

Jakub Tomasz NOWAKOWSKI

**Studia nad muchówkami minującymi z rodziny  
*Agromyzidae* (Diptera). 4. Nowy rodzaj palearktyczny  
na *Leguminosae***

**Исследования над минирующими двукрылыми из семейства  
*Agromyzidae* (Diptera) 4. Новый палеарктический род  
на *Leguminosae***

**Studies on mining flies (Diptera, *Agromyzidae*). 4. A new  
Palaeartic genus on *Leguminosae***

[With 10 text-figures]

***Irenomyia* gen. nov.**

This genus seems to be closest to *Haplomyza* HENDEL, 1914 (nomen novum for *Antineura* MELANDER, 1913, nec OSTEN SACKEN, 1881)<sup>1</sup> from which it differs by the following features:

Imago. Body (including scutellum) coloured black. Costa reaching  $m_{1+2}$  always before the apex of the wing [fig. 2]. Genitalia of the ♂ [fig. 4–5]<sup>2</sup>: Ejaculatory apodeme rectangular in outline, its conical basis almost as high as the blade. Ejaculatory bulb barrel shaped, higher than the ejaculatory

<sup>1</sup> Cf. MELANDER, 1949; FRICK, 1952.

<sup>2</sup> Terminology, cf. NOWAKOWSKI, 1959.

apodeme and only  $1\frac{1}{2}$  time shorter than it. Basiphallus about twice longer than distiphallus. Larva [fig. 7–8]. Ventral process of paraclypeal phragma cut off obliquely, slightly sclerotized. Anterior spiracle with 5 bulbs, posterior

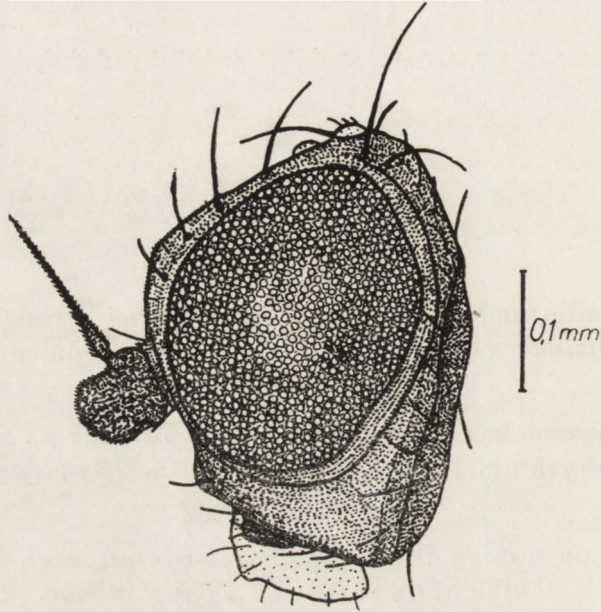


Fig. 1. *Irenomyia obscura* (ROHD.-HOLM.): Head of ♂ [ex *Caragana frutex* (L.) C. KOCH, Warszawa-Wilanów, 19 VIII 1958].

with 3 bulbs. Under the posterior spiracles a pair of side-wards. Ecology. Host plants: *Leguminosae*. Area of distribution: Palaearctic.

Type species: *Xeniomyza obscura* ROHDENDORF-HOLMANOVA, 1959<sup>1</sup>.

<sup>1</sup> The author intended to describe this species as a new one under an other name, however, the paper of ROHDENDORF-HOLMANOVA (1959) appeared earlier. As the species in question was described there rather briefly and included to the genus *Xeniomyza* HER. in DE MEIJ. the author gives a full redescription of it.

HERING (1957) stated that the miner of *Caragana* L., known to NOWAKOWSKI from Poland, was *Phytagromyza caraganae* ROHD.-HOLM. in HER. for the author has given to Prof. HERING the mines of *Irenomyia obscura* (ROHD.-HOLM.) earlier than the adults have been reared.

*Irenomyia obscura* (ROHD.—HOLM.)

