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FLIGHT DYNAMIC OF LEPIDOPTERA OF ECONOMIC IMPORTANCE IN SOMBOR DURING 2010 AND FORECAST FOR 2011

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Abstract

Light traps were used throughout 2010 for collecting moths in Sombor and Čelarevo. Results are presented for the following species: *Loxostege sticticalis, Ostrinia nubilalis, Autographa gamma, Helicoverpa armigera, Spodoptera exigua, Lacanobia oleracea, Mamestra brassicae, Agrotis ipsilon, A. exclamationis, A. segetum* and *Hyphantria cunea.* Frequencies are given and compared with averages for the period 1980–2004.

The year 2010 was very humid, because temperature conditions were similar to average ones and precipitation was much higher than the long-term average. The hydrophilic species *L. oleracea* and *A. ipsilon* showed a frequency much above average; *A. gamma* and *M. brassicae* were less frequent than on average, but still had an impact on agriculture production in 2010 in Vojvodina. Usual conditions in July and August favored *O. nubilalis* and *H. armigera*, so their impact on agriculture production was also significant.

Forecasts suggest increased frequency for the first generation in 2011 of the species *L. oleracea, A. exclamationis* and *H. cunea.* A negative trend is predicted for *O. nubilalis,* but it can still cause significant damage due to the large number of recorded moths. *A. segetum* is expected to show an increase in some places and a decrease in others, but its frequency was too small to expect widespread damage in 2011. For the species *L. sticticalis, A. gamma, H. armigera, S. exigua, M. brassicae* and *A. ipsilon*, long-term forecasts are not presented because of their migratory nature.

KEY WORDS**:** Lepidoptera, light trap, *Autographa gamma.*

Introduction

It is important to follow the frequency and flight dynamic in order to be warned of possible damages. Forecasting is the basis for Integral Pest Management in plant protection.

During 2010 more than 40,000 moth specimens were determined in the Agroprotekt laboratory. Altogether, more than 150 species of moths were recorded. The flight dynamic was registered for all encountered species. Some data were published at the website www.agroupozorenje.rs. In this paper frequency is discussed for the following species: *Loxostege sticticalis* (Linnaeus, 1761), *Ostrinia nubilalis* (Hübner, 1796), *Autographa gamma* (Linnaeus, 1758), *Helicoverpa armigera* (Hübner, 1808), *Spodoptera exigua* (Hübner, 1808), *Lacanobia oleracea* (Linnaeus, 1758), *Mamestra brassicae* (Linnaeus, 1758), *Agrotis ipsilon* (Hufnagel, 1766), *A. exclamationis* (Linnaeus, 1758), *A. segetum* (Denis & Schiffermüller, 1775) and *Hyphantria cunea* (Drury, 1773). Wherever applicable, a forecast for 2011 has been done.

In order to explain the results of flight dynamic, temperature and precipitation values in 2010 have been compared with the average for Sombor in the period 1948–2009.

Material and Methods

For catching moths light traps of the RO Agrobečej type were used, with mercury light 250W bulbs as a light source. Two light traps were attended. The first one was placed in a southern suburb of Sombor, UTM code CR56. The second light trap was placed a few kilometers north of Čelarevo, UTM code CR81. Traps were attended from April 7 to October 14. Moths were collected every day and determined in the laboratory of Agroprotekt. Counting results divided into 5-day periods are presented in Tabs. I and II.

Results for Sombor in 2010 are compared with previous data for Sombor (VAJGAND *et al.*, 2008, VAJGAND, 2008, VAJGAND, 2009a, VAJGAND, 2009b) in Tab. III.

Average meteorological data are given for the period 1948–2009. Some of those data were supplied by the Faculty of Agriculture in Novi Sad, and we would like to thank them for their cooperation. The temperature curve shows that April was colder than average by 0.7 °C, May by 0.7 °C, June by 0.6 °C and September by 0.7 °C. July and August were warmer than average by 0.4 °C and 0.8 °C respectively (Fig. 1). The average temperature in the vegetation period in 2010 was lower by 0.3 °C compared with the longtime average. Total precipitation for the period April–September was 310 mm/m2 higher than the average. July and August had 30 mm less precipitation than average. But April, May and June altogether had precipitation 300mm higher than average, so vegetation had ample water reserve in the soil. The year 2010 was very humid, because temperature conditions were similar to the average and precipitation was much higher than the long-term average.

Results

Loxostege sticticalis (Linnaeus, 1761) – Beet webworm

In Sombor in 2010 a total of 14 specimens of the species was recorded (Tab. I): a single specimen on July 1 and again on the 13th and twelve in the period August 6–17. In Čelarevo only two specimens (Tab. II) were registered, one on August 6 and another on August 18. A long-term forecast was not given, since this is a migratory species.

Table I. Numerousness of moths at light trap in Sombor during 2010 in five-day period.

