F6 (2); clava 3.3-3.4 times as long as wide and shorter than two preceding segments combined, with 3 longitudinal sensilla.

Mesosoma: Shorter than metasoma. Mesoscutum finely longitudinally striate, without adnotaular setae. Wings. Forewing (Fig. 5) 7.3-7.7 times as long as wide; hypochaeta reaching posterior margin, distal macrochaeta 1.9-2.7 times length of proximal macrochaeta; disc hyaline, without bare area and with 5 or 6 irregular rows of setae in broadest part; longest marginal cilia 2.5-2.9 times greatest width of wing. Hind wing 25-27 times as long as wide, hyaline, with a row of microtrichia along each margin; longest marginal cilia 7.6-9.0 times greatest width of wing.

Metasoma. Ovipositor not reaching or sometimes almost reaching mesophragma anteriorly and slightly exserted beyond apex of gaster posteriorly; ratio of total ovipositor length to length of its exserted part 10-12:1. External plate of ovipositor with 1 seta. Ovipositor length/foretibia length ratio 1.9-2.1:1.

Measurements (holotype): Body: 701; head: 133; mesosoma: 218; metasoma: 350; ovipositor: 291. Antenna: scape: 109; pedicel: 45; F1: 18; F2: 55; F3: 52; F4: 58; F5: 64; F6: 66; clava: 114. Forewing: 606/83; longest marginal cilia: 209. Hind wing: 545/22; longest marginal cilia: 167. Legs (given as femur, tibia, tarsus): fore: 136, 138, 185; middle: 133, 191, 194; hind: 121, 203, 200.

MALE. Unknown, although may be present among the unassociated males of the *atomus*-group species of *Anagrus* which were collected from the type localities in Russia.

DIAGNOSIS. The new species is very closely related to *A. atomus*, which has a distinct bare area in the broadest part of the forewing disc. All specimens of *A. kvas* sp. n. consistently have the broadest part of the forewing disc more or less uniformly covered with microtrichia (Fig. 5). In addition, F5 of the female antenna has two longitudinal sensilla whereas that of *A. atomus* has only one such sensillum. The female antennal clava of the new species is notably shorter than combined length of F5 and F6, but in *A. atomus* the female antennal clava is a little longer than the last two funicle segments together.

DISTRIBUTION. Known only from the type localities in Russia (Primorskii krai, Sakhalin) and China (Beijing).

HOSTS. Unknown.

ETYMOLOGY. The specific name refers to the famous Russian rye bread-based beverage favored by the authors.

COMMENTS. The specimens of *A. kvas* sp. n. were collected in both MT and YPT.

11. *Anagrus* (*Anagrus*) *atomus* (Linnaeus, 1767)

Ichneumon atomos [sic] Linnaeus, 1767: 941 (type material of unspecified sex, Uppsala, Sweden [depository unknown, type(s) lost from the Linnean collection], not examined).

Anagrus atomus (Linnaeus): Haliday, 1833: 347; Debauche, 1948: 137; Viggiani, 1970a: 13; Graham, 1982: 199; Chiappini, 1987: 73.

Anagrus (*Anagrus*) *atomus*: Chiappini, 1989: 102; Chiappini & Lin, 1998: 561; Triapitsyn, 1998b: 82; Baquero & Jordana, 1999: 41.

MATERIAL. **Russia**: Krasnodar, 10-27.VIII 2001, V. Kostjukov, 10♀. Moscow region, Fryazevo, M. Tretiakov: 2-15.VI 2000, 1♀; 25.VII 2000, 2♀; 23.VIII 2000, 3♀; 25-31.VIII 2000, 2♀. Mamontovka, E. Shouvakhina: 10-20.VII 2000, 3♀; 23.VIII 2000, 3♀. Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 15-26.IX 1999, 1♀; 9-12.X 2000, 1♀; 31.VII-10.VIII 2001, 1♀ [UCRC, ZIN]. Sakhalin, 6 km E Sokol, near Belaya River, 16.VIII 2001, D. Bennett, T. Anderson, 3♀ [CAS]. Tambov region, Talinka (7 km S Pavlovka), 26-27.V 2000, M. Tretiakov, 1♀ [UCRC]. **Belgium**: Liège Province, Wanze, Antheit, Corphalie, R. Detry: 11-25.V 1990, 2♀; 3-17.VIII 1990, 1♀ [ISNB]. **Canada**: British Columbia: Oliver, 5.II-1.III 1999, T. Lowery, K. Todd, 1♀. Summerland, 5-26.VII 2000, T. Lowery, 1♀ [UCRC]. **China**: Beijing Province, Mentougou District, Xiaolongmen Sta., 39˚59.22'N, 115˚31.48'E, 1095 m, 28.VII 2002, G. Melika, 4♀ [SPLK, UCRC]. **Egypt**: Alexandria, VI 2001, M. Abd-El-Fattah, 7♀, 8♂ (ex. *Empoasca* sp. eggs on beans) [UCRC]. Giza, near pyramids, 1♀ (emerged in UC Berkeley quarantine at Albany, California, USA, 4.VI 1954, ex. *Chenopodium* sp. material) [EMEC]. **France**: Département Gironde: Sainte Colombe, 44˚54'N, 00˚02'W, M. van Helden: 2.VII 1998, 2♀, 1♂; 30.VII 1998, 2♀, 4♂; 13.VIII 1998, 5♀; 27.VIII 1998, 1♀; 9.VII 1999, 1♀; 17.VIII 2000, 6♀. Tourtirac, 44˚53'57"N, 00˚02'02"W, 100 m, 26-27.VI 2000, S. Triapitsyn, 1♀ [UCRC]. **Germany**: Bavaria, Franconia, Veitshöchheim, 22.VII 2003, S. Triapitsyn, 1♀. **Greece**: Thessalia, Larisa Co., Ayiokambos, 39˚43'N, 22˚52'E, 20 m, 7.III 2001, A. Kapranas, 1♀ [UCRC]. **Iran**: Kavar Province, 14.V 1998, N. Zareh, 3♀, 2♂ (progeny of, 4th generation, University of California, Riverside, USA, quarantine colony on eggs of *Circulifer tenellus* (Baker, 1895), coll. 15.VII 1998, I. Bayoun). **Italy**: Lazio, Castel Porziano, 41˚46.67'N, 12˚24.75'E, 30 m, 11-12.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀ [UCRC]. Sardinia, Tempio (Cusseddu), 19-26.VI 1978, 1♀ [CNCI]. **Kyrgyzstan**: Chuy: Bishkek, Thor-Aryk (Boz-Peldek Mt.), 42˚46'55"N, 74˚34'11"E, 1094 m, 14.VIII 1998, C. Dietrich, 1♀. Karagajly-Bulak, 9 km W Ak-Tyuz, 42˚52'47"N, 76˚02'13"E, 2180-3400 m, 26.VII 2000, C. Dietrich, 1♀ [UCRC] **Pakistan**: Multan, 15.V 1979, 3♀ («ex. cotton leaves infested with jassids & whiteflies, CIBC No. 4620») [BMNH]. **Republic of Korea**: Jeju-do, Jeju-si, 38˚29'N, 126˚31'E, 3-7.IX 2001, J.-W. Kim, 1♀ [UCRC]. **Spain**: Aranques, 3.VIII 1952, J. Holloway, 1♀ (ex. *Portulaca* plant material). Santa Pola, 1♀ (emerged in UC Berkeley quarantine at Albany, California, USA, 20.V 1953, ex. *Circulifer tenellus* egg on wild beet) [EMEC]. **Sweden**: Uppsala, Hågadalen, 10-17.VIII 1990, F. Ronquist, 1♀ [CNCI]. **Turkmenistan**: Ashgabat region, Enev, S. Myartseva (ex. *Empoasca* sp. eggs on red beets): 1.VI 1992, 3♀; 5.VII 1992, 1♂; 14.VII 1992, 1♂; 27.VII 1992, 1♀; 19.VIII 1992, 3♀, 2♂ [UCRC]. **United Kingdom:** England:

Berkshire Co., Ascot, Silwood Park, 27.VI-4.VII 1984, J. Waage, M. Matthews, 4♀. Cambridgeshire Co., Duxford, R. George: 19-26.VI 1979, 1♀; 1-11.VIII 1979, 1♀ [BMNH]. Cheshire Co., Ashton-upon-Mersey, 14.VIII 1919, O. Whittaker, 1♀ [USNM]. Herefordshire Co., Ross-on-Wye, 7-15.IX 1979, R. George, 1♀ [BMNH]. Scotland, Edinburgh, 6-9.VIII 1991, R. Wharton, 2♀ [TAMU]. Wales, South Glamorgan Co., Pendoylan, Llanerch Vineyard, 9.IX 1999, S. Triapitsyn, 1♀ [UCRC]. **USA**: California: El Dorado Co., Camino, 3.XI 1996, M. Moratorio, 3♀, 1♂ (ex. *Edwardsiana rosae* (Linnaeus, 1758) eggs on apple and blackberry). Mendocino Co., Ukiah, 15.IV 1999, M. Moratorio, 1♀ (ex. *E. rosae* eggs on blackberry) [UCRC]. New York, Dutchess Co., Poughkeepsie, 6.V 1934, H. Steiner, numerous ♀, ♂ (ex. eggs of *Typhlocyba pomaria* McAtee, 1926; misidentified by A. Gahan as *A. armatus nigriventris* Girault, 1911) [USNM]. Washington, Benton Co., nr. Swaley (Prosser), 9.II 2000, D. James, 8♀ (ex. overwintering leafhopper eggs on blackberry) [UCRC].

DIAGNOSIS. See Chiappini (1987, 1989), who also provided (1989) a long list of its synonyms.

