

NEW SPECIES OF AYLACINE GALL WASPS (HYMENOPTERA, CYNIPIDAE, AYLACINI) FROM UKRAINE

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New Species of Aylacine Gall Wasps (Hymenoptera, Cynipidae, Aylacini) from Ukraine. Melika G., Klymenko S. — Two new species of aylacine gall wasps are described from eastern Ukraine: *Diastrophus hieracii* Melika et Klymenko, sp. n. from the “Kamyani Mohyly” Natural Reserve (Donets'k Region) and *Aulacidea diakontschukae* Melika et Klymenko, sp. n. from the “Khomutovs'kyi Step” Natural Reserve (Donets'k Region). The following synonymy is established: *Rhodus oriundus* Quinlan, 1968 = *Salviela kezivi* Melika, 2003, syn. n.

Key words: Hymenoptera, Cynipidae, Aylacini, taxonomy, Ukraine, new species.

Новые виды орехотворок-айлацин (Hymenoptera, Cynipidae, Aylacini) из Украины. Мелика Г., Клименко С. — Описаны 2 вида орехотворок-айлацин из Восточной Украины: *Diastrophus hieracii* Melika et Klymenko, sp. n. из заповедника «Каменные могилы» (Донецкая обл.) и *Aulacidea diakontschukae* Melika et Klymenko, sp. n. из заповедника «Хомутовская степь» (Донецкая обл.). Установлена следующая синонимия: *Rhodus oriundus* Quinlan, 1968 = *Salviela kezivi* Melika, 2003, syn. n.

Ключевые слова: Hymenoptera, Cynipidae, Aylacini, таксономия, Украина, новые виды.

The fauna of the aylacine gall wasps (Cynipidae, Aylacini) of Ukraine is one of the best examined local faunas. Many species were described from this region, especially from the steppe zone. In addition to many well-known European species, L. A. Diakontschuk (1980, 1981 a, b, 1982, 1983, 1984, 1987, 2003) described other 26 species of aylacine wasps from Ukraine. In spite of it, undescribed species still exist in this region. Below, we describe two new species from Donets'k Region, which are especially interesting because of their unusual host plant relationships. Cynipid gallers are very conservative in their host associations and host-shifting occurs rarely and are very interesting evolutionary events. Host associations of the two newly described species are discussed below.

We follow the current terminology of morphological structures (Gibson, 1985; Ronquist, Nordlander, 1989; Fergusson, 1995). Abbreviations for forewing venation follow F. Ronquist and G. Nordlander (1989). Measurements and abbreviations used here include: F1–F12, 1st and subsequent flagellomeres; POD (post-ocellar distance) is the distance between the inner margins of the posterior ocelli; OOD (ocellar-ocular distance) is the distance from the outer edge of a posterior ocellus to the inner margin of the compound eye; LOD, the distance between lateral and frontal ocellus. Width of radial cell measured along 2r. Pictures of some structures of adult wasps were made by digital camera, and then used to prepare ink drawings.

Diastrophus hieracii Melika et Klymenko, sp. n. (fig. 1–14)

Material. Holotype ♀: Ukraine, Donets'k Region, “Kamyani Mohyly” Natural Reserve, 22–28.04.2002, ex stem galls on *Hieracium* sp. (leg. S. Klymenko). Paratypes: 5 ♀ with the same labels as in the holotype. Holotype and 3 paratype ♀ deposited in the collection of the Schmalhausen Institute of Zoology, Kyiv, Ukraine; 2 ♀ paratypes in the collection of the Systematic Parasitoid Laboratory, Köszeg, Hungary.

Female. Length 2.8–3.2 mm. Head black, mandibles brown; antennae dark brown to black; mesosoma uniformly black, legs uniformly dark brown, except black basis of coxae; metasoma black, hypopygium dark brown.

