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Will the invasive western conifer seed bug *Leptoglossus occidentalis* Heidemann (Hemiptera: Heteroptera: Coreidae) seize all of Europe?

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In our day, thanks to high-speed transport systems, people are moving living species (intentionally or not) across ecosystems and countless borders. As we know, most introduced species usually do not survive, because they find neither a tolerable environment nor an available ecological niche. Sometimes, successful establishment may also require multiple introductions (Balcom 2004).

Of those species that do become established, only a limited number spread and become damaging. Such invasive species are a major threat to our environment because they not only may replace native species (especially beneficial ones) but sometimes they even can change an entire habitat, severely reducing its structure and diversity. Their full effects often are not detected, because the invasion process usually is very long and goes through a series of stages, such as import, release or escape, establishing a population, spreading, becoming a problem, and others (Balcom 2004, Williamson 2006).

Moreover, the place of origin of an alien species also plays a role in the process of establishing a population in a new habitat; in Central Europe (i.e., Austria and Switzerland, where the studies were conducted) among the alien intercepted insects, 40% were associated with commodities from Asia, 32% from other European regions, and only 2% from North America (Kenis et al. 2007). Therefore, any new European record of invasive insect species originating from North America is of a great importance, because it helps to document its spreading in a new environment and facilitate preparation for its controlling.

One recent introduction from North America to Europe was that of the western conifer seed bug (*Leptoglossus occidentalis* Heid.). It was originally restricted in its distribution to the western United States, Canada, and Mexico, and is considered a severe pest on conifer seed orchards; it sometimes also causes serious alarm in the autumn, when large numbers of adults suddenly invade houses looking for overwintering sites (cf. Mitchell 2000).

In Europe, the species was first established in 1999 in northern Italy, where it was accidentally introduced to different localities (Taylor et al. 2001, Tescari 2001, Villa et al. 2001). Then the species quickly expanded its range towards the west and north of the continent; over a period of eight years it had invaded Slovenia, Croatia, Hungary, Switzerland, Austria, Germany, and Czech Republic to the north, and France to the west (Gogala 2003, Jurc & Jurc 2004, Tescari 2004, Rabitsch & Heiss 2005, Harmat et al. 2006, Kment & Bařnař 2007, Moulet 2006, Werner 2006, Dusoulier et al. 2007); in 2003 it was also independently recorded in Spain (Ribes et al. 2004, Ribes & Escolà 2005).

In early 2007, it was unexpectedly collected at Weymouth College in England (Malumphy & Reid 2007), and a few months ago it was found also in Belgium in Oostendse (information posted on the 16th of October 2007 to *http://www.zwvlkoepel.be/iwg*; and Aukema & Libeer 2007). In contrast to all previous records (except that from Spain), because of the place of collecting, the latter two might suggest two independent introductions rather than invasions from southern Europe.

Recently, in October 2007, two populations of this species were recorded in the southern part of Poland (*Lower Silesia*: Wrocław, on a building's window, close to a group of *Pinus strobus*, 18.10.2007, leg. J. Gubernator—see Photo; *Cracow-Wieluń Upland*: Miechów near Cracow, on window sill, 10.10.2007, leg. J. Szafarska, groups of *Pinus silvestris* nearby). These are the first records of this invasive bug in Poland. The available evidence (especially the collecting sites, present area of species distribution, and the speed of spread —see Dusoulier et al. 2007) suggest that *L. occidentalis* entered Poland from the Czech Republic, where it too was recorded for the first time in 2007 (Kment & Bařnař 2007), and where it has quickly spread its range furtherto the north.

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Leptoglossus occidentalis in Wrocław, Poland (photo by J. Gubernator).

The species is quite easily distinguished from all other Central European species of the Coreidae, because of its reddish-brown body with a white zig-zag line across the center of the wings, and the characteristic expansions on the hind tibia (see the Photo).

In its natural habitat the nymphs and adults spend the summer on pines and other coniferous trees, feeding on green cones and needles, causing a high incidence of conelet abortion and a reduction in the yield and quality (vitality) of seeds. As the weather cools in September, western conifer-seed bugs search for sheltered places to hibernate, and therefore are often seen around homes in the autumn. Its host plants include white pine (*Pinus strobus*), red pine (*Pinus resinosa*), Scots pine (*Pinus sylvestris*), Austrian pine (*Pinus nigra*), mugo pine (*Pinus mugo*), lodgepole pine (*Pinus contorta*), white spruce (*Picea glauca*), Douglas-fir (*Pseudotsuga menziesii*), several other conifers, and pistachio (*Pistacia vera*) (Rice et al. 1985, Blatt 1994, Bates 2000, Mitchell 2000).

When we consider the speed of spread of this invasive species (Dusoulier et al. 2007) and the area of its host plants occurrence in Europe, we can ask what happens when this introduced species is successful in its new European habitats.

Unfortunately, because *L. occidentalis* has only recently arrived in the "old continent," only its first records in different countries were usually documented, so far. Nevertheless, we should realize that any new species takes up space and food resources and therefore has some effect on a local ecosystem; the scale of the consequences can depend on the population size the invader reaches, which could lead native species to be displaced to less optimal niches, or to the local extirpation of the native species altogether.

For the next few years, more detailed research on the population biology of *L. occidentalis* in Europe instead of just documentation of new European country records should be emphasized. National Plant Protection Organisations in different European countries should cooperate in conducting a survey of the distribution and population characteristics of this true bug, as was done in the Netherlands and Belgium for the invasive New Zealand wheat bug *Nysius huttoni* White (Hemiptera: Heteroptera: Lygaeidae) (Smit et al. 2007). If appropriate measures are not taken, *L. occidentalis* may indeed spread over all Europe; then we will not only have a beautiful "tropical-like species" to admire (Fig. 1), but a regularly breeding invasive species making changes in our coniferous forest ecosystems.

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