DISTRIBUTION. *Russia (Krasnodarskii krai, Moscow region, Tambov region, Primorskii krai, Sakhalin); Argentina (Triapitsyn, 2000a), Austria (Chiappini, 1989), Belgium, Bulgaria (Donev, 1998), Canada (Triapitsyn, 1998b), Chile (Triapitsyn, 2000a), China, Croatia (Bakkendorf, 1971), Egypt, Finland (Noyes, 2002), France, Germany, Greece (Donev, 1998), Iran (Triapitsyn, 1998b), Israel (Noyes, 2002), Italy, *Kyrgyzstan, Macedonia (Donev, 1998), Moldova (Trjapitzin, 1978), New Zealand (Triapitsyn, 2001), *Pakistan, Poland (Chiappini, 1989), *Republic of Korea, Serbia and Montenegro (Serbia) (Donev, 1998), Spain, Sweden, Switzerland (Triapitsyn, 1998a; Noyes, 2002), Turkey (Noyes, 2002), Turkmenistan, United Kingdom (England, Wales, *Scotland), USA. Widespread throughout the Palaearctic region.

HOSTS. Various leafhoppers (Cicadellidae) and planthoppers (Delphacidae) listed by Noyes (2002) and also by Chiappini (1987), Chiappini et al. (1996), Baquero & Jordana (1999), and Triapitsyn (1998b, 2001).

COMMENTS. This is the first mymarid species described and, arguably, the most common Palaearctic species of *Anagrus*. Its taxonomy was well summarized by Graham (1982); his and Haliday's (1833) concept of *A. atomus* is followed here.

12. *Anagrus* (*Anagrus*) *frequens* Perkins, 1905

Anagrus frequens Perkins, 1905: 198 (lectotype – ♀, designated by Triapitsyn & Beardsley, 2000: 32, Bundaberg, Queensland, Australia [B. P. Bishop Mus., Honolulu, Hawaii], examined); Sahad & Hirashima, 1984: 58.

Anagrus (*Anagrus*) *frequens*: Chiappini et al., 1996: 571; Triapitsyn, 1997: 5; Chiappini & Lin, 1998: 561; Triapitsyn & Beardsley, 2000: 32; Triapitsyn, 2001: 278.

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, 6.VI 1999, M. Michailovskaya, 1♀ [UCRC, ZIN]. Sakhalin, 6 km E Sokol, near Belaya River, 16.VIII 2001, D. Bennett, T. Anderson, 1♀ [CAS]. **American Samoa**: Tutuila Island, Mapusaga, 12-19.II 2002, M. Schmaedick, 2♀ [UCRC]. **Japan**: Shimame Pref., Matsue City, Nishikawatsu, 20.VIII 1985, K. Miura, 1♀ («sweeping *Zoysai japonica*») [CNCI]. **Northern Mariana Islands** (USA): Guam Island, Dededo, 13.XI 1936, O. Swezey, 3♀ («ex leafhopper eggs on corn») [USNM].

DIAGNOSIS. See Chiappini et al. (1996) for the diagnosis and Triapitsyn (2001) for the most updated list of synonyms of *A. frequens*.

DISTRIBUTION. *Russia (Primorskii krai, Sakhalin); *American Samoa; Australia, China (Chiappini & Lin, 1998) including Taiwan (Triapitsyn & Beardsley, 2000), Democratic Republic of the Congo (Triapitsyn, 1998a), Fiji (Triapitsyn & Beardsley, 2000), French Polynesia (Triapitsyn, 2001), Hawaiian Islands (USA) (Chiappini et al., 1996; Triapitsyn & Beardsley, 2000), Japan (Sahad & Hirashima, 1984), Malaysia (Noyes, 2002), New Zealand (Triapitsyn, 2001), Northern Mariana Islands (USA), Papua New Guinea (Triapitsyn, 2001), Philippines (Triapitsyn & Beardsley, 2000), South Africa (Triapitsyn & Beardsley, 2000), Thailand (Triapitsyn, 1997), as well as several countries in New World tropics (Triapitsyn, 1997, 2002).

HOSTS. Various planthopper (Delphacidae) and perhaps some leafhopper (Cicadellidae) species on corn, sugarcane, and other plants, listed by Sahad & Hirashima (1984), Chiappini et al. (1996), Triapitsyn (1997), Triapitsyn & Beardsley (2000), and Noyes (2002).

13. *Anagrus* (*Anagrus*) *longitibialis* Donev, 1996

Fig. 11

Anagrus (*Anagrus*) *longitibialis* Donev *in* Chiappini et al., 1996: 568 (holotype – ♀, Zdravec Mountain (1200 m), Rhodope Mountains, Bulgaria [A. Donev coll., Dept. Zool., Univ. Plovdiv "Paisiy Hilendarski", Plovdiv], not examined).

MATERIAL. **Italy**: Campania, SE end of Lago del Matese, 1050 m, 41˚24.41'N, 14˚24.20'E, 7-8.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀ [UCRC].

DIAGNOSIS. See Chiappini et al. (1996). Male of this species is unknown.

DISTRIBUTION. Bulgaria, *Italy.

HOSTS. Unknown.

COMMENTS: This is the first record of this species outside of the type localities in Bulgaria.

The *incarnatus* species group

14. *Anagrus* (*Anagrus*) *breviphragma* Soyka, 1956

Anagrus breviphragma Soyka, 1956: 25 (lectotype – ♀, effectively designated by Chiappini, 1989: 105, type locality unknown (Europe) [NHMW], examined).

Anagrus (*Anagrus*) *breviphragma*: Chiappini, 1989: 105; Triapitsyn, 1997: 6; Triapitsyn, 2000a: 214.

MATERIAL. **Russia**: Moscow region: Fryazevo, M. Tretiakov: 2-15.VI 2000, 2♀; 25.VII-14.VIII 2000, 1♀, 1♂; 15-25.VIII 2000, 1♀; 25-31.VIII 2000, 2♀. Mamontovka, E. Shouvakhina: 10-20.VII 2000, 2♀; 1-10.VIII 2000, 1♀. Primorskii krai: Mel'nichnyi, 1-5.VI.2001, M. Michailovskaya, 1♂. Gornotayozhnoye, M. Michailovskaya: 8.VI 1999, 1♀; 11-12.VI 1999, 1♀; 3-4.VII 1999, 1♀; 25-26.IX 1999, 1♀; 11-21.VI 2000, 1♀; 1-10.VIII 2000, 1♀; 5-8.X 2000, 4♀; 9-12.X 2000, 6♀; 10-20.VI 2002, 1♀; 24.IX-5.X 2002, 2♀ [IBPV, UCRC, ZIN]. Sakhalin: 2 km E Sokol, D. Bennett, T. Anderson, 24.VII 2001, 2♀. 2-3 km E Sokol, N. Minakawa,

24.VII 2001, 1♀; 6 km E Sokol, D. Bennett, T. Anderson: 24.VII 2001, 5♀; 31.VII 2001, 6♀; 16.VIII 2001, 3♀ [CAS]. **China**: Beijing, Fragrant Hills, 23-24.VII 2002, M. Buffington, 1♀ [UCRC]. **France**: Département Gironde, Sainte Colombe, 44˚54'N, 00˚02'W, 30.VII 1998, M. van Helden, 1♀. **Italy**: Campania, SE end of Lago del Matese, 41˚24.41'N, 14˚24.20'E, 1050 m, 7-8.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 2♂. Lazio: Castel Porziano, 41˚46.67'N, 12˚24.75'E, 30 m, 11-12.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 3♀, 4♂. 0.8 km W Sasso, 42˚02.97'N, 12˚02.21'E, 264 m, 9-10.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀ [UCRC]. **Kyrgyzstan**: Chuy, Karagajly-Bulak, 9 km W Ak-Tyuz, 42˚52'47"N, 76˚02'13"E, 2180-3400 m, 26.VII 2000, C. Dietrich, 1♀ [UCRC]. **Sweden**: Upland Uppsala, Eriksberg, 11-19.VII 1987, F. Ronquist, 1♀ [CNCI]. **United Kingdom**: England, Berkshire Co., Ascot, Silwood Park, 1960-1961, G. Rothschild, 1♀, 1♂ (ex. eggs of *Conomelus anceps* (Germar, 1821); misidentified by R. Doutt as *A. atomus*) [EMEC].

DIAGNOSIS. See Chiappini (1989) who also provided a list of synonyms of this species. *A. breviphragma* is clearly closely related to the *A. incarnatus* complex; presence of a large bare are on the forewing disc is practically its only distinctive feature from *A. incarnatus*.

DISTRIBUTION. *Russia (Moscow region, Primorskii krai, Sakhalin); Argentina (Triapitsyn, 1997), Austria (Chiappini, 1989), Belgium (Triapitsyn, 1998a), Brazil (Triapitsyn, 1997), Bulgaria (Donev, 1998), *China (Beijing), Colombia (Triapitsyn, 2002), France, Germany (Chiappini, 1989), Greece (Donev, 1998), Guadeloupe Island (France) (Triapitsyn, 1997), Guiana (Triapitsyn, 1997), *Hungary (Thuróczy, 1983 [as *A. atomus*, misidentification]), Italy, Japan (Triapitsyn, 2000a), *Kyrgyzstan, *Sweden, United Kingdom (England, Wales) (Walker, 1979 [as *A. silwoodensis* I. Walker, 1979]).

HOSTS. Cicadellidae: *Cicadella viridis* (Linnaeus, 1758) (Chiappini, 1989; Chiappini et al., 1999) and *Dalbulus maidis* (De Long in Wolcott, 1923) (Triapitsyn, 1997; Virla, 2001). Delphacidae: *Conomelus anceps* (Germar, 1821) (Triapitsyn, 2000a), *Delphacodes kuscheli* Fennah, 1955, *Peregrinus maidis* (Ashmead, 1890) (Triapitsyn, 1997), as well as (under laboratory conditions) *Dicranotropis hamata* (Boheman, 1847) and *Muellerianella fairmairei* (Perris, 1857) (Moratorio & Chiappini, 1995). Miridae: *Orthotylus virescens* (Douglas et Scott, 1865) (Triapitsyn, 2000a).