	L. sticticalis	*O. nubilalis*	*A. gamma*	*H.armigera*	*S.a exigua*	*L. oleracea*	*M. brassicae*	*A. ipsilon*	*A. exclamationis*	*A. segetum*	*H. cunea*
12-16.04.	0	0	0	0	0	0	0	0	0	0	0
17-21.04.	0	0	0	0	0	0	0	0	0	0	0
22-26.04.	0	0	0	0	0	0	0	0	0	0	0
27.04-01.05.	0	1	0	0	0	0	0	0	0	0	0
02-06.05.	0	3	0	0	0	1	0	1	0	0	0
07-11.05.	0	0	0	0	0	9	0	0	1	1	0
12-16.05.	0	9	0	0	0	5	0	0	0	4	0
17-21.05.	0	0	0	1	0	4	0	0	3	4	0
22-26.05.	0	51	0	1	0	19	0	0	2	11	0
27-31.05.	0	89	0	4	0	28	0	1	21	20	0
01-05.06.	0	28	1	0	0	19	0	0	10	10	0
06-10.06.	0	113	2	5	0	41	0	6	12	8	0
11-15.06.	0	176	2	0	0	15	0	5	3	1	0
16-20.06.	0	78	5	0	0	7	0	7	0	1	0
21-25.06.	0	11	9	2	0	1	0	2	1	0	0
26-30.06.	0	27	4	0	0	3	0	2	1	0	0
01-05.07.	1	33	5	0	0	1	0	1	0	0	0
06-10.07.	0	1	11	2	0	1	0	3	0	1	0
11-15.07.	1	11	7	2	0	1	1	0	0	0	0
16-20.07.	0	13	10	0	0	8	0	0	0	0	0
21-25.07.	0	91	4	3	0	31	3	5	11	5	1
26-30.07.	0	146	4	6	0	79	7	10	15	13	1
31.07-04.08.	0	509	2	13	0	65	11	12	15	10	4
05-09.08.	2	1042	6	9	0	161	9	39	11	4	1
10-14.08.	6	1076	3	2	0	17	0	7	3	0	0
15-19.08.	4	1100	4	27	0	12	0	10	6	6	1
20-24.08.	0	194	3	34	0	7	0	9	0	1	0
25-29.08.	0	80	1	69	0	10	0	1	0	0	0
30.08-03.09.	0	0	1	56	0	4	0	1	0	0	0
04-08.09	0	120	0	102	0	3	1	0	0	1	0
09-13.09	0	303	2	73	0	15	0	7	0	2	0
14-18.09.	0	208	0	47	0	29	4	5	1	2	0
19-23.09.	0	38	0	8	0	9	1	1	0	2	0
24-28.09.	0	35	1	5	0	24	4	1	0	2	0
29.09-03.10.	0	9	0	16	0	37	1	4	0	6	0
04-10.10.	0	0	0	1	0	4	1	0	0	0	0

Table II. Numerousness of moths at light trap in Čelarevo during 2010 in five-day period

	L. sticticalis	*O. nubilalis*	*A. gamma*	*H. armigera*	*S.exigua*	*L.oleracea*	*M. brassicae*	*A. ipsilon*	*A. exclamationis*	*A. segetum*	*H. cunea*
12-16.04.	0	0	0	0	0	0	0	0	0	0	0
17-21.04.	0	0	0	0	0	0	0	0	0	0	0
22-26.04.	0	0	1	0	0	0	0	0	0	0	0
27.04-01.05.	0	0	0	0	0	1	1	2	0	0	0
02-06.05.	0	1	1	0	0	1	0	0	1	2	0
07-11.05.	0	6	0	3	0	2	0	0	3	0	0
12-16.05.	0	19	0	0	0	2	0	0	2	2	1
17-21.05.	0	3	0	0	0	3	0	0	1	0	0
22-26.05.	0	144	2	0	0	12	0	1	12	2	0
27-31.05.	0	200	2	1	0	11	0	0	8	1	0
01-05.06.	0	25	0	0	0	2	0	0	0	0	0
06-10.06.	0	259	1	3	0	6	0	0	2	1	0
11-15.06.	0	515	0	0	0	0	0	1	3	0	0
16-20.06.	0	496	2	0	0	0	0	2	1	0	0
21-25.06.	0	16	7	0	0	0	0	0	0	0	0
26-30.06.	0	22	2	2	0	3	0	1	0	0	0
01-05.07.	0	11	4	0	0	0	0	1	0	0	0
06-10.07.	0	6	4	0	0	2	0	0	0	0	0
11-15.07.	0	22	4	3	0	2	0	0	1	0	0
16-20.07.	0	232	3	5	0	1	0	1	10	3	0
21-25.07.	0	268	3	0	0	6	0	3	14	0	0
26-30.07.	0	1242	28	10	0	15	2	10	21	7	1
31.07-04.08.	0	2733	17	12	0	20	0	5	14	7	3
05-09.08.	1	2959	10	29	0	8	5	21	19	4	1
10-14.08.	0	2789	3	7	0	5	0	8	8	1	3
15-19.08.	1	1296	4	22	0	2	0	10	4	1	0
20-24.08.	0	601	0	40	0	0	0	7	1	2	0
25-29.08.	0	267	0	59	0	2	0	2	0	1	0
30.08-03.09.	0	2	0	11	0	0	0	0	1	0	0
04-08.09.	0	346	0	84	0	2	1	0	0	0	0
09-13.09.	0	2148	2	97	0	4	1	3	1	0	0
14-18.09.	0	356	3	33	0	7	2	4	0	1	0
19-23.09.	0	316	2	15	0	9	0	10	0	2	0
24-28.09.	0	19	0	0	0	8	1	1	0	0	0
29.09-03.10.	0	25	0	5	0	10	0	10	0	1	0
04-14.10.	0	5	0	1	0	3	0	50	0	3	0

Table III. Number of moths during 2010 and comparison with average for long time period (VAJGAND *et al.*, 2008)

