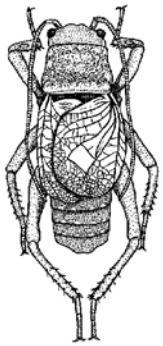

Far Eastern Entomologist

Дальневосточный энтомолог

Journal published by Far East Branch
of the Russian Entomological Society
and Laboratory of Entomology,
Institute of Biology and Soil Science,
Vladivostok

Number 130: 1-7 ISSN 1026-051X September 2003

A REVIEW OF THE FAMILY TRIGONALYIDAE (HYMENOPTERA) OF THE PALAEARCTIC REGION

A. S. Lelej

Institute of Biology and Soil Science, Far East Branch of the Russian Academy of Sciences, Vladivostok-22, 690022, Russia

Check-list of twelve species in five genera of two subfamilies is given. The spelling of Orthogonalyinae is corrected. Genus *Teranishia* Tsuneki (type species *T. nipponica* Tsuneki, ♂ non ♀) transferred to subfamily Orthogonalyinae. *Taeniogonalos mongolica* (Popov, 1945), **stat. resurr.**, **comb. n.** is proposed for *T. flavocincta* (Teranishi, 1929), nom. praeocc., non *T. flavicincta* (Bischoff, 1913) (secondary homonymy).

KEY WORDS: Hymenoptera, Trigonalyidae, taxonomy.

А.С. Лелей. Обзор семейства Trigonalyidae (Hymenoptera) Палеарктической области // Дальневосточный энтомолог. 2003. № 130. С. 1-7.

Дан список 12 видов из 5 родов и 2 подсемейств. Исправлено написание Orthogonalyinae. Род *Teranishia* Tsuneki (типовой вид *T. nipponica* Tsuneki, ♂ non ♀) переведен в подсемейство Orthogonalyinae. Название *Taeniogonalos mongolica* (Popov, 1945), **stat. resurr.**, **comb. n.** предложено для вторичного омонима *T. flavocincta* (Teranishi, 1929), nom. praeocc., non *T. flavicincta* (Bischoff, 1913).

Биолого-почвенный институт ДВО РАН, Владивосток-22, 690022, Россия

INTRODUCTION

Trigonalyidae is a small group of parasitic wasp (88 species in 16 genera) which has cosmopolitan distribution, with the exception of arctic and alpine zones (Carmean

& Kimsey, 1998). They lay the eggs on foliage; for the hatching eggs must be consumed by herbivorous caterpillar or sawfly larva. The ultimate hosts of trigonalyids are the parasites or predators, which attack the caterpillar or sawfly larva, some species are direct parasites of sawflies. Yamane (1973) and Weinstein & Austin (1991) give the review of the biology. Trigonalyidae are most abundant in the tropics. Twenty-four species and twenty-three species correspondingly are known for Oriental and Neotropic region, twelve species in five genera are known for Palaearctic, one species found in Europe. There are two paper with review of Russian Trigonalyidae (Marshakov, 1981; Lelej, 1995) in which eight species in four genera are recorded and keyed. All these species are distributed in Russian Far East and only *Pseudogonalos hahnii* is known in European part of Russia. Trigonalyid distribution on the Russian Far East is limited by southern part, which belong to Manzhurian Province of Palaearchearctic (Eastern Palaearctic) subregion. Such distribution patterns are good evidence of close relations of this subregion with Oriental region also. Recently the phylogeny and reclassification of the family based on world material has been made (Carmean & Kimsey, 1998). They have proposed many new synonyms for genera and species. Unfortunately in this basic work my paper (Lelej, 1995) with some important changes in taxonomy of Palaearctic taxa is overlooked. For current paper I study 115 specimens from the collections of Institute of Biology and Soil Science (Vladivostok) and Zoological Institute (St Petersburg).

LIST OF THE PALAEARCTIC TRIGONALYIDAE

Subfamily ORTHOGONALYINAE Carmean et Kimsey, 1998

Orthogonalinae Carmean & Kimsey, 1998: 52.

REMARKS. The stem of *Orthogonalys* for the family-group name is *orthogonaly-os*, which would make Orthogonalyinae the correct spelling (I.M. Kerzhner, personal communication). According to article 35.4.1 of International Code of Zoological Nomenclature (1999) Orthogonalyinae Carmean et Kimsey must be used for this subfamily.