COMMENTS. This is a very common and widespread Palaearctic and Neotropical species, on which biological information is available (Moratorio & Chiappini, 1995; Virla, 2001). Walker (1979) provided an account of some earlier misidentifications of this species (as *A. silwoodensis*) in the United Kingdom.

The *Anagrus incarnatus* complex

Species comprising this complex include *A. incarnatus* and several closely related forms or, quite likely, sibling species from the *incarnatus* species group, all of which lack adnotaular setae on the midlobe of mesoscutum and have a similar forewing (as in fig. 6) and male genitalia (Fig. 7), which are typical for that species group (Chiappini & Mazzoni, 2000). Their identification based solely on morphological

features is practically impossible at this stage of our knowledge of this group. Within this complex, proportions of the female antennal segments (especially the length of F2 and F3), presence and number of longitudinal sensilla on funicle segments, and ovipositor length vary so greatly and in different combinations, so assessing intra-specific vs. interspecific variability using morphometric analysis is often not feasible. For instance, we have specimens belonging to this group, which either have or lack a longitudinal sensillum on F2 of the female antenna. Furthermore, F3 may be without or with 1 or 2 longitudinal sensilla, and F4 or F5 with 1 or 2 longitudinal sensilla. The ovipositor can be very short, not exserted beyond apex of the gaster, to very long and markedly exserted (up to 1/3 of its total length), while the ovipositor/foretibia ratio varies from 1.8:1 to 4.0:1. Additionally, there are a few specimens from the Russian Far East, belonging possibly to 2 or 3 different species, which are similar to *A. incarnatus* in every regard except for completely different forewings.

From the Russian Far East alone, we have examined 260 specimens on points or cards and 21 on slides (collected near Sokol, Sakhalin, in July and August 2001 by D. Bennett, T. Anderson, and N. Minakawa) as well as 22 specimens on points or cards and 38 on slides (collected in Gornotayozhnoye, Primorskii krai, during 1999-2002 by M. Michailovskaya), which belong to this complex and could not be further, positively, identified to the species. A few of them are definitely the same as *Anagrus* "sp. 1" from Fujian, China, illustrated by Chiappini & Lin (1998). Nevertheless, we were able to match a good number of additional specimens from the Russian Far East and elsewhere with the described species in this complex (i.e., *A. incarnatus, A. fisheri*, and, tentatively, *A. nilaparvatae*); these are listed under "Material Examined" for the respective taxa, as follows.

15. *Anagrus* (*Anagrus*) *incarnatus* Haliday, 1833

Anagrus incarnatus Haliday, 1833: 347 (lectotype – ♀, designated by Graham, 1982: 200, type locality unknown, possibly in England (UK) [Nat. Hist. Division, National Mus. Ireland, Dublin], not examined); Viggiani, 1970a: 15; Graham, 1982: 200; Triapitsyn, 1998a: 143.

Anagrus incarnatus incarnatus: Debauche, 1948: 132.

Anagrus (*Anagrus*) *incarnatus*: Chiappini, 1989: 112; Triapitsyn, 1997: 7; Baquero & Jordana, 1999: 44.

MATERIAL. **Russia**: Kamchatka, Vestnik Bay, 27.VII 1999, B. Urbain, 1♀ [CAS]. Krasnodar, 26-27.VIII 2001, V. Kostjukov, 1♀. Leningrad region, 69-km Railway Station near Sosnovo, 25-26.VIII 1985, V. Trjapitzin, 1♂ [ZIN]. Moscow region: Fryazevo, M. Tretiakov: 2-15.VI 2000, 1♀; 25.VI-2.VII 2000, 4♀; 3-8.VII 2000, 1♀; 24.VII-14.VIII 2000, 15♀, 1♂; 15-25.VIII 2000, 7♀; 25-31.VIII 2000, 4♀. Mamontovka, E. Shouvakhina: 10-20.VIII 2000, 3♀; 20-31.VIII 2000, 1♀, 2♂. Primorskii krai: Mel'nichnyi, 29.VI-1.VII.2001, M. Michailovskaya, 1♀. Gornotayozhnoye, M. Michailovskaya: 28.VI-4.VII 1999, 1♀; 11-14.VII 1999, 1♀; 24.VII-1.VIII 1999, 1♀; 12-17.VIII 1999, 2♀; 6-14.IX 1999, 2♀; 11-21.VI 2000, 4♀; 21.VI 2000, 1♀; 22-30.VI 2000, 3♀; 1-10.VII 2000, 2♀; 21-31.VII 2000, 1♀; 1-10.VIII 2000, 2♀; 5-8.X 2000, 2♀; 9-12.X 2000, 2♀; IX-XI 2001, 1♀; 1-10.X 2001, 1♀; 10-19.VII 2002, 2♀ [IBPV, UCRC, ZIN]. Sakhalin: 2-3 km E Sokol, 10.VIII

2001, N. Minakawa, 1♀. 6 km E Sokol, D. Bennett, T. Anderson: 31.VII 2001, 5♀; 16.VIII 2001, 17♀ [CAS]. Vladimir region, Omutische (nr. Petushki), 28.VII 1985, V. Trjapitzin, 1♀ [ZIN]. **Belgium**: Liège Province, Wanze, Antheit, Corphalie, R. Detry: 28.VII-11.VIII 1989, 1♀; 20.X-3.XI 1989, 1♂; 28.VI-6.VII 1989, 1♀. Waterloo, 20-27.IX 1992, P. Dessart, 2♀ [ISNB]. **Denmark**: ?Dyrehaven, III-V 1925, O. Bakkendorf, 1♀ (ex. *Conomelus anceps* (Germar, 1821) eggs) [USNM]. Möen Island, Karensby, 14.VII 1927, O. Bakkendorf, 1♀ ("ex. Agrionin eggs from *Nymphaea*") [UCRC]. **France**: Département Gironde: Sainte Colombe, 44˚54'N, 00˚02'W, M. van Helden: 30.VII 1998, 1♀; 13.VIII 1998, 1♀; 9.VII 1999, 1♀; 17.VIII 2000, 2♀ [UCRC]. **Japan**: Yamaguchi Pref., Yamaguchi City, Hirakawa, 9.IV 1983, K. Miura, 12♀, 5♂ (ex. *Cicadella viridis* (Linnaeus, 1758) eggs on *Juncus* sp. [CNCI, UCRC]. **Kyrgyzstan**: Talas, nr. Boo-Terek, 42˚35'15"N, 71˚45'49"E, 1000 m, 15.VI 1999, C. Dietrich, 1♀ [UCRC]. **Netherlands**: Leersum, Brockhuizen, VIII 1975, H. Vlug, 1♀ (on *Vinca minor* L.). **Sweden**: Uppland Uppsala, Eriksberg, F. Ronquist: 11-18.VII 1986, 3♀; 18-25.VIII 1986, 1♀; 25-31.VIII 1986, 1♀. Uppsala, Hågadalen, F. Ronquist: 10-17.VIII 1990, 1♀; 17-26.VIII 1990, 1♀ [CNCI]. **United Kingdom:** England: Berkshire Co., Ascot, Silwood Park: 1960-1961, G. Rothschild, 2♂ (ex. eggs of *Conomelus anceps*; misidentified by R. Doutt as *A. atomus*); 20.IX 1961, O. Richards, 1♂ (ex. egg of *Asciodema obsoleta* (Fieber, 1864)) [EMEC]; 27.VI-4.VII 1984, J. Waage, M. Matthews, 2♀ [BMNH]. Hampshire Co., Romsey, Awbridge, C. Vardy: VI 1981, 2♀; IX 1981, 1♀. Yorkshire Co., Malham Tarn, 11-14.IX 1981, H. Disney, 1♀ [BMNH]. **USA**: Wyoming, Sheridan Co., Story, 1.VIII 1983, G. Gordh, 1♀ [UCRC].

DIAGNOSIS. See Chiappini (1989) for the diagnoses of both *A. incarnatus* and *A. incarnatosimilis* Soyka, 1956. The latter was synonymized under *A. incarnatus* by Triapitsyn (1997), who also provided a long list of synonyms of this common species.

DISTRIBUTION. Russia (*Kamchatka, *Primorskii krai, *Sakhalin, *Krasnodarskii krai, Leningrad region, *Moscow region, *Vladimir region); Austria (Chiappini, 1989), Belgium, Bulgaria (Donev, 1998), Denmark, Finland (Hellén, 1974), France, Germany (Foerster, 1847; Triapitsyn, 1998a), Greece (Donev, 1998), Italy (Viggiani, 1970a, Viggiani & Jesu, 1988; Chiappini, 1989), Japan, ?Juan Fernández Islands (Chile) [a doubtful record according to Triapitsyn (1997)], *Kyrgyzstan, Macedonia (Donev, 1998), Netherlands, New Zealand (Triapitsyn, 2001), Poland (Chiappini, 1989), Serbia and Montenegro (Serbia) (Donev, 1998), Spain (Baquero & Jordana, 1999), *Sweden, Switzerland (Triapitsyn, 1998a), Turkmenistan (Triapitsyn, 1997), United Kingdom (England (Walker, 1979 [as *A. mutans* I. Walker, 1979 and *A. stenocrani* I. Walker, 1979]), Wales (Walker, 1979 [as *A. mutans*])), *USA (Wyoming).

