

## Two New Species of *Colobaea* Zetterstedt (Diptera, Sciomyzidae) from Palaearctic Asia

by

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R. ROZKOŠNÝ and K. ELBERG: Two New Species of *Colobaea* Zetterstedt from Palaearctic Asia.

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Two new species, *Colobaea eos* sp. n. and *C. flavipleura* sp. n., are described. The type material was collected at several localities in the far eastern USSR and is deposited in the Zoological Museum, Moscow State University. Diagnostic characters of the male terminalia are illustrated and all of the known species of *Colobaea* are keyed. The generic characteristics of the genus are briefly discussed, including some unique features found in both of the new species. An annotated world catalog of the 12 known species is given.

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### INTRODUCTION

The genus *Colobaea* Zetterstedt includes tiny species, the distribution and biology of which is relatively little known. According to a recent monograph of the Palaearctic Sciomyzidae (Rozkošný 1987), seven Palaearctic species of this genus are known and only one species has been recorded from North America. However, two very interesting new Nearctic species were described in a recent paper (Knutson et al. 1990). Two additional undescribed species from the Middle East and Nigeria are mentioned in the same paper.

While studying extensive material of sciomyzids in the Zoological Museum of Moscow State University we discovered several new species, including two closely related and sympatric *Colobaea* species apparently restricted to eastern parts of the Palaearctic region.

Many Sciomyzidae are widely distributed in various aquatic situations and in mesic woods, and some species occur in drier situations. The majority of known sciomyzid larvae feed upon pulmonate snails, or rarely on Sphaeriidae, as predators or parasitoids. Oviposition, hatching, larval life, pupation, and emergence of most species proceed continuously throughout the favorable season, but also some univoltine species are known. Most species in temperate zones overwinter as pupae, only a few species hibernate as adults.

In the genus *Colobaea*, the complete biology of only one species (*C. bifasciella*) has been published, but the puparia of three other species (*C. distincta*, *C. pectoralis*, *C. punctata*) have been found in the shells of several aquatic snails of the genera *Anisus*, *Lymnaea*, *Planorbarius*, and *Planorbis*. Thus, a highly specialized, parasitoid mode of life is inferred for all larvae of this genus. The known life cycle of *C. bifasciella* may serve as a good example. The female lays one or two eggs across the shell suture of *Lymnaea palustris* (Müll.) or *L. truncatula* (Müll.). The young larva penetrates into the respiratory chamber where it apparently feeds mainly on mucus. The older larva feeds vigorously, consumes most of the soft parts, ultimately killing the snail, and pupates within the shell. The larval period lasts about 25 days and two or three generations may develop during one year. Puparia of several *Colobaea* species were first illustrated by Lundbeck (1923) and the life history of *C. bifasciella* was studied by Knutson and Lyneborg (1965). Rozkošný (1967) provided brief descriptions of the puparia of *C. distincta* and *C. pectoralis*. The essential aspects of the life cycle of an undescribed species of *Colobaea* from Iran (as *C. iranica* Knutson, nomen nudum) were presented by Knutson et al. (1973). Descriptions of complete life cycles and immature stages of *C. americana*, *C. bifasciella*, *C. pectoralis*, and *C. punctata* have been prepared by L. Knutson and A.D. Bratt (L. Knutson, pers. comm.).

## DESCRIPTIONS OF NEW SPECIES

### *Colobaea eos* sp. n.

Holotype: Male: USSR, Kunashir I., Stolbchaty, 13.vii.1985, S. Churkin leg. Deposited in the Zoological Museum, Moscow (male genitalia on slide).

