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MORPHOLOGY, BIOLOGY AND CONTROL POSSIBILITIES OF TWO *ARGYRESTHIA* SPECIES – *A. THUIELLA* AND *A. TRIFASCIATA* (LEPIDOPTERA: ARGYRESTHIIDAE)

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Abstract

KONEČNÁ HANA, ŠEFROVÁ HANA. 2014. Morphology, Biology and Control Possibilities of Two *Argyresthia* species – *A. thuiella* and *A. trifasciata* (Lepidoptera: Argyresthiidae). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis,* 62(3): 529–538.

The bionomics of *Argyresthia thuiella* (Packard, 1871) and *A. trifasciata* Staudinger, 1871 was studied on ornamental conifers in southern Moravia, Czech Republic. *Argyresthia thuiella* overwinters as caterpillar inside twigs and pupates the following spring there. Moths are on the wing during June until the beginning of July. *Argyresthia trifasciata* adults were observed from mid May till the beginning of June. Its larvae reach the stage of maturity from October to December. They pupate in the debris under trees. Both species develop one generation annually. *Argyresthia thuiella* was found on *Thuja occidentalis*, *T. plicata* and *Chamaecyparis lawsoniana*; *A. trifasciata* on *Juniperus virginiana*, *J. chinensis*, *J. sabina*, *J. × media*, *J. squamata and J. horizontalis*. Both species cause mainly aesthetic damage to plants. Stronger attack of *Argyresthia* may cause damage to trees. Control possibilities were tested on both species. The chaetotaxy of these species was first done in this experiment.

Keywords: *Argyresthia*, control, Cupressaceae, larval chaetotaxie

INTRODUCTION

The genus *Argyresthia* Hübner, 1825 is represented by approximately 30 species in the Czech Republic (Laštůvka & Liška, 2011). About two thirds of these develop on different broad-leaved trees. The other species develop on conifers (Pinaceae, Cupressaceae) (see e.g. Busck, 1907; Agassiz, 1996; Reiprich, 2001). Some species are considered to be pests of fruit trees or conifers (e.g. Miller, 1956; Řezáč, 1963). Autochthonous species are dominant in this genus as only two of them are alien (e.g. Šefrová & Laštůvka, 2005), namely *Argyresthia thuiella* (Packard, 1871) and *A. trifasciata* Staudinger, 1871. *Argyresthia thuiella* comes from the North America and *A. trifasciata* was described in the Swiss Alps. Both species develop on Cupressaceae which are not native in central Europe and are quite often used in planting. *Argyresthia* species can cause aesthetical damage if they occur in high abundance. Due to the above mentioned fact, both species have been researched by many authors, e.g. Britton & Zappe (1922), Kurir (1983), Shirvani (1986), Frankenhuyzen (1974), Gál & Szeöke (1999), Gál & Szeöke (2000) and Kahrer (2002). The important identifying method of larvae is chaetotaxy. Řezáč (1963) described the chaetotaxy of species which couse damage of fruit. Ahlberg (1927) described the species *A. conjugella*. We don't know other sources. They don't probably exist.

The aim of this work was to summarise and update the knowledge about the morphology, bionomics and spread of these moths. Furthermore, potential control possibilities of these species were tested and are discussed.

MATERIAL AND METHODS

Field experiments were conducted in 2007–2010 in the Castle park in Lednice and in the arboretum of the Mendel University in Brno. Occurrence

of both species was determined by visual control of the host trees. Abundance was evaluated using the following scale: 1 – rare occurrence, 2 – less than 10 individuals, 3 – 10 to 20 individuals, 4 – 20 to 100 individuals, 5 – hundreds to thousands of individuals. The Castle park in Lednice is located at 176 m a. s. l. The average annual temperature is 9.4 °C and the average precipitation total is 450–550 mm. It is a park and covers nearly 200 km^2 (Remešová, 2007; Rožnovský & Litschmann, 2013). Arboretum of the Mendel University in Brno is located at 220–250 m a. s. l. The average annual precipitation is 505 mm and the average temperature is 9.4 °C. This park covers 11 ha in the NW part of Brno (www.mendelu.cz, 2013).

The last instar caterpillars were used for the study of chaetotaxy. Caterpillars were fixed in 70% ethanol, cut along the left side, placed in 10% solution of KOH and boiled in water bath. The exoskeleton was placed on a microscopic slide and a sample for microscopy was made. Nomenclature of larval setae follows Stehr (1987) and Scoble (1995).