Head transverse, 1.3 times as broad as high in front view (fig. 1); 2.0–2.1 times as broad as long from above (fig. 2), slightly broader than mesosoma, gena distinctly broadened behind eye in dorsal view; POD only slightly shorter than OOD; frontal ocellus

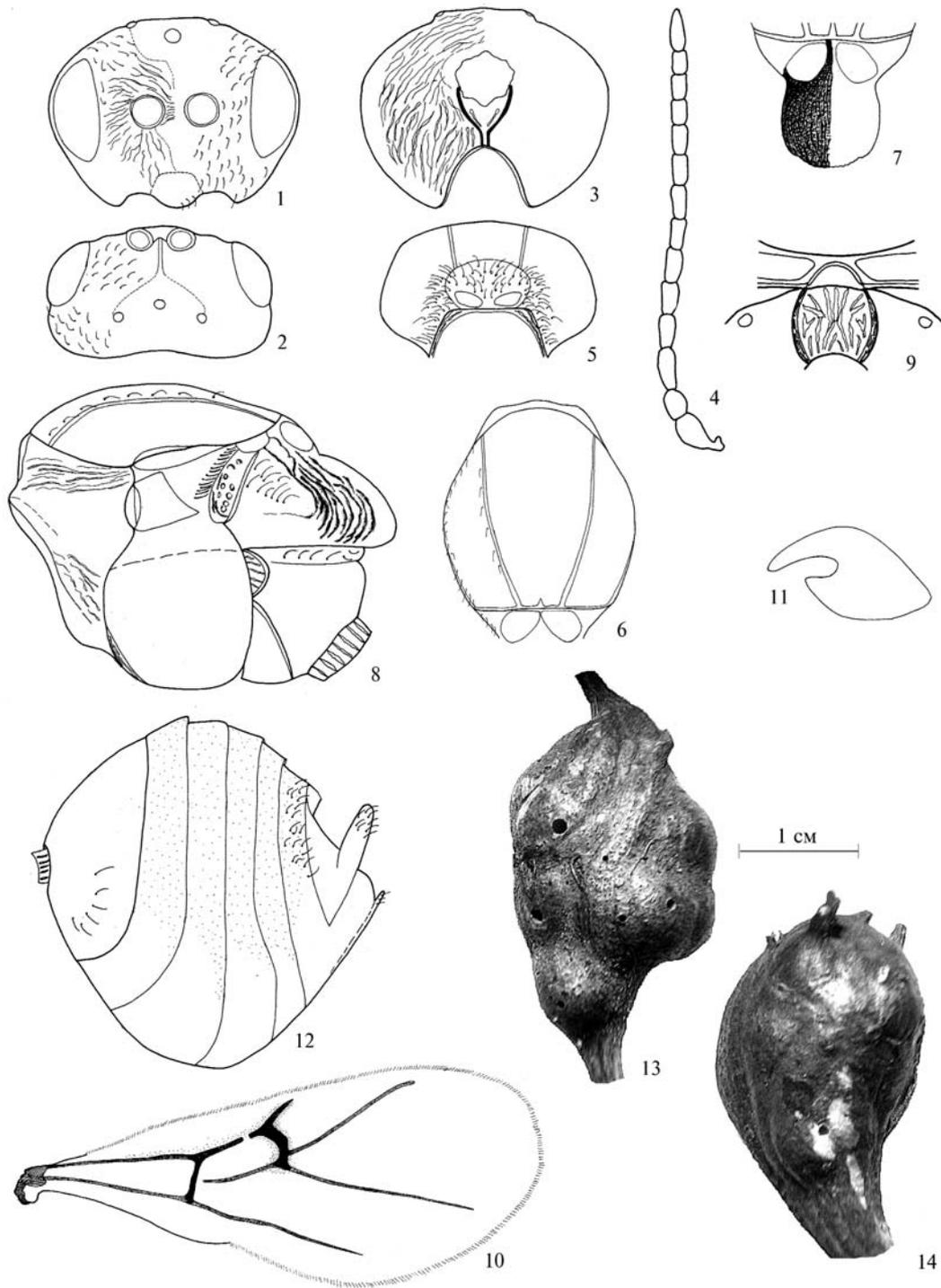


Fig. 1–14. *Diastrophus hieracii*, ♀: 1 – head, front view; 2 – head, dorsal view; 3 – head, posterior view; 4 – antenna; 5 – pronotum, dorsal view; 6 – mesoscutum, dorsal view; 7 – scutellum, dorsal view; 8 – mesosoma, lateral view; 9 – propodeum, dorsal view, part; 10 – forewing; 11 – tarsal claw; 12 – metasoma, lateral view; 13–14 – gall.