Paratypes: 10 males, 11 females. 1♂ same data as holotype: USSR South Maritime Territory, Kamenushka, 23.vii.1983 1♂, 26.vii.1983 1♂, 31.vii.1983 1♂, 4.vi.1984 1♂, 23.vi.1984 1♂, 30.vi.1984 1♂, 15.vii.1984 1♂, 25.vii.1984 1♂, 6.viii.1984 1♂, 15.viii.1984 1♂, 19.viii.1984 1♂, 13.viii.1987 1♂, 15.viii.1987 1♂ (all A. Shatalkin leg.); 40 km SE Ussuriysk, 20.viii.1983 1♂ (A. Ozerov leg.); 32 km SE Ussuriysk, 27.viii.1987 1♂ (A. Antropov leg.); Kedrovaya Pad' Nature Reserve, 20.viii.1984 2♂ (A. Shatalkin leg.); Lazo Nature Reserve 25.vii.1986 1♂ (A. Ozerov leg.). Kunashir I., Tretyakovo, 21.vii.1985 1♂; Mendelevo, 23.vii.1985 1♂ (both S. Churkin leg.). All in the Zoological Museum, Moscow.

Head chiefly dark. Frons matt and deeply black, yellowish only between eye and antenna on each side. Parafrontalia, ocellar triangle, and postociput subshining, with sparse whitish pruinosity. Face shining brown, parafacialia brownish to yellow, densely white-pruinose. Cheek about as wide as one-fourth of eye height, upper part of cheek and lower postocular area along eye margin broadly white-pruinose. Antenna orange, arista blackish, arisal hairs relatively short and dorsal hairs barely longer than ventral hairs. Broadest plumosity of arista narrower than one-half width of 3rd antennal segment; latter oval, barely twice as long as broad. Proboscis and palpi brown. Chaetotaxy: 2 fronto-orbitals, anterior one distinctly shorter; 1 ocellar; 1 inner vertical; 1 outer vertical; 1 postocellar; inner vertical and ocellar setae longer than other setae.

Thorax dark, almost black on mesonotum, brown to yellowish-brown on pleuron. Mesonotum whitish pruinose, scutellum more brown. Pleura chiefly shining brown, sternopleuron and hypopleuron densely white pruinose. Anterior spiracle yellow. Chaetotaxy: 1 dorsocentral, 1 humeral, 2 notopleurals, 1 presutural, 1 supraalar, 1 postalar, 2 scutellars, 1 propleural, pteropleuron with several hairs, sternopleuron with scattered pubescence. Prescutellar acrostichals absent. Wing hyaline, at most with yellowish tinge, both cross-veins slightly infuscated. Apical portion of  $M_4$  vein much shorter than posterior cross-vein. Haltere pale yellow, squama brownish with dark ciliae. Legs chiefly yellow including coxae, only fore tibia and tarsi deeply black. Apices of fore and hind femora and basal third of hind tibia distinctly brownish. Fore coxa with only 2 short setae in distal half, 2 anterodorsals on hind femur.

Abdomen shining black, at base partly yellowish. Cerci dark in both sexes. Abdominal pile medium long, stronger marginal setae barely distinct. Male terminalia (Figs. 1-7) specific: posterior part of gonostylus suboblong, distinctly emarginate on outer side, anterior part of gonostylus without the short peglike setae that are typical for many other species of this genus, bilobed, with straplike inner process. Postgonite elongate as in other species, aedeagal complex without epiphallus.

Measurements: Body length 2.8-3.8 mm, wing length 2.7-4.0 mm

### *Colobaea flavipleura* sp. n.

Holotype: Male, USSR, South Maritime Territory, Kamenushka, 27.vii.1983, A. Shatalkin leg. Deposited in the Zoological Museum, Moscow (male genitalia on slide).

Paratypes: 7 males, 6 females. USSR, South Maritime Territory, Kamenushka, 23.vii.1983 1♂ 1♀, 26.vii.1983 1♂, 1.viii.1983 2♂ 1♀, 3.vii.1984 1♀, 8.viii.1984 1♂, 31.vii.1988 1♂ 2♀ (all A. Shatalkin leg.); 40 km SE Ussuriysk, 19.viii.1983 1♂ (A. Ozerov leg.). Amur area, Zeya, 12.vii.1982 1♂ (A. Ozerov leg.).

General appearance resembling *C. eos* sp. n. Frons also velvety black, often even more tapered towards anterior margin in males. Third antennal segment usually more darkened in apical third. Palpi and proboscis paler, yellowish brown to yellow. Anterior fronto-orbital seta very weak, barely as long as one-half of posterior fronto-orbital.