The control possibility of both species was verified in the Chateau park of Lednice and in the arboretum of the Mendel University in Brno in 2009. The following tree species were chosen for this experiment: *Juniperus sabina, J. × media* and *Thuja occidentalis*. The following insecticides were used in this experiment: Dimilin 48 SC (diflubenzuron, 0.025%), Calypso 480 SC (thiacloprid, 0.025%), Nurelle D (cypermethrin, chlorpyrifos, 0.2%), and Mospilan 20 SP (acetamiprid, 0.04%).

The control of *Argyresthia thuiella* was carried out in the Castle park in Lednice where it occurs in high abundance every year on *Thuja occidentalis* (Konečná & Šefrová, 2009). Effectiveness of all insecticides mentioned was tested in recommended concentrations in June 14th, June 25th and July 30th 2009. The first date of the treatment corresponds with the period of maximal flying and oviposition. The second date of the treatment is characterised by the end of adult life span and hatching of caterpillars. The third date of the treatment is in the period of the initial phase of mining in leaves. The experiment was evaluated on September 10th 2009 by means of calculation of the amount of dryied branches on 1 m^2 of the treated area and its comparison with the untreated control area. The insecticide was applied to 1 m^2 of each experimental tree. Some trees were left untreated as a control.

The treatment against *A. trifasciata* was carried out on the May 15th, June 23th and July 30th 2009 in the arboretum of the Mendel University in Brno. The first date of treatment is identical to span of flying and oviposition. The second and the third date of treatment are identical to feeding of gallery into needle of junipers. These insecticides were used: Calypso 480 SC, Nurelle D, Mospilan 20 SP. The experiment was evaluated on September 11th 2009 by means of calculation of the amount of dryied branches on the treated area and its comparison with the untreated control area.

RESULTS AND DISCUSSION

1. *Argyresthia thuiella* (Packard, 1871)

Morphology

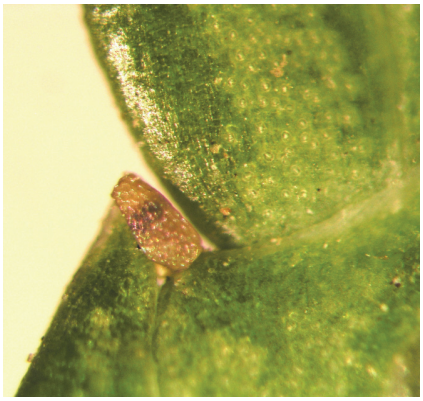
Adult (Fig. 1). Wingspan 5.0–7.0 mm. Head white with a prominent bunch of white hairs on the crown. Antennae reach up to 2/3 of the lenght of forewings. Proboscis functional. Labial palpus light brown, moderately bent and sharp. The bottom and legs gray. Forewings fairly narrow, white to gray, with dark brown/red spots in costa and apex, and with three dark spots in the hind margin with the middle one being the largest. Hindwings gray, with long fringes. No sexual differences in colouration. Gender identification can be easy after the endpoint of the abdomen (see also Busck, 1907; Povolný & Zacha, 1990; Vávra, 1999; Tomiczek *et al.*, 2005; Šefrová, 2005, 2006).

Egg (Fig. 2). More or less barrel-shaped, but with a soft chorion and therefore partly variable in its shape 0.35–0.40 × 0.20–0.28 mm. Chorion with a hollows structure on its surface. Freshly laid eggs white and green, later yellowish. Eggs are laid individually. Britton & Zappe (1922) state the size of an egg is 0.33 × 0.17 mm with yellowish green colouration and irregular shape with coarsely shaped structure.

Caterpillar. The last instar caterpillar is 5–6 mm long, slightly brown-green with black head with six stemmata. The mandibles are provided with five small teeth, three of them are distinct. Thoracic legs are not reduced, they are commonly structured.

