# A new species of gall wasp from the Russian Far East (Hymenoptera: Cynipidae, Aylacini)

## G. Melika

# Новый вид орехотворки с Дальнего Востока России (Hymenoptera: Cynipidae, Aylacini)

## Ж. Мелика

Systematic Parasitoid Laboratory, Plant Protection and Soil Conservation Service of County Vas, Kelcz-Adelffy str. 6, Köszeg 9730, Hungary. E-mail: melikageorge@freemail.hu

Abstract. A new species of cynipid gall wasp, *Aulacidea tobiasi* sp. n. (Cynipidae) from the Russian Far East is described. The new species reared from the stem swelling-like galls in *Saussurea grandifolia* Max. and *S. pulchella* (Fischer) DC (Asteraceae). The content and biology of the genus *Aulacidea* Ashmead are discussed.

Key words. Hymenoptera, Cynipidae, gall wasp, Aylacini, Aulacidea, new species, biology, Russian Far East.

**Резюме**. Описывается новый вид орехотворки *Aulacidea tobiasi* sp. n. (Cynipidae) с Дальнего Востока России. Новый вид выведен из стеблевых галлов на *Saussurea grandifolia* Max. и *S. pulchella* (Fischer) DC (Asteraceae). Обсуждается состав и биология рода *Aulacidea* Ashmead.

Ключевые слова. Hymenoptera, Cynipidae, орехотворки, Aylacini, Aulacidea, новый вид, биология, Дальний Восток России.

## Introduction

*Aulacidea* Ashmead, 1897 (Cynipidae, Aylacini), a Holarctic genus of aylacine gall wasps, is morphologically distinguishable from other Cynipidae by a closed radial cell on the forewing and a striate mesopleuron. Twenty nine species are described in the genus; of these 22 species are known from the Palaearctic and 7 from America North of Mexico (Burks 1979). In Western Europe the genus is represented by 12 species, recently revised by Nieves-Aldrey (1994). All species induce galls on plants of the family Asteraceae. In this paper, *Aulacidea tobiasi* sp. n. is described from the Russian Far East and some remarks on the biology and host plants of the Palaearctic species are given.

We follow the current terminology of morphological structures for description (Gibson, 1985; Ronquist, Nordlander, 1989; Fergusson, 1995). Abbreviations for forewing venation follow Ronquist and Nordlander (1989). Measurements and abbreviations used here include: F1–F12 — 1st and subsequent flagellomeres; POD — postocellar distance, the distance between the inner margins of the posterior ocelli; OOD — ocellar-ocular distance, the distance from the outer edge of a posterior ocellus to the inner

margin of the compound eye. Width of radial cell measured along 2r. Linear drawings were made from images taken with a digital camera and modified in AdobePhotoshop 6.0.

#### Aulacidea tobiasi Melika, sp. n. (Figs 1–11).

Diagnosis. Differs from the all known Aulacidea species by the presence of strong transverse interrupted striations on the scutum, and smooth shining areas between striae. In all other species of this genus the sculpture of scutum is more delicate and if distinctly transversely striate, than interspaces between striae are not smooth and shining, but mat and/or coriaceous. Also wing veins of the new species are very light, slightly pigmented and metasomal terga are without punctures or they are very indistinct and more or less traceable on the posterior terga only. A. tobiasi sp. n. belongs to the A. hieracii (Bouché) species group sharing with other members a genae that is broadened behind compound eves, and F1 nearly equal to F2 in females. Moreover, the new species differs from A. hieracii with much paler colour and metasomal terga without punctures. A. tobiasi sp. n. also resembles A. phlomica Belizin in light coloration, however, it differs with 13-segmented antenna in females, metasomal terga without punctures, median mesoscutal line well-impressed and distinct in posterior half, the central propodeal area with striae, lateral propodeal carinae thicker, and the forewing with long cilia. Additionally, in specimens of A. phlomica the scutum and scutellum are always black, the female antenna is 12-segmented, the median mesoscutal line is well-impressed only in the most posterior part of the scutum, and never reaches half the length of the scutum; tergum 3 punctate, and the forewing margin is without cilia. The new species resembles also A. laurae Nieves-Aldrey and A. follioti Barbotin in the presence of longitudinal delicate striae on the bottom of scutellar foveae, however it differs in the complete notauli, which are distinct, well-impressed through their entire length, and which reach the pronotum.