## IMAGO

Head [fig. 1]. Frons about  $1\frac{1}{2}$  time longer than wide, in front equal to the width of an eye, posteriorly wider. Lunule higher than a semicircle and than half of its distance from the anterior ocellus. Frontal orbit exceeding  $\frac{1}{4}$  of the width of the frons. Ocellar triangle right-angled. Two *ors* and two *ori* gradually shortening towards the front. First *ors* inserted before  $\frac{3}{4}$  of the distance between the basis of the antenna and *vti*, bent backwards and outwards. Second *ors* inserted in about half this distance, bent backwards and inwards. Two *ori* directed backwards and inwards too. Orbital hairs very scarce, a few on each side. *oc* relatively short, crossing only with *ors*. Eyes inserted obliquely, bare. Cheek in profile projecting in front of the eye. Jowl over  $\frac{1}{3}$  of the height of the eye, reaching high posteriorly. One short *vi* and 4–5 peristomal hairs. Facial carina sharp. Oral margin protruding anteriorly, slightly angular. Bases of antennae close to each other. Third antennal joint rounded quadratic, very shortly pubescent in front. Arista not much longer than antenna, in the basal part thickening, with short pubescence.

Thoracic bristles. 3+1 *dc*, but the two anterior ones considerably shortened, not much longer than *acr*. The fourth *dc* stands just before the transverse suture of mesonotum, the third *dc* far behind the suture. *acr* in 2–3 rows, only on the anterior half of the mesonotum. 1–4 *ia* behind the suture. *i. pa* lacking. Upper margin of mesopleura hairless.

Abdomen. Sixth tergite longer than the fifth. Basal joint of the oviscapt not longer than the sixth tergite, shiny.

Wing [fig. 2]. Costa reaching  $m_{1+2}$  before the apex of the wing. Second section of the costa more than four times longer than the third which is  $1\frac{1}{2}$  time longer than the fourth.  $t_p$  lacking. *an* present.

Size. Length of wing — 1.2 mm.

Coloration. Body black, with dimm lustre; only frontal vitta, jowls, anterior tibiae, all tarsi and abdominal basis lighter, brownish. Halteres white, but in some dried, badly

preserved specimens they are brown to black. Sometimes yellow membranes are seen between the tergites. Veins dark brown.

Genitalia of ♂ [fig. 4–5]. Epanthrium shorter than the sixth tergite. Phallapodeme reaching the fourth segment. Ejaculatory apodeme strongly developed, its blade rectan-

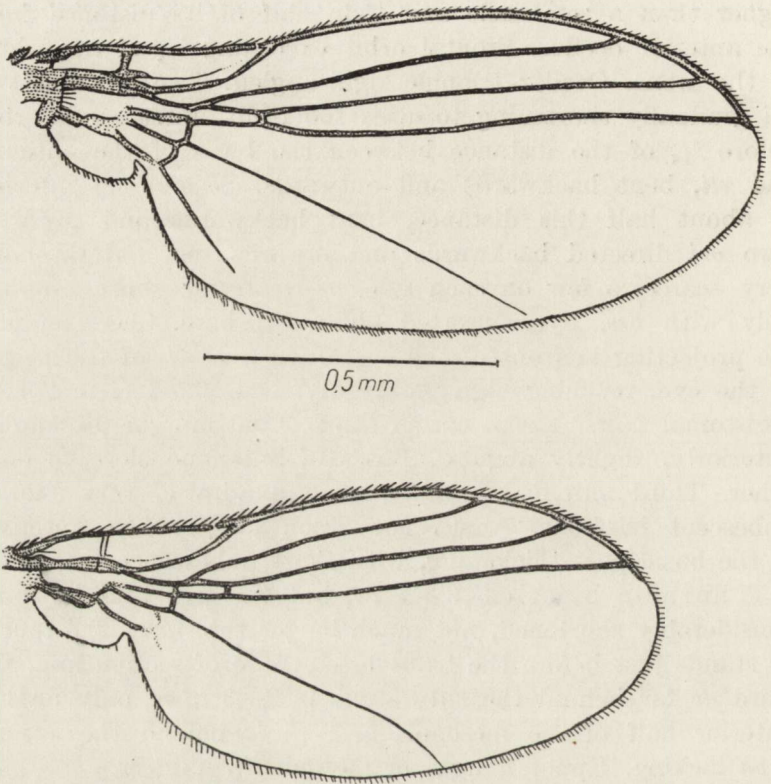


Fig. 2. *Irenomyia obscura* (ROHD.-HOLM.): Wing of ♀ (ex *C. arborescens* LAM., Lomianki near Warszawa, 20 VII 1956).

