A new species of *Istocheta* Rondani (Diptera: Tachinidae) from the Mercantour National Park, France

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Abstract

A new tachinid species (Diptera: Tachinidae) from the Mercantour National Park in southeastern France, *Istocheta incisor* **n. sp.**, is described. The new species is probably nearly related to *I. nyctia* Borisova-Zinov'eva, 1966 from the Russian Far East.

Keywords: Tachinidae, *Istocheta*, France, Mercantour National Park.

Zusammenfassung

Istocheta incisor **n. sp.**, eine neue Raupenfliege (Diptera: Tachinidae) aus dem Mercantour Nationalpark in Südost-Frankreich, wird beschrieben. Die neue Art ist wahrscheinlich nahe verwandt mit *I. nyctia* Borisova-Zinov'eva, 1966 aus dem Fernen Osten Russlands.

Contents

1 Introduction

The species of *Istocheta* Rondani are externally often very similar, but they provide useful characters for distinction in the male and sometimes also in the female genitalia. The cerci of the males have peculiar appendages or extensions (compare figures in Borisova-Zinov'eva 1963, 1964, 1966b and Chao et al. 1998). Keys to species are provided by Borisova-Zinov'eva (1964, 1966b) and Chao et al. (1998). The numerous Palaearctic species are listed in the catalogue of Herting & Dely-Draskovits (1993), for additions see Richter (1995) and O'Hara et al. (2009).

The new species described in this paper is a result of a collecting travel into the Mercantour National Park during July 2009.

Acronyms of depositories

MNHN	Muséum National d'Histoire Naturelle, Paris, France
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany
ZMHB	Museum für Naturkunde, Humboldt Universität, Berlin, Germany

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2 Methods

Measurements follow Tschorsnig & Richter (1998).

The photos were taken with a Keyence digital microscope VHX-500 FD and a Leica DFC 480 digital camera on a Leica MZ16 APO microscope.

No special preparation in glycerine of male and female postabdomina were made because the features of diagnostic importance are well visible in dry condition, but as a result not all characters of the postabdomina can be described.

3 Description of *Istocheta incisor* n. sp.

Material

Holotype (♂): France, Alpes-de-Haute-Provence, Haute Ubaye, 0.4 km SE Maison Méane, 1800 m, 16.VII.2009, leg. H.-P. Tschorsnig (SMNS).

Paratypes: 1♂, 1♀, same data as holotype (SMNS, MNHN). – 1♀, same country, region, date and collector, 2 km NW Col de Larche, 1900 m (SMNS). – 1♀, same data as before, but 17.VII.2009 (ZMHB). – 1♀, same country, region and collector, 2.5 km NW Col de Larche, 1860 m, 17.VII.2009 (SMNS).

All localities are situated in the Mercantour National Park in southeastern France.

Etymology

Incisor, from (Lat.) incidere = to cut into. The name, a noun in apposition, was chosen because the fused female sternite/tergite 7 has the shape and most probably also the function of a cutter.

Description

Male [statements given within square brackets refer to the male paratype]:

Colouration and pruinescence: Body black. Gena and a narrow stripe of parafacial along facial ridge brown. Palpus yellow. Halter reddish. Tegula and basicosta black. Calypters white. Legs black. Epandrium reddish brown lateroventrally, surstyli and cerci brown, appendages of cerci yellow. Head and thorax covered with grey pruinescence. Scutum with two pairs of sharply delimited dark presutural longitudinal stripes, the median stripes about as wide as 1/5–1/4 of the distance between them. Abdomen dorsally and ventrally entirely covered with grey pruinescence, with dark reflecting pattern in lateral view and a very slightly darker hind margin of the tergites in caudal view.

Head (Fig. 1): Face 1.3 [1.4] times as long as frons. Eye densely covered with long hairs. Frons at its narrowest point 1.22 [1.15] times as wide as an eye in dorsal view. Inner vertical bristles 0.8 [0.9] times as long as eye height, parallel or slightly divergent; outer vertical bristles not or only very slightly differentiated from the setae of the postocular row. Postocular setae long, bent forwards. Ocellar bristles strong, pro- and lateroclinate. Frontal bristles descending to aristal base. Two or three reclinate upper orbital bristles present, stronger but otherwise hardly differentiated from the uppermost frontal bristles. Two proclinate orbital bristles present. Frons with several rows of setulae which descend on about upper anterior half of the parafacial. Parafacial at its narrowest point about 0.6 times as wide as horizontal diameter of eye. Facial ridge convex in profile, with stout, erect bristles on lower 2/3–4/5. Vibrissa arising at level of lower anterior facial margin; the latter strongly protruding from the face, but not visible in lateral view. Antennae widely recessed into the deep facial cavity. Third antennal segment 7 times as long as second antennal segment. Arista bare, thickened on about basal 2/3. Second aristomere as long as wide. Gena, when seen in profile, about 0.7 of vertical diameter of eye. Genal dilation strongly reduced. Back of head with pale hairs, and 2–3 irregular rows of black setae on upper third behind the postocular row. Prementum about 2.5 times as long as its diameter. Palpus well-developed, with numerous black setulae, thickened part at most as wide as half of prementum.