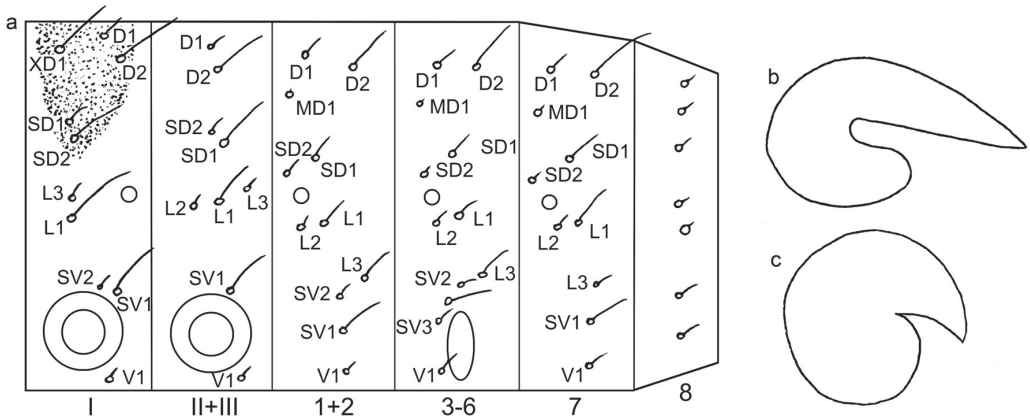
Claws of the thoracic legs are short and sturdy with a wide base (Fig. 3). There are 10–13 rounded crochets with a short tip on the abdominal prolegs, located in two slightly curved lines. There are 15 to 17 similar crochets located on the anal prolegs. Chaetotaxy (Fig. 3). Setae all over the body relatively short. The prothoracic segment on the dorsal side rather strongly sclerotized, the sclerotization involves both – setae D1, D2 and XD1 placed in a triangle and the underlying subventral setae of which SD1 is positioned slightly ahead of SD2. There are only two lateral setae on the prothorax, placed one under another. However, there are three lateral setae on other segments. The D1 on the meso- and metathorax is placed slightly ahead compared with D2 and SD2 and significantly ahead as compared with SD1. The lateral setae are almost in one diagonal line, L1 is slightly down. MD1 and SD2 on the abdominal segments almost indistinct. Lateral setae L1 and L2 are relatively close to each other, L3 is significantly distant. The subventral setae on the first and second segment of the abdomen are placed one under another. The third to sixth segment contain subventral setae placed almost in one line.

1: *Argyresthia thuiella – imago (Orig. A. Laštůvka)*



2: *Argyresthia thuiella – egg*

4: *Argyresthia thuiella – pupa*



3: *Argyresthia thuiella: a – body chaetotaxy of caterpillar, b – claw of thoracic leg, c – crochet of abdominal proleg*

Pupa (Fig. 4). Length 3.2–4.2 mm. Patočka (1999) gives dimensions 2.8–3.8 × 0.4–0.6 mm. Labium relatively short and proboscis short and spiked. Maxillary palpi small and triangular. Hindwings perceptible only on the first abdominal segment. Forewings and antennae reach up to the fifth segment. The third pair of legs longer than the wings. A cremaster present. The fifth and sixth segments of the abdomen movable. Exuvia pale orange-brown.

Biology

There is a single generation of *A. thuiella* in the course of a year. Adults hatch depending on the temperature from the first half of June to early July. In this period, the female lays eggs individually on imbricate leaves of the host plants.

The stadium of egg lasts 16–20 days at 25 °C. Britton & Zappe (1922) reported egg-hatching after 13 days. Povolný & Zacha (1990) reported egg-hatching after 25 days on average. Caterpillars bite into the arbor leaves where they feed on the palisade parenchyma. It is not possible to detect the damage caused by the first instar at eye. The second instar causes damage 1–2 mm wide which corresponds to a dry scale on the leaves. Symptoms can be registered by the end of July. Contested scale-like leaves and twigs gradually subside. The caterpillars overwinter as the 4th or 5th instar inside leaf corridors and continue feeding in leaves in the spring. From late April to late May, the larvae pupate in a soft cocoon inside the mine which is in line with the findings of other authors (Busck, 1907; Britton & Zappe, 1922; Povolný & Zacha, 1990; Lehmann, 2007). The pupal stage lasts 14–20 days.

Ecological Requirements and Host Plants

The host plants for *A. thuiella* are *Thuja* spp. (Busck, 1907; Povolný & Zacha, 1990; Tomiczek *et al.*, 2005; Lehmann, 2007; Konečná & Šefrová, 2009). It occurs in remarkably high concentration especially on *Thuja occidentalis*. This species is prevalent in the Castle park in Lednice. *Argyresthia thuiella* was found at a lower density on *Thuja plicata* and *Chamaecyparis lawsoniana* (Tab. I) in this locality. Both of these species are planted near the heavily infested trees of *Thuja occidentalis*.