HOSTS. Cicadellidae: *Cicadella viridis* (Linnaeus, 1758) (Chiappini, 1989; Moratorio & Chiappini, 1995 [as *A. incarnatosimilis* Soyka, 1956]; Chiappini et al., 1999). Delphacidae: *Conomelus anceps* (Germar, 1821) (Triapitsyn, 1997), *C. lorifer dehneli* Nast, 1966 (Noyes, 2002), *Dicranotropis hamata* (Boheman, 1847) and *Muellerianella fairmairei* (Perris, 1857) (Moratorio & Chiappini, 1995 [as *A. incarnatosimilis*]), *Megamelus notula* (Germar, 1830) (Noyes, 2002), *Stenocranus*

major (Kirschbaum, 1868) (Noyes, 2002)*, S. minutus* (Fabricius, 1787) (Walker, 1979). Miridae: *Asciodema obsoleta* (Fieber, 1864) (new host record). Odonata (Coenagrionidae): (Bakkendorf, 1926, part.) – see above record from Karensby, Denmark, as well as comments under *A. brocheri* and *A. subfuscus*. It was interesting to discover that Bakkendorf's voucher specimens from the same rearing contained both *A. subfuscus* (the majority of specimens) and *A. incarnatus*.

Numerous records of this species from eggs of rice leafhoppers and planthoppers in the Oriental and southeastern Palaearctic regions, summarized by Chiappini & Lin (1998) and Noyes (2002), should for now be referred to *A. nilaparvatae* (see comments under the latter species). Several leafhopper and planthopper hosts of *A. incarnatus* from Japan and Republic of Korea by Sahad & Hirashima (1984) are likely those of *A. nilaparvatae* as well, although perhaps some of them could be the "real" *A. incarnatus*.

Radu & Botoc (1960) reported *A. incarnatus incarnatus* from Romania (Sapca Verde near Cluj), but that was apparently a misidentification of some other species of *Anagrus* because F2 and F3 of the female antenna are much longer in *A. incarnatus* than they are in the specimen photographed. The record of this species from eggs of *Peregrinus maidis* (Ashmead, 1890) (Delphacidae) in Lesser Antilles by De Santis (1989) is almost certainly a misidentification of either *A. flaveolus* Waterhouse, 1913 or *A. breviphragma.*

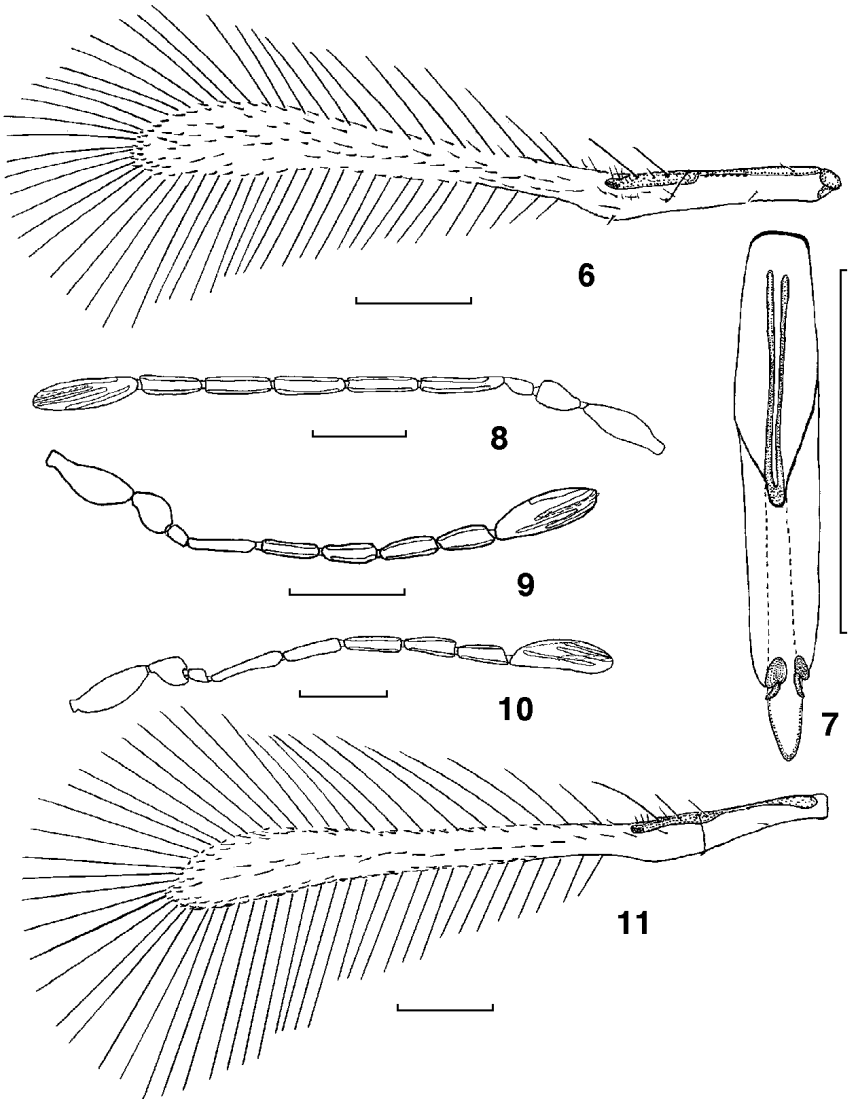
Numerous records of *A. incarnatus* from eggs of various damselflies in Europe (Fursov, 1995) probably in most part should be referred to *A. subfuscus* (see comments under the latter species). The specimens identified by Triapitsyn (1997) as *A. incarnatus* from eggs of the relict dragonfly, *Epiophlebia superstes* (Selys, 1889) (Odonata: Anisozygoptera: Epiophlebiidae), in Japan differ slightly from most of the European *A. incarnatus* but fall within the limits of the *A. incarnatus* complex. Most likely, however, those minor differences in the ovipositor length, body coloration, etc., are due to a host-induced and/or geographical intraspecific variability, which is to be expected in a polyphagous and widespread species such as *A. incarnatus*, although it could be its sibling species as well.

COMMENTS. Bakkendorf's (1926) synonymies of practically all the previously described species of *Anagrus* under *A. incarnatus* resulted in numerous misidentifications, mostly in Europe, until the revisionary works by Graham (1982), Chiappini (1989), and Chiappini et al. (1996) allowed for their recognition. In Russia, the non-aquatic form of *A. incarnatus* was first recorded (in Leningrad region) by Hellén (1974).

16. *Anagrus* (*Anagrus*) *fisheri* Donev, 1998

Anagrus fisheri Donev, 1998: 76 (holotype – ♀, Rozhenski manastir (Monastery), Bulgaria [A. Donev coll., Dept. Zool., Univ. Plovdiv "Paisiy Hilendarski", Plovdiv], not examined).

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, 24.VII-1.VIII 1999, M. Michailovskaya, 1♀ [UCRC]. **Greece**: Rhodes Island (Rodhos), Ixia, 8-20.VIII 1985, M. Day, 1♀ [CNCI]. **Italy**: Lazio, Castel Porziano, 41˚46.67'N, 12˚24.75'E, 30 m, 11-12.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 3♀ [UCRC].



Figs 6-11. 6, 7) *Anagrus nilaparvatae* (6 – lab. colony at Silwood Park, England, UK; 7 – paratype); 8) *Anagrus* sp. A (Gornotayozhnoye, Primorskii krai); 9) *Anagrus* sp. B (Gornotayozhnoye, Primorskii krai); 10) *Anagrus* sp. C (Gornotayozhnoye, Primorskii krai); 11) *A. rilensis* (Bosco di Manziana, Lazio, Italy). 6) female forewing, 7) male genitalia, 8-10) female antennae, 11) male forewing. Scale bars = 0.1 mm.

DIAGNOSIS. This species is known from the female sex only; its original description and diagnosis (Donev, 1998) are sufficient for its easy recognition.

DISTRIBUTION. *Russia (Primorskii krai); Bulgaria, *Greece, *Italy.

HOSTS. Unknown.

COMMENTS. The specimen from Primorskii krai fits the description of *A. fisheri* in every regard except for a slightly higher ovipositor/foretibia ratio, which is 5.3:1 (this ratio is 4.0:1 in the holotype). However, significant variation in ovipositor length is very common in those species of *Anagrus* which have a very long ovipositor.

17. *Anagrus* (*Anagrus*) *nilaparvatae* Pang et Wang, 1985

Figs 6, 7

Anagrus nilaparvatae Pang & Wang, 1985: 52 (holotype – ♀, Fuoshan, Guangdong, China [SCAC], not examined; paratype –♂, labeled: Foshan, Guangdong, CHINA, June, 1982, He Jiamxing leg. Host: *Nilaparvata lugens* // *Anagrus nilaparvatae* Pang & Wang Paratype ♂ [SCAC], examined).

Anagrus incarnatus Haliday: Sahad & Hirashima, 1984: 46 (? part.).

Anagrus flaveolus Waterhouse, 1913: Sahad & Hirashima, 1984: 55 (misidentification).

Anagrus (*Anagrus*) *?flaveolus* Waterhouse, 1913; Chiappini et al., 1996: 584 (part., from the Old World only).

Anagrus (*Anagrus*) *?nilaparvatae*: Chiappini & Lin, 1998: 566.

