

## RESEARCH REGARDING EXTERNAL ANATOMY OF *PHORODON HUMULI*

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**Abstract:** This paper presents data referring the morphological characteristics and biometrical measurements of *Phorodon humuli*, species captured from potato cultivations for a period of three years, from Didactic Station Timisoara and Varfurile, Arad County. The aphids have been collected with the yellow vessel traps on a three days. The adult wingless form of *Phorodon humuli* have a pear shape body and can be range from yellow to light green in colour with darker green longitudinal stripes on the upper surface of the abdomen. The head characteristically has a pair of elongate projections on the inside of the antennal tubercles. The siphunculi are thicker at their bases and slightly curved outwards at their tips. The cauda is blunt, light colour and short. The winged aphid are pale yellowish green with a dark head and thorax. The smallest length of the body established for aphids captured in West Zone of Romania was 1.45 mm, while the biggest was 2.30 mm. The average body length was  $1.95 \pm 0.24$  mm. Regarding the length of the head and thorax, it may be noticed that the maximum length of these parts was 1.10 mm and minimum length was 0.65 mm. The minimum width of head was 0.30 mm and the maximum width of head was 0.35 mm. The average value calculated for head width was  $0.86 \pm 0.12$  mm. As far as the thorax width is concerned, this was minimum 0.50 mm and maximum 0.85 mm. Mean thorax width was  $0.70 \pm 0.08$  mm. The mean length of the abdomen was  $1.10 \pm 0.13$  mm, while the average value calculated for abdomen width was  $0.84 \pm 0.12$  mm. In the existent literature from our country, there is little information referring to biometric measurement and for these reasons, knowing the following aspect is of paramount importance.

**Key word:** *Phorodon humuli*, biometrical measurements

### INTRODUCTION

Aphids are of great interest to applied entomologists because of their economic role in agriculture and horticulture; consequently many of the pest species are well researched and studied. Apart from weakening plants due to feeding, and the contamination by honey dew, aphids transmit plant viruses, and some produce galls or other growth distortions. (<http://www.wbrc.org.uk/WORCRECD/Issue%2023/aphids.htm>)

Hop aphids have piercing sucking mouthparts which are used to suck the phloem out of the plant. They secrete a sugary substance called "honey dew". This substance when secreted especially in hop cones, provides the perfect habitat for sooty mold fungi to grow. Plant productivity is reduced by aphid feeding on foliage yet the greater yield and quality problem that hop aphids cause is sooty mold. Aesthetic cone damage and decreased cone quality from sooty mold will diminish cone marketability. (<http://www.uvm.edu/extension/cropsoil/wp-content/uploads/Hop-Aphid.pdf>)

Heavy infestations reduce hop plant vigour and may induce defoliation. Even light infestations of the harvested hop cones can reduce their economic value. Added to this, it is able to transmit Hop mosaic carlavirus, Hop split leaf blotch virus and Hop line pattern virus. This species may also cause a little damage on plums, by curling young leaves and by transmitting Plum pox potyvirus. (<http://www.rothamsted.ac.uk/insect-survey-resources/aphid-species>)

**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 on a two days.

**RESULTS AND DISCUSSIONS**

The adult wingless form of *Phorodon humuli* have a pear shape body and can be range from yellow to light green in colour with darker green longitudinal stripes on the upper surface of the abdomen. The head characteristically has a pair of elongate projections on the inside of the antennal tubercles. The siphunculi are thicker at their bases and slightly curved outwards at their tips. The cauda is blunt, light colour and short. The winged aphid are pale yellowish green with a dark head and thorax.

It can be observed that, out of a total of 30 individuals of the species *Phorodon humuli*, (table 1) the smallest length of the body established for aphids captured in West Zone of Romania Romania was 1.45 mm, while the biggest was 2.30 mm.

Table 1

Biometrics measures *Phorodon humuli*

No.	Body length (mm)	Head+thorax length (mm)	Head width (mm)	Thorax width (mm)	Abdomen (mm)	
					Length	Width
1	2,30	1,10	0,30	0,80	1,20	1,10
2	2,30	1,05	0,35	0,80	1,25	1
3	2,30	1	0,30	0,85	1,30	1,10
4	2,20	1	0,30	0,80	1,20	1,05
5	2,20	0,95	0,35	0,80	1,25	0,95
6	2,15	0,90	0,30	0,80	1,25	0,95
7	2,10	1	0,30	0,80	1,10	0,95
8	2,10	0,90	0,30	0,75	1,30	0,85
9	2,20	1	0,30	0,70	1,20	0,85
10	2,20	1	0,30	0,70	1,20	0,80
11	2,10	0,95	0,30	0,70	1,15	0,85
12	2,10	0,90	0,30	0,70	1,20	0,85
13	2,10	0,90	0,30	0,70	1,20	0,80
14	2	0,90	0,30	0,70	1,10	0,85
15	2	0,85	0,30	0,70	1,15	0,85
16	2	0,85	0,30	0,70	1,15	0,80
17	1,90	0,85	0,30	0,70	1,05	0,80
18	1,90	0,75	0,30	0,70	1,15	0,80
19	1,80	0,85	0,30	0,70	1,05	0,80
20	1,80	0,80	0,30	0,75	1	0,90
21	1,80	0,80	0,30	0,70	1	0,80
22	1,70	0,70	0,30	0,60	1	0,75
23	1,70	0,70	0,30	0,70	1	0,70
24	1,70	0,75	0,30	0,60	0,95	0,85
25	1,70	0,65	0,30	0,60	1,05	0,80
26	1,70	0,70	0,30	0,65	1	0,75
27	1,70	0,70	0,30	0,60	1	0,75
28	1,65	0,75	0,30	0,60	0,90	0,70
29	1,60	0,70	0,30	0,60	0,90	0,65
30	1,45	0,70	0,30	0,50	0,75	0,55
Average	1,95	0,77	0,35	0,70	1,10	0,84
Average deviation	0,04	0,02	0,01	0,02	0,02	0,03
Standard deviation (s)	0,24	0,12	0,05	0,08	0,13	0,12
(m) Min	1,45	0,65	0,30	0,50	0,75	0,55
(M) Max	2,30	0,10	0,35	0,85	1,30	1,10

