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The Eastern Palearctic Species of *Agnentina* (Plecoptera: Perlidae)

Ignac SIVEC¹, Lidia A. ZHILTZOVA² and Bill P. STARK³

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ABSTRACT

Seven *Agnentina* species known from the eastern Palearctic region are redescribed from types and newly associated material. Illustrations of male and female genitalia, head and pronotal patterns, eggs, larval color patterns and larval proventriculi are used to support species descriptions. *Perla cadaverosa* McLACHLAN and *P. immersa* McLACHLAN are transferred to *Agnentina*, a female lectotype is designated for *A. cocandica* (McLACHLAN) and *A. dubia* ZWICK is placed as a synonym of *A. pedata* (KOPONEN). Preliminary keys are presented for adults and larvae.

Key words: Plecoptera, Perlidae, *Agnentina*, Eastern Palearctic, taxonomy

IZVLEČEK

Vzhodnopalearktične vrste rodu *Agnentina* (Plecoptera: Perlidae). – Sedem vrst rodu *Agnentina* iz vzhodnega palearktika je ponovno opisanih na podlagi študije tipskega in recentno nabranega materiala. Opis vrst dopolnjujejo ilustracije genitalij samcev in samic, vzorec na glavi in pronotumu, tako pri odraslih kot pri ličinkah, ter mikroskopski posnetki jajc in proventrikla pri ličinkah. *Perla cadaverosa* McLACHLAN in *P. immersa* McLACHLAN sta prestavljeni v rod *Agnentina*, lektotip samice je opisan za vrsto *A. cocandica* (McLACHLAN), *A. dubia* ZWICK je postavljena kot sinonim vrste *A. pedata* (KOPONEN). Generirani so preliminarni ključi za določanje odraslih osebkov in ličink posameznih vrst.

Ključne besede: Plecoptera, Perlidae, *Agnentina*, vzhodni paleartik, sistematika

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KLAPÁLEK (1907) proposed *Agnentina* as a subgenus of *Perla* and later (KLAPÁLEK 1923) gave the group generic status. Throughout much of the last century the genus remained poorly defined and was, in fact, considered a synonym of *Dinocras* (KLAPÁLEK 1907) by ILLIES (1966). When ZWICK (1984) discovered syntypes of *Perla elegantula* KLAPÁLEK, type of the genus, the true nature of *Agnentina* and the synonymy of *Phasganophora* (KLAPÁLEK 1914) became obvious. ZWICK (1984) noted that *A. elegantula*, a potentially threatened potamon species, was known from only three sites in central Europe, but there are now recent reports of the species in Austria (GRAF 1997) and Hungary (KOVÁCS & AMBRUS 2000). Subsequently, STARK (1986) reviewed the Nearctic species, SIVEC et al. (1988) gave a generic synopsis and preliminary species list, and others (STARK & SIVEC 1991; DU & CHOU 1998) have added new species descriptions and redescriptions of older species from the Orient.

Contributions to the knowledge of eastern Palearctic *Agnentina* were made by KOPONEN & BRINCK (1949), ZHILTZOVA (1964, 1975), RAUŠER (1968) and ZWICK (1984). Unfortunately, these studies have often been limited by scarce material and by limited access to types, which has produced some confusion. RAUŠER (1968), for example, provides beautiful illustrations of "*Phasganophora brevipennis* NAVAS", which are actually *A. extrema* (NAVAS). This may have led to ZWICK's (1984) failure to recognize *A. extrema* as a valid species in the genus and also led SIVEC et al. (1988) to incorrectly attribute an aedeagal illustration of *A. extrema* to *A. brevipennis*.

Over the past forty years, one of us (LAZ) accumulated material through personal collecting and also studied older pinned material and types in the collection of the Zoological Institute, Russian Academy of Sciences, St. Petersburg. This material includes more than 600 specimens of seven *Agnentina* species now recognized from the eastern Palearctic region (Fig. 56). The comprehensive nature of this collection permits associations of males, females and larvae to be made for most species of the genus in this region. It is hoped that this study will provide a basis for continued investigations of this important genus across this vast region.



Fig. 56: Geographical distribution of *Agnetina* species (B – *A. brevipennis*; C – *A. cadaverosa*; Co – *A. cocandica*; Ex – *A. extrema*; I – *A. immersa*; P – *A. pedata*; Se – *A. senilis*; D – *A. dubia*).

Agnetina brevipennis (NAVAS)

Figs. 1-8

Paragnetina brevipennis NAVAS, 1912. River Kur, Chabarovskiy District, Garmachta, Siberia, holotype ♂ (Zoological Institute, Russian Academy of Sciences, St. Petersburg).

Acroneuria mongolica KLAPÁLEK, 1921. syn. ZHILTZOVA, 1972.

Neophasganophora brevipennis: ZAPEKINA-DULKEIT & DULKEIT, 1961.

Phasganophora brevipennis: ZHILTZOVA, 1975.

Agnetina brevipennis: ZWICK, 1984.

Agnetina brevipennis: TESLENKO & ZHILTZOVA, 1989.

