ISSN 2075-1117, Russian Journal of Biological Invasions, 2013, Vol. 4, No. 4, pp. 209–211. © Pleiades Publishing, Ltd., 2013.
Original Russian Text © Yu.G. Arzanov, 2013, published in Rossiiskii Zhurnal Biologicheskikh Invasii, 2013, No. 3, pp. 2–6.

Lignyodes bischoffi Blatchley, 1916 (Curculionidae)—A New Species of Invasive Weevils for Russia

Yu. G. Arzanov

Institute of Arid Zones, Southern Scientific Center, Russian Academy of Sciences, pr. Chekhova 41, Rostov-on-Don, 344006 Russia

e-mail: arz99@mail.ru

Received April 16, 2013

Abstract—A new invasive species of American origin was registered in the south of European Russia. Beetles were collected in Rostov oblast (Neklinovskii district; Merzhanovo; July 20, 2007; D.G. Kasatkin) and Stavropol krai (Pyatigorsk; July 31, 2012; V.I. Lantsov). This species migrated from Europe, where it had penetrated in the middle of the 20th century with transfer of seeds of American ash.

Keywords: beetles, weevils, Curculionidae, Tychiini, *Lignyodes bischoffi*, Rostov oblast, Stavropol krai

DOI: 10.1134/S2075111713040024

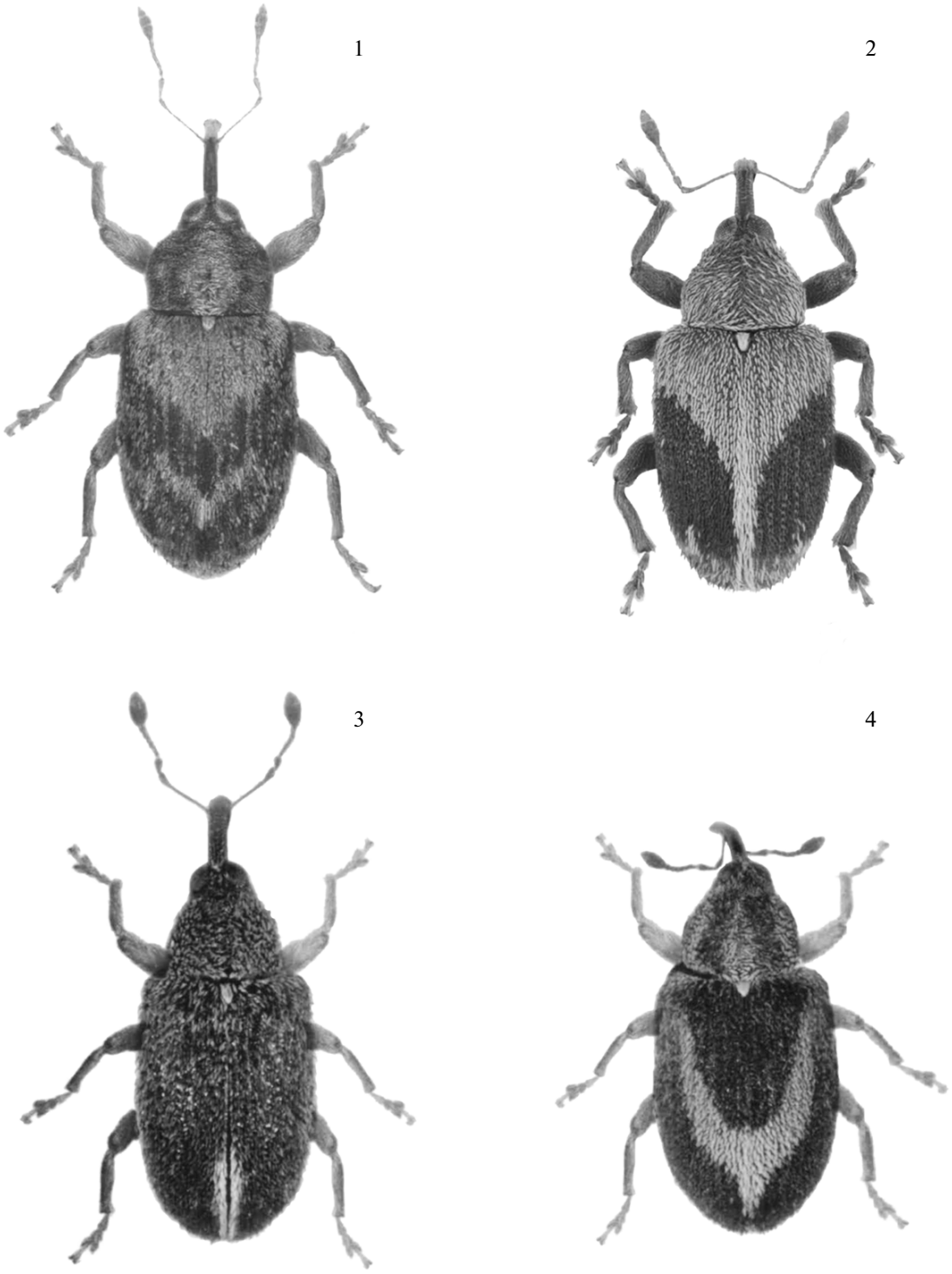
A new invasive species of American origin *Lignyodes bischoffi* was registered in the south of European Russia, in Rostov oblast and Stavropol krai. In its native habitat in North America and Europe, the species develops on ash trees. Ash trees belong to the genus *Fraxinus* and are widely distributed in the temperate zone of the Holarctic, i.e., in Europe, the Far East, North America, and North Africa. In addition, more than 50 species of this genus were recorded in North America, while only 4 and 1 species (*F. excelsior* L.) were found in the Far East and Europe, respectively. The species of American origin *F. pennsylvanica* Marsh. and *F. americana* L. are usually used for landscape gardening in cities.