1. Genus *Orthogonalys* Schulz, 1905

Orthogonalys Schulz, 1905: 76 (type species *Orthogonalys boliviana* Schulz, 1905, Bolivia, by monotypy); Carmean & Kimsey, 1998: 52.

Orthogonalos Schulz, 1907: 8 (unjustified emendation); Marshakov, 1981: 104; Tsuneki, 1991: 19.

Satogonalos Teranishi, 1931: 10 [type species *Satogonalos debilis* (Teranishi, 1929), Japan, by original designation]; Lelej, 1995: 12. Synonymized by Tsuneki, 1991.

Orthogonalys elongata (Teranishi, 1929)

Orthogonalos elongata Teranishi, 1929: 144; Marshakov, 1981: 105.

Orthogonalos debilis Teranishi, 1929: 143; Marshakov, 1981: 105. Synonymized by Tsuneki, 1991.

Orthogonalos hirasana Teranishi, 1929: 144. Synonymized by Tsuneki, 1991.

Satogonalos debilis: Lelej, 1995: 14.

Orthogonalys elongata: Carmean & Kimsey, 1998: 54.

MATERIAL. 11 specimens from Russia (Sakhalin) and Japan (Hokkaido, Honshu).

DISTRIBUTION. Russia (South Sakhalin, Kuril Islands: Kunashir, Shikotan); Japan (Hokkaido, Honshu) (Bennett & Lelej, 2003).

***Orthogonalys fukuiensis* (Tsuneki, 1991)**

Orthogonalos fukuiensis Tsuneki, 1991: 28, ♂.
Orthogonalys fukuiensis: Carmean & Kimsey, 1998: 54.

DISTRIBUTION. Japan (Honshu). This species is known by holotype only.

***Orthogonalys hagoromonis* (Teranishi, 1929)**

Orthogonalos hagoromonis Teranishi, 1929: 143; Marshakov, 1981: 104.
Satogonalos hagoromonis: Lelej, 1995: 13.
Orthogonalys hagoromonis: Carmean & Kimsey, 1998: 54.

MATERIAL. Russia: Primorskii krai, Brovnichi, 14.VII 1979, 1♂ (S. Belokobylskij).

DISTRIBUTION. Russia (Primorskii krai); Japan (Honshu).

2. Genus *Teranishia* Tsuneki, 1991

Teranishia Tsuneki, 1991: 3 (type species *Teranishia nipponica* Tsuneki, 1991, ♂ non ♀, Japan, by monotypy).

REMARKS. Type species *T. nipponica* (male) has antennae without tyloids, supraantennal elevation highly prominent, propodeal foramen rounded, the characters which resemble *Orthogonalys* male. Based on original genitalia structure of *T. nipponica* I propose to conserve separate genus for this species. Probably undescribed female of Genus 1 from Japan (Carmean & Kimsey, 1998) which has some unique characters is the opposite sex of *T. nipponica*.

***Teranishia nipponica* Tsuneki, 1991**

Teranishia nipponica Tsuneki, 1991: 15, ♂ non ♀.

DISTRIBUTION. Japan (Honshu). This species is known by male only.

Subfamily TRIGONALYINAE Cresson, 1887

Trigonalinae Cresson, 1887: 183; Carmean & Kimsey, 1998: 54.

REMARKS. The stem of *Trigonalys* for the family-group name is *trigonaly-os*, which would make Trigonalyidae, Trigonalyinae or Trigonalyini the correct spelling (I.M. Kerzhner, personal communication). For last fifty years Trigonalidae and Trigonalyidae have been used approximately equal even former more often. According to the article 35.4.1 of International Code of Zoological Nomenclature (1999) Trigonalyidae Cresson, 1887, Trigonalyinae Cresson, 1887 and Trigonalyini Cresson, 1887 must be used.

3. Genus *Bareogonalos* Schulz, 1907

Bareogonalos Schulz, 1907a: 18 (type species *Trigonalys canadensis* Harrington, 1896, Canada, designated by Schluz, 1907b; Marshakov, 1981: 104; Carmean & Kimsey, 1998: 60.

Nippogonalos Uchida, 1929: 79 (type species *Nippogonalos jezoensis* Uchida, 1929, Japan, by monotypy); Tsuneki, 1991: 4; Lelej, 1995: 12. Synonymized by Bischoff, 1938.