Origin and Distribution

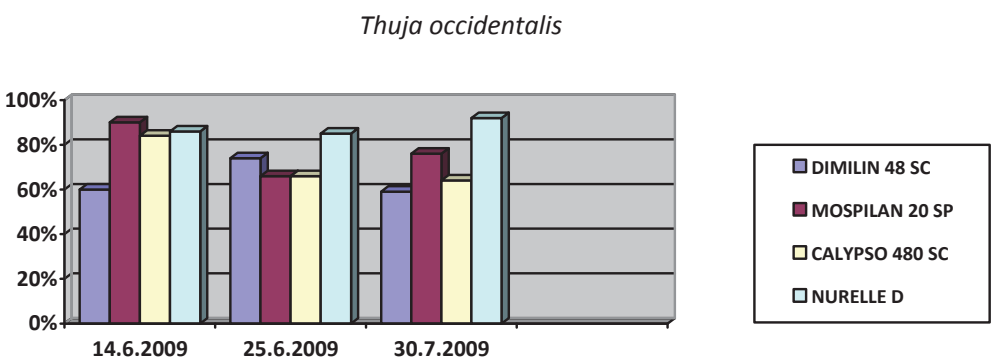
Argyresthia thuiella was described by Packard (1871) in North America. This species was studied in detail, mainly in Canada, from the 1820s to 1870s (Silver, 1957). This moth was first registered in Europe in the Netherlands in 1972 (Frankenhuyzen, 1974). It spread over most of the western and central Europe over the next two decades. Currently its occurrence has been registered in Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Germany, Hungary, the Netherlands, Poland, Slovakia, Slovenia and Switzerland (Frankenhuyzen, 1974; Plate & Köllner, 1977; Kurir, 1983; Povolný & Zacha, 1990; Opalicki, 1991; Fischer, 1993; Deschka, 1995; Škerlavaj & Munda, 1999; Gál & Szeöke, 1999; Baraniak & Walczak, 2004; Tomov, 2009; Roques *et al.*, 2010). First occurrence in the Czech Republic was registered at several locations in 1988 (Povolný & Zacha, 1990; Povolný in Novák & Liška, 1997). Currently it can be found in the entire territory of the Czech Republic depending on the host plants occurrence, mainly in urbanized areas and parks. *A. thuiella* spreads by wind and through nurslings of host plants (Povolný & Zacha, 1990; Novák & Liška, 1997; Šefrová & Laštůvka, 2005).

Importance and Control Possibilities

Argyresthia thuiella reached high population density during its first years of invasion into the Czech Republic. This was accompanied by significant optical damage to *Thuja* spp. Shirvani (1986) achieved very good success rate using chemical pest control methods (pyrethroids or growth inhibitors) during the intensive oviposition period. This means of chemical control was determined as the most suitable also by Tomiczek *et al.* (2005). The results of our chemical treatment suggest its usefulness and can be recommended. During the period of flight and oviposition of *A. thuiella* the best results were reached by using the insecticide Mospilan 20 SP with 90% efficiency. Products

I: *Host trees and occurrence of Argyresthia thuiella; 0 – no occurrence, 1 – very sporadic, 2 – < 10 individuals, 3 – 10–20 individuals, 4 – 20–100 individuals, 5 – very abundant (hundreds to thousands of individuals or mines)*

Host tree	Arboretum	Castle park in Lednice
Thuja occidentalis	2	5
Thuja plicata	0	2
Chamaecyparis lawsoniana	0	3
Juniperus sabina	0	0



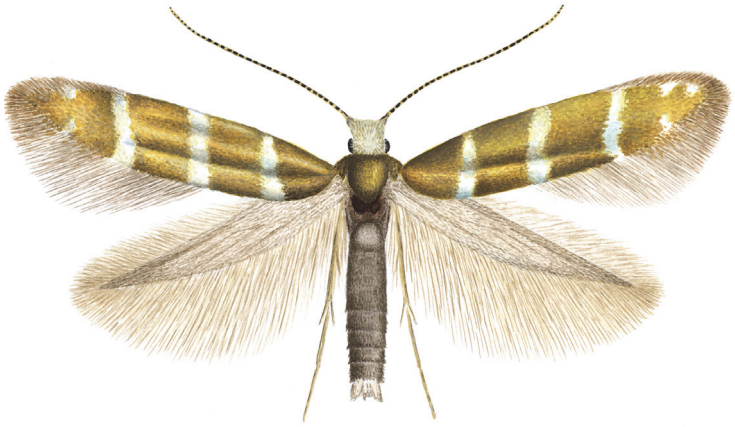
5: *Efficacy of different insecticides against Argyresthia thuiella (Lednice, application date: June 14th, June 25th and July 30th, 2009)*

Nurelle D and Calypso 480 SC reached efficiency of over 80%. Lower efficiency was observed when using Dimilin 48 SC, i.e. 60%. During the second and third repetition of the treatment, the efficacy of the products ranged between 59–92%. Therefore, I conclude that the use of chemical insecticides in later stages, when the caterpillars hatch and during the initial phase of mining, is possible with a relatively high success rate (Fig. 5).