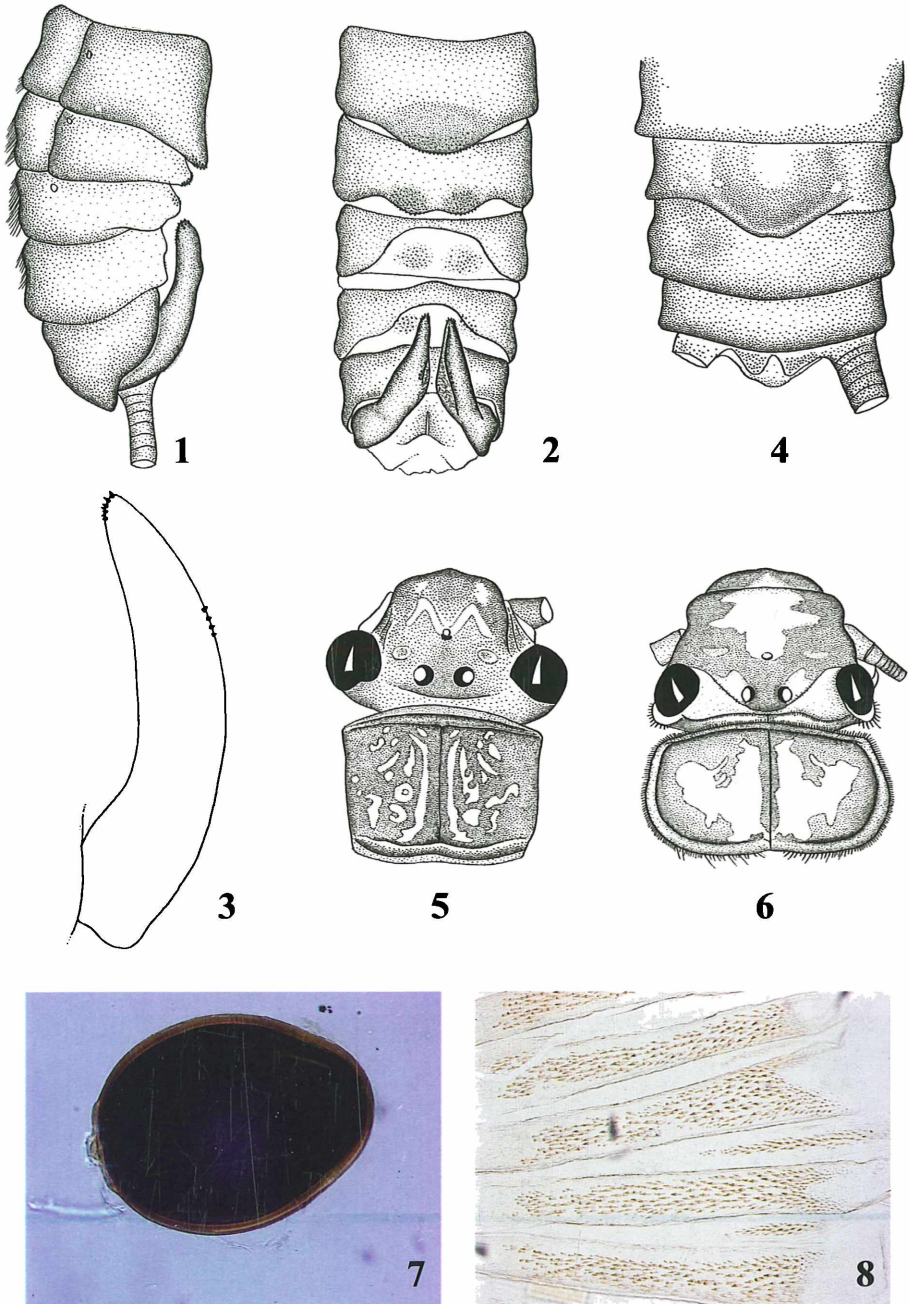
Male.- Brachypterous. Forewing length 3,5-5,5 mm. General color brown. Ocellar area usually covered with dark pigment that extends laterally behind posterior ocelli; calluses, occiput and area forward of anterior ocellus pale, but darker around anterior and lateral margins of head (Fig. 5). Pronotum brown with paler rugosities. Legs pale brown, antennae and cerci dark brown. T5 produced into a rounded lobe overlapping T6 base; T6 produced into an emarginate lobe slightly overlapping T7 base; T7 and T8 with large mesal membranous areas; sensilla basiconica patches on lobes of T5 and T6 and in the membrane of T7 and T8 (Figs. 1, 2). Hemiterga simple, wide at basal curve and tapering to a rounded apex in dorsal aspect (Fig. 2); hemiterga gently curved in lateral aspect and without a distinct ankle (Fig. 3); sensilla basiconica clustered near basal curve and at tip of sclerotized part of hemiterga, and scattered along length of soft inner margins.

Female.- Macropterous. Forewing length 18-20 mm. Color pattern typically darker than male. Subgenital plate variable; general shape triangular with lateral margins rather straight and slanted to a variable but often somewhat truncate apex (Fig. 4).

Egg.- Length 0,36 mm, width 0,26 mm. Collar inconspicuous, nipple shaped and set on an obscure, thickened apical plate. General shape oval but collar end wider, tapering only slightly beyond the equator to a broadly rounded tip. Chorion without reticulation (Fig. 7).

Larva.- Pigment pattern striking with dark areas sharply defined. Head pattern dark between ocelli, expanded to lateral margins of antennal bases and forward along margins of frons enclosing a mushroom shaped pale area forward of median ocellus (Fig. 6). Occiput, callosities, median base of labrum and antennal bases pale. Pronotum very dark around margins and along median suture enclosing a large bilobed pale area on disc (Fig. 6). Major proventricular bands armed with at least five irregular rows of acanthae throughout most of length; accessory bands short, less than half the length of major bands and armed with about three irregular rows of acanthae (Fig. 8).

Distribution.- Eastern Palearctic from Altai Mountains and Mongolia to Far East including Sakhalin (Fig. 56).



Figs.1-8: *Agnetina brevipennis*: abdominal tip of male: dorsal view (2), lateral view (1); hemitergum in lateral view (3); abdominal tip of female (4); head and pronotum of adult (5); head and pronotum of larva (6); egg (7); proventricular bands (8).

***Agnentina cadaverosa* (McLACHLAN), comb. nov.**

Figs. 9-16

Perla cadaverosa McLACHLAN, 1875. Oburdon, mid stream of river Zeravshan, Tadzhikistan, holotype ♀ [in fragments] (Zoological Institute, Russian Academy of Sciences, St. Petersburg).

