

First records of the tropical bed bug *Cimex hemipterus* (Heteroptera: Cimicidae) from Russia

Первые находки тропического постельного клопа *Cimex hemipterus* (Heteroptera: Cimicidae) в России

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The tropical bedbug *Cimex hemipterus* (Fabricius, 1803) was found for the first time in Russia: in many districts of Moscow in 2015–16, in five districts of St Petersburg, in Moscow Prov., Smolensk and Saransk in 2016. Unusual activity during daytime in autumn was characteristic of individuals of this species in different places of St Petersburg. *C. lectularius* Linnaeus, 1758 was absent in St Petersburg and Moscow in places where *C. hemipterus* was found, and apparently the former species is displaced by the latter. In all localities, *C. hemipterus* is resistant to insecticides used for controlling *C. lectularius*. It may be expected that *C. hemipterus* will overwinter successfully in heated facilities in Russia and spread to other regions where it can displace *C. lectularius*.

Тропический постельный клоп *Cimex hemipterus* (Fabricius, 1803) найден впервые в России: во многих районах Москвы в 2015–16 гг., в пяти районах Санкт-Петербурга, в Московской области, Смоленске и Саранске – в 2016 г. В Санкт-Петербурге отмечена необычная активность особей этого вида в светлое время суток. В Санкт-Петербурге и Москве, в местах, где был найден *C. hemipterus*, отсутствовал *C. lectularius* Linnaeus, 1758, который, очевидно, вытесняется этим видом. Во всех пунктах сбора материала *C. hemipterus* устойчив к инсектицидам, применяемым для борьбы с *C. lectularius*. Можно ожидать, что *C. hemipterus* будет благополучно переживать в России зимы в отапливаемых помещениях и распространяться в других регионах, вытесняя *C. lectularius*.

Key words: Russia, Moscow, St Petersburg, Smolensk, Saransk, tropical bed bug, Cimicidae, *Cimex hemipterus*, new records

Ключевые слова: Россия, Москва, Санкт-Петербург, Смоленск, Саранск, тропический постельный клоп, *Cimex hemipterus*, новые находки

Until now, only *Cimex lectularius* Linnaeus, 1758, one of the two species of the genus which are closely associated with humans and rarely feed on other hosts (bats and chickens), has been known in Russia. The second species, *Cimex hemipterus* (Fabricius, 1803), before the Second World War was distributed almost exclusively throughout the tropics. At that time, its habitat extended beyond the Tropic of Cancer only in the south of China, northern India, and in Florida, but it did not cross the

30th parallel in the Northern Hemisphere. In the second half of the XX and the beginning of the XXI centuries transport communications, movements of people and goods between countries and continents reached an unprecedented level, and transportations contributed to the appearance of many adventive species in new territories. One of such species is *C. hemipterus*, which has considerably advanced beyond the tropics and has been recorded from South Africa (Newberry et al., 1987), Australia

(Doggett et al., 2003), the Korean peninsula (Péricart, 1996), Israel (Rosen et al., 1987; Mumcuoglu & Shalom, 2010) and the United Kingdom (Péricart, 1996; Reinhardt & Siva-Jothy, 2006).

In November 2016 G.A. Lunina, an employee of the Center for Hygiene and Epidemiology in St Petersburg, appealed to me with a request to identify specimens of bed bugs that were found in different districts of St Petersburg and were characterized by unusual behavior and resistance to common insecticides. These specimens were identified by me as *Cimex hemipterus*. Additionally, R.A. Khryapin, an employee of the Moscow city center of disinfection, informed me about findings of this species in Moscow, Smolensk and Saransk in 2015 and 2016.