In Europe, the weevil *Lignyodes bischoffi* was first found in 1960 in Slovakia. Extraordinary phenotypic and a number of morphological features which made it different from the Palearctic representatives pushed L. Dieckman, the famous entomologist from Europe, to describe this Slovakian species as completely new; he called it *L. slovacicus* (Dieckmann, 1970). The name was then reduced to synonyms to *L. bischoffi* (Dieckmann, 1974).

Later, this species was also found in Austria, Switzerland, Hungary, Bulgaria, Moldova, and East Ukraine (Dieckmann, 1988; Podlussány, 1996; Poiras, 1998). According to the data of European specialists (Stanies, 2003; Wanat, 2003; Wanat and Gosik, 2003; Gosik, 2006), the beetle develops only on American ash (*Fraxinus pennsylvanica*) along highways. Poiras (1991), who studied biological and ecological features of *Lignyodes bischoffi* in Moldova, found that this invasive species is trophically related to American species of the genus *Fraxinus* (*F. lanceolata* Borkh., *F. ornus* L., and *F. oxycarpa* Willd.), as well as to the European ash (*F. excelsior* L.). He also pointed out that *Lignyodes bischoffi* gives high preference to American ash, while the native European species are inhabited by it significantly more rarely and no swarms are formed. This provides evidence for the assumptions of specialists from Poland (Wanat and Gosik, 2003; Gosik, 2006), who claim that the feeding selectivity of the beetle is

Table

1(2)	Head tube extremely thin, in basal half thinner than the fore tibiae at the base. Pronotum weakly transverse. Body and head tube colored reddish brown; antenna and legs slightly lighter. Unclear dark oblique stripes on the dorsal side of wing cases (Fig. 1). Penis with parallel-sided apex ..... ***bischoffi*** Blatschley
2(1)	Bigger head tube, in basal half wider than the fore tibiae at the base. Pronotum weakly transverse. More or less clear pattern on the dorsal side. Penis asymmetric.
3(4)	Forehead between eyes with thin sparse scales. Wing cases with large light-colored triangular spot at the base (Fig. 2). ..... ***enucleator*** Pz.
4(3)	Forehead between eyes with wide densely arranged scales. Wing cases are dark, consisting of brown or dark brown scales and only along raphe having a row of light-colored yellow scales (Fig. 3) or dark ones with V-formed light stripe in the middle (Fig. 4). ..... ***suturatus*** Fairm.



Figs. 1–4. Weevils of the genus *Lignyodes* Dejean, 1833 (external appearence).
(1) *L. boschoffi* (by Wanat and Mocarski, 2008); (2) *L. enucleator*; (3) *L. suturatus*, dark-colored specimen; (4) *suturatus*, light-colored specimen.

determined by the size of ash seed, in which the pre-imaginal stages take place. European ash has narrow and flat seeds, which is likely to prevent the normal development of *Lignyodes bischoffi* larvae.

When one takes into consideration the biological preferences, common host tree, absence of barriers, and high ability of *L. bischoffi* to migrate, the species is expected to rapidly spread westwards, which will cause

problems for landscape gardening in Russia. It should be pointed out that this species was included in the list of alien invasive species of Poland in 2008 (North European and...) and, probably, has acquired the same status in Russia.

