

A new species of the genus *Issus* Fabricius (Hemiptera: Fulgoroidea: Issidae) from Montenegro

Новый вид рода *Issus* Fabricius (Hemiptera: Fulgoroidea: Issidae) из Монтенегро

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A new species of the genus *Issus* Fabricius, 1803 is described from Montenegro. European fauna of the genus *Issus* is discussed.

Новый вид рода *Issus* Fabricius, 1803 описан из Монтенегро. Обсуждена европейская фауна рода *Issus*.

Key words: planthoppers, systematics, Europe, Balkan Peninsula, Fulgoroidea, Issidae, *Issus*, new species

Ключевые слова: фулгоровидные цикадовые, систематика, Европа, Балканский полуостров, Fulgoroidea, Issidae, *Issus*, новый вид

INTRODUCTION

The genus *Issus* Fabricius, 1803, the type genus of the family Issidae has traditionally been in focus of study of European hemipterologists. Thus, finding of a new *Issus* species in Europe after more than 200 years of study is an event of particular interest.

The type species of *Issus*, *Cicada coleoptrata* was described by J.C. Fabricius (1781) from Germany; but only 20 years later, the genus *Issus* was erected (Fabricius, 1803). According to I.M. Kerzhner (2006), this generic name is derived from the name of the ancient town “Issus” situated 30 km to the north of Iskenderun in the Hatay Province (Turkey). In the same year as for *C. coleoptrata*, another well-known European species of the genus, *I. muscaeformis* (originally as *Cicada muscaeformis*) was described by F.P. von Schrank (1781) from Austria. Later this species was erroneously described as *I. truncatus* by F.X. Fieber (1876) (Melichar, 1906), who also described *I. frontalis* Fieber, 1876 (= *I. novaki* Dlabola, 1959) from Dalmatia (Croatia) (Fieber, 1876; Dlabola, 1959;

Gnezdilov et al., 2011). G.A. Olivier (1791) added one more species from France (*Fulgora cinerea*), but this remains an uncertain species (Gnezdilov et al., 2014). A. Ahrens (1814) described *I. lauri* from Greece, which is currently widely distributed in Central and Eastern European Mediterranean (Gnezdilov et al., 2014). Finally J. Dlabola (1958) described *I. pospisili* (originally as *Issus muscaeformis pospisili*) from Georgia which was later recorded also from Southern Russia and Greece (Gnezdilov, 2000, 2010, 2011; Gnezdilov et al., 2014). Three species, *I. climacus* Fieber, 1876 (from Portugal) as well as *I. bellardi* Melichar, 1906 and *I. fieberi* Melichar, 1906 (both from Cyprus) are unassociated with males, but one, *I. climacus* can be distinguished by a peculiar narrow median process with an apical concavity on the hind margin of female sternum VII (Fieber, 1876; Gnezdilov et al., 2011); for the other species, identification is still problematical (Gnezdilov et al., 2014). The condition of the hind margin of female sternum VII similar to that of *I. climacus* (i.e., with two short median horns) is also found in *I. maderensis*

Lindberg, 1954 (from Madeira) as well as *I. capapi* Remane, 1985 and *I. capala* Remane, 1985 (both from La Palma Island of Canary Islands) (Remane, 1985).

After the transfer of *Issus analis* Brullé, 1833 and *I. pallipes* Lucas, 1853 (both described from Greece) to *Zopherisca* Emeljanov, 2001 (Issidae) and *Tettigometra* Latreille, 1804 (Tettigometridae) by Gnezdilov & Bourgoïn (2017) and Gnezdilov (2017), respectively, 10 species of *Issus* are known from Europe. Of these, a new species described here and five other species are from the Balkan Peninsula, viz., *I. coleoptratus*, *I. frontalis*, *I. lauri*, *I. muscaeformis*, *I. pospisili* and *I. montenegrus* sp. nov.

MATERIAL AND METHODS

Morphological terminology follows Gnezdilov (2003) and Gnezdilov et al. (2014). The classification of the family Issidae follows Gnezdilov (2013, 2016). The drawings are made using a Leica MZ95 light microscope with drawing tube. The photos were taken by a Leica MZ95 microscope with a camera Leica DFC 290 and then assembled with the Helicon Focus 5.3 and Adobe Photoshop CS6.

