

Revision of the genus *Empis* Linnaeus (Diptera: Empididae) from Russia and neighbouring lands. I. Subgenus *Xanthempis* Bezzi

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The subgenus *Xanthempis* Bezzi of the genus *Empis* L. has been revised in the eastern Palaearctic, with special reference to the fauna of Russia and neighbouring lands. Taxonomic status and distribution of 30 species have been discussed, of which 11 are described as new to science: *E. adzharica* sp. n. (Georgia), *E. alanica* (Russia: North Caucasus), *E. belousovi* sp. n. (Russia: the Far East), *E. kovalevi* sp. n. (Georgia), *E. kozlovi* sp. n. (Russia: Transbaikalia; Mongolia), *E. oxilara* sp. n. (the Ukraine: the Crimea), *E. pavli* sp. n. (Georgia), *E. richteri* sp. n. (Russia: East Siberia, Buryatia), *E. subscutellata* sp. n. (the Ukraine: the Crimea), *E. zinovjevae* sp. n. (Georgia), *E. zlobini* sp. n. (Russia: the Far East). The key to the Palaearctic *Xanthempis* species are given.

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Introduction

The genus *Empis* is one of the largest groups in the family Empididae. It includes, at least in the Palaearctic region, more than 350 species. The representatives of this genus are extremely diverse in habitus (2 to 12 mm long), inhabit different biotopes, and are usually more numerous from late spring to early summer. The nectar-feeding dominates in adults, although predatory activity, or mixed feeding, or predatory activity only during the mating period were also observed. The species of the genus *Empis* is well known because of their peculiar epigamic behaviour which has been described for many species. Flies of this genus are usually well-represented in collections, although they have been most well studied within the western part of

the Palaearctic region only. The systematic of the genus is very problematic even within the Palaearctic and the subgeneric division of this group should be undoubtedly revised (Chvala, 1994). The fauna of the genus *Empis* from Russia and neighbouring lands remains poorly studied. According to the Palaearctic Catalogue (Chvala, Wagner, 1989), about 65 species are recorded within this region, and this is only a minor part. The subgenus *Xanthempis* includes 25 species in the Palaearctic region on the whole and 5 species among them are recorded from the territory of the former USSR. Several new species were described during the past years (Chvala, 1994, 1996; Daugeron, 1997). The primary purpose of this revision is to clarify the fauna and identification of the eastern Palaearctic species of the subgenus *Xanthempis*.

Materials

This study is based on vast collections of the Zoological Institute, Russian Academy of Sciences (St. Petersburg) and the Zoological Museum of the Moscow State University. Actually, the materials collected by many entomologists during about the past 130 years were examined. In addition, some type materials deposited in the Hope Entomological Collections (England, Oxford), Biosystematic Research Centre (Canada, Ottawa), and Museum für Naturkunde der Humboldt-Universität (Germany, Berlin) were studied. The types of new species described below are deposited in the collections of the Zoological Institute (ZIN), the Russian Academy of Sciences (St. Petersburg) and the Zoological Museum of the Moscow State University (ZMMU).

Subgenus *Xanthempis* Bezzi, 1909

Xanthempis Bezzi, 1909: 88 (as subgenus of *Empis*).

Type species: *Empis stercorea* Linne, 1761 (orig. des.)

Generally large and yellow, body length from 4 to 8 mm. Head elongate posteriorly, with post-occiput very convex. Occiput behind ocelli often with species-specific dark pattern. Eyes rather small, broadly dichoptic and with all ommatidia equally small in both sexes. Frons shorter than face. Face bare. Antennae inserted above middle of head in profile, very long and slender; 1st antennal segment at least 3 times longer than wide (except *E. scutellata*, *E. testiculata*, and *E. subscutellata*); 2nd segment always shortest, globular; 3rd segment conspicuously prolonged, longest among antennal segments; style shortened; 1st and 2nd segments bearing short black setulae. Palpi small, bearing only several minute hairs. Proboscis long and rather strong. Thorax with reduced (especially in *E. digramma*) but a very specialised and species-specific distinctive chaetotaxy: generally, 1 *h*, 1 *ph* (or lacking), 1 to 3 *ntpl*, 1 *sa* (or lacking), 1 *pa*, 1 to 3 pairs of *sc*; *dc* uniserial or irregularly biserial (*E. lutea*, *E. albifrons*), few in number (but no more 10); *ac* lacking (except *E. lutea* female and *E. albifrons*), but even if present never arranged in regular rows; all strong bristles usually surrounded by additional short (or minute) setulae. Length, number, and position of thoracic bristles vary often, even on the left and right sides of mesonotum. Metapleura bears only a few hair-like bristles (metapleural fan) surrounded usually shorter additional hairs. Prothorax large, prosternum (partly fused

with episterna) with minute fine hairs at sides only; pronotum (prothoracic collar) well-developed and bilobed, bearing several strong spine-like bristles. The ground-colour of thorax varies from completely yellow (in most species) to completely grey-black (*E. stiryaca*, *E. semicinerea*, *E. testiculata*). Mesonotum (even if completely or partly dark-grey) often with specific pattern of dark longitudinal stripes or spots. Wings large, elongated and always hyaline, stigma usually indistinct or yellowish and very faint (if present), veins brown-black to yellowish (usually becoming yellowish toward base). Axillary lobe slightly developed and axillary excision obtuse, at least 90. Radial fork broadly "open", obtuse. Legs simple, long and slender; usually yellow, without any black pattern; femora and tarsi never dilated or thickened. No distinct bristles except for circlets of preapical bristles on femora and tibiae and very short dorsal bristles on tibiae. Abdomen covered with rather sparse short hairs and bristles, with distinct hind-marginal bristles on the last (8th) pregenital segment and 1st tergite only (except *E. scutellata*, *E. subscutellata*, and *E. testiculata*). Sclerites of 8th abdominal segment in male with a tendency to a complete fusion to form a single ring-like sclerite. Male genitalia enlarged, of simple structure in ground-plan. Dorsal lamellae (cerci, according to Cumming et al. [1995]) are usually of complicated structure and deeply excised. Lateral lamellae (epandrium) are rather simple. Ventral lamella (hypandrium) is always small, only partly covering aedeagus at its extreme base, bearing sometimes short hair- or spine-like bristles. Aedeagus (phallus) is simple, strongly varying in length, sometimes with loops and bends, usually with a characteristically shaped sheath-like opening at tip. Female abdomen with last two segments elongate and cerci very long and slender.

Key to the Palaearctic *Empis* (*Xanthempis*) species

Remarks. Taking into account the taxonomic difficulty of this subgenus and the fact that many species either have never been keyed or described as new to science, I give the key to the *Xanthempis* species from the Palaearctic region on the whole. I have not examined some *Xanthempis* species included in the Key given below. *E. rohaceki*, *E. lagoensis*, *E. algecirasensis*, *E. loewiana*, and *E. dispina* were keyed following Chvala (1996), *E. testiculata* corresponds to Engel's (1943) description, and *E. sesquata*, *E. chopardi*, *E. edithae*, and *E. ifranensis* are presented in accordance with their original descriptions (Ito, 1961; Daugeron, 1997).

1. 1st antennal segment very short, slightly longer than 2nd segment 2
 — 1st antennal segment long, at least 3 times longer than wide, much longer than 2nd segment 3
- 2(1). Mesonotum yellow, light grey pollinose, rarely almost greyish, with a very narrow, almost linear, darker median stripe. Occiput behind ocelli dark-grey up to lower row of bristles. Male: dorsal lamellae with two blunt processes, aedeagus recurved at tip. — W, S and Central Europe *scutellata* Curtis
 — Mesonotum largely dark-grey, with two darker narrow median stripes. Occiput behind ocelli dark-grey almost up to neck. Male: dorsal lamellae with one blunt process, aedeagus straight at tip. — The Crimea *subscutellata* sp. n.
- 3(2). Thorax yellow in ground-colour, pleura at most with dark spots 4
 — Thorax, including pleura, completely greyish-black 40
- 4(3). Mesonotum uniformly coloured 5
 — Mesonotum with dark pattern (stripes or spots), even if mostly dark grey 17
- 5(4). *sa* bristle present 6
 — *sa* bristle absent 9
- 6(4). *dc* bristles irregularly 2-serial, *acr* bristles present (except *lutea* male) 7
 — *dc* bristles 1-serial, *acr* bristles absent 8
- 7(6). Frons and occiput shining yellow in upper part. 1 strong *ntpl* bristle. Male: *acr* bristles absent; aedeagus evenly arched, broad at base; dorsal lamellae simple, lateral lamellae with a long narrow projection behind. — W, S and Central Europe *lutea* Meigen
 — Frons and occiput wholly silvery pollinose. 2 *ntpl* bristles. Male: *acr* bristles present, even if fine; aedeagus slender and straight, directed upwards, and with a loop before tip; dorsal lamellae bifurcate, lateral lamellae with a short triangular-shaped projection. — Central Europe *albifrons* Bezzi
- 8(6). Occiput with a black patch behind ocelli. Male: aedeagus slender, bent before tip. — Central Europe (Carpathians) *rohaceki* Chvala
 — Occiput uniformly yellow behind ocelli. Male: aedeagus with a swelling between base and preapical bend. — The Caucasus *kovalevi* sp. n.
- 9(5). 2 equally strong *ntpl* bristles; abdominal setae whitish. Prothoracic spiracle pale. Male: genitalia small, closed, lamellae simple, aedeagus short. — W, NW and central Europe *laetabilis* Collin
 — 1 strong *ntpl* bristle; abdominal setae blackish 10
- 10(9). Prothoracic spiracle black to brown. Notopleural line black 11
 — Prothoracic spiracle pale to yellow 13
- 11(10). Occiput, including ocellar tubercle, yellow. Male: aedeagus deeply S-shaped. — The Caucasus *pavli* sp. n.
 — Occiput with a dark spot just behind ocellar tubercle 12
- 12(11). 5–6 pairs of *dc* bristles. Occiput behind ocelli with a large black-grey spot reaching to lowest row of bristles. Male: aedeagus straight and upturned, slender throughout, terminal opening transparent and cup-like. — The Caucasus *ponti* Chvala
 — 8–10 pairs of *dc* bristles. Occiput behind ocellar tubercle with a small, elongate-triangular, brownish indistinct spot. Male: aedeagus gently curved, with short beak-like apical part. — Transbaikalia *kozlovi* sp. n.
- 13(11). Occiput yellow to reddish-yellow, without dark pattern, at most ocellar tubercle brownish 14
 — Occiput behind ocellar tubercle with dark, somewhat silvery-grey pollinose pattern 15
- 14(13). Ocellar tubercle brownish. Basal antennal segments yellowish-brown. Male: aedeagus long and slender, gently curved, pointed toward apex. — The Caucasus *caucasica* Bezzi
 — Ocellar tubercle yellowish. Antennae black. Male: aedeagus slightly undulating, or twice gently bent; apical opening enlarged, spoon-like. — The Italian Alps *lagoensis* Chvala
- 15(13). Mesonotum shining yellow, or at least subshining. Upper part of occiput black. Antennae usually black. Notopleural line black, at least posteriorly. About 6 pairs of *dc* bristles. — W, S and Central Europe, the Caucasus *concolor* Verrall
 — Mesonotum dull, greyish or silvery-grey pollinose. About 8–10 pairs of *dc* bristles 16
- 16(15). Occiput behind ocellar tubercle almost entirely blackish-grey. Antennae black. — Spain *algecirasensis* Strobl
 — Occiput behind ocellar tubercle with a median blackish-grey spot above neck. Basal antennal segments yellowish. — Spain *nevadensis* Chvala (Figs 26, 72)
- 17(4). Thoracic bristles very reduced, minute. Mesonotum with 2 dark, narrow, longitudinal stripes on a broad greyish median stripe. Squamae and abdomen almost bare. Head yellow, occiput with a small polished black patch behind ocelli. Prothoracic spiracle yellow. — Europe *digramma* Meigen

- Thoracic bristles well developed 18
- 18(17). Mesonotum with 2 pairs of brownish large spots between lateral margins and *dc* bristles. *sa* bristle present. Occiput with a narrow elongate dark spot behind ocelli. Prothoracic spiracle brownish. — The Caucasus *adzharica* sp. n.
- Mesonotal pattern consisting of longitudinal stripes 19
- 19(18). Mesonotum with a single dark median stripe 20
- Mesonotum with 2 or more stripes 32
- 20(19). Prothoracic spiracle black or brown 21
- Prothoracic spiracle yellow. Mesonotum at least finely greyish pollinose, median stripe broadened, or with a grey shadow at sides. Abdominal setae pale. (Here belongs also *E. unistriata* Becker known from Swiss Alps from female only) 29
- 21(20). Mesonotum (viewed from above) with a blackish broad median stripe between *dc* bristles, brown laterally (including notopleura). — N Africa: Morocco (Atlas) *chopardi* Daugeron
- Mesonotum shining yellow, with a narrow, contrasting black median stripe occupying at most half of the region between *dc* bristles. Abdominal setae black 22
- 22(21). Occiput black-brown behind ocelli. *dc* bristles situated on dark line. Median stripe of equal width along the whole length, disappearing on prescutellar depression. — S Europe *kuntzei* Becker (Figs 4, 21, 46, 69)
- Occiput behind ocelli partly yellow, with distinct dark spot 23
- 23(22). Occiput with a small elongate brownish spot behind ocelli 24
- Occiput with a large brownish spot behind ocelli 27
- 24(23). Median stripe occupying half of the region between *dc* bristles, widened anteriorly. Male: apical opening of aedeagus large, with a deep marginal excision. — The Far East *zlobini* sp. n.
- Median stripe occupying at most one third of the region between *dc* bristles 25
- 25(24). Median stripe disappearing just before scutellum. Occiput with distinct wedge-shaped spot. Male: lateral lamellae broad; hypandrium without prominence, bearing 2 small spinules; apical opening of aedeagus long, with straight margins. — The Far East *belousovi* sp. n.
- Median stripe disappearing before prescutellar depression 26
- 26(25). Mesonotum (viewed from above) shining, median stripe distinct. Occiput with a wedge-shaped spot. Male: lateral lamellae broad; hypandrium with a small pointed prominence bearing 2 minute hair-like bristles. — Japan (Hokkaido), Kuriles *japonica* Frey
- Mesonotum (viewed from above), including median stripe, finely silvery-grey pollinose leaving region between the stripe and *dc* bristles shining. Occiput with a drop-like spot. Male: lateral lamellae narrow; hypandrium with a large prominence bearing 2 spinules. — Transbaikalia *richteri* sp. n.
- 27(23). Occiput behind ocelli with a rounded spot. Male: aedeagus long, thin, evenly curved. — The Caucasus *alanica* sp. n.
- Occiput behind ocelli with a rhombus-like spot 28
- 28(27). Male: lateral lamellae concave above; aedeagus bent beyond middle, short apical part as stout as basal part. Female: fore and hind tibiae with uniformly small hairs, without small dorsal bristles. — Throughout the Palaearctic region *stercorea* Linnaeus
- Male: lateral lamellae convex above; aedeagus bent at middle, basal part with a swelling, apical part as long as, but much more slender than, basal part. Female: fore and often also hind tibiae with 1 or 2 small black bristles above. — W, NW and Central Europe *aemula* Loew
- 29(20). Mesonotum with a pair of black-brown spots laterally and a broad black median stripe. Occiput with a diamond-shaped black spot. *dc* bristles outside the dark median stripe. 1 *ntpl* bristle. *sa* bristle absent. — Japan (Honsyu) *sesquata* (Ito)
- Mesonotum with a median stripe only 30
- 30(29). Mesonotum with a narrow black median stripe as in *stercorea*, but margins right up to *dc* bristles greyish. Occiput yellow, with a narrow dark median strip-like patch. — Central Europe *loewiana* Bezzi
- Mesonotum with a broad blackish-grey median stripe occupying most of the region between *dc* bristles 31
- 31(30). *sa* bristle present. *dc* bristles situated partly outside the brown median stripe (on yellow ground) and partly on the stripe margin. 2 *ntpl* bristles. Scutellum with 3 pairs of bristles. — the Caucasus *zinovjevae* sp. n.
- *sa* bristle absent 32
- 32(31). *dc* bristles outside the dark median stripe (on yellow ground). 1 *ntpl* bristle. Occiput above neck mostly black. Male: genitalia with 3 stripe-like projections on dorsal lamella behind. — Throughout Europe (including the Urals) *univittata* Loew

- *dc* bristles on the margin of the dark median stripe (on black ground). At least 2 *ntpl* bristles 33
- 33(32). Pronotum with 3 to 6 black spines on each side. Scutellum with a pair of large bristles. All tibiae with the usual short setae ventrally. — Central Europe *aequalis* Loew
- Pronotum with 10 to 12 strong black spines on each side. Scutellum with 2 pairs of large bristles. Fore and mid tibiae with very long *av* and *pv* setae, hind tibiae with similar *pv* bristles. — Central Europe *laeta* Loew (Figs 5, 22, 47)
- 34(19). Mesonotal stripes on yellow background 35
- Mesonotal stripes on dark-grey background 37
- 35(34). *sa* bristle absent. Mesonotum with 2 narrow brown-black stripes along the line of *dc* bristles. Occiput behind ocelli with a large brownish spot divided by narrow yellowish median line. Prothoracic spiracle black. — The Crimea *oxilara* sp. n.
- *sa* bristle present. Mesonotum with 3 well defined black stripes, *dc* bristles on the yellow background. Thoracic pleura uniformly yellow 36
- 36(35). Occiput behind ocelli largely polished black. Prothoracic spiracle blackish. Male: aedeagus very long and thin. — Throughout Europe (including the Urals) *trigramma* Wiedemann
- Upper half of occiput uniformly rather light-grey pollinose. Prothoracic spiracle yellowish. Male: aedeagus short and rather stout. — The Caucasus *adriani* Chvala
- 37(34). *sa* bristle present. Mesonotum light-grey pollinose, leaving only lateral margins yellow, *dc* bristles situated on narrow dark lines. — Spain *dispina* Chvala
- *sa* bristle absent 38
- 38(37). Prothoracic spiracle yellow. 2 *ntpl* bristles. Mesonotum lighter grey pollinose in anterior view, with 2 narrow black lines between *dc* bristles; humeri and posthumeral region yellowish. — SW and Central Europe *testacea* Fabricius
- Prothoracic spiracle brown to blackish. 1 *ntpl* bristle. Mesonotum (viewed from above) with a duller black median stripe and 2 shorter and somewhat broader stripes at sides; in anterior view the lateral stripes invisible 39
- 39(38). Male: aedeagus almost equally slender throughout. — Throughout Europe (including the Urals) *punctata* Meigen
- Male: aedeagus with a large swelling at basal part and a small swelling at apical part. — N Africa: Morocco (Atlas) ... *edithae* Daugeron
- 40(3). Prothoracic spiracle yellow. — Greece (Crete) *testiculata* Bezzi
- Prothoracic spiracle blackish to brown 41
- 41(40). *sa* bristle absent. Squamae with black fringes. Mesonotum almost uniformly blackish-grey, stripes indistinct. Abdomen and legs darkened. — Central Europe (Alps) *styriaca* Strobl
- *sa* bristle present. Squamae with pale fringes 42
- 42(41). Mesonotum with 4 narrow brownish stripes. Male: aedeagus short, simple, pointed toward apex. — N Africa: Morocco (Atlas) *ifranensis* Daugeron
- Mesonotum with 2 distinct blackish stripes on the lines of *dc* bristles. Male: aedeagus rather slender, strongly curved in apical part. — S and Central Europe *semicinerea* Loew

Faunistic account

Remarks. Fifteen species of *Xanthempis* were included in the Key to the insects from the European part of the USSR (Gorodkov, Kovalev, 1969) although only 4 species had been definitely recorded within this territory by that time. Since this monograph is most popular and available in Russia, I consider it necessary to discuss all *Xanthempis* species noted in it. The species, which have not yet been recorded within the territory of Russia and neighbouring lands, are marked with asterisk (*).

Empis (Xanthempis) adriani Chvala, 1996 (Figs 13, 38, 63)

Empis (Xanthempis) adriani Chvala, 1996: 14, Fig. 5.

Material examined. **Russia:** 1 female, Vladikavkaz, 7 V 1899 (leg. Demokidov); 1 male, Kuban' Prov. [now Krasnodar Terr.], 14 V 1911; 1 female, Kishi River (= Chegs), Maikop Distr., 18 VI 1911 (all leg. Volnukhin); 1 male, 1 female, Caucasus Nature Reserve, from herbaceous cover, 22 VI 1935 (all leg. Deev); **Azerbaijan:** 2 females, 3 males, Pirkuli, 20 km N of Shemakhi, forest, 20 V 1972 (all leg. V. Richter). All these specimens are deposited in the ZIN.

Occiput behind ocellar tubercle with a large brown-grey spot leaving eye margins narrowly yellow. Antennae black. Thorax yellow, pleura unicolour, without any darkening. Mesonotum with 3 broad dark stripes separated by very narrow yellow regions, lateral margins broadly yellow including humeri,

broad posthumeral region, whole of notopleural and prescutellar depressions, and postalar calli. Scutellum almost uniformly yellow except an indistinct shadow at base, metanotum with a grey central spot. The three dark mesonotal stripes equally broad, the median one shorter, ending before scutellar depression. Thoracic chaetotaxy: 1 *h* (several minute spinules anteriorly), *ph* lacking, 1 *ntpl* (two additional shorter bristles and some still smaller setulae in front of notopleural depression); 1 *sa*, 1 *pa*, and a pair of *sc*; *acr* lacking, *dc* uniserial, very fine and small, about 8 setae in a row, ending in 2 longer bristles. Pronotum with 8 to 9 unequal black spine-like bristles on each side. Metapleura with about 5 rather small and weak bristles. Prothoracic spiracle yellow. Legs yellow, tarsi darkened, almost blackish, basitarsi mostly yellow; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 black costal bristle, axillary excision obtuse. Abdomen including genitalia yellow, all tergites with indistinct dark triangular patches dorsally. Male genitalia: lateral lamellae blunt on both tips and covered with long hairs; dorsal lamellae (pointing forwardly) narrow and with a small hook-like projection anteriorly at tip; aedeagus short, thick, almost concealed within lamellae.

Male length: body 4.2–4.6 mm, wing 5.0–5.8 mm.

Female length: body 4.9–5.6 mm, wing 5.2–5.7 mm.

Differential diagnosis. According to the mesonotal pattern *E. adriani* can be referred to *E. trigramma* only. It differs from the latter in many distinctive characters given partly in the key.

Remarks. Chvala (1996) described this species from two specimens which were collected by A. C. Pont in Georgia in the environs of Kazbegi. The material I examined shows that *E. adriani* is rather common throughout the Caucasus Mountain Ridge, although this species has not yet been recorded from its western slopes. *E. ponti* is likely to be the Caucasian endemic. The species is found in forests on the mountain slopes, apparently at many altitudes reaching 2100–2200 m, within the time-period from May 7 to July 10–11.

Distribution. Russia: Krasnodar Terr., North Ossetia. Azerbaidjan, Georgia.

***Empis (Xanthempis) adzharica* Shamshev, sp.n.** (Figs 39, 82–83)

Material. Holotype: male, Georgia: Adzharia, environs of Kabuleti, Kintrish Nature Reserve, 17 V 1971 (leg. V. Kovalev) — deposited in the ZMMU.

Paratypes. Georgia: 2 females, Sukhumi, Kelasuri, oak forest, 18 V 1969 (leg. Gorodkov) — deposited in the ZIN.

Diagnosis. Rather a mid-sized species with very characteristic mesonotal pattern consisting of 2 pairs

of brownish large lateral spots; occiput including ocellar tubercle yellow, without any pattern; 1 *sa* bristle; prothoracic spiracle brownish.