By analysing the data regarding the length of the head and thorax, it may be noticed that the maximum length of these parts was 1.10 mm and minimum length was 0.65 mm. The average value calculated for the length of these parts was  $0.86 \pm 0.12$  mm.

The minimum width of head was 0.30 mm and the maximum width of head was 0.35 mm. The average value calculated for head width was  $0.35 \pm 0.01$  mm.

As far as the thorax width is concerned, this was minimum 0.50 mm and maximum 0.85 mm. Mean thorax width was  $0.70 \pm 0.08$  mm

Analysing data on the length and width of the abdomen, it can be seen that the minimum length of the abdomen was 0.75 mm and minimum width was 0.55 mm, the maximum length of the abdomen was 1.30 mm and the maximum width was 1.10 mm. The mean length of the abdomen was  $1.10 \pm 0.13$  mm, while the average value calculated for abdomen width was  $0.84 \pm 0.12$  mm

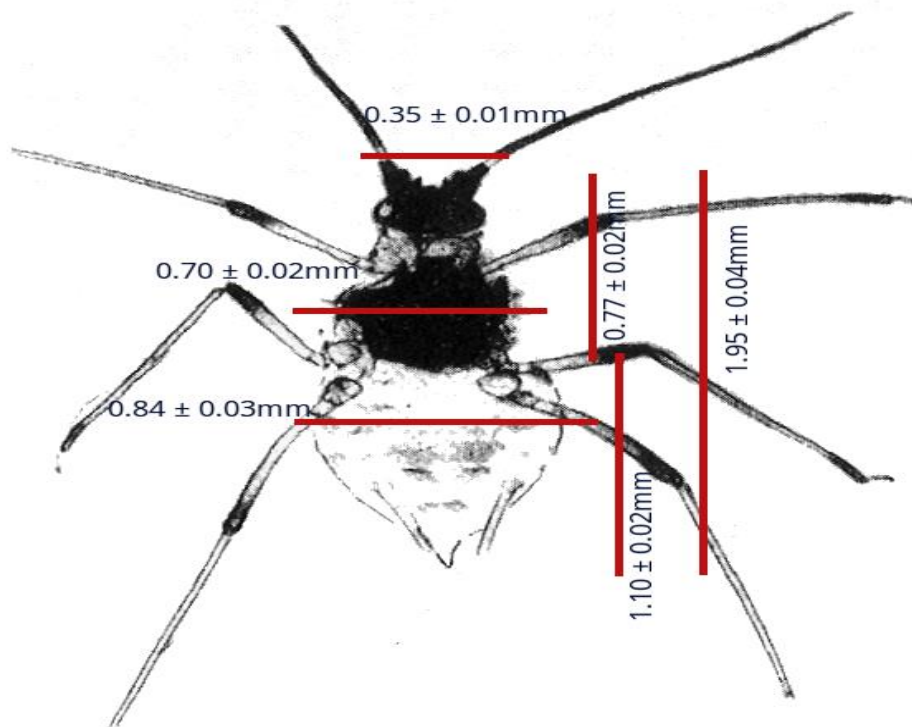


Figure 1: The body length of *Phorodon humuli*

### CONCLUSIONS

The species *Phorodon humuli* have at heat a pair of elongate projections on the inside of the antennal tubercles. Those tubercles have an important role in determining the species.

The body have a pear shape and can be range from yellow to light green in colour with darker green longitudinal stripes on the upper surface of the abdomen.

In West Zone of Romania Romania, at species *Phorodon humuli*, the smallest length of the body was 1.45 mm, while the biggest was 2.30 mm.

The average value calculated for the length of the head and thorax was  $0.86 \pm 0.12$  mm. The average value calculated for head width was  $0.35 \pm 0.01$  mm. Mean thorax width was  $0.70 \pm 0.08$  mm. The mean length of the abdomen was  $1.10 \pm 0.13$  mm, while the average value calculated for abdomen width was  $0.84 \pm 0.12$  mm.

The results are similarities to those in the literature which states that the body length of *Phorodon humuli* ranges from 1.5 - 2.5 mm and in the case of specimens collected in the Western part of Romania their average is  $1.95 \pm 0.24$  mm.

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