

First record of the tobacco flea beetle *Epitrix hirtipennis* Melsheimer [Coleoptera: Chrysomelidae: Alticinae] in Russia

M. J. Orlova-Bienkowskaja

A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Leninskii Prospect 33, Moscow, 119071, Russia;
e-mail: marinaorlben@yandex.ru

The invasive pest of tobacco *Epitrix hirtipennis* (Melsheimer, 1847) is recorded in Russia for the first time. In April 2013 two specimens were collected in Sochi and in May one specimen was collected in Tuapse (near the Black Sea shore, in the Northern Caucasus). *Epitrix hirtipennis* is native to North and Central America. It was first recorded in the EPPO region in 1983 in Italy. It was subsequently recorded in the Azores (Portugal), Greece, Turkey, FYR of Macedonia, Bulgaria, and Syria. *Epitrix hirtipennis* is the first known alien flea beetle in Russia.

Flea beetles of the genus *Epitrix* Foudras, 1860 (Coleoptera: Chrysomelidae: Alticinae) are tiny beetles that feed mainly on Solanaceae. Some of them are serious pests. The genus has a worldwide distribution and consists of nearly 180 species. Fourteen of them are native to the Palaearctic ecozone, and 12 to the Nearctic ecozone (Döberl, 2000). Four Nearctic species have been established in the EPPO region: *E. cucumeris* (Harris, 1851), *E. similis* Gentner, 1944, *E. fasciata* Blatchley, 1918, and *E. hirtipennis* (Melsheimer, 1847) (EPPO, 2011). The former two species are included in the EPPO A2 List of pests recommended for regulation as quarantine pests and are serious pests of potato and other vegetables, while the latter two, feeding mainly on tobacco, are not included (EPPO, 2011; Germain *et al.*, 2013).

Epitrix hirtipennis was the first American species of this genus introduced to Europe. In 1983 this species, native to North and Central America, was found in Europe for the first time in Northern Italy (Sannino *et al.*, 1984). It then quickly spread to South and Central Italy (Sannino & Balbiani, 1990) and was also found in Azores (Portugal) in 1985 (Israelson, 1985), Greece in 1988 (Lykouressis, 1991), Turkey in 1993 (Döberl, 1994), FYR of Macedonia in 1996 (Krsteska *et al.*, 2009), Bulgaria in 2000 (Trenchev & Tomov, 2000) and Syria in 2002 (Gruev & Döberl, 2005). Additionally, *E. hirtipennis* has been introduced to the Pacific region: to Tahiti (Gourves *et al.*, 1979), Fiji (Waterhouse, 1997) and Hawaii (Nishida, 2002). Records from Spain, Sri Lanka, and the Philippines (Deseö *et al.*, 1993) are not considered reliable, because no references on collected material or other details are given. Spread of *E. hirtipennis* may combine long-distance, human-mediated dispersal and natural spread by adult flights (Beenen & Roques, 2010).

Larvae of *E. hirtipennis* are root-feeding, while adults feed on leaves. In the native range *E. hirtipennis* is known mainly as a pest of tobacco, but can also feed on eggplant, potato, tomato and many other solanaceous plants (Capineria, 2001). In Europe *E. hirtipennis* causes severe damage on

tobacco in Italy, Greece and Bulgaria (Deseö *et al.*, 1993; Lykouressis *et al.*, 1994; Deligeorgidis *et al.*, 2007; Tomov *et al.*, 2007). It also damages eggplant in Greece (Lykouressis, 1991). *Epitrix hirtipennis* is sometimes found on potato, but is not considered a serious pest of potato crops in the European countries (Boavida & Germain, 2009).

In spring 2013 three specimens of *E. hirtipennis* were collected by sweeping weeds in the Northern Caucasus near the Black Sea shore [Sochi, Krasnosel'skaya street (43.58°N, 39.76°E), 30.04.2013, two females; Tuapse, Kalarasha street (44.13°N, 39.08°E), 7.05.2013, one female] (Fig. 1). The specimens will be deposited in the collection of Zoological Institute of Russian Academy of Sciences (St-Petersburg).

The specimens have been identified by their external morphology and the structure of spermatheca (Fig. 2) (White & Barber, 1974; Döberl, 2000). *Epitrix hirtipennis* differs from most of the Palaearctic and Nearctic *Epitrix* species in colour: head and pronotum are rufous. Pronotal



Fig. 1 Female of *Epitrix hirtipennis* collected in Tuapse (Krasnodar Territory, Russia).



Fig. 2 Spermatheca of the female of *Epitrix hirtipennis* collected in Tuapse (Krasnodar Territory, Russia).

antebasal impression is weak. Elytra are yellow with dark brown suture and transverse stripe at midlength. Elytral intervals are covered with dense long white setae. Thickenings at anterior angles of pronotum are short. Elytral scutellar row of punctures does not reach the midlength of elytra and consists of 14 punctures. Pronotum is covered with dense punctures, which are as large as those in elytral rows. Spermatheca is elongate, pear-shaped, without constriction.