Рис. 1–14. *Diastrophus hieracii*, ♀: 1 – голова, вид спереди; 2 – голова, вид сверху; 3 – голова, вид сзади; 4 – антенна; 5 – пронотум, вид сверху; 6 – мезоскутум, вид сверху; 7 – щиток, вид сверху; 8 – мезосома, вид сбоку; 9 – пропodeум, вид сверху, часть; 10 – переднее крыло; 11 – коготок лапки; 12 – метасома, вид сбоку; 13–14 – галл.

with impression toward frons; interocellar area, occiput smooth shining, without punctures; occipital carina absent, vertex and occiput rounded, last with transverse very minute striation above occipital foramen; interocellar area together with upper half of frons form a slightly elevated very smooth and shining zone without setae, which continuing into a median longitudinal carina, going down in between antennal foramens; lower half of frons aside of this median carina, area between compound eye and antennal socket transversely striate, with short white setae (fig. 1); postocciput and postgena with strong parallel rugae, with more dense white setae as front of head; gular sulci free, well separated at hypostomata; oral foramen 1.3 times as high as height of occipital foramen, distance between oral and occipital foramina nearly 2.0 times as short as height of occipital foramen (fig. 3); transfacial line 1.5 times as long as height of compound eye, 1.8–1.9 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 4.2 times as short as transfacial distance; distance between compound eye and antennal rim nearly equal to diameter of antennal socket; slightly elevated central area of lower face finely coriaceous; lower face laterally of elevated central area and malar space with minute interrupted irradiating striae; malar space behind striation and gena behind compound eye finely coriaceous, with more longitudinal orientation of striae, 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 tintorial pits indistinct; malar space 1.3 times as short as height of compound eye; POD (in front view of head) 0.6–0.7 times as short as malar space and 0.5 times as long as height of compound eye; gena broadened behind eye (fig. 1). Mandibles brown. Antenna uniformly dark brown to black, 14-segmented, F1 only slightly longer than F2, pedicel 1.5 times as short as F1, scapus 2.25 times as long as F1, F12 1.9 times as long as F11, nearly equal in length to F11 + F10 (fig. 4).

Mesosoma uniformly black, 1.25–1.3 times as long as high in lateral view (fig. 8). Pronotum dorso-medially 2.0 times as short as the greatest length measuring on outer margin; submedian pronotal pits distinct, deep, slightly transverse, separated by carina which narrower than width of submedial pit; pronotal plate distinct, slightly elevated above pronotum, with piliferous points (fig. 5); pronotum densely pubescent along anterior edge, less setae laterally; pronotum laterally, in antero-dorsal part, with transverse parallel striae, central part smooth with very delicate coriaceous sculpture, antero-ventral edge again with strong transverse parallel striae (fig. 8). Propleuron black, smooth, shining. Scutum black, slightly longer than broad in dorsal view, uniformly smooth and shining, without sculpture, with very few sparse short scattered setae, especially laterally to notauli and prolong lateral edge; notauli deeply impressed, complete, reach pronotum, with smooth shining bottom; anterior parallel lines very indistinct, nearly invisible; median mesoscutal line well-impressed in very posterior part, parapsidal lines invisible, absent (fig. 6). Scutellum black, 1.3 times as long as broad in dorsal view; disk with mainly longitudinally orientated strong rugae; scutellar foveae ovate, reach to 1/3 of scutellum length, separated by distinct longitudinally striate carina, bottom of scutellar fovea smooth, shining (fig. 7). Dorso-axillar area smooth, shining (fig. 7). Mesopleuron uniformly smooth and shining, acetabular carina narrow, area delimited by it longitudinally striate (fig. 8). Propodeum black, laterally finely coriaceous, with dense white long setae; lateral propodeal carinae distinct, uniformly thick, slightly bent outwards in the middle; central propodeal area shining, with strong irregular rugae, without setae; metanotum shining, with few striae; metanotal trough smooth, shining, with few sparse short white setae; propodeal spiracle rounded, with strong raised carina along anterior border (fig. 9); metanotal sulcus reach mesopleuron slightly higher than the half height of mesopleuron; axillula smooth, shining with few white setae; lateral area of propodeum behind metapleural sulcus dull rugose; nucha black, sulcate (fig. 8).

