

Research Regarding Somatic Measurements at River Lobster Males (*Astacus Fluviatilis*)

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Abstract

The body measurements was made on 20 males of river lobsters (*Astacus fluviatilis* or *Astacus astacus*). The lobsters on witch the study was made had an average total length of body of 12.72 cm \pm 0.19 cm (formed from: 6.07 \pm 0.10cm the length of cefalothorax, 4.73 \pm 0.10 cm the length of abdomen and 1.91 \pm 0.07 cm length of telson), and a body weight of 55.70 \pm 3.07 g. the males present a length of feelers of 8.53 \pm 0.34 cm, a antennas of 2.20 \pm 0.05 cm, and the stem of the eyes of 0.51 \pm 0.02 cm. The body of male present a average width of 3.35 \pm 0.07 cm at level of cefalothorax, and 2.40 \pm 0.05 cm at abdomen level. Average deepness of cefalothorax was 2.85 \pm 0.07cm, and abdomen deepness of 1.34 \pm 0.03cm. The 5 pairs of periopode had an average length of 10.91 \pm 0.42 cm, 6.06 \pm 0.22 cm, 7.21 \pm 0.21 cm, 6.57 \pm 0.16 cm and 5.85 \pm 0.15cm. The average length of pleopods was at first pear of 2.00 \pm 0.06 cm, at second pair of 2.11 \pm 0.05 cm, at third of 1.85 \pm 0.05 cm, at fourth of 1.73 \pm 0.04 cm and at fifth pair of 1.55 \pm 0.04 cm.

Keywords: river lobster (*Astacus fluviatilis*), somatic measurements, body measures

1. Introduction

Regarding the controlled breeding of lobsters, individs use for reproduction, are chosen from the most well developed exemplars, picked from natural habitat. For being chosen with obiectivity, the lobsters has to be measured and weighing.

Because the big diversity of species and of habitats (rivers, lakes and ponds), its necessary to execute body measurements at river lobsters, regarding the very few number of informations from literature existing in Romania [2, 3, 4, 5, 6, 7], and from Europe [1, 8].

2. Materials and methods

The somatic measurements was made on 20 river lobster males (*Astacus fluviatilis* or *Astacus astacus*), picked from the Carp Farm Garla Mare, county Mehedinti, Romania. The body measurements was made with the metric ribbon or

with caliper, and the weigth determination with electronic weigthing machine. At river lobster males, involved in study, was followed the next somatic measurements: total length of the body (determinated with the metric ribbon from postorbital zone till the posterior extremity of telson), the length of cefalothorax (measured by the metric ribbon or with caliper from the postorbital part at anterior part of abdomen), the length of abdomen (established by the metric ribbon from the cranial extremity of the first segment till the 6th abdominal segment), the length of telson (measured by the demarcation between abdomen and telson at posterior extremity of telson), the legth of backlashes (determinated from the base of apex till the backlash of it), the length of the claws (measured from the base to the top), the width of cefalothorax (determined with the caliper in the moust width part of cefalothorax), the width of abdomen (measured with the caliper in the most width part of abdomen), the deepnes of cefalothorax (established with the caliper at the level of 3th abdominal segment in dorso-ventral sens), and the body weigth (established with the

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help of weighing machine). At individuals from checking probe, the average value of all

measurements was calculated, and also the parameters of dispersal.

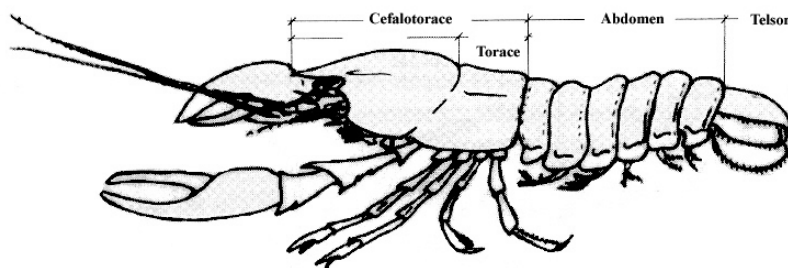


Figure 1. Delimitation of body regions at lobster (after Arrignon, 2004)

3. Results and discussion

Analyzing the first table, it can be observed that the 20 male river lobsters (*Astacus fluviatilis*), involved in study had an average total length of the body of 12.72±0.19 cm, and the extreme limits vary between 11.90 cm and 14.20 cm. For this character, exist between the individuals tested a small variability (CV=6.83%), and the average was satisfying ($S_{x\%} = 1.49\%$).

Males present an average length of cephalothorax of 6.07±0.10 cm, of abdomen 4.73±0.10 cm, of telson 1.91±0.07 cm. The total length of the body, was 12.72 cm, and was constituted in proportion of 48% from the length of cephalothorax, 37% from the length of abdomen, and 15% from the length of telson.