	Number of moths of first generation			Number of moths of second or second and third generation			Total sum per year			Ratio for Sombor nums. in 2010x100/ average
	Sombor		Čelarevo	Sombor		Čelarevo	Sombor		Čelarevo	
	aver.[1]	2010	2010	aver.[1]	2010	2010	aver.[1]	2010	2010	(%)
L. sticticalis	x	x	x	x	x	x	215	14	2	7
O. nubilalis	940	619	1717	8222	4976	15632	9163	5595	17349	61
A. gamma	x	x	x	x	x	x	549	87	105	16
H. armigera[2]	x	x	x	x	x	x	1565[2]	488	442	31
S. exigua[2]	x	x	x	x	x	x	35[2]	0	0	0
L. oleracea	202	150	43	205	518	106	408	670	149	164
M. brassicae	13	0	1	108	43	12	121	43	13	36
A. ipsilon	x	x		x	x		39	140	153	359
A. exclamationis	83	54	33	95	62	94	178	116	127	65
A. segetum	96	60	8	232	55	33	330	115	41	35
H. cunea	131	0	1	265	8	8	396	8	9	2

1 Average for period 1980-2004 (VAJGAND *et al.*, 2008)
2 Average for period 1994-2004 (VAJGAND *et al.*, 2008)

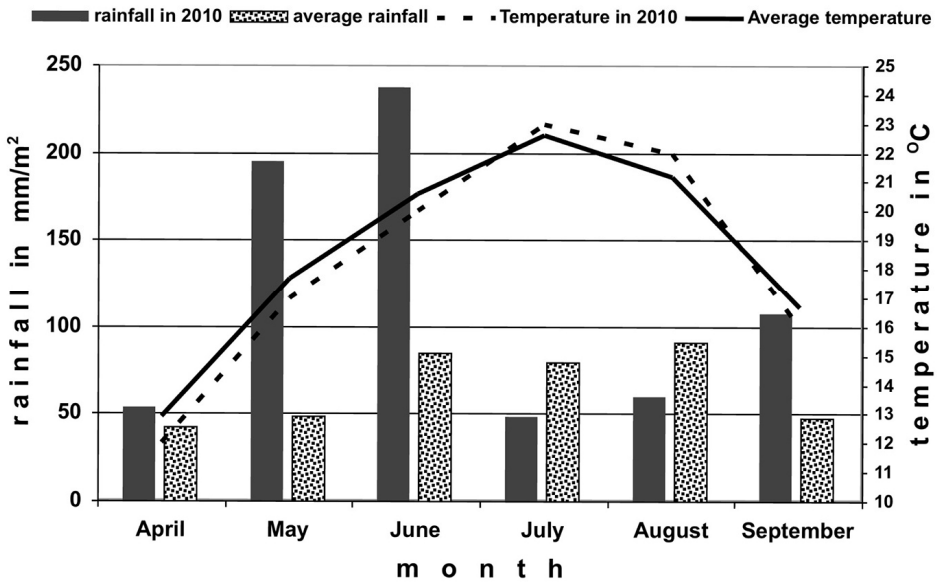

Figure 1. Meteorological data for Sombor in 2010 and average data for period since 1948 to 2009.

Ostrinia nubilalis (Hübner, 1796) – European corn borer

In Sombor, the first specimen of the first generation was caught on May 1. Regular records started on May 22. Frequency increased fast, and the first pick of female was caught on May 28. Female specimens achieved 15 per night. Frequency peak occurred on June 16, when 32 females were registered. After that, frequency dropped substantially and reached the minimum in the next 15 days. The third peak of the first generation was on July 3 (17 females). The first generation ended on July 3 (Fig. 2).

The first specimen of the second generation was registered on July 10. Frequency remained low till July 23, and began to rise afterwards. The peak was registered on August 3 and the maximum was reached on August 15, with 374 females registered. After that frequency dropped fast until August 28. From August 29 to September 4 it was very cold and no adult specimens were recorded. Activity restarted on September 4, and another peak was experienced on September 12, when 64 females were registered. Records ended on October 3.

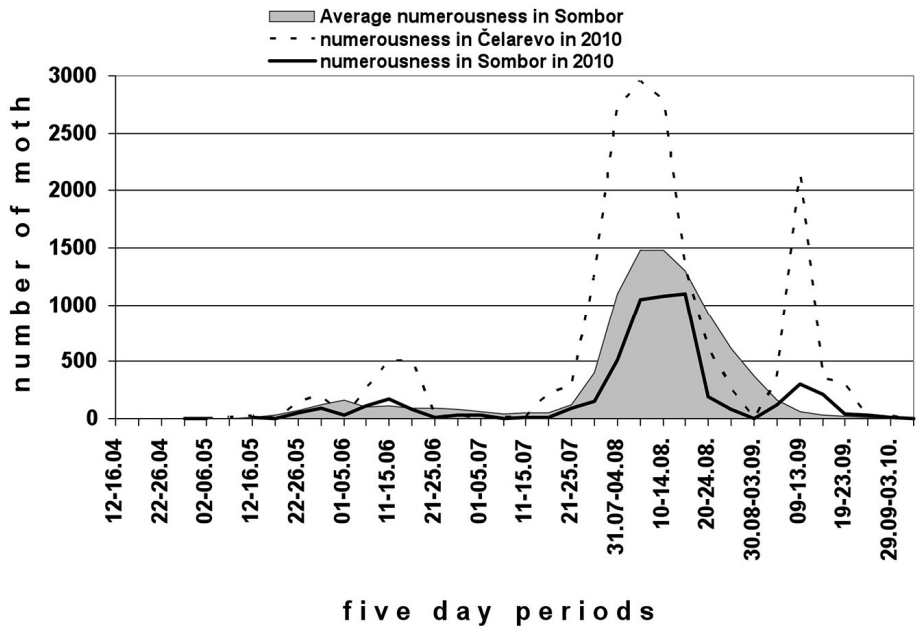

Figure 2. Flight dynamic of *Ostrinia nubilalis* on light trap in 2010.