Description. Male. Head yellow. Face, frons and occiput slightly shining. Face along eye margins and occiput finely silvery pollinose. Frons broad, parallel-sided, bearing 4–5 blackish, very short, adpressed marginal setulae. Face as broad as frons, somewhat widening below. A pair of short, ocellar bristles. Ocellar tubercle yellowish. Occiput behind ocelli without any dark pattern, in some view with narrow elongate polished spot. Chaetotaxy of occiput includes 2 strong long bristles on each side nearer to eye margin; 9–10 setulae just behind ocellar tubercle; an upper irregular, transverse row of short bristles; and a lower, more or less regular, transverse row of long strong bristles (16–18) becoming finer and hair-like below nearer to mouth-opening. Antennae, including stylus, yellowish-brown, 3rd segment somewhat darker. Third antennal segment long and narrow, 2nd segment globular. First and 2nd antennal segments bearing short black setulae. Ratio of length and width for 1st antennal segment 1.9:0.5; for 2nd segment 0.7:0.6; for 3rd segment 3.6:0.7. Proboscis yellowish, labrum brownish at apex. Ratio of proboscis length to head height 11.4:5.2. Palpi short oval, yellow at basal half and brownish-yellow at apical half; covered with short dense white pubescence; bearing 7–8 brownish setae including a longer apical bristle, 3 bristles near base, and 3–4 somewhat shorter bristles nearer to apex. Thorax yellow, slightly shining. Prothoracic spiracle and notopleural line brownish. Mesonotum on each side with a brownish indistinct spot before *ph* bristle and the same spot on level of *sa* bristle (posterior spots more distinctly pronounced in females). All thoracic bristles black. Thoracic chaetotaxy: 1 *h* (2–3 minute setulae anteriorly); 1 *ph*; 2 *ntpl* (5 minute setulae anteriorly); 1 *sa*; 1 *pa* (a short setula beside); 2 pairs of *sc* (inner ones longer); *acr* lacking; *dc* uniserial, very thin and short (except a prescutellar pair), 9–10 bristles in a row. Pronotum on each side with 8–10 straight spine-like bristles of different length. Metapleura with 3 long and 4 shorter and thinner black setae. Legs long and slender, yellow, tarsi brownish-yellow toward apex. Coxae bearing black hairs and bristles. Femora covered with very short adpressed black bristles, densely pubescent ventrally; all femora with 1 strong short preapical bristle anteriorly. Tibiae covered with very short adpressed black bristles; fore and hind tibiae with 2–3 relatively long dorsal bristles varying in length and position. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hyaline, with brown veins becoming lighter (including costa) near

base. One black short costal bristle. Stigma lacking. Squamae yellow, covered with numerous rather long brownish hair-like fringes. Axillary angle obtuse. Halteres yellow. Abdomen yellow, slightly shining; with an indistinct, relatively narrow, dark stripe; covered with short black hairs and bristles. Genitalia: lateral lamellae broad, with a well pronounced rounded projection, covered with dense long hairs; dorsal lamellae with two excisions; aedeagus relatively short and thick, pointed at tip, hook-like curved before apex.

Length body 5.1 mm, wing 6.9 mm.

Female. Resembling male in all details except for sexual differences. Cerci long, narrow, brown.

Length body 5.4—6.0 mm, wing 6.9—7.5 mm.

Differential diagnosis. *E. adzharica* can be easily distinguished from all *Xanthempis* species by a combination of very characteristic mesonotal pattern consisting of 2 pairs of brownish large lateral spots and 1 *sa* bristle.

Etymology. The species is named after the geographical place in the Caucasus where it was collected.

Distribution. Georgia.

***Empis (Xanthempis) aemula* Loew, 1873**
(Fig. 64)

Empis aemula Loew, 1873: 228.

Material examined. **Ukraine:** 1 male, Chinadievo, 50 km NE of Mukachevo, Carpathians, 22 V 1978 (leg. A. Zinov'ev) — in the ZIN.

Description. A large species with a rhombus-like brown-black spot on occiput behind ocelli. Antennae black, basal segments sometimes lighter. Thorax yellow to reddish-yellow. Mesonotum with a narrow brown-black median stripe sometimes varying in shape. Thoracic chaetotaxy: 1 *h* (several minute hairs anteriorly), 1 *ph*, 1 *ntpl* (several very short hairs in front of notopleural depression); *sa* lacking; 1 *pa*; 2 pairs of *sc* (inner pair longer), sometimes with additional pair of very short hair-like bristles; *acr* lacking, *dc* uniserial, very fine and small in anterior part of mesonotum, becoming longer toward scutellum, about 10—11 hairs in a row. Pronotum with about 7—8 short spine-like bristles on each side. Metapleura with about 6 long bristles and about the same number of additional shorter hairs. Prothoracic spiracle black. Legs yellow, tarsi brownish; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, one black costal bristle. Abdomen, including genitalia, yellow, all tergites with a dark median stripe dorsally. Male genitalia: lateral lamellae with convex upper margin; dorsal

lamellae with a large projection bearing a long bristle; dorsal lamellae posteriorly, and hind upper margin of lateral lamellae with long black setae; aedeagus slender, especially on a long apical part behind the angular bend, and with a distinct inner swelling before the bend.

Male length: body 6.3—7.3 mm, wing 8—9 mm.

Female length: body 7—8.2 mm, wing 7.5—8.3 mm.

Differential diagnosis. *E. aemula* is closely related to *E. stercorea*. Actually, these two species differ each from other by male genitalia structure only (as given in the Key). In addition, *E. aemula* resembles *E. alanica* sp. n. though the latter has the occiput with a round spot and long, thin, evenly curved aedeagus.

Remarks. This species is rather widely spread in Europe (more common for submontane regions), including South Scandinavia. *E. aemula* is likely to be the European species, the extreme eastern border of the area going to north from the submontane Carpathians to south of Sweden. I have also examined the only specimen of *E. aemula* collected in Central Europe which is deposited in the collection of the ZIN: 1 male, Marba, 8 VI 1869, *Empis stercorea* L., Kowarz det., No 331. It corresponds to the description of this species given by Collin (1961) in all details.

Distribution. Ukraine: Carpathians.

****Empis (Xanthempis) aequalis* Loew, 1867**
(Figs 1, 14, 40, 65)

Empis aequalis Loew, 1867: 20 and 13.

Description. Rather a large species (more than 5 mm long), occiput with a dark spot leaving the broad postocular margins and sides yellow. Antennae black. Thorax yellow. Mesonotum with a broad, greyish-black median stripe occupying the whole area between *dc* bristles, the latter situated on the dark margins of the stripe. Thoracic chaetotaxy: 1 *h*, 1 smaller hair-like *ph*, 2—3 *ntpl*, *sa* lacking, 1 *pa*, and 1 pair of *sc* (rarely with a minute hair on each side); *acr* lacking, *dc* uniserial, very fine and small (except 2—3 prescutellar pairs). Pronotum with 3—6 rather small black spine-like bristles on each side. Metapleura with about 4—5 fine dark setae. Prothoracic spiracle yellow. Legs yellow, tarsi darkened; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, one short and thin costal bristle. Abdomen including genitalia yellow, all tergites with distinct darker triangular spots dorsally. Male genitalia [figured in details by Engel (1943)]: lateral lamellae long rectangular; dorsal lamellae broadly oval, with a small narrow dorsal excision at about middle; aedeagus thickened at basal part.

Differential diagnosis. This species is closely related to *E. univittata*, *E. laeta*, and *E. loewiana* though differing from them in several distinctive characters given in the Key. *E. aequalis* also resembles *E. adzharica* sp. n., however, the latter have a *sa* bristle that distinguishes it among all species fore-noted.

Remarks. *E. aequalis* is only known from the central parts of Europe. I have seen the lectotype of this species designed by M. Chvala. I have also found a single undetermined specimen of *E. aequalis* (coll. ZIN) which, however, was taken from the Central Europe: 1 female, Thusis, Graubund, Schweiz, 23 VII 1910 (leg. J. Wagner). There is also one more specimen of this species determined by Kowarz.

***Empis (Xanthempis) alanica* Shamshev, sp.n.**
(Figs 15, 41, 84—85)

Material. *Holotype*: male, **Russia**: environs of Pyatigorsk, NE slope of Mt. Mashuk, 9 V 1996 (leg. Lantsov).

Paratype. **Russia**: 1 male, North Caucasus, Arkhyz, Kyafiragur, 26 VII 1939 (leg. D'yakonov). All type specimens are deposited in the ZIN.

Diagnosis. Rather a large species with a very narrow brown stripe on mesonotum; occiput with a large round spot behind ocelli; no *sa* bristle; prothoracic spiracle black; aedeagus very long and thin, pointed at apex.

Description. Male. Head reddish-yellow. Frons and face finely silvery-grey pollinose; frons with a small, slightly shining, dark spot behind antennae; occiput and mouth-opening margins slightly shining. Frons broad, parallel-sided, bearing 4—5 blackish very short adpressed marginal setulae. Face as broad as frons, parallel-sided. One pair of short, ocellar bristles. Ocellar tubercle dark-brown. Occiput behind ocelli with a large dark-brown round spot. Chaetotaxy of occiput includes 2 strong long bristles on each side nearer to eye margin; 2 pairs of thin bristles just behind ocellar tubercle; an upper irregular transverse row of short bristles; and a lower more or less regular transverse row of long strong bristles (16—18) becoming finer and hair-like below nearer to mouth-opening. Third antennal segment and stylus black, 1st and 2nd segments yellowish-brown. Third antennal segment long and narrow, 2nd segment globular. First and 2nd antennal segments bearing short black setulae. Ratio of length and width for 1st antennal segment 2.1:0.6; for 2nd segment 0.7:0.7; for 3rd segment 4.2:0.7. Proboscis yellowish, labrum brownish at apex. Ratio of proboscis length to head height 11.3:5.6. Palpi elongate oval, reddish-yellow, covered with short dense white pubescence, bearing 7—8 brownish setae including a longer apical bristle and same bristle near base. Thorax yellow,

slightly shining. Pleura above coxae finely silvery-grey pollinose only. Prothoracic spiracle and notopleural line black. Mesonotum along median line with a very narrow dark-brown stripe beginning from anterior margin of mesonotum, and ending before prescutellar depression. All thoracic bristles black. Thoracic chaetotaxy: 1 *h* (2—3 minute setulae anteriorly); 1 *ph*; 2 *ntpl*, lower one much more thinner and shorter (5 minute setulae anteriorly); *sa* lacking; 1 *pa* (1 very thin and short setula beside); 1 pair of converging *sc*; *acr* lacking; *dc* uniserial, very thin and short (except 2 prescutellar pairs), 7 bristles in a row. Pronotum on each side with 5 straight strong spine-like bristles of different length. Metapleura with 2 long black and 5—6 short setae. Legs long and slender, yellow, tarsi brownish-yellow. Coxae with black hairs and bristles. Femora covered with very short adpressed black bristles, densely pubescent ventrally; all femora with 1 strong short preapical bristle anteriorly. Tibiae covered with very short adpressed black bristles; all tibiae with 2—4 relatively long dorsal bristles varying in length and position. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hyaline, with dark-brown veins becoming almost yellow (except for costa) basically. One black short costal bristles. Stigma lacking. Squamae yellow, covered with numerous rather long black hair-like fringes. Axillary angle obtuse. Halteres yellow. Abdomen yellow, slightly shining. All segments covered with short black hairs and bristles. Genitalia: lateral lamellae nearly triangular; dorsal lamellae with two excisions; aedeagus very long, thin, gently curved and needle-shaped at apical part.

Length: body 4.7—4.8 mm, wing 6.3—6.5 mm (holotype body 4.7 mm, wing 6.3 mm).

Female. Unknown.

Differential diagnosis. Although *E. alanica* sp.n. is closely related to *E. stercorea* and *E. aemula* in many characters however it can be easily distinguished from all species of this complex by shape of aedeagus which is unusually long and thin.

Etymology. The species is named after the historical name "Alania".

Distribution. **Russia**: Stavropol', Krasnodar Terr.

****Empis (Xanthempis) albifrons* Bezzi, 1909**

Empis nana Loew, 1867: 21 (not Macquart, 1823) (preocc. name) *Empis (Xanthempis) albifrons* Bezzi, 1909: 91 (new name).

Description. A species with occiput without dark pattern, densely silvery-grey pollinose at upper part right up to the lower row of black bristles. Anten-

nae black. Thorax yellow. Mesonotum without any pattern. Thoracic chaetotaxy: 1 thin short *h*, 1 small *ph*, 2 *ntpl*, 1 thin short *sa*, 1 *pa*, and 1 pair of *sc*; usually 2 pairs of equally fine *acr* at about middle of mesonotum, *dc* irregularly biserial, hair-like including the last prescutellar pair. Pronotum with several short hairs on each side. Metapleura usually with 4—5 long hair-like bristles and additional shorter dark hairs. Prothoracic spiracle yellow. Legs yellow, tarsi darkened, almost blackish; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 short costal bristle. Abdomen, including genitalia, yellow. Male genitalia very distinctive [figured in details by Chvala (1994, p. 156)]: lateral lamellae with the short outer projection; dorsal lamellae long bifurcate near base; aedeagus rather slender, pointing upwards, and with a distinct, apically broadened loop before a thread-like tip.

Male length: body 4.2—4.5 mm, wing 5.3—6.0. Female length: body 4.0—6.0 mm, wing 5.3—6.0 mm.

Differential diagnosis. This species can be easily distinguished from all other *Xanthempis* species by the *acr* bristles (even in males) and a peculiar aedeagus. However, females of *E. albifrons* resemble females of *E. lutea* (second *Xanthempis* species with *acr* bristles) in many respects but the latter has a single *ntpl* bristle and upper half of the occiput is shining, yellow.

Remarks. *E. albifrons* is only known from temperate Europe, it is more common for higher altitudes. I have not seen the type of this species but 3 specimens of *E. albifrons* are deposited in the collection of the ZIN: 3 females, Styria alp., *Empis nana* Lw., Strobl det. These specimens correspond to the redescription of this species (Chvala, 1994) in all details.

***Empis (Xanthempis) belousovi* Shamshev, sp.n.**
(Figs 16, 42, 86—88)

Material. Holotype: male, **Russia**: Primorsk Terr., 40 km SE Ussurijsk, 25 V 1985 (leg. A. Ozerov) — deposited in the ZMMU.

Paratypes. 1 female, **Russia**, Iman River, Kartun, 26 VI 1913 (leg. Buyanova); 2 males, 1 female, Sakhalin Island, Due, 20 VI 1914 (all leg. Belousov) — deposited in the ZIN.

Diagnosis. Resembling *E. stercorea*, occiput behind ocelli with a narrow dark-brown wedge-shaped spot; aedeagus evenly curved, with a bend just before the long apical opening, lateral lamellae broad, hypandrium without prominence.

Description. Male. Head reddish-yellow. Face, frons, and occiput finely silvery pollinose; mouth-opening margins narrowly shining. Frons broad,

parallel-sided, bearing 4—5 blackish very short adpressed marginal setulae. Face broader than frons, slightly widening below. One pair of short ocellar bristles. Ocellar tubercle black-brown. Occiput behind ocelli with a dark-brown wedge-shaped spot covering ocellar tubercle and reaching lower row of bristles. Chaetotaxy of occiput includes 2 strong long bristles on each side nearer to eye margin; 2 pairs of short adpressed bristles just behind ocellar tubercle; an upper regular transverse row of short bristles, 4—6 rather short bristles in centre, and a lower more or less regular transverse row of long strong bristles (about 12) becoming finer and hair-like below nearer to mouth-opening. Third antennal segment, except base, and stylus black, 1st and 2nd segments, and 3rd segment at base yellowish-brown. Third antennal segment long and narrow, 2nd segment globular. First and 2nd antennal segments bearing short black setulae. Ratio of length and width for 1st antennal segment 2.6:0.5; for 2nd segment 0.8:0.7; for 3rd segment and stylus 4.5:0.6:0.8. Proboscis yellowish, lighter near base. Ratio of proboscis length to head height 12.1:5.6. Palpi elongate oval yellow, covered with short dense white pubescence and bearing 5—6 blackish thin bristles. Thorax yellow, slightly shining. Pleura finely silvery-grey pollinose. Prothoracic spiracle and notopleural line brownish. Mesonotum along median line with a dark-brown, finely silvery-grey pollinose stripe occupying 1/3 of area between rows of *dc* bristles, widening anteriorly, having indistinct margins, beginning from anterior margin of mesonotum, and ending on prescutellar depression nearer to scutellum. Scutellum and metanotum with dark spot (very weakly pronounced in lighter specimens). All thoracic bristles black. Thoracic chaetotaxy: 1 *h* (3 very short to minute setulae anteriorly); 1 *ph*; 1 *ntpl* (about 7 minute setulae anteriorly); *sa* lacking; 1 *pa* (1 very thin and short setula beside); 2 pairs of converging *sc* (inner pair much more longer and stronger); *acr* lacking; *dc* uniserial, very short and fine in anterior part, 8 bristles in a row, 2 prescutellar pairs longest. Prosternum with 8—9 very short and fine blackish bristles. Pronotum on each side with 6—7 straight strong spine-like bristles of different length. Metapleura with 4—5 long blackish and about 12 shorter and lighter bristles situated irregularly. Legs long and slender, yellow, tarsi brownish toward apex. Coxae finely silvery-grey pollinose, bearing black hairs and bristles. Femora covered with very short adpressed black bristles, densely pubescent ventrally. Tibiae covered with very short adpressed black bristles; all tibiae with 2—3 relatively long dorsal bristles varying in length and position. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hy-

aline, with brownish veins becoming lighter (including costa) near base. Costal bristle undeveloped. Squamae yellow, covered with numerous rather long brownish hair-like fringes. Axillary angle obtuse. Halteres yellow. Abdomen yellow, slightly shining; with distinct brownish elongate spots forming a stripe dorsally. All segments covered with relatively short brownish-yellow hairs and bristles. Genitalia: lateral lamellae broad, nearly triangular in apical part, with rounded apex; dorsal lamellae with two processes; aedeagus rather long, with a bend just before the long apical opening, the latter with straight margins.

Length: body 6.6–6.8 mm, wing 8.0–8.4 mm (holotype body 6.6 mm, wing 8.0 mm).

Female. Resembling male in all details except for sexual differences. Cerci brownish yellow.

Length: body 6.1 mm, wing 7.0 mm.

Differential diagnosis. *E. belousovi* is closely related to *E. zlobini* and *E. japonica*. However, the former has a broader median stripe on mesonotum, narrower lateral lamellae, the hypandrium with a triangular rounded prominence bearing 2 small spinules, and an apical opening of aedeagus with a deep marginal excision. The latter differs from the new species by the hypandrium with a small pointed prominence bearing 2 very short hair-like bristles and a short apical opening.

Etymology. The species is named after the name of the collector.

Distribution. Russia: Primorsk Terr., Sakhalin Island.

Empis (Xanthempis) caucasica Bezzi, 1909 (Fig. 66)

Empis (Xanthempis) caucasica Bezzi, 1909: 93.

Material examined. **Russia:** Stavropol' Terr.: 1 male, Essentuki, 16 VI 1926 (leg. L. I. Vladimirovskaya); Dagestan: 1 male, 1 female, Sergokala, broad-leaf forest, 31 V 1972 (all leg. V. Richter); North Ossetia: 4 males, 1 female, environs of Vladikavkaz, Dargavs, 24 VII 1925 (all leg. Kirichenko); Ingushetia: 1 male, Salgi, Tersk. Prov. [old administrative name], 5462 m, 4 VIII 1927 (leg. Kirichenko). **Armenia:** 1 male, 1 female, environs of Ankavan, 15 VII 1965 (all leg. V. Richter); 1 male, 1 female, Stepanavan, canon of Dzoraget River, 1500, 24 VI 1980 (all leg. Volkovich). **Georgia:** 1 male, 2 females, Tiflis [= Tbilisi] Prov., Armaz, near Mukhet, 5 VI 1911 (all leg. Bagdanov); 1 male, Lagodekhi Nature Reserve, canyon of Lagodekhi-teskhali River, 10 VII 1973 (leg. V. Richter). **Azerbaijan:** 1 male, Petrovsk-Port, 28 V 1926 (leg. Ryabov) — deposited in the ZIN.

Description. A species with uniformly yellow occiput (in some view with small elongate darkening occupying ocellar tubercle). Third antennal segment black, 1st and 2nd segments brown-yellow. Thorax reddish-yellow to yellow, slightly shining. Mesonotum without any pattern. Thoracic chaetotaxy: 1 *h* (with 1–2 much more shorter and 4–5 minute setulae), 1 *ph*, 1 *ntpl* (several minute setulae anteriorly), *sa* lacking, 1 *pa* (1 very short setula beside); 2 pairs of *sc* (inner pair longest); *acr* lacking; *dc* uniserial, long (last prescutellar pair longest), 6–7 pairs in a row. Pronotum with about 7 bristles on each side. Metapleura with 4–5 long setae and additional shorter dark hairs. Prothoracic spiracle yellow. Notopleural line yellow. Legs yellow, tarsi darkened toward apex; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 small black costal bristle. Abdomen including genitalia yellow. Male genitalia [figured in details by Chvala (1996: 10, Fig. 1.)]: lateral lamellae nearly triangular in shape; dorsal lamellae rather small, with a deep excision and inner surface covered with small spinules near anterior margin; aedeagus long and slender, gently curved, pointed toward apex.

Male length: body 5.6–5.8 mm, wing 6.4–6.8. Female length: body 6.1–6.3 mm, wing 7.3–7.5 mm.

Differential diagnosis. With its yellow mesonotum and absence of *sa* bristle *E. caucasica* belongs to complex of closely related species and especially does to *E. pavli*, *E. kozlovi*, *E. lagoensis*, *E. concolor*, *E. algecirasensis*, and *E. nevadensis*. All they have distinctive differences in male genitalia (at least shape of aedeagus). *E. pavli*, which is also known from the Caucasus and has like *E. caucasica* occiput behind ocelli without dark pattern, differs from its by black prothoracic spiracle and notopleural line, and strongly curved aedeagus. *E. kozlovi*, which is described in present paper from Transbaikalia, has, before black prothoracic spiracle, occiput behind ocelli with a very characteristic spot and quite different aedeagus resembling that rather in *univittata*-complex. *E. caucasica* is compared in the Key given above with *E. lagoensis* (Italy, Alps) but the latter has yellowish ocellar tubercle, black antennae and enlarged, spoon-like apical opening of aedeagus. *E. concolor* (wide-spread species), *E. algecirasensis* (Spain), and *E. nevadensis* (Spain) differs from *E. caucasica* by species-specific patterns on occiput behind ocelli and some other characters given partly in the Key.

Remarks. *E. caucasica* was not included in the Key to insects from the European part of the USSR, although it is widely distributed throughout the Caucasus. *E. caucasica* is undoubtedly the mountain species and appears to be the Caucasian endemic. It can be found from late May to August.

Distribution. Russia: North Ossetia, Dagestan, Ingushetia, Armenia, Azerbaijan, Georgia.

***Empis (Xanthempis) concolor* Verrall, 1872**
(Figs 2, 17, 43, 67)

Empis concolor Verrall, 1872: 283. *Empis occipitalis* Bezzi, 1909: 91 (MS name).

Material examined. Russia: Stavropol' Terr.: 2 males, Strizhament, environs of Stavropol', 1 VII 1973 (all leg. Tryapitsyn); Krasnodar Terr.: 1 female, North Caucasus, Karachaevesk, about 900 m, beech forest, 13 IX 1965 (leg. Gorodkov). Georgia: 3 males, 3 females, Sukhumi, Kelasuri, 18 V 1969 (all leg. Gorodkov) — deposited in the ZIN.

Description. A species with occiput largely blackish in upper part, including ocellar tubercle (the spot varying in size and colour intensity). Antennae black (sometimes basal segments brown to yellowish-brown). Thorax yellow to dark-yellow. Mesonotum without any pattern. Thoracic chaetotaxy: the strongest bristle is the upper posterior notopleural, the others smaller and finer; 1 *h* (with several minute hairs); 1 *ph*, 1 *ntpl* (several minute hairs along lower edge of notopleural depression), *sa* lacking, 1 *pa* (1 very short setula beside); 1 pair of *sc* (sometimes with a small hair each side); *acr* lacking; *dc* uniserial, rather small (in some specimens very small and fine), becoming slightly longer posteriorly (last two pairs longest), 6 pairs in one row. Pronotum with about 6 bristles on each side. Metapleura with 2—4 long setae and additional shorter dark hairs. Prothoracic spiracle pale to yellow. Notopleural line usually black, rarely almost white. Legs yellow, tarsi blackish. Wings hyaline, stigma indistinct, a short black costal bristle. Abdomen yellow; tergites often with an irregular darker pattern along anterior margin and along median line. Male genitalia [figured in details by Collin (1961: 456, Fig. 159) and Chvala (1994: 159, Figs 281—283)]: lateral lamellae long, triangular in shape; dorsal lamellae with a deep excision, larger upper process finger-like, blackish, the smaller lower one pale and bearing a strong black bristle; aedeagus rather short, stout and almost straight.

Male length: body 4.3—5.5 mm, wing 5.5—6.6 mm. Female length: body 5.0—6.6 mm, wing 6.0—6.5 mm.

Differential diagnosis. *E. concolor* is closely related to several species which are very similar externally. These are *E. pavli*, *E. kozlovi*, *E. lagoensis*, *E. algeriensis*, and *E. nevadensis*. Their differences have been discussed.

Remarks. A widely distributed in Europe species (including Great Britain). It can be found from the middle of May to the middle of September, on dates ranging from May 18 (Sukhumi) to September 13 (Karachaevesk). The last date is unusually late and appears to be the latest date of occurrence of both species and *Xanthempis* on the whole.

Distribution. Russia: Krasnodar Terr., Stavropol' Terr. Georgia: Abkhazia.

***Empis (Xanthempis) digramma* Meigen, 1835**
(Figs 3, 18, 44, 68)

Empis punctata: Fabricius, 1805 and Meigen, 1830, not *Empis punctata* Meigen, 1804. *Empis digramma* Meigen in Gistel, 1835: 69. *Empis bilineata* Loew, 1867: 20. *Empis diagramma* Meigen: Chvala and Wagner, 1989: 275 (misprint).

Material examined. Russia?: 1 female, Zherebkovo, 17 V 1927, leg. Znoiko — deposited in the ZIN.