Thorax: Prosternum with 8–10 strong setulae along lateral margins. Proepisternum bare. Postpronotum with 3 bristles arranged in a more or less straight line. Scutum with 3 + 3 pairs of acrostichal bristles, 2 + 3 pairs of dorsocentral bristles, 0 + 3 intra-alar bristles. First postsutural supra-alar bristle shorter than notopleural bristles. Katepisternum with 3 bristles. Katepimeron bare. Anepimeral seta about twice as long as general anepimeral hairs. Scutellum with 4 pairs of bristles along its margin: basal and subapical bristles strong, lateral and apical bristles less strong, subequal in length; apical bristles horizontal, divergent [crossed]; distance between subapical bristles equal to distance between subapical and basal bristles; surface of scutellum with erect hairs and 1–2 pairs of preapical bristles. Anatergite with 1–2 very fine hairs [bare] below lower calypter.

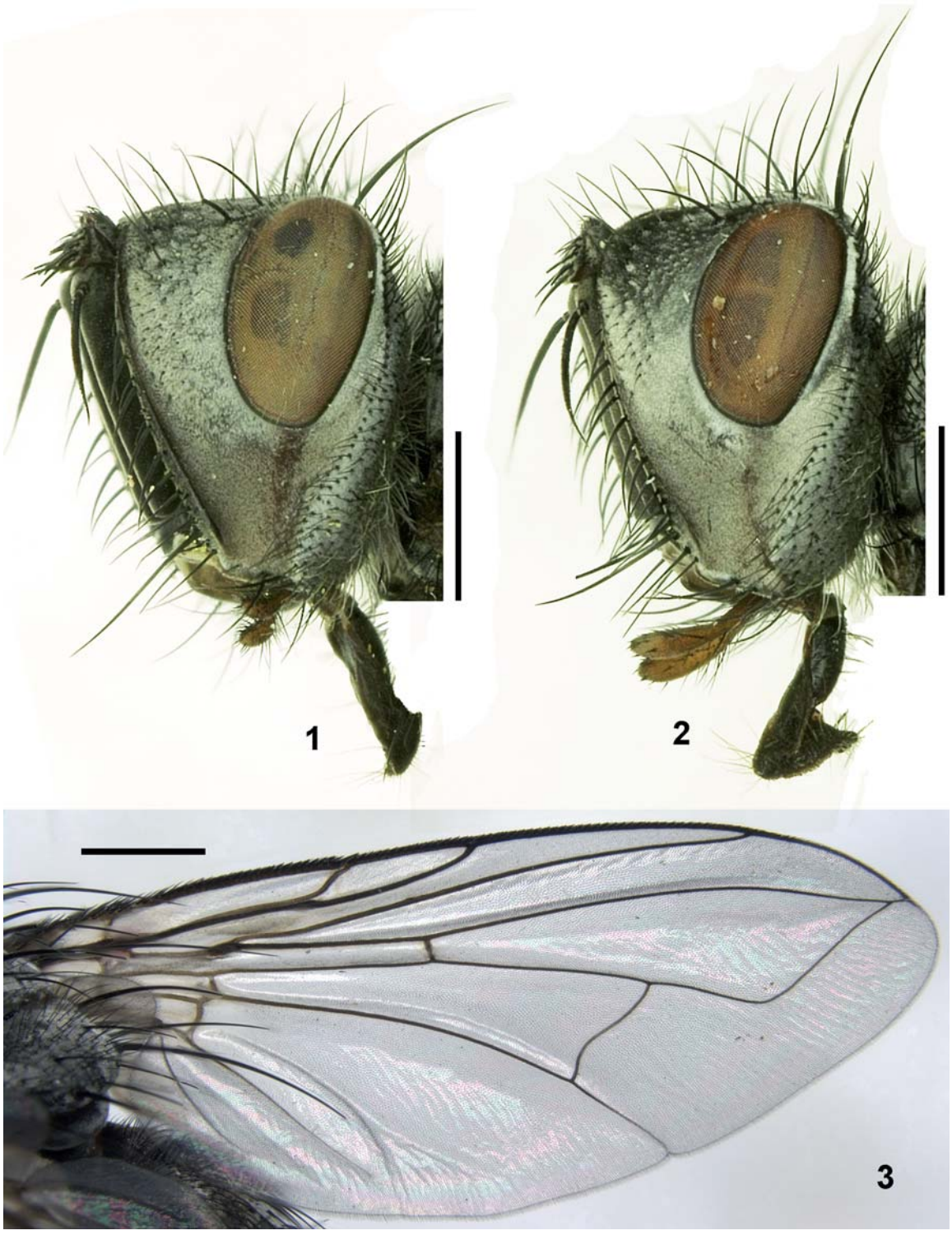
Wing (Fig. 3): Costal bristle nearly undifferentiated from the other costal setae. Second costal portion with fine hairs ventrally. Base of R_{4+5} with 2–3 setulae. R_1 and CuA_1 bare. Fourth costal section 2.8 [2.5] times as long as sixth costal section. Section of M between crossveins r-m and dm-cu 2.0 [2.2] times as long as section between dm-cu and bend of M. Bend of M obtuse. Petiole of wing cell r_{4+5} as long as 0.1 of section of M beyond bend.