Thorax distinctly paler than in *C. eos* sp. n. Pleura entirely yellow. Thoracic setae well developed but presutural seta missing. Wings slightly narrower than in *C. eos* sp. n., entire membrane finely tinged with brown, cross-veins without special darkening. Apical portion of  $M_4$  vein distinctly shorter than in *C. eos* sp. n. Legs yellow, only fore tibia and tarsus completely black. Dark rings on apices of fore and hind tibiae and at basis of hind tibia often barely distinct or completely missing.

Abdomen dark brown, usually extensively yellowish at base. Male genitalia (Figs. 8-13) specific: posterior part of gonostylus with innerwardly directed outer tip, anterior part of gonostylus simply tapered, rodlike in distal half. Postgonite

very slender in distal half or more, aedeagal complex with distinct epiphallus (Fig 11, ep).

Measurements: Body length 2.6-3.4 mm, wing length 3.0-3.2 mm.

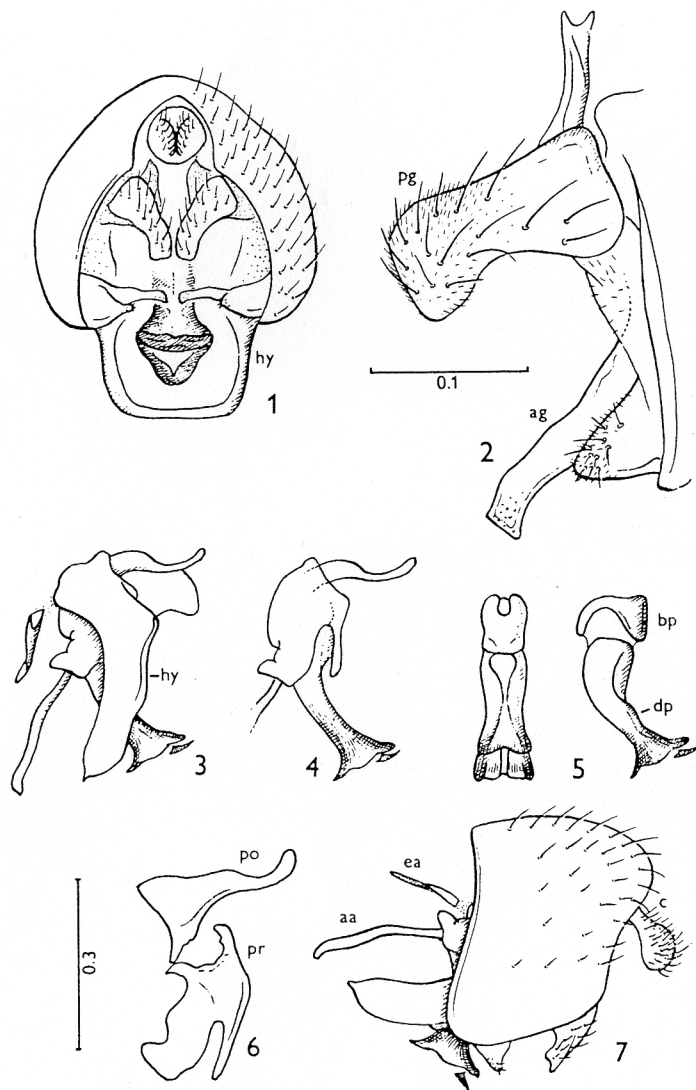
## DISCUSSION

Both species described above display a set of unique or at least uncommon characters in comparison with the other Palaearctic and Nearctic species. First, they possess only one pair of dorsocentral setae, while two dorsocentrals apparently belong to the ground-plan of the genus. Only one postalar seta was found in both of the new species, as in most other congeneric taxa except *C. bifasciella* and *C. canadensis*. Also, the prescutellar acrostichal setae are missing as in other Palaearctic species (they are short and weak but distinct only in Nearctic *C. canadensis* and *C. montana*). The third antennal segment is oval and broad, not tapered and slightly arched ventrally as in many European and one Central Asian species; its form resembles *C. montana* and *C. nigroaristata* in this respect. The arista is equally haired above and below, the dorsal hairs are not conspicuously longer than ventral ones as in many species. The short peglike setae on the anterior part of the gonostylus are missing in both new species as in *C. canadensis* where this obviously plesiomorphic character state was reported for the first time. Consequently there is good evidence that the presence of peglike structures on male gonostyli does not represent an obligatory generic character for *Colobaea*.