Fig. 3. *Xenomyza illicitensis* HER. in DE MEIJ. Wing of ♀ (ex *Sueda fruticosa* L., Eleche, Spain, 16 VI 1933, leg. M. HERING).

gular in outline, basis conic. Ejaculatory bulb barrel shaped, higher than the apodeme and only  $1\frac{1}{2}$  time shorter than it. Ejaculatory duct wide, visible in the axis of the aedoeagus. Postgonites tiny. Epiphallus strongly developed, bent downwards, formed of a wide median sclerite produced into

a narrow hook, and of two lateral sclerites of fibrous structure. Membranous fold of the epiphallus expanding laterally. Phallosophore pear shaped, short and broad. Aedoeagus of simple

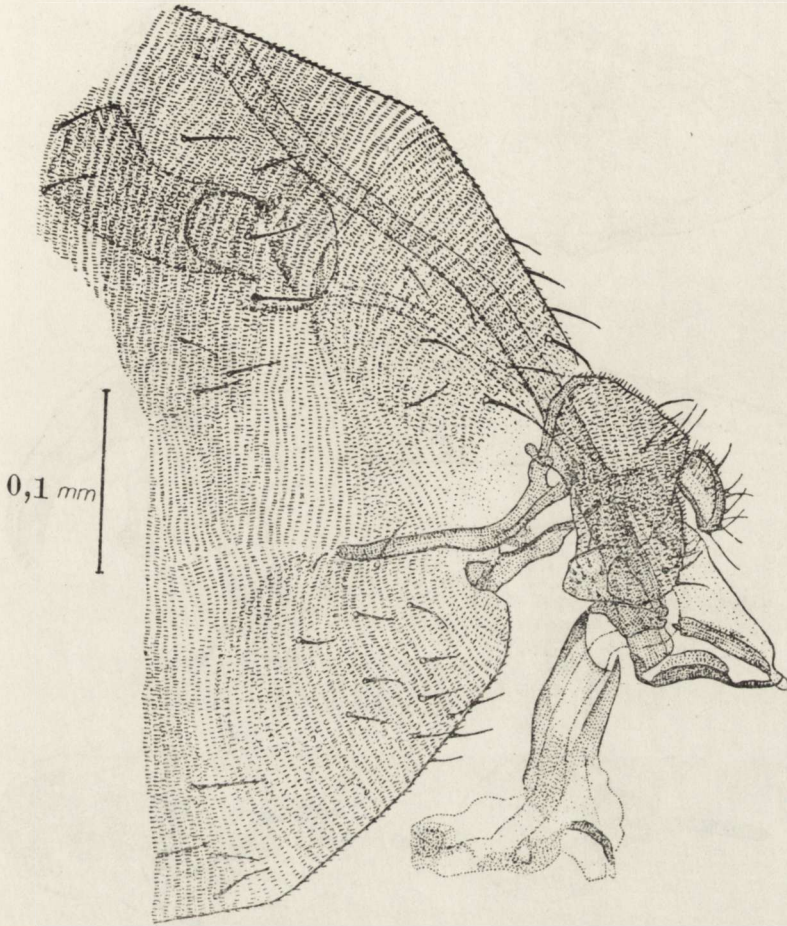


Fig. 4. *Irenomylia obscura* (ROHD.-HOLM.). Terminal part of abdomen of ♂ with aedoeagus protruding (Łomianki, 20 VII 1956).

structure, showing the shape of a curved tube with a ventral process (hypophallus).

Material: 2 ♂♂ and 2 ♀♀ reared on 10 VII 1957 from larvae mining leaves of *Caragana arborescens* LAM. collected on 22 VI 1957 at Łomianki near Warszawa. — 3 ♂♂ and 6 ♀♀ swept

on 20 VII 1956 from *C. arborescens* LAM. at Łomianki. — 1 ♀ reared on 7 VII 1958 from *C. arborescens* LAM. collected on 22 VI 1958 at Warszawa-Ochota. — 2 ♂♂ reared on 18 VIII