Epitrix hirtipennis differs from *E. fasciata* (American species, introduced to Azores) in the shape of spermatheca, larger and more elongate body (2.05 mm long, 1.9 as long as wide) and in the shape of elytral transverse band, which is not broken at the third interval between puncture rows; from the American species *E. subcrinita* in the absence of metallic lustre of elytra, in pronotal antebasal impression shallow, and in the shape of spermatheca; from palaeartic *E. pubescens* ab. *ferruginea* in the short thickening at anterior angles of pronotum, pronotal antebasal impression shallow, and shorter elytral scutellar row; from *E. allardi* (endemic of Canary Islands) in short elytral scutellar row; from the far-eastern species *E. setosella* in yellow elytra and larger pronotal punctures.

Soon after the establishment of *E. hirtipennis* in Italy its quick expansion to the east was predicted (Döberl, 1994). Now this prognosis is being seen to occur. Only two alien species of leaf-beetles were recorded from Russia until recently: *Zygogramma suturalis* (Fabricius, 1775), intentionally introduced for biological control of ragweed (*Ambrosia* spp.) (Reznik *et al.*, 2008), and the Colorado potato beetle *Leptinotarsa decemlineata* (Say, 1824) (Bieńkowski, 2011; Maslyakov & Izhevskii, 2011). Within last 2 years two more alien species have been found: *Diabrotica virgifera* LeConte, 1868 (All-Russian Plant Quarantine Center, 2011) and *E. hirtipennis* (present article). The appearance of new alien species corresponds to the general tendency: the rate of arrival of leaf beetles to Europe is increasing exponentially, and the ranges of new alien species expand (Beenen & Roques, 2010).

Acknowledgements

The author expresses her gratitude to M. Döberl (Abensberg, Germany) for confirmation of identification of the species and to K.V. Makarov (Moscow State Pedagogical

University) for help in preparing the photos. The research has been supported by the Program of Presidium of Russian Academy of Sciences 'Wildlife' – 'Invasions'.

Premier signalement de l'altise du tabac *Epitrix hirtipennis* Melsheimer [Coleoptères: Chrysomelidés: Alticinae] en Russie

L'organisme nuisible envahissant du tabac *Epitrix hirtipennis* (Melsheimer, 1847) est signalé en Russie pour la première fois. En avril 2013 deux spécimens ont été collectés à Sochi et au mois de mai un spécimen a été collecté à Tuapse (près de la côte de la mer Noire, dans le nord du Caucase). *E. hirtipennis* est natif d'Amérique du Nord et d'Amérique Centrale. C'est en Italie, en 1983, qu'il a été signalé pour la première fois dans la région OEPP. Il a ensuite été observé aux Açores (Portugal), en Grèce, en Turquie, en EYR Macédoine, en Bulgarie, et en Syrie. *E. hirtipennis* est la première altise exotique observée en Russie.

Первое нахождение блошки шершавой *Epitrix hirtipennis* Melsheimer [Coleoptera: Chrysomelidae: Alticinae] в России

В России обнаружен новый инвазивный вид, вредитель табака – блошка шершавая *Epitrix hirtipennis* (Melsheimer, 1847). В апреле 2013 года два экземпляра были пойманы в Сочи, а в мае один экземпляр – в Туапсе (Черноморское побережье, Северный Кавказ). *E. hirtipennis* происходит из Северной и Центральной Америки. Он был впервые отмечен в регионе ЕОКЗР в Италии в 1983 г. Затем его обнаружили также на Азорских островах (Португалия), в Греции, Турции, Македонии, Болгарии и Сирии. *E. hirtipennis* – первая чужеродная блошка (Alticinae), указанная для фауны России.

References

- All-Russian Plant Quarantine Center (2011) [*Western corn rootworm is already in Russia.*] <http://www.vniikr.ru/> [accessed on 11 September 2013] (in Russian).
- Beenen R, Roques A (2010) Leaf and Seed Beetles (Coleoptera, Chrysomelidae). Chapter 8.3. In *Alien Terrestrial Arthropods of Europe* (ed. Roques A *et al.*) *BioRisk* 4, pp. 267–292. doi: 10.3897/biorisk.4.52.
- Bieńkowski AO (2011) [*Leaf beetles of European Russia.*] 534 pp. Lambert Academic Publishing, Saarbrücken (DE) (in Russian).
- Boavida C & Germain JF (2009) Identification and pest status of two exotic flea beetle species newly introduced in Portugal: *Epitrix similis* Gentner and *Epitrix cucumeris* (Harris). *EPPO Bulletin* 39, 501–508. Paris: European and Mediterranean Plant Protection Organization.
- Capinera JL (2001) *Handbook of Vegetable Pests*. 729 pp. Academic Press, San Diego.
- Deligeorgidis PN, Ipsilandis CG, Kaltsoudas G, Sidiopoulos G, Deligeorgidis NP, Vailopoulou M *et al.* (2007) Chemical control of