In the first generation a total of 619 specimens were registered (Tab. II), which constitutes 65% of the average number of moths for Sombor (VAJGAND *et al*., 2008). In the second generation period 4,976 moths were registered, or 60% of the average number for Sombor. The grand total for 2010 is 5,595 moths, 61% of the average number per year.

In Čelarevo the season began on May 5. Frequency remained low until May 25. The first peak of females was on May 26, when 45 specimens were recorded. The second peak was on June 11. The third, highest peak (flight maximum) was recorded on Jun 18, with 101 females in one night. After that, frequency decreased over the following 20 days. The first generation ended on July 2.

The first specimen of the second generation was registered on July 6, but frequency was low until July 17. After that date frequency steadily increased (Fig. 2). The maximum frequency was registered on August 6, with 890 females recorded. Another peak was on August 14, with 504 female specimens. After that, frequency became lower until August 28. As in Sombor, from August 29 to September 4 activity ceased. It began again on September 4, and another peak was registered on September 9, with 1020 females recorded. Activity at this location ended on October 9. In Čelarevo 1,717 specimens of the first generation were registered, and 15,632 of the second generation. The total for 2010 is 17,349 specimens (Tab. III).

In 2010 *Ostrinia nubilalis* had an important impact on the production of corn and sweet peppers, but especially sweet peppers as the author had never seen so many moths, eggs and larvae on this plant.

September 2010 was colder and rainier than average. In spring 2011 lesser numbers of the moths are to be expected than in spring 2010. But even so, the population of first generation will be big enough to damage corn in 2011.

Autographa gamma (Linnaeus, 1758) – Silver Y moth

In Sombor, it was on the wing from June 4. The usual frequency was one or two moths per night except for July 7 when six moths were registered. This does not represent a typical peak, because frequency before and after remained one or two moths per night. Continuous records lasted until August 25, and from that date to September 24 only occasional specimens were recorded (Fig. 3). The total number of specimens was 87, making only 16% of the average (Tab. III).

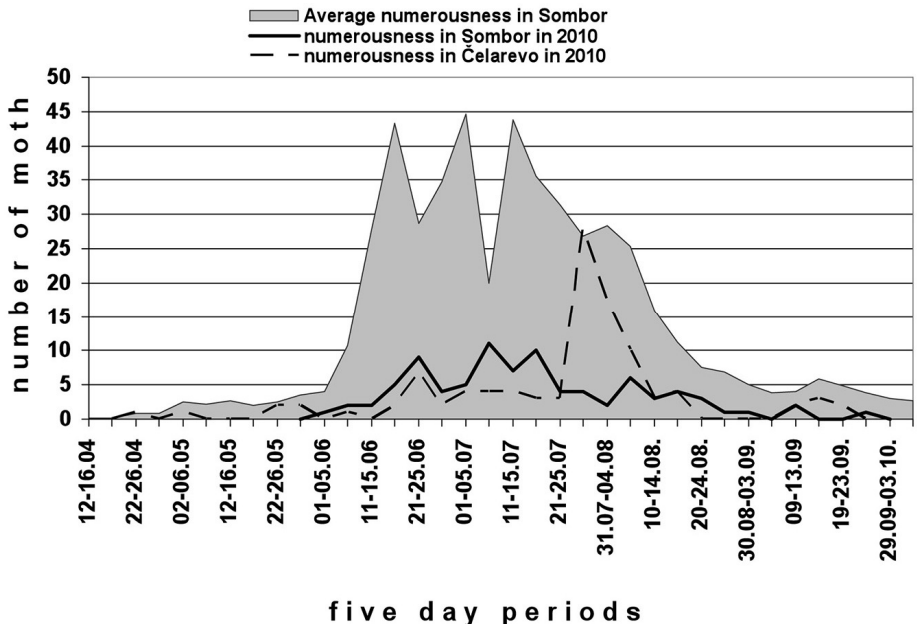

Figure 3. Flight dynamic of *Autographa gamma* on light trap in 2010.

In Čelarevo, a single specimen was recorded on April 26 and again on June 6. Records became continuous between June 17 and August 19. Maximum activity was encountered on July 26, when eight specimens were registered. Between September 9 and 23, only seven moths were recorded.

Although only a small number of moths were caught in the light trap, a lot of moths, eggs and larvae were encountered: this species was the dominant pest of the sweet peppers in the first half of July 2010. No long-term forecast is given because this is migratory species.

Helicoverpa armigera (Hübner, 1808) – Cotton Bollworm, Corn Earworm

In the locality of Sombor, the first moth was registered on May 21. This species appeared irregularly until July 21, but from then almost every day until October 8. In that period four peaks were registered: on August 18 (15 specimens), August 29 (46 specimens – maximum of flight - the highest frequency), September 5 (35 specimens) and September 12 (24 specimens) (Fig. 4).

In Čelarevo, a single specimen was registered on 17 occasions between May 8 and July 20. Records were continuous from July 29 to October 4. The peaks represent August 6 (16 moths) and August 27 (19 moths). Maximum frequency was achieved on September 8, when 48 moths were caught.