Description. A large species with small eyes and jowls broad below eyes. Occiput (including ocellar tubercle) with a narrow polished black patch surrounded by a larger, dull, dark greyish spot. Antennae black, 1st and 2nd segments often brownish to yellowish-brown. Thorax yellow in ground-colour. Mesonotum with 2 narrow blackish grey stripes on a light-grey background; the greyish pollinose median stripe of about the same width posteriorly as scutellum, narrowing anteriorly, confined to the space between the two dark stripes. Thoracic chaetotaxy: all bristles extremely short and inconspicuous; 1 *h* (with several minute black dots); *ph* lacking, 1 *ntpl* (several minute dots in notopleural depression), *sa* lacking, 1 *pa*; 1 pair of minute *sc*; *acr* lacking; *dc* uniserial, in the form of very small dark hairs situated on dark narrow stripes, very inconspicuous throughout. Pronotum with about 8—10 black stubby spinules on each side on a produced lateral lobe. Metapleura with about 5 spinulae and additional small black dots. Prothoracic spiracle yellow. Legs yellow, tarsi black towards tip; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 very small costal bristle. Abdomen yellow; tergites with a more or less distinct blackish median stripe. Male genitalia [figured in details by Collin (1961: 468, Fig. 166) and Chvala (1994: 173)]: lateral lamellae produced posteriorly; dorsal lamellae small; aedeagus very stout at base, slender apically, with a curious loop near the middle. Male length: body 5.5—7.0 mm, wing 6.6—8.3 mm. Female length: body 5.0—8.3 mm, wing 7.0—8.3 mm.

Differential diagnosis. Many characters noted (including highly characteristic male genitalia) put this species aside all other *Xanthempis* species. Although *E. dispina* described recently from Spain (Chvala, 1996) has, according to the original description, a similar mesonotal pattern and the same size, it differs from *E. digramma* in many other characters, including quite different male genitalia. I have also seen one still undescribed species from the Caucasus (a female only) which is closely related to both

these species but differs, however, from them in some characters.

Remarks. *E. digramma* is widely distributed but uncommon for Europe, though it has not yet been recorded from its eastern part. There are 2 specimens of this species in the ZIN Collection caught in Romania (2 males, Bucsecs, Transsylvania, 1897 (leg. Grunaek), *Empis punctata* Fabr., det. Grunaek) and misidentified as *E. punctata*. In addition, there are 5 specimens determined by Strobl: 2 males, 2 females, Admont, Steierm., *Empis bilineata* Lw.; 1 female, Styria (all leg. Strobl).

Distribution. Russia?

***Empis (Xanthempis) japonica* Frey, 1955**
(Figs 19, 45, 80—81)

Empis (Xanthempis) japonica Frey, 1955: 8.

Material examined. **Russia:** Kuril Islands: 2 males, 3 females, Kunashir, Lagunnoe Lake, 12 VII 1954 (all leg. Violovich); 1 female, Kunashir, Yuzhno-Kuril'sk, 12 VII 1973 (leg. Kerzhner) — deposited in the ZIN.

Description. Occiput with an indistinct, brownish silvery-grey pollinose spot occupying ocellar tubercle. Third antennal segment black, 1st and 2nd segments yellowish-brown (in one specimen almost blackish). Thorax yellow to reddish-yellow. Mesonotal pattern as in *E. stercorea* but median stripe ending before prescutellar depression. Thoracic chaetotaxy: 1 *h* (3 minute hairs anteriorly), 1 thin *ph*, 1 *ntpl* (a shorter bristle somewhat below and several very short hairs anteriorly); *sa* lacking, 1 *pa* (with a very short setula anteriorly); 2 pairs (sometimes 1 pair) of *sc*, the inner pair much more stronger and longer; *acr* lacking; *dc* uniserial, very fine and small in anterior part of mesonotum, becoming longer toward scutellum (last 2 pairs strongest and longest), about 10 bristles in a row. Prosternum with 8—9 very short and fine blackish bristles. Pronotum with about 7—8 short spine-like bristles on each side. Metapleura with 5 long setae and about the same number of additional shorter hairs. Prothoracic spiracle brown. Legs yellow, tarsi darkened towards apex; covered with simple bristles and hairs. Wings hyaline, with indistinct stigma, a thin costal bristle. Abdomen yellow, with a dark-brown median stripe. Male genitalia: lateral lamellae broad, nearly triangular in shape; dorsal lamellae with two processes, the lower one bearing long bristle; aedeagus rather long, slightly curved, with 2 bends, broader in basal half; apical opening rather short, with straight margins.

Male length: body 5.6–5.8 mm, wing 7.6–7.8 mm. Female length: body 5.5–6.0 mm, wing 7.3–7.5 mm.

Differential diagnosis. *E. japonica* is most closely related to *E. belousovi* and *E. zlobini*. *E. stercorea* and, especially, *E. richteri* also resemble *E. japonica* but differ from them by some distinctive characters given in the Key.

Remarks. Frey (1955) described this species after 2 specimens (male and female) taken from Hokkaido (Kusiro, Akanko). I have not seen type specimens since they were not found in the Frey's Collection in Helsinki but the description of specimens identified as *E. japonica* coincide in all details with the original description of this species, including male genitalia which according to Frey are characterised as "Forceps triangular, lappenformig, wie aufgeblasen; die oberlamelle lappenformig, hinten mit 2 recht breiten, schwarzbeborsteten Zipfeln. Penis gelb, lang, breit bandformig abgeplattet, nahe der Spitze hakenformig". Based on black to brown prothoracic stigma, absence *sa* bristle, and mesonotal pattern (a single median stripe) Frey compared this species with *E. kuntzei* and *E. stercorea* only. Actually, *E. japonica* is typical representative of *stercorea*-complex. However, *E. kuntzei* (known from Corsica only) is smaller (5 mm), with occiput mostly blackish behind ocelli, and male genitalia somewhat different (Engel, 1943: Plate 21, Fig. 178). *E. stercorea* differs from *E. japonica* by a very characteristic pattern on occiput and male genitalia, as it has been given in the Key. It is interesting to note here that I have not found any specimens of *E. stercorea* taken from the Far East, although it is widely distributed throughout Siberia.

Distribution. Russia: Kuril Islands (Kunashir).

***Empis (Xanthempis) kovalevi* Shamshev, sp.n.**
(Figs 89—90)

Material. **Holotype:** male, West Georgia, Borzhomi Nature Reserve, 10 VIII 1969 (leg. V. Kovalev) — deposited in the ZMMU.

Diagnosis. Rather a small species with occiput and thorax completely yellow, mesonotum without any pattern, prothoracic spiracle brown, *ac* lacking, 1 *ph*, 1 *sa*, 2 *ntpl*.

Description. Male. Head yellow. Face, frons, and occiput finely silvery pollinose (denser on face and occiput); slightly shining; mouth-opening margins shining. Frons broad, parallel-sided; bearing 4—5 blackish very short adpressed marginal setulae. Face nearly as broad as frons, parallel-sided. One pair of short ocellar bristles. Ocellar tubercle brown. Occiput behind ocelli without any pattern. Chaetotaxy of occiput includes 2 long bristles on each side nearer to eye margin; 4 very short setulae just behind ocellar tubercle, an upper irregular transverse row of 6 short

bristles; and a lower regular transverse row of long strong bristles (about 12) becoming finer and hair-like below nearer to mouth-opening. 3rd antennal segment black, 1st and 2nd segments yellowish-brown, stylus dark-brown. 3rd antennal segment long and narrow, 2nd segment globular. 1st and 2nd antennal segments bearing short black setulae. Ratio of length and width for 1st antennal segment 1.4:0.4; for 2nd segment 0.5:0.5; for 3rd segment 3.0:0.6. Proboscis yellowish, labrum brownish at apex. Ratio of proboscis length to head height 10.3:4.6. Palpi short oval yellow, covered with short dense white pubescence, bearing a brownish thin relatively long bristle, and 3—4 shorter bristles near apex. Thorax uniformly yellow. Pleura finely greyish pollinose. Prothoracic spiracle and notopleural line brown. Mesonotum without any pattern, slightly shining. All thoracic bristles black. Thoracic chaetotaxy: 1 *h* (with 1 somewhat shorter and 2—3 minute setulae anteriorly); 1 *ph*; 2 *npl*, posterior one somewhat shorter (3 minute hairs anteriorly); 1 *sa*; 1 *pa* (1 very thin and short bristle beside); 2 pairs of convergent *sc* (inner pair much more stronger and longer); *acr* lacking; *dc* uniserial, strong, nearly equal in length, 6 bristles in a row. Pronotum on each side with 6—7 straight strong spine-like bristles of different length. Metapleura with 4 long black bristles and 5 shorter setulae, all bristles arranged irregularly. Legs long and slender, yellow, tarsi darker. Coxae with black hairs and bristles. Femora covered with very short adpressed black bristles, densely pubescent ventrally. Tibiae covered with short erected black hairs ventrally, fore tibiae with 1 short dorsal bristle at apical half. Tarsi simple, covered with short adpressed black bristles. Wings hyaline, with brownish veins becoming yellow (including costa) near base. One black costal bristles. Squamae yellow, covered with numerous rather long brownish hair-like fringes. Axillary angle obtuse. Stigma lacking. Halteres yellow. Abdomen yellow, slightly shining; with an indistinct darker stripe dorsally. All segments covered with short light-brown hairs and bristles. Genitalia: lateral lamellae with a well pronounced projection, the latter rounded at apex and covered with numerous long hairs; dorsal lamellae with two excisions; aedeagus curved under right angle, with a broad swelling between base and bend.

Length: body 4.3 mm, wing 5.9 mm.

Female. Unknown.

Etymology. The new species is named in the memory of Dr V. G. Kovalev, the Russian dipterologist, who collected it.

Differential diagnosis. *E. kovalevi* sp. n. is closely related to *E. rohaceki*, *E. lutea*, and *E. albifrons* differing from them in many distinctive characters. *M. rohaceki* has, according to the original descrip-

tion (Chvala, 1994), an occiput with a black patch behind ocelli, black antennae, and different male genitalia. *E. lutea* and *E. albifrons* differ from the new species by a more or less numerous *acr* bristles (except *E. lutea* male) and absolutely different male genitalia. So, *E. lutea* has the aedeagus evenly arched, broad at base; simple dorsal lamellae, and lateral lamellae with a long narrow process behind. In *E. albifrons* aedeagus is slender and straight, directed upwards, with a loop before apex; dorsal lamella is bifurcate.

Distribution. Georgia.

***Empis (Xanthempis) kozlovi* Shamshev, sp.n.**
(Figs 20, 91—92)

Material. *Holotype*: male, Sugu-Nur River, below Khara-Gol, Kent., 12—15 VII 1929 (leg. Kozlov).

Paratypes: 1 male, Russia, Chita Reg., environs of Chernyshevsk, Ulureiskii, river bank with willows and poplars, on yellow tent, 7 VIII 1977 (leg. V. Kovalev) — deposited in the ZMMU; 1 male, Transbaikalia, Bayan-Gol River, 15 VII 1961 (no the name of collector is given); 1 female, Chita Prov., 16 km ENE of Nerch. Zav., flood-lands, 23 VII 1975 (leg. V. Richter). The holotype and part of paratypes are deposited in the ZIN.

Diagnosis. Rather a large species with a yellow mesonotum, *sa* bristle lacking, a small brownish elongate-triangular spot on the occiput behind ocelli, black prothoracic spiracle and notopleural line.

Description. Male. Head yellow. Frons and face finely silvery-grey pollinose; occiput and mouth-opening margins slightly shining. Frons broad, somewhat narrowing toward antennal base, bearing 4—5 blackish very short adpressed marginal setulae. Face almost as broad as frons, slightly widening below. One pair of short ocellar bristles. Ocellar tubercle yellowish. Occiput behind ocelli with a small brownish elongate-triangular spot, rather densely silvery-grey pollinose. Chaetotaxy of occiput includes 2 rather short bristles on each side nearer to eye margin; 6—7 short thin adpressed bristles just behind ocellar tubercle; an upper irregular transverse row of short rather sparse bristles; and a lower more or less regular transverse row of long strong bristles (16—18) becoming finer and hair-like below nearer to mouth-opening. 3rd antennal segment and stylus black, 1st and 2nd segments yellowish-brown. 3rd antennal segment long and narrow, 2nd segment globular. 1st and 2nd antennal segments bearing short black setulae. Ratio of length and width for 1st antennal segment 2.1:0.7; for 2nd segment 0.7:0.7; for 3rd segment 4.4:0.8. Proboscis brownish-yellow. Ratio of proboscis length to head height 8.1:5.4. Palpi elongate oval yellow, covered with short dense white

pubescence and bearing a brownish thin bristle at apex and several shorter setulae nearer to base. Thorax uniformly yellow, slightly shining. Pleura finely silvery-grey pollinose. Prothoracic spiracle and notopleural line black. Mesonotum without any pattern. All thoracic bristles black. Thoracic chaetotaxy: 1 *h* (4 minute setulae anteriorly); 1 *ph*; 1 *ntpl* (with 1 shorter and 3 additional minute bristles); *sa* lacking; 1 *pa* (1 very thin and short bristle beside); 2 pairs of convergent *sc* (inner ones longer and stronger); *acr* lacking; *dc* uniserial, rather thin and short (except 2 prescutellar pairs), 8—9 bristles in a row. Pronotum on each side with 5 straight strong spine-like bristles of different length. Metapleura with a regular row of 4 long black bristles and 10—12 short setulae situated irregularly. Legs long and slender, yellow, tarsi darker toward apex. Coxae with black hairs and bristles. Femora covered with very short adpressed black bristles, densely pubescent ventrally. Tibiae covered with very short adpressed black bristles. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hyaline, with brownish veins becoming almost yellow (including costa) near base. One black short costal bristles. Squamae yellow, covered with numerous rather long brownish hair-like fringes. Axillary angle right. Halteres yellow. Abdomen yellow, slightly shining; all segments covered with short black hairs and bristles. Genitalia: lateral lamellae nearly triangular; dorsal lamellae with darkened upper process and short lower process; aedeagus with short beak-like apical part.

Length: body 5.4—5.7 mm, wing 6.2—6.8 mm (holotype body 5.6 mm, wing 6.6 mm).

Female. Resembling male in all details except for sexual differences. Cerci brownish.

Length: body 5.7 mm, wing 6.8 mm.

Differential diagnosis. *E. kozlovi* sp. n. undoubtedly belongs to the species complex characterised by the yellow mesonotum (without pattern) and the *sa* bristle absence. It is most closely related to *E. concolor*, *E. algecirasensis*, and *E. nevadensis*. However, all these species have a pale to yellow prothoracic spiracle. In addition, there are some differences in the shape and colour of the occipital pattern (they are given in the Key). Finally, they all differ from the new species in male genitalia. It is interesting to note that in male genitalia *E. kozlovi* mostly resembles *E. nevadensis* which is known from Spain.

Remarks. *E. kozlovi* is the first representative of *Xanthempis* from this part of the Palearctic region.

Etymology. The new species is named in honour of P. K. Kozlov, the Russian traveller, who was the first to collect it.

Distribution. Russia: Chita Prov., Yakutia. Mongolia?

****Empis (Xanthempis) laetabilis* Collin, 1926** (Figs 23, 70)

Empis (Xanthempis) laetabilis Collin, 1926: 237.

Description. Occiput with a more or less pronounced greyish spot behind ocellar tubercle. Antennae black, basal segments sometimes lighter. 1st antennal segment short, about 3 times longer than wide. Thorax yellow. Mesonotum usually darker, humeri and postalar calli (sometimes also scutellum) more clearly yellow. Thoracic chaetotaxy: 1 *h*, 1 very minute *ph*, 2 *ntpl*, *sa* lacking, 1 *pa*, 1 pair of *sc*, *acr* lacking, *dc* uniserial, fine and hair-like becoming longer toward scutellum, about 8—9 bristles in a row. Pronotum with 8—10 unequal black spine-like bristles on each side. Metapleura with 2—3 rather short bristles surrounded by additional shorter hairs. Prothoracic spiracle pale. Legs yellow, tarsi darkened, almost blackish, toward apex; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 short costal bristle. Abdomen including genitalia yellow, all tergites more or less darkened at least along anterior margins, hind-marginal bristles not differentiated. Male genitalia [figured in details by Collin (1961, p. 468) and Chvala (1994, p. 156)]: small, both lamellae simple; lateral lamellae membranous below, at tip with 3—4 small black spine-like bristles; tergite and sternite on segment 8 separated; aedeagus short, thick, practically hidden within lamellae.

Male length: body 4.0—4.8 mm, wing 5.2—6.3 mm. Female length: body 5.5—6.5 mm, wing 6.0—6.3 mm.

Differential diagnosis. *E. laetabilis* can be easily distinguished from all other *Xanthempis* species by a rather short 1st antennal segment, 2 strong *ntpl* bristles, a minute *ph* bristle, and small simple male genitalia. *E. ponti* resembles this species in the habitus but differs from *E. laetabilis* in many characters given partly in the Key. In many characters, including male genitalia, *E. laetabilis* is also closely related to *E. ifranensis* described recently from Morocco. However, the latter appears to have a mesonotum with stripes.

Remarks. Although *E. (X.) laetabilis* is known from several localities in Europe (including England and Scandinavia) it is a rare species everywhere (Chvala, 1994). I have studied 1 male and 1 female (Scotland) of this species from the Hope Entomological Collections (Oxford).

***Empis (Xanthempis) lutea* Meigen, 1804**

(Figs 6, 24, 48—49, 71)

Empis lutea Meigen, 1804: 228. *Empis fulva* Macquart, 1823: 160. *Empis ochracea* Curtis, 1824: plate 18 (nom. nudum). *Empis ochracea* Curtis, 1835: plate 18.

Material examined. **Ukraine:** 1 male, 1 female, environs of Mumshary, 40 km NE of Uzhgorod, beech forest, near stream, 500 m, 27 VII 1964; 11 males, 11 females, Malaya Ugol'ka, 30 km N of Tyachev, Carpathians, 20 VII 1964 (all leg. Gorodkov). **Hungary:** 3 males, 6 females, Szabadsag-hegy, Budapest, broad-leaved forest, 450—500 m, 28 VI 1970 (all leg. Gorodkov). **Austria:** 1 female, Sud-Steierm., leg. Strobl, *Empis lutea* Mg. — deposited in the ZIN.

Description. A small species with yellow occiput (ocellar tubercle black or darkened). Antennae black, basal segments often brownish. Thorax yellow. Mesonotum without any pattern. Thoracic chaetotaxy: all bristles (except *npl*, *pa*, and *sc* ones) small and fine; 1 *h* (about 3 additional shorter bristles); 1 *ph*, 1 *npl* (about 5 much more shorter additional bristles anteriorly), 1 *sa*, 1 *pa* (with a very short setula); 1 pair of *sc*; male: *acr* lacking; *dc* arranged in 2 irregular rows, fine and hair-like; female: *acr* present and hardly differentiated from *dc* bristles, the latter more numerous (in comparison with male), shorter and more spine-like, distributed down the middle of mesonotum and over its entire width in front of scutellar depression. Pronotum with about 4—5 short bristles on each side. Metapleura with 2—3 small black bristles and additional shorter dark hairs. Prothoracic spiracle yellow. Legs yellow, tarsi darkened; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 short black costal bristle. Abdomen including genitalia yellow. Male genitalia: lateral lamellae with conspicuously long, slender outer process; dorsal lamellae simple; aedeagus rather short, evenly curved, broader at base and gradually narrowed apically.

Male length: body 3.5—5.5 mm, wing 4.7—6.2. Female length: body 4.0—5.7 mm, wing 5.0—5.6 mm.

Differential diagnosis. With its fully yellow mesonotum, 1 *sa* bristle, presence *acr* bristles (except male), and some other characters this species can be compared to *E. albifrons*, *E. rohaceki*, and *E. kovalevi* only. The main differences are given in the Key.

Remarks. *E. lutea* is widely distributed throughout Europe (including England).

Distribution. Ukraine: Carpathians.

***Empis (Xanthempis) oxilara* Shamshev, sp.n.**

(Figs 25, 50, 93—94)

Material. **Holotype** male: **Ukraine:** the Crimea, 12 km N of Sudak, Lesnoe, oak forest, 22 V 1963 (leg. Gorodkov).

Paratypes. **Ukraine:** the Crimea: 2 females, Salgir Valley, 28 V 1899 (all leg. Bazhenov); 2 males, environs of Alushta, 12 V 1900 (all leg. N. Kuznetsov); 1 female, Alushta, Crimea Nature Reserve, 2 VI 1929; the same locality: 1 male, 5 V 1929; 1 male, 18 V 1929; 1 female, 25 VI 1929 (all leg. Bukovskii); 1 male, pass Angar, 765 m, on light, 27 V 1963; 6 males, 7 females, Lesnoe, 12 km N of Sudak, 22 V 1963; 3 males, eastern slope of Mt. Chatyr-Dag, 25 V 1963 (all leg. Gorodkov). All type specimens are deposited in the ZIN.

Diagnosis. Rather a large species with 2 narrow brownish lateral stripes on mesonotum; occiput behind ocelli with a large brown spot divided by narrow yellowish median line; no *sa* bristle; prothoracic spiracle black.

Description. Male. Head reddish-yellow, finely silvery-grey pollinose, slightly shining; face denser pollinose; mouth-opening margins narrowly shining. Frons broad, somewhat narrowing toward antennal base, bearing 4—5 blackish very short adpressed marginal setulae. Face broader than frons, somewhat widening below. One pair of short ocellar bristles. Ocellar tubercle brownish. Occiput behind ocelli with a large brown rhombus-like spot divided in middle by indistinct lighter (yellowish) narrow stripe. Chaetotaxy of occiput includes 2 strong long bristles on each side nearer to eye margin; an upper irregular transverse row of short bristles; and a lower more or less regular row of long strong bristles (16—18) becoming finer and hair-like below nearer to mouth-opening. 3rd antennal segment and stylus black, 1st and 2nd segments yellowish-brown. 3rd antennal segment long and narrow, 2nd segment globular. 1st and 2nd antennal segments bearing short black setulae. Ratio of length and width for 1st antennal segment 2.4:0.6; for 2nd segment 0.7:0.6; for 3rd segment 4.5:0.6. Proboscis yellowish, labrum brownish at apical part. Ratio of proboscis length to head height 10.8:5.8. Palpi elongate oval yellow, covered with short, dense, white pubescence and bearing 5—6 brownish thin bristles. Thorax reddish-yellow, slightly shining. Pleura finely silvery-grey pollinose. Prothoracic spiracle and notopleural line black. Mesonotum with 2 very narrow dark-brown stripes running along line of *dc* bristles, beginning nearly on level of humeri, and ending before prescutellar depression. All thoracic bristles black. Thoracic

chaetotaxy: 1 *h* (2 additional shorter and 4—5 minute bristles anteriorly); 1 *ph*; 1 *ntpl* (with 2 shorter and thinner bristles situated below and 3—4 very short additional bristles anteriorly); *sa* lacking; 1 *pa* (with 1 very thin and short bristle beside); 1 pair of convergent *sc*; *acr* lacking; *dc* uniserial, rather long, 8—9 bristles in a row (2 last pairs longest). Pronotum on each side with 12—13 straight strong spine-like bristles of different length. Metapleura with a more or less regular row of 5—6 very long bristles and 9—10 short bristles situated irregularly. Legs long and slender, yellow, tarsi brownish-yellow toward apex. Coxae finely silvery-grey pollinose, bearing black hairs and bristles. Femora covered with very short adpressed black bristles, densely pubescent ventrally. Tibiae covered with very short adpressed black bristles; all tibiae with 2—3 relatively long dorsal bristles varying in length and position. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hyaline, with brownish veins becoming lighter (including costa) near base. One black thin costal bristle. Squamae yellow, covered with numerous rather long brownish hair-like fringes. Axillary angle right. Halteres yellow. Abdomen yellow, slightly shining; all segments covered with short relatively dense brownish bristles. Genitalia: lateral lamellae nearly triangular; dorsal lamellae with darkened upper process and weakly pronounced lower process; aedeagus rather long and thin, with distinct dorsal swelling in middle and short apical opening.

Length: body 5.9—6.2 mm, wing 7.3—7.6 mm (holotype body 5.8 mm, wing 7.6 mm).

Female. Resembling male in all details except for sexual differences. Cerci brownish to brownish yellow.

Length: body 6.4—6.8 mm, wing 6.9—7.7 mm.

Differential diagnosis. With its mesonotal pattern *E. oxilara* has no similar species among *Xanthempis*. In male genitalia it is closely related to *E. aemula*.

Distribution. Ukraine: The Crimea.

***Empis (Xanthempis) pavli* Shamshev, sp.n.**
(Figs 95—96)

Material. Holotype male: Georgia, Sukhumi, Kalasuri, oak forest, 18 V 1969 (leg. Gorodkov).

Paratypes. Georgia: 1 female, the same data as in holotype; 1 male, Bakuriani, Borzhomi Distr., 2000 m, 25 VII 1951 (leg. V. Vinogradova). All type specimens are deposited in the ZIN.

Diagnosis. Rather a large species with a mesonotum and an occiput yellow (without any pattern), *sa* absent, prothoracic spiracle black to brown, in male aedeagus deeply S-shaped.