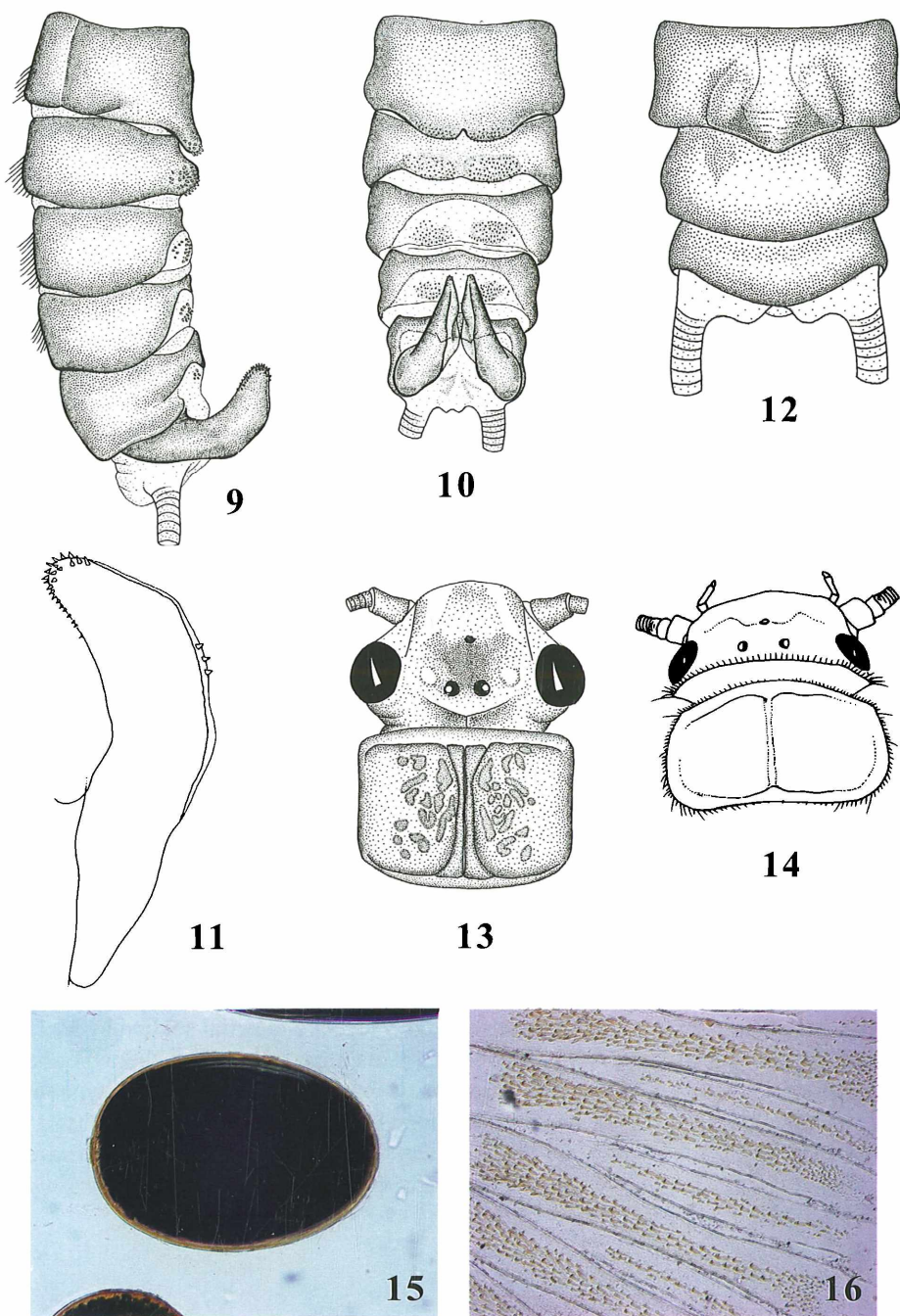
Male.- Brachypterous. Forewing length 4-5 mm. General color pale brown. Head pale brown with darker ocellar region; dark pigment typically not extending between posterior ocelli and not forward of median ocellus (Fig. 13). Lappets and occipital area pale brown. Pronotum pale brown with darker rugosities clustered mostly in middle half of disc (Fig. 13). Legs pale brown, cerci darker than body. Wings usually not extending over abdominal base. T5 produced into a rounded lobe with small median notch or emargination, and overlapping T6 base; T6 produced into a slightly emarginate lobe scarcely reaching T7 base; T7 and T8 with large mesal membranous areas; sensilla basiconica clustered on lobes of T5 and T6 and in membrane of T7 and T8 (Figs. 9,10). Dorsal aspect of hemiterga short, thick and wide from basal curve becoming more slender and tapering to apex (Fig. 10); hemiterga gently curved along ventrolateral margin but somewhat angulate dorsally and without distinct ankle (Fig. 11). Sensilla basiconica clustered on hemitergal apex and in a sparse patch near midlength.

Female.- Macropterous. Forewing length 24-28 mm. General color similar to male but typically not as dark. Subgenital plate triangular or rounded with apex projecting only slightly over S9 (Fig. 12). Median area of plate paler than marginal areas.

Egg.- Length 0,54 mm, width 0,36 mm. Collar short, not distinctly nipple shaped (Fig. 15). General shape oval, widest at equator and only slightly, and symmetrically, tapered to both ends. Chorion without reticulation.

Larva.- Pigment pattern in available material indistinct, but with darker area between ocelli and extending laterally above M-line to near antennal bases; M-line apparent; lateral margins of head dark (Fig. 14). Major proventricular bands armed with about seven rows of acanthae, reduced to about three rows on most bands; accessory bands slightly more than half as long as major bands and generally with about two rows of acanthae (Fig. 16).

Distribution.- Known from three localities in the Zeravshanskiy Khrebet Mountains of Tadzhikistan (Fig. 56).



Figs. 9-16: *Agnetina cadaverosa*: abdominal tip of male: dorsal view (10), lateral view (9); hemitergum in lateral view (11); abdominal tip of female (12); head and pronotum of adult (13); head and pronotum of larva (14); egg (not of the same ratio as other egg images) (15); proventricular bands (16).

Aagnetina cocandica (McLACHLAN)

Fig. 17-23

Perla cocandica McLACHLAN, 1875. Kokand, Uzbekistan, lectotype ♀ [here designated] (Zoological Institute, Russian Academy of Sciences, St. Petersburg).

Aagnetina cocandica: Klapálek, 1923.

Phasganophora undata Klapálek, 1921. Nukus, Uzbekistan, lectotype ♂ [desig. Zhiltzova, 1995] nov. syn.

Kamimuria costulata Navas, 1923. syn. Zhiltzova, 1979.

Male.- Macropterous. Forewing length 12-14 mm. General color pale brown. Head pale brown with slightly darker pigment over ocellar region and extending laterally slightly beyond ocelli (Fig. 21); occiput and anterior region of frons with diffuse brown pigmentation. Pronotal pattern pale brown with indistinct rugosities. T5 produced into a rounded lobe overlapping T6 base; T6 produced into an emarginate lobe overlapping T7 base; T7 and T8 with large mesal membranous areas (Figs. 17,18); sensilla basiconica clustered on lobes of T5 and T6 but sparse or absent on membrane of T7 and T8. Dorsal aspect of hemiterga with a moderately large carina at basal curve; hemiterga wide at basal curve, tapered to subapex and expanded slightly before tip (Fig. 18); in lateral aspect the hemiterga are slightly sinuate and bent near basal curve, with broadly rounded tip and no distinct ankle (Fig. 19). Sensilla basiconica clustered on hemitergal apex and on carina of basal curve.