Legs: Claws as long as fifth tarsal segment. Inner anterior surface of fore coxa bare. Fore tibia with a row of 4–5 short anterodorsal bristles and 2 posterior bristles; preapical anterodorsal bristle as long and strong as preapical dorsal bristle. Mid tibia with 1 anterodorsal bristle, 2 posterodorsal bristles, 1 strong ventral bristle. Hind tibia with a row of 8–9 anterodorsal bristles, 2–3 posterodorsal bristles, 2–3 anteroventral bristles, and 2 dorsal preapical setae; preapical posteroventral seta short, hair-like. Hind coxa bare on posterodorsal margin.

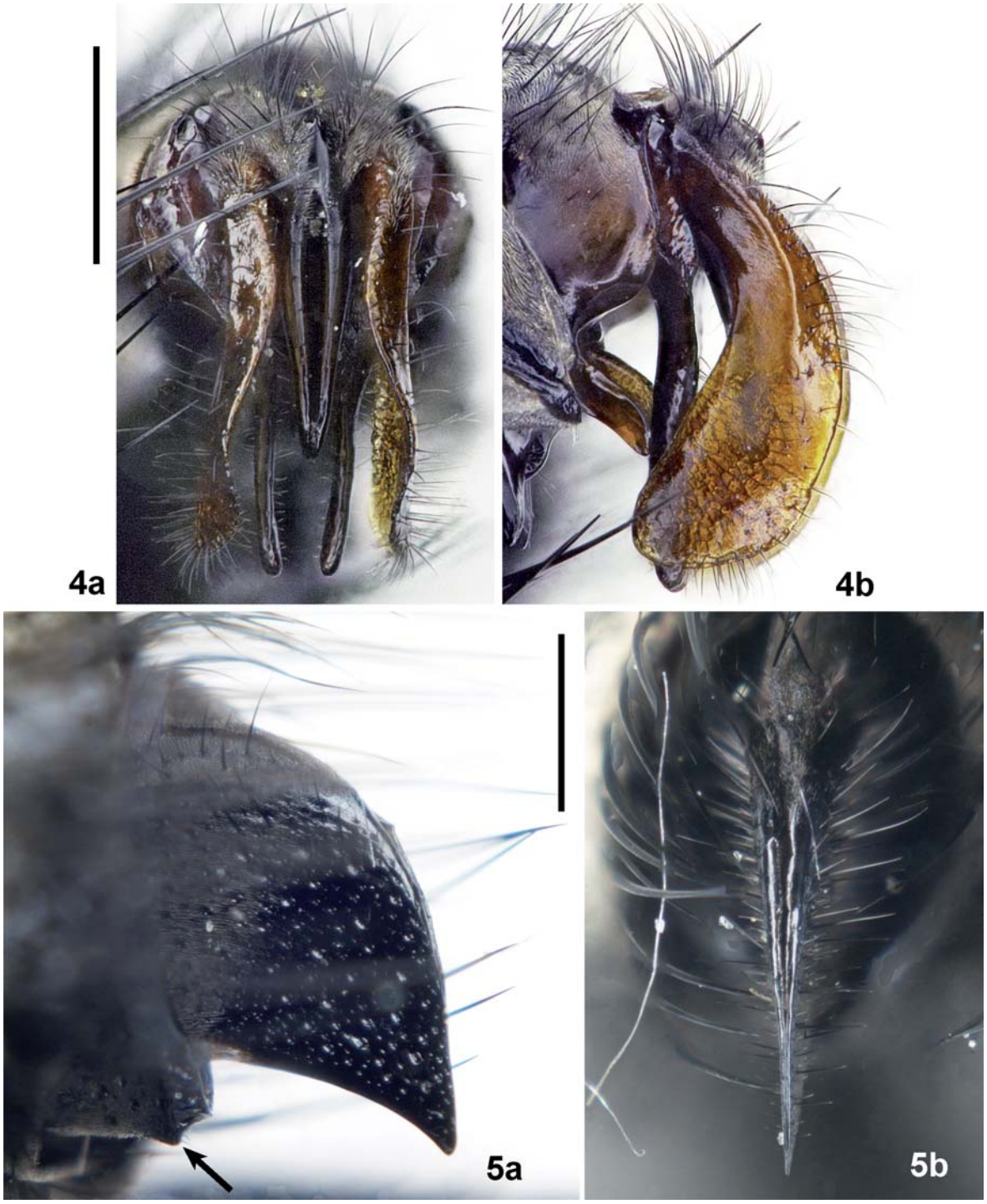
Abdomen: Middorsal depression on syntergite 1+2 confined to anterior 0.6–0.7 of that segment. Syntergite 1+2 with 1 pair of median marginal bristles and 2–3 pairs of lateral marginal bristles; tergite 3 with 1 pair of median marginal bristles, 2–3 pairs of lateral marginal bristles, and 1 pair of short median discal bristles; tergite 4 with a complete row of marginal bristles and 1 pair of discal bristles; tergite 5 with a row of semi-erect marginal bristles and several irregular discal bristles. Hairs on abdomen strong, recumbent dorsally, semi-erect and even stronger laterally.