Both new species are closely related although *C. flavipleura* sp. n. is distinctly paler at first glance, mostly because of the yellow pleura in this species. Also, the dark apical rings on the fore and hind femora and the basal rings on the hind tibia are often missing. On the contrary, the anterior fronto-orbital seta in *C. eos* sp. n. is distinctly stronger than in *C. flavipleura* sp. n., always longer than one-half the length of the posterior fronto-orbital seta. The presutural seta on the mesonotum is well developed in *C. eos* sp. n. and missing in *C. flavipleura* sp. n. Distinct differences were also found in the shape of the male genitalia. Both parts of the gonostylus as well as the pregonites and postgonites show a widely different form. A distinct epiphallus is attached to the aedeagal complex in *C. flavipleura* sp. n. but this structure is missing in *C. eos* sp. n.

It may be concluded that all of the members of the genus *Colobaea* share the following characters: (1) frons matt and mid-frontal stripe not developed, (2)

Fig. 1-7. *Colobaea eos* sp. n., male terminalia. 1 - andrium in ventral view, 2 - anterior and posterior parts of gonostylus, 3 - aedeagal complex and hypandrium in lateral view, 4 - aedeagal complex (without hypandrium), 5 - aedeagus in ventral and lateral view, 6 - pregonite and postgonite, 7 - andrium in lateral view. Scales in mm.  
aa - aedeagal apodeme, ag - anterior part of gonostylus, bp - basiphallus, c - cerci, dp - distiphallus, ea - ejaculatory apodeme, hy - hypandrium, pg - posterior part of gonostylus, po - postgonite, pr - pregonite.



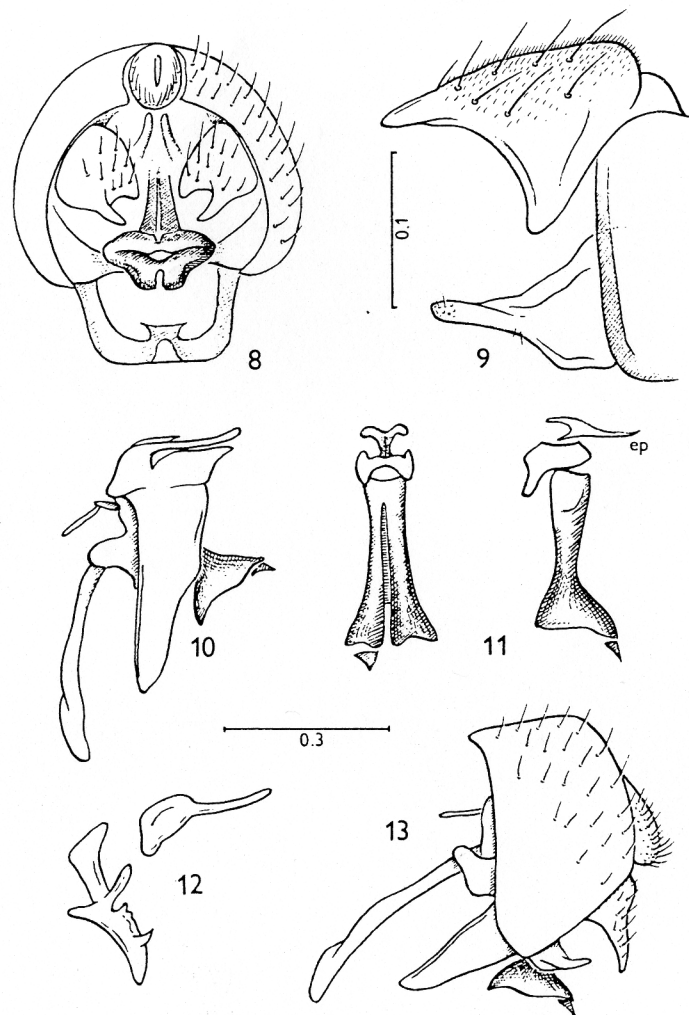


Fig. 8-13. *Colobaea flavipleura* sp. n., male terminalia. 8 - andrium in ventral view, 9 - anterior and posterior parts of gonostylus, 10 - inner copulatory organ in lateral view, 11 - aedeagus in ventral and lateral view, 12 - pregonite and postgonite, 13 - andrium in lateral view. Scales in mm. ep - epiphallus.