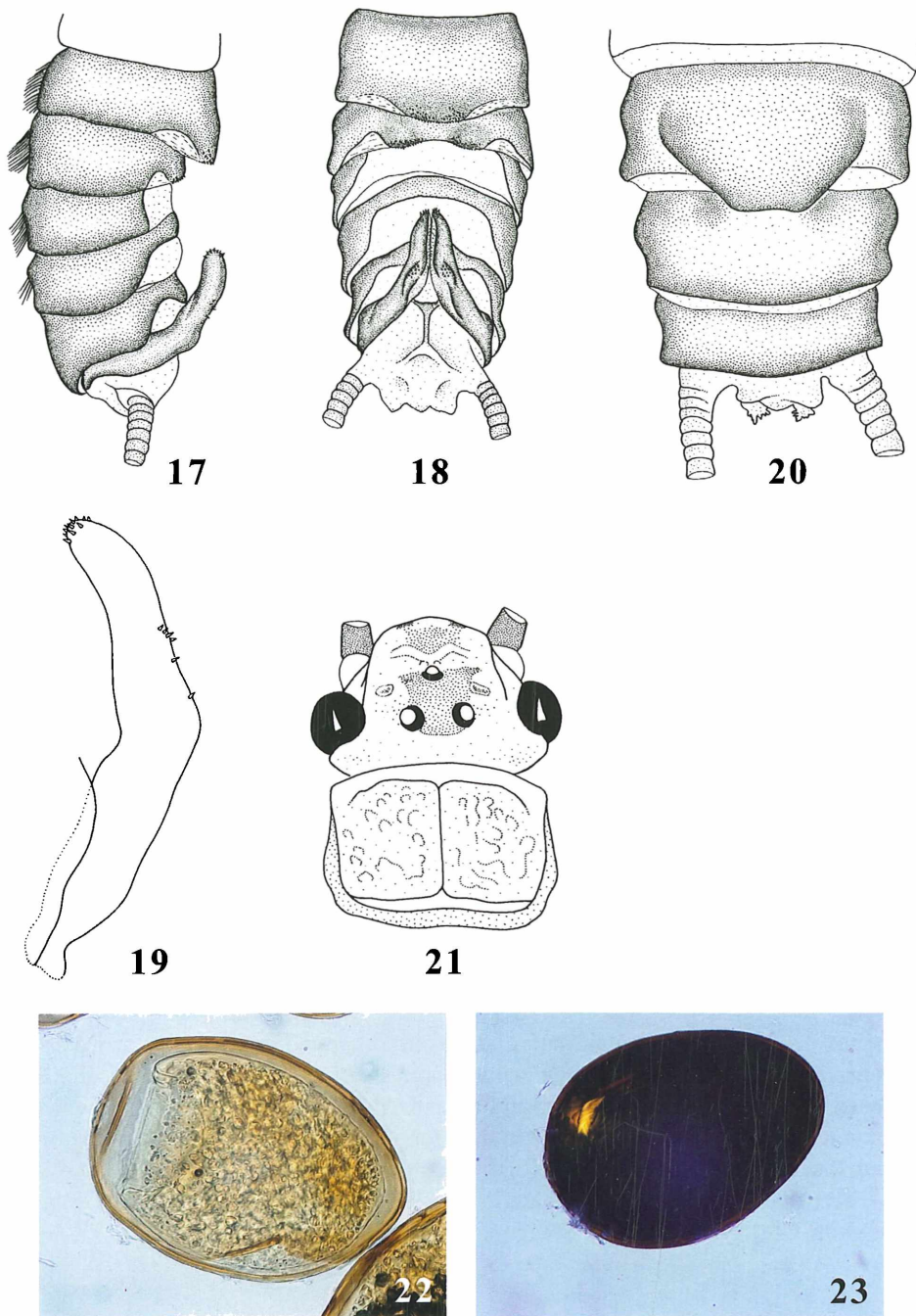
Female.- Macropterous. Forewing length 16-19 mm. Subgenital plate somewhat triangular with truncate apex overlapping base of S9. Lateral and apical margins relatively straight (Fig. 20).

Egg.- Length 0,37 mm, width 0,25 mm. Collar a low button-like process. Outline oval, widest at equator and only slightly narrowed towards poles (Figs. 22, 23). Chorion without reticulation.

Larva.- Unknown.

Distribution.- Known from lowland reaches of large rivers of central Asia in Uzbekistan, Kazakhstan, Turkmenistan and Mongolia (Fig. 56).

Comments.- McLACHLAN (1875) includes females from Kokand and Samarkland in his type series, but only the Kokand specimen appears to have survived. We designate this surviving specimen in the Zoological Institute at St. Petersburg as lectotype. The lectotype, here designated in order to ensure the name's proper and consistent application, bears label information which identifies it as the "Isfraim (Kokan)" specimen of the Fedcenko material studied by McLachlan. Klapálek (1921) proposed *Phasganophora undata* for male specimens from Nukus (Uzbekistan) and from Mongolia. Zhiltzova (1995) designated a male from the former site as lectotype and found among a series of undetermined lowland *Aagnetina* from Uzbekistan and Kazakhstan that *A. undata* males from these sites were associated with *A. cocandica* females and that these species were very similar in coloration. This forms the basis of the synonymy of these species; *Kamimuria costulata* was previously placed in the synonymy of *P. undata* by Zhiltzova (1979).



Figs.17-23: *Agnetina cocandica*: abdominal tip of male: dorsal view (18), lateral view (17); hemitergum in lateral view (19); abdominal tip of female (20); head and pronotum of adult (21); egg (22, 23).

Agnentina extrema (NAVAS)

Figs. 24-31

Togoperla extrema NAVAS, 1912. Eugenievka, Primorskiy Kray, Russia, lectotype ♂ [desig. ZHILTZOVA, 1995] (Zoological Institute, Russian Academy of Sciences, St. Petersburg).

Kamimuria sibirica KLAPÁLEK, 1921. syn. LEVANIDOVA and ZHILTZOVA, 1979.

Kamimuria costalis NAVAS, 1923. syn. ZHILTZOVA, 1979.

Phasganophora brevipennis: RAUŠER, 1968, not NAVAS, 1912, not KLAPÁLEK, 1921.

Agnentina extrema: SIVEC et al., 1988.