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 6-14.IX 1999, 1♀; 22-30.VI 2000, 1♀; 21-31.VII 2000, 1♀; 5-8.X 2000, 3♀; 9-12.X 2000, 1♀ [UCRC, ZIN]. **Hawaiian Islands** (USA): Oahu Island, Round Top Drive, 1550', 10-24.VI 1997, W. Perreira, 1♀ [UCRC]. **Indonesia**: Java Island, Cianjur, Sukamaju, 4.IX 1993, 2♀ (ex. *Nilaparvata lugens* (Stål, 1854) on rice, trapping) [CNCI]. **Japan**: Hiroshima Pref., Fukuyama City, VIII 1998, K. Miura, 1♀ (ex. *Nilaparvata lugens* eggs) [CNCI]. Kanagawa Pref., Yokohama, 1.VIII 1920, C. Clausen, 1♀ [UCRC]. Kochi Pref., Nangoku City, Monobe, 20.IX 1981, K. Miura, 1♀ (ex. eggs of *Laodelphax striatellus* (Fallén, 1826) in rice field) [CNCI]. Also other reared material from Japan, listed (under *A. flaveolus*) by Chiappini et al. (1996) [EMEC]. **Nepal**: Nagarkot, 6000-7000', 24.VI 1981, G. Gordh, 1♀. **Philippines**: Luzon Island: Batangas, Tanauan, 24.VIII 1979, R. Apostol, 1♀ (ex. eggs of *Sogatella furcifera* (Horváth, 1899)). Los Baños, IRRI [The International Rice Research Institute], 8.XII 1979, A. Barrion, C. Casiro, 2♀ (ex. eggs of *Nilaparvata lugens*) [BMNH]. **Republic of Korea**: Gangwon-do, Pyengchang, Jinbu, Cheokchun, 23.IX 1998, J.-Y. Choi, 2♀. Suwon-si, Seoudun-dong, Seoul National University, 17.IX 2001, J.-W. Kim, 2♀ [UCRC]. **Taiwan** (China): Antei, 25.VII 1981, T. Miura, 1♀ (ex. *Nilaparvata lugens* on rice) [CNCI]. **United Kingdom:** England, Berkshire Co., Ascot, Silwood Park, 10.VIII 1984, N. Larter, 8♀ (ex. eggs of *Nilaparvata lugens*, lab. culture of Oriental origin) [BMNH].

DIAGNOSIS. Morphologically, this species is indistinguishable from *A. incarnatus*, with which it might very well be conspecific; males of these two species are identical (as in figs 6, 7). A more or less positive identification of several specimens from Primorskii krai as *A. nilaparvatae* was made because all these females lack a longitudinal sensillum on F3, like some specimens of *A. nilaparvatae* from Japan and Sri Lanka (Chiappini et al., 1996; Chiappini & Lin, 1998). Only generally different geographical distribution (perhaps except for the southeastern Palaearctic

region, where both forms might be present) and host associations preclude the apparent synonymy of *A. nilaparvatae* with *A. incarnatus*. Availability of molecular data may provide necessary clues for recognition of these two sibling species in the future, but for now this problem remains unresolved. Specimens from Japan and Republic of Korea, misidentified by Sahad & Hirashima (1984) as the common New World species *A. nigriventris* Girault, 1911, may belong here as well despite the different body coloration, although biological data (provided by the same authors) indicated that they would not parasitize the usual hosts of *A. nilaparvatae*; so the third, still undescribed, sibling species may be involved.

DISTRIBUTION. *Russia (Primorskii krai); Bangladesh (Sahad & Hirashima, 1984 [as *A. incarnatus* and *A. flaveolus*]), China (including Taiwan), Guam Island (USA: Northern Mariana Islands) (Chiappini et al., 1996), *Hawaiian Islands (USA), India (Chiappini et al., 1996), Indonesia, Japan, Malaysia (Chiappini et al., 1996), Mauritius (Chiappini et al., 1996), *Nepal, Pakistan (Chiappini et al., 1996), Philippines, Republic of Korea, Sri Lanka (Chiappini et al., 1996; Chiappini & Lin, 1998), Thailand (Sahad & Hirashima, 1984 as [*A. flaveolus*]).

HOSTS. *Cicadella viridis* (Linnaeus, 1758) (Cicadellidae) in Japan (Chiappini et al., 1996) and various rice-feeding leafhoppers and planthoppers listed by Sahad & Hirashima (1984), Chiappini et al. (1996), and Chiappini & Lin (1998), who also reviewed and listed numerous publications referring to the distribution and host associations of this species (also under the names *A. flaveolus, A.* nr. *flaveolus,* or *A. incarnatus*) in Asia (e.g., Yeo et al., 1990; Kim et al., 1992; etc.).

18. *Anagrus* (*Anagrus*) sp. A
Fig. 8

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, VIII-IX 1999, M. Michailovskaya, 1♀ [UCRC].

DIAGNOSIS**.** This is an apparently undescribed species which is characterized by the female antenna having two longitudinal sensilla on F2-F6 (Fig. 8). The mesoscutum has a pair of adnotaular setae. The forewing is similar to that of *A. nilaparvatae* (Fig. 6). The ovipositor is very short (the ovipositor/foretibia length ratio is 1.5:1) and not exserted beyond apex of gaster. The external plate of the ovipositor has 3 setae. The male is unknown.

DISTRIBUTION. Known only from the single specimen from one locality in Primorskii krai.

HOSTS. Unknown.

19. *Anagrus* (*Anagrus*) sp. B
Fig. 9

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, 17-31.VIII2001, M. Michailovskaya, 1♀ [UCRC].

DIAGNOSIS**.** This is an apparently undescribed species which is characterized by the light body color and the female antenna having two longitudinal sensilla on F3-F6 (Fig. 9). *A. fennicus* has a similar antenna but it is a very dark species. The

mesoscutum has a pair of adnotaular setae. The forewing is similar to that of *A. nilaparvatae* (Fig. 6). The ovipositor/foretibia length ratio is 2.0:1 and the ovipositor is not exserted beyond apex of gaster. The external plate of the ovipositor has 3 setae. The male is unknown.

DISTRIBUTION. Known only from the single specimen from one locality in Primorskii krai.

20. *Anagrus* (*Anagrus*) sp. C
Fig. 10

MATERIAL. **Russia**: Primorskii krai, Gornotayozhnoye, VIII-IX 1999, M. Michailovskaya, 1♀ [UCRC].

DIAGNOSIS**.** This is an apparently undescribed species which is characterized by the female antenna lacking longitudinal sensilla on F3 and having 2 such sensilla on F4-F6 (Fig. 10). The mesoscutum has a pair of adnotaular setae. The forewing is similar to that of *A. nilaparvatae* (Fig. 6). The ovipositor/foretibia length ratio is 2.6:1 and the ovipositor is slightly exserted beyond apex of gaster. The external plate of the ovipositor has 3 setae. The male is unknown.

DISTRIBUTION. Known only from the single specimen from one locality in Primorskii krai.

21. *Anagrus* (*Anagrus*) *nigriceps* (Smits van Burgst, 1914)

Litus nigriceps Smits van Burgst, 1914: 125-127 (lectotype – ♀, designated by Graham, 1982: 201, Wageningen, Netherlands [Dept. Entomol., Agric. Univ., Wageningen], examined); transferred to *Anagrus* by Graham, 1982: 200-201.

Anagrus (*Anagrus*) *nigriceps*: Chiappini et al., 1996: 586; Triapitsyn, 1998a: 143.

MATERIAL. **Russia**: Krasnodar, 16-24.VIII 2001, V. Kostjukov, 3♀ [ZIN]. Moscow region: Fryazevo: 1-5.VIII 1995, S. Triapitsyn, 2♀, 1♂; 2-15.VI 2000, M. Tretiakov, 1♀; 25.VI-2.VII 2000, M. Tretiakov, 2♀; 24.VII-15.VIII 2000, M. Tretiakov, 2♀; 15-31.VIII 2000, M. Tretiakov, 2♀ [UCRC, ZIN]. Omsk region, Omsk, STAZRA, VII 1948, 1♀, 1♂ ("from eggs of a dark leafhopper") [ZIN]. Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 28.VI-4.VII 1999, 1♀; 15-17.VIII 1999, 1♀; VIII-IX 1999, 1♀; 6-14.IX 1999, 2♀; 5-8.X 2000, 2♀; 9-12.X 2000, 3♀; 12-17.VII 2001, 1♀; IX-XI 2001, 1♀ [IBPV, UCRC, ZIN]. Sakhalin, 6 km E Sokol, 16.VIII 2001, D. Bennett, T. Anderson, 3♀ [CAS]. **Belgium**: Liège Province, Wanze, Antheit, Corphalie, R. Detry: 1-14.VII 1989, 1♀; 27.VII-11.VIII 1989, 1♀, 2♂; 20.X-3.XI 1989, 7♀; 3-17.XI 1989, 2♀; 27.IV-11.V 1990, 1♀; 11-25.V 1990, 2♀; 14-28.IX 1990, 1♀; 28.IX-12.X 1990, 3♀. Waterloo, P. Dessart: 1.IV-13.V 1992, 1♂; 28.IX-4.X 1992, 1♀ [ISNB]. **China**: W Sichuan, 20 km N Sabde, 3200 m, 12-14.VII 1998, 1♀ [CNCI]. **France**: Département Gironde: Mérignac, 16-19.VIII 2000, S. Bessart, M. van Helden, 1♀, 1♂. Sainte Colombe, 44˚54'N, 00˚02'W, M. van Helden: 30.VII 1998, 2♀; 9.VII 1999, 1♀. Département Hérault, Montpellier,