Description. Male. Head yellow, frons and face finely silvery-grey pollinose, mouth-opening margins shining. Frons broad, somewhat narrowing toward antennal base, bearing 4—5 blackish very short adpressed marginal setulae. Face almost as broad as frons, somewhat widening below. One pair of short ocellar bristles. Ocellar tubercle yellowish-brown. Occiput behind ocelli without any pattern. Chaetotaxy of occiput includes 2 long bristles on each side nearer to eye margin; an upper irregular transverse row of short bristles; and a lower regular transverse row of long strong bristles (10—12) becoming finer and hair-like below nearer to mouth-opening. 3rd antennal segment black, 1st and 2nd segments yellowish-brown, stylus brown. 3rd antennal segment long and narrow, 2nd segment globular. 1st and 2nd antennal segments with short black setulae. Ratio of length and width for 1st antennal segment 2.5:0.5; for 2nd segment 0.6:0.6; for 3rd segment 4.4:0.7. Proboscis yellowish, labrum brownish at apex. Ratio of proboscis length to head height 10.9:5.5. Palpi short oval yellow, covered with short dense white pubescence and bearing 2—3 brownish thin relatively long bristles near apex. Thorax uniformly yellow, slightly shining. Pleura finely greyish pollinose. Prothoracic spiracle and notopleural line black. Mesonotum without any pattern, shining. All thoracic bristles black. Thoracic chaetotaxy: 1 *h* (1 short and 3—4 minute setulae anteriorly); 1 *ph*; 1 *ntpl* (an additional shorter bristle somewhat below); *sa* lacking; 1 *pa* (1 very short setula beside); 1 pair of convergent *sc*; *acr* lacking; *dc* uniserial, rather short (except for 2 prescutellar pairs), 5—6 bristles in a single row. Pronotum on each side with 5 straight spine-like bristles of different length. Metapleura with a regular row of 4 long black bristles and 6—7 shorter setulae. Legs long and slender, yellow, tarsi brownish-yellow. Coxae with black hairs and bristles. Femora covered with very short adpressed black bristles, densely pubescent ventrally. Tibiae covered with very short adpressed black bristles, with 2 short dorsal bristles at apical half. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hyaline, with brownish veins becoming almost yellow (including costa) near base. One black short costal bristle. Squamae yellow, covered with numerous rather long black hair-like fringes. Axillary angle obtuse. Stigma lacking. Halteres yellow. Abdomen yellow, slightly shining; with indistinct light-brownish spots dorsally. All segments covered with short black hairs and bristles. Genitalia: lateral lamellae rounded at apex, with rather short straight black bristles along margin; dorsal lamellae with moderately deep excision, bearing short spines and bristles along apical margin on inner surface; aedeagus deeply S-shaped curved.

Length: body 5.5 mm, wing 7.1 mm.

Female. Resembling male in all details except for sexual differences. Cerci long narrow brownish-yellow.

Length: body 5.6 mm, wing 6.2 mm.

Differential diagnosis. *E. pavli* is closely related to *E. lagoensis* described recently from Italy but the latter has both a prothoracic spiracle and a notopleural line pale to yellow, antennae black, and aedeagus slightly undulating, with apical opening enlarged, spoon-like. *E. concolor* also has a black notopleural line but it differs from the new species by the upper part of occiput black and elongated, almost straight aedeagus. In addition, *E. pavli* resembles *E. caucasica* and *E. kozlovi* differing from them by a very characteristic shape of the aedeagus in males. The female of the new species can be distinguished from the female of *E. caucasica* by a black to brown prothoracic spiracle, and by a yellow occiput (including ocellar tubercle) from the female of *E. kozlovi*.

Etymology. The species is named after the man's name "Pavel" given in Russian transliteration.

Distribution. Georgia.

***Empis (Xanthempis) ponti* Chvala, 1996**
(Figs 27, 73)

Empis (Xanthempis) ponti Chvala, 1996:10, Fig. 2-3.

Material examined. Russia: North Ossetia: 2 males, environs of Vladikavkaz, 1 VIII 1925; the same locality: 1 male, 14 VII 1925; 1 male, 10 VII 1925, 8 males, 8 females, Kobi, Voenno-Gruzinskaya road, 14 VII 1925; 3 males, 2 females, the same locality, 13 VII 1925 (all leg. Kirichenko) — deposited in the ZIN.

Description. Occiput behind ocelli with a large black-grey spot extending to lowest row of bristles. Antennae black, basal segments somewhat lighter. Thorax reddish-yellow to yellow, slightly shining. Mesonotum without any pattern. Thoracic chaetotaxy: all bristles long and strong; 1 *h* (with an additional much more shorter setula, and 2—3 minute bristles anteriorly); 1 *ph*, 1 *ntpl* (with a lower much more shorter setula and several minute bristles anteriorly); *sa* lacking, 1 *pa* (with 1 very short setula anteriorly); 2 pairs of *sc* (inner pair much more longer); *acr* lacking; *dc* long (a pair before prescutellar depression longest), 4—6 (usually 6) in a single row, all nearly equal in length. Pronotum with about 5—6 long bristles on each side. Metapleura with 2—3 long setulae and additional shorter dark hairs. Prothoracic spiracle blackish. Legs yellow, tarsi blackish; fore and mid tibiae more or less darkened toward apex; covered with simple bristles and hairs;

all tibiae with 4—8 dorsal bristles spread irregularly. Wings hyaline, stigma indistinct, a blackish short costal bristle. Abdomen yellow. Male genitalia: lateral lamellae simple; dorsal lamellae deep excised, the blunt dorsal process bearing a long black terminal bristle; aedeagus straight and upturned, slender throughout, terminal opening transparent and cup-like.

Male length: body 4.0—4.5 mm, wing 5.3—5.6. Female length: body 4.5—5.1 mm, wing 5.2—5.7 mm.

Differential diagnosis. *E. ponti* undoubtedly belongs to the *E. lutea*-complex, however, it seems to be an intermediate species between *E. lutea*, *E. albifrons*, *E. rohacheki*, and *E. kovalevi*, on the one hand and *E. pavli*, *E. kozlovi*, *E. lagoensis*, *E. concolor*, *E. algecirasensis*, and *E. nevadensis* on the other. The main differences between these species are given in the Key.

Distribution. Russia: North Ossetia. Georgia.

***Empis (Xanthempis) punctata* Meigen, 1804**
(Figs 7, 28, 51, 74)

Empis punctata Meigen, 1804: 227. *Empis dorsalis* Curtis, 1824: plate 18 (nom. nudum). *Empis ignota* Meigen, 1830: 338. *Empis dorsalis* Curtis, 1835: plate 18.

Material examined. Russia: Leningrad Prov.: 1 female, St. Petersburg, Chernaya Rechka, 17 VI 1862 (leg. A. Moravits); 1 female, Shuvalovo, 1 VI 1915 (leg. Yakobson); 1 male, gouv. Peterb., Sergiewo, 11 VII 1908 (leg. O. Jhon), coll. Russian. Entomol. Soc.; 1 male, Peterhof Distr., Lebyazh'e, 11 VI 1900 (leg. L. Bianki); 1 female, Luga Distr., Log Village, 30 VI 1918; the same locality: 1 male, 16 VII 1918; 1 female, 6 VII 1918; 1 female, 19 VI 1918; 1 male, 3 females, 13 VII 1918; 1 male, 3 VIII 1918 (all leg. G. Yakobson); 1 male, Luga, 4 VI 1954; the same locality: 1 male, 1 female, 11 VI 1954; 1 male, 18 VI 1955; 1 female, Luga Distr., Yashchera, 29 VI 1963 (all leg. A. A. Stackelberg); Novgorod Prov.: 2 females, Borovichi [date and name not given]; 1 female, the same locality, 29 VI 1917 (leg. A. A. Stackelberg?); Karelia: 1 male, Kizhi, bank of Onega Lake, 19 VI 1979 (leg. Gorodkov); Ekaterinburg Prov.: 1 female, Seversk Distr., Polevskoi, glade in birch-fir forest, 30 VI 1970 (leg. Zinovjev). Byelorussia: 1 female, Vitebsk Reg., Ambrosovich (= Lavy), 22 VI 1926; the same locality: 1 male, 29 V 1926; 2 females, 13 VI 1926; 3 females, 16 VI 1926; 2 females, Mogilev Prov., Zamostoch'e, 10 VI 1905 (all leg. Birulya). Lithuania: 3 males, 1 female, Kowno (=Kaunas), Georgenburg, 17 V 1904 (leg. Winogradoff). Czechia: 2 males, 2 females, Bohemia, Franzensbad, 25 V 1899 (all leg. Pleske) — deposited in the ZIN.

Description. Species with occiput blackish to brown. Antennae black. Thorax (viewed from above) almost entirely blackish-grey, leaving humeri, notopleural depressions, and postalar calli yellow to yellowish. Thoracic pleura yellow, with distinct blackish-grey spots on lower part of sterno- and hypopleura, and an indistinct spot on mesopleura. Mesonotum with a duller black median stripe and two shorter and somewhat broader stripes at sides, in anterior view the lateral stripes invisible. Thoracic chaetotaxy: 1 *h* (1—2 small hairs anteriorly); 1 *ph*, 1 *ntpl* (with a small hair anteriorly), *sa* lacking, 1 *pa* (1 very short setula beside); 2 pairs of *sc* (inner pair longer); *acr* lacking; *dc* short and fine, becoming slightly longer posteriorly (last two pairs longest), about 6 bristles in a row. Pronotum with about 5—8 rather long spine-like bristles on each side. Metapleura with about 4 long black bristles and additional shorter dark hairs. Prothoracic spiracle blackish to brownish. Legs yellow, tarsi blackish; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 black costal bristle. Abdomen yellow; tergites a with dark median stripe. Male genitalia [figured in details by Collin (1961: 460, Fig. 161 and Chvala, 1994: 170, Figs 298—299)]: lateral lamellae triangular in shape; dorsal lamellae with two blunt dorsal processes, posteriorly near base with another process bearing a long black bristle; aedeagus simple, not very long, almost equally slender throughout.

Male length: body 4.2—5.3 mm, wing 5.5—6.7. Female length: body 4.8—6.0 mm, wing 5.6—6.0 mm.

Differential diagnosis. Among *Xanthempis* species *E. punctata* is most closely related to *E. edithae* (Morocco) and, according to the original description of the latter (Daugeron, 1997), differs from its by some characters of male genitalia only. I failed to separate females of these two species since they appears to be identical in all respects.

Remarks. This species is widely distributed throughout Europe, though is uncommon. According to our data, the area of *E. punctata* reaches the Urals in the east. It can be found from the beginning of June to the end of August.

Distribution. Russia: Karelia, Leningrad, Novgorod, Ekaterinburg Provs. Byelorussia, Lithuania.

***Empis (Xanthempis) richteri* Shamshev, sp.n.**
(Figs 29, 52, 97—98)

Material. Holotype male: Russia: Buryatia, 7 km S of Zakamensk, village Khasura, 30 VI 1971 (leg. V. Richter).

Paratypes. 2 males, 2 females, the same data as in holotype; Yakutia: 1 female, Aldan River, near

mouth of Tympton River, 29 VI 1926; 1 female, the same locality, 10 VII 1926 (all leg. Zaikov). All type specimens are deposited in the ZIN.

Diagnosis. Resembling *E. stercorea*, occiput behind ocelli with a narrow dark-brown drop-like spot, aedeagus evenly curved, with a bend just before apical opening.

Description. Male. Head reddish-yellow, frons and face finely silvery pollinose; mouth-opening margins narrowly shining. Frons broad, somewhat narrowing toward antennal base, bearing 4—5 blackish very short adpressed marginal setulae. Face almost as broad as frons, slightly widening below. One pair of short ocellar bristles. Ocellar tubercle dark-brown. Occiput behind ocelli with a narrow, dark-brown, drop-like spot covered with fine silvery-grey pollen. Chaetotaxy of occiput includes 2 strong long bristles on each side nearer to eye margin; 2 pairs of short adpressed bristles just behind ocellar tubercle; an upper irregular transverse row of short bristles; and a lower more or less regular transverse row of long strong bristles (16—18) becoming finer and hair-like below nearer to mouth-opening. 3rd antennal segment and stylus black, 1st and 2nd segments yellowish-brown. 3rd antennal segment long and narrow, 2nd segment globular. 1st and 2nd antennal segments with short black bristles. Ratio of length and width for 1st antennal segment 2.6:0.5; for 2nd segment 0.7:0.6; for 3rd segment 4.8:0.6. Proboscis yellowish, lighter near base. Ratio of proboscis length to head height 10.2:5.5. Palpi elongate oval yellow, covered with short dense white pubescence and bearing 5—6 brownish setulae. Thorax reddish-yellow, slightly shining. Pleura finely silvery-grey pollinose. Prothoracic spiracle and notopleural line black. Mesonotum along median line with a narrow dark-brown, finely silvery-grey pollinose stripe beginning from anterior margin of mesonotum, and ending before prescutellar depression. All thoracic bristles black. Thoracic chaetotaxy: 1 *h* (1 shorter and 4 minute bristles anteriorly); 1 *ph* (1 minute bristle anteriorly); 1 *ntpl* (with 5—6 very short additional bristles); *sa* lacking; 1 *pa* (1 very short setula beside); 2 pair of convergent *sc* (inner pair longer and stronger); *acr* lacking; *dc* uniserial rather long, 11—12 bristles in a row (only prescutellar bristles somewhat longer). Pronotum on each side with 6—7 straight spine-like bristles of different length. Metapleura with more or less regular row of 5—6 very long bristles and numerous short bristles situated irregularly. Legs long and slender, yellow, tarsi brownish-yellow toward apex. Coxae finely silvery-grey pollinose, bearing black hairs and bristles. Femora and tibiae covered with very short adpressed black bristles. All tibiae with 2—3 relatively long dorsal bristles varying in

length and position. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hyaline, with brownish veins becoming lighter (including costa) near base. One black thin costal bristle. Squamae yellow, covered with numerous rather long brownish hair-like fringes. Axillary angle obtuse. Halteres yellow. Abdomen yellow, slightly shining; with indistinct brownish narrow stripe dorsally. All segments covered with relatively short brownish-yellow hairs and bristles. Genitalia: lateral lamellae long, narrow, nearly triangular in apical part; dorsal lamellae elongate, with two weakly pronounced processes; aedeagus rather short and narrow, with 2 bends just before the short apical opening.

Length: body 5.1—5.8 mm, wing 7.6—7.8 mm (holotype body 5.1 mm, wing 7.6 mm).

Female. Resembling male in all details except for sexual differences. Cerci brownish yellow.

Length: body 6.4—7.3 mm, wing 7.1—7.7 mm.

Differential diagnosis. *E. richteri* is closely related to *E. stercorea*, *E. aemula*, *E. japonica*, *E. belousovi*, and *E. zlobini* but differs from them as it is given in the key.

Etymology. The species is named in honour of Dr V. A. Richter, the Russian dipterologist.

Distribution. Russia: Buryatia, Yakutia.

****Empis (Xanthempis) scutellata* Curtis, 1835**
(Figs 30, 53, 61—62)

Empis scutellata Curtis, 1824: plate 18 (nom. nudum).

Empis scutellata Curtis, 1835: plate 18. *Empis pallens* von Roser, 1840: 53. *Empis parvula* Egger, 1860: 344.

Description. A small species with occiput blackish behind ocellar tubercle up to the second transverse row of bristles. Antennae with yellow 1st and 2nd segments, 3rd segment black except for yellowish-brown base. 1st antennal segment unusually short, barely longer than 2nd segment. Thorax dull yellow (in females sometimes with grey spots on pleura above coxae), finely silvery pollinose. Mesonotum with a very slender dark median stripe, more or less enlarged posteriorly, widening into a triangle before scutellum on prescutellar depression, and occupying at least base of scutellum (in females mesonotum sometimes uniformly grey; in light specimens the stripe very indistinct, nearly disappearing); metanotum dark. Thoracic chaetotaxy: 1 *h* (several short hairs anteriorly); 1 *ph*, 1 small *ih* (sometimes lacking); 2 *ntpl*, 1 *sa* (a smaller bristle anteriorly), 1 *pa* (1 very short setula beside); 2 pairs of *sc* (inner pair much more longer); *acr* lacking; *dc* short

and thin, becoming longer posteriorly (last two pairs longest), about 6—10 bristles in a row. Pronotum with about 6—8 rather short spine-like bristles on each side. Metapleura with about 4—5 setae and additional minute hairs. Prothoracic spiracle contrasting black. Legs yellow, tarsi with apical segments darkened; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 short and thin costal bristle. Abdomen dirty yellow, tergites without dark pattern. Male genitalia: lateral lamellae triangular in shape; dorsal lamellae with two blunt processes, lower process much more longer and bearing a long apical bristle; aedeagus short and rather stouter towards base, with tip recurved.

Male length: body 3.7—4.8 mm, wing 5.6—6.5.

Female length: body 4.6—5.2 mm, wing 5.3—6.3 mm.

Differential diagnosis. *E. scutellata* can be easily distinguished from all other *Xanthempis* species by basal antennal segments almost equally short and large eyes (cheeks invisible). *E. testiculata*, *E. styriaca*, *E. ifranensis*, and *E. laetabilis* have also shortened 1st antennal segment, however, it is always 2—3 times longer than wide in these species. *E. scutellata* is most closely related to *E. subscutellata* sp. n. differing from its by characters given in the key.

Remarks. *E. scutellata* is widely distributed in Europe but seems to be uncommon species preferring rather warmer and open biotopes. I have examined 2 males and 2 females (England) of this species which were loaned from the Hope Entomological Collections (Oxford).

****Empis (Xanthempis) semicinerea* Loew, 1867**
(Figs 8, 31, 54, 75)

Empis semicinerea Loew, 1867: 21 and 16.

Description. A rather small species with occiput behind ocelli blackish-grey, densely silvery-grey pollinose. 3rd antennal segment black, basal segments yellowish-brown. Thorax including pleura completely greyish-black. Mesonotum rather light-grey pollinose, with 2 distinct blackish stripes along the lines of *dc* bristles. Thoracic chaetotaxy: 1 *h* (numerous very short setulae anteriorly), *ph* lacking, 1? *ih*, 2 *ntpl*, posterior one shorter (several minute setulae in front of notopleural depression and a row of several very short setulae along upper margin of the latter); 1 *sa*, 1 *pa* (a very short bristle anteriorly), and 1 pair of *sc*; *acr* lacking, *dc* rather short (except 2 prescutellar pairs), with thin and strong bristles interacting in anterior part of mesonotum, about 7 bristles in a single row. Pronotum with 6—8 strong and 4—6 shorter bristles on each side.

Metapleura with 3 long setulae and about the same number of additional shorter hairs. Prothoracic spiracle blackish. Legs yellow; tarsi brownish; covered with simple bristles and hairs; all tibiae with 7—8 dorsal bristles spread irregularly. Wings hyaline, stigma indistinct, 1 short costal bristle. Abdomen yellowish. Male genitalia: lateral lamellae rounded at apex; dorsal lamellae with two processes; aedeagus rather slender, strongly curved in apical part.

Male length: body 4.0—4.5 mm, wing 5.1—5.7 mm. Female length: body 4.2—4.4 mm, wing 5.3—5.6 mm.

Differential diagnosis. With its completely greyish-black thorax (including pleura) *E. semicinerea* can be compared to *E. testiculata* and *E. styriaca* only. The main differences between these species are given in the Key.

Remarks. *E. semicinerea* is rather common in temperate Europe. I have examined the lectotype of this species. In addition, I have studied two pairs of this species which were determined by Strobl (1 male, 1 female, Admont, Steierm., leg. Strobl, *Empis semicinerea* Lw.) and Kowarz (1 male, 1 female, Carlsbad, V 1870, *Empis semicinerea* Lw.) and which are deposited in the ZIN.

***Empis (Xanthempis) stercorea* Linnaeus, 1761**
(Figs 9, 32, 55, 76)

Empis stercorea Linnaeus, 1761: 247. *Asilus ferrugineus* Scopoli, 1763: 364. *Empis pertinax* Harris, 1780: 150. *Empis rapax* Pallas in Wiedemann, 1818: 25. *Empis stercoraria*: Macquart, 1827: 117 (lapsus). *Empis stigma* Meigen, 1838: 88.

Material examined. **Russia:** Leningrad Prov.: 1 male, Vyborg Distr., Bol'shoi Beresovi Island, 26 VI 1980 (leg. Kandybina); 1 female, Ligovo, Baltiiskaya [now Oktyabr'skaya] railway, 12 VI 1904; the same locality: 1 female, 25 V 1905; 2 female, 29 V 1905; 1 female, 24 VI 1909 (all leg. G. Yakobson); 1 female, St. Petersburg, Lebyazh'e, 30 V 1899; 1 female, the same locality, 3 VIII 1899; 1 male, Lebyazh'e Village, Peterhof Distr., 11 VI 1900; 1 female, Sablino, [Oktyabr'skaya] railway, 16 VI 1920; the same locality: 1 female, 18 VI 1920, *Empis stercorea* L., Stackelberg det.; 1 male, 13 VI 1920, *Empis stercorea* L., Stackelberg det.; 1 female, 6 V 1922; 1 female, 18 VI 1922, *Empis stercorea* L., Stackelberg det. (all leg. L. Bianki); 1 male, St. Petersburg, Smolenskoe cemetery, 20 VI 1897 (leg. Zubovskii), *Empis stercorea* L. (?); 1 female, Novyi Peterhof, 22 VI 1896, 1 female, Lebyazh'e, Peterhof Distr., 29 VI 1899 (all leg. A. Chekini); 1 female, Kartashevka, Petrograd, 24 VI 1926; 1 male, Rozhdestveno, 21 VI 1956; 1 male, Yashchera, Luga Distr., 11 VI 1968; 1 female, the same locality: 15 VII 1958; 1 male, 25 VI 1965; 1

female, Luga, 7 VII 1952; 1 female, the same locality, 15 VI 1954 (all leg. A. A. Stackelberg); 1 male, 1 female, Stroganovo, 16 VI 1940; 1 female, Luga Distr., Krasnye Gory, 11 VI 1958 (all leg. Chernovskii); 1 female, Tsarskoe Selo [now Pushkin], 24 VI 1922, 1 female, the same locality, date not given; 2 females, locality not given [environs of St. Petersburg?]; 1 male, locality not given [environs of St. Petersburg?], *Empis stercorea* L., Stackelberg det., (all leg. Olsuf'ev); 1 female, Peterhof Distr., Volosovo, road to Staryi Peterhof, 25 V 1921 (leg. V. Barovskii); 1 female, Tsarskoe Selo [= Pushkin], 10 VI 1901 (leg. Pleske); 1 female, Sergievka, Staryi Peterhof, 13 VI 1930; 1 male, the same locality, 12 VI 1930 (all leg. Burakova); 1 male, Tolmachevo, Luga Distr., 15 VI 1935 (leg. Rodendorf); Pskov Prov.: 1 female, Gdov Distr., Kharlamova Gora, 27 V 1891; 1 female, the same locality: 3 VI 1891; 1 female, 23 VI 1891; 1 female, 4 VII 1891 (all leg. Pleske); 1 female, Zhulyatovsk, 6 VI 1898 (leg. Ispolatov); Tver' Prov.: 1 female, Novgorod Prov., Valdai Distr. [now in Tver' Prov.], 27 VI 1908 (leg. F. A. Zaizev); Smolensk Prov.: 1 female, National Park "Smolenskoe poozer'e", 13 VI 1993 (leg. Zlobin); Arkhangel'sk Prov.: 1 male, 1 female, Nyandoma, garden in village, 13 VII 1982 (leg. Gorodkov); 1 female, Kessedy River, Adz'va river basin [North Ural], 8 VII 1909 (leg. Kulik); Vologda Prov.: 1 female, Tot'ma, 1 VI 1936 (leg. V. Borovskii); Karelia: 1 female, airport Pudozh, fir-grove, 19 VII 1982 (leg. Gorodkov); Komi: 1 female, Ukhta, airport, fir-grove, 3 VIII 1976 (leg. Gorodkov); Kirov Prov.: 1 male, Vyatka Prov. [now Kirov], Urzhum, 1—8 VI 1900; 1 female, the same locality, 20—25 V 1900 (all leg. Krulikovskii); Yaroslavl' Prov.: 1 female, Berditsyno, 3 VI 1907 (leg. A. Yakovlev); Perm' Prov.: 1 female, Molotov Prov. [now Perm'], Kizelov Distr., Mt. Osiyanka, 23 VIII 1947 (leg. Okurikhin? [name given illegibly]); Ryazan' Prov.: 4 females, Dankov Distr., Gremyachka, 30 V 1908 (leg. A. Semenov); Ufa Prov.: 1 female, Katav-Ivanovskii Nature Reserve, Dvoinishi, 30 VI 1926 (leg. Vakulenko); Ekaterinburg Prov.: 1 male, Sverdlovsk Prov. [now Ekaterinburg], Seversk Distr., Polevskoi, glade in birch-fir forest, 30 VI 1970. leg. Zinovjev; Krasnodar Terr.: 1 female, Krasnaya Polyana, Pslukh, 7 VI 1978 (leg. V. Richter); 1 female, Teberda, Klukhor Distr., on light, 20 VII 1940 (leg. Stepanov); 1 male, Teberda Nature Reserve, 1400 m, 30 V 1964 (leg. Gorodkov); North Ossetia: 1 female, Maikop Distr., Psebai, Shisha River, 17 V 1911 (leg. Volnukhin); 1 female, glade Guzeripl', Belaya River, 4 VI 1935 (leg. Deev); Tyumen' Prov.: 2 females, Voi Sablya Iz-Lun Sablya Iz, Bol'shaya Synya River [North Ural], 5 VIII 1909 (leg. Zhuravskii); Tomsk Prov.: 1 male, 3 females, Mariinsk Distr., Tisul', 21 VI 1911 (leg. Gorchakovskii); 1 female, Biisk Distr., Lugovaya, 6 VI 1916 (leg. Varaksina); 1 male, Abakan, Kyzas River, 27 VI 1897 (leg. Yu. Wagner); Irkutsk Prov.: 1 female, Belaya River, Angara, 1873 (leg. Gartung),

48840, *Empis stercorea* Linn.; 1 female, Bol'she-Razvodinskoe, 27 VI 1910 (leg. Prorokov); 1 female, Irkutsk, kitchen-garden, 28 VI 1926 (leg. Zonova); Krasnoyarsk Terr.: 1 female, Bunbui, Kansk Distr., Enisei Prov. [now Krasnoyarsk Terr.], 7 VI 1916 (leg. Valdaev); 1 male, 1 female, Rybinskoe, Kansk Distr., Enisei Prov. [now Krasnoyarsk Terr.], 1 VII 1912 (leg. Vilenchik); 1 female, Bol'shaya Sliznevaya River, 4 VII 1953 (leg. G. Dul'keit). **Ukraine:** 1 female, Poltava, Priluki Distr., Antonovka Village, 14 V 1925 (leg. Lukyanovich); 1 male, Kanev Nature Reserve, 7 km SE of Kanev, 30 V 1979; 1 female, same locality, 28 V 1979 (all leg. Gorodkov). **Georgia:** 1 female, Lagodekhi, Zakataly Distr., 1896 (leg. Mlokosovich). **Lithuania:** 1 male, Verro, Lifyandia, 10 VI 1908 (leg. Chekini, Somina). **Estonia:** 1 female, Estlandiya, Toila, 10 VI 1905 (leg. V. Borovskii); 3 males, 4 females, South Estonia, Peedu, 22—28 VI 1951 (all leg. A. A. Stackelberg). **Czechia:** 1 male, Bohemia, Franzensbad, 7 VI 1899; 1 female, same locality, 30 V 1899 (all leg. Pleske). **Finland:** 1 female, Raijala, 13 VI 1904 (leg. Redikorzev); 1 male, Rajala, Saima-Kanal, 12 VI 1907; 2 females, the same locality, 3 VI 1910 (all leg. Adelung), *Empis stercorea* L., Frey det. **Austria:** 1 male, 2 females, Styriae alp., [date not given] (leg. Strobl), *E. stercorea* var. *stigma* Mg.; ? 1 male, Asch, 15 VI 1870, *Empis stercorea* L., Kowarz det., N 331; 1 female, [locality written illegibly], 19 VI 1871? [last number of the date written illegibly], *Empis stercorea* L., Kowarz det., N 331 (all Kowarz's Coll.) — deposited in the ZIN.