Postabdomen (Fig. 4): Surstyli narrow, straight in lateral view, convergent in caudal view, reaching near the apical end of the appendages of the cerci. Cerci long and narrow, separated on 3/4 of its median length in dorsal view. Appendages of the cerci very large, continuously widened, not folded; free part of the appendages beyond the insertion point about 5 times as long as the basal part of the cerci (measured in dorsal view from the insertion point of the appendages to the very base of the cerci, not in the midline).

Body length 9.0 [8.7–9.7] mm.



Figs. 1–3. *Istocheta incisor* n. sp. – **1**. Head, holotype ♂. **2**. Head, ♀. **3**. Wing, ♀. – Scales: 1 mm.



Figs. 4–5. *Istocheta incisor* n. sp., paratype ♂ (4) and ♀ (5) terminalia. – **4**. Epandrium, cerci and surstyli in caudal (a) and lateral (b) views. **5**. Sternite 6 and sternite/tergite 7 in lateral (a) and caudal (b) views; the arrow indicates the short process of sternite 6. – Scales: 0.5 mm.

Female, differing from male as follows:

Basicosta dark brown to black. Abdominal pruinescence more dense than in male; in lateral view with dark reflecting pattern and a dark midline. Hairs on eye shorter (1/2–2/3 of male). Frons at its narrowest point 1.30–1.46 times as wide as an eye in dorsal view. Third antennal segment 5.4–6.3 times as long as second antennal segment. Back of head with 1–3 irregular rows of black setae on upper third. Thickened part of palpus about as wide as 2/3 of prementum (Fig. 2). Rarely an additional shorter presutural dorsocentral bristle present, anterior to the foremost of the two strong bristles. Katepimeron bare or with 1–4 hairs. Anatergite with a group of 3–5 fine hairs below lower calypter. Fourth costal section 3.0–3.3 times as long as sixth costal section. Section of M between crossveins r-m and dm-cu 1.9–2.0 times as long as section between dm-cu and bend of M. Petiole of wing cell r_{4+5} as long as 0.1–0.2 of section of M beyond bend. Claws 0.9 times as long as fifth tarsal segment. Mid tibia occasionally with 1–2 setae in addition to the strong anterodorsal bristle. Hairs on abdomen more recumbent and bristles in the dorsal median line more erect than in male; marginal bristles of tergite 5 all recumbent. – Postabdomen (Fig. 5): Sternite 6 with a short process on posteroventral margin. Sternite 7 and tergite 7 fused to a flat, heavily sclerotized, cutter-like sclerite with sharp ventral edge.