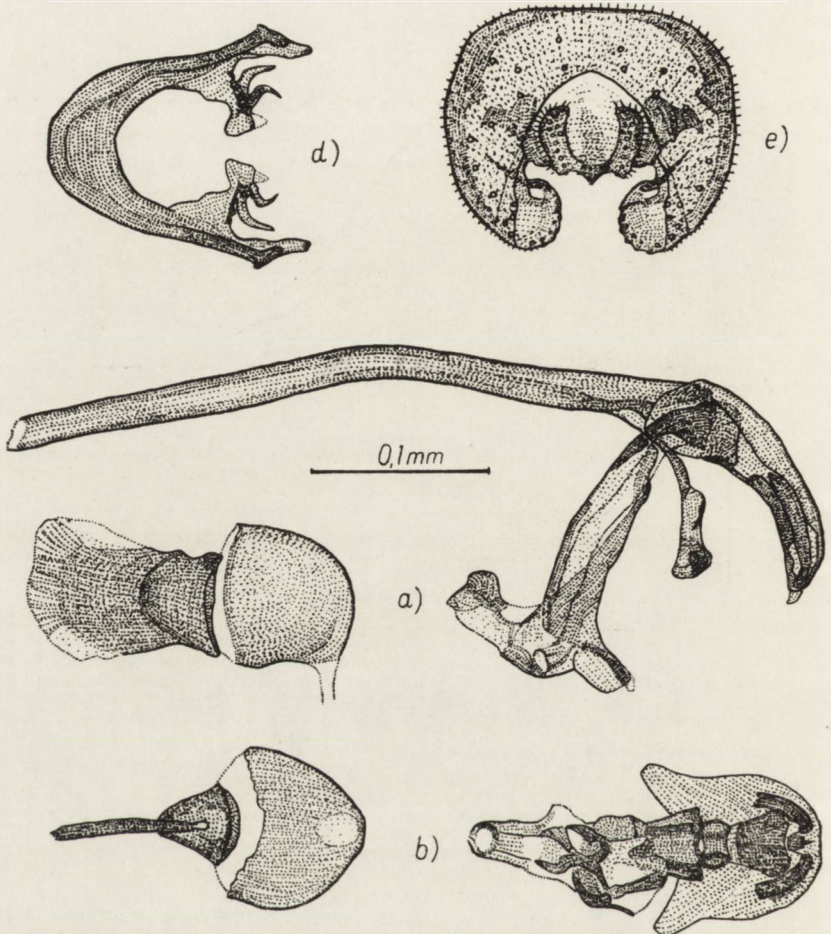


Fig. 5. *Irenomyia obscura* (ROHD.-HOLM.). Terminalia of ♂: a—copulatory apparatus from the side, b—from below, d—hypandrium and pregonites from below, e—epandrium, cerci and surstyli from behind (ex *C. arborescens* LAM., Łomianki, 10 VII 1957).

1958 from *Caragana frutex* (L.) C. KOCH collected in Wilanów Park at Warszawa on 3 VIII 1958. — 4 preparations of the male genitalia. — 4 preparations of the wing. — The material is kept in the collection of the Institute of Zoology of the Po-

lish Academy of Sciences in Warszawa, except two specimens (♂ and ♀ swept on 20 VII 1956) that were sent to Prof. E. M. HERING, Berlin-Dahlem.

LARVA [fig. 7-8]

Body yellow. Head segment without cuticular processes. Prothorax only with a semicircle of processes on the dorsal side. Mesothorax, metathorax and abdominal segments with

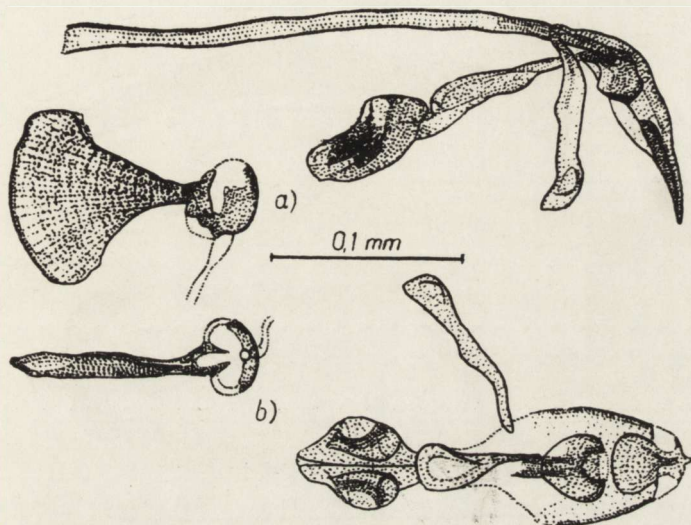


Fig. 6. *Xeniomyza illicitensis* HER. in DE MEIJ. Copulatory apparatus of ♂: a— from the side, b— from below (ex *Sueda fruticosa* L., Elche, Spain, 14 VI 1933, leg. M. HERING).