At all 20 males of river lobster (*Astacus fluviatilis*), the average length of antennas was

2.20±0.05 cm, and of feelers was 8.53±0.34 cm, and the stem of the eyes was 0.51±0.02 cm.

The body of river lobster males (*Astacus fluviatilis*), present an average width of cephalothorax of 3.35±0.07 cm, and of abdomen of 2.40±0.05 cm. The average deepness of cephalothorax was 2.85±0.07 cm, and of abdomen 1.34±0.03 cm.

The average weight of the body at all 20 males, was 55.70±3.07 g, and individual limits between a minimum of 40 g and a maximum of 78g. From the studied characters at river lobster males (*Astacus fluviatilis*), only the body weight present a high variability (CV=24.63%), and the average doesn't satisfy with precision ($S_{x\%} = 5.51\%$).

In the second table are showed the dimensions segment of first pair of pereopods at river lobster males (*Astacus fluviatilis*), involved in study.

Table 1. Somatic measurements at lobster males (*Astacus fluviatilis*)

No.	Specification	U.M.	Length							Width				Body weight (g)
			Total of the body	Cephalothorax	Abdomen	Telson	Antennas	Feelers	Stem of eyes	Cephalothorax	Abdomen	Cephalothorax	Abdomen	
1	n	individuals	20	20	20	20	20	20	20	20	20	20	20	20
2	X	cm	12.72	6.07	4.73	1.91	2.20	8.53	0.51	3.35	2.40	2.85	1.34	55.70
3	Sx	cm	0.19	0.10	0.10	0.07	0.05	0.34	0.02	0.07	0.05	0.07	0.03	3.07
4	S	cm	0.87	0.45	0.44	0.30	0.24	1.53	0.10	0.30	0.24	0.32	0.11	13.72
5	CV	%	6.83	7.45	9.36	15.65	11.04	17.95	18.98	9.01	10.12	11.30	8.53	24.63
6	Sx%	%	1.49	1.65	2.11	3.66	2.27	3.99	3.92	2.09	2.08	2.46	2.24	5.51
7	Minim	cm	11.90	5.50	4.00	1.50	1.80	6.50	0.40	2.90	2.10	2.30	1.20	40.00
8	Maxim	cm	14.20	6.70	5.50	2.50	2.50	10.80	0.60	3.90	2.80	3.30	1.60	78.00

Table 2. Segments dimension of the first pair of pereopods at lobster males (*Astacus fluviatilis*)

No	Specification	U.M.	Length							
			Left propod	Right propod	Dactylus	Carpopod	Meros	Ischium	Basis	coxa
1	n	individuals	20	20	20	20	20	20	20	20
2	X	cm	5.64	5.83	3.36	1.41	2.76	1.39	0.55	0.21
3	Sx	cm	0.34	0.30	0.13	0.04	0.07	0.07	0.02	0.01
4	S	cm	1.50	1.32	0.60	0.20	0.30	0.30	0.09	0.02
5	CV	%	26.60	22.66	17.76	13.98	10.93	21.76	17.20	10.91
6	Sx%	%	6.03	5.15	3.87	2.83	2.54	5.04	3.64	4.76
7	Minim	cm	3.00	4.00	2.70	1.00	2.20	0.90	0.40	0.20
8	Maxim	cm	8.00	8.20	4.50	1.70	3.20	1.70	0.70	0.30

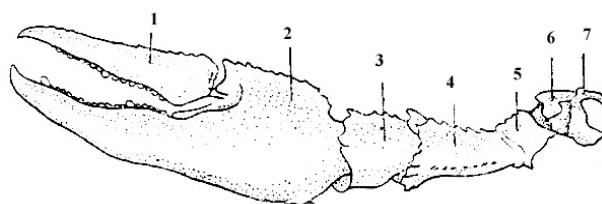


Figure 2. Lobster pereiopod (after Arrignon, 2004)

1 – dactylus; 2 – propod; 3 – carpopodus; 4 – meros; 5 – ischium; 6 – bazis; 7 - coxa

At all 20 males of river lobsters, the left propod measured in average 5.64 ± 0.34 cm, and the right one 5.83 ± 0.30 cm, dactylus has an average length of 3.36 ± 0.13 cm, carpopodium was of 1.41 ± 0.04 cm, meros 2.27 ± 0.07 cm, the ischium 1.39 ± 0.07 cm, bazis, 0.55 ± 0.02 cm and the coxa has an average length of 0.21 ± 0.01 cm. The total length of the first pereiopode is constituted from: 47.16% the propod, 11.79% carpopodium, 28.03% the legth of the first pereiopode of river lobster males.