Type specimens of the species described below are deposited in the Museum für Naturkunde, Berlin, Germany (MNB) and in the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia (ZIN).

SYSTEMATICS

Subfamily **ISSINAE** Spinola, 1839

Tribe **ISSINI** Spinola, 1839

Subtribe **ISSINA** Spinola, 1839

Genus ***Issus*** Fabricius, 1803

***Issus montenegrus* sp. nov.**

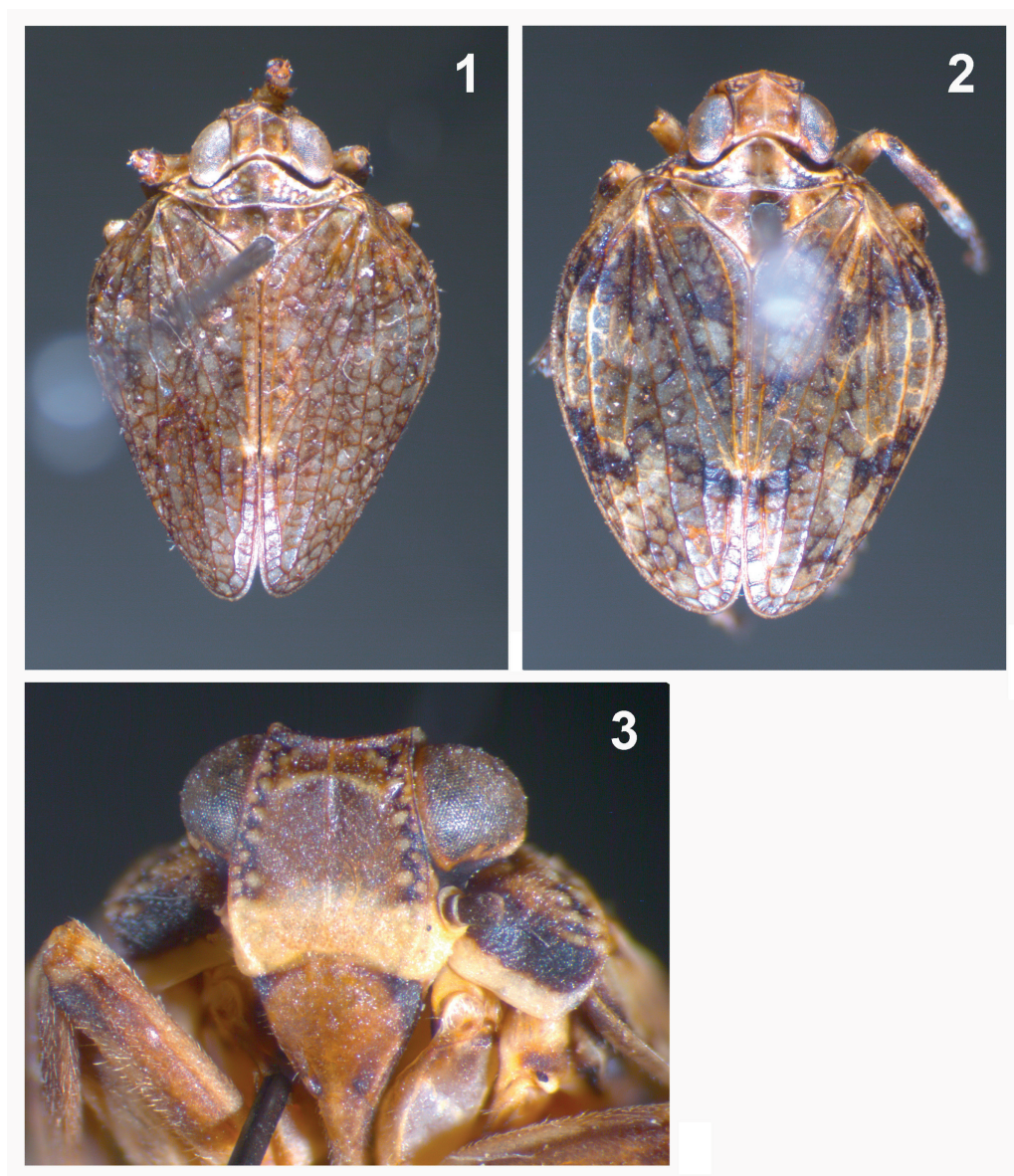
(Figs 1–14)

Holotype. Male, **Montenegro**, “No. 340 Montenegro / Jezerskido 1100 m. / 18.6.11 Spaney- / Schumacher S.V.” (MNB).

