**Cydalima perspectalis** (Walker, 1859), a new species for the Romanian fauna (Lepidoptera: Crambidae: Spilomelinae)

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**Summary**
The box tree moth *Cydalima perspectalis* (WALKER, 1859) is an East Asian species that has been recently introduced in Europe. Its larvae feed on *Buxus* species and can seriously damage these ornamental plants. In this paper we report the occurrence of the species in southern Romania (Bucharest). Given the considerable distance from the nearest records in western Hungary and European Turkey, it is likely that we deal with an independent introduction related to *Buxus* ornamental plants. The population dynamics and potential expansion of the species in Romania should be carefully monitored.

**Key words:** *Buxus*, distribution, expansion, invasive species, monitoring

**Introduction**
The box tree moth *Cydalima perspectalis* (WALKER, 1859) is naturally distributed in the subtropical regions of East Asia (India, China, Japan, Korea and the Russian Far East). The larvae feed on several *Buxus* species (Buxaceae) (e.g. *B. microphylla*, *B. sempervirens*, *B. sinica*), and can severely affect these ornamental plants (MALLY & NUSS 2010 and references therein).

*Cydalima perspectalis* has been detected in Europe in 2007, when it was reported from south-western Germany (KRÜGER 2008), Switzerland (BILLEN 2007, KÄPELI 2008, SIGG 2009) and the Netherlands (MUUS et al. 2009, VAN DER STRATEN & MUUS 2010). Since then the species has been found in an increasing number of localities and several other European countries. Between 2008 and 2010 it was recorded from southern England (MITCHELL 2009), France (FELDTRAUER et al. 2009), Austria (RODELAND 2009), Liechtenstein (SLAMKA 2010), Belgium (CASTEELS et al. 2011, DE PRINS & STEEMAN 2011) and northern Italy (BIONDI 2010, EPPO 2011a). In September 2011, SÁFIÁN & HORVÁTH (2011) collected the species in a botanical garden in western Hungary. The same authors also mentioned that the species has been recently found in Slovenia, without providing further details. In 2011, the species appeared in the European part of Turkey, being recorded from the western side of Istanbul (HIZAL et al. 2012). It is assumed that *C. perspectalis* has been accidentally introduced into Europe, linked to the use of *Buxus* plants for ornamental purposes (e.g. KRÜGER 2008, KÄPELI 2008, MUUS et al. 2009, SIGG 2009). However, the species also appears to be capable of bearing fairly low temperatures and spreading naturally on the continent (KRÜGER 2008, FELDTRAUER et al. 2009, MUUS et al. 2009, SIGG 2009, LEUTHARDT et al. 2010, VAN DER STRATEN & MUUS 2010), so that its very rapid expansion is most likely due to both active colonization and independent human-induced introductions.
Although in 2011 the box tree moth has been removed from the alert list of the European and Mediterranean Plant Protection Organization (EPPO) (EPPO 2011b), the larvae of *C. perspectalis* are known to often cause severe defoliations of the evergreen *Buxus* (e.g. Krüger 2008, Kapelli 2008, Sigg 2009) and therefore represent a serious threat to these plants.

The species has been placed in various Spilomelinae genera (e.g. *Palpita* Hübner, 1808, *Diaphania* Hübner, 1818, *Glyphodes* Guenée, 1854, *Neoglyphodes* Streltzov, 2008), but recent morphology-based research indicates that the species should be placed in *Cydalima* Lederer, 1863 (Mally & Nuss 2010).

**Material**

One living specimen of *C. perspectalis* was photographed (Fig. 1) on the afternoon of October 6, 2011 in the north-western part of Bucharest (southern Romania, 44°29'12'' N, 26°02'22'' E, 92 m a.s.l.) (Fig. 2). The third author found the specimen lying in the grass in the yard of a kindergarten, but no *Buxus* plants were identified in the immediate vicinity. However, the surrounding area has several gardens and parks and it is likely that the specimen originated from a distance of a few hundreds of meters.