In table number 3, is presented the legth of pereiopodes of river lobster males (*Astacus fluviatilis*).

The pereiopodes of lobster males had different lengths. The first pair measured in average 10.91 ± 0.42 cm, the second pair 6.06 ± 0.22 cm, the third pair 7.21 ± 0.21 cm, the fourth pair 6.57 ± 0.16 cm and the fifth pair 5.85 ± 0.15 cm. Reporting the average length of pereiopodes at average legth of the first pair of pereiopodes, the third pair touch 66.09%, the fourth 60.22%, the second pair 55.55%, and the fifth pair 53.99%. Between the males involved in study exist a medium variability (CV between 10% and 20%) for the length of all pereiopodes. The average established for every pair of pereiopdes has satisfy precision ($S_x \% < 5\%$).



Figure 3. River lobster male – ventral wieu (original photo).

Table 3. Pereiopodes length at lobster males (*Astacus fluviatilis*)

No.	Specification	U.M.	Length of pereiopodes				
			1	2	3	4	5
1	n	individs	20	20	20	20	20
2	X	cm	10.91	6.06	7.21	6.57	5.89
3	Sx	cm	0.42	0.22	0.21	0.16	0.15
4	S	cm	1.88	0.99	0.92	0.72	0.65
5	CV	%	17.27	16.38	12.75	10.91	11.03
6	Sx%	%	3.85	3.63	2.91	2.44	2.55
7	Minim	cm	8.50	5.00	6.00	5.50	5.00
8	Maxim	cm	13.90	8.00	8.50	7.60	6.70

In the table number 4, is presented the length of all 5 pairs of pleopodes at river lobster males (*Astacus fluviatilis*).

All the 20 river lobster males present an average length of the first pair of pleopodes of 2 ± 0.06 cm, at second pair of 2.11 ± 0.05 cm, and at third pair 1.85 ± 0.05 cm, at fourth pair of 1.73 ± 0.04 cm, and the fifth pair 1.55 ± 0.04 cm. In the lot all of the

five pleopode pairs had a average variability for the length of these. For all the pleopode pairs. The average length satisfy us as value and precision ($S_x\% < 5\%$). At river lobster males, the biggest length we find was at the second pair of pleopode, from witch the first pair represent 94.79%, the third pair 87.68% the fourth 81.99% and the fifth 73.46%.

Table 4. Pleopodes length at lobster males (*Astacus fluviatilis*)

No.	Specification	U.M.	Pleopodes length				
			1	2	3	4	5
1	n	individ	20	20	20	20	20
2	X	cm	2.00	2.11	1.85	1.73	1.55
3	Sx	cm	0.06	0.55	0.05	0.04	0.04
4	S	cm	0.25	0.24	0.22	0.18	0.17
5	CV	%	12.35	11.60	12.21	10.29	11.17
6	Sx%	%	3.00	26.07	2.70	2.31	2.58
7	Minim	cm	1.50	1.60	1.40	1.40	1.20
8	Maxim	cm	2.40	2.50	2.20	2.00	1.80

4. Conclusions

- All 20 de river lobster males (*Astacus fluviatilis*), had a total average length of the body of 12.72 ± 0.19 cm, and the cefalothorax measured 6.07 ± 0.10 cm, the abdomen 4.73 ± 0.10 cm, and the telson 1.91 ± 0.07 cm.
- River lobster males present an average length of feelers of 8.53 ± 0.34 cm and of antennas of 2.20 ± 0.05 cm, and of eyes stem of 0.51 ± 0.02 cm.
- The body of lobster males, had an average width at cefalothorax level of 3.35 ± 0.07 cm and at abdomen level of 2.40 ± 0.05 cm. The average deepness of cefalothorax was of 2.85 ± 0.07 cm, and at abdomen of 1.34 ± 0.03 cm.
- The average body weighth of males was 55.70 ± 3.07 g, and individual limits oscilated between a minimum of 40 g and a maximum of 78 g.
- The average length of pereopodes was at first pair 10.91 ± 0.42 cm, the second pair 6.06 ± 0.22 , the third 7.21 ± 0.21 cm, the fourth 6.57 ± 0.16 cm and the fifth pair 5.85 ± 0.15 cm. The length of the first pereopode was constituted from 47.16% propod, 11.79% carpopodes, 23.08% meros, 11.62% ischium, 4.06% bazis and 1.75% coxa. The length of dactilus represent 28.09% from the length of the first pereopode.
- The average length of pleopodes was at first pair of 2 ± 0.06 cm, at second of 2.11 ± 0.05 cm, at

third 1.85 ± 0.05 cm, at fourth 1.73 ± 0.04 and at fifth of 1.55 ± 0.04 cm.

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