All legs uniformly dark brown, except black basis of coxae, tarsal claws with acute basal lobe (fig. 11) Forewing longer than body; marginal cilia long, distinct; radial cell 3.0–3.1 times as long as broad, opened; R1 and Rs do not reach wing margin, Rs curved in proximal 1/3; areolet absent, Cu_{1b} not curved outward wing margin (fig. 10).

Metasoma slightly longer than head + mesosoma, strongly compressed laterally, black, with brownish tone, tergite 2 with few sparse white setae baso-laterally, smooth, without punctures, subsequent tergites smooth, shining, with sparse, indistinct punctures dorsally and laterally in the upper half of tergite; hypopygium smooth, without punctures, prominent part of ventral spine of hypopygium short, with very few short white setae ventrally (fig. 12).

Male unknown.

Etymology. The species name *hieracii* reflects its host association with the plants of the genus *Hieracium* (Asteraceae).

Comparative remarks. *Diastrophus hieracii*, differs from other two known European species, *D. rubi* (Bouché, 1834) and *D. mayri* Reinhart, 1876 by the scutum, which is longer than broad in dorsal view, the scutellum is longitudinally striate, the head more rounded in front view, the 3rd and subsequent tergites with punctures, while in *D. rubi* and *D. mayri* the scutum is broader than long in dorsal view, the scutellum is uniformly dull coriaceous, without longitudinally orientated striae; the head more transverse in front view, tergites without punctures. In *D. hieracii*, female antenna 14 segmented, F12 1.9 times as long as F11, nearly equal in length to F11 + F10, while in *D. rubi* antenna 13-segmented, if 14-segmented (suture between F11 and F12 well-visible), than F12 equal in length to F11. *Diastrophus hieracii*, differs from *D. mayri* also by absence of areolet in the forewing, while it is present in the last species.

Some diagnostic characters of *D. hieracii* are present in certain Nearctic species of *Diastrophus*: in *D. nebulosus* (Osten Sacken, 1861), *D. radicum* Bassett, 1870 and *D. smilacis* Ashmead, 1896 the disk of scutellum also longitudinally striate; in *D. smilacis* the scutum is slightly elongate; in *D. radicum* and *D. nebulosus* 3rd and subsequent tergites with inconspicuous punctures. However, *D. hieracii* differs from these species by other characters and especially by the host plant association.

Biology. Larvae of *Diastrophus hieracii* induces stem swelling-like galls on *Hieracium* sp. (Asteraceae). Galls are in stems, multilocular, variously shaped, 2.0–2.5 cm in length and up to 1.5 cm in diameter, tissues are not hardly lignified, easily cuttable; galled stem is deformed (fig. 13–14). Galls become mature in autumn; adults emerge in spring the next year.