Paratypes: 1 male, same data as for holotype (MNB); 1 male, “No. 351 Montenegro / Dobrskoselo 400 m. / 19.6.11 Spaney- / Schumacher S.V.” (MNB); 1 female, “No. 505 Montenegro / Mratinje / 1000–1200 m / 30.6.11 Spaney- / Schumacher S.V.” (MNB); 1 male, 1 female, “No. 354 Montenegro / Lipa b.Cetinje 600 m. / 19.6.11 Spaney- / Schumacher S.V.” (ZIN).

Description. Externally very close to *Issus muscaeformis* (Schrank). Metope elongate, with convex lateral margins, with complete median carina running from its upper margin to metopoclypeal suture and thick transverse carina in its upper half; sublateral carinae weak (Figs 3, 5). Coryphe nearly square, with median carina, anterior margin obtusely angulate, posterior margin concave (Figs 1, 2, 4). Third segment of rostrum shorter than second one, slightly narrowing apically (Fig. 5). Males and females with rich transverse venation of fore wings (Figs 1, 2). Hind tibia with two lateral spines in its upper half and 9–10 spines apically. First metatarsomere with two lateroapical and eight intermediate spines. Claws longer than arolium (in dorsal view). Hind margin of arolium straight (in dorsal view).

Colouration. Metope above clypeus as well as head laterally below and above pedicel light yellow or ivory (Figs 3, 5). Upper half of metope dark brown to black (between lateral margins and sublateral carinae). Metopial median and sublateral carinae and pustules light brown yellowish. Eyes are outlined by black stripe. Postclypeus brown to dark brown, with black lateral parts and its upper angles below metopoclypeal suture, also with pair of dark brown spots above anteclypeus (Figs 3, 5). Post-anteclypeal suture black. Rostrum with third segment totally black or with black apex. Scape and pedicel dark brown (Fig. 3). Paranotal lobes with light yellow stripe on their lower margin and with black wide stripe above it. Epimerae of mesonotum and episternae of metanotum black. Fore wings light brown yellowish with dark brown veins. Hind wings grey