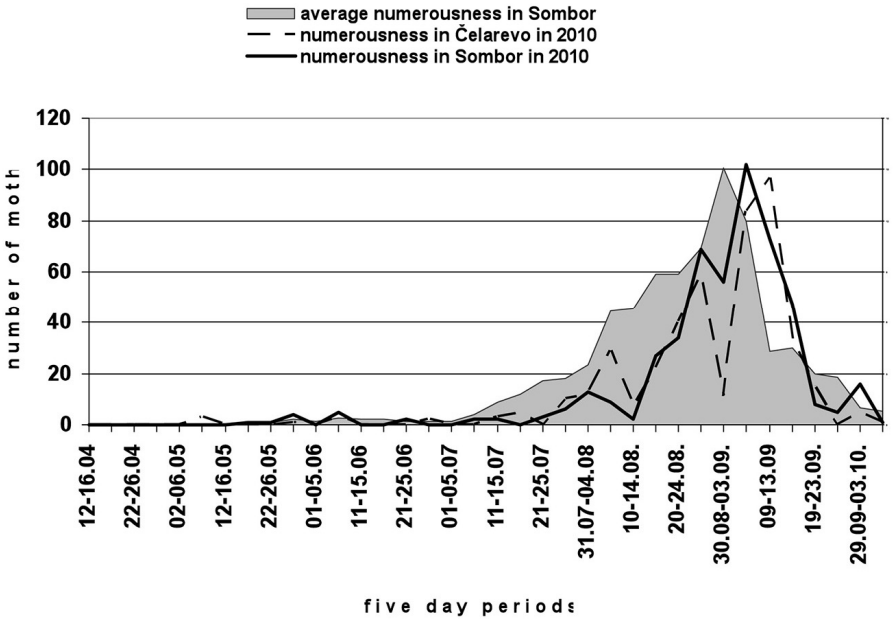

Figure 4. Flight dynamic of *Helicoverpa armigera* on light trap in 2010.

Altogether, in Sombor in 2010 a total of 488 specimens was recorded (Tab. III). This is only 31% of the long-term average. The total for this moth in Čelarevo was 442. In 2010, larvae vastly affected production of sweet pepper, tomato, corn, snap beans, tobacco and cabbage. This is a migratory species, so no forecast is given.

Spodoptera exigua (Hübner, 1808) - Beet armyworm

Not registered in 2010 (Tab. III). This is a migratory species, so a forecast is not given.

Lacanobia oleracea (Linnaeus, 1758) – Bright-line Brown-eye

In 2010 in Sombor three generations were registered. Permanent records of the first generation were noticed in the period from May 4 to June 19 (Fig. 5). A total of 152 moths were registered, constituting 75% of the average (Tab. III). The maximum frequency of the first generation was registered on June 5, when 13 moths were caught. Single specimens appeared from June 19 to July 16. After that, frequency increased and the maximum of the second generation was registered on August 6 (76 moths). Thereafter frequency decreased very fast. Small numbers were encountered until September 10, when frequency rose again. Specimens caught after September 10 belong to the third generation. The maximum was registered on September 25, when 12 moths were recorded. The second generation yielded 403 specimens, the third 115. Frequency of the second generation in 2010 was twice the average. The total for the species in 2010 was 670. This is 164% of the long-term average.

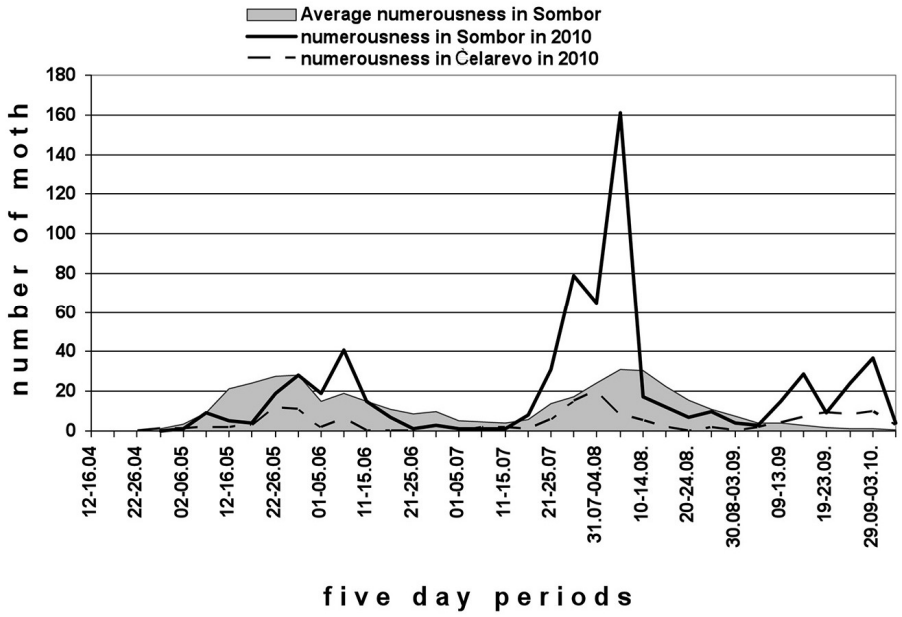

Figure 5. Flight dynamic of *Lacanobia oleracea* on light trap in 2010.

In Čelarevo, the species appeared in three generations (Fig. 5). The first one started on April 27 and with breaks lasted until June 28. The maximum per night was achieved on May 26, when eight specimens were registered. The total for the first generation is 43 moths. The second generation was on the wing from July 8 to August 27, and 63 specimens were registered. The maximum of 8 specimens was achieved on August 1. The third generation was present from September 6 to October 4. The maximum of 5 specimens was achieved on September 18. The third generation yielded 43 moths altogether. The total for the species in 2010 in Čelarevo was 149 (Tab. III).