1-5.XII 1977, J. Huber, 1♀, 1♂ [UCRC]. **Greenland Island** (Denmark): Upernaviarssuk, 60˚45'N, 45˚54'W, 9-11.VIII 1982, P. Nielsen, 4♀, 3♂. Qagssiarssuk, 61˚09'N, 45˚30'W, 26.VI-21.VII 1984, P. Nielsen, 1♂ [CNCI]. **Iran**: Markazi Province, Karaj, 10-15.VII 1978, J. Huber, 1♀. **Israel**: (locality unknown), M. Samish, 1♀ [UCRC]. **Italy**: Lazio: Castel Porziano, 41˚46.67'N, 12˚24.75'E, 30 m, 11-12.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 2♀. Mignone River near Rota, 42˚09.20'N, 12˚00.61'E, 150 m, 9.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀. Roccaccia, 42˚19.81'N, 11˚45.67'E, 125 m, 10.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀ [UCRC]. **Kyrgyzstan**: Chuy, 10 km N Telek, 43˚10'51"N, 74˚03'55"E, 570 m, 11.VI 1999, C. Dietrich, 1♀. Dzhalal-Abad, Kara-Kysmak Ravine, 42˚06'49"N, 71˚33'28"E, 2500 m, 18.VI 1999, C. Dietrich, 1♀. Issyk-Kul: Barskaun Ravine, 16 km S Barskaun, 42˚02'47"N, 77˚36'16"E, 2320 m, 4.IX 1998, C. Dietrich, 1♀. 5 km NNW Karasaj, 41˚33'58"N, 77˚52'54"E, 3530 m, 3.IX 1998, C. Dietrich, 1♀. Naryn: Alabuga R., 25 km W Baetovo, 41˚17'47"N, 74˚39'20"E, 1700 m, 29.VIII 1998, C. Dietrich, 2♀, 1♂. Kichi-Kara-Kudzhur Ravine, 7 km ESE Dolon Pass, 41˚49'28"N, 75˚48'06"E, 2958 m, 31.VIII 1998, C. Dietrich, 1♀. Moldo-Too Ridge, E Kara-Go Pass, 41˚30'22"N, 74˚44'11"E, 2260 m, 30.VI 1999, C. Dietrich, 1♀. Osh, Karakulzha, Lajsu Ravine, 40˚31'20"N, 73˚37'10"E, 1815 m, C. Dietrich: 25.VIII 1998, 1♀; 25.VI 1999, 1♀. Talas, nr. Boo-Terek, 42˚35'15"N, 71˚45'49"E, 1000 m, 16.VI 1999, C. Dietrich, 1♀ [INHS, UCRC]. **Netherlands**: Leersum, Brockhuizen, VIII 1975, H. Vlug, 1♀ (on *Vinca minor* L.). **Sweden**: Upland Uppsala, Eriksberg, F. Ronquist: 18-25.VIII 1986, 1♀; 14-21.IX 1986, 1♀; 19-29.VII 1987, 1♀ [CNCI]. **United Kingdom:** England: Berkshire Co., Ascot, Silwood Park, 27.VI-4.VII 1984, J. Waage, M. Matthews, 4♀. York Co., Leeds University, 1921, T. Taylor, 1♀ (marked as "*Oscinella frit*" material) [BMNH]. **USA**: New York, Yates Co., 42˚39'12"N, 77˚11'34"W, 360 m, 19.II-7.III 1994, L. Williams, III, 2♀, 1♂ (on *Prunus serotina*) [UCRC].

DIAGNOSIS. See Chiappini et al. (1996).

DISTRIBUTION. *Russia (Krasnodarskii krai, Moscow region, Omsk region, Primorskii krai, Sakhalin); Belgium, *China (Sichuan), *France, *Greenland (Denmark), *Iran, *Israel, *Italy, *Kyrgyzstan, Netherlands, *Sweden, *United Kingdom (England), *USA (New York).

HOSTS. Unknown.

COMMENTS. This is a very common Palaearctic species, for the first time recorded here from the Nearctic region (Greenland and USA).

22. *Anagrus* (*Anagrus*) *avalae* Soyka, 1956

Anagrus avalae Soyka, 1956: 24 (holotype – ♀, Mt. Avala near Belgrade, Serbia, Serbia and Montenegro [NHMW], examined; oldest available replacement name for *A. nigriceps* Girault, 1915 (*A. armatus* var. *nigriceps*) nec Smits van Burgst, 1914); Chiappini & Triapitsyn, 1999: 120.

Anagrus (*Anagrus*) *avalae*: Chiappini, 1989: 108; Triapitsyn, 1998b: 104; Triapitsyn, 2001: 282.

MATERIAL. **Russia**: Leningrad region, 69-km Railway Station near Sosnovo, 25-26.VIII 1985, V. Trjapitzin, 1♀ [ZIN]. Moscow region, Mamontovka, E. Shouvakhina: 10-20.VII 2000, 2♀; 20-31.VIII 2000, 2♀. Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 12-17.VIII 1999, 1♀; 15-26.VIII 1999, 1♀; 15-26.IX 1999, 1♀; 24.IX-5.X 2002, 1♂ [UCRC, ZIN]. Sakhalin, D. Bennett, T. Anderson: 2 km E Sokol, 21.VII 2001, 1♀. 6 km E Sokol: 24.VII 2001, 1♀; 16.VIII 2001, 1♀ [CAS]. **Belgium**: Liège Province, Wanze, Antheit, Corphalie, R. Detry: 28.VII-11.VIII 1989, 1♂; 27.IV-11.V 1990, 1♀; 2.IX-12.X 1990, 1♀ [ISNB]. **Canada**: British Columbia: Oliver, 5.II-1.III 1999, T. Lowery, K. Todd, 2♀. Summerland: 11.III-26.IV 1999, T. Lowery, K. Todd, 2♀; 14-28.VII 1999, T. Lowery, K. Todd, 1♀; 5-24.III 2000, T. Lowery, 5♀, 2♂ [UCRC]. **France**: Département Gironde: Sainte Colombe, 44˚54'N, 00˚02'W, M. van Helden: 30.VII 1998, 1♀; 17.VIII 2000, 2♀ [UCRC]. **Iran**: Markazi Province, Karaj, 10-15.VII 1978, J. Huber, 3♀ [CNCI]. **Italy**: Lazio: Bosco di Manziana, 42˚07.392'N, 12˚07.314'E, 400 m, 9.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 2♀. Castel Porziano, 41˚41.47'N, 12˚22.63'E, 10 m, 11.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀. Mignone River near Rota, 42˚09.20'N, 12˚00.61'E, 150 m, 6.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀ [UCRC]. Umbria, Perugia, Monte Peglia, 8-23.VI 1978, 1♀ [CNCI]. **Netherlands**: Limburg, Valkenburg, 7.X 1931, W. Soyka, 1♀ (identified by W. Soyka as A. *bakkendorfi*) [EMEC]. **Sweden**: Uppsala, Hågadalen, F. Ronquist: 17-26.VIII 1990, 1♀; 26.VIII-5.IX 1990, 1♀ [CNCI]. **United Kingdom:** England: Hampshire Co., Romsey, Awbridge, VI 1981, C. Vardy, 1♀. Herefordshire Co., Ross-on-Wye, 15-22.IX 1979, R. George, 1♀ [BMNH]. **USA**: California, El Dorado Co., Camino, 3.XI 1996, M. Moratorio, 3♀ (ex. *Edwardsiana rosae* (Linnaeus, 1758) eggs on apple) [UCRC].

DIAGNOSIS. See Chiappini & Triapitsyn (1999) and also comments (below) for *A. bakkendorfi*.

DISTRIBUTION. *Russia (Leningrad region, Moscow region, Primorskii krai, Sakhalin); Australia (Triapitsyn, 2001), Belgium, Bulgaria (Donev, 1998 [as *A. arcuatus* Soyka, 1956 and *A. valkenburgensis* Soyka, 1956]), Canada, France, Germany (Böll, 2002), Greece (Donev, 1998 [as *A. arcuatus*]), *Iran, Italy, Netherlands, New Zealand (Triapitsyn, 2001), Serbia and Montenegro (Serbia), *Sweden, United Kingdom (England), USA.

HOSTS. Cicadellidae: *Edwardsiana froggatti* (Baker, 1925) (Triapitsyn, 2001; Triapitsyn & Teulon, 2002 [as *E. crataegi* (Douglas, 1876)]) as well as *E. avellanae* (Edwards, 1888), *E. prunicola* (Edwards, 1914), *E. rosae* (Linnaeus, 1758), ?*Edwardsiana* sp., *Empoasca vitis* (Goethe, 1875), *Ribautiana tenerrima* (Herrich-Schaeffer, 1834), *Typhlocyba pomaria* McAtee, 1926, ?*Typhlocyba* sp., and ?*Zygina rhamni* Ferrari, 1882 (Chiappini & Triapitsyn, 1999).

COMMENTS. The taxonomy and the list of synonyms of this common Holarctic species were given by Chiappini & Triapitsyn (1999). The complicated history of misidentifications of this species in Australia and New Zealand was overviewed by Triapitsyn (2001).

23. *Anagrus* (*Anagrus*) *brocheri* Schulz, 1910

Anagrus "nov. sp.": Brocher, 1910: 177, pl. XI, fig. 8.

Anagrus brocheri Schulz, 1910: 192 (lectotype – ♀, effectively designated by Chiappini, 1989: 111 (mentioned as holotype), Vandoeuvres, Geneva, Switzerland [Mus. d'Hist. Natur., Geneva], examined); Henriksen, 1922: 21-23.

Anagrus latior Soyka, 1956: 25 (holotype – ♀, Neusiedler See, Austria [NHMW], examined); synonymized under *A. brocheri* by Chiappini, 1989: 110.

Anagrus andreae Soyka, 1956: 26 (holotype – ♀, Neusiedler See, Austria [NHMW], examined); synonymized under *A. brocheri* by Chiappini, 1989: 110.

Anagrus andrease [sic]; Chiappini, 1989: 110.

Anagrus (*Anagrus*) *brocheri*: Chiappini, 1989: 110.

Anagrus sp.: Reinhardt & Gerighausen, 2001: 221, 224, 226.

MATERIAL. **Russia**: Sakhalin, 6 km E Sokol, near Belaya River, D. Bennett, T. Anderson: 24.VII 2001, 1♀; 31.VII 2001, 1♀ [CAS]. **Kazakhstan**: East Kazakhstan region, Ust' Kamenogorsk, 1999, K. Reinhardt, 2♀, 1♂ (ex. *Sympecma paedisca* (Brauer, 1877) (Lestidae) eggs in leaves of reed, *Phragmites australis* (Cavanilles) Steudel) [CNCI, UCRC]. **Kyrgyzstan**: Naryn, Kichi-Kara-Kudzhur Ravine, 7 km ESE Dolon Pass, 41˚49'28"N, 75˚48'06"E, 2958 m, 31.VIII 1998, C. Dietrich, 1♀ [UCRC]. **Netherlands**: Limburg, Valkenburg, 7.X 1931, W. Soyka, 1♀ (misidentified by W. Soyka as *A. incarnatus*) [EMEC].