always two fronto-orbital setae although the anterior one sometimes weak, (3) prosternum bare, (4) mesopleuron bare, (5) pteropleuron with several weak setae, (6) sternopleuron haired and usually with one or two distinct setae at upper margin, (7) vein  $A_1+CuA_2$  evanescent apically, not reaching wing margin, (8) inner posterior border of hind coxa bare, (9) anterior part of gonostylus in male with short, blunt, peglike bristles (except for both species described here and *C. canadensis*), and (10) postgonite conspicuously elongated distally. Obviously, the apomorphic character state prevails only in the case of characters 7, 9 and 10.

Key to the species of *Colobaea* Zetterstedt

1. Wing with two transverse dark bands (Palearctic) ..... *C. bifasciella*
- Wing without transverse dark bands ..... 2
2. Frons dull yellow, with short black bristles (Nearctic) ..... *C. canadensis*
- Frons predominantly or entirely velvety black ..... 3
3. Third antennal segment predominantly or entirely black, two pairs of dorsocentral setae on mesonotum ..... 4
- Third antennal segment orange, at most slightly darkened along distal margin, only one pair of dorsocentrals on mesonotum (eastern Palearctic) ..... 11
4. Mesopleuron completely black ..... 5
- Mesopleuron at least in part yellow ..... 8
5. Third antennal segment three times as long as wide basally, cross-veins distinctly infumated (Palearctic) ..... *C. beckeri*
- Third antennal segment twice as long as wide basally, cross-veins not infumated ..... 6
6. Third antennal segment including arista entirely black, anterior margin of frons extensively yellow ..... 7
- Third antennal segment white at base, arista white, frons entirely black (Palearctic) ..... *C. distincta*
7. Fore tarsus black, only last segment contrasting yellow (Palearctic) ..... *C. nigroaristata*
- Fore tarsus with basitarsus black, following two segments brownish, segments 4 and 5 yellowish (Nearctic) ..... *C. montana*
8. Thorax yellow only on propleuron. narrow dorsal margin and lower part of mesopleuron (Nearctic) ..... *C. americana*
- Thorax more extensively yellow ..... 9
9. Third antennal segment three times as long as wide basally, both cross-veins conspicuously infumated (central Asia) ..... *C. limbata*
- Third antennal segment only twice as long as wide basally, cross-veins not infumated ..... 10
10. Upper margin of mesopleuron with complete dark stripe (Palearctic) ..... *C. pectoralis*
- Upper margin of mesopleuron with rounded black spot below anterior notopleural seta (Palearctic) ..... *C. punctata*
11. Presutural seta on mesonotum well developed, pleura chiefly dark brown to black, hind femur with broad brown preapical ring (eastern Palearctic) ..... *C. eos* sp. n.
- Presutural seta on mesonotum absent, pleura chiefly yellow, hind femur at most slightly darkened on extreme apex (eastern Palearctic) ..... *C. flavipleura* sp. n.

ANNOTATED WORLD LIST OF *COLOBAEA* SPECIES

*C. americana* Steyskal, 1954

*Colobaea americana* Steyskal, 1954: 61

Nearctic: Canada (Manitoba, Quebec), USA (New York). Illustrations: antenna, wing (Steyskal, 1954; Knutson, 1987), distribution map (Knutson et al., 1990). Type material: holotype and paratype in Canadian National Collection, Ottawa.