On the basis of the data of Wanat and Mocarski (2008), mature *L. bischoffi* are found on green ash in July, stay on its leaves and fruit until September or October, and become rather abundant and easy to sample by shaking the tree crown at least at the end August. At the beginning of September, females lay eggs into the basal and thickened area of the seed (usually one egg per seed). The place where the egg has been laid becomes dark purple or black, and it is well distinguished even on ripe brown-colored seeds. After having been infected, the seeds usually fall off. If there are many such seeds around the tree trunk, this is reliable evidence that the tree is infected with *Lignyodes bischoffi* weevils. European species of *Lignyodes*, unlike the invader of American origin, never form large swarms or cause mass falling of seeds.

In America, the fauna of the genus *Lignyodes* has been studied in detail by Clark (1980) and includes more than ten species. In the Palearctic, only two species have been registered—*L. enucleator* (Panzer, 1798) and *L. suturatus* Fairmaire, 1859.

The table for identification of species from the genus *Lignyodes* which have been registered in Russia is given below.

ACKNOWLEDGMENTS

In conclusion, I would like to thank K.V. Makarov (Moscow State Pedagogical University) for the photo of *L. enucleator* and K.S. Artokhin (Southern Federal University, Rostov-on-Don) for the photos of *L. suturatus* that became an ornament of this work.

REFERENCES

Clark, W.C., Revision of Nearctic weevils of the genus *Lignyodes* Dejean (Coleoptera: Curculionidae), *Trans. Am. Entomol. Soc.*, 1980, vol. 106, pp. 273–326.

Dieckmann, L., Die paläarktischen *Lignyodes*-Arten, einschließlich einer neuen Art aus der Slowakei (Coleoptera, Curculionidae), *Entomol. Nachr.*, 1970, vol. 14, pp. 97–104.

Dieckmann, L., Beitrag über mitteleuropäische Rüsselkäfer (Coleoptera, Curculionidae), *Entomol. Nachr.*, 1974, vol. 18, pp. 65–70.

Dieckmann, L., Beiträge zur Insektenfauna der DDR: Curculionidae (Curculioninae: Ellescini, Acalyptini, Tychiini, Anthonomini, Curculionini), *Beitr. Entomol.*, 1988, vol. 38, pp. 365–468.

Gosik, R., Weevils (Curculionoidea) of the middle part of the Bug River Valley, *Ann. Uni. Mariae Curie-Sklodowska Sect. C*, 2006, vol. 61, pp. 7–69.

North European and Baltic Network on Invasive Alien Species, Permanent Internet Portal. http://www.nobanis.org

Podlussány, A., Magyarország ormányosalka, tú bogarainak fajlistája (Coleoptera: Curculionoidea), *Folia Entomol. Hung.*, 1996, vol. 57, pp. 197–225.

Poiras, A.A., Peculiarities of biology of *Lignyodes bischoffi* (Blatchley) (Coleoptera, Curculionidae) in Moldova, in *Mater. 10-go s"ezda Vsesoyuznogo entomologicheskogo obshchestva "Uspekhi entomologii v SSSR: Lesnaya entomologiya"* (Proc. 10 Congr. All-Russ. Enthomol. Soc. "Advanced Entomology in USSR: Forest Entomology"), Leningrad, 1991, pp. 103–105.

Poiras, A.A., *Catalogue of the Weevils and Their Host Plants in the Republic of Moldova*, Sofia: Pensoft, 1998.

Stanies, B., Nowe stanowisko *Lignyodes bischoffi* (Blatchley, 1916) [=*Lignyodes slovacicus* Dieckmann, 1970] (Coleoptera: Curculionidae) w Polsce oraz uwagi o jego biologii, *Wiad. Entomol.*, 2003, vol. 21, pp. 249–250.

Wanat, M., Kolejne stanowiska *Lignyodes bischoffi* (Blatchley, 1916) (Coleoptera; Curculionidae) w Polsce, *Wiad Entomol.*, 2003, vol. 22, no. 4, pp. 246–247.

Wanat, M. and Gosik, R., Materialy do znajomości ryjkowców (Insecta: Coleoptera: Curculionoidea) doliny Bugu, *Nowy Pam. Fizjogr.* (Warszawa), 2003, vol. 2, nos. 1–2, pp. 31–52.

Wanat, M. and Mocarski, Z., Current range of the ash seed weevil *Lignyodes bischoffi* Blatchley, 1916 (Coleoptera: Curculionidae) in Poland, *Polskie Hismo Entomol.*, 2008, vol. 77, pp. 177–182.

Translated by N. Shulaev