In 2010, this species had an important impact on cabbage production. It was also present in sugar beet, but in small numbers. The generation quotient (according to the method of MÉSZÁROS,1963) is 3.4 for Sombor, and 2.5 for Čelarevo. The forecasted trend for the first generation in 2011 is positive. We predict economically important damage in spring 2011 to cabbage, cauliflower (in whole Vojvodina) and in sugar beet in moist places (close to the Danube and Tisa Rivers).

Mamestra brassicae (Linnaeus, 1758) – Cabbage moth

In Sombor, no specimens of the first generation were registered in the light trap. The second generation became active on July 13 and ended on August 9 (Fig. 6). A subtotal of 31 moths was registered in this period. The maximum of six specimens was registered on August 6. The third generation yielded only 12 specimens from September 4 to October 6. Daily frequency did not exceed three specimens.

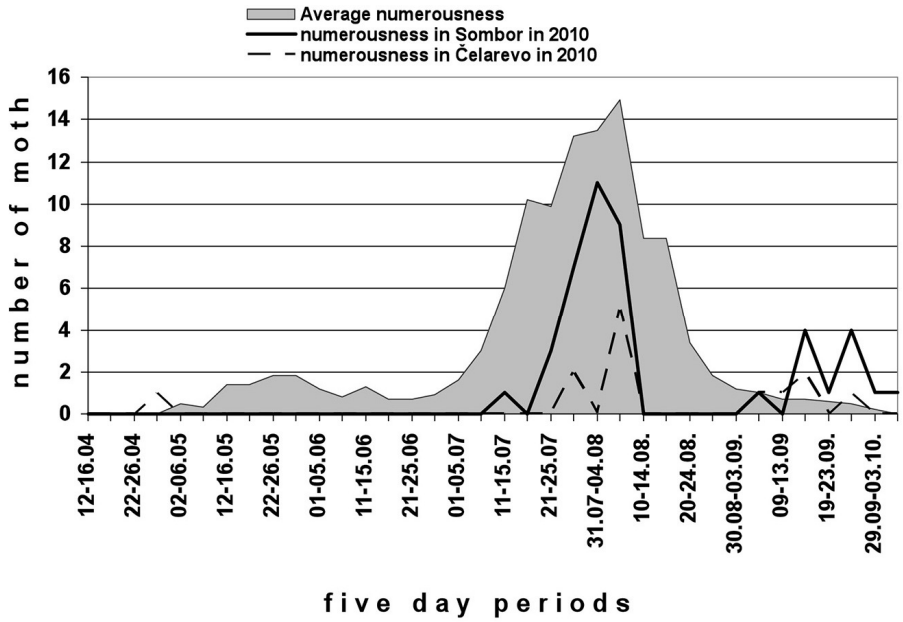

Figure 6. Flight dynamic of *Mamestra brassicae* on light trap in 2010.

In Čelarevo, the first generation was represented by a single specimen caught on May 1 (Fig. 6). The second generation lasted from July 26 to August 7. Only seven moths were caught, so there were no obvious peaks. The third generation was represented by just five specimens between September 8 and 25.

M. brassicae in 2010 had an important economic impact on the cabbage production generally, but on sugar beet production only locally.

The total for Sombor is 43, 13 for Čelarevo (Tab. III). That makes 36% of the longterm average for Sombor. The generation quotient (according to method of MÉSZÁROS Z. 1963) is doubtful, so a long-term forecast is not given.

Agrotis ipsilon (Hufnagel, 1766) - Black cutworm, Greasy Cutworm or Dark Sword-grass

Only single specimens were registered on May 5 and 30 (Tab. I). The species appeared regularly from June 6 to July 9, from July 24 to September 1 and from September 12 to October 3. In the first period there were 26 moths registered, 94 in the second and 18 in the third. Maximum activity was registered on August 8, with 22 specimens. The long-term maximum for Sombor remains eight specimens, on August 10, 1998. The total for 2010 is 140 specimens of the species. This is the biggest total for Sombor since 1986, when regular monitoring started.

In Čelarevo, single moths were registered on April 27, May 25, June 14, 16 and 27, and July 1 (Tab. II). Permanent activity was registered in two periods from July 19 to August 28, and from September 9 to October 14. In the first period 67 specimens were registered. The first peak was on August 6 with eight specimens, the other on August 18 with five. In the second period there were 78 moths recorded. The peak was achieved on August 20, when six moths were caught, and maximum of flight on October 13, with 34 specimens.

When comparing flight dynamic in 2010 to the average, we can conclude that greatest activity in 2010 appeared at the beginning of August. That represents a discrepancy with the long-term pattern, where the greatest activity was recorded at the end of June.

Although numbers in Sombor were the highest recorded so far, no damage by this species was noted in the agriculture. No forecast for 2011 is given because this is a migratory species.

Agrotis exclamationis (Linnaeus, 1758) – Heart & dart

The first generation in Sombor started on May 11. Just a single specimen was registered by May 25. Regular records were encountered from May 25 to June 12 (Fig. 7). The local maximum for this period was registered on May 29, with seven specimens caught. Only a single specimen was registered on June 21 and 27. This generation yielded 54 moths. The second generation started on July 21. The peak was registered on August 6 - five moths. The activity persisted until August 18, and a single specimen was registered on September 16. Altogether, 62 moths of the second generation were recorded.