2. *Argyresthia trifasciata* Staudinger, 1871

Morphology

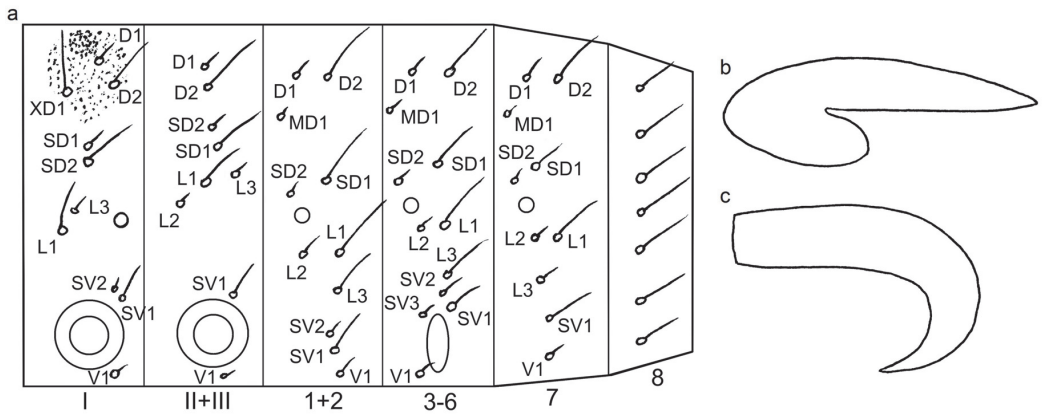
Adult (Fig. 6). Wingspan 8.0–10.0 mm. Head whitish with prominent bunch of white hair on the vertex. Simple eyes missing. Proboscis functional. Palpi labiales tan-colored, curved, pointed and reaching above the eye. Antennae reach to 2/3 of the forewing length. Thorax green



6: *Argyresthia trifasciata – imago (Orig: A. Laštůvka)*

7: *Argyresthia trifasciata – egg*

9: *Argyresthia trifasciata – cocoon of pupa*



8: *Argyresthia trifasciata: a – body chaetotaxy of caterpillar, b – claw of thoracic leg, c – crochet of abdominal proleg*

metallic, abdomen and legs grey. Forewings rather narrow, green-yellow or brown-green. Forewings also feature three whitish transverse stripes. This prominent color pattern helps to distinguish this *Argyresthia* from other central European *Argyresthia* species. Hindwings lanced, silver-gray, with long fringes (see also Stigter & Frankenhuyzen, 1992; Agassiz, 1996; Vávra, 1999; Tomiczek *et al*., 2005).

Egg (Fig. 7). More or less barrel-shaped with a pitted structure of chorion, 0.40–0.45 × 0.28–0.32 mm. Stigter & Frankenhuyzen (1992) reported 0.25 × 0.35 mm. Eggs are yellow and are laid individually.

Caterpillar. Grown caterpillar 5–6 mm long, brown-green or green. Thoracic legs not reduced, and commonly structured (Stigter & Frankenhuyzen, 1992; Agassiz, 1996; Vávra, 1999). Claws on the thoracic legs are significantly elongated and pulled to the tip (Fig. 8). The abdominal prolegs contain 8–12 slender and curved crochets placed in two slightly curved lines. Anal prolegs contain similar crochets.

Chaetotaxy (Fig. 8). Setae all over the body relatively long. The prothoracic segment rather strongly sclerotized on the dorsal side, the sclerotization involves setae D1, D2 and XD1 placed in a triangle. The subdorsal setae lie beyond the sclerotized pad and are placed beneath one another. There are only two lateral setae on the prothorax, the shorter one is positioned slightly backward compared to the longer one. There are three lateral setae on other segments. On the meso- and metathorax the dorsal setae are placed almost beneath one another, SD2 slightly shifted forward compared to SD1. The lateral setae are almost in one diagonal line, L1 slightly upward. SD2 on abdominal segments very short. The lateral setae are located more or less in the shape of a right-angled triangle with the tip in L1. The subventral setae on the first and second abdominal segment are one under another. There are three subventral setae placed in a triangle shape on the third to the sixth segment.