9 creeping welts interrupted on the dorsal and ventral sides. Welts on the middle segments almost equal to the width of the segments, composed of 8 rows of cuticular processes. Cuticular processes big, circular at the base, triangular in outline, with points directed backwards. Anal segment without cuticular processes. Longitudinal sclerite slightly developed. Mouth hooks bidentate, of unequal height, the right hook protrudes considerably over the left one. Ventral process of paraclypeal phragma slightly sclerotized, cut off obliquely. Anterior spiracle mushroom shaped, with 5 bulbs, posterior spiracle with 3 bulbs, atrium considerably longer than the

spiracular process. Under the posterior spiracles a pair of projecting warts on the sides of the anal segment.

Puparium yellow, 1.3 mm in length.

Material: Preparations of larvae taken from leaves of *Caragana arborescens* LAM. collected on 21 VII 1956 and on 12 VI 1957 at Łomianki and on 26 VII 1957 in the Łazienki Park at Warszawa. 8 puparia from which adults were reared.

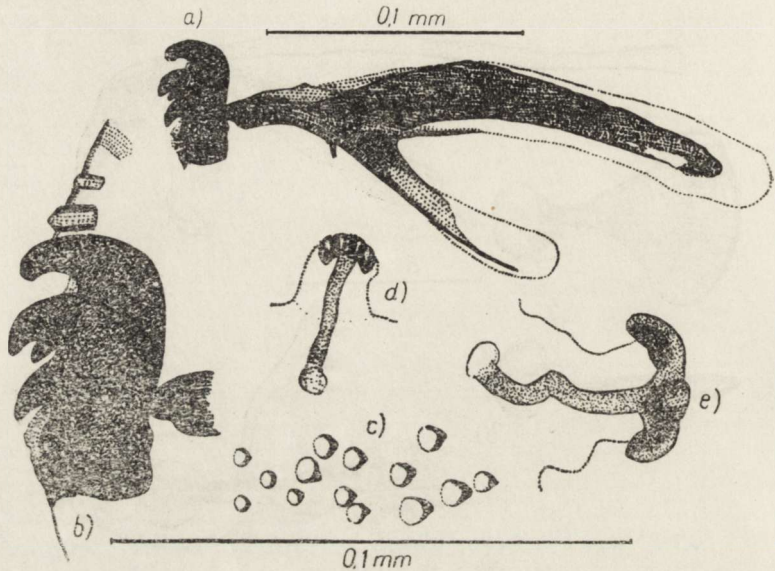


Fig. 7. *Irenomyia obscura* (ROHD.-HOLM.). Larva: a—cephalo-pharyngeal skeleton, b—mouth hooks, maxillary palpi and antennae c—cuticular processes, d—anterior spiracle, e—posterior spiracle (ex *C. arborescens* LAM., Łomianki, 22 VI 1957).

#### ECOLOGY

Host plants: *Caragana arborescens* LAM. and *C. frutex* (L.) C. KOCH (= *C. frutescens* D. C.).

Upper surface linear-blotch leaf mine (ophistigmatonome) [fig. 9—10]. Linear part of the mine short, usually curved, soon widening in the blotch part. Frass forming in the linear part a green stripe and in the blotch part a green cloudlet in which black grains were inserted. Length of the linear part about 5 mm, width up to 1 mm, surface of the blotch part



about 20 mm<sup>2</sup>. The arcuate exit slit on the upper side of the leaf, at the margin of the mine. Often several mines in one leaf, sometimes a couple of them in one leaflet.