- Thrips tabaci*, *Epitrix hirtipennis* and *Myzus persicae* in tobacco fields in Northern Greece. *Journal of Entomology*, **4**, 463–468.
- Deseö KV, Balbiani A, Sannino L & Zampelli G (1993) [Biology and biological control of the tobacco flea beetle *Epitrix hirtipennis* Melsh. (Col., Chrysomelidae).] *Anzeiger für Schädlingkunde, Pflanzenschutz, Umweltschutz* **66**, 26–29 (in German).
- Döberl M (1994) [Interesting findings of Alticinae (Col., Chrysomelidae) in Western Europe.] *Entomologische Nachrichten und Berichte* **38**, 179–182 (in German).
- Döberl M (2000) [Contribution to the knowledge of the genus *Epitrix* Foudras, 1860 in the Palaearctic Region (Coleoptera: Chrysomelidae: Alticinae).] *Mitteilungen des Internationaler Entomologischer Verein* **25**, 1–23 (in German).
- EPPO (2011) *Epitrix cucumeris*, *E. similaris* and *E. tuberis*. *EPPO Bulletin* **41**, 369–373. Paris: European and Mediterranean Plant Protection Organization. doi: 10.1111/j.1365-2338.2011.02504.x.
- Germain JF, Chatot C, Meusnier I, Artige E, Rasplus JY & Cruaud A (2013) Molecular identification of *Epitrix* potato flea beetles (Coleoptera: Chrysomelidae) in Europe and North America. *Bulletin of Entomological Research*, **103**, 354–362.
- Gourves J, Samuelson GA, Boheman CH & Fairmaire H (1979) The Chrysomelidae of Tahiti (Coleoptera). *Pacific Insects* **20**, 410–415.
- Gruev B & Döberl M (2005) *General distribution of the Flea Beetles in the Palaearctic Subregion (Coleoptera, Chrysomelidae: Alticinae)*. Supplement, 239 pp. Pensoft, Sofia (BG).
- Israelson G (1985) Notes on the coleopterous fauna of the Azores, with description of new species of *Athete* Thomson. *Boletim do Museu Municipal do Funchal* **37**, 5–19.
- Krsteska V, Dimeska V & Stojanoski P. (2009) *Epitrix hirtipennis* Melsh on tobacco. *Abstracts of presentations made at the 2009 Coresta Joint Meeting of the Agronomy and Phytopatology Study Groups*, 15. Agro/Phyto, Rovinj.
- Lykouressis DP (1991) *Epitrix hirtipennis*, a new pest of tobacco in Greece, with notes of its morphology, bioecology and control. *Entomologica Hellenica* **9**, 81–85.
- Lykouressis DP, Mentzos G & Parentis A (1994) The phenology of *Epitrix hirtipennis* (Mels.) (Col., Chrysomelidae) and damage to tobacco in Greece. *Journal of Applied Entomology* **118**, 245–252.
- Maslyakov VYU & Izhevskii SS (2011) [*Invasions of Phytophagous Insects into European Russia*], 272 pp. Institute of geography of Russian Academy of Sciences, Moscow (RU) (in Russian).
- Nishida GM ed. (2002) Hawaiian Terrestrial Arthropod Checklist. 4th edn. *Bishop Museum Technical Report* **22**, 313.
- Reznik SY, Spasskaya IA, Dolgovskaya MY, Volkovitsh MG & Zaitzev VF (2008) The ragweed leaf beetle *Zygogramma suturalis* F. (Coleoptera: Chrysomelidae) in Russia: current distribution, abundance and implication for biological control of common ragweed, *Ambrosia artemisiifolia* L. In *Proceedings of the XII International Symposium on Biological Control of Weeds*, pp. 614–619. CAB International, La Grande Motte (FR).
- Sannino L & Balbiani A (1990) [Possibilities of biological control of *Epitrix hirtipennis* in Italia.] *Supplemento a L'Informatore Agrario*, **13** 17–20 (in Italian).
- Sannino L, Balbiani A & Espinosa B (1984) [A new pest devastating tobacco in Benevento, *Epitrix hirtipennis* Melsh. (Coleoptera, Chrysomelidae), preliminary note.] *L'Informatore Agrario* **29**, 55–57 (in Italian).
- Tomov R, Trencheva K, Trenchev G & Kenis M (2007) A review of the non-indigenous insects of Bulgaria. *Plant Science* **44**, 199–204.
- Trenchev G & Tomov R (2000) Tobacco flea beetle *Epitrix hirtipennis* (Melsheimer) (Coleoptera, Chrysomelidae), a new serious pest on tobacco in Bulgaria. *Yearbook for Plant Protection, Skopje* **11**, 61–64.
- Waterhouse DF (1997). *The Major Invertebrate Pests and Weeds of Agriculture and Plantation Forestry in the Southern and Western Pacific*. ACIAR Monograph Vol. 44, 99 pp. The Australian Centre for International Agricultural Research, Canberra (AUS).
- White RE & Barber HS (1974) 4. Nomenclature and definition of the tobacco flea beetle, *Epitrix hirtipennis* (Melsh.), and of *E. fasciata* Blatchley, (Coleoptera: Chrysomelidae). In *Proceedings of the Entomological Society of Washington* **76**, 4 397–400.