RESEARCH REGARDING EXTERNAL ANATOMY OF SPECIES *AULACORTHUM SOLANI* AND *MACROSIPHUM EUPHORBIAE*

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Abstract: *This paper presents data referring the morphological characteristics and biometrical measurements of Aulacorthum solani and Macrosiphum euphorbiae, species captured from potato cultivations for a period of three years, from Didactic Station Timisoara and Varfurile, Arad county. At Aulacorthum solani the adult wingless form has a pear shaped body. It can be whitish green or yellow, in which case there is a bright green or rust coloured spot at the base of each siphunculus. The legs are long with dark knee joints. Siphunculi are long with black tips. The antennae have dark joints and are slightly longer than the body. At Aulacorthum solani the winged form looks quite different, with much darker antennae, legs and siphunculi. The smallest length of the body established for aphids captured in West Zone of Romania was 1,90 mm, while the biggest was 3,0 mm. The average body length was 2,48 ± 0,35 mm. The average value calculated for head width was 0.42 ± 0.06 mm. Mean thorax width was 0.73 ± 0.08 mm. The mean length of the abdomen was 1.40 ± 0.20 mm, while the average value calculated for abdomen width was 0,97± 0.16 mm. At Macrosiphum euphorbiae the wingless female potato aphid is green sometimes with a darker dorsal stripe. It has a pear shaped body. The antennae are dark at the joints between the segments and are longer than the body. The legs are longer than in other aphids, pale green but darker at the apices. The siphunculi are pale coloured, cylindrical with dark tips. The winged form has a uniform darker coloured body and appendages and has a green abdomen. The smallest length of the body established for aphids captured in West Zone of Romania was 2,80 mm, while the biggest was 3,40 mm. The average body length was 3,13 ± 0,17 mm. The average value calculated for the length of the head and thorax was 1,19 ± 0.08 mm. The average value calculated for head width was 0.46 ± 0.05 mm. Mean thorax width was 0.86 ± 0.13 mm. The mean length of the abdomen was 1.94 ± 0.17 mm, while the average value calculated for abdomen width was 1,28 ± 0.12 mm.*

Key word: *Aulacorthum solani, Macrosiphum euphorbiae biometrical measurements*

INTRODUCTION

Aphids are small soft-bodied, generally sluggish insects that have piercing-sucking mouthparts, which are inserted into the phloem tissue and remove fluids. Aphids are the only insects that have "honey tubes," or cornicles, on the abdomen. The cornicles, which project beyond the body of aphids can make them appear jet-propelled. Aphids feed on most fruit and vegetable plants, flowers, ornamentals, and shade trees.

Aulacorthum solani (Foxglove aphid, Glasshouse-potato) aphid has one of the broadest host ranges of any aphid, having been recorded from species of over 82 plant families, including monocots and dicots.

The potato aphid *Macrosiphum euphorbiae* infests over than 200 plant species in more than 20 plant families, including several commercially important crops.

MATERIAL AND METHODS

The researches have been carried out for a period of three years, in the experimental field of the Didactic Station Timisoara (STN) and Varfurile, Arad county. The aphids have been collected with the yellow vessel traps

RESULTS AND DISCUSSIONS

At *Aulacorthum solani* the adult wingless form has a pear shaped body. It can be whitish green or yellow, in which case there is a bright green or rust coloured spot at the base of each siphunculus. The legs are long with dark knee joints. Siphunculi are long with black tips. The antennae have dark joints and are slightly longer than the body. At *Aulacorthum solani* the winged form looks quite different, with much darker antennae, legs and siphunculi.

It can be observed that, out of a total of 30 individuals of the species *Aulacorthum solani* , (table 1) the smallest length of the body established for aphids captured in West Zone of Romania was 1,90 mm, while the biggest was 3,0 mm. The average body length was 2,48 ± 0,35 mm.(figure 2)