Order **HETEROPTERA** Latreille, 1810

Family **CIMICIDAE** Latreille, 1802

Genus ***Cimex*** Linnaeus, 1758

Cimex hemipterus (Fabricius, 1803)
(Fig. 1)

Material examined. Russia: St Petersburg: Primorskiy Distr., Kamyschovaya str, apartment, VIII–IX.2016 (V.A. Seleznev), 4 females; Primorskiy Distr., Dolgoozernaya str, apartment, 5.XII.2016 (G.A. Lunina), 1 female; Vasileostrovskiy Distr., 12 line, dormitory, 21.XI.2016 (K.S. Bogdanov, G.A. Lunina), 5 males, 3 females, 7 nymphs of II and IV instars; Vasileostrovskiy Distr., Birzhevaya line, apartment, 8.XII.2016 (G.A. Lunina), 1 female; Pushkin Distr., Pushkin, Academic Avenue, dormitory, 12.25.XI.216 (G.A. Lunina), 15 males, 5 females, 45 nymphs of I–V instars; Kalininskiy Distr., Butlerov str, utility room, 8.XII.2016 (S.V. Andreeva), 3 males, 1 nymph of II instar; Tsentral'nyy Distr., Mytninskaya str., prison cells, 16.XII.2016 (G.A. Lunina), 1 male, 1 female.

Additional material. Based on material of the Moscow city center of disinfection (Khryapin, personal communication), *C. hemipterus* was also found in the following localities. *Moscow:* Otradnoe Distr., Otradnaya str, apartment, 13.II.2015 (Korostyleva E.V.); Otradnoe Distr., Proezd Yakushkina, apartment, 26.VIII.2015 (S.A. Babanin); Yaroslavskiy Distr., Yaroslav-

skoe highway, apartment, 5.X.2015 (T.D. Tokareva); Voykovskiy Distr., Clara Zetkin str, apartment, 29.VI.2016 (V.V. Chistyakov); Sokolinaya Gora Distr., Mironovskaya str, apartment, 29.VI.2016 (V.D. Sobolev); Obruchevskiy Distr., Miklouho-Maclay str, dormitory, 20.VII.2016 (S.A. Bushueva); Yaroslavskiy Distr., Veshnik vod str, apartment, 26.VII.2016 (A.A. Korneev); Severnoe Izmaylovo Distr., Sirenevyy Boulevard, apartment, 6.VIII.2016 (unknown collector); Ivanovskoe Distr., Stalevarov str, apartment, 2.IX.2016 (N.A. Boskhryakov); Basmanniy Distr., Verkhnyaya Syromyatnicheskaya str, trading hall, 22.X.2016 (unknown collector); Novokosino Distr., Novokosinskaya str, apartment, 14.XI.2016 (M.G. Saprykina); Bogorodskoe Distr., Marshal Rokossovskiy Boulevard, apartment, 17.XI.2016 (E.A. Chukanova). *Moscow Prov., Domodedovo town, Novaya str, cottage, 9.X.2016 (N.A. Nagaytseva).* In total, more than 300 specimens have been collected in these and other localities of Moscow and the Moscow Prov., but only listed above localities was documented in the Moscow city center of disinfection. *Smolensk Prov., Smolensk, Kirov str, dormitory, 24.IX.2016 (unknown collector), number of specimens is unknown. Republic of Mordovia:* Saransk: Respublikanskaya str, cottages, VII–IX.2016 (unknown collector), 10 imagoes, 3 nymphs; Rabochaya str, prison cells, same dates (T.D. Pizelkina), 8 imagoes, 7 nymphs.

According to Usinger (1940), *Cimex hemipterus* differs from *C. pipistrelli* Jenyns, 1839 and *C. pilosellus* (Horváth, 1910) species groups by cleft, surrounded by bristles paragenital sinus at hind margin of fifth ventrite (vs cleft paragenital sinus with naked area around it, and rounded paragenital sinus with bristles around it, respectively). It differs from *C. lectularius* species group (*C. lectularius* Linnaeus, 1758 and *C. columbarius* Jenyns, 1839) by pronotum less than 2.5 times as wide as long at middle, with not broadly expanded lateral margins (vs pronotum more than 2.5 times as wide as long, with broadly expanded lateral margins) and interocular space about four times as wide as eye in males (vs interocular space almost 7 times as wide as eye in *C. columbarius*).