Description. Female. Head brown dorsally, posteriorly light brown to yellow, lower face, gena, and mandible yellow. Head transverse, 1.3 times as broad as high in front view (Fig. 1), 2.0-2.2 times as broad as long from above (Fig. 2), slightly broader than mesosoma; gena distinctly broadened behind eye in dorsal view; POD 0.9 times OOD; anterior ocellus with impression toward frons; vertex with slightly elevated interocellar area, and occiput alutaceous to very finely coriaceous, without punctures; occipital carina absent; vertex and occiput rounded, the latter with transverse very minute striation above occipital foramen; postocciput and postgena finely coriaceous, with more dense white setae than the head in front view; gular sulci free, well separated at hypostomata; oral foramen 1.3 times as high as occipital foramen, distance between oral and occipital foramina nearly equal to height of occipital foramen (Fig. 3); transfacial line 1.4-1.5 times as long as height of compound eye, 1.5 times as long as height of lower face (measuring from antennal rims to the tip of clypeus); distance between antennal rim and inner margin of compound eye 3.6 times as short as transfacial distance; slightly elevated area of lower face finely coriaceous; lower face laterad elevated central area and malar space with minute interrupted irradiating striae; malar space behind striations and gena behind compound eye finely coriaceous, however with longitudinally orientated striae which giving a view of longitudinal very minute striation for gena behind compound eye; clypeus very minutely coriaceous; epistomal sulcus distinct, broad, slightly impressed, smooth, shining; anterior tentorial pits indistinct; malar space as long as height of compound eye; POD (in front view of head) 0.5-0.6 times length of malar space and 0.6 times as long as height of compound eye; gena broadened behind compound eye (Fig. 1). Antenna 13-segmented, yellow, scapus and pedicel slightly darker; placoidal sensillae starting from F2, absent on F1; F1 1.7 times as long as pedicel, very slightly shorter than F2; F3 the longest flagellomere, F11 1.8 times as long as F10; F7-F10 nearly equal; ratio of scapus : pedicel: F1-F11 = 20 : 10 : 17 : 18 : 21 : 18 : 16 : 16 : 13 : 12 : 11 : 11 : 20 (Fig. 4).

Mesosoma dorsally dark brown, lighter laterally, especially mesopleuron; 1.25 times as long as high in lateral view (Fig. 7). Pronotum dorso-medially 1.8 times as short as the greatest length measuring on outer margin; finely coriaceous; submedian pronotal pits distinct, narrow, transverse, deep, separated by carina which are broader than width of submedian pit; carina of pronotal plate visible in very anterior part, just behind pit (Fig. 5); pronotum densely pubescent along anterior edge, with less setae laterally and a few sparse short white setae dorsomedially; pronotum seems striate laterally because longitudinal orientated minute striae more distinct; along anteroventral edge few short strong parallel rugae. Propleuron light brown, with transverse wrinkles (Fig. 6). Scutum dark brown to almost black, with very few sparse short scattered setae, especially lateral to notauli; slightly broader than long in dorsal view; notauli distinctly impressed, complete, reaching pronotum, with smooth shining bottom; anterior parallel lines very indistinct or even invisible; median mesoscutal line wellimpressed, reaching half of scutum; internotauli area with very strong interrupted transverse rugae, in between anterior parallel lines scutum also transversely rugose, however striae much more delicate; area between notauli and parapsidal line also with transverse rugae; area between transverse rugae smooth, shining, distance between rugae 2.0-3.0 times broader than width of ruga (Fig. 8). Scutellum subequal, slightly longer than broad in dorsal view; disk dull rugose, with more delicate sculpture towards and between scutellar foveae, impressed in postero-dorsal area; scutellar foveae ovate, relatively small, separated by distinct coriaceous carina, bottom of scutellar fovea smooth, shining, in some specimens with distinct longitudinal striae, extending half length of foveae (Fig. 8). Dorso-axillar area coriaceous (Fig. 8). Mesopleuron uniformly



**Figs 1–11.** Aulacidea tobiasi sp. n.,  $\bigcirc$ . 1 — head, front view; 2 — head, dorsal view; 3 — head, posterior view; 4 — antenna; 5 — pronotum, dorsal view; 6 — pronotum and propleura, front view; 7 — mesosoma, lateral view; 8 — scutum and scutellum, dorsal view, 9 — propodeum, dorsal view; 10 — forewing; 11 — metasoma, lateral view.

transversely striate, with very few short white setae, especially along ventral edge; acetabular carina very narrow (Fig. 7). Propodeum dark brown, laterally finely coriaceous, with dense white long setae; lateral propodeal carinae distinct, uniformly thick, subparallel, without interruption continuing into metanotum; central propodeal area shining, with strong irregular rugae, without setae; metanotum shining, with few striae; metanotal trough smooth, shining, with dense white setae; propodeal spiracle transverse, with strong raised carina along anterior border (Fig. 9); metanotal sulcus reaching mesopleuron, high in anterior 1/4; axillula smooth, shining, with very dense white setae; lateral area of propodeum behind metapleural sulcus with strong longitudinal rugae; nucha dark brown, sulcate (Fig. 7). All legs evenly yellow, with slightly darker coxae, tarsal claws darker, simple, without basal lobes.