The author found feeding larvae of the summer generation mostly in the second half of June, but later also through the whole of July and in the first half of August. The pupal stage of this generation lasts in the laboratory 12–16 days. Larvae

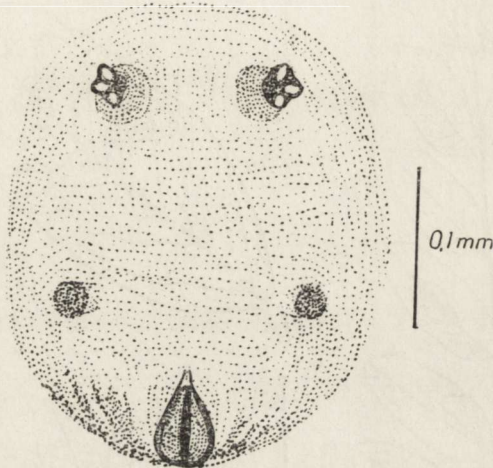


Fig. 8. *Irenomyia obscura* (ROHD.-HOLM.). Terminal part of the puparium [ex *C. frutex* (L.) C. KOCH, Wilanów, 3 VII 1958].

of the hibernating generation feed in September and October. The species here in question occurs in dense populations. The author observed mines in masses and swarms of tiny flies soaring over leaves of the host plants.

The species was found in Poland on shrubs of *Caragana* L. grown in parks and gardens and on shrubs run wild. *C. arborescens* LAM. is grown in this country more often than *C. frutex* (L.) C. KOCH. These shrubs occur in the wild state in steppes, in steppe-forests, on sunny slopes and on skirts of mixed forests and pine forests. In the Altai Region adults were reared or swept on June 13–23 from wild shrubs of *C. arborescens* LAM. occurring in a pine forest and in a river valley, whereas in the Ukraine they are swept in the middle of September from grown shrubs (ROHDENDORF-HOLMANOVA, 1959).

## AREA OF DISTRIBUTION

*Irenomyia obscura* (ROHD.-HOLM.) is common in Warszawa and its neighbourhood on grown shrubs. It was found also at Velikiy Anadol, Ukraine, on grown shrubs and at Lebyazhe,

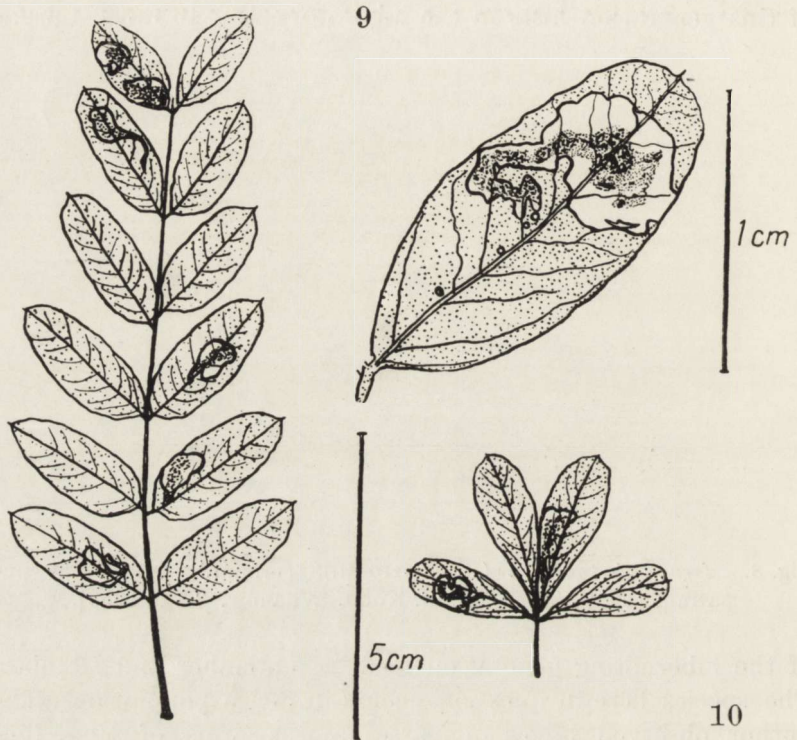


Fig. 9—10. *Irenomyia obscura* (ROHD.-HOLM.). Mine: 9—on *C. arborescens* LAM., 10—on *C. frutex* (L.) C. KOCH.

Altai Region, on wild ones (ROHDENDORF-HOLMANOVA, 1959). The species is thus widely distributed, probably nearly as wide as its hosts. The natural distribution area of its known host plants includes the south of European Russia, the Ukraine, Caucasus, Siberia, Central Asia and Mongolia. Other species of *Caragana* L. occur also in China and Japan. These shrubs are often grown in Europe.