Comments. The genus *Diastrophus* Hartig, 1840 includes 2 Palaearctic species: *D. rubi* (Bouché, 1834), known to induce stem swelling-like galls on *Rubus* species (Rosaceae) and *D. mayri* Reinhart, 1876 on *Potentilla* L. (Rosaceae). According to the recent revision, 15 Nearctic *Diastrophus* species are known from America North of Mexico (Schick, Liu, 2003), thus, the genus is represented by 17 Holarctic species. In the Nearctic Region, 5 species are associated with *Potentilla*, host relationships of one species are unknown, one species induces galls on *Fragaria* L. (Rosaceae), one species is associated with *Smilax* (Smilacaceae), and 7 species with *Rubus*. Originally, gall wasps were herb gall inducers, and woody hosts, like *Rosa* L., *Rubus* L. (Rosaceae), *Quercus* L. (Fagaceae) were colonized later with the species those form a monophyletic clade (Liljeblad, Ronquist, 1998; Ronquist, 1999; Ronquist, Liljeblad, 2001). One species, *D. smilacis* Ashmead, 1896 induces galls on the monocotyledonous *Smilax*, in contrast to other Aylacini genera, which induce galls on herbaceous host plants (Ronquist, 1994). All other known species associate with Rosaceae (*Rubus*, *Potentilla* and *Fragaria*). Nieves-Aldrey (1994) suggested that *Diastrophus* and *Xestophanes* Foerster, 1869 form a monophyletic group on the basis of their rosaceous host associations, presence of a basal lobe on tarsal claws and glabrous smooth sculpture of mesothorax

and vertex. Association of 8 *Diastrophus* species with *Rubus* probably originated once and two reversal events have contributed to the patterns of association of *Diastrophus* with *Potentilla* and *Smilax* (Schick, Liu, 2003). In our case, *D. hieracii*, probably another reversal event, when a host-shifting to *Hieracium* had happened.

***Aulacidea diakontschukae* Melika et Klymenko, sp. n. (fig. 15–25)**

Material. Holotype ♀: Ukraine, Donetsk Region, “Khomutovs’kyi Step” Natural Reserve, 14–23.03.2003, leg. S. Klymenko; ex flower heads of *Phlomis tuberosa*. Paratypes: 3 ♀ and ♂ with the same labels as the holotype. Holotype and 1 paratype ♀ are deposited in the collection of the Schmalhausen Institute of Zoology, Kyiv, Ukraine; 2 ♀ and ♂ paratypes in the collection of the Systematic Parasitoid Laboratory, Kőszeg, Hungary.

Female. Length 2.2–2.8 mm. Head and mesosoma black; antennae brown, except black scapus and pedicellum; legs light brown, except dark brown to black coxae, trochanter and basis of femora; metasoma black, hypopygium brown.

Head nearly rounded, 1.2 times as broad as high in front view (fig. 15); 2.0–2.1 times as broad as long from above (fig. 16), slightly broader than mesosoma, gena not broadened behind eye; POD 1.3 times as long as OOD; frontal ocellus with impression toward frons; interocellar area and occiput delicately coriaceous, without punctures; occipital carina absent, vertex and occiput rounded, last with transverse very minute striation above occipital foramen; area between compound eye and antennal socket longitudinally minutely striate, with short white setae; postocciput and postgena coriaceous, with more dense white setae as the front of head; gular sulci free, well separated at hypostomata; oral foramen 1.5 times as high as height of occipital foramen, distance between oral and occipital foramina slightly shorter than height of occipital foramen; transfacial line 1.4 times as long as height of compound eye, 1.4–1.5 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 3.8 times as short as transfacial distance; distance between compound eye and antennal rim slightly larger than diameter of antennal socket; slightly elevated central area of lower face finely coriaceous; lower face laterally of elevated central area and malar space with irradiating minute striae; malar space behind striation and gena behind compound eye finely coriaceous, with more longitudinal orientation of striae; clypeus very minutely coriaceous; epistomal sulcus distinct, broad, slightly impressed, smooth, shining; anterior tintorial pits indistinct; malar space 1.4 times as short as height of compound eye; POD (in front view of head) 0.6–0.65 times as short as malar space and 0.4–0.5 times as long as height of compound eye (fig. 15). Mandibles dark brown. Antenna uniformly brown, except black scapus and pedicellum, 13-segmented, F1 0.75 as short as F2, F2 equal F3, pedicel 0.75 times as short as F1, scapus only 1.6 times as long as F1, F11 1.7 times as long as F10, F10 equal F9 (fig. 17).