Bareogonalos jezoensis (Uchida, 1929)

Nippogonalos jezoensis Uchida, 1929: 78; Tsuneki, 1991: 4; Lelej, 1995: 12.

Bareogonalos jezoensis: Marshakov, 1981: 104; Carmean & Kimsey, 1998: 61.

MATERIAL. 7 specimens from the Russia (Primorskii krai) and Japan (Hokkaido, Honshu).

DISTRIBUTION. Russia (Primorskii krai); Japan (Hokkaido, Honshu); Indonesia (Java).

4. Genus *Pseudogonalos* Schulz, 1906

Pseudogonalos Schulz, 1906: 209 (type species *Trigonalis* (!) *hahnii* Spinola, 1840, Europe); Tsuneki, 1991: 3; Lelej, 1995: 12; Carmean & Kimsey, 1998: 72.

Jezonogonalos Tsuneki, 1991: 32 (type species *Jezonogonalos marujamae* Tsuneki, 1991, ♀, Japan); Carmean & Kimsey, 1998: 70. Synonymized by Lelej, 1995.

Pseudogonalos hahnii (Spinola, 1840)

Pseudogonalos hahnii Spinola, 1840: 1; Marshakov, 1981: 104; Tsuneki, 1991: 3; Lelej, 1995: 12; Carmean & Kimsey, 1998: 72.

MATERIAL. 25 specimens from Ukraine, Kazakhstan and Russia (Smolensk, Amurskaya oblast, Primorskii krai).

DISTRIBUTION. Russia (European part, Altai, Irkutskaya oblast, Chitinskaya oblast, Amurskaya oblast, Primorskii krai); Western Europe; Ukraine; Kazakhstan; Mongolia; North-East China.

Pseudogonalos marujamae (Tsuneki, 1991)

Jezonogonalos marujamae Tsuneki, 1991: 3, ♀ non ♂ as in description.

Teranishia nipponica Tsuneki, 1991: 15, ♀ non ♂; Carmean & Kimsey, 1998: 73, ♀.

Pseudogonalos marujamae: Lelej, 1995, ♀ ♂.

MATERIAL. Russia: Kuril Islands, Kunashir, Tretyakovo, 24.VI 1984,1♂ (V. Makarkin); Kunashir, Golovnina volcano, 3.VII 1989, 1♀ (A. Lelej). Japan: Hokkaido, Tomakomai exp. forest, 6-7.VII 1998, 2♀ (N. Kurzenko, A. Lelej); Honshu, Ohno, 26.IX 1982, 1♀ (T. Murota).

DISTRIBUTION. Russia (Kuril Islands: Kunashir); Japan (Hokkaido, Honshu).

REMARKS. The female of this species has been described by K. Tsuneki (1991) twice in different genera: as *Jezogonalos marujamae* and *Teranishia nipponica*. For the more the type specimens (females) has been collected in Maruyama (Sapporo) by C. Teranishi 2.VIII 1922 (1♀ *maruyamae*) and VII 1922 (4♀ *nipponica*). The true male of *P. marujamae* has tyloids on flagellomere 8-13 (total 21 flagellomeres) and genitalia structure similar to *P. hahnii*. I have not seen the reason for the erection of this species in the separate genus *Jezonogonalos*.

5. Genus *Taeniogonalos* Schulz, 1906

Taeniogonalos Schulz, 1906: 212 (type species *Trigonalys maculata* Smith, 1851, Australia, by monotypy); Tsuneki, 1991: 59; Carmean & Kimsey, 1998: 65.

Poecilogonalos Schulz, 1906: 212 (type species *Trigonalys thwaitesii* Westwood, 1874, Oriental region, by monotypy); Marshakov, 1981: 105; Tsuneki, 1991: 46; Lelej, 1995: 14. Synonymized by Carmean & Kimsey, 1998.

Nanogonalos Schulz, 1906: 211 (type species *Nanogonalos enderleini* De Santis, 1980, South America, by monotypy); Marshakov, 1981: 107. Synonymized by Carmean & Kimsey, 1998.

Taiwanogonalos Tsuneki, 1991: 35 [type species *Taiwanogonalos alishana* Tsuneki, 1991, China (Taiwan), by original designation]. Synonymized by Carmean & Kimsey, 1998.