## SYSTEMATIC POSITION OF THE GENUS

In the external morphology of the adult and particularly in the type of advancement of the costal concentration of the wing venation *Irenomyia* gen. nov. is very similar to *Haplomyza* HEND. from which it differs mainly by the dark coloration of the scutellum. As follows from the description of FRICK (1952) there are, however, some essential differences in the male genital apparatus, particularly in the ejaculatory bulb and apodeme. According to the limitation of *Haplomyza* HEND. by FRICK (1952) three Palaearctic species should be included in this genus, which were described or redescribed by HENDEL (1931) as *Liriomyza deficiens* HEND., *L. haplonoura* HEND. and *L. latigenis* (HEND.); they show a costa reaching  $m_{1+2}$  before the apex of the wing, an atrophied  $t_p$  and very scarce orbital hairs. Since all type specimens of these species, investigated by the author, are females, he does not know, whether these Palaearctic species form one natural group with the Nearctic and Australian representatives of *Haplomyza* HEND. In any case, this genus should be limited more distinctly against *Liriomyza* MIK. A similar but even more advanced costal concentration occurs in *Xeniomyza* HER. in DE MEIJ. [fig. 3]. It differs from *Irenomyia* gen. nov. by the lack of the anal vein (*an*) and of the *pvt* bristles, by the yellow coloration of the greatest part of the body and by certain larval features, but in the first place by the type of the male genital apparatus [fig. 6]<sup>1</sup>. *Haplomyza* HEND. and *Xeniomyza* HER. in DE MEIJ. live on *Centrospermae* (*Chenopodiaceae* and *Caryophyllaceae*), but these two genera do not seem to be more closely related with each other than *Haplomyza* HEND. with *Irenomyia* gen. nov. feeding on *Leguminosae*.

One can hardly say at present, whether certain similarities of these three genera are synapomorphous, symplesiomorphous or parallel, i. e. homoiologous in nature (cf. HENNIG, 1953;

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<sup>1</sup> As ROHDENDORF-HOLMANOVA (1959) wrote that three species of *Xeniomyza* Her. in DE MEIJ. are known from North America, we think, she included *Haplomyza* HEND. in this genus. This should be, however, even formally uncorrect, as *Haplomyza* HEND. was erected earlier (1914) than *Xeniomyza* HER. in DE MEIJ. (1934).

NOWAKOWSKI, 1960<sup>1</sup>). In any case, the genera represent something like three stages of an evolutionary trend; it is manifested mainly in a full costal concentration of the wing venation without atrophy of the costal section between  $r_{4+5}$  and  $m_{1+2}$ , besides in a considerable decrease of the body size, in a reduction of certain bristles, in the appearance and growth of yellow fields in the coloration of the body and in an increase of the number of spiracular bulbs of the larva. Whereas *Xenomyza* HER. in DE MELJ. and *Haplomyza* HEND. show a decisive preponderance of apomorphy, *Irenomyia* gen. nov. shows a combination of extremely plesiomorphous features with extremely apomorphous ones.

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<sup>1</sup> NOWAKOWSKI J. T. Introduction to a systematic revision of the family *Agromyzidae* (Diptera) with an outline of a theory of host plant selection by these flies. Ann. Zool., Warszawa (in print).

## STRESZCZENIE

Autor opisuje nowy rodzaj — *Irenomyia* gen. nov. oraz redeskrybuje jego gatunek typowy — *Xeniomyza obscura* ROHD.-HOLM. wyhodowany z larw minujących liście *Caragana arborescens* LAM. i *C. frutex* (L.) С. КОСН. Opis obejmuje zewnętrzną morfologię imago, terminalia samca, larwę oraz minę. Autor porównuje też opisany rodzaj z rodzajami *Haplomyza* HEND. i *Xeniomyza* HER. in DE MEIJ., u których nastąpiła podobna koncentracja kostalna użyłkowania skrzydła.

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## РЕЗЮМЕ

Автор описывает новый род — *Irenomyia* gen. nov. и дает редескрипцию его типового вида — *Xeniomyza obscura* ROHD.-HOLM., выведенного из личинок минирующих листья *Caragana arborescens* LAM. и *C. frutex* (L.) С. КОСН. Описывается внешняя морфология imago, терминалия самца, личинка и мина. Автор сравнивает описанный род с родами: *Haplomyza* HEND. и *Xeniomyza* HER. in DE MEIJ., у которых наблюдается подобная костальная концентрация жилкования крыла.

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