Table 1

Biometrics measures of *Aulacorthum solani*

No. art.	Body length (mm)	Head+thorax length (mm)	Head width (mm)	Thorax width (mm)	Abdomen (mm)	
					Length	Width
1	3	1,30	0,50	0,80	1,70	1,10
2	3	1,30	0,50	0,80	1,70	1,10
3	2,90	1,20	0,50	0,80	1,70	1,15
4	2,90	1,15	0,45	0,80	1,65	1,10
5	2,90	1,25	0,50	0,75	1,65	1,15
6	2,85	1,35	0,50	0,80	1,50	1,20
7	2,80	1,30	0,50	0,75	1,50	1,15
8	2,80	1,20	0,50	0,75	1,60	1,15
9	2,80	1,25	0,50	0,75	1,55	1,05
10	2,80	1,30	0,50	0,70	1,50	1
11	2,70	1,10	0,40	0,80	1,60	1,10
12	2,55	1	0,35	0,65	1,55	0,90
13	2,50	1	0,35	0,65	1,50	0,90
14	2,50	1,05	0,35	0,65	1,45	0,90
15	2,50	1,10	0,40	0,65	1,40	0,85
16	2,50	1,20	0,45	0,70	1,55	0,65
17	2,45	1,15	0,45	0,75	1,30	0,75
18	2,40	1,10	0,40	0,90	1,30	1,10
19	2,40	1,20	0,40	0,70	1,20	1
20	2,40	1,15	0,40	0,80	1,25	0,90
21	2,30	1,10	0,45	0,90	1,20	1,05
22	2,20	1,10	0,40	0,70	1,10	0,90
23	2,20	1,05	0,40	0,75	1,15	0,85
24	2,10	0,80	0,40	0,70	1,10	0,90
25	2,10	0,90	0,40	0,70	1,20	0,95
26	2	0,80	0,40	0,70	1,10	0,90
27	2	0,70	0,40	0,70	1,30	1,10
28	1,90	0,70	0,30	0,60	1,20	0,70
29	1,95	0,75	0,35	0,60	1,20	0,70
30	1,90	0,70	0,30	0,60	1,20	0,70
Average	2,48	1,08	0,42	0,73	1,40	0,97
Average deviation	0,06	0,04	0,01	0,01	0,04	0,03
Standard deviation (s)	0,35	0,20	0,06	0,08	0,20	0,16
(m) Min	1,90	0,70	0,30	0,60	1,10	0,65
(M) Max	3	1,35	0,50	0,90	1,70	1,20

By analyzing the data presented in the table regarding the length of the head and thorax, it may be noticed that the maximum length of these parts was 1.35 mm and minimum length was 0,70 mm. The average value calculated for the length of these parts was 1,08 ± 0.20 mm.

The minimum width of head was 0.30 mm and the maximum width of head was 0.50 mm. The average value calculated for head width was 0.42 ± 0.06 mm.

As far as the thorax width is concerned, this was minimum 0.60 mm and maximum 0,90 mm. Mean thorax width was 0.73 ± 0.08 mm

Analyzing data on the length and width of the abdomen, it can be seen that the minimum length of the abdomen was 1.10 mm and minimum width was 0.65 mm, the maximum length of the abdomen was 1.70 mm and the maximum width was 1.20 mm. The mean length of the abdomen was 1.40 ± 0.20 mm, while the average value calculated for abdomen width was 0,97± 0.16 mm (Figure 1)

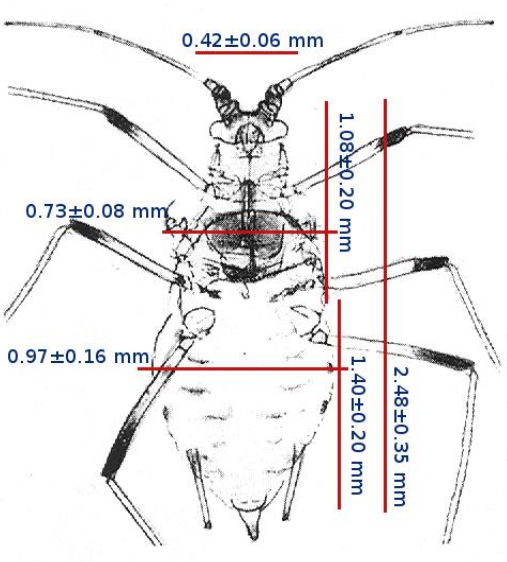

Figure 1: Biometrical measures of *Aulacorthum solani* (scheme)

At *Macrosiphum euphorbiae* can be observed that, out of a total of 30 individuals, (table 2) the smallest length of the body established for aphids captured in West Zone of Romania was 2,80 mm, while the biggest was 3,40 mm. The average body length was 3,13 ± 0,17 mm.(figure 2)

By analyzing the data presented in the table regarding the length of the head and thorax, it may be noticed that the maximum length of these parts was 1.35 mm and minimum length was 1,0 mm. The average value calculated for the length of these parts was 1,19 ± 0.08 mm.

The minimum width of head was 0.35 mm and the maximum width of head was 0.55 mm. The average value calculated for head width was 0.46 ± 0.05 mm.

As far as the thorax width is concerned, this was minimum 0.70 mm and maximum 1,10 mm. Mean thorax width was 0.86 ± 0.13 mm

Analyzing data on the length and width of the abdomen, it can be seen that the minimum length of the abdomen was 1.65 mm and minimum width was 1,10 mm, the maximum length of the abdomen was 2,20 mm and the maximum width was 1.45 mm. The mean length of the abdomen was 1.94 ± 0.17 mm, while the average value calculated for abdomen width was 1,28 ± 0.12 mm (Figure 2).