*C. beckeri* (Hendel, 1902)

*Colobaea beckeri* Hendel, 1902: 85

Palearctic: Central Europe (Austria, Czechoslovakia). Illustrations: antenna (Hendel, 1902), male terminalia (Rozkošný, 1966, 1987; Vala, 1989). Type material: Naturhistorisches Museum, Vienna (3 syntypes) and Museum für Naturkunde, Berlin (3 syntypes).



**C. bifasciella** (Fallén, 1820)*Opomyza bifasciella* Fallén, 1820: 12

Palearctic: Europe from Ireland, England, Swedish and Soviet Lapland to the Alps, Italy, Hungary and vicinity of Moscow. Illustrations: male (Rivosecchi & Prigioni, 1981; Vala, 1989), female (Knutson & Lyneborg, 1965), head (Sack, 1939), wing (Hendel, 1902; Séguy, 1934; Sack, 1939; Rozkošný, 1984b, 1987), male terminalia (Rozkošný, 1966, 1984b, 1987; Vala, 1989). Type material: Naturhistoriska Riksmuseet, Stockholm.

**C. canadensis** Knutson and Orth, 1990: 485*Colobaea canadensis* Knutson & Orth in Knutson et al., 1990: 485

Nearctic: Canada (Manitoba). Illustrations: antenna, wing, male terminalia, distribution map (Knutson et al., 1990). Type material: holotype and 2 paratypes in Canadian National Collection, Ottawa, and U.S. National Museum of Natural History, Washington (1 paratype).

**C. distincta** (Meigen, 1830)*Opomyza distincta* Meigen, 1830: 106

Palearctic: Europe from Great Britain, southern Fennoscandia and the Leningrad area to the Netherlands, France, and Italy. Illustrations: male (Séguy, 1934), head (Séguy, 1934; Sack, 1939; Rozkošný, 1984b), male terminalia (Rozkošný, 1966, 1984b, 1987; Vala, 1989). Type material: Muséum National d'Histoire Naturelle, Paris.

**C. eos** sp. n.

Palearctic: Far eastern USSR (Maritime Territory, Kuril Is.).

Illustrations: male terminalia (Figs. 1-7). Type material: holotype and 13 paratypes in Zoological Museum, Moscow.

**C. limbata** (Hendel, 1933)*Ctenulus limbatus* Hendel, 1933: 39

Palearctic: Central Asia (Uzbek and Tadjik SSR). No illustrations published. Type material: Two syntypes in Zoological Institute, Academy of Sciences, Leningrad.

**C. montana** Knutson and Orth, 1990*Colobaea montana* Knutson & Orth in Knutson et al., 1990: 486

Nearctic: USA (Montana). Illustrations: antenna, wing, male, terminalia, distribution map (Knutson et al., 1990). Type material: holotype and 1 paratype in U.S. National Museum of Natural History, Washington.

**C. nigroaristata** Rozkošný, 1984*Colobaea nigroaristata* Rozkošný, 1984a: 85

Palearctic: Northern Europe (Sweden, Finland). Illustrations: head, male terminalia (Rozkošný, 1984a, 1984b; Vala, 1989). Type material: Zoological Institute, Lund (holotype and 2 paratypes), Zoological Museum, Helsinki (1 paratype).

**C. pectoralis** (Zetterstedt, 1847)*Opomyza pectoralis* Zetterstedt, 1847: 2420

Palearctic: From Great Britain and central Fennoscandia to North Africa (Egypt), eastwards to the Leningrad area. Illustrations: wing, male terminalia (Rozkošný, 1966, 1984b, 1987; Vala, 1989). Type material: Zoological Institute, Lund.

**C. punctata** (Lundbeck, 1923)*Ctenulus punctatus* Lundbeck, 1923: 106

Palearctic: Europe and Asia (from Great Britain and southern Fennoscandia to Italy and Yugoslavia, eastwards through Estonia, Turkey and northern Kazakhstan to eastern Siberia). Illustrations: wing (Knutson & Lyneborg, 1956; Rozkošný, 1984b, 1987), male terminalia (Rozkošný, 1966, 1984b, 1987; Rivosecchi & Prigioni, 1981; Vala, 1989). Type material: syntypes in Zoological Museum, Copenhagen.

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