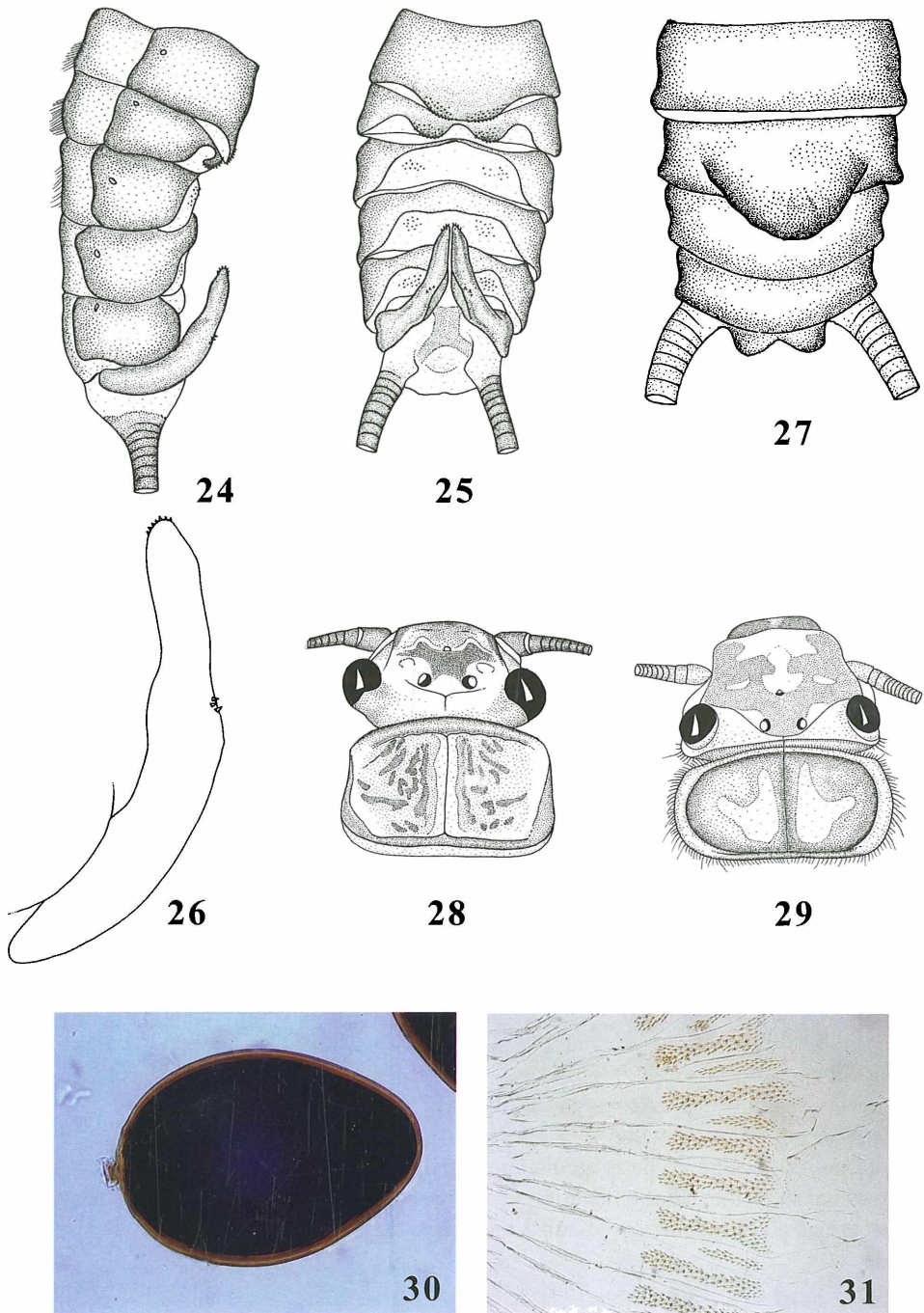
Male.- Macropterous. Forewing length 10-12 mm. General color brown. Head patterned with dark brown to black pigment over ocelli and extending forward to M-line; area of dark pigment invaded with pale pigment between posterior ocelli and bordered sharply with yellow on the sides (Fig. 28); occiput dusky brown, antennae and lappets brown. Pronotum dark but with a narrow median yellow band; rugosities dark, indistinct from background of disc (Fig. 28). Wings brown with dark brown veins. Legs brown with femora darker in distal half and tarsi dark brown. Cercal bases pale brown but darker distally. Abdomen pale on venter and sides, dark on terga. T5 produced into a rounded lobe overlapping T6 base; T6 produced into a distinctly bilobed process overlapping T7 base; T7 and T8 with large mesal membranous areas (Figs. 24, 25); sensilla basiconica patches on lobes of T5 and T6 and in membrane of T7 and T8. Hemiterga in dorsal aspect wide at basal curve with a low softer area offset by a low carina; apical half of hemiterga finger shaped (Fig. 25); in lateral aspect hemiterga are gently sinuate, curved forward from the base and with no distinct ankle (Fig. 26). Sensilla basiconica are clustered at the tips and near the basal curve.

Female.- Macropterous. Forewing length 15-16,5 mm. Subgenital plate variable with margins irregularly rounded but with scalloping sometimes forming a slightly offset apical tab and with apex sometimes slightly notched (Fig. 27). Plate extends over base and anterior third of S9.

Egg.- Length 0,40 mm, width 0,27 mm. Collar nipple shaped. General shape oval but with collar end wider, narrowing slightly beyond the equator to a broadly rounded tip (Fig. 30). Chorion without reticulation.

Larva.- Dark pigment pattern on head extends forward between posterior ocelli to median ocellus, laterally to antennal bases and along sides of frons (Fig. 29); dark pattern encloses two lateral oval pale areas near antennal bases and a large stalked mushroom shaped area forward of median ocellus which connects with a transverse pale area along anterior margin of frons. Dusky pigment also occurs along occipital fringe and around compound eyes. Pronotal margins pale and median band dark. Major proventricular bands short and armed with 5-7 rows of acanthae, which are reduced to three rows near midlength and expanded to four near tip (Fig. 31); accessory bands with about three rows of acanthae and extending for at least half the length of the major bands.

Distribution.- Central and eastern Russia from Krosnoyarsk and Mongolia and south of the River Vilyuy (tributary of Lena) to Amur and Primorskiy Kray. Questionably recorded from a female taken at Nyda (Obskaya Guba) (Fig. 56).



Figs. 24-31: *Agnetina extrema*: abdominal tip of male: dorsal view (25), lateral view (24); hemitergum in lateral view (26); abdominal tip of female (27); head and pronotum of adult (28); head and pronotum of larva (29); egg (30); proventricular bands (31).

***Agnentina immersa* (McLACHLAN), comb. nov.**
Figs. 32-39

Perla immersa McLACHLAN, 1875. Tashkent, Uzbekistan, holotype ♀ [heavily damaged] (Zoological Museum, MGU, Moscow).

Male.- Brachypterous. Forewing length 8-10 mm; body length 14-16 mm. General color brown. Head pattern dark brown in ocellar area, extending laterally to antennal bases and forward to anterior ocellus; between hind ocelli the pigment is paler but somewhat darker behind suture; lappets dark and median area forward of M-line pale brown (Fig. 36). Pronotum pale yellow-brown with narrow dark median line; rugosities and anterior disc margin darker (Fig. 36). Head wider than pronotum. T5 produced into a rounded lobe overlapping base of T6; T6 produced into a medially notched lobe slightly overlapping T7 base; T7 and T8 with large mesal membranous areas; T9 bearing an anteromesal lobe (Figs. 32, 33); sensilla basiconica clustered on lobes of T5 and T6 and sparse or absent on T7 and T8. Hemitergal lobes pale, dorsal aspect of hemiterga thick and wide at basal curve; a low curved carina extends from inner hemitergal margins at basal curve, diagonally to outer margins, forming a prominent dorsal depression; around anterior margin of carina a row of 3-6 large sensilla basiconica are located (Fig. 33); apical region of hemiterga rather straight and tapered to tip; ventrolateral aspect of hemiterga angled at midlength, dorsolateral aspect sinuate with expression of a thick ankle (Fig. 34). Sensilla basiconica clustered at hemitergal tip, ankle and basal curve.