Differential diagnosis

Istocheta incisor n. sp. and *I. longicornis* (Fallén, 1810) are barely distinguishable by external morphological characters, but male and female genitalia are entirely different. The following key may be used to recognize the two species:

1 Thickened part of palpus about as wide as 1/3 of prementum in ♂, about half as wide in ♀. Basicosta dark brown in ♂, brown or light brown in ♀. – ♂ postabdomen (see Borisova-Zinov'eva 1966b: fig. 42): Surstyli bent forwards, distinctly widened basally, parallel in caudal view. Abruptly widened apical portion of the lobe-like appendages of the cerci folded inwards dorsally (in dry condition); appendages of moderate length, their free part beyond the insertion point about as long as the basal part of the cerci (measured in dorsal view from the insertion point of the appendages to the very base of the cerci, not in the midline). – ♀: Posterior margin of abdominal tergite 5 transversely oval in caudal view. Sternite 7 and tergite 7 of normal shape, not fused and without special modifications (compare Borisova-Zinov'eva 1966b: fig. 6). . ..... ***I. longicornis***

– Thickened part of palpus about half as wide as prementum in ♂, about as wide as 2/3 in ♀. Basicosta black in ♂, black or dark brown in ♀. – ♂ postabdomen (Fig. 4): Surstyli straight in lateral view, narrow over its whole length, convergent in basal half in caudal view. Appendages of the cerci continuously widened, not folded, very large; free part of the appendages beyond the insertion point about 5 times as long as the basal part of the cerci. – ♀: Posterior margin of abdominal tergite 5 longitudinally oval or rounded in caudal view. Sternite 7 and tergite 7 fused to a flat, heavily sclerotized, cutter-like sclerite with sharp ventral edge (Fig. 5). .... ***I. incisor*** n. sp. [+ ***I. nyctia***]

Istocheta nyctia (Borisova-Zinov'eva, 1966) (see Borisova-Zinov'eva 1966a: 272) from Russian Far East has the same special type of ovipositor as *I. incisor* n. sp., thus probably constituting a synapomorphy of the two species. In the key of Borisova Zinov'eva (1966b) *I. nyctia* and *I. longicornis* key out in the same couplet, but the given outer morphological differences are weak. According to this key *I. nyctia* has slightly narrower antennae and a bare anatergite. The presence of the special ovipositor is, however, a striking difference between the two species.

Females of *I. incisor* n. sp. and *I. nyctia* are well separable (males of *I. nyctia* are unknown) because the posteroventral margin of sternite 6 of *I. incisor* has a short process (absent in *I. nyctia*) and sternite/tergite 7 is more acute apically (compare Fig. 5a and Borisova-Zinov'eva 1966a: fig. 5 or Borisova-Zinov'eva 1966b: fig. 60).

The shape of sternite/tergite 7 of a specimen from China, treated as *I. nyctia* by Chao et al. (1998: fig. 3143U1), resembles more the new species than Borisova Zinov'eva's original description of *I. nyctia*.

Ecology

I. nyctia n. sp. was collected at full daylight during dry and sunny weather at a roadside with ruderal flora near alpine meadows. The specimens were feeding on flowers of *Pastinaca sativa* Linnaeus and *Laserpitium siler* Linnaeus (Daucaceae).

Remarks

Two males and ten females of *Istocheta longicornis* were collected together with the new species at the same places at the same time and on the same flowers. This was surprising because species of *Istocheta* were entirely absent during the long-time investigation of the tachinid fauna of the Hautes-Alpes (Tschorsnig et al. 2003), even though this neighbouring French département provides very similar habitats. Neither *Istocheta incisor* n. sp. nor *I. longicornis* were collected below 1800 m during the excursion, but *I. longicornis* is also known from low altitudes in other parts of Europe.

Hosts of *I. incisor* n. sp. are unknown, but are most likely to be adults of Scarabaeidae (Coleoptera) because all currently known hosts of *Istocheta* belong to this family (Borisova-Zinov'eva 1964). Also the mode of oviposition of *I. incisor* is unknown, but it is obvious that sternite/tergite 7 has probably the function to cut a slit into the host body, wide enough for a large egg to be deposited through this opening. It would be especially interesting to know if the egg is placed directly into the host body, or if the cut penetrates only the elytra and the egg is placed between elytra/wings and terga.

A typical piercer, in contrary, which is also known from several other tachinid genera (*Compsilura*, *Cylindromyia* etc.), would instead produce a narrow slit or hole for a narrow egg or larva. There are also three species of *Istocheta* [*I. rufipe*s Villeneuve, 1937, *I. subrufipes* (Borisova-Zinov'eva, 1964), *I. adrufipes* (Borisova-Zinov'eva, 1964)] which have the ovipositor not simply telescopic (as it is usually the case in this genus), but developed as a narrow and pointed piercer (compare Borisova-Zinov'eva 1964: figs. 25–27), not like a "cutter" as in *I. incisa* and *I. nyctia*.

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