Mesosoma uniformly black, 1.25–1.3 times as long as high in lateral view. Pronotum dorso-medially 2.3 times as short as the greatest length measuring on outer margin; submedian pronotal pits distinct, transverse, separated by carina which slightly narrower than width of submedian pit; pronotal plate delimited in very anterior 1/3, very finely minutely coriaceous (fig. 19); pronotum densely pubescent along anterior edge, less setae laterally; pronotum laterally, in antero-dorsal part coriaceous, antero-ventral edge with transverse parallel striae. Propleuron black, with longitudinally orientated striae, with some sparse white setae (fig. 20). Scutum black, subequal, nearly as long as broad in dorsal view, minutely coriaceous, minute striae longitudinally orientated, giving a view of transverse striation under proper lighting, with very few sparse short scattered setae, especially laterally to notauli and prolong lateral edge; notauli deeply impressed, complete, reach pronotum, with smooth shining bottom, strongly broadened in posterior 1/3; anterior parallel lines narrow, distinct, reach to 1/4 of scu-

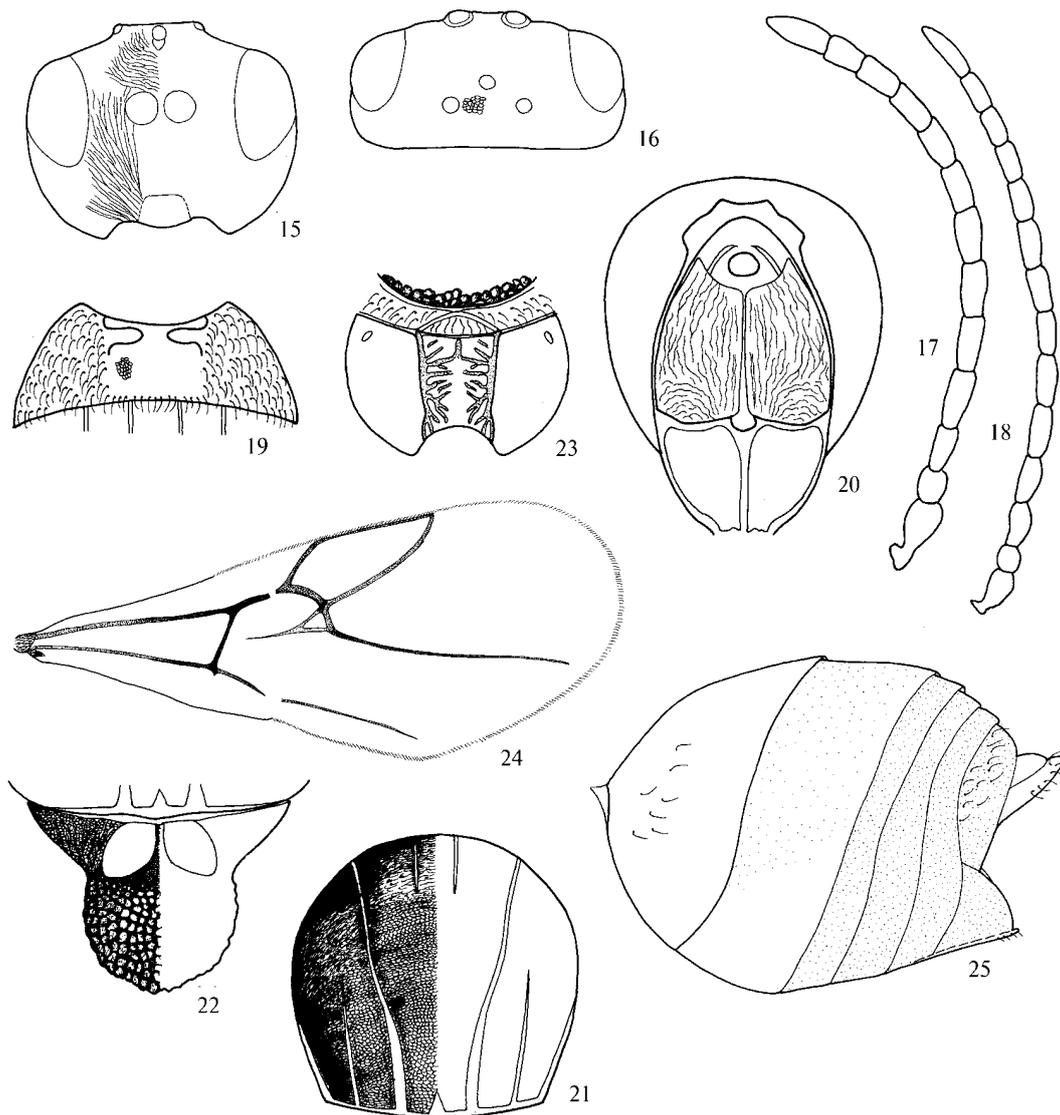


Fig. 15–25. *Aulacidea diakontschukae*: 15 – head, front view, ♀; 16 – head, dorsal view, ♀; 17 – antenna, ♀; 18 – antenna, ♂; 19 – pronotum, dorsal view, ♀; 20 – pronotum and propleura, front view, ♀; 21 – mesoscutum, dorsal view, ♀; 22 – scutellum, dorsal view, ♀; 23 – propodeum, dorsal view, part, ♀; 24 – forewing, ♀; 25 – metasoma, lateral view, ♀.

Рис. 15–25. *Aulacidea diakontschukae*: 15 – голова, вид спереди, ♀; 16 – вид сверху, ♀; 17 – антенна, ♀; 18 – антенна, ♂; 19 – пронотум, вид сверху, ♀; 20 – пронотум и проплевра, вид спереди, ♀; 21 – мезоскутум, вид сверху, ♀; 22 – щиток, вид сверху, ♀; 23 – проподеум, вид сверху, часть, ♀; 24 – переднее крыло, ♀; 25 – метасома, вид сбоку, ♀.