Description. A large species with a rhombus-like, brown-black spot on occiput behind ocelli. Antennae black, basal segments sometimes lighter. Thorax yellow to reddish-yellow. Mesonotum with a narrow brown-black median stripe somewhat broadening behind on scutellum and metanotum (sometimes varying in shape and colour intensity). Thoracic chaetotaxy: 1 *h* (with several minute hairs anteriorly), 1 *ph*, 1 *ntpl* (several very short hairs in front of notopleural depression); *sa* lacking, 1 *pa*, and 2 pairs of *sc* (inner pair longer); *acr* lacking, *dc* very fine and small in anterior part of mesonotum, becoming longer toward scutellum, about 6—10 bristles in a single row. Pronotum with about 10 short spine-like bristles on each side. Metapleura with about 6 long bristles and about the same number of additional shorter hairs. Prothoracic spiracle black. Notopleural line pale. Legs yellow, tarsi darkened toward apex; covered with simple bristles and hairs. Wings hyaline, with distinct brownish costal stigma. Abdomen yellow, tergites with a dark median stripe dorsally. Male genitalia: lateral lamellae triangular in shape, with concave upper margin; dorsal lamellae small; aedeagus with an angular bend behind middle, apical shorter part equally stout.

Male length: body 5.2–7.5 mm, wing 6.6–9.0 mm. Female length: body 6.8–9.2 mm, wing 7.0–8.3 mm.

Differential diagnosis. *E. stercorea* is most closely related to *E. aemula* but differs distinctly from it in male genitalia structure as has been given in the Key. In the Far East and East Siberia this species should be compared with *E. richteri*, *E. japonica*, *E. belousovi*, and *E. zlobini*, in the Caucasus with *E. alanica*. Differences between all these species and *E. stercorea* have been discussed above and are given in the Key.

Remarks. *E. stercorea* is the commonest *Xanthempis* species in the Palaearctic. This species has not been recorded from North Africa, Asia Minor, Middle Asia, Mongolia, China, and Far East (including Japan) yet.

Distribution. Russia: Leningrad, Pskov, Tver', Smolensk, Arkhangel'sk, Kirov, Yaroslavl', Perm', Ryazan', Ufa, Ekaterinburg, Tyumen', Tomsk, Irkutsk Provs., Krasnoyarsk Terr., Karelia, Komi, Krasnodar Terr., North Ossetia. Ukraine, Georgia, Lithuania, Estonia.

****Empis (Xanthempis) styriaca* Strobl, 1893 (Fig. 77)**

Empis styriaca Strobl, 1893: 61.

Description. A rather small species with occiput behind ocelli completely black, silvery-grey pollinose. Antennae black-brown. Thorax including pleura completely greyish-black. Mesonotum almost uniformly blackish-grey, with indistinct stripes (at least 2 darker lateral stripes). Thoracic chaetotaxy: 1 *h* (with several minute hairs anteriorly), 1 *ph*, 1 strong and 1 much shorter (posterior one) *ntpl* (several very short hairs in front of notopleural depression and a row of several very short hairs along upper margin of the latter); *sa* lacking, 1 *pa*, and 1 pair of *sc*; *acr* lacking, *dc* very fine and small in anterior part of mesonotum, becoming longer toward scutellum, about 6—10 bristles in a row. Pronotum with 5 rather short spine-like bristles on each side. Metapleura with about 4 long setulae and about the same number of additional shorter hairs. Prothoracic spiracle black. Legs darkened; covered with simple bristles and hairs. Wings hyaline, stigma indistinct, 1 very short costal bristle. Abdomen darkened, shining, covered with rather sparse hairs and bristles. Male genitalia: hypopygium large; lateral lamellae elongate, covered with short marginal bristles and hairs; dorsal lamellae with two processes; aedeagus rather short and nearly straight, enlarged in basal part and somewhat curved before apex, with small oval apical opening.

Male length: body 4.3 mm, wing 5.2 mm.

Differential diagnosis. With its blackish-grey thorax *E. styriaca* is closely related to *E. semicinerea* and

E. testiculata but differs from them in a number of characters given partly in the Key.

Remarks. I have examined a single specimen of this species which was determined by Strobl (1 male, Styriae alp., leg. Strobl, *Empis styriaca*) and which is deposited in the ZIN.

***Empis (Xanthempis) subscutellata* Shamshev, sp.n.**

(Figs 10, 33, 56, 99—101)

Material. *Holotype.* male, **Ukraine:** the Crimea, environs of Simferopol', 28 IV 1899 (leg. Bazhenov).

Paratypes. 2 males, 2 females, the same locality, 20—26 IV 1899 (all leg. Bazhenov); 1 female, Kastel', Alushta, 19 V 1900 (leg. N. Kuznetsov); 1 male, western slope of Mt. Severnaya Demerdzhi, 900 m, above puddle on road, 26 V 1963 (leg. Gorodkov). All type specimens is deposited in the ZIN.

Diagnosis. Small species with almost equally short basal antennal segments, occiput ash-grey up to neck; mesonotum ash-grey, with 2 darker median stripes, a long black *sa* bristle.

Description. Male. Frons, face, and occiput densely ash-grey pollinose. Occiput dark almost up to neck, nearer to mouth-opening and just around neck indistinctly yellow. Frons about as wide as the distance between posterior ocelli, somewhat widening toward antennae. Face broader than frons, almost parallel-sided. Eyes reaching to mouth-opening, cheeks not visible. Frons with about 6 blackish very short adpressed marginal setulae. One pair of long black forwardly directed ocellar bristles; ocellar tubercle bearing 6—8 very short black bristles. Occiput with 2 more or less regular transverse rows of bristles; bristles of lower row somewhat longer. 3rd antennal segment (except base) and stylus black; 1st, 2nd, and 3rd segment base brownish-yellow (reddish-brown in darker specimens). 3rd antennal segment elongate, cylindrical; 2nd segment globular. Basal antennal segments bearing short black bristles. Ratio of length and width for 1st antennal segment 0.8:0.5; for 2nd segment 0.6:0.7; for 3rd segment and stylus 3.2:0.8:1.1. Proboscis yellowish-brown, lighter near base (nearly brownish in darker specimens). Ratio of proboscis length to head height 11.8:5.4. Palpi elongate yellow, covered with short dense white pubescence and bearing 5—6 brownish setulae. Thorax yellow in ground-colour. Mesonotum dark-grey (except yellow humeri, notopleural depression, and postalar calli), finely silvery pollinose, (viewed from above) with 2 narrow darker median stripes. Scutellum and metanotum dark-grey. Pleura with dark-grey spots. Thoracic chaetotaxy: 1 *h* (several short hairs anteriorly); 1 *ph*, 1 small *ih* (sometimes lacking); 2 *npl* (with a much more shorter

bristle below and several minute bristles anteriorly), 1 *sa* (a smaller bristle anteriorly), 1 *pa* (1 very short setula beside); 2 pairs of *sc* (inner pair much more longer); *acr* lacking; *dc* uniserial, short and thin, becoming longer posteriorly (last two pairs longest), about 6—10 bristles in a single row. Pronotum with 4—6 rather short spine-like bristles on each side. Metapleura with about 4—5 setulae and additional minute hairs). Prothoracic spiracle contrasting black. Legs yellow, tarsi darkened toward apex; covered with black pubescence, tibiae and femora with several preapical bristles, all tibiae bearing several dorsal short bristles. Wings hyaline; veins brown, somewhat lighter near base; stigma indistinct; 1 short and thin costal bristle. Abdomen dirty yellow, slightly shining, finely silvery-grey pollinose; tergites without dark pattern, with short and sparse blackish bristles, hind marginal bristles distinct but in distal part of abdomen nearly as long as other bristles. Male genitalia: small, yellowish; lateral lamellae nearly triangular in shape, with short bristles along anterior margin; dorsal lamellae with one blunt process, covered with short bristles only; aedeagus rather short, stouter towards base, with straight tip.

Length: body 4.2—5.1 mm, wing 5.8—6.4 mm (holotype body 5.0 mm, wing 6.3 mm).

Female. Resembling male in all details except for sexual differences. Cerci brownish yellow.

Length: body 4.4—5.1 mm, wing 5.2—6.0 mm.

Differential diagnosis. *E. subscutellata* sp. n. is very closely related to *E. scutellata* differing from it by a larger dark spot on occiput, mesonotal pattern consisting of two narrow dark-grey stripes, and male genitalia, including lateral lamellae with short bristles along anterior margin, dorsal lamellae with one blunt process, ventral lamella pointed at tip, aedeagus straight at tip. *E. testiculata*, according original description (Bezzi, 1909), resembles the new species in many characters, however, it has prothoracic spiracle yellow and somewhat longer 1st antennal segment.

Distribution. Ukraine: the Crimea.

****Empis (Xanthempis) testacea* Fabricius, 1805**

Empis testacea Fabricius, 1805: 141.

Description. A very large species with occiput at least in upper third black and densely grey pollinose. Antennae black. Thorax blackish-grey, leaving broad margins yellow, including humeri and inner post-humeral area, notopleural depressions, and a wide area round postalar calli; scutellum with margins broadly yellow. Thoracic pleura largely yellow. Mesonotum (viewed anteriorly) lighter grey pollinose and

only with 2 narrow blackish stripes between *dc* bristles; in dorsal view with 2 further broad black lateral stripes; in posterior view only with 3 stripes, a median line reaching prescutellar depression. *sa* lacking, *dc* short and fine (last two pairs longest), about 6 bristles in a row. Pronotum with about 5 rather long spine-like bristles on each side. Metapleura with about 6 long black bristles and additional shorter dark hairs. Prothoracic spiracle yellow. Legs yellow, tarsi black. Wings hyaline, stigma indistinct. Abdomen yellow; tergites without any pattern or at most with narrow dark median stripe. Male genitalia [figured in details by Chvala (1994, p. 171, fig. 300)]: lateral lamellae nearly rectangular in shape; dorsal lamellae with two small processes; aedeagus evenly bowed, simple, not very long.

Male length: body 6.2–7.0 mm, wing 8.3–9.0. Female length: body 6.5–8.3 mm, wing 7.5–8.6 mm.

Differential diagnosis. *E. testacea* can be compared with *E. dispina*, *E. punctata*, and *E. edithae*. However, the former has mesonotal pattern consisting of two narrow dark lines along *dc* bristles only and highly characteristic dorsal lamellae with 2 strong spines at tip. *E. punctata* and *E. edithae* differ from this species by black prothoracic spiracle and mesonotal pattern.

Remarks. *E. testacea* is distributed in Europe, mostly along the Atlantic coast, although it was also found in Spain and France. I have not seen any materials on this species. The above-given diagnosis is based on Chvala's (1994) description.

***Empis (Xanthempis) trigramma* Wiedemann, 1822**

(Figs 11, 34, 57, 78)

Empis trigramma Wiedemann in Meigen, 1822: 38.

Material examined. **Russia:** Leningrad Prov.: 1 male, 1 female, Luga, 4 VI 1954; the same locality: 1 female, 16 VI 1954; 1 female, 20 VI 1955; 1 male 16 VI 1955; 1 female, Cheremnitskoe Lake, 29 VI 1955; 1 male, Elizavetino, 22 V 1954; 1 male, Luga Distr., Yashchera, 20 V 1968; the same locality: 1 male, 24 VI 1968 (all leg. A. A. Stackelberg); 1 male, Pavlovsk, [date not given], Wagner's coll.; 1 female, Saryi Peterhof, Sergievka, 12 VI 1930 (leg. Burakova); 1 male, Popovka, near Pavlovsk, 20 V 1920 (leg. V. Fridolin); 1 female, environs Petersburg, 1869 (leg. Sol'skii), 9173, *Empis trigramma* Meig.; 1 male, Gatchina, Malogatchinskoe forestry, cottage, 11 VI 1922 (leg. Borovskii); 16 males, 11 females, Otradnoe, bank of lake, alder grove, 6 VI 1965, *Empis (Xanthempis) trigramma* Mg., Gorodkov det.; 1 male, Priozersk Distr., Otradnoe, 28 V 1968 [pinned to-

gether with spider] (all leg. Gorodkov); Yaroslavl' Prov.: 1 male, 1 female, Berditsino, flowers Sorbur., 3 VI 1907 (all leg. A. I. Yakovlev), A. Yakovlev's Coll.; 2 males, 4 females, Yaroslavl', [date not given], Wagner's Coll. Moscow Prov.: 1 female, Dmitrov, Shpilevo, 14 VI 1918 (leg. N. Kuznetsov); Voronezh Prov.: O. N. Chalaya (pers. comm.); Kursk Prov.: 1 male, Graivoron Distr., Borisovka, 11 V 1915 (leg. S. Malyshev); Ufa Prov.: 1 male, Katav-Ivanovsk Nature Reserve, Dvoinishi, 24 VI 1926 (leg. Vakulenko); Samara Prov.: 1 male, 2 females, Zhiguli, Middle Volga, leaf-bearing forest, 13 VI 1937 (leg. Preobrazhenskii), *Empis trigramma* Meig., det. E. Novoderezhkin; Saratov Prov.: 2 males, Sarepta [now Krasnoarmeisk], 7–8 V 1917 (leg. N. Kuznetsov); Ekaterinburg Prov.: 1 male, Severskii Distr., Polevskoi, damp herbs, 30 VI 1970 (leg. Zinov'ev). **Ukraine:** 2 males, 1 female, Kiev, beginning of V 1903; 1 female, the same locality, 12 V 1903 (all leg. Yu. Wagner); 1 male, 1 female, Khar'kov, 18 V 1976, [name not given], *Empis trigramma* Mg. **Byelorussia:** 1 male, Bodzentin, Kelezk Distr., 11 V 1895 (leg. Jakobson). **Lithuania:** 1 female, Kowno (=Kaunas), Georgenburg, 6 V 1904 (leg. Winogradoff) — deposited in the ZIN.

Description. A large species with occiput largely black above neck. Antennae black. Thorax yellow in ground-colour. Mesonotum with 3 broad black stripes (often varying in shape and colour intensity) separated by more or less wide yellow stripes along the lines of *dc* bristles; lateral dark stripes shorter and narrower, demarcated on the outside by *ph* and *sa* bristles; scutellum entirely blackish, metanotum only narrowly yellowish at sides. Thoracic chaetotaxy: 1 *h* (1–2 small hairs anteriorly); 1 *ph*, 2 *ntpl*, 1 *sa*, 1 *pa* (with 1 very short setula); 1 pair of *sc* (sometimes with a small hair each side); *acr* lacking; *dc* short and fine, becoming longer posteriorly (last two pairs longest), about 5–7 bristles in a row. Pronotum with about 10 small spine-like bristles on each side. Metapleura with 3–5 long setulae and additional shorter dark hairs. Prothoracic spiracle blackish. Legs yellow, tarsi darkened, often almost black; covered with simple bristles and hairs. Wings hyaline, stigma indistinct. Abdomen yellow; tergites with dark median triangular spots. Male genitalia: lateral lamellae nearly triangular in shape, pointed apically; dorsal lamellae without projections; aedeagus very long and thin, thread-like in apical part.

Male length: body 4.8–7.2 mm, wing 5.8–8.2. Female length: body 5.8–8.3 mm, wing 6.0–7.5 mm.

Differential diagnosis. With its mesonotal pattern and male genitalia *E. trigramma* cannot be confused with any other *Xanthempis* species except *E. adriani* which is only known from the Caucasus. The main differences between these species are given in the Key.

Remarks. The commonest species of this subgenus in temperate Europe it, however, has not yet been known from the north-western region of Russia. *E. trigramma* is undoubtedly, the commonest in Leningrad Prov. Record from Ekaterinburg Prov. is now the extreme eastern point in the area of this species. Records on the occurrence of *E. trigramma* in Transcaucasia (Gorodkov, Kovalev, 1969) seem to be doubtful. It was probably based on Engel's (1943) note to *E. trigramma*: Caucasus, Talysh (Mik). However, I have not found any specimens of this species from the Caucasus. It should be noted that this record may also be referred to *E. adriani* having a very similar mesonotal pattern.

Distribution. Russia: Leningrad, Yaroslavl', Moscow, Kursk, Voronezh, Samara, Ufa, Ekaterinburg Provs. Ukraine: Kiev, Khar'kov Provs. Beylorussia. Lithuania.

***Empis (Xanthempis) univittata* Loew, 1867**
(Figs 12, 35, 58, 79)

Empis stercorea L. var. b Zetterstedt, 1842: 378. *Empis univittata* Loew, 1867: 20.

Material examined. Russia: Leningrad Prov.: 1 female, Peterhof Distr., Polukhinka, 16 VI 1894 (leg. Bianki); Perm' Prov.: 3 males, 1 female, Kungur, 24 VII 1970 (all leg. Zinov'ev); Samara Prov.: 2 males, Zhiguli Middle Volga, 23 VI 1938 (all leg. Novoderzhkin). Ukraine: 1 female, 7 km SE Kanev, Kanev Nature Reserve, 29 V 1979 (leg. Gorodkov). Estonia: 1 male, Estlyandia, Toulala, 10 VI 1905 (leg. V. Borovskii). Austria: 2 females, Edmont, Steierrn. (leg. Strobl), *Empis univittata* Lw., Strobl det.

Description. A species with occiput almost black above neck, rarely upper postocular margins very narrowly yellowish; lower part of occiput below neck yellow. Antennae black. Thorax yellow. Mesonotum with a single broad blackish to blackish-grey distinct median stripe, occupying almost the whole area between *dc* bristles, which are situated on the yellow background outside the mid-stripe. Thoracic chaetotaxy: 1 *h* (with another small hair anteriorly); 1 *ph*, 1 *ntpl*, *sa* lacking, 1 *pa* (with 1 very short setula); 1 pair of *sc* (sometimes with a small hair each side); *acr* lacking; *dc* short and fine, becoming slightly longer posteriorly (last two pairs longest), about 6 bristles in a row. Pronotum with about 4—6 bristles on each side. Metapleura with 4—5 long setulae and additional shorter dark hairs. Prothoracic spiracle yellow. Legs yellow, tarsi blackish; covered with simple bristles and hairs. Wings hyaline, stigma indistinct. Abdomen yellow; tergites with blackish anterior and lateral margins. Male genitalia: lateral lamellae triangular in shape, convex above, pointed

and upturned apically; dorsal lamellae with two stripe-like projections posteriorly, the smaller lower one with a long bristle; aedeagus with a slight bend at base, and another more distinct one just before apical part.

Male length: body 4.5—5.8 mm, wing 6.0—7.0. Female length: body 5.2—7.3 mm, wing 6.5—7.2 mm.

Differential diagnosis. *E. univittata* is closely related to *E. zinovevi*, *E. aequalis*, *E. laeta*, and *E. loewiana* and can be distinguished from them in characters given in the Key.

Remarks. *E. univittata* was known from central and eastern parts of Europe (extending approximately to 60° N in Scandinavia). Collin (1941) identified this species among materials collected in the Russian Far East (male, Maiche, Shkotovo Distr., 3 VIII 1927 and female, Razdol'naya, Ussuri Reg., 4 VI 1928) and this record was later published in the Palaearctic Catalogue (Chvala, Wagner, 1989). Unfortunately, I failed to find these specimens in the Collection of the ZIN. However, taking into account the distribution pattern of this species, the occurrence of *E. univittata* in the Far East seems to be doubtful.

Distribution. Russia: Leningrad, Perm', and Samara Provs. Ukraine: Cherkassy Reg., Estonia.

***Empis (Xanthempis) zinovjevae* Shamshev, sp.n.**
(Figs 36, 59, 102—103)

Material. Holotype male, Georgia: Bakuriani, 2200 m, glade in beech forest, 24 V 1972 (leg. Zinov'eva).

Paratype. 1 male, the same data as in holotype. Both type specimens are deposited in the ZIN.

Diagnosis. A species with a broad brownish stripe on mesonotum; occiput with a large dark-brown spot behind ocelli, 1 *sa*, 3 pairs of *sc*; *dc* situated outside the brown median stripe (on yellow area).

Description. Male. Head, including frons and face, reddish-yellow, finely silvery pollinose, slightly shining; mouth-opening margins narrowly shining. Frons broad, parallel-sided, bearing 4—5 blackish very short adpressed marginal setulae. Face broader than frons, widening below. One pair of short ocellar bristles. Ocellar tubercle brownish-yellow. Occiput with a large dark-brown spot behind ocelli. Chaetotaxy of occiput includes an upper regular row of 3 strong long bristles on both sides relative to ocellar tubercle and 5 or 6 additional short bristles; 10—11 short bristles in centre of occipital area, and a lower regular row of long strong bristles becoming finer and hair-like below. 3rd antennal segment and stylus black, 1st and 2nd segments yellowish-brown. 3rd antennal segment long and narrow, 2nd

segment globular. 1st and 2nd antennal segments with short black bristles. Ratio of length and width for 1st antennal segment 2.0:0.7; for 2nd segment 0.7:0.6; for 3rd segment 3.1:0.7. Proboscis reddish-yellow, labrum brownish at apical part. Ratio of proboscis length to head height 10.7:5.1. Palpi short oval reddish-yellow, covered with minute silvery-white hairs and bearing 9—10 long brownish hairs. Thorax reddish-yellow, slightly shining. Pleura covered with greyish-white, relatively sparse pollen. Prothoracic spiracle, notopleural line, scutellum, and metanotum yellow. Mesonotum with a broad brown median stripe covered with golden-grey pollen (in some view with additional median light narrow stripe), occupying whole area between *dc* bristles, and ending on level of prescutellar depression. All thoracic bristles black. Thoracic chaetotaxy: 1 *h* (with 6—7 minute bristles anteriorly); 1 relatively thin and short *ph*; 2 *ntpl* (posterior one somewhat shorter) and 4 very short additional bristles anteriorly; 1 *sa*; 1 *pa* (1 very short setula besides); 3 pairs of *sc*, all convergent, two inner pairs longest (in the paratype even with an additional pair of thin and short hairs); *acr* lacking, *dc* uniserial, rather strong, 6 bristles in a row, becoming longer toward scutellum, situated partly outside the brown median stripe (on yellow area) and partly (3—4 pairs of short and thin bristles in the middle) on the stripe margin. Pronotum with 16—17 strong spine-like bristles and a row of 5—6 setulae on each side. Metapleura with a row of 4—5 long and 2—3 short setae. Legs long and slender, yellow, tarsi brownish-yellow. Coxae with black hairs and bristles. Femora covered with very short adpressed black bristles; fore femora almost bare ventrally. Tibiae covered with very short adpressed black bristles; all tibiae with 1—4 relatively long dorsal bristles. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hyaline, with brownish veins becoming almost yellow (including costa) near base. One black thin costal bristle. Squamae yellow, covered with numerous rather long yellowish hair-like fringes. Axillary angle obtuse. Halteres reddish-yellow. Abdomen yellow, slightly shining, with a brownish broad stripe dorsally; covered with yellowish hairs denser and longer near base of abdomen. Genitalia: lateral lamellae broad, produced posteriorly, covered with very long (especially on the produced part) yellowish hairs; dorsal lamellae with deep excision; aedeagus rather short, gently curved, with a large membranous broadening in basal part and rather short oval apical opening.