**Results and discussion**

Because of its rapid expansion in Central Europe, *C. perspectalis* has been subject to an increasing number of studies during the last 2-3 years. Although its biology in Europe is not fully known yet, data from certain regions are already available in literature (e.g. Leuthardt et al. 2010, Sage & Karl 2010, van der Straten & Muus 2010, Korycinska & Eyre 2011, Hizal et al. 2012). Eggs are around 1 mm in diameter and are laid in flat batches on the underside of *Buxus* leaves. In the beginning they are pale yellow, but later they present a black spot where the cephalic capsule of the larva is forming. The mature larvae are up to 4 cm long and have a green ground colour with longitudinal black (thick) and white (thin) stripes and black dots outlined in white on the dorsal side of the body. The species overwinters during the larval stage.

The pupae are 1.5-2 cm long and lay inside a whitish cocoon usually deeply hidden among *Buxus* twigs and leaves.
The adults can be fairly easily identified based on external morphology (Fig. 1). The wings are bright white with tinges of purple (especially in fresh specimens). The forewings have brown costa and the termen with a wide brown margin. A white discoidal spot is well contrasted by the brown costal margin that it touches. A brown band on the anal margin of the forewing is present in many (but not all) specimens. The hindwings have a broad brown marginal band. The body is white, with the exception of the head and the terminal part of the abdomen, which are brown (MALLY & NUSS 2010, KORYCINSKA & EYRE 2011). Occasionally, melanic forms appear which are completely brown, with the exception of the white discoidal spot on the forewings (KORYCINSKA & EYRE 2011, SÁFIÁN & HORVÁTH 2011). Cydalima perspectalis has 3.5-4 cm wingspan and is a large species among European Crambidae. It is mostly active by night, but it may also be found during daytime (e.g. the specimen from Bucharest).

Buxus plants infested by C. perspectalis can be identified by the presence of a high number of dead leaves and of a considerable amount of webbing with frass and cephalic capsules of earlier larval stages. The larvae can completely defoliate Buxus bushes and can eventually kill the plants (e.g. KRÜGER 2008, SIGG 2009, SAGE & KARL 2010, HIZAL et al. 2012). The negative effects are amplified by the fact that the moth seems to have at least two-three broods in Central Europe (e.g. LEUTHARDT et al. 2010, SAGE & KARL 2010), which means that larvae are active during the entire growth season of the plants.

Control measures of C. perspectalis are relatively well-established in East Asia, due to its economic importance. There is information on its chemical (ZHOU et al. 2005) and biological control (CHOO et al. 1991, LEE et al. 1996), as well as on its pheromones (KAWAZU et al. 2007). It appears that certain field trials with the Japanese pheromone in Europe were unsatisfactory (VAN DER STRATEN & MUUS 2010). Pheromones were used to determine the number of broods in the area of Basel (LEUTHARDT et al. 2010). Since research on the biological control of C. perspectalis in Europe is highly needed, the remaining effective measures include the use of chemical products and, if possible, physical control by cutting infested material (KORYCINSKA & EYRE 2011).

The records from Bucharest and the European part of Istanbul (Turkey) (HIZAL et al. 2012) are the easternmost currently known on the continent. Bucharest is separated by more than 800 km from the nearest records of C. perspectalis in western Hungary (SÁFIÁN & HORVÁTH 2011) and by about 450 km from Istanbul. It is not impossible that the species is actually more widespread but has passed completely unnoticed in the areas between. However, given its apparently recent introduction in Europe, it is more likely that the record from Bucharest is due to accidental introduction together with infested Buxus plants. Since the species appears to resist well to Central European winters and can spread both naturally and artificially (through infested Buxus ornamental plants), it is likely that it will soon become much more widespread in Europe. In Romania urgent research is needed to assess the degree of colonization, population dynamics and potential expansion of C. perspectalis. Studies on its biology are also necessary in the context of limited data from Europe and especially its eastern parts.

During the last year only, two new Lepidoptera species have been added to the Romanian list of invasive species (RÁKOSY & MOMEU 2009), namely the North-American noctuid Tarachidia candefacta (HÜBNER, [1831]) (SZÉKELY et al. 2011) and C. perspectalis.
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References


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