tum; median mesoscutal line well-impressed and broad in very posterior part, parapsidal lines distinct, reach to 2/3 length of scutum (fig. 21). Scutellum black, elongated, nearly 2.0 times as long as broad in dorsal view, disk dull rugose; scutellar foveae ovate, reach to 1/3 length of scutellum, separated by distinct longitudinally striate carina, bottom of scutellar fovea smooth, shining (fig. 22). Dorso-axillar area coriaceous, with some longitudinally orientated rugae toward scutellar foveae (fig. 22). Mesopleuron uniformly and entirely transversely striate, area between striae shining, smooth, acetabular carina delimited very narrow area. Propodeum black, laterally finely coriaceous, with dense white long setae; lateral propodeal carinae distinct, uniformly thick, subparallel,

central propodeal area shining, with strong, mainly transversely orientated irregular rugae, without setae; metanotum coriaceous, mat, with few striae; metanotal trough finely coriaceous, with relatively dense short white setae; propodeal spiracle ovate, with strong raised carina along anterior border (fig. 23); metanotal sulcus reach mesopleuron in anterior 1/3 of mesopleuron; axillula coriaceous, with relatively dense white setae; lateral area of propodeum behind metapleural sulcus dull rugose; nucha black, sulcate. All coxae, trochanter and distal half of femurae black, rest of leg light brown to yellow; tarsal claws simple, without basal lobe. Forewing longer than body; veins dark brown, marginal cilia long, distinct; radial cell short, 2.5 times as long as broad, distinctly closed, marginal vein weaker; Rs strongly curved in proximal 1/3; areolet triangular, large, distinct, Cu_{1b} not curved outward wing margin (fig. 24).

Metasoma slightly longer than head + mesosoma, slightly compressed laterally, black, tergite 2 with few sparse white setae baso-laterally, smooth, without punctures, tergite 3 with punctures dorsally and dorso-laterally, in the upper half of tergite; subsequent tergites and hypopygium densely uniformly punctate, prominent part of ventral spine of hypopygium short, with very few short white setae ventrally (fig. 25).

Male same as female, except scutellum more delicately sculptured, scutellar foveae smaller, median mesoscutal line very indistinct in the very posterior part of scutum; antenna 14-segmented, pedicel 2.0 times as short as F1, F1 slightly curved, nearly equal F2, F12 1.7 times as long as F11, F10 equal F11 (fig. 18). Length 1.8 mm.