Table 2

Biometrics measures of *Aulacorthum solani*

No. art.	Body length (mm)	Head+thorax length (mm)	Head width (mm)	Thorax width (mm)	Abdomen (mm)	
					Length	Width
1	3,40	1,30	0,55	1,10	2,10	1,45
2	3,40	1,20	0,50	1,05	2,20	1,45
3	3,40	1,25	0,55	1	2,15	1,45
4	3,35	1,25	0,55	1,05	2,10	1,40
5	3,35	1,20	0,50	1	2,15	1,45
6	3,30	1,20	0,50	0,90	2,10	1,40
7	3,30	1,10	0,45	0,80	2,20	1,40
8	3,25	1,20	0,50	1,05	2,05	1,30
9	3,20	1,25	0,50	1	1,95	1,30
10	3,20	1,20	0,45	1	2	1,35
11	3,20	1,20	0,50	1	2	1,20
12	3,20	1,10	0,50	1	2,10	1,30
13	3,20	1,05	0,45	0,90	2,15	1,35
14	3,15	1,05	0,4	0,80	2,10	1,35
15	3,15	1,25	0,5	0,80	1,90	1,35
16	3,15	1,20	0,45	0,75	1,95	1,30
17	3,10	1,20	0,40	0,85	1,90	1,35
18	3,10	1,20	0,45	0,75	1,90	1,30
19	3,05	1,15	0,45	0,70	1,90	1,20
20	3	1,35	0,45	0,75	1,65	1,15
21	3	1,25	0,40	0,70	1,75	1,25
22	3	1,20	0,40	0,70	1,80	1,35
23	3	1,25	0,45	0,70	1,75	1,25
24	3	1,25	0,40	0,70	1,75	1,15
25	2,95	1,20	0,40	0,80	1,75	1,15
26	2,9	1,25	0,45	0,85	1,65	1,10
27	2,9	1,15	0,40	0,80	1,75	1,10
28	2,9	1,10	0,40	0,80	1,80	1,10
29	2,9	1,10	0,40	0,75	1,80	1,10
30	2,8	1	0,35	0,70	1,70	1,10
Average	3,13	1,19	0,46	0,86	1,94	1,28
Average deviation	0,03	0,01	0,01	0,02	0,03	0,02
Standard deviation (s)	0,17	0,08	0,05	0,13	0,17	0,12
(m) Min	2,8	1	0,35	0,7	1,65	1,1
(M) Max	3,4	1,35	0,55	1,1	2,2	1,45

At *Macrosiphum euphorbiae* the wingless female potato aphid is green sometimes with a darker dorsal stripe. It has a pear shaped body The antennae are dark at the joints between the segments and are longer than the body. The legs are longer than in other aphids, pale green but darker at the apices. The siphunculi are pale coloured, cylindrical with dark tips.

The winged forms has a uniform darker coloured body and appendages and has a green abdomen

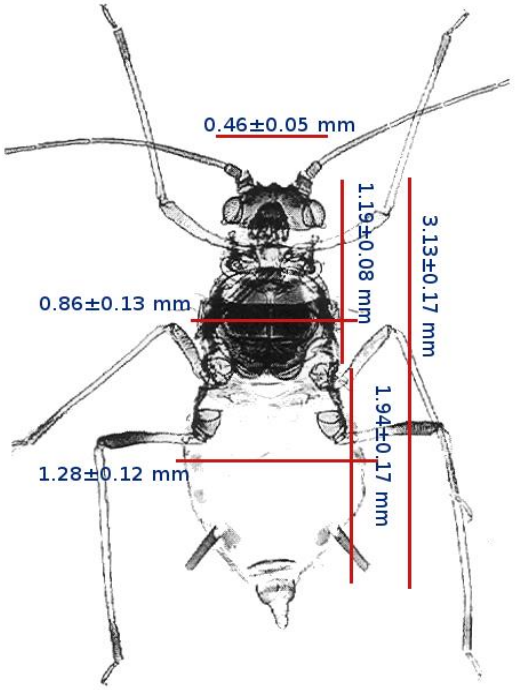

Figure 2: Biometrical measures of *Macrosiphum euphorbiae* (scheme)

CONCLUSIONS

The results are similar with literature showing that the body length of *Aulacorthum solani* is between 1.8 to 3.0 mm and the smallest length of the body established for aphids captured in West Zone of Romania was 1,90 mm, while the biggest was 3,0 mm. The average body length was 2,48 ± 0,35 mm.

At *Macrosiphum euphorbiae* the results are similar to those in the literature showing that the body length is between 2,3 – 3,4 mm and for aphids captured in West Zone of Romania the smallest length of the body established was 2,80 mm, while the biggest was 3,40 mm. The average body length was 3,13 ± 0,17 mm.

Comparing of measurements related to length of head and thorax, width of head, thorax length and width of the abdomen with data from the literature can not be made because not found their correspondent in the literature consulted.

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