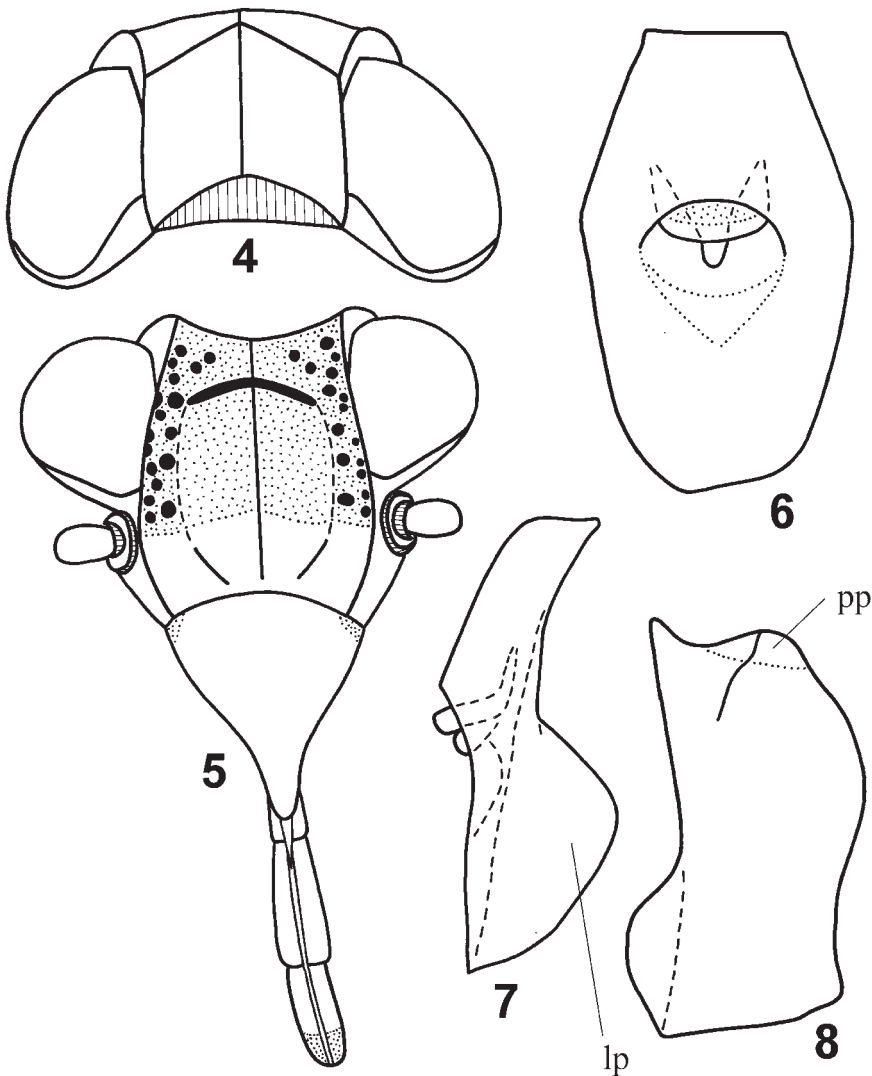


Figs 1–3. *Issus montenegrus* sp. nov. **1**, male, paratype (Cetinje), dorsal view; **2**, female, paratype (Mratinje), dorsal view; **3**, holotype, frontal view.

brownish with brown to dark brown veins. Fore and middle femora and tibiae brown. Hind femora with dark spots subapically. Apices of fore and middle tibiae, third tarsal segments, and claws dark brown. Leg spines brown, with black apices. Abdominal tergites dark brown to black. Abdominal sternites light yellow or sternites IV–VII

and pygofer brown to dark brown. In male, anal tube light yellow, and hind parts (posterodorsal) of style dark brown. In female, anal tube light yellow, and gonoplasts light yellow with dark brown margins.

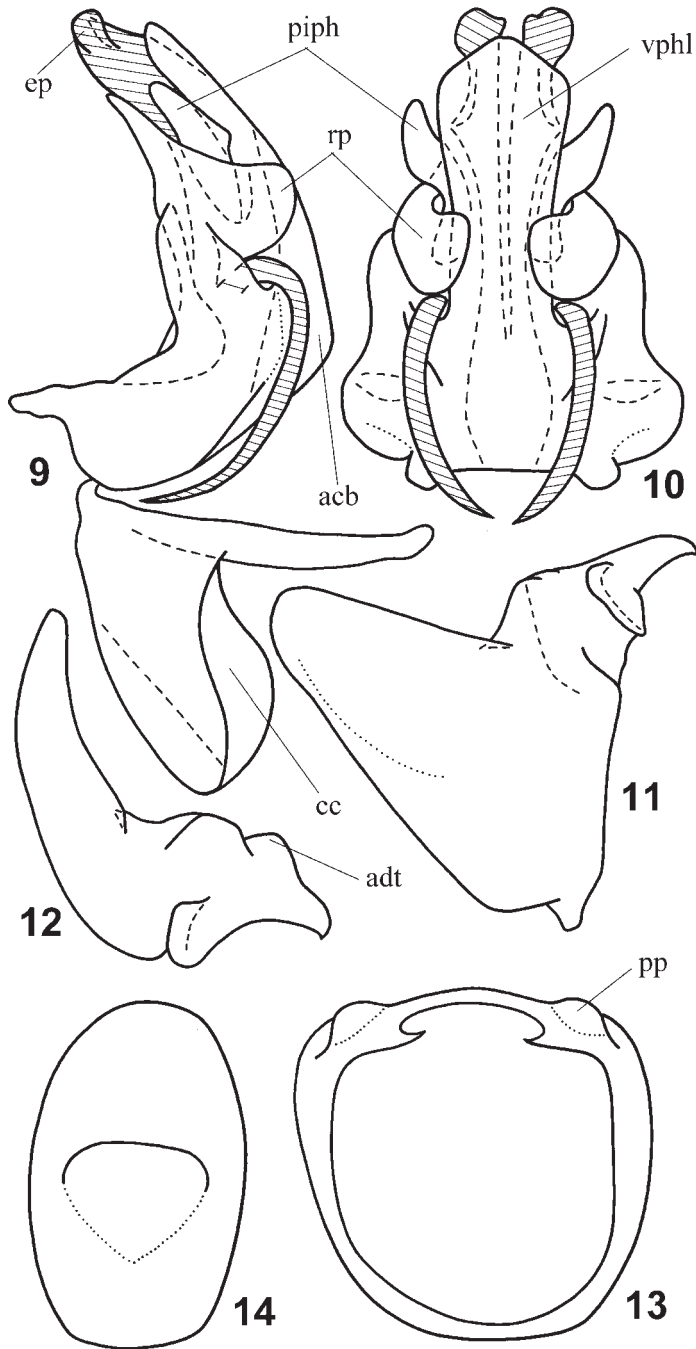
Male genitalia (Figs 6–13). Pygofer with convex hind margin (Fig. 8) and with a pair of hemispherical projections api-