Forewing longer than body; marginal cilia long, distinct; radial cell closed, about 3.0 times as long as broad; R1 and Rs reaching wing margin; marginal vein very light, but distinct; Rs curved; areolet absent;  $Cu_{1b}$  not curved outward wing margin (Fig. 10).

Metasoma slightly longer than head and mesosoma combined, slightly compressed laterally; light brown to yellow, tergum 3 and subsequent visible terga dorsally dark brown to black; tergum 2 with basolateral patches of dense white setae; terga smooth, shining, without punctures; prominent part of ventral spine of hypopygium short, with very few short white setae ventrally (Fig. 11).

Body length 2.1-2.4 mm.

Male with 14-segmented antenna; F1 distinctly shorter than F2; head more rounded in dorsal view; median mesoscutal line narrower, less impressed, reaching 1/3 length of scutum only; otherwise the same as female. Body length 1.9-2.1 mm.

*Material.* Holotype:  $\bigcirc$ , Russia "Primorskiy kray, Gornotayozhnaya stantsiya, 4.IX.1983, Storozheva N.", "*Saussurea grandifolia*, galls on stems, em. 29.V.1984". Paratypes. 7  $\bigcirc$ , 6  $\checkmark$ , with labels as in holotype; 1  $\bigcirc$ , Primorskiy Terr., "Kedrovaya Pad" Nature Reserve, coll. 2 V 1983 on *Saussurea* sp., em. 25 IV 1984 (M. Zerova); 3  $\bigcirc$ , Primorskiy Terr., Shamora (= Lazurnaya) Bay, coll. 10 IX 1986 in stems of *Saussurea pulchella*, em. 26 XI 1987 (M. Zerova).

Holotype and some paratypes (6  $\bigcirc$ , 2  $\circlearrowright$ ) are deposited in the collection of the Schmalhausen Institute of Zoology (Kiev, Ukraine); 2  $\bigcirc$ , 2  $\circlearrowright$  paratypes are in the collection of Zoological Institute (St. Petersburg, Russia), and 3  $\bigcirc$ , 2  $\circlearrowright$  paratypes are in the collection of the Systematic Parasitoid Laboratory (Köszeg, Hungary).

#### Distribution. Russia (Primorskiy Territory).

*Biology.* The species is known to induce stem swelling-like galls in *Saussurea grandifolia* Max. and *S. pulchella* (Fischer) DC (Asteraceae). Galls are like in *A. hieracii* (Bouché).

*Etymology.* This new species is named in honour of Prof. V.I. Tobias, well-known Russian hymenopterist.

Comments. Most of the European species of Aulacidea induce galls on stems and leaves of species of Asteraceae family, especially on Hieracium spp. [A. hieracii (Bouché), A. nibletti Quinlan, A. pilosellae (Kieffer), A. subterminalis Niblett], while other species known to induce galls on Acroptilon repens (L.) DC. (A. acroptilonica Tyurbajev), Scorzonera spp. [A. abdominalis (Thomson), A. laurae Nieves-Aldrey, A. scorzonerae (Giraud)], Sonchus sp. (A. follioti Barbotin), Arnica montana L. (A. arnicae Hoffmeyer), Serratula spp. (A. ascanica Diakontschuk, A. serratulae Diakontshuk), Phlomis tuberosa L. (A. phlomica Belizin), Silybum marianum (L.) Gartn. (A. freesei Nieves-Aldrey), and Tragopogon spp. (A. tragopogonis (Thomson). Aulacidea hieracii was also found to induce galls on Cacalia hastata L. (Belizin, 1959; Kovalev, 1965) and Senecio sp. (our data) in Primorskiy Territory (Russian Far East). Diakontschuk (2001) mentioned also Saussurea spp., as a host plant for A. hiearcii, however, this is incorrect data and that record concerns here in described new species. Kierych (1979) also mentioned Linaria vulgatum Fries. as a host plant in Poland, but this should be confirmed.

Some species described and placed in *Aulacidea* have doubtful status and must be carefully revised. Belizin (1954) described *Trischiza taurica* from Crimea on *Sygosis urticeti* Dahlb., which was later transferred to *Aulacidea* (Kovalev, 1982). However, the validity of this species is uncertain. *A. verticillica* (Belizin) described from Russia and known to induce stem galls on *Salvia verticillata* L. supposedly belongs to the *Neaylax* Nieves-Aldrey and must also be revised.