DIAGNOSIS. See Chiappini (1989).

DISTRIBUTION. *Russia (Sakhalin); Austria, Belgium (Triapitsyn, 1998a), Bulgaria (Donev, 1998), ?Denmark (Henriksen, 1922), Greece (Donev, 1998), Italy (Jesu, 2002), *Kazakhstan, *Kyrgyzstan, Macedonia (Donev, 1998), *Netherlands, Switzerland.

HOSTS. *Coenagrion pulchellum* (Van der Linden, 1825), ?*Erythromma najas* (Hansemann, 1832) (Odonata: Coenagrionidae) (Henriksen, 1922), and ?*Lestes* sp. (Odonata: Lestidae) (Brocher, 1910); *Sympecma paedisca* (Brauer, 1877) (Lestidae) is added here as a new host record for this species.

COMMENTS. The record of *A. brocheri* from eggs of the damselfly *E. najas* in Denmark by Henriksen (1922) needs to be confirmed by an authoritative taxonomic identification, if his voucher specimens still exist. *A. brocheri* is apparently just one of the complex of at least three species of *Anagrus* in Europe (the others are *A. incarnatus* and *A. subfuscus*), which are able to parasitize a broad range of zygopteran hosts, sometimes in sympatry with each other (possibly in different combinations). Therefore, misidentifications among them are quite likely, especially of the older rearings reviewed by Henriksen (1918, 1922) and, more recently, Fursov (1995). Type material of yet another apparently aquatic species, *A. hydrophilus* Ashmead, 1905, collected in fresh water in Russian Turkestan, is lost (Chiappini et al., 1996), so its true identity may never be revealed; it very well might be conspecific with one of the three Palaearctic species of damselfly egg parasitoids mentioned above.

24. *Anagrus* (*Anagrus*) *obscurus* Förster, 1861

Anagrus obscurus Förster, 1861: 43 (status of type(s) not specified – ♀, ?Engadin Valley, Switzerland [lost from NHMW], neotype – ♀, designated by Chiappini, 1989: 112, Kroessbach, Tirol, Austria [NHMW], examined); Soyka, 1956: 25; Donev, 1998: 76.

Anagrus (*Anagrus*) *obscurus* Foerster sensu Soyka: Chiappini, 1989: 111; Baquero & Jordana, 1999: 45, 47.

MATERIAL. **Russia**: Moscow region: Fryazevo, 12-15.VI 2000, M. Tretiakov, 1♀. Primorskii krai, Gornotayozhnoye, M. Michailovskaya: 5-11.VI 1999, 1♀; 11-21.VI 2000, 2♀ [UCRC, ZIN]. Sakhalin: 2 -3 km E Sokol, 10.VIII 2001, N. Minakawa, 2♀. 6 km E Sokol, D. Bennett, T. Anderson: 24.VII 2001, 1♀; 31.VII 2001, 5♀; 16.VIII 2001, 1♀ [CAS]. **Italy**: Emilia-Romagnia, Piacenza, 15.II 1984, E. Chiappini, 1♀ (ex. *Anakelisia fasciata* (Kirschbaum, 1868) eggs on *Carex* sp., det. E. Chiappini). Lazio, Castel Porziano, 41˚46.67'N, 12˚24.75'E, 30 m, 11-12.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 14♀, 2♂ [UCRC]. **Kyrgyzstan**: Dzhalal-Abad, jct. Kara-Kysmak & Chatkal R., 42˚04'00"N, 71˚35'41"E, 2240 m, 18.VI 1999, C. Dietrich, 2♀ [UCRC]. **Republic of Korea**: Jeju-do, Jeju-si, 38˚29'N, 126˚31'E, 3-7.IX 2001, J.-W. Kim, 1♀. Gyeonggi-do: Suwon-si, Seoudun-dong, Seoul National University, 15.IX 2001, J.-W. Kim, 1♀ [UCRC]. **UK:** England, Surrey Co., Chobham Common, 26.VIII 1982, J. Noyes, 1♀ [BMNH].

DIAGNOSIS. See Chiappini (1989). *A. obscurus* is extremely close to *A. fennicus* morphologically, but differs from it based on biological and molecular data presented by Chiappini et al. (1999).

DISTRIBUTION. *Russia (Moscow region, Primorskii krai, Sakhalin); Austria, Bulgaria (Donev, 1998), Greece (Donev, 1998), *England (UK), Italy, *Kyrgyzstan, Macedonia (Donev, 1998), *Republic of Korea, Spain (Baquero & Jordana, 1999), Switzerland.

HOSTS. *Anakelisia fasciata* (Kirschbaum, 1868) (Delphacidae) and *Cicadella viridis* (Linnaeus, 1758) (Cicadellidae) [the latter under laboratory conditions only] (Chiappini et al., 1999).

COMMENTS. This normally dark-colored species also has a yellow form (according to Chiappini et al. 1999), which may be morphologically indistinguishable from *A. nigriceps*, a yellow-brown species. Thus, these two taxa may very well be conspecific, especially considering the fact that A. Foerster's and W. Soyka's specimens came from high altitudes (in the Alps), where most mymarids are naturally darker colored. However, molecular and biological studies, similar to those undertaken by Chiappini et al. (1999), must be conducted with these two species before any conclusions regarding their possible conspecificity (or otherwise) can be made.

25. *Anagrus* (*Anagrus*) *subfuscus* Foerster, 1847

Anagrus subfuscus Foerster, 1847: 214 (?holotype – ♂, ?Aachen, Germany [lost from NHMW], neotype – ♀, designated by Chiappini, 1989: 109, Eegenhoven (Héverlé), Belgium [ISNB], examined); Rimsky-Korsakov, 1916: 222; 1925: 70; Viggiani, 1970a: 13, 15; Sahad & Hirashima, 1984: 63.

Anagrus incarnatus: Bakkendorf, 1926: 260 (part.); 1933: 51 (part.); Rimsky-Korsakov, 1940: 230 (? part.).

Anagrus incarnatus subfuscus: Debauche, 1948: 135.

Anagrus lestini Laplante, 1975: 291, **nom. nud.**

Anagrus (*Anagrus*) *subfuscus* sensu Debauche: Chiappini, 1989: 108; Donev, 1998: 74; Triapitsyn, 1998a: 144; Triapitsyn, 2000a: 220.

MATERIAL. **Russia**: Moscow region, Fryazevo, M. Tretiakov: 2-15.VI 2000, 1♀; 25.VI-2.VII 2000, 3♀, 1♂; 24.VII 2000, 1♀; 26.VII-14.VIII 2000, 1♀; 25-31.VIII 2000, 2♀. Primorskii krai, Gornotayozhnoye, 11-21.VI 2000, M. Michailovskaya, 1♀ [UCRC, ZIN]. **Denmark**: Möen Island, Karensby, 14.VII 1927, O. Bakkendorf, numerous ♀, ♂ ("ex. Agrionin eggs from *Nymphaea*") [UCRC, USNM]. **France**: Département Gironde, Sainte Colombe, 44˚54'N, 00˚02'W, 13.VIII 1998, M. van Helden, 1♀ [UCRC]. **USA**: Michigan, Douglas Lake, Bryant's Bog, 19.VII 1930, C. Hoffman, 2♀ («reared from Gyrinid eggs») [USNM].

DIAGNOSIS. See Debauche (1948) and Chiappini (1989).

DISTRIBUTION. Russia (*Moscow region, Novgorod region, Tver' region, *Primorskii krai); Argentina (Triapitsyn, 2000a), Belgium, Bulgaria (Donev, 1998), Canada (Triapitsyn, 2000a), *Denmark, France, Germany, Greece (Donev, 1998), Italy (Viggiani, 1970a), ?Japan (Sahad & Hirashima, 1984), Romania (Botoc, 1963), Spain (Baquero & Jordana, 1999), Switzerland (Zimmerman, 1984), United Kingdom (England) (Triapitsyn, 2000a), USA (Triapitsyn, 2000a).

HOSTS. Homoptera: *Cicadella viridis* (Linnaeus, 1758) (Cicadellidae) (Chiappini, 1989) and Heteroptera: *Asciodema obsoleta* (Fieber, 1864), *Heterocordylus tibialis* (Hahn, 1833), *Orthotylus concolor* (Kirschbaum, 1856) and *O. virescens* (Douglas et Scott, 1865) (Miridae) (Triapitsyn, 2000a), and *Mesovelia furcata* Mulsant et Rey, 1852 (Mesoveliidae) (Zimmerman, 1984); also Odonata: *Calopteryx virgo* (Linnaeus, 1758) (Henriksen, 1922), *Calopteryx* sp. (Calopterygidae) and *Lestes* sp. (Lestidae) (Rimsky-Korsakov, 1916, 1925), *Coenagrion pulchellum* (Van der Linden, 1825) (Coenagrionidae) (Henriksen, 1922), as well as *Lestes disjunctus* Selys, 1862 and *L. unguiculatus* Hagen, 1862 (Triapitsyn, 2000a). The above new record of *A. subfuscus* from eggs of Gyrinidae (Coleoptera) in Michigan, USA, needs confirmation (of the host only).

COMMENTS. Older records, including several misidentifications, of *A. subfuscus* from various damselfly hosts in Europe were summarized by Henriksen (1918, 1922) and do not need to be repeated here. A «semi-aquatic» form of this species was first recorded in Russia in Bologovskoe Lake (Tver' region) and Uglianka River (near Shimsk, Novgorod region), by Rimsky-Korsakov (1916). Subsequent reports of probably the same species (but as *A. incarnatus*) in Russia and elsewhere in Europe were summarized by Fursov (1995).