Taeniogonalos fasciata (Strand, 1913)

Poecilogonalos fasciata Strand, 1913: 97; Lelej, 1995: 14.

Poecilogonalos magnifica Teranishi, 1929: 144; Marshakov, 1981: 105; Tsuneki, 1991: 50; Lelej, 1995: 14. Synonymized by Carmean & Kimsey, 1998.

Taeniogonalos fasciata: Carmean & Kimsey, 1998: 67.

MATERIAL. 15 specimens from Russia (Primorskii krai), Korea and Japan (Honshu).

DISTRIBUTION. Russia (Primorskii krai); Korea; China (Anhui, Zhejiang, Taiwan); Japan (Honshu, Kyushu); Malaysia; Indonesia.

Taeniogonalos maga (Teranishi, 1929)

Poecilogonalos maga Teranishi, 1929: 144; Marshakov, 1981: 106; Tsuneki, 1991: 51; Lelej, 1995: 14.

Taeniogonalos maga: Carmean & Kimsey, 1998: 68.

Poecilogonalos yuasai Teranishi, 1938: 178, ♀. Synonymized by Tsuneki, 1991.

Taiwanogonalos alishana Tsuneki, 1991: 36. Synonymized by Carmean & Kimsey, 1998.

Taiwanogonalos alticola Tsuneki, 1991: 42. Synonymized by Carmean & Kimsey, 1998.

Taiwanogonalos claripennis Tsuneki, 1991: 38. Synonymized by Carmean & Kimsey, 1998.

Taiwanogonalos laeviceps Tsuneki, 1991: 40. Synonymized by Carmean & Kimsey, 1998.

Taiwanogonalos minima Tsuneki, 1991: 43. Synonymized by Carmean & Kimsey, 1998.

Taiwanogonalos satoi Tsuneki, 1991: 39. Synonymized by Carmean & Kimsey, 1998.

Taiwanogonalos similis Tsuneki, 1991: 45. Synonymized by Carmean & Kimsey, 1998.

Poecilogonalos intermedia: Marshakov, 1981: 106 (missidentification).

MATERIAL. 69 specimens from Russia (Amurskaya oblast, Primorskii krai, Sakhalin, Kuril Islands) and Japan (Hokkaido, Honshu).

DISTRIBUTION. Russia (Amurskaya oblast, Primorskii krai, South Sakhalin, Kuril Islands: Kunashir, Shikotan); Japan (Hokkaido, Honshu); China (Taiwan).

***Taeniogonalos mongolica* (Popov, 1945), stat. resurr., comb. n.**

Nanogonalos mongolicus Popov, 1945: 76; Marshakov, 1981: 107. Synonymized with *Poecilogonalos flavocincta* by Lelej, 1995.
Nanogonalos flavocincta Teranishi, 1929: 144.
Poecilogonalos flavocincta: Lelej, 1995: 14.
Taeniogonalos flavocincta: Carmean & Kimsey, 1998: 67 [nom. praeocc., non *Taeniogonalos flavicincta* (Bischoff, 1913)].

MATERIAL. 2 specimens from Russia (Amurskaya oblast, Primorskii krai).
DISTRIBUTION. Russia (Amurskaya oblast, Primorskii krai); Mongolia; Korea; China (Inner Mongolia).
REMARKS. After transferring *flavicincta* Bischoff, 1913 from genus *Lycogonalos* Bischoff, 1913 and *flavocincta* Teranishi, 1929 from genus *Nanogonalos* Schulz, 1906 to genus *Taeniogonalos* Schulz, 1906 (Carmean & Kimsey, 1998) they are became the secondary homonyms in spite that differ in one letter [articles 57.3.1, 58.12 of ICZN (1999)]. Carmean & Kimsey (1998) have not mentioned this homonymy. The junior synonym *mongolica* is used for Teranishi's name and new combination is proposed here.

***Taeniogonalos sauteri* (Bischoff, 1913)**

Taeniogonalos sauteri Bischoff, 1913: 153, ♀; Tsuneki, 1991: 59, ♀; Carmean & Kimsey, 1998: 68.
Taeniogonalos pictipennis Strand, 1914: 32, ♀. Synonymized by Tsuneki, 1991.
Pseudogonalos flavoscutellata Chen, 1949: 14, ♀. Synonymized by Tsuneki, 1991.