In Čelarevo the first generation was present from May 5 to June 20. Maximum of flight was registered on May 26 – 6 moths. The first generation yielded 33 specimens. The second generation lasted from July 14 to August 21. The maximum was achieved on July 26, with ten moths. In this period one peak was registered on August 3, when nine moths were caught. After that, only a single specimen was recorded on September 2, and another on September 12. During the second generation period a total of 94 moths were registered.

The total for Sombor in 2010 was 116. This is 65% of the long-term average. In Čelarevo, 127 moths were registered (Tab. III). The generation quotient (according to method of MÉSZÁROS Z. 1963) is 1.1 for Sombor, and 2.8 for Čelarevo. The forecast for the first generation in 2011 is positive, but the population is not numerous. Thus we can expect economically important damage only sporadically, in those places where damage was encountered in the past.

In 2010 the species was not economically important.

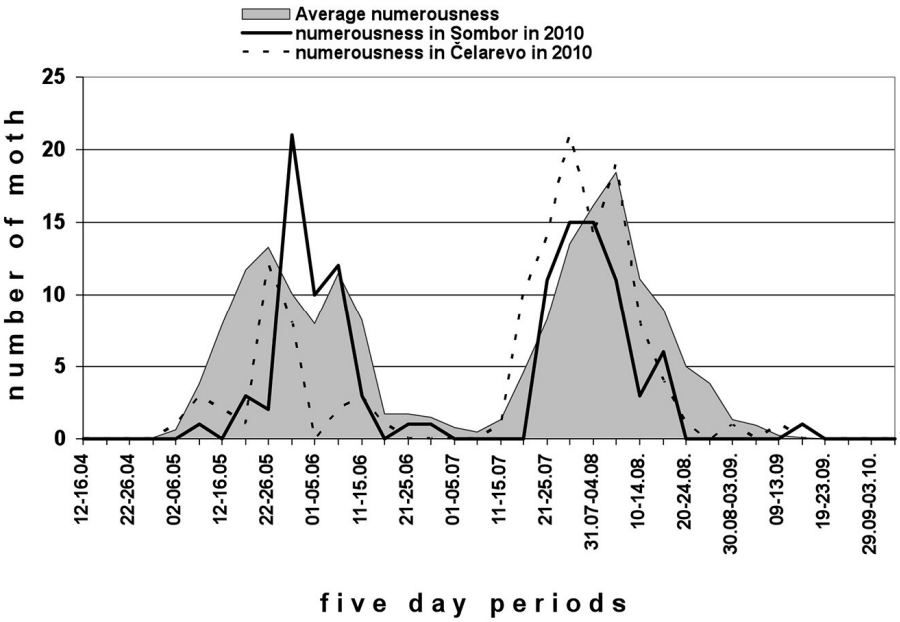

Figure 7. Flight dynamic of *Agrotis exclamationis* on light trap in 2010.

Agrotis segetum (Denis & Schiffermüller, 1775) – Turnip moth

The first generation in Sombor was registered from May 11 to Jun 18, a total of 60 moths. Maximum of flight was achieved on May 27, with eight specimens caught. The second generation lasted from July 21 to August 24, with one small pause. The maximum was registered on July 27, with eight moths recorded. In that period there were 40 specimens registered. The third generation took place from September 8 to October 3. Only 15 specimens were recorded in this period, just one or two per night. The second generation of 2010 represents just one quarter of the average value. The increase of frequency in the first and second generation was late by 10 to 15 days in comparison with the average flight dynamic (Fig. 8). The total sum of the species in 2010 was 115. That is 35% of the average number for Sombor (Tab. III).

In Čelarevo, the first generation was represented by only eight specimens from May 5 to June 9. The second generation lasted from July 17 to August 28, with 26 moths recorded. The third generation from September 14 to October 8 yielded only 7 specimens.

The generation quotient (according to the method of MÉSZÁROS, 1963) shows a value of 0.9 for Sombor, and 3.6 for Čelarevo. Therefore, the forecast for the trend of the first generation in 2011 is negative for Sombor and positive for Čelarevo. In any case, the number of specimens is small in both places. So the first generation in 2011 can have an impact on the agricultural production only in those places where damage was experienced in the last few years.

Hyphantria cunea (Drury, 1773) – Fall webworm

In the locality of Sombor, eight single specimens were registered between July 21 and August 16 (Tab. I), all of which belong to the second generation. If we compare this to the records for the previous years, this year shows a significant decrease as the average number per year for Sombor is 396 moths (VAJGAND *et al*., 2008).