The specimens examined by me and by R.A. Khryapin (personal communication) correspond to the diagnostic characters of

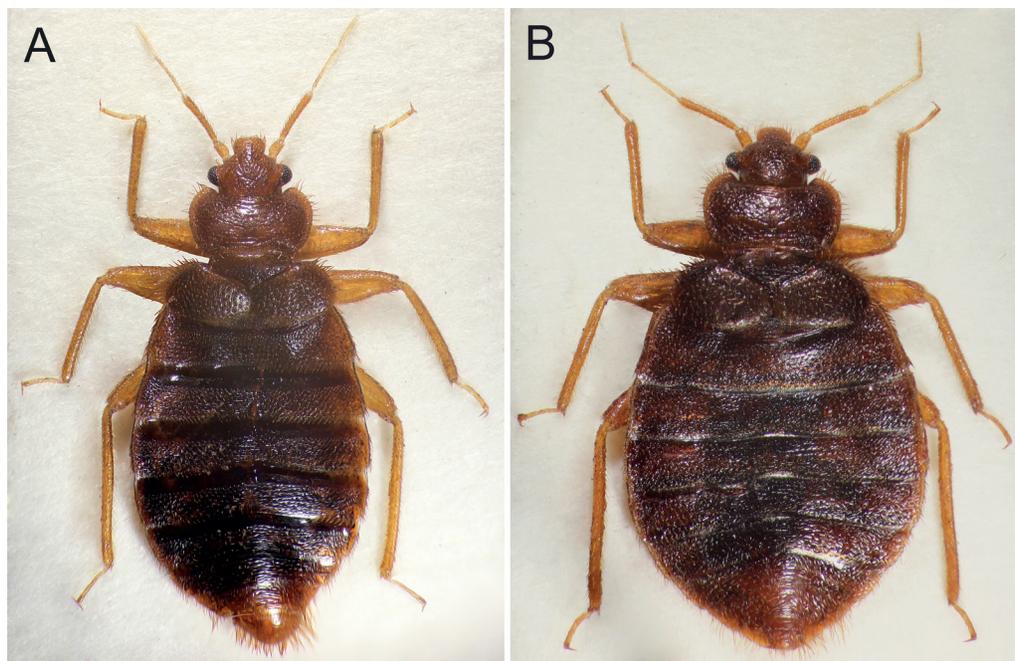


Fig. 1. *Cimex hemipterus* (Fabricius, 1803), specimens collected in St Peterburg. **A**, male; **B**, female.

C. hemipterus listed above. The pronotum of the specimens studied by me is 2.10–2.37 times as wide as long; the interocular space in males is 4.27–5.20 times as wide as the eye; the body length is 5.0–6.15 mm in males and 5.15–6.55 mm in females.

There is no doubt that *C. hemipterus* can survive winters in apartments and other heated premises of Moscow, since the first bugs were found there no later than February 2015, and by the end of 2016 its findings already numbered in the hundreds. Probably, this species is also able to survive winters in heated premises in St Petersburg and other inhabited localities of Russia, since its lower temperature threshold, according to various sources, is between 15 and 19 °C; the species is also not very sensitive to variation of humidity within the range from 33 to 98% RH (Usinger, 1940).

Unusual activity of *C. hemipterus* during daylight hours was noted in different apartments in St Petersburg. These apartments had not been subjected to chemical treat-

ment before these observations, so that the impact of poisons on the behavior of bugs can be eliminated. In general, *C. hemipterus* was resistant to insecticides used for controlling common bed bugs in all the localities where this species was found. No such daytime activity was noted in Moscow. This peculiarity in the behavior of the tropical bed bugs in St Petersburg may be explained by the fact that these thermophilic insects were forced to seek any warm, sun-warmed places during the autumn months when the central heating in buildings was still absent or discontinuous.

In all places in St Petersburg where *C. hemipterus* was found, there was no *C. lectularius* (the latter species was recorded in St Petersburg recently only in Kronstadt [Posadskaya str, apartment, 20.XII.2016 (G.A. Lunina), 1 female, 1 nymph of II instar], and *C. hemipterus* was not found there). Perhaps this is a result of displacement of the latter species by the former. It is known that males of *C. hemipterus*

willingly mate with females of *C. lectularius* in mixed populations, and this mating leads to a decrease of longevity and fertile egg production of *C. lectularius* females, which subsequently lay only inviable eggs in populations where *C. hemipterus* predominate (Newberry, 1989).

Based on the above, we can expect the appearance of *C. hemipterus* in other population centers throughout Russia and displacement of *C. lectularius* by this invasive species.

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