MATERIAL. Japan: Honshu, Izumi-mura, 10.X 1982, 1♀ (T. Murota).
DISTRIBUTION. Japan (Honshu, Kyushu, Ryukyu); China (Taiwan, Shangdong); Philippines.

***Taeniogonalos tricolor* (Chen, 1949)**

Poecilogonalos tricolor Chen, 1949: 16.
Taeniogonalos tricolour (!): Carmean & Kimsey, 1998: 68.

MATERIAL. No specimens examined.
DISTRIBUTION. Korea; China (Zhejiang); Thailand.

ACKNOWLEDGMENTS

I thank Dr. S.A. Belokobylskij for the loan of material; Dr. I.M. Kerzhner for the nomenclature consultation; Dr. Sk. Yamane, Mrs. C. Nozaka, Mr. T. Tano, Mr. H. Kurokawa, Mr. T. Murota for the help during trip to Japan (Honshu) in 1993; Mrs. M. Fukushima for the help during trip to Japan (Hokkaido) in 1998; Mr. P. Tripotin for the help during trip to Korea in 2000.
This investigation has been supported in part by the grant of Far East Branch of Russian Academy of Sciences (A.S. Lelej principal investigator).

REFERENCES

Bennett, D.J. & Lelej A.S. 2003. To the knowledge of trigonalyid wasps (Hymenoptera: Trigonalyidae) of Sakhalin. – Far Eastern Entomologist. N 130: 8.

Bischoff, H. 1913. Trigonaloiden aus Formosa. – Archiv für Naturgeschichte Berlin 79(2), A, 150-156.

Carmean, D. & Kimsey, L. 1998. Phylogenetic revision of the parasitoid wasp family Trigonalidae (Hymenoptera). – Systematic Entomology 23: 35-76.

Chen, S.H. 1949. Records of Chinese Trigonaloidae. – Sinensia 20(1-6): 7-18.

Cresson, E.T. 1887. Synopsis of the families and genera of the Hymenoptera of America, north of Mexico, together with a catalogue of the described species and bibliography. – Transactions of the American Entomological Society. Supplement 14. 350 p.

International Code of Zoological Nomenclature. Fouth edition. 1999. London.

Lelej, A.S. 1995. [Fam. Trigonalidae - Trigonalid wasps]. – In: Kupianskaya A.N., Lelej A.S., Storozheva N.A. (eds). [Key to the insects of Russian Far East]. IV(2): 8-14. (In Russian).

Marshakov, V.G. 1981. [Trigonalidae (Hymenoptera) of the USSR fauna]. – In: B.A. Korotyaev (ed.). Morfologia i sistematica nasekomykh Dalnego Vostoka [Morphology and Systematics of insects of the Far East]. Leningrad. P. 100-107. (In Russian).

Popov, V.V. 1945. [Zoogeography and morphology patterns of family Trigonalidae (Hymenoptera)]. – Doklady Akademii nauk SSSR 48(1): 75-78. (In Russian).

Schulz, W.A. 1905. Hymenopteren-Studien. Wilhelm Engelmann, Leipzig. 147 p.

Schulz, W.A. 1906. Die trigonaloiden des Kőniglichen Zoologischen museums in Berlin. – Mitteilungen aus dem Zoologischen Museum. Berlin 3: 203-212.

Schulz, W.A. 1907. Hymenoptera. Fam. Trigonaloidae. – In: Wytsman P. (ed.). Genera Insectorum. Fasc. 61. Bruxelles. P. 1-24, pl. 1-3.

Spinola, M.M. 1840. Description de trois Hymenopteres nouveaux recueillis par M. Leprieur a Cayenne. – Magasin de Zoologie 10: 1-20, pl. 41-43.

Strand, E. 1913. H. Sauter's Formosa Ausbeute. Fam. Trigonalidae (Hym.). – Supplementa Entomologica 2: 97-98.

Strand, E. 1914. H. Sauter's Formosa-Ausbeute. Trigonalidae II (Hym.). – Supplementa Entomologica 3: 32-33.

Teranishi, C. 1929. Trigonaloidae from Japan and Korea (Hym.). – Insecta Matsumurana 3(4): 143-161, pl. 6, 7.

Teranishi, C. 1931. A new species of the Trigonaloidae (Hym.) with description of a new genus. – Transactions of the Kansai Entomological Society 2: 9-11, pl. 3.