Length: body 6.1—6.3 mm, wing 7.6—7.9 mm (holotype body 6.1 mm, wing 7.6 mm).

Female. Unknown.

Differential diagnosis. The new species is closely related in mesonotal pattern to *E. univittata*, *E. aequalis*, *E. laeta*, and *E. chopardi* but it differs from all these species by the presence of *sa* bristle. Both *E. univittata* and *E. chopardi* have a single *ntpl* bristle, all *dc* bristles are outside the dark median stripe. In *E. aequalis* and *E. laeta* (having also 2 *ntpl* bristles) all *dc* bristles are situated on the margin of the dark median stripe; the former also has 1 pair of large *sc* bristles and the latter can be easily distinguished by bristling of tibiae covered with very long ventral hair-like bristles (unusual case among *Xanthempis* species).

Etymology. The species is named in honour of Dr K.B. Zinov'eva (St. Petersburg) who collected it.

Distribution. Georgia.

***Empis (Xanthempis) zlobini* Shamshev, sp.n.**
(Figs 37, 60, 104—106)

Material. Holotype male, Russia: Primorsk Terr., Lazo Nature Reserve, Zvezdochka, 14 VI 1980 (leg. Zlobin) — deposited in the ZIN.

Diagnosis. Resembling *E. stercorea*, occiput behind ocelli with a distinct narrow black-brown elongate spot; aedeagus evenly curved, with a bend just before apical opening, the latter rather long, with a deep marginal excision.

Description. Male. Head reddish-yellow, frons and face covered with fine silvery pollen; mouth-opening margins narrowly shining. Frons broad, parallel-sided, bearing 4—5 blackish very short adpressed marginal setulae. Face broader than frons, slightly widening below. One pair of short ocellar bristles. Ocellar tubercle black-brown. Occiput slightly shining, finely silvery-grey pollinose, behind ocelli with a narrow distinct black-brown elongate spot covering ocellar tubercle and reaching a lower row of bristles. Chaetotaxy of occiput includes 2 strong long bristles on each side nearer to eye margin; 2 pairs of short adpressed bristles just behind ocellar tubercle; an upper regular transverse row of short bristles, 4—6 rather short bristles in centre, and a lower more or less regular transverse row of long strong bristles (about 12) becoming finer and hair-like below nearer to mouth-opening. 3rd antennal segment, except base, and stylus black; 1st and 2nd segments, and 3rd segment at base yellowish-brown. 3rd antennal segment long and narrow, 2nd segment globular. 1st and 2nd antennal segments with short black bristles. Ratio of length and width for 1st antennal segment 2.5:0.5; for 2nd segment 0.8:0.7; for 3rd segment and stylus 4.4:0.7:1.0. Proboscis yellowish, lighter near base. Ratio of proboscis length to

head height 11.2:5.5. Palpi elongate oval yellow, covered with short dense white pubescence and bearing 5—6 blackish setulae. Thorax yellow, slightly shining. Pleura covered with fine silvery-grey pollen. Prothoracic spiracle and notopleural line brownish. Mesonotum along median line with a distinct dark-brown stripe covered with fine silvery-grey pollen, occupying 1/2 of area between rows of *dc* bristles, widening anteriorly, beginning from anterior margin of mesonotum, and ending just before scutellum. All thoracic bristles black. Scutellum yellow. Metanotum with a rectangular dark spot. Thoracic chaetotaxy: 1 *h* (with 3 very short bristles anteriorly); 1 *ph*; 1 *ntpl* (with about 7 minute bristles anteriorly); *sa* lacking; 1 *pa* (1 very short bristle besides); 2 pairs of convergent *sc* (inner pair much more longer and stronger); *acr* lacking; *dc* uniserial, very short and fine in anterior part, 8—9 bristles in a row, 2 prescutellar pairs longest. Prosternum with about 9 very short blackish setulae. Pronotum on each side with 9—10 straight spine-like bristles of different length. Metapleura with 6 long and 3 shorter bristles situated irregularly. Legs long and slender, yellow, tarsi brownish. Coxae finely silvery-grey pollinose, bearing black hairs and bristles. Femora covered with very short adpressed black bristles, densely pubescent ventrally. Tibiae covered with very short adpressed black bristles; all tibiae with 2—3 relatively long dorsal bristles. Tarsi simple, covered with short adpressed black bristles, with somewhat stronger bristles (especially fore tarsi) ventrally. Wings hyaline, with brownish veins becoming lighter (including costa) near base. Costal bristle not pronounced. Squamae yellow, covered with numerous rather long brownish hair-like fringes. Axillary angle obtuse. Halteres yellow. Abdomen yellow, slightly shining; with distinct brownish triangular spots forming a stripe dorsally. All segments covered with relatively short brownish-yellow hairs and bristles. Genitalia: lateral lamellae narrow, nearly triangular in apical part, with rounded apex; dorsal lamellae with two processes, the lower one bearing two long bristles; aedeagus rather long, with a bend just before the long apical opening, the latter with a deep marginal excision.

Length: body 5.8 mm, wing 7.4 mm.

Female. Unknown.

Differential diagnosis. *E. zlobini* is closely related to *E. stercorea*, *E. aemula*, *E. belousovi* and *E. japonica*. *E. stercorea* and *E. aemula* have a very characteristic rhombus-like brownish-black spot on the occiput behind ocelli. *E. belousovi* and *E. japonica* have a very similar pattern of occiput but the spot is somewhat narrower than in the new species. These species differ also from *E. zlobini* by a narrower median stripe (especially anteriorly). In addition, *E.*

belousovi has a broader lateral lamellae, ventral lamella (hypandrium) without prominence, and an apical opening of the aedeagus with straight margins; *E. japonica* has hypandrium with a small pointed prominence bearing 2 very short hair-like bristles, and an apical opening of aedeagus shorter, with straight margins.

Etymology. The species is named in honour of Dr V. V. Zlobin, the Russian dipterologist, who collected it.

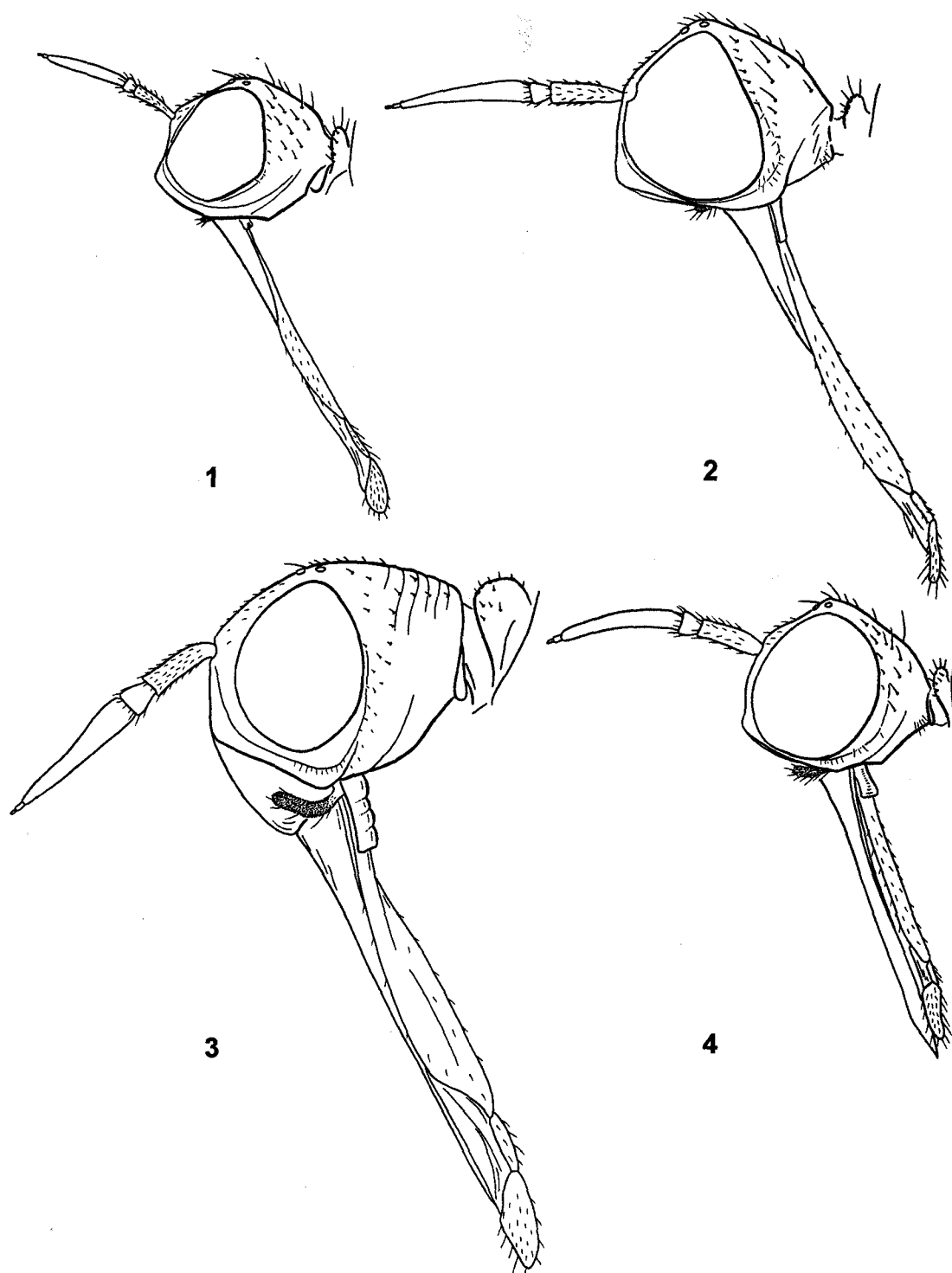
Distribution. Russia: the Far East.

Conclusion

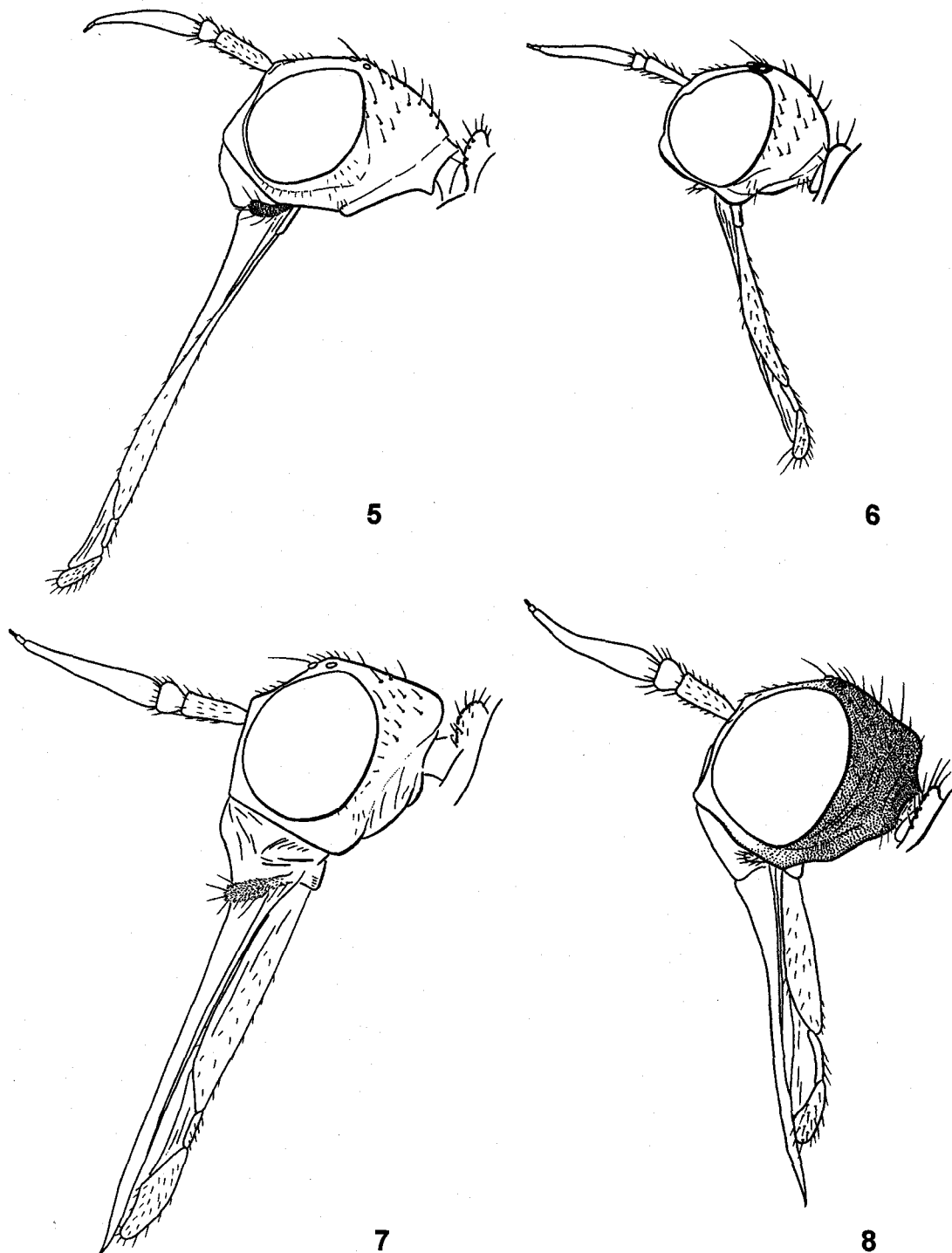
At present, 44 *Xanthempis* species are known in the Palaearctic region, of which 23 species were recorded from the territory of Russia and neighbouring lands. This numbers cannot be considered final since I have seen at least about five still undescribed species from the Caucasus, the Altai, North China, and the Far East. The European fauna of this subgenus (especially in submontane and mountain regions) is the most diverse within the Palaearctic region. When moving to the east, the species diversity of *Xanthempis* abruptly reduces and no original species (probably except (*E.*) *sesquata*) have yet been known from this part of the Palaearctic. There appears to be no transpalaearctic species within *Xanthempis* ones. *E. stercorea* is the most wide-spread representative of the subgenus, however, it has not been found in the Far East, where *Xanthempis* is represented of several very closely related species which obviously refer to *E. stercorea*. It is interesting to note that *Xanthempis* was not found in the Middle Asia, although there were rich collections from this region in *Empis* on the whole.

Acknowledgements

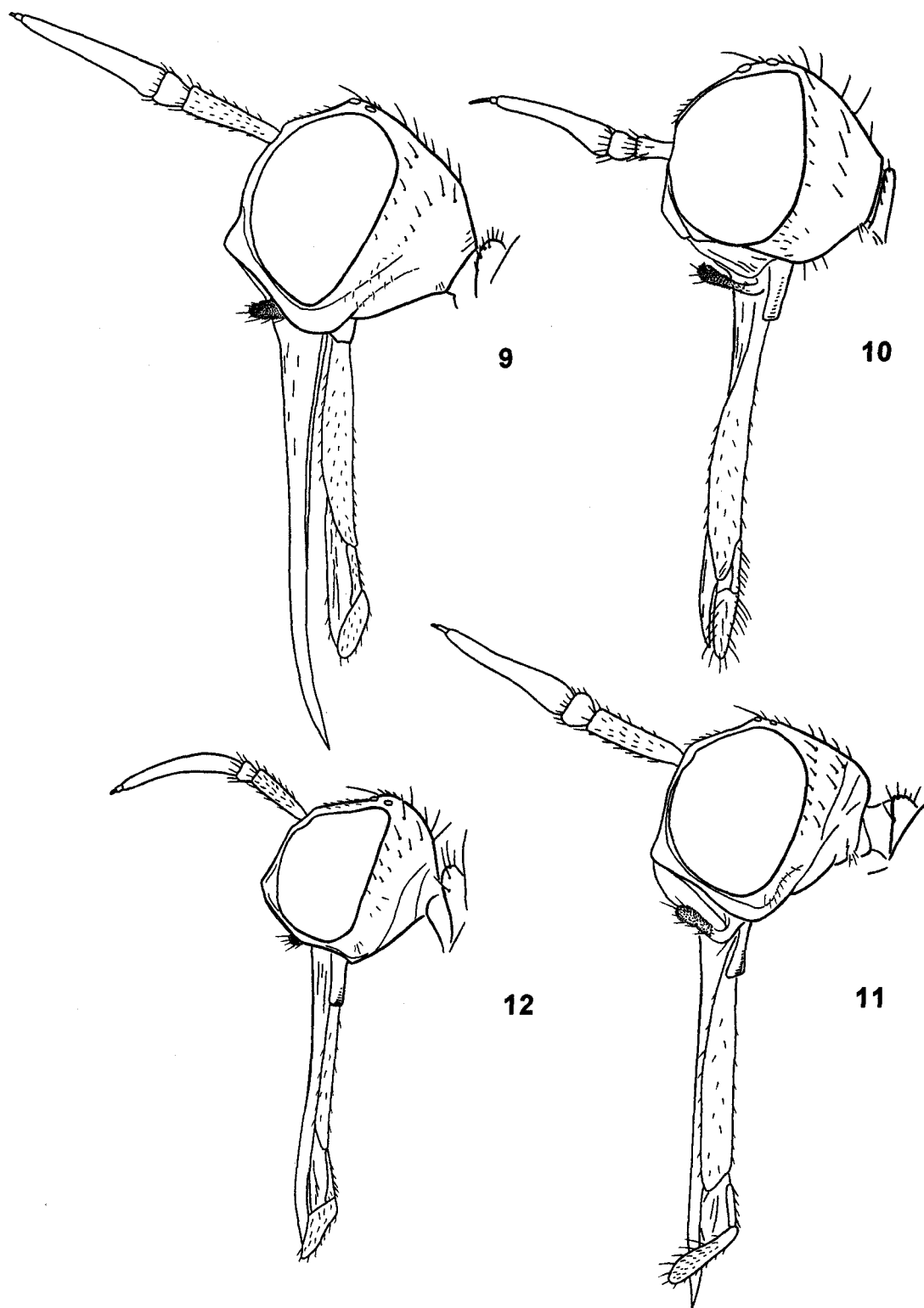
I am very grateful to Dr. A. Pont (Hope Entomological Collections, Oxford), Dr. J. M. Cumming (Biosystematic Research Centre, Ottawa), and Dr. H. Schumann (Zoologisches Museum of the Humboldt University, Berlin) for the loan of the type specimens. I am very indebted to Dr. A. I. Shatalkin, Dr. A. L. Ozerov (the Zoological Museum of the Moscow State University) and Dr. V. I. Lantsov (Russia, Pyatigorsk) for the donation of the material and to Dr. P. Grootaert (Institut Royal des Sciences Naturelles de Belgique, Bruxelles), Dr. I. Ya Grichanov (Institute of Plant Protection, St. Petersburg) and Dr. B. J. Sinclair (Biosystematics Laboratory, Graduate School of Social & Cultural Studies, Kyushu University, Japan) for helping me to get literature.



Figs 1—4. Heads of species of *Empis* (*Xanthempis*), males, lateral view.
1, *E. (X.) aequalis* Loew (lectotype); 2, *E. (X.) concolor* Verrall (Russia: Stavropol' Prov.); 3, *E. (X.) digramma* Meigen (Transsylvania); 4, *E. (X.) kuntzei* Becker (lectotype).

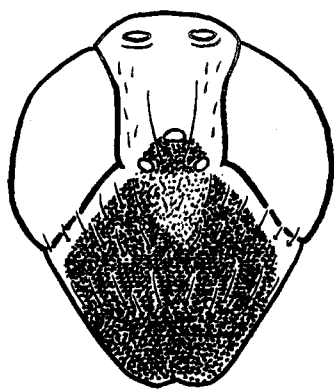


Figs 5—8. Heads of species of *Empis* (*Xanthempis*), males, lateral view.
5, *E. (X.) laeta* Loew (Central Europe, Kowarz's Col.); 6, *E. (X.) lutea* Meigen (Hungary); 7, *E. (X.) punctata* Meigen (Czechia); 8, *E. (X.) semicinerea* Loew (lectotype);

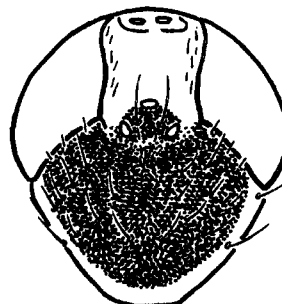


Figs 9—12. Heads of species of *Empis* (*Xanthempis*), males, lateral view.

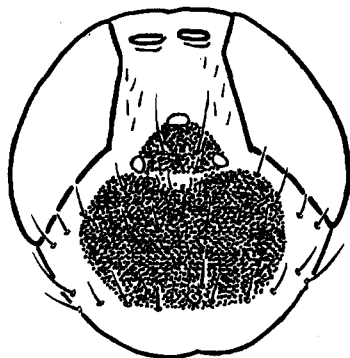
9, *E. (X.) stercorea* Linnaeus (Russia: Leningrad Prov.); 10, *E. (X.) subscutellata* sp. n. (paratype); 11, *E. (X.) trigramma* Wiedemann (Russia: Leningrad Prov.); 12, *E. (X.) univittata* Loew (Russia: Perm' Prov.).



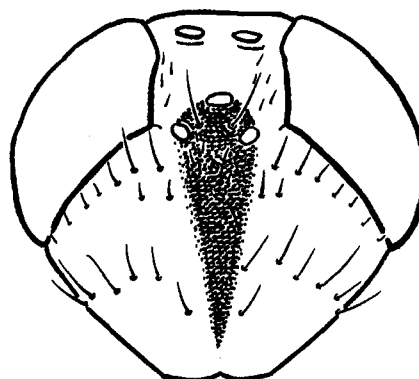
13



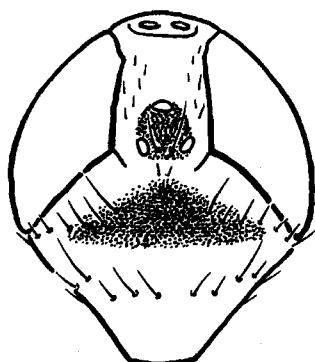
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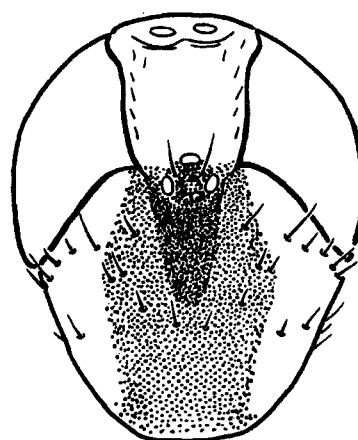
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16

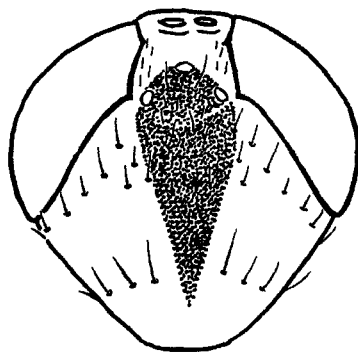


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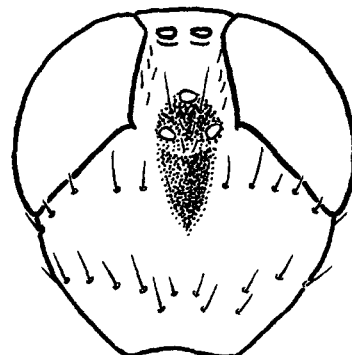


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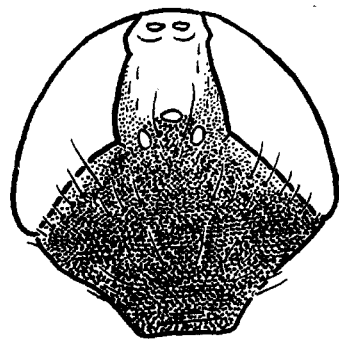
Figs 13—18. Heads of species of *Empis* (*Xanthempis*) (antennae not shown), males, dorsal view.
 13, *E. (X.) adriani* Chvala (Azerbaijan, Pirkuli); 14, *E. (X.) aequalis* Loew (lectotype); 15, *E. (X.) alanica* sp. n. (holotype); 16, *E. (X.) belousovi* sp. n. (holotype); 17, *E. (X.) concolor* Verrall (Russia: Stavropol' Prov.); 18, *E. (X.) digramma* Meigen (Transsylvania).