Diakontschuk (1984, 1988) described a number of *Aulacidea* species from Middle Asia: *A. discolor* Diakontshuk from Tadzhikistan and Turkmenistan from the stem galls on *Centaurea* spp. and *Echinops* sp.; *A. koelpiniae* Diakontshuk from Turkmenistan from the stems of *Koelpinia linearis* Pall., and *A. parvula* Diakontshuk from Tadzhikistan and Turkmenistan from the stem galls on *Cousinia polycephala* Rupr., *C. bipinnata* Boiss., *C. tenella* Fisch.et Mey, *C. onopordoides* Ldb., *C. radians* Bge., *C. refracta* Juz., *Centaurea iberica* Trev., *Rhaponticum integrifolium* C. Winkl., and *Echinops ritro* L.

The last species is also mentioned by Diakontschuk (1984) from Georgia from stem galls on *Eryngium* sp. (Brassicaceae). This record seems very unlikely and is probably the result of a misidentification. Also the generic affinity of this species must be carefully checked.

Recently, Diakontschuk (2003) described two other *Aulacidea* species from the steppe zone of Ukraine. *A. rubi* Diakontschuk was reared from stem galls on *Rubus idaeus* L., but it is a doubtful plant association and should be confirmed. *A. lutigea* Diakontschuk was reared from stems of *Atriplex* sp. (Chenopodiaceae), however this species certainly does not belong to the *Aulacidea* genus but to *Cecconia* Kieffer (head, in front view as high as broad, malar space as long as the height of the compound eye; scutellar foveae shallow and indistinct).

### Acknowledgments

The author thanks Dr. M.D. Zerova for the opportunity to work in the collection of cynipids in the Schmalhausen Institute of Zoology (Kiev). I also thank Maria Bechtold (Systematic Parasitoid Laboratory, Köszeg) for making drawings from digital photographs and for microscopic preparations.

### References

- Belizin V.I. 1954. Gall wasps of the subfamily Figitinae (Hymenoptera, Cynipidae) of the fauna of USSR and neighbouring countries. *Proc. Zool. Inst. USSR Acad. Sci.* **15**: 74–88. (In Russian).
- Belizin V.I. 1959. Gall wasps of the tribe Aylaxini (Hym., Cyn.) new for the fauna of the USSR. *Entomol. Obozr.* **38**(3): 662–674. (In Russian).
- Burks B.D. 1979. Cynipidae. In: Krombein K.V., Hurd P.D., jr., Smith D.R., Burks B.D. (eds.). Catalog of Hymenoptera in America North of Mexico. 1: 1060–1107. Washington.
- Diakontshuk L.A. 1984. New species of the genus Aulacidea (Hymenoptera, Cynipidae) from the Ukrainian SSR. In: *Taxonomy and Zoogeography of Insects*: 71–77. Kiev. (In Russian).
- Diakontshuk L.A. 1988. New and little known gall wasps of the subfamily Cynipinae (Hymenoptera, Cynipidae) from Central Asia. *Entomol. Obozr.* **67**(1): 166–181. (In Russian).
- Diakontshuk L.A. 2001. New genus and new species of cynipids (Hymenoptera, Cynipidae) from *Saussurea* (Asteraceae). *Vestnik zool.* **35**(3): 89–92. (In Russian).
- Diakontshuk L.A. 2003. New and little known species of cynipids (Hymenoptera, Cynipidae) from Ukraine. *Vestnik zool.* **37**(2): 9–16. (In Russian).
- Fergusson N.D.M. 1995. The cynipoid families. *In:* Hanson P.E., Gauld I.D. (eds). *The Hymenoptera of Costa Rica* : 247–265. Oxford, New York, Tokyo.
- Gibson G.A.P. 1985. Some pro- and mesothoracic structures important for phylogenetic analysis of Hymenoptera, with a review of terms used for the structure. *Canad. Entomol.* **117**: 1395–1443.
- Kierych E. 1979. Galasowkowate. Cynipoidea. Katalog Fauni Polski. 33(XXVI, 2): 1-104.
- Kovalev O.V. 1965. Gall-inducing cynipids (Hymenoptera, Cynipidae) from the south of Far East. *Entomol. obozr.* **44**(1): 46–73. (In Russian).
- Kovalev O.V. 1982. Cynipid gall-makers of the subfamily Aylacinae (stat. n.) (Hymenoptera, Cynipidae) and their species described within the family Figitidae. *Proc. Zool. Inst. USSR Acad. Sci.* **110**: 85–93. (In Russian).
- Nieves-Aldrey J.L. 1994. Revision of West-European genera of the tribe Aylacini Ashmead (Hymenoptera, Cynipidae). J. Hym. Res. 3: 175–206.
- Ronquist F., Nordlander G. 1989. Skeletal morphology of an archaic cynipoid, *Ibalia rufipes* (Hymenoptera: Ibaliidae). *Entomol. Scand. Suppl.* **33**: 1–60.