Teranishi, C. 1938. An addition to the Japanese Trigonaloid Fauna (Trigonaloidae, Hym.). – Kontyu 12(5): 188.

Tsuneki, K. 1991. Revision of the Trigonalidae of Japan and adjacent territories (Hymenoptera). – Special Publications Japan Hymenopterists association 37: 1-68.

Uchida, T. 1929. Ueber die Trigonaloiden Japans (Hym.). – Insecta Matsumurana 3(2-3): 77-80, pl. 2.

Weinstein, P. & Austin, A.D. 1991. The host-relationships of trygonalyid wasps (Hymenoptera: Trigonalyidae), with a review of their biology and catalogue to world species. – Journal of Natural History 18: 209-214.

Yamane, Sk. 1973. Descriptions of the second to final instar larvae of *Bareogonalos jezoensis* with some notes on its biology (Hymenoptera, Trigonalidae). – Kontyu 41(2): 194-202.

SHORT COMMUNICATION

D. J. Bennett[1] & A. S. Lelej[2]. TO THE KNOWLEDGE OF TRIGONALYID WASPS (HYMENOPTERA: TRIGONALYIDAE) OF SAKHALIN. – Far Eastern Entomologist. 2003. N 130: 8.

Д. Дж. Беннетт, А. С. Лелей. К познанию тригоналид (Hymenoptera: Trigonalyidae) Сахалина // Дальневосточный энтомолог. 2003. N 130. С. 8.

Up to now, only one trigonalid wasp lacking locality data, *Taeniogonalos maga*, has been known to occur on Sakhalin [1]. Recent collecting during International Sakhalin Island Project (ISIP) in the summer of 2003 has resulted in the capture of four trigonalid specimens of another genus and species. We enumerate below two species in two genera known to occur on Sakhalin. The genus *Orthogonalys* Schulz, 1905 is new for Sakhalin fauna. The northern border for the distribution of the Trigonalyidae on Sakhalin is moved northwards to 49° N. ISIP-2003 was supported in part by the Biological Sciences Directorate (Biodiversity Surveys and Inventories Program) and the International Program Division of the U.S. National Science Foundation, grants numbers DEB-0071655 and DEB-0202175 (Theodore W. Pietsch, principal investigator), and by the Far East Branch of Russian Academy of Sciences, grant number 03-3-E-06-017 (E.A. Makarchenko, principal investigator).

1. *Orthogonalys elongata* (Teranishi, 1929)

MATERIAL. Sakhalin: SK-03-DJB-070, 5 km E Sokol, 47°14.56' N, 142°46.56' E, Malaise trap in mixed conifer and deciduous forest, 25.VIII 2003, 3♂ (D. Bennett); SK-03-DJB-009, 20 km NNE of Ainskoye village, Starodinskaya River, sweeping on the herbs and bushes, 22.VII 2003, 1♂ (D. Bennett).

DISTRIBUTION. Russia (South Sakhalin [new record], Kuril Islands: Kunashir, Shikotan); Japan (Hokkaido, Honshu).

2. *Taeniogonalos maga* (Teranishi, 1929)

MATERIAL. Sakhalin: Konuma [currently Novoaleksandrovsk], VIII 1942, 1♀ (K. Tamanuki).

DISTRIBUTION. Russia (Amurskaya oblast, Primorskii Krai; South Sakhalin, Kuril Islands: Kunashir, Shikotan); Japan (Hokkaido, Honshu); China (Taiwan).

1. Lelej, A.S. 1995. [Fam. Trigonalidae - Trigonalid wasps]. – In: Kupianskaya, A.N., Lelej, A.S. & Storozheva, N.A. (eds). [Key to the insects of Russian Far East], IV(2): 8-14. (In Russian).

Author's addresses:
1) Division of Entomology, University of Kansas, Lawrence, 66045-7523,USA
2) Institute of Biology and Soil Science, Vladivostok-22, 690022, Russia

---

© **Far Eastern entomologist (Far East. entomol.)** Journal published since October 1994.
Editor-in-Chief: S.Yu. Storozhenko
Editorial Board: A.S. Lelej, Yu.A. Tshistjakov, N.V. Kurzenko
Address: Institute of Biology and Soil Science, Far East Branch of Russian Academy of Sciences, 690022, Vladivostok-22, Russia.
E-mail: entomol@ibss.dvo.ru FAX: (4232) 310 193