26. *Anagrus* (*Anagrus*) *bakkendorfi* Soyka, 1946

Anagrus bakkendorfi Soyka, 1946: 40 (lectotype – ♀, effectively designated by Chiappini, 1989: 107, Valkenburg, Netherlands [NHMW], examined; Chiappini & Triapitsyn, 1999: 121, 124.

Anagrus latipennis Soyka, 1956: 4 (lectotype – ♀, effectively designated by Chiappini, 1989: 107, Malchin, Mecklenburg, Germany [NHMW], examined); synonymized under *A. bakkendorfi* by Chiappini, 1989: 106.

Anagrus incarnatus fuscus Botoc, 1963: 99, fig. 5a-5d (status of the type(s) not specified – ♀, Cluj, Romania [an unspecified depository in Romania], not examined), **syn. n.**

Anagrus (*Anagrus*) *bakkendorfi*: Chiappini, 1989: 106-107.

MATERIAL. **United Kingdom:** England, Berkshire Co., Ascot, Silwood Park, 27.VI-4.VII 1984, J.Waage, M. Matthews, 1♀ [BMNH].

DIAGNOSIS. See Chiappini (1989). This species can be recognized using the key by Chiappini et al. (1996). Chiappini & Triapitsyn (1999) provided rather shaky reasons for keeping *A. avalae* out of an apparent synonymy with *A. bakkendorfi*, which was described earlier. Until molecular data is available on these two forms and/or intraspecific variability, especially in the body color and the length of ovipositor in females, is assessed based on a morphometric study using a large number of reared specimens, we reluctantly concede to the decision by Chiappini & Triapitsyn (1999) to keep them as two separate taxa for the time being. However, the fact that females of both *A. bakkendorfi* and *A. avalae* were collected on the same day (7.VIII 1931) by W. Soyka on a window in Valkenburg, the Netherlands, and described by him later as four different species (i.e., *A. bakkendorfi, A. latipennis, A. diversicornis* Soyka, 1956, and *A. valkenburgenis* Soyka, 1956, [the two latter were synonymized under *A. avalae* by Chiappini & Triapitsyn (1999)]) indicates that they all most likely belong to just one species, *A. bakkendorfi*.

DISTRIBUTION. Germany, Netherlands, Poland (Chiappini, 1989), *Romania, and United Kingdom (England). The record of *A. bakkendorfi* from France (Chiappini et al., 1996) probably was a misidentification of *A. avalae*, if both species are considered valid (see comments by Chiappini & Triapitsyn, 1999).

HOSTS. Unknown.

COMMENTS. Chiappini & Triapitsyn (1999) commented on the status of *A. fuscus* Botoc, 1963 (described as *A. incarnatus fuscus*) but came short of synonymizing it with either *A. avalae* or *A. bakkendorfi* because the type material was not available. We could not examine the type(s) either, but nevertheless propose the apparent synonymy of *A. incarnatus fuscus* under the older of these two taxa, considering the fact that it fits the current diagnosis of *A. bakkendorfi* (i.e., the female body is dark colored and the ovipositor is long and notably projecting beyond the apex of gaster). Unfortunately, the ovipositor/foretibia ratio cannot be calculated from the original description and measurements of *A. incarnatus fuscus*. We believe that other two options (i.e., either keeping *A. fuscus* as a valid species (as chosen by Chiappini & Triapitsyn, 1999) or as a synonym of *A. incarnatus* (Noyes, 2002)) would not be optimal. First, it is positively not *A. incarnatus*. Second, keeping *A.*

fuscus as a separate and valid taxon would mean further oversplitting of *A. bakkendorfi*/*A. avalae*, which were already unnecessary oversplit by Soyka (1956). Unless substantial evidence exists to prove it otherwise, we rather prefer to separate mymarid species based on the combinations of more or less stable characters (although it is often not possible) than on minor morphological differences, which are often subject to intraspecific variability, even though scientific names were given to such forms in the past.

27. *Anagrus* (*Anagrus*) *ensifer* Debauche, 1948

Anagrus ensifer Debauche, 1948: 136 (holotype – ♀, Vossem, Belgium [ISNB], examined); Ison, 1959: 222; Walker, 1979: 200.

Anagrus incarnatus: Bakkendorf, 1926: 256 (part.).

Anagrus (*Anagrus*) *ensifer*: Chiappini, 1989: 106.

MATERIAL. **Russia**: Krasnodar, 11-12.VIII 2001, V. Kostjukov, 1♀ [ZIN]. Moscow region, Fryazevo, 25.VI-2.VII 2000, M. Tretiakov, 1♀ [UCRC]. **Denmark**: ?Dyrehaven, III-V 1925, O. Bakkendorf, 10♀ (ex. *Conomelus anceps* (Germar, 1821) eggs) [UCRC, USNM]. **France**: Département Gironde, Sainte Colombe, 44˚54'N, 00˚02'W, M. van Helden: 13.VIII 1998, 1♀; 17.VIII 2000, 2♀ [UCRC]. **Italy:** Lazio: Castel Porziano, 41˚46.67'N, 12˚24.75'E, 30 m, 11.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 2♀. Mignone River near Rota, 42˚09.20'N, 12˚00.61'E, 150 m, 9.VI 2003, M. Bologna, J. Munro, A. Owen, J. Pinto, 1♀ [UCRC]. **Sweden**: Upland Uppsala, Eriksberg, 11-19.VII 1987, F. Ronquist, 1♀ [CNCI]. **United Kingdom:** England, Berkshire Co., Ascot, Silwood Park, 27.XI 1973, I. Walker, 2♀ (ex. eggs of *Conomelus anceps* on *Juncus effusus*) [BMNH].

DIAGNOSIS. See Debauche (1948) and Chiappini (1989).

DISTRIBUTION. *Russia (Krasnodarskii krai, Moscow region); Belgium, Denmark, *France, Germany (Chiappini, 1989), Greece (Donev, 1998), *Italy, Sweden, United Kingdom (England, Wales) (Walker, 1979).

HOSTS. Delphacidae: *Conomelus anceps* (Germar, 1821) (Ison, 1959) and *Muellerianella fairmairei* (Perris, 1857) (Walker, 1979).

COMMENTS: Walker (1979) provided references to earlier misidentifications of this species in United Kingdom. This distinct species can be easily recognized using the key by Chiappini et al. (1996).

28. *Anagrus* (*Anagrus*) *fennicus* Soyka, 1956

Anagrus fennicus Soyka, 1956: 26 (lectotype – ♀, effectively designated by Chiappini, 1989: 112, Finland (28˚N, 68˚10'E) [NHMW], examined).

Anagrus (*Anagrus*) *fennicus*: Chiappini, 1989: 112.

MATERIAL. **Russia**: Moscow region, Fryazevo, M. Tretiakov: 18-28.IV 2000, 1♀; 25.VI-2.VII 2000, 3♀; 26.VII-14.VIII 2000, 2♀, 2♂. Tambov region, Talinka (7 km S Pavlovka), 26-27.V 2000, M. Tretiakov, 1♀ [UCRC, ZIN]. **Belgium**: Waterloo, 10-20.IX 1992, P. Dessart, 1♀ [ISNB]. **Kyrgyzstan**: Talas, nr. Boo-Terek, 42˚35'15"N,

71˚45'49"E, 1000 m, 15.VI 1999, C. Dietrich, 1♀ [UCRC]. **Sweden**: Uppsala, Eriksberg, 11-19.VII 1987, F. Ronquist, 2♀ [CNCI]. **United Kingdom:** England: Berkshire Co., Ascot, Silwood Park, 27.VI-4.VII 1984, J. Waage, M. Matthews, 2♀, 1♂. Hampshire Co., Romsey, Awbridge, VI 1981, C. Vardy, 1♀. Wales, West Glamorgan Co., Oxwich NNR, 8.VI 1982, J. Noyes, 1♀ [BMNH].

DIAGNOSIS. See Chiappini (1989). This is a large (for *Anagrus*), quite distinctive species with a dark, almost black, body; F3-F6 of the female antenna bear 2 longitudinal sensilla each, and the ovipositor is relatively short (the ovipositor/foretibia ratio is about 1.8:1).

DISTRIBUTION. *Russia (Moscow region, Tambov region); *Belgium, Finland, Italy (Chiappini, 1996), *Kyrgyzstan, *Sweden, *United Kingdom (England, Wales).

HOSTS. *Cicadella viridis* (Linnaeus, 1758) (Chiappini, 1996; Chiappini et al., 1999).

COMMENTS. *A. fennicus* is for the first time recorded for the British fauna. This species can be recognized using the key by Chiappini et al. (1996).

29. *Anagrus* (*Anagrus*) *striatus* Chiappini et Lin, 1998

Anagrus (*Anagrus*) *striatus* Chiappini & Lin, 1998: 566 (holotype – ♀, Shenyang, Liaoning, China [BCRI], examined).

MATERIAL. **Republic of Korea**: Gyeonggi-do, Kwangju, Dochek, Taehwasan, 5.VIII 1998, I.-B. Leon, S.-H. Lee, 1♀. Suwon-si, Seoudun-dong, Seoul National University, 15.IX 2001, J.-W. Kim, 1♀ [UCRC].

DIAGNOSIS. Chiappini & Lin (1998) described, illustrated, and diagnosed the female. Male of this species is unknown.

DISTRIBUTION. China (Fujian, Liaoning), *Republic of Korea.

HOSTS. Unknown.

COMMENTS. This distinctive species has not yet been discovered in the Russian Far East. It can be easily recognized using the key by Chiappini & Lin (1998).

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