Pupa (Fig. 9). Length 3–4.5 mm. The cocoon is made of tiny scales of needle leaves connected with white fiber. Labium short, proboscis short and spiked. Palpi maxillaris small and triangular. Hindwings are perceptible only on the first abdominal segment. Forewings and antennae reach up to the fifth segment. The third pair of legs is longer than the wings.

Biology

There is a single generation of *Argyresthia trifasciata* in the course of a year. In central European conditions, the adults hatch depending on the temperature from the first half of May to early June. The presence of adults is easy noticeable during day by a beating of host plants. The most frequent flight activity can be noticed in the evenings. Females lay eggs indivudually beneath the scales on young green twigs and also on older woody stems of junipers. The stadium of the egg lasted 14–20 days at temperature 25 °C. Stigter & Frankenhuyzen (1992) reported hatching depending on the temperature after 18–27 days. The caterpillars grow very slowly. They feed on the palisade parenchyma of leaves. The damage caused by the caterpillars in the first instar cannot be detected at eye. The second instar can cause damage (a mine) that is 1–2 mm large. This size corresponds to the dry scales on the leaves and usually takes place by the end of June. During its development it damages more shoots and it usually leaves host plants by the end of October to December as a grown caterpillar. It usually pupates in the debris under the tree where the pupa overwinters (Konečná & Šefrová, 2009). Opinions of other authors on overwintering vary. Stigter & Frankenhuyzen (1992), Gomboc (2003) and Tomiczek *et al*. (2005) reported that the activity of caterpillars is intercepted by the cold temperatures in the winter but again starts in early spring and the caterpillars continue feeding and they pupate during March–April in hidden locations of the plant.

Ecological Requirements and Host Plants

Argyresthia trifasciata significantly prefers *Juniperus virginiana*. It was also found on *J. chinensis*, *J. sabina*, *J.* × *media*, *J. squamata* and *J. horizontalis*. It also occurs on the cultivars of these plants (Konečná & Šefrová, 2009). Most authors also list *Thuja* spp. as host trees (Baggiolini, 1963; Stigter & Frankenhuyzen, 1992; Stigter, 2002; Tomiczek *et al*., 2005; Lehmann, 2007) (Tab. II).

Origin and Distribution

Argyresthia trifasciata was described from Switzerland. It is native in Switzerland, France, Austria, Italian Alps, probably in the Iberian Peninsula and elsewhere where its host plant is native. It moved to decorative cultivars of junipers at the beginning of 1980's. Currently its occurrence has been registered in Austria, Belgium, the Czech Republic, Denmark, England, France, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, and Switzerland (Gennetas, 1976; Huisman *et al*., 1986; Bathon *et al*., 1988; Oehmig, 1988; Emmet, 1989; Stigter & Frankenhuyzen, 1992; Fischer, 1993; Svensson, 1994; Agassiz, 1996; Buhl *et al*., 1998; Huemer, 1998; Tokár *et al*., 1999; Gál & Szeöke, 2000; Baraniak & Walczak, 2003; Gomboc, 2003; Aarvik *et al*., 2006; De Prins & Steerman, 2010). It was first registered in the Czech Republic in Klenčí pod Čerchovem in 1995. This species was found in calamity occurrence on several trees of *Juniperus virginiana* in Prague in 1997 (Vávra in Novák & Liška, 1997). Currently it has probably spread all over the Czech Republic depending on host plants occurrence. It spreads by wind and through the transport of host plants (Vávra, 1999; Šumpich, 2002; Šefrová & Laštůvka, 2005). It causes mainly aesthetic damage