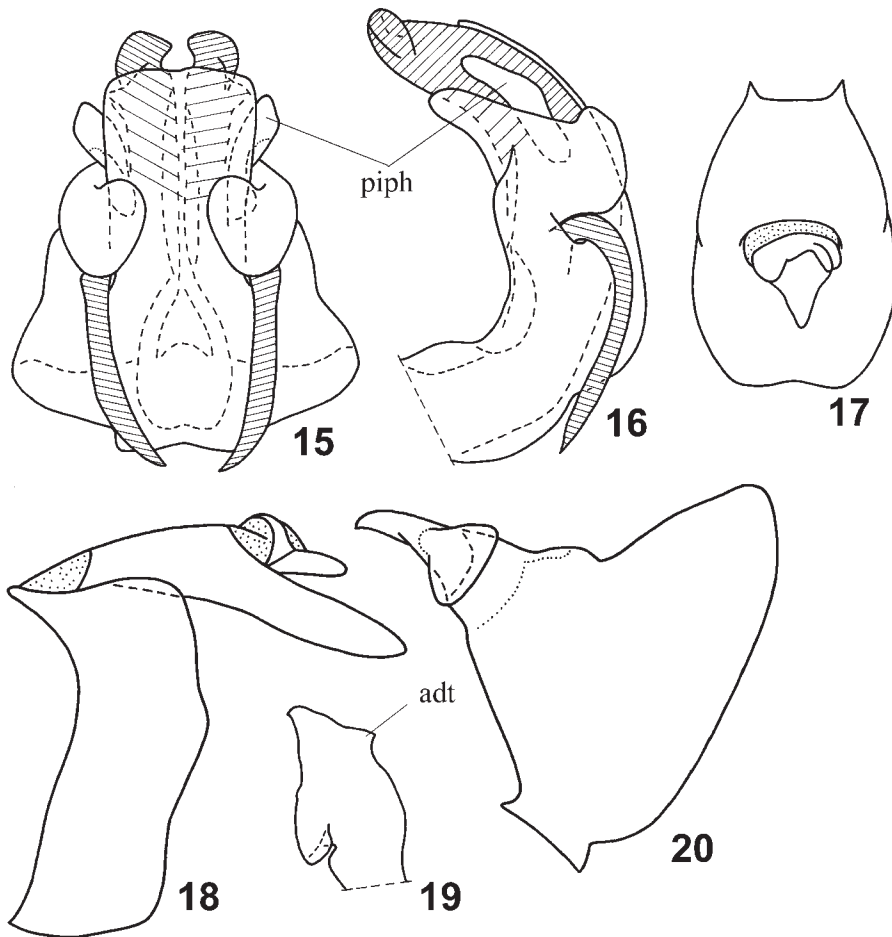
Figs 4–8. *Issus montenegrus* sp. nov., holotype. **4**, head, dorsal view; **5**, head, frontal view; **6**, male anal tube, dorsal view; **7**, male anal tube, lateral view; **8**, male pygofer, lateral view. Abbreviations: *lp*, lateral process of anal tube; *pp*, hemispherical projection of pygofer.