Etymology. The species is named in honour of Ukrainian cynipidologist, Dr. L. A. Diakonstchuk.

Diagnosis. Majority of the Palaearctic *Aulacidea* species possess a latero-basal patch of dense white setae on tergite 3, except two species: *A. acroptilonica* Tyurebajev, 1972 and *A. ascanica* Diakonstchuk, 1984, which have only a few sparse white setae latero-dorsally, like *A. diakontschukae*. The first species induces multilocular stem galls on *Acroptilon repens* (L.) (Asteraceae) (Kovalev, Diakonstchuk, 1986), whereas the second one induces also multilocular stem galls, but on *Serratula xeranthemoides* Bieb. (Diakonstchuk, 1984). *Aulacidea ascanica* is similar to *Isocolus* species, except the radial cell is closed; *Isocolus serratulae* (Mayr, 1882). In *A. acroptilonica* and *A. ascanica* the frons with some indistinct punctures, the radial cell of the forewing more elongated and narrower, about 3.0 times as long as broad, areolet small; F1 of the female antenna longer than F2; notauli much less broadened in the posterior part, the median mesoscutal line narrow and shallow in the most posterior part of the scutum; scutellar foveae more elongated, reach to half length of the scutellum, while in *A. diakontschukae*, the frons without punctures, the radial cell of the forewing shorter, broader, and narrower, 2.5 times as long as broad, the areolet larger, triangular; F1 of the female antenna distinctly shorter than F2, notauli strongly broadened in the posterior part, the median mesoscutal line broad, deeply impressed in the most posterior part of the scutum; scutellar foveae shorter, reach to 1/3 length of scutellum. In *A. ascanica* also the female antenna 12-segmented and the scutellum subequal, nearly as long as broad in dorsal view, while in *A. diakontschukae*, female antenna 13-segmented and the scutellum distinctly longer than broad in dorsal view.

Biology. *Aulacidea diakontschukae*, induces galls in flower heads of *Phlomis tuberosa* L. (Lamiaceae). Galls become mature in autumn; adults emerge in spring next year.

Comments. The only *Aulacidea* species known to induce hidden stem galls on *Phlomis* L. (Lamiaceae) is *A. phlomica* Belizin, 1959; however, it can be readily differentiated from the new species by its diagnostic characters. Representatives of other four aylacine genera also inducing stem galls on *Phlomis* L. are *Panteliella bicolor* (Ionescu et Roman, 1960) and *P. fedtschenkoi* (Rübsaamen, 1896); *Phanacis phlomidis* Belizin, 1959, *Vetustia investigata* Belizin, 1959, and *Rhodus oriundus* Quinlan, 1968. *Aulacidea phlomica*, *Panteliella bicolor* and *Pan. fedtschenkoi*, *Phanacis phlomidis*, and *V. investigata* induce very

similar galls on *Ph. tuberosa* L., which are nested in the stem of the plant and hardly distinguishable, thus, adult wasps are necessary to distinguish which species caused them (Belizin, 1959; Quinlan, 1968). *Rhodus oriundus* Quinlan, 1968 was described from Greece and known to induce swelling-like galls in the apical buds of *Phlomis cretica* Presl., later was found also on *Salvia fruticosa* Mill. in Israel (Lamiaceae) (Zerova et al., 2003) (as *Salviela kezivi* Melika, 2003, syn. n.); the latter name is synonymized here, as its type series from Israel was found to be conspecific with the specimens from Greece. In the *Aulacidea* genus, only two species are known to induce galls in flower heads: *A. laurae* Nieves-Aldrey, 1992 in *Scorzonera laciniata* (L.) (Asteraceae) (Nieves-Aldrey, 1992, 2001) and *A. serratulae* Diakontschuk, 1984 in *Serratula bracteifolia* (Iljin) Stank. (Asteraceae) (Diakontschuk, 1984). Thus, *A. diakontschukae* is the third *Aulacidea* species known to induce galls in flower heads and the second one associated with *Phlomis* L. (Lamiaceae).

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