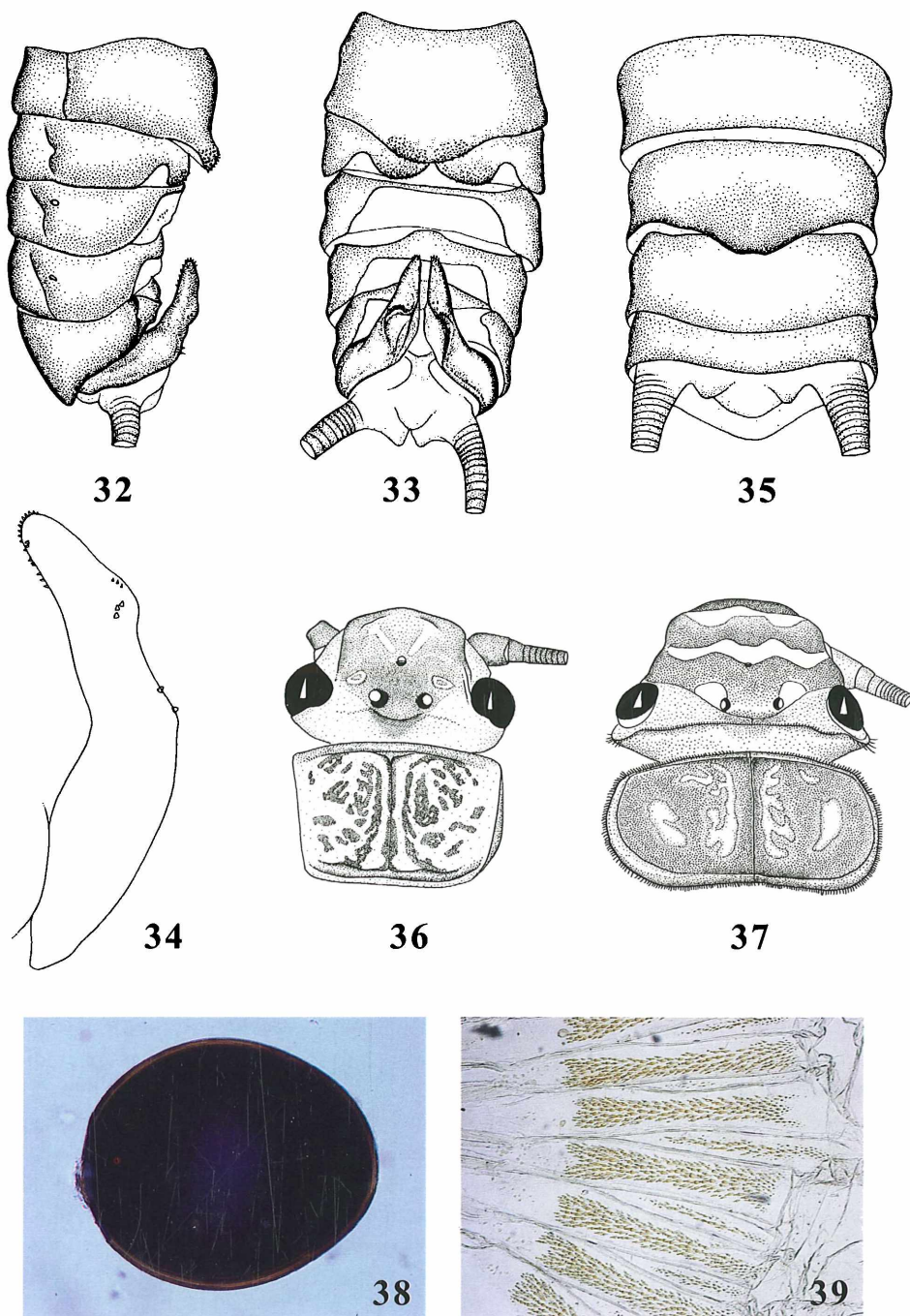
Female.- Macropterous. Forewing length 16-21,5 mm; body length 20-25 mm. Similar to male in coloration but not as dark. Subgenital plate variable, only slightly produced into a short, wide tab with apical margin truncate, rounded, or more typically emarginate, forming a slightly bilobed structure (Fig. 35).

Egg.- Length 0,39 mm, width 0,30 mm. Collar a low, relatively wide, button like structure. General shape oval with greatest width above equator, nearer collar end; outline narrowed slightly to a broadly rounded tip (Fig. 38). Chorion without reticulation.

Larva.- Head pattern with pale M-line distinct. Dark pigment behind M-line extends through ocellar area and reaches occipital fringe; callus lateral to hind ocelli distinct. Forward of M-line a transverse dark pigment band separates the M-line from the pale pigment found along the anterior margin of the head. Occiput with dusky areas near compound eyes (Fig. 37). Lateral pronotal margins pale; disc dark along midline; dark pattern on central disc interrupted by a pair of large irregular yellow areas. Major proventricular bands armed throughout length with 5-7 rows of acanthae but slightly narrowed at midlength. Most accessory bands about half as long as major bands and slender, with 2-3 acanthae rows (Fig. 39).

Distribution.- West Tien Shan region (Fig 56).

Comments.- The holotype subgenital plate figured in the original description (McLACHLAN 1875) does not show the mesal notch present on the specimen. In material at hand, the wide head and short wings gives specimens a distinctive, almost carrot-like shape.



Figs. 32-39: *Agnetina immersa*: abdominal tip of male: dorsal view (33), lateral view (32); hemitergum in lateral view (34); abdominal tip of female (35); head and pronotum of adult (36); head and pronotum of larva (37); egg (38); proventricular bands (39).

Agnentina pedata (KOPONEN)

Figs. 40-47

Neophasganophora pedata KOPONEN, 1949. Yssyk Kul, Kirghizstan, holotype ♂ (Helsinki Museum).

Agnentina dubia ZWICK, 1984. Kishl, Shut, Buchara, Uzbekistan, holotype ♀ (Zoological Institute, Russian Academy of Sciences, St. Petersburg) [replacement name], syn. nov.

Agnentina pedata: ZWICK, 1984.

Male.- Macropterous. Forewing length 10-12 mm; body length 12,5-15 mm. General color pale brown. Head with darker pigment between hind ocelli and extending forward as a diffuse patch to M-line; calluses and M-line distinct; area forward of M-line darker (Fig. 44). Pronotum brown with scattered pale rugosities; midline dark but often with narrow pale pigment stripe invading dark band for much of length along midline. T5 produced into a rounded lobe overlapping T6 base; T6 produced into a notched lobe which approaches T7 base; T7 and T8 with large mesal membranous areas (Figs. 40,41); sensilla basiconica clustered on lobes of T5 and T6, sparse or absent on T7 and T8. Dorsal aspect of hemiterga with slight carina extending forward from inner margins of basal curve forward, becoming less distinct but reaching inner margin forward of basal curve (Fig. 41); hemiterga gently sinuate in lateral aspect but with a slightly angulate bend at basal curve; ankle indistinct (Fig. 42). Sensilla basiconica clustered at hemitergal tip and dorsally at midlength.

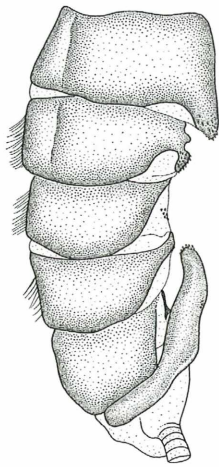
Female.- Macropterous. Forewing length 16-18 mm; body length 16-20 mm. Subgenital plate very variable. Margins of plate rounded or almost truncate, sometimes weakly notched (Fig. 43). Central area of plate pale, margins usually brown.

Egg.- Length 0,39 mm, width 0,27 mm. Collar indistinct, outline oval but generally wider at collar end and tapering to a broadly rounded tip (Fig. 46). Chorion without reticulation.