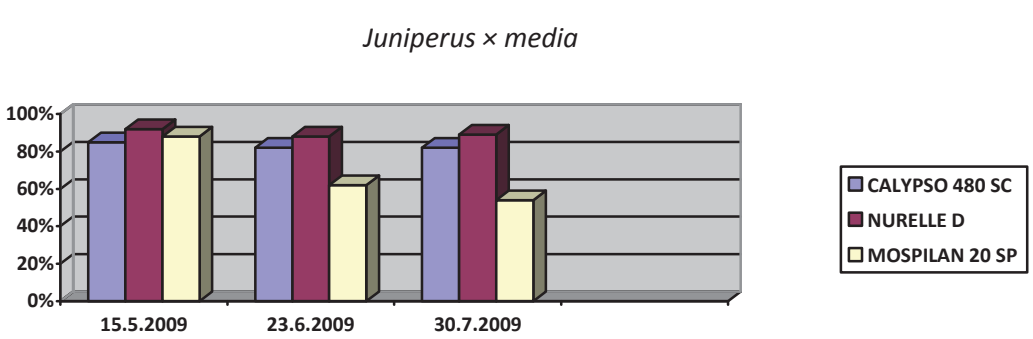
II: *Host trees and density of Argyresthia trifasciata: - not evaluated, 0 – no occurrence, 1 – very sporadic, 2 – < 10 individuals, 3 – 10–20 individuals, 4 – 20–100 individuals, 5 – very abundant (hundreds to thousands of individuals or mines)*

Host tree	Arboretum	Castle park in Lednice
Thuja occidentalis	0	0
Thuja plicata	0	0
Juniperus communis	0	0
Juniperus chinensis	4	-
Juniperus sabina	4	4
Juniperus sabina 'Tamariscifolia'	3	3
Juniperus × media	4	-
Juniperus × media 'Pfitzeriana Aurea'	-	0
Juniperus × media 'Pfitzeriana Glauca'	-	0
Juniperus horizontalis	4	0
Juniperus horizontalis 'Plumosa'	0	-
Juniperus virginiina	4	-
Juniperus squamata	-	0
Juniperus conferta	0	-
Calocedrus decurrens	0	-
Chamaecyparis lawsoniana	0	0
Chamaecyparis pisifera 'Filifera'	-	0

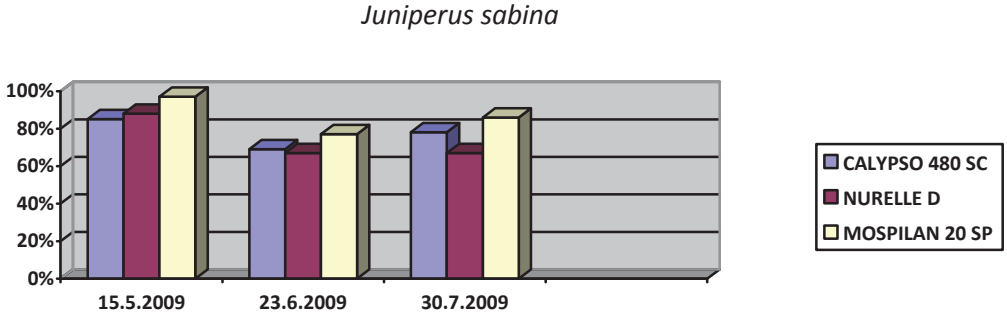
to ornamental plants like *A. thuiella* (Tomiczek *et al.*, 2005).

Importance and Control Possibilities

The opinions of various authors differ largely with respect to the timing for *Argyresthia trifasciata* control. Tomiczek *et al.* (2005) consider the time of active moths flight and oviposition as ideal for insecticide application. Similarly Kahrer (2002) considers the first half of June, i.e. period of moth flight and oviposition, as the best time for control. Lehmann (2007) on the other hand recommends performing the control treatment at the beginning of July and its repetition after 14 days. He explains



10: *Efficiency of selected insecticides against Argyresthia trifasciata (Arboretum Brno, application date: May 15th, June 23th and July 30th 2009)*



11: *Efficiency of selected insecticides against Argyresthia trifasciata (Arboretum Brno, application date: May 15th, June 23th and July 30th 2009)*

this by the relatively long period of adult activity, which, according to his opinion, can last until August. Vávra (1999) recommends August – the time of mine formation.

Based on the results of our chemical treatment I can recommend insecticide application in the period of flight and oviposition when the efficacy of the first application did not fall below 85% (Figs. 10, 11). The best results were reached by the use of Mospilan 20 SP with efficiency of 97% on *Juniperus sabina*. Both later applications showed the treatment effectiveness 54–88% (Figs. 10, 11). The use of insecticides in later times, especially when the caterpillars begin to hatch and at the early mine stadium, it is likely to be performed with a relatively high success rate.