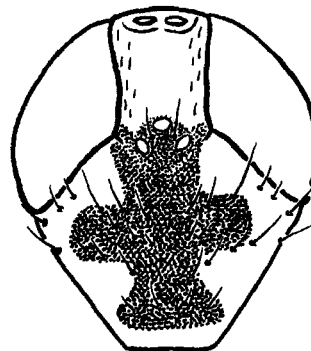
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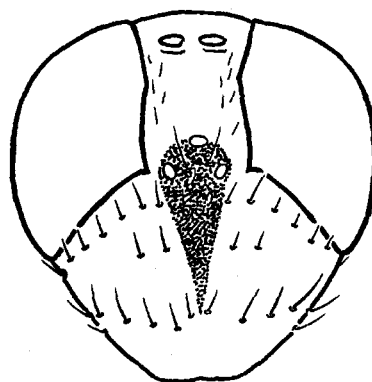
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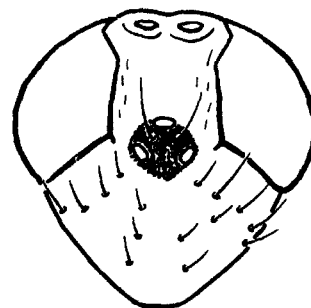
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22

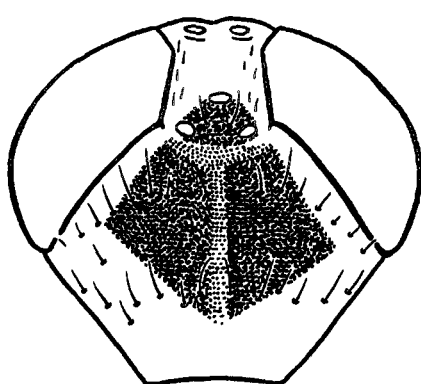


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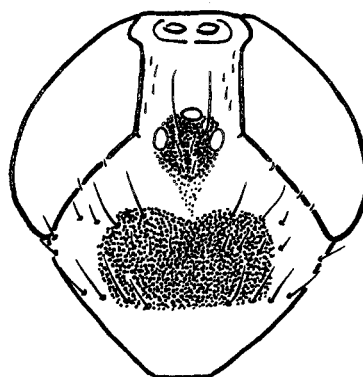


24

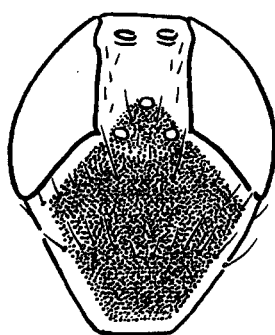
Figs 19—24. Heads of species of *Empis* (*Xanthempis*) (antennae not shown), males, dorsal view.
19, *E. (X.) japonica* Frey (Kurile Islands); 20, *E. (X.) kozlovi* sp. n. (holotype); 21, *E. (X.) kuntzei* Becker (lectotype); 22, *E. (X.) laeta* Loew (lectotype); 23, *E. (X.) laetabilis* Collin (Scotland); 24, *E. (X.) lutea* Meigen (Hungary).



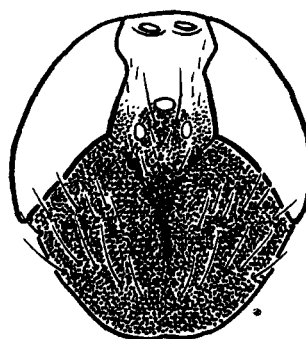
25



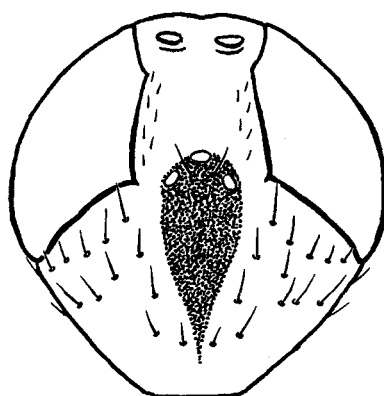
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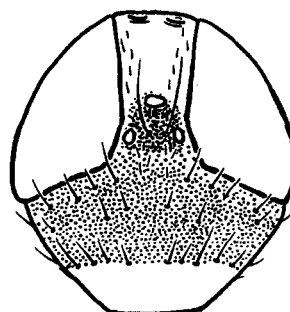
27



28

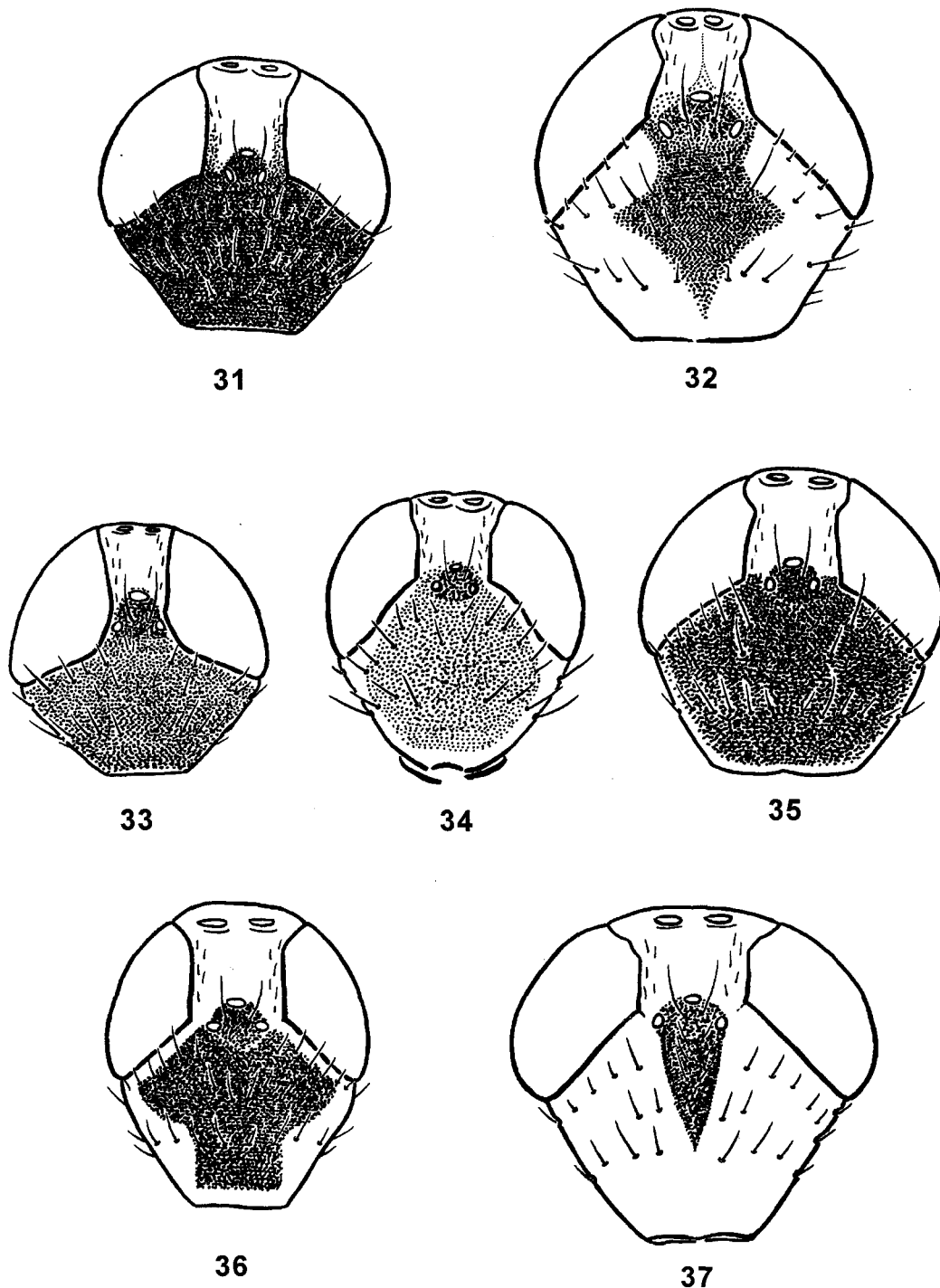


29

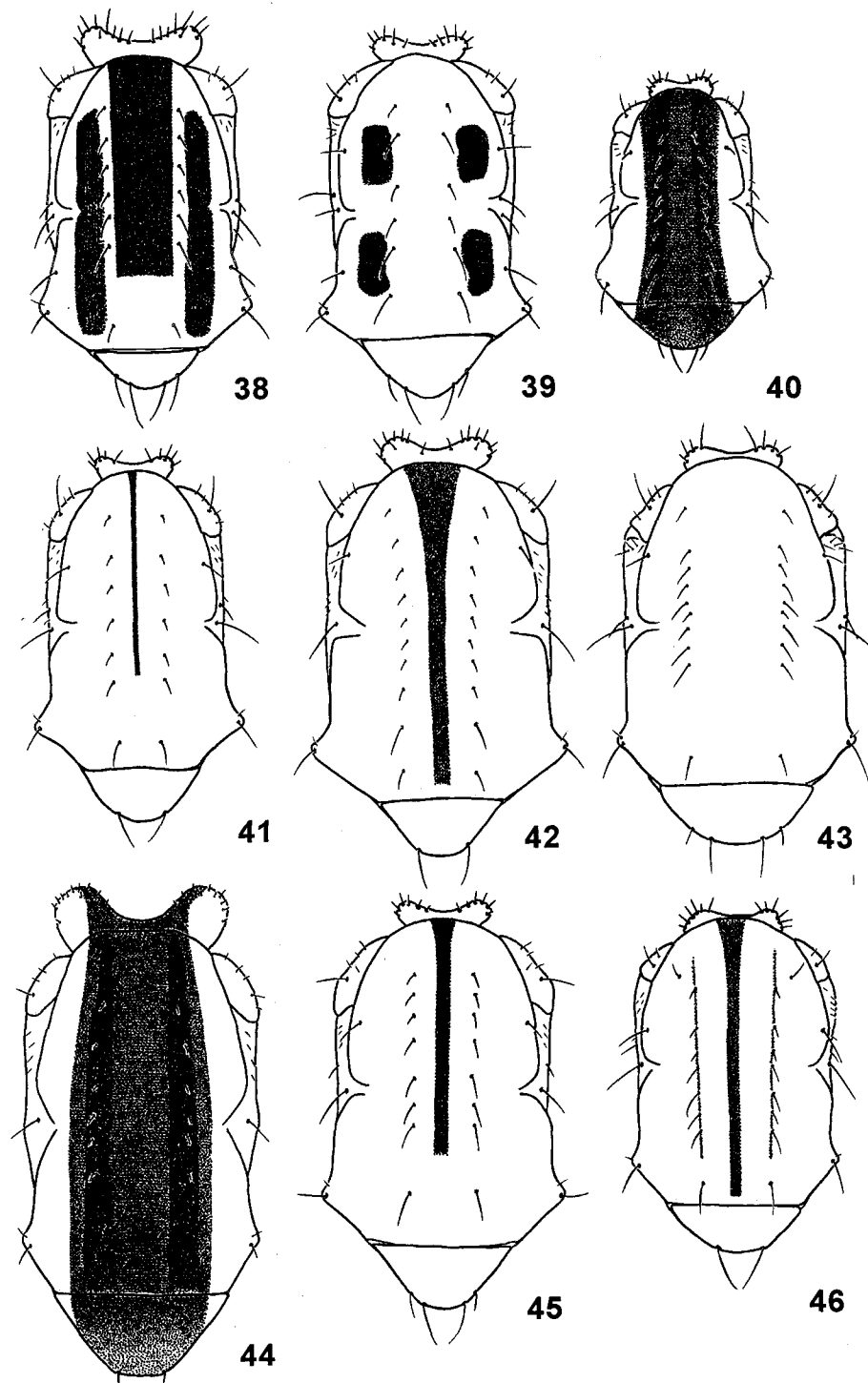


30

Figs 25—30. Heads of species of *Empis* (*Xanthempis*) (antennae not shown), males, dorsal view.
 25, *E. (X.) oxilara* sp. n. (holotype); 26, *E. (X.) nevadensis* Chvala (paratype); 27, *E. (X.) ponti* Chvala (Russia: North Ossetia); 28, *E. (X.) punctata* Meigen (Czechia); 29, *E. (X.) richteri* sp. n. (holotype); 30, *E. (X.) scutellata* Curtis (England).

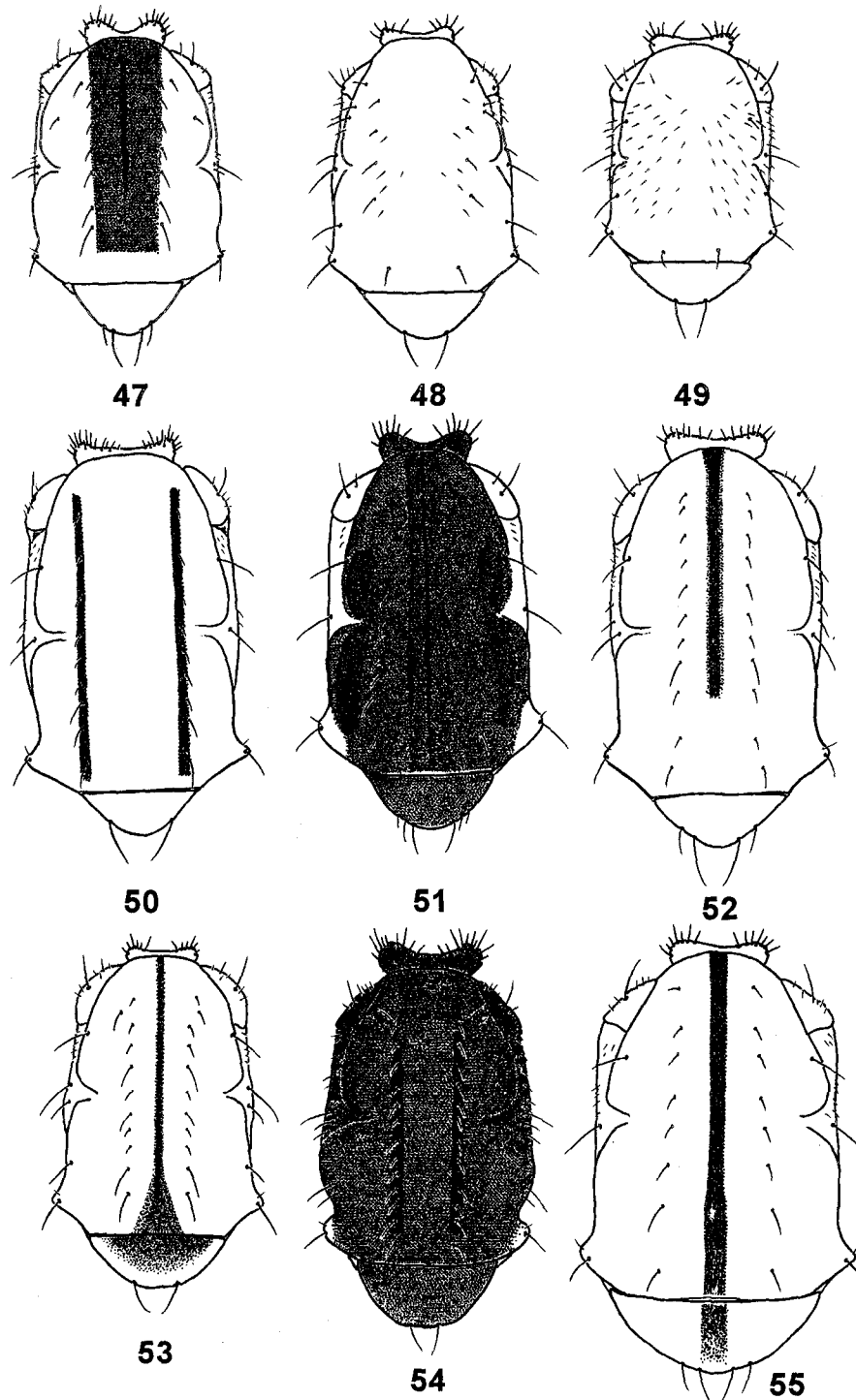


Figs 31—37. Heads of species of *Empis* (*Xanthempis*) (antennae not shown), males, dorsal view.
31, *E. (X.) semicinerea* Loew (lectotype); **32**, *E. (X.) stercorea* Linnaeus (Russia: Leningrad Prov.); **33**, *E. (X.) subscutellata* sp. n. (paratype); **34**, *E. (X.) trigramma* Wiedemann (Russia: Leningrad Prov.); **35**, *E. (X.) univittata* Loew (Russia: Perm' Prov.); **36**, *E. (X.) zinovjevae* sp. n. (holotype); **37**, *E. (X.) zlobini* sp. n. (holotype).



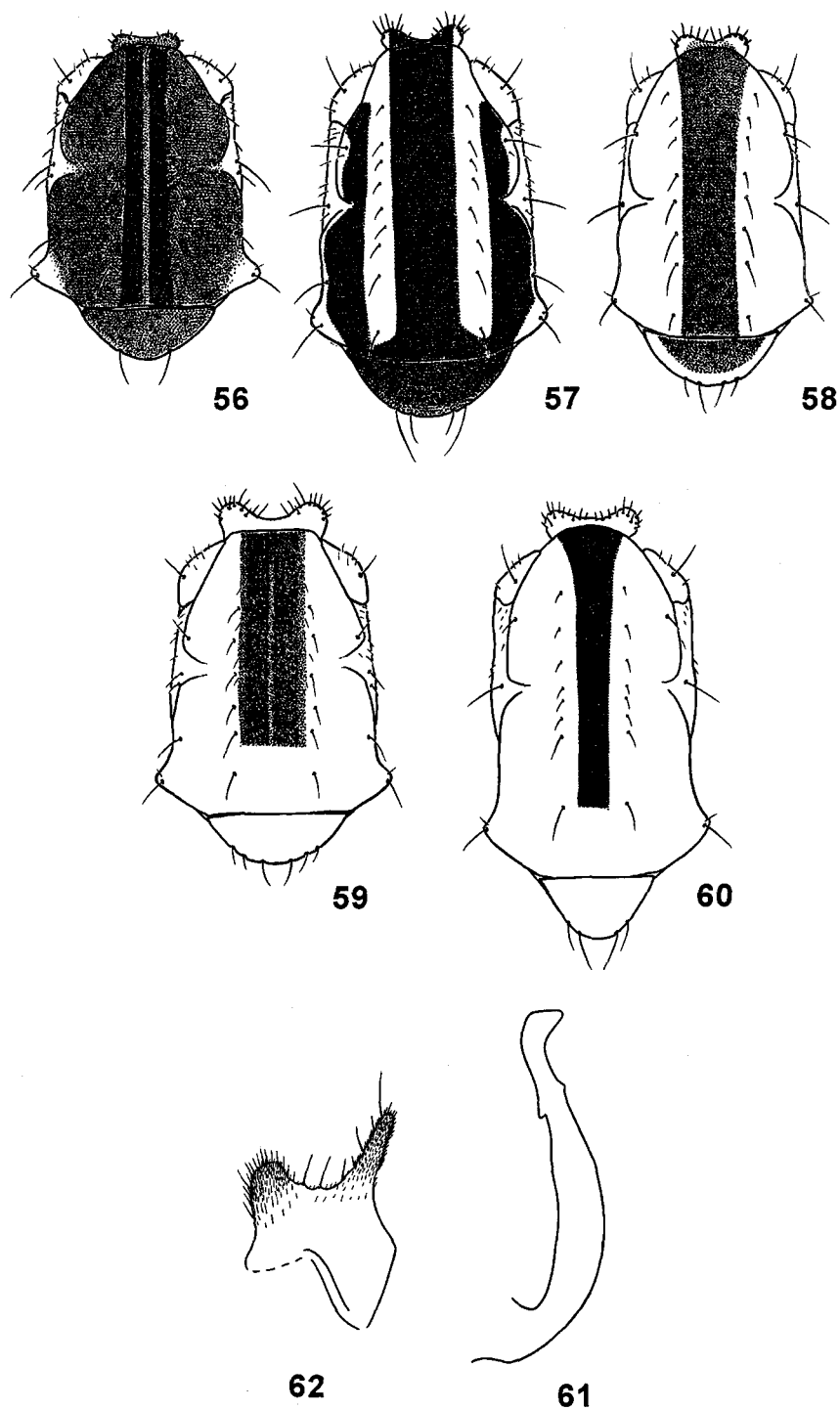
Figs 38—46. Thorax of species of *Empis* (*Xanthempis*), males, dorsal view.

38, *E. (X.) adriani* Chvala (Azerbaijan, Pirkuli); 39, *E. (X.) adzharica* sp. n. (holotype); 40, *E. (X.) aequalis* Loew (lectotype); 41, *E. (X.) alanica* sp. n. (holotype); 42, *E. (X.) belousovi* sp. n. (holotype); 43, *E. (X.) concolor* Verrall (Russia: Stavropol' Prov.); 44, *E. (X.) digramma* Meigen (Transsylvania); 45, *E. (X.) japonica* Frey (Kurile Islands); 46, *E. (X.) kuntzei* Becker (lectotype).



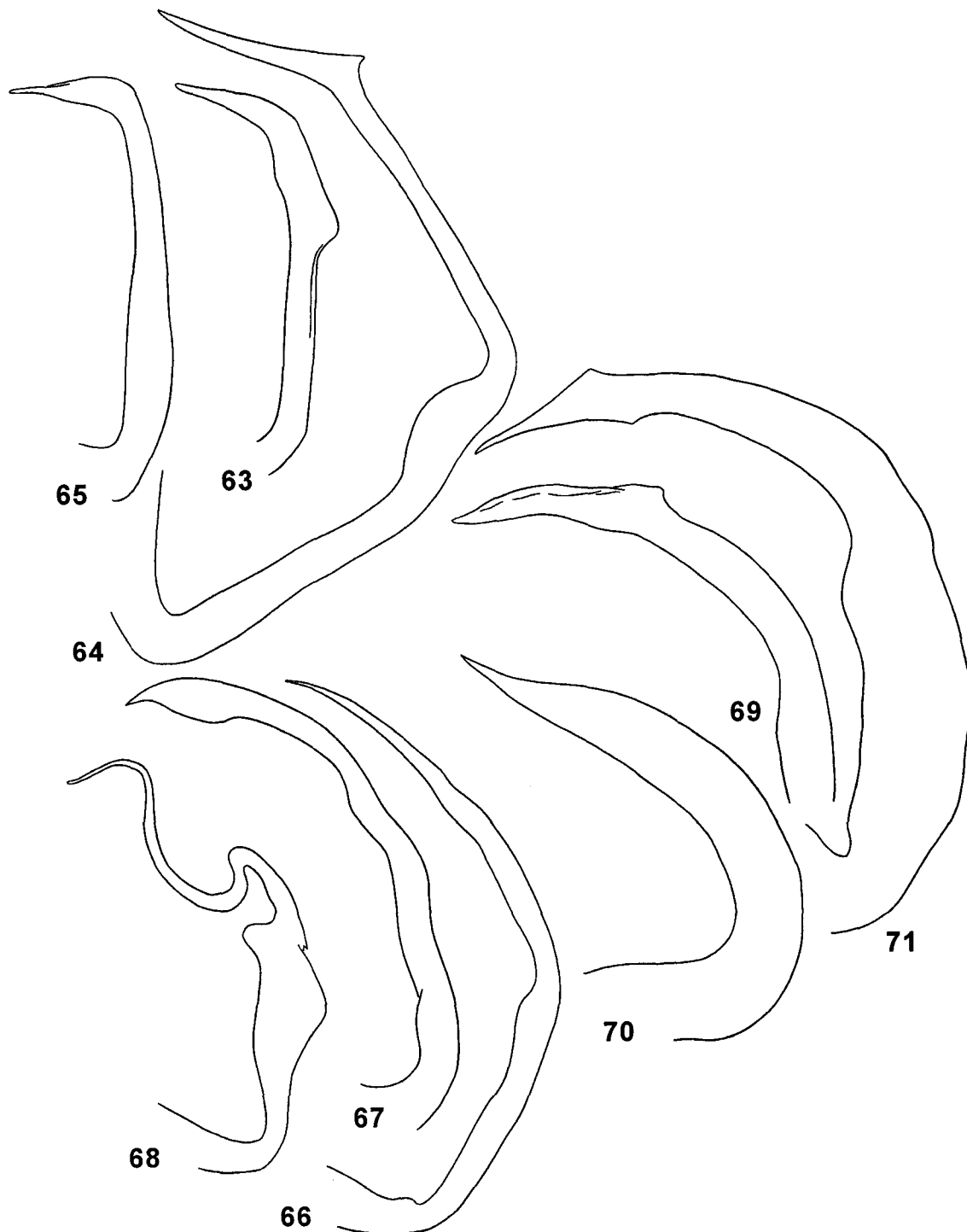
Figs 47—55. Thorax of species of *Empis* (*Xanthempis*), males except Fig. 49, dorsal view.