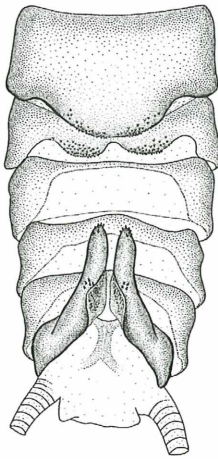
Larva.- Dark pigment on head forward of hind ocelli along M-line and anterolaterally forward of M-line. Area between hind ocelli paler; occiput dark behind eyes (Fig. 45). Pronotum dark along midline and in central disc, but center of disc with several irregular large pale areas; lateral pronotal margins pale. Major proventricular bands wide at base and armed with about 8-10 acanthae rows but reduced quickly to 2-3 rows of larger acanthae for most of length, becoming wider with 3-4 acanthae rows near ends of bands; accessory bands more than half as long as major bands, wider at base with about 4 acanthae rows and reduced to a single row at apex (Fig. 47).

Distribution.- Southern Kazakhstan and around Lake Yssysk Kol in Kirghizstan (Fig. 56).

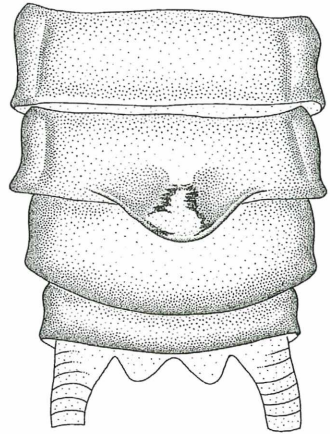
Comments.- Brink's editorial comments in KOPONEN'S (1949) posthumous paper indicates the type specimen could not be located. ZWICK (1984) states, based on this comment, that the type "is unfortunately lost" However, the type has been relocated and although the abdominal tip is missing, one of us (LAZ) was able to associate topotype material with the holotype based on other characters. ZWICK (1984) proposed *A. dubia* as a replacement name for *A. brevipennis* (KLAPÁLEK 1921, not NAVAS 1912) after that species was transferred to the genus. Eggs extracted from Klapálek's holotype in the Zoological Institute, St. Petersburg, are consistent with those dissected from specimens of *A. pedata*, consequently we place *A. dubia* as a junior synonym of that species.



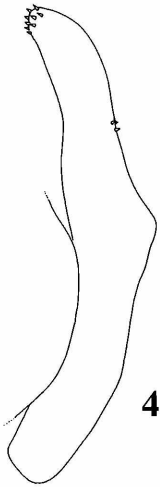
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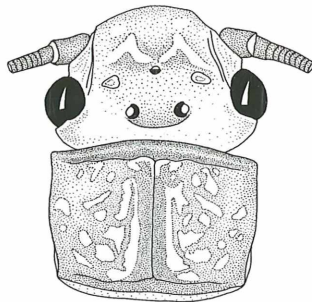
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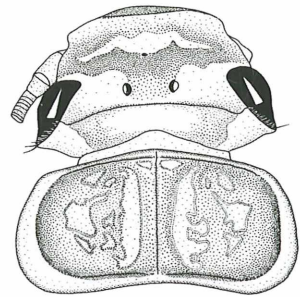
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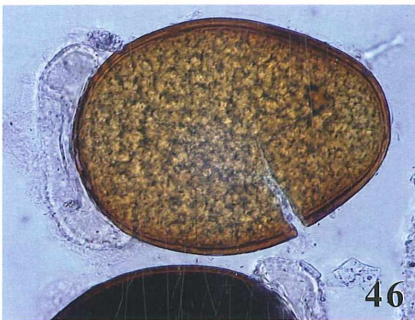
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Figs. 40-47: *Agnetina pedata*: abdominal tip of male: dorsal view (41), lateral view (40); hemitergum in lateral view (42); abdominal tip of female (43); head and pronotum of adult (44); head and pronotum of larva (45); egg (46); proventricular bands (47).

Agnentina senilis KLAPÁLEK

Figs. 48-55

Agnentina senilis KLAPÁLEK, 1921. Mineralny Wody, Russia, lectotype ♀ [desig. ZWICK, 1984] (National Museum, Prague).

Agnentina acutipennis KLAPÁLEK, 1921. syn. ZHILTZOVA, 1995.

Agnentina senilis: ZHILTZOVA, 1964.

Agnentina senilis: ZWICK, 1984.

Agnentina senilis: ZHILTZOVA, 1995; invalid lectotype designation.

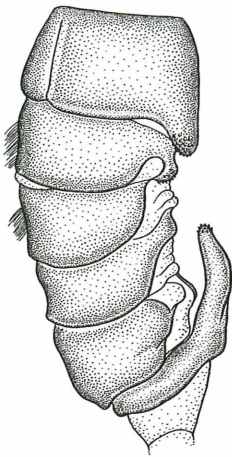
Male.- Macropterous. Forewing length 9-10 mm. General color pale brown. Head pattern with dark pigment from suture, between ocelli and extending to distinct M-line; occiput mostly pale; area forward and lateral to M-line dark (Fig. 52). Pronotum relatively pale but with dusky brown along midline and diffusely scattered over disc; pale rugosities scattered on disc. T5 produced into a rounded lobe overlapping T6 base; T6 produced into a mesally notched or emarginate lobe which covers T7 base; T7 and T8 with large mesal membranous areas (Fig. 49); sensilla basiconica clustered on lobes of T5 and T6, sparse or absent on T7 and T8; membrane of T7 and T8 appearing wrinkled in lateral aspect (Fig. 48). In dorsal aspect, hemiterga appear pale and finger-like with a low, short carina on inner margins at basal curve (Fig. 49). In ventrolateral aspect the hemiterga are bent abruptly near basal curve and appear gently sinuate beyond the bend (Fig. 50); ankle indistinct; sensilla basiconica clustered at tip and on dorsal margin beyond basal curve.

Female.- Macropterous. Forewing length 19-20 mm. Subgenital plate variable. Plate outline irregularly rounded to truncate and extending over base of S9. Dark pigment present on sides and base of plate but pale mesally to plate apex (Fig. 51).

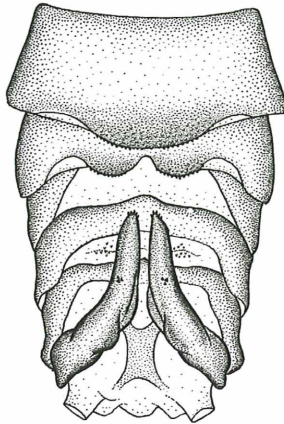
Egg.- Length 0,39 mm, width 0,27 mm. Collar low and relatively wide. Outline oval, widest near equator and on collar end, tapering to a broadly rounded tip (Fig. 54). Chorion without reticulation.

Larva.- Head pattern dark between ocelli and extending forward to M-line and laterally to antennal bases; forward of M-line mostly pale; occiput pale (Fig. 53). Pronotum pale around lateral and posterior margins; area along midline with diffuse pale brown pigment; disc darker but with an irregular, large pale area within dark area. Major proventricular bands with about 5-7 acanthae rows at base, reduced to 1-2 rows at midlength and widened to 3-4 rows at apex. Accessory bands about half as long as major bands and about five acanthae rows wide at base, narrowing abruptly to 1-2 rows in basal fourth of band (Fig. 55).