CONCLUSIONS

Argyresthia thuiella is currently present in the majority of western and central Europe. Its occurrence is dependent on the presence of the host plants *Thuja* spp. and cypress (*Chamaecyparis lawsoniana*). This species has a single generation annually. Adults hatch according to the locality temperature from the first half of June to the beginning of July and it overwinters as a caterpillar inside *Thuja* twigs.

Argyresthia trifasciata prefers *Juniperus virginiana*. It was also found on *J. chinensis*, *J. sabina*, *J.* × *media*, *J. squamata* and *J. horizontalis*. It also occurs on the cultivars of these plants. Its occurrence in the Czech Republic was first registered in 1995. It is also present in most of Europe. It has one generation annually. Adults hatch depending on locality temperature from the beginning of May to the beginning of June. *A. trifasciata* hibernates as a pupa, usually in detritus under the host tree.

Differences between caterpillars of *A. thuiella* and *A. trifasciata* were found in their chaetotaxy. Caterpillar of *A. thuiella* has relatively short setae all over its body. The prothoracal segment on the dorsal side is strongly sclerotized and includes setae D1, D2, XD1, SD1 and SD2 in the sclerotized field. Lateral setae are placed almost in an oblique line. Caterpillar of *A. trifasciata,* on the contrary, contains relatively long setae on the whole body. Prothoracal segment on the dorsal side is slightly sclerotized and includes only setae D1, D2 and XD1 in the sclerotized field. Lateral setae are placed in shape of a right-angled triangle.

Results of treatment using the selected products show relatively good efficiency, both when applied at the time of flight and oviposition as well as at the beginning of the formation of mines. Significant reduction of the number of infected branches can be seen in the graphs (Figs. 5, 10, 11). The results show the most effective treatment against *A. thuiella* proved to be Nurelle D at a concentration of 0.2% (recommended by the manufacturer) applied at the beginning of the creation mines, on July 30th on *Thuja occidentalis*, reaching efficiency of 92%. The most effective treatment against *A. trifasciata* proved to be Mospilan 20 SP at a concentration of 0.04% (recommended by the manufacturer) used during the period of flight and oviposition, on May 15th on *Juniperus sabina*, reaching efficiency of 97%. Practical use of these species control can be recommended in cases of extreme abundance.

SUMMARY

The aim of this work was to investigate and describe the bionomics, host plants, harmfulness and control possibilities of *Argyresthia trifasciata* and *A. thuiella*. Both species were introduced to the Czech Republic from other geographical locations. Monitoring of *A. thuiella* and *A. trifasciata* was conducted in the Castle park in Lednice and arboretum of the Mendel University in Brno from 2007 to 2010. *A. thuiella* overwinters as a caterpillar inside twigs where it pupates in the spring. Adults are on the wing in June and beginning of July. Adults of *A. trifasciata* are on the wing from the beginning of May to the first decade of June. Fully grown caterpillar leaves the mine from October to December. Pupae are usually formed in detritus under the host tree where they spend the winter. Both species have one generation annually. *A. thuiella* was registered on *Thuja occidentalis*, *T. plicata*, and *Chamaecyparis lawsoniana; A. trifasciata* on *Juniperus virginiana*, *J. chinensis*, *J. sabina, J.* × *media*, *J. squamata, J. horizontalis.* Significant overpopulation and aesthetic damage can be seen on older trees. The control possibility of both species of *Argyresthia* was studied and verified in the Castle park in Lednice and arboretum of the Mendel University in Brno in 2009. The experiment was carried out on the following plants: *Juniperus sabina, Juniperus* × *media* and *Thuja occidentalis* using the following insecticides: Dimilin 48 SC (diflubenzuron) concentration 0.025%, Calypso 480 SC (thiacloprid), 0.025%, Nurelle D (cypermethrin), 0.2% and Mospilan 20 SP (acetamiprid), 0.04%.

The treatment was applied against both species during the period of flight and oviposition, termination of adult activity, early stage of caterpillar-hatching and during the initial phase of the leaf-mining. The results show the most effective *Argyresthia thuiella* control proved to be Nurelle D at a concentration of 0.2% (recommended by the manufacturer) applied at the beginning of the creation mines, on July 30th on *Thuja occidentalis*, reaching efficiency of 92%. The most effective *Argyresthia trifasciata* control proved to be Mospilan 20 SP at a concentration of 0.04% (recommended by the manufacturer) used during the period of flight and oviposition, on May 15th on *Juniperus sabina*, reaching efficiency of 97%. Practical use of these species control can be recommended for instances of extremely numerous occurrence of the species.

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