cally (Figs 8, 13, *pp*). Anal tube long and wide, narrowed basally and apically (in dorsal view) (Fig. 6), with large semicircular lateral processes (Fig. 7, *lp*). Anal column short. Phallobase wide (in ventral view) (Fig. 10), strongly curved (in lateral view), with angularly convex basal part below its ventral lobe (in lateral view) (Fig. 9, *acb*). Each dorsolateral lobe with a large rounded

process of its ventral margin covering basal part of aedeagal hook (Figs. 9, 10, *rp*) and with a digitate processes on its inner side (Figs. 9, 10, *pip*). Aedeagus well visible above phallobase. Ventral phallobase lobe long and wide, narrowing to apex (Fig. 10, *vph*). Apical aedeagal processes wide (in lateral view), each with an ear-shaped projection (Fig. 9, *ep*). Aedeagus with a pair of



Figs 9–14. *Issus montenegrus* sp. nov., genitalia (9–13, holotype; 14, paratype). **9**, penis and connective, lateral view; **10**, penis, ventral view; **11**, style, lateral view; **12**, style, dorsal view; **13**, male pygofer, caudal view; **14**, female anal tube, dorsal view. Abbreviations: *acb*, angularly convex basal part of phallobase; *adt*, additional tooth of capitulum of style; *cc*, connective cup; *ep*, ear-shaped projection of apical aedeagal process; *pp*, hemispherical projection of pygofer; *piph*, digitate processes of inner side of dorsolateral lobes of phallobase; *rp*, rounded processes of dorsolateral phallobase lobes; *vphl*, ventral phallobase lobe.



Figs 15–20. *Issus muscaeformis* (Schrank) (Hungary: Mehadia), male genitalia. **15**, penis, ventral view; **16**, penis, lateral view; **17**, anal tube, dorsal view; **18**, pygofer and anal tube, lateral view; **19**, capitulum of style, dorsal view; **20**, style, lateral view. Abbreviations: *adt*, additional tooth of capitulum of style; *pip*, digitate processes of inner sides of dorsolateral lobes of phallosome.

long ventral hooks (half as long as aedeagus) which pointed apically and directed basally. Connective with large cup (Fig. 9, *cc*). Style with concave hind margin and acutely angulate posterodorsal angle (Fig. 11). Capitulum of style on massive neck (in lateral view), narrowing apically, with smooth additional tooth (in dorsal view) (Fig. 12, *adt*). Lateral tooth of capitulum wide.

Female genitalia. Anal tube widely truncate apically (in dorsal view) (Fig. 14). Gonocoxa VIII without lobe-shaped process.

Total length (males and females) 5.5–6.0 mm.

Etymology. The new species is named after the country Montenegro.

Remarks. The new species is very similar to *I. muscaeformis* (Schrank) in the presence of many transverse veins between the main longitudinal veins of fore wings (with no difference in the wing venation between males and females; Figs 1, 2), the metope dark brown to black with a light yellow or ivory wide band above the clypeus (Kunz et al., 2011) (Figs 3, 5), and the gonocoxa VIII

of ovipositor without lobe-shaped process (Biedermann & Niedringhaus, 2009). *Issus muscaeformis* was apparently erroneously recorded from Montenegro by G. Horváth (1918) who listed four issid species for the country: *I. lauri*, *Latissus dilatatus* (Fourcroy, 1785), *Agalmatium flavescens* (Olivier, 1791) and "*I. muscaeformis*" from Cetinje (the latter indication may apply to the new species, because Cetinje is one of its type localities).

The new species can be separated from *I. muscaeformis* (Figs 15–20) by the male genital characters summarized in a key below.

- 1(2). Male anal tube longer (in dorsal view) (Fig. 6), with large semicircular lateral processes (Fig. 7, *lp*). Phallobase with angularly convex basal part (Fig. 9, *acb*); ventral phallobase lobe narrowing apically (Fig. 10). Capitulum of style on wide neck (Fig. 11), with rounded additional tooth (in dorsal view) (Fig. 12, *adt*). Hind margin of pygofer strongly convex (Fig. 8).....
.....*I. montenegrus* sp. nov.
- 2(1). Male anal tube shorter (in dorsal view) (Fig. 17), without lateral processes (Fig. 18). Phallobase with smoothly convex basal part (Fig. 16); ventral phallobase lobe widely truncate apically (Fig. 15). Capitulum of style on narrower neck (Fig. 20), with sharp additional tooth (in dorsal view) (Fig. 19, *adt*). Hind margin of pygofer convex only medially (Fig. 18).....
.....*I. muscaeformis* (Schrank)

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