47, *E. (X.) laeta* Loew (lectotype); 48, *E. (X.) lutea* Meigen (Hungary); 49, the same, female; 50, *E. (X.) oxilara* sp. n. (holotype); 51, *E. (X.) punctata* Meigen (Czechia); 52, *E. (X.) richteri* sp. n. (holotype); 53, *E. (X.) scutellata* Curtis (England); 54, *E. (X.) semicinerea* Loew (lectotype); 55, *E. (X.) stercorea* Linnaeus (Russia: Leningrad Prov.).



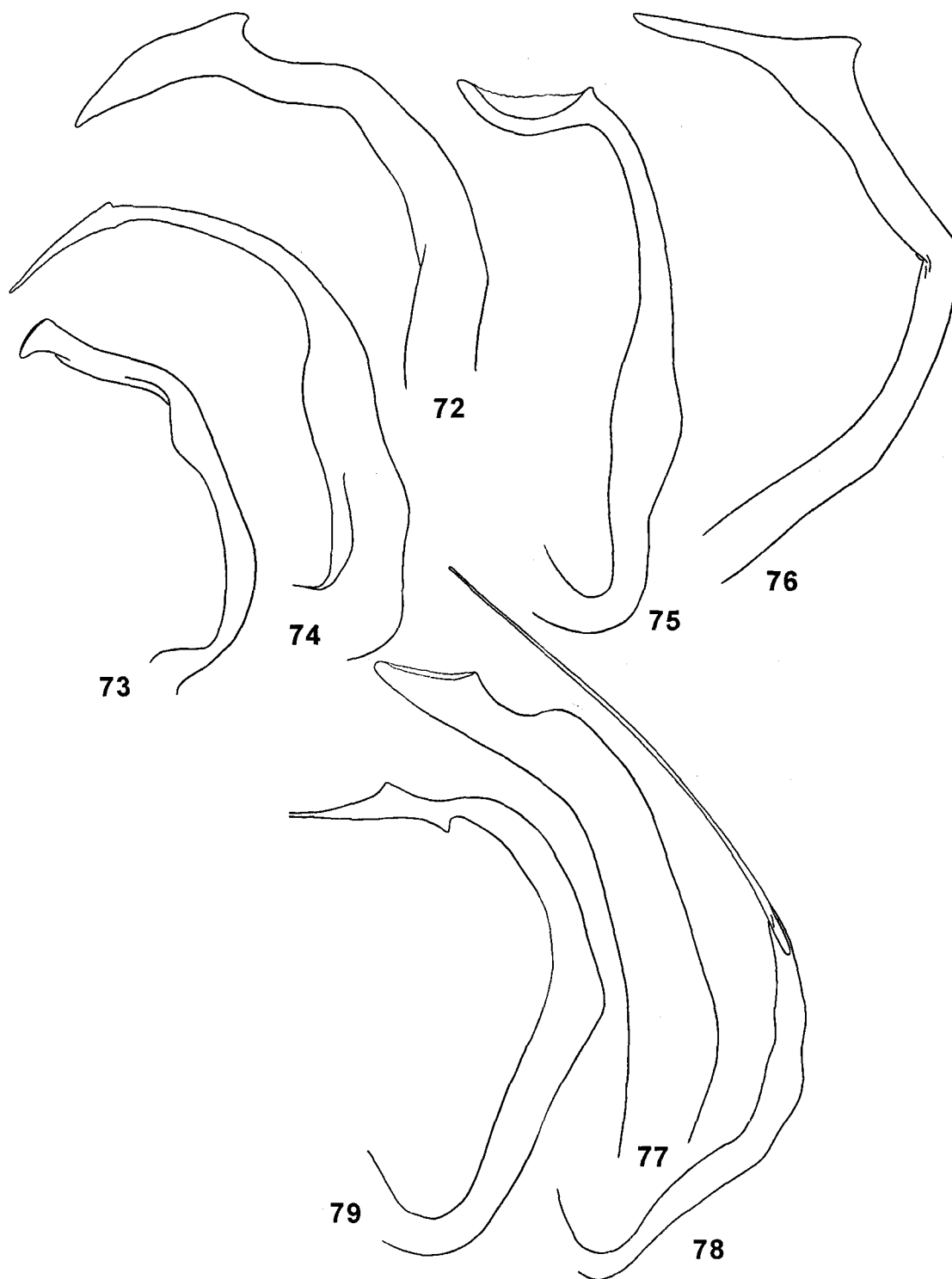
Figs 56—62. *Empis* (*Xanthempis*), males.

56—60, thorax, dorsal view: 56, *E. (X.) subscutellata* sp. n. (paratype); 57, *E. (X.) trigramma* Wiedemann (Russia: Leningrad Prov.); 58, *E. (X.) univittata* Loew (Russia: Perm' Prov.); 59, *E. (X.) zinovievae* sp. n. (holotype); 60, *E. (X.) zlobini* sp. n. (holotype); 61, *E. (X.) scutellata* Curtis (England), aedeagus, lateral view; 62, *E. (X.) scutellata* Curtis (England), dorsal lamella.



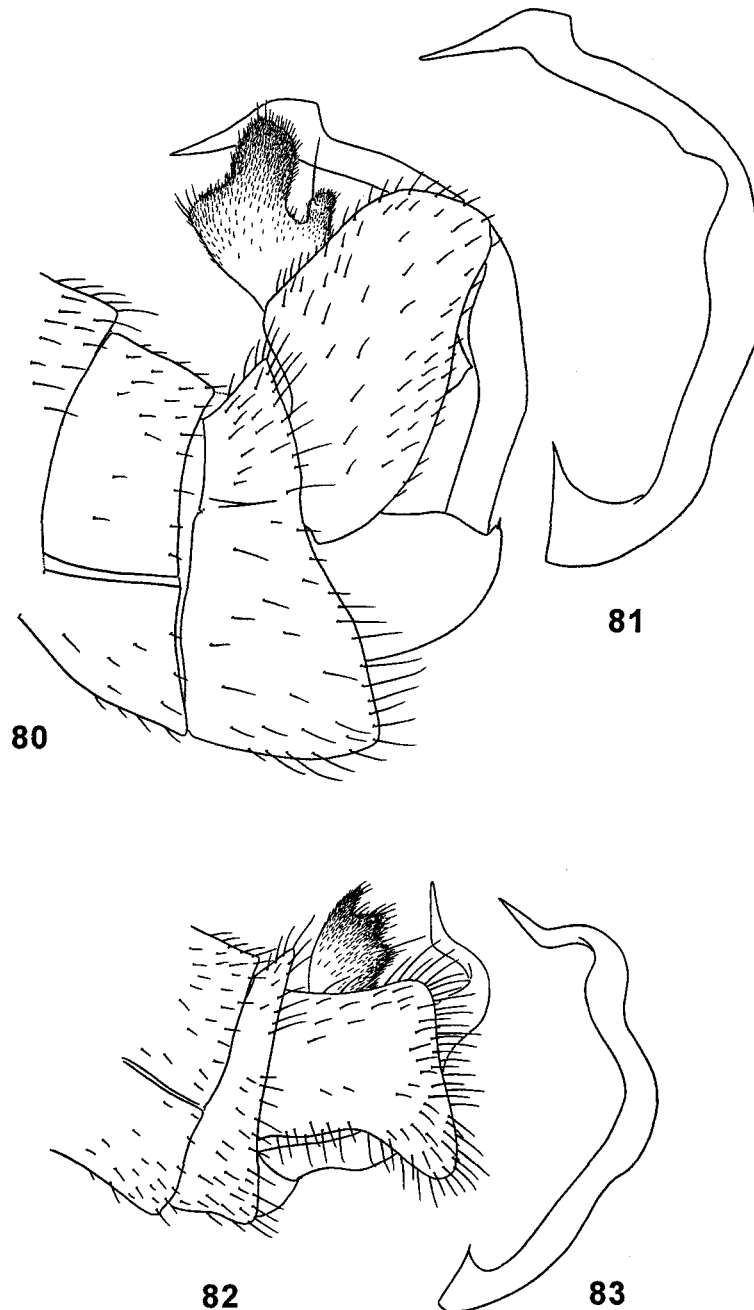
Figs 63—79. Aedeagus of species of *Empis* (*Xanthempis*), lateral view, except Fig. 62.

63, *E. (X.) adriani* Chvala (Azerbaijan, Pirkuli); **64**, *E. (X.) aemula* Loew (Carpathians); **65**, *E. (X.) aequalis* Loew (lectotype) [not macerated]; **66**, *E. (X.) caucasica* Bezzi (Russia: Stavropol' Terr.); **67**, *E. (X.) concolor* Verrall (Russia: Stavropol' Terr.); **68**, *E. (X.) digramma* Meigen (Transsylvania); **69**, *E. (X.) kuntzei* Becker (lectotype) [not macerated]; **70**, *E. (X.) laetabilis* Collin (Scotland) [not macerated]; **71**, *E. (X.) lutea* Meigen (Hungary).

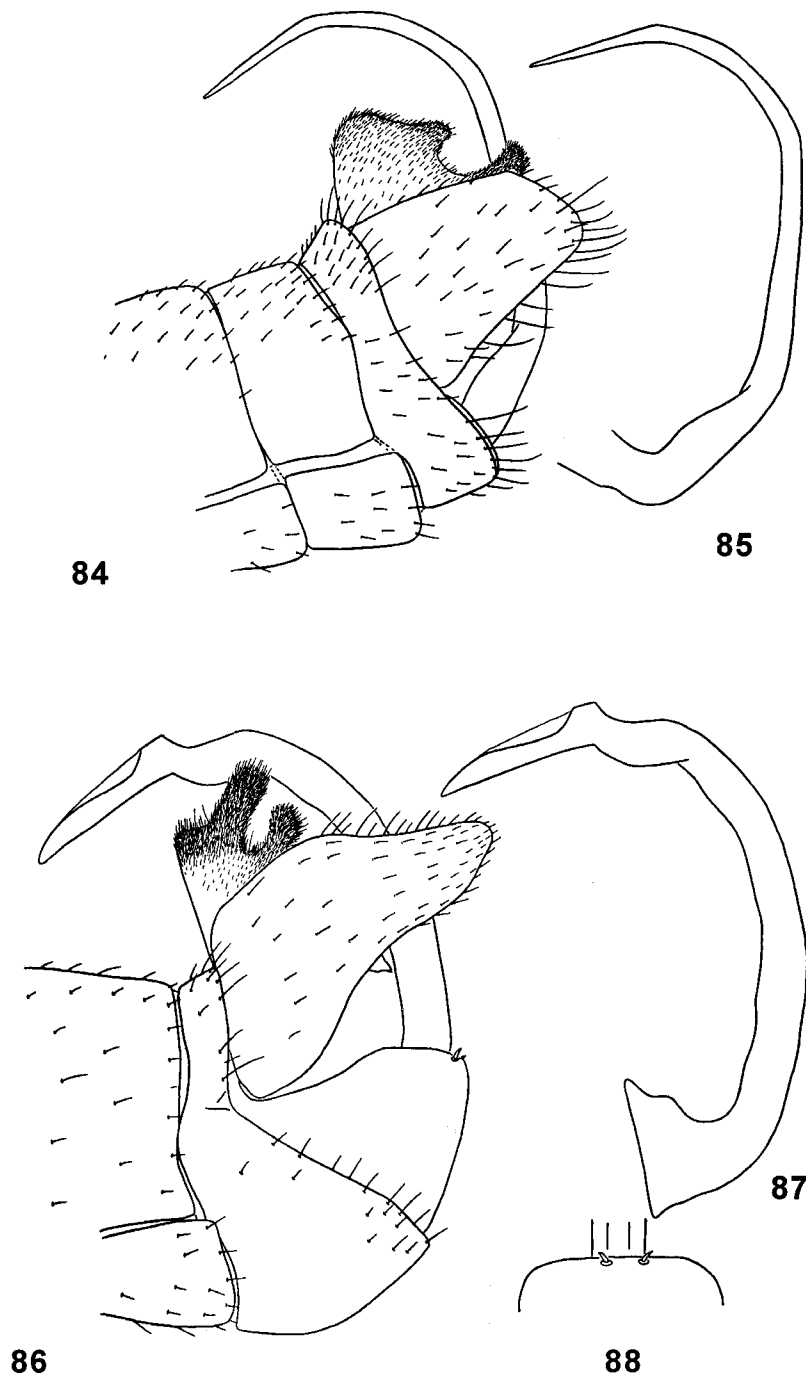


Figs 72—79. Aedeagus of species of *Empis* (*Xanthempis*), lateral view.

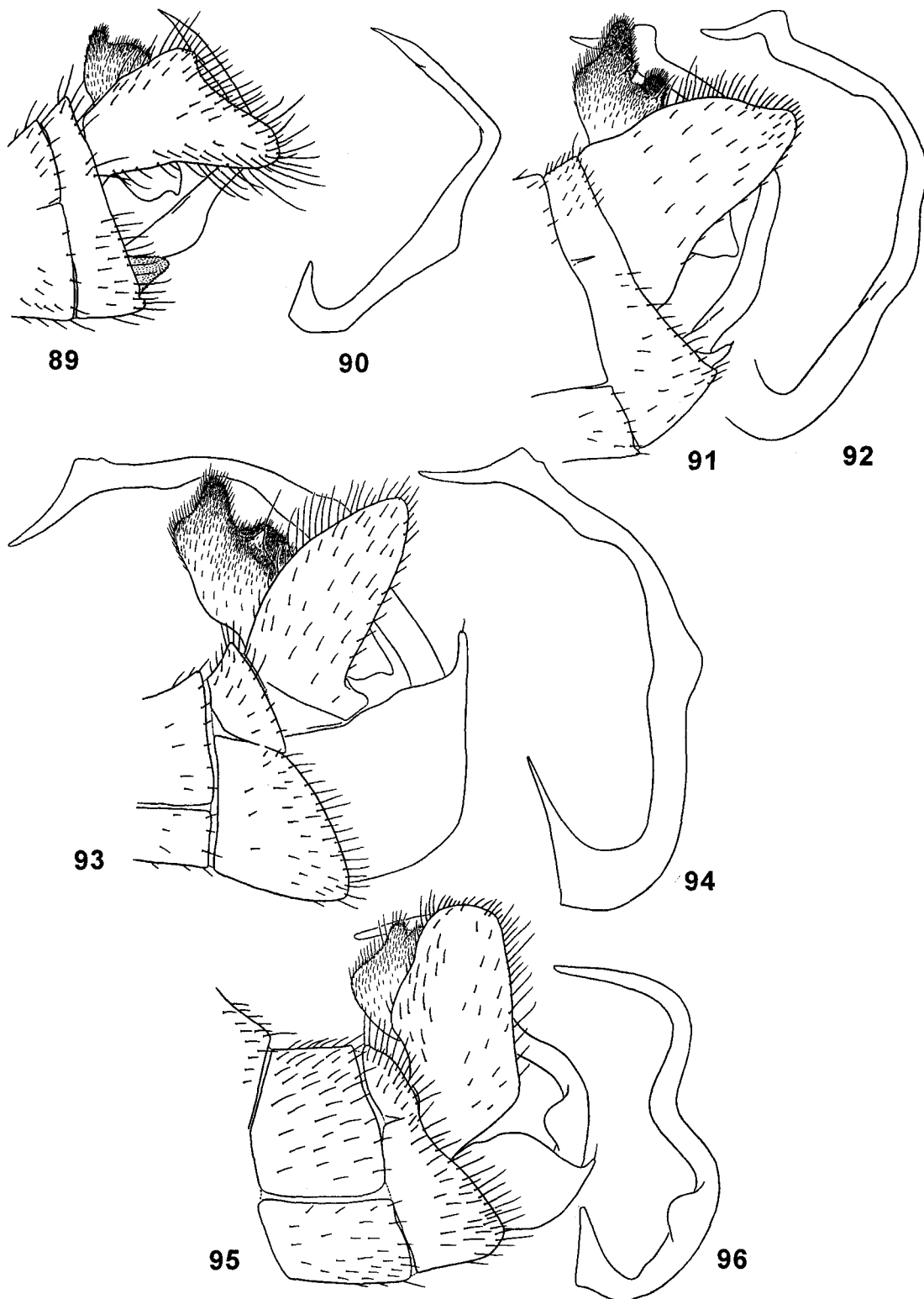
72, *E. (X.) nevadensis* Chvala (paratype) [not macerated]; 73, *E. (X.) ponti* Chvala (Russia: North Ossetia); 74, *E. (X.) punctata* Meigen (Czechia); 75, *E. (X.) semicinerea* Loew (lectotype) [not macerated]; 76, *E. (X.) stercorea* Linnaeus (Russia: Leningrad Prov.); 77, *E. (X.) styriaca* Strobl (Austria) [not macerated]; 78, *E. (X.) trigramma* Wiedemann (Russia: Leningrad Prov.); 79, *E. (X.) univittata* Loew. (Russia: Perm' Prov.).



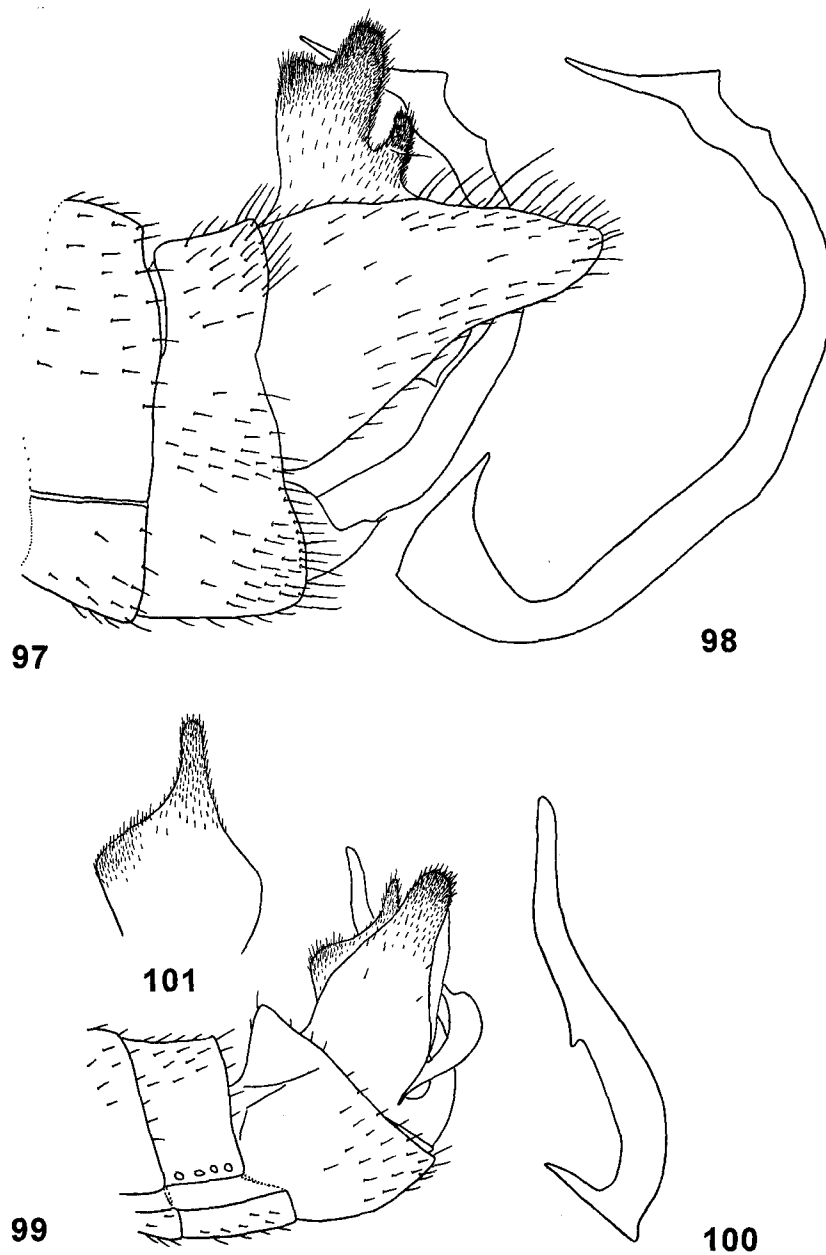
Figs 80—83. Male postabdomen and edeagus of species of *Empis* (*Xanthempis*), lateral view.
80—81, *E. (X.) japonica* Frey (Kuril Islands); 82—83, *E. (X.) adzharica* sp. n.



Figs 84—88. Male postabdomen and edeagus of species of *Empis* (*Xanthempis*), lateral view, except Fig. 88. 84—85, *E. (X.) alanica* sp.n., holotype; 86—88, *E. (X.) belousovi* sp.n., paratype: 88, tip of hypandrium and part of aedeagus, posterior view.

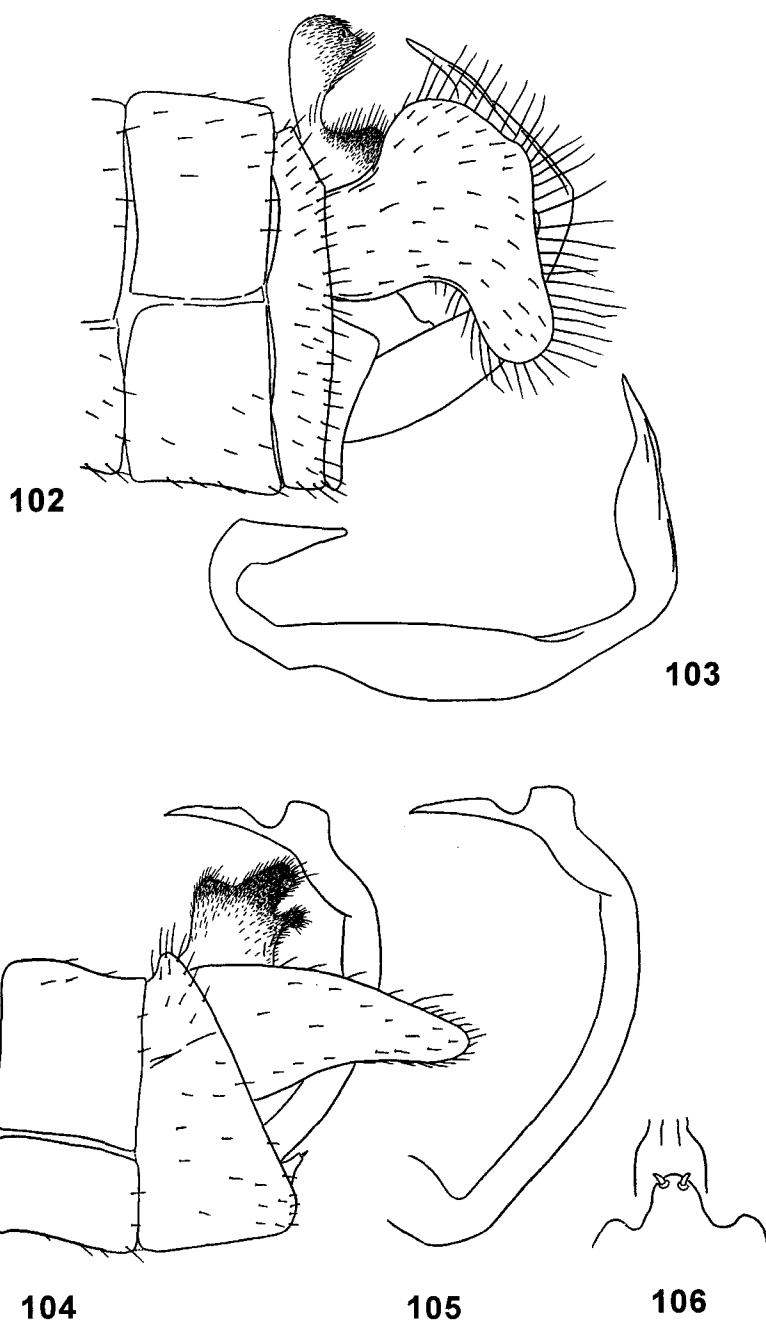


Figs 89—96. Male postabdomen and edeagus of species of *Empis* (*Xanthempis*), lateral view.
 89—90, *E. (X.) kovalevi* sp.n., holotype; 91—92, *E. (X.) kozlovi* sp.n., paratype; 93—94, *E. (X.) oxilara* sp.n., paratype; 95—96, *E. (X.) pavli* sp. n., holotype.



Figs 97—101. *Empis* (*Xanthempis*).

97—98, *E. (X.) richteri* sp. n., holotype: 97, male postabdomen, lateral view; 98, aedeagus, lateral view. 99—101, *E. (X.) subscutellata* sp. n., paratype: 99, male postabdomen, lateral view; 100, aedeagus, lateral view; 101, dorsallamellaella; 101, dorsal lamella, lateral view.



Figs 102—106. *Empis* (*Xanthempis*).

102—103, *E. (X.) zinovjevae* sp. n., holotype: 102, male postabdomen, lateral view; 103, aedeagus, lateral view. **104—106, *E. (X.) zlobini* sp. n., holotype:** 104, male postabdomen, lateral view; 105, aedeagus, lateral view; 106, tip of hypandrium and part of aedeagus, posterior view.

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