



21-22 November, 2024

## THE EFFECT OF SOME FOOD SOURCES ON THE PRODUCTION OF ENCHYTRAEUS BUCHHOLZI (GRINDAL)

Adrian-Dan Rășinar, Tiberiu Polen, Octavian Sorin Voia, Cătălin Zoican, Dragoș Moraru  
University of Life Sciences "King Mihai I" from Timișoara, Faculty of Bioengineering of Animal Resources, Calea Aradului no.119

**Abstract:** Grindal worms are an important food source in aquaculture and aquarism. They are obtained with a relatively low production cost and the possibility of contamination with different pathogens is avoided compared to harvesting from nature. The aim of the work is the use in the feed of grindal worms of two recipes of wet feed based on milk 92% and wheat flour 8%, (Lots C1-C5) compared to milk 84%, egg 10% and flour 6% (Lots E1- E5) on the development of grindal biomass grown on a substrate represented by ground moss in a volume of 400 cm<sup>3</sup> with 84% humidity. Feeding and harvesting were performed once a day. The weighing was carried out with a precision of 0.01 g. Following the research, we found that groups E2-E5 achieved a significantly higher biomass production ( $p \leq 0.05$ ) by 1.53 grams per day, compared to groups C2-C5, with the exception of group E1, where an insignificant increase was found ( $p \geq 0.05$ ) compared to C1. Feed conversion was superior in the experimental groups compared to the control groups by 10.2 %. The production of grindal biomass per cm<sup>3</sup> of substrate in groups E1-E5 was significantly higher (0.232 g, compared to control groups C1-C5, which had an average of 0.209 g/cm<sup>3</sup>).

### • Introduction

*Enchytraeus buchholzi* or popularly known grindal worm belongs to the family Enchytraeidae of the order Enchytraeida. Together with earthworms and leeches, grindal worms are a group of oligochaete invertebrates. Small, thin, segmented bodies are characteristic of the Enchytraeidae family, which are adapted for living in moist soils and organic detritus. *Enchytraeus buchholzi* are also often found in places where there is decaying plant matter due to providing a nutrient-rich habitat. In aquaculture and aquarism, grindal worms are mainly used as live food due to their nutritional value. It is an excellent source of proteins and essential lipids for aquatic organisms and fish. Breeding is relatively easy, with low cost, making these worms a constant source of high quality food.

### • Material and method

In order to carry out the experiment, we used 10 square glass trays with sides of 20/20 cm in which we added the substrate for the culture of grindal worms. The substrate was made of ground moss (*Polytrichum commune*), washed and dried beforehand, in an amount of 40 g, moistened with 200 ml of water. The 10 culture media were divided into 2 batches (C vs E), of 5 trays each (C1-C5 and E1-E5 respectively). The trays were placed in two cabinets to protect them from possible attacks by mites or black flies. In batch C, we used as feed a paste consisting of cow's milk with 1.5% fat to which wheat flour was added. For batch E, we used a paste consisting of cow's milk with 1.5% fat, whole chicken egg and wheat flour. The experimental period lasted for 30 days, during which we collected the grindal worms daily, by scraping, and then we weighed them. The scraped biomass from the 10 culture trays was weighed daily with a precision of 0.01g and the resulting data were statistically processed by applying the t-test with the Statistica 7 Program.

### • Results and discussions

Table 4 shows the average daily amounts of harvested biomass (g).

Table 5 shows the production of biomass harvested during the 30 days of the experiment in the 2 experimental variants, as well as the amount of food consumed.

Table 4. Comparison between the grindal biomass harvested in the 2 experimental variants (g/daily average)

Code	Batch C		Batch E		Significance of differences	
	X	S	Code	X		S
C1	2.75	0.72	E1	3.02	0.42	0.27 <sup>ns</sup>
C2	2.78	0.46	E2	3.04	0.40	0.26 <sup>*</sup>
C3	2.75	0.31	E3	3.11	0.46	0.36 <sup>***</sup>
C4	2.80	0.39	E4	3.14	0.48	0.34 <sup>**</sup>
C5	2.83	0.47	E5	3.12	0.51	0.29 <sup>*</sup>
Total	13.91	0.73	Total	15.44	1.35	1.53 <sup>***</sup>

$p \leq 0.05$

X- average grindal biomass [g]

Table 5. Food conversion in grindal biomass

Code	Batch C			Batch E			Differences		
	Food consumed (g)	Total biomass (g)	CS	Code	Food consumed (g)	Total biomass (g)	CS	g (E-C)	% (E/C)
C1		82.5	2.18	E1		90.7	1.98	-0.2	90.83
C2		83.4	2.16	E2		91.3	1.97	-0.19	91.2
C3	180	82.4	2.18	E3	180	93.4	1.93	-0.25	88.53
C4		84.1	2.14	E4		94.2	1.91	-0.23	89.25
C5		84.8	2.12	E5		91.6	1.92	-0.2	90.57
Total	900	417.2	2.16	Total	900	463.2	1.94	-0.22	89.8

CS- specific consumption

### • Conclusions

The experimental batches that were fed with milk, egg and flour compared to the batches fed with milk and flour achieved a superior biomass production, of 1.53 g. The experimental batches also achieved 10.2% better feed conversion rates than the control batches. In the experimental batches (E) fed with the recipe containing milk, egg and flour we obtained, after the experiment, a higher production of grindal worm biomass, related to the culture volume, 11% higher compared to the control batches (C), which were fed milk and flour. The use of egg in the food structure, in the experimental batches, compared to the control batches, brought an increase in the production of worm biomass, a decrease in specific consumption and an increase in the amount of worm biomass related to the culture volume. In the following, we consider it is necessary to deepen the studies regarding other sources of food used, other culture substrates, the control over the pH, as well as the quality of the biomass obtained.