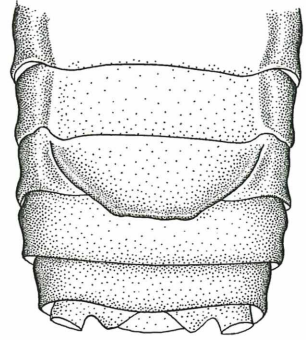
Distribution.- From Crimea (Ukraine) to Georgia through the foothills of the Caucasus to Rostov (Fig. 56).



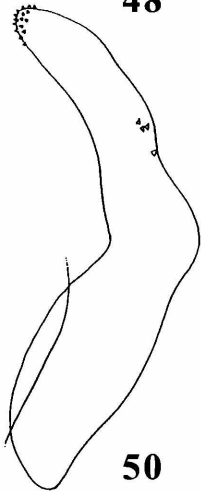
48



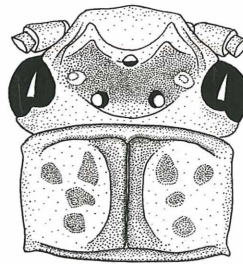
49



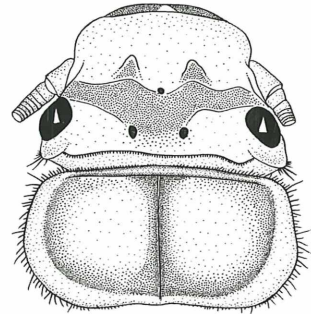
51



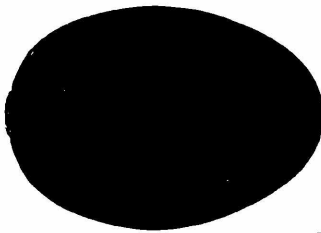
50



52



53



54



55

Figs. 48-55: *Agnetina senilis*: abdominal tip of male: dorsal view (49), lateral view (48); hemitergum in lateral view (50); abdominal tip of female (51); head and pronotum of adult (52); head and pronotum of larva (53); egg (54); proventricular bands (55).

Keys to Eastern Palearctic *Agetina*

The following keys to adults and larvae of *Agetina* are quite preliminary due, in part, to the faded condition of much of the material. As fresh specimens become available it may be necessary to revise the couplets that are based on color pattern and doubtlessly new and more obvious characters may be developed.

Males

- | | |
|---|--------------------|
| 1. Brachypterous | 2 |
| Macropterous | 4 |
| 2. T5 notched; hemiterga short, wide and bent near tip on dorsolateral margin (Figs. 10, 11) | <i>cadaverosa</i> |
| T5 rounded; hemiterga longer and sinuate or smoothly curved on dorsolateral margin (Fig. 3) | 3 |
| 3. Hemiterga angled on ventrolateral margin and sinuate along dorsolateral margin (Figs. 33, 34) | <i>immersa</i> |
| Hemiterga evenly curved along both margins in lateral aspect (Fig. 3) | <i>brevipennis</i> |
| 4. Hemiterga sinuate along ventrolateral and dorsolateral margins (Fig. 26); pronotum dark brown with a pale median band | <i>extrema</i> |
| Hemiterga distinctly angulate along ventrolateral or dorsolateral margins (Fig. 18); pronotum rather pale, with or without a dark median band | 5 |
| 5. Pronotum with dark pigment bands on either side of median suture | 6 |
| Pronotum pale along median suture; dorsal aspect of hemiterga with a prominent carina at basal curve (Fig. 18) | <i>cocandica</i> |
| 6. Dark pigment on head extends behind posterior ocelli onto occiput; hemiterga angulate on dorsolateral margin near midlength (Fig. 41) | <i>pedata</i> |
| Dark pigment on head not extending through ocelli to occiput; hemiterga angulate on ventrolateral margin near midlength (Fig. 50) | <i>senilis</i> |

Females

- | | |
|--|-------------------|
| 1. Pronotum with a pale background, numerous dark rugosities and a narrow dusky brown midline (Figs. 13, 36) | 2 |
| Pronotal pigment pattern not as described above (Figs. 28, 5, 44, 52) | 3 |
| 2. Forewing length at least 24 mm; egg length 0,54 mm; egg rather symmetrically rounded on both ends (Fig. 15) | <i>cadaverosa</i> |
| Forewing length no more than 22 mm; egg length 0,39 mm; egg somewhat spindle shaped, narrowed more beyond equator than near collar (Fig. 38) | <i>immersa</i> |
| 3. Pronotum dark with a narrow median pale band (Fig. 28); egg collar distinctly nipple shaped (Fig. 30) | <i>extrema</i> |
| Pronotal pattern not as above; egg collar nipple shaped or button shaped (Figs. 7, 46, 54) | 4 |

- | | |
|---|--------------------|
| 4. Pronotum pale along median suture | <i>cocandica</i> |
| Pronotum with narrow dark pigment bands on either side of median suture (Figs. 5, 44, 52) | 5 |
| 5. Dark pigment on head not extending onto occiput | <i>senilis</i> |
| Dark head pigment present on occiput behind ocelli | 6 |
| 6. Egg collar a small nipple set on a thickened polar plate (Fig. 7) | <i>brevipennis</i> |
| Egg collar obscure, but not set on thickened polar plate (Fig. 46) | <i>pedata</i> |

Larvae (*A. cocandica* unknown)

- | | |
|---|--------------------|
| 1. Pale area forward of median ocellus narrowly stalked and somewhat expanded beyond dark head pattern of frons (Figs. 6, 29) | 2 |
| Pale area forward of median ocellus not stalked | 3 |
| 2. Dark pronotal disc pigment extends over flange to lateral margins (Fig. 6); posterolateral pronotal fringe setae rather uniformly short (Fig. 6); major proventricular bands more than twice as long as accessory bands (Fig. 8) | <i>brevipennis</i> |
| Dark pronotal disc pigment not extending over flange (Fig. 29); posterolateral pronotal fringe setae mixed, irregular in length (Fig. 29); major proventricular bands about 1.5 times as long as accessory bands (Fig. 31) | <i>extrema</i> |
| 3. Transverse dark pigment band anterior to median ocellus completely encloses M-line (Figs. 37, 45) | 4 |
| Dark pigment anterior to median ocellus diffuse and not completely enclosing M-line (Figs. 14, 53) | 5 |
| 4. Area between ocelli completely filled with dark pigment from suture to median ocellus; major proventricular bands similar in width at each end and with at least 4 rows of acanthae at midlength (Fig. 39) | <i>immersa</i> |
| Area between ocelli with some pale pigment between posterior ocelli and over suture (Fig. 45); major proventricular bands much wider at one end and narrowed to 2-3 rows at midlength (Fig. 47) | <i>pedata</i> |
| 5. Major proventricular bands with at least 7 acanthae rows reduced to about 3 rows at midlength (Fig. 16) | <i>cadaverosa</i> |
| Major proventricular bands with at most 5 acanthae rows reduced to a single row at midlength (Fig. 55) | <i>senilis</i> |

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