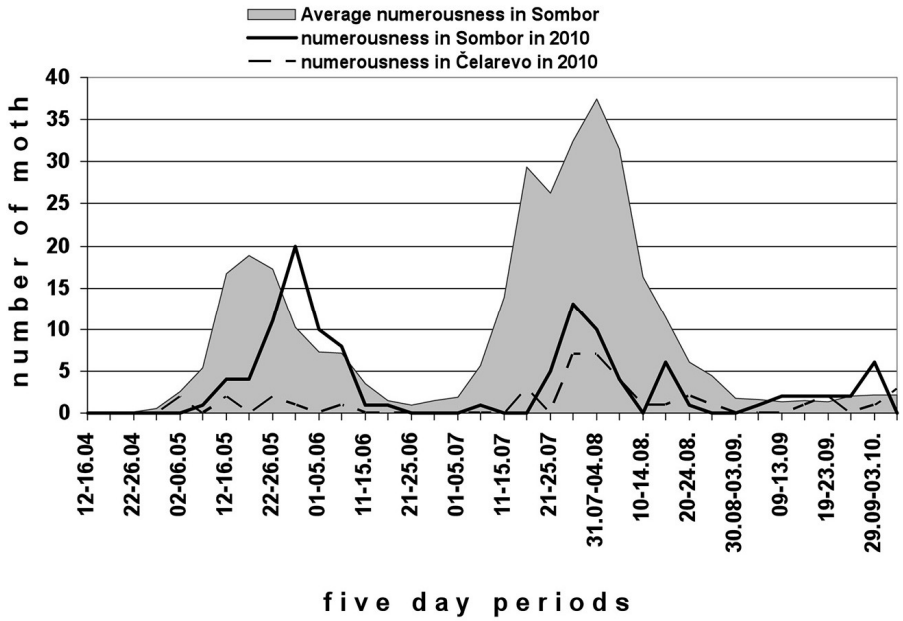

Figure 8. Flight dynamic of Agrotis segetum on light trap in 2010.

In Čelarevo, a single moth of the first generation was recorded on May 13. The second generation appeared from July 26 to August 13. Only eight specimens were registered in that period (Tab. II).

The second generation of the fall webworm defoliated the mulberry tree (*Morus* spp.) and ornamentals at the end of August and the beginning of September 2010. Forecast for the first generation in 2011 shows positive trends. It will be present in smaller numbers, so certain damage is to be expected on ornamental plants, walnut (*Juglans regia*) and mulberry tree.

Discussion and Conclusion

Recorded numbers in Sombor in 2010 have been compared to long-term averages (Tab. III):

Species *L. sticticalis, S. exigua* and *H. cunea* were present in much smaller numbers in comparison with the long-term data. Only larvae of *H. cunea* were registered in ornamental plants and mulberry trees.

Species *A. gamma, H. armigera, M. brassicae* and *A. segetum* were 16 to 36% up on the average. Moist conditions suited the first three species, so they had a negative impact on the sweet pepper, corn, cabbage and tobacco production.
O. nubilalis and *A. exclamationis* achieved only 61-65% of their averages. *O nubilalis* was economically important for sweet pepper and corn production. No damage by *A. exclamationis* was encountered.

Hydrophilic species *L. oleracea* and *Agrotis ipsilon* were substantially more numerous than the average.

The forecast for the first generation in 2011 is that positive trends will take place for the species *L. oleracea, A. exclamationis* and *H. cunea*. Negative trends are expected for *O. nubilalis,* but the species is so numerous it can do damage in the first generation. For *A. segetum* trends are expected to be positive in some places, and negative in others. Numerousness is too small to expect widespread economically important damage in 2011. For the species *L. sticticalis, A. gamma, H. armigera, S. exigua, M. brassicae* and *A. ipsilon*, a long-term forecast is not given because most of them are migratory species.

Each year flight dynamic has some special characteristics, so short term control of the frequency for those species must be continued.

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ДИНАМИКА БРОЈНОСТИ ЕКОНОМСКИ ЗНАЧАЈНИХ ВРСТА LEPIDOPTERA У СОМБОРУ ТОКОМ 2010 И ПРОГНОЗА ЗА 2011 ГОДИНУ

ДРАГАН ВАЈГАНД

Извод

За праћење бројности и динамике лета лептира активних ноћу коришћена је светлосна клопка тип РО Агробечеј. Прегледано је преко 40.000 примерака и детерминисано преко 150 врста лептира. У раду су дати резултати праћења динамике лета врста: *Loxostege sticticalis, Ostrinia nubilalis, Autographa gamma, Helicoverpa armigera, Spodoptera exigua, Lacanobia oleracea, Mamestra brassicae, Agrotis ipsilon, A. exclamationis, A. segetum* и *Hyphantria cunea* на локалитетима Сомбор и Челарево (Табела I и II.). Резултати су упоређени са вишегодишњим подацима за период од 1980 до 2004 године (Табела III.).

За климу у 2010. години се може закључити да је била влажнија од просечне јер су средње месечне температуре биле сличне просечнима а падавине много веће.

Врсте *L. sticticalis, S. exigua* и *H. cunea* су током 2010. године имале много мању бројност од просечне. Врсте *A. gamma, H. armigera, M. brassicae* и *A. segetum* су имале бројност 16 до 36% од просечне. *O. nubilalis* и *A. exclamationis* су имале 61-65% просечне бројности. Хидрофилне врсте *L. oleracea* и *Agrotis ipsilon* су имале много већу бројност од просечне.

Током 2010. године мали економски значај је имала vrsta *H. cunea.* Врсте *O. nubilalis, A. gamma, H. armigera, L. oleracea* и *M. brassicae* биле су економски значајне.

Позитивна прогноза броја лептира за прву генерацију током 2011. године предвиђа се за врсте: *L. oleracea, A exclamationis* и *H. cunea*. Негативна прогноза се саопштава за врсту *O. nubilalis,* али је бројност довољно велика да прва генерација направи штете у производњи кукуруза. За *A. segetum* се на неким местима саопштава позитивна прогноза, а на некима негативна. Без обзира на прогнозу, сматрамо да је бројност мала и да врста у првој генерацији не може да буде штетна на већем подручју у пролеће 2011. године. За врсте *L. sticticalis, A. gamma, H. armigera, S. exigua, M. brassicae* и *A. ipsilon*, дугорочна прогноза се не саопштава јер су већином у питању селице.

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