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PERFORMANCE OF NILE TILAPIA (*OREOCHROMIS NILOTICUS*) FED WITH DIFFERENT LEVELS OF SL491* BASED ON PROPOLIS RATIONS

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INTRODUCTION

Introducing the world's greatest potential for fish production through aquaculture, Brazil has been getting on with the creation of several species in inland aquaculture (Agridata, 2003) and its growing contribution to world production of fish, are alternatives to increase food production (Rojas, Fracalossi and Indrusiak, 2002).

The use of additives in animal feed can promote higher growth, improve the health and physiological fish, thus minimizing the mortality and poor development, and thus improving feed efficiency.

Propolis is a product consisting of a mixture of various natural resins, which are collected by bees from plants commonly visited by these insects. It has numerous actions highlighting the: antimicrobial, anti-HIV, antiviral, antifungal, antiparasitic and anti-inflammatory. It has an antiseptic, bacteriostatic and astringent (Bankova et al., 1998; Kujumgiev et al., 1999, Moreno et al., 1999; Castaldo and Capasso, 2002). Among the chemical compounds present in propolis are flavonoids stand (Castaldo and Capasso, 2002), which according to Grange and Davey (1990) are related to the antibacterial activity of propolis.

Fish farming, currently seeks more effectively to the production of meat, especially steaks. However to obtain sub-products can lead to greater profitability of the fish. Among these sub-products, this skin, which after passing through the tanning process, becomes a noble product and high quality.

The purpose of this study was to evaluate the performance of the fish and the physical and mechanical properties of leather Nile tilapia (*Oreochromis niloticus*) fed diets with different levels of inclusion of SL491* based on propolis.

MATERIALS AND METHODS

SL491* The product was prepared in the Laboratory of Pharmacology of the UEM, according to a methodology developed by Franco and Bueno (1999), and later incorporated into diets at five different levels. We used 96-reversed Nile tilapia sexually, with initial weight of 13g.

The fish were fed six different diets, each referring to a treatment. Therefore, five treatments (T1, T2, T3, T4 and T5) receiving different levels of inclusion of SL491* and a witness, ie, without inclusion (T6).

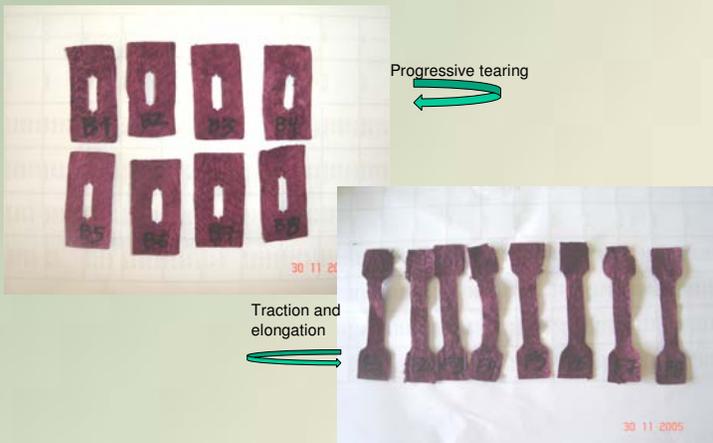
At the end of the experiment to slaughter, all subjects were numb with shock heat in cool boxes with crushed ice and water (1:1), weighed and measured for the measurements of the average final weight, total length, standard length average weight of the fillet, skin weight, weight of the clean skin without scales. After these measurements were calculated the average weight gain, feed conversion, the average total apparent consumption of food, the fillet, the percentages of gross skin and clean skin without scales, there was a weight / standard length and weight total length.

After the performance measurements were taken the skins of fish for processing and made the physical and mechanical characteristics.

The process that was applied to the skin consisted of the following steps: soaking, fleshing, liming, alkaline products remotion, purge, degrease, pickling, tanning, neutralization, retanning, dyeing, greasing, drying and softening (Hoinacki, 1989 and Souza, 2004).

The samples were identified and brought to the laboratory in air-conditioned environment at 23 ° C and relative humidity of 50% for a period of 24 hours. The tests were performed with EMIC dynamometer, with the speed of separation between charges of 100 ± 20 mm / mm. Before testing, we determine the thickness measurements of each specimen.

The data were subjected to analysis of variance at 5% probability and in case of significant differences test was used for comparison of means by Tukey ESTAT program.



RESULTS AND DISCUSSION

Table 1 shows the figures for the average weight of fish in four time periods, and the first three periods there was no effect of adding SL491*. There was a difference between the average weights of fish in the 4th period. There is evidence that the addition of the SL491* can be added to the T4 level, because they noticed an increase in weight of fish in the same ascending order of addition of the SL491*.

Table 1 - Mean values of the weights of fish fed diets with different levels of addition of the SL491*

Treatments	Intervalo				Teste F
	P1	P2	P3	P4	
T1	34,52Aa	37,37Aa	65,74Ba	134,26Cbc	1,66 ^{NS}
T2	35,54Aa	39,27Aa	67,06Ba	143,37Cbc	
T3	35,36Aa	39,50Aa	66,40Ba	145,85Cabc	
T4	33,93Aa	37,17Aa	65,23Ba	160,44Ca	
T5	35,97Aa	39,39Aa	62,54Ba	149,84Cbc	
T6	35,33Aa	38,08Aa	62,54Ba	130,10Cc	
Test F	972,77**				T x P = 2,05*
CV (%)	11,17				

Regarding the average weight gain of fish (Table 2) was observed a difference between the average weight gain of fish in the 3rd range. You can see evidence that the addition of the SL491* can be added to the T4 level.

Table 2 - Mean values of weight gain of fish fed diets with different levels of addition of the SL491*

Variables	Intervalo			Teste F
	1 = P1 - P2	2 = P2 - P3	3 = P3 - P4	
T1	2,85Aa	28,38Ba	71,75Cbc	2,61*
T2	3,73Aa	27,80Ba	76,31Cbc	
T3	4,13Aa	26,90Ba	77,10Cbc	
T4	3,24Aa	28,06Ba	99,34Ca	
T5	3,42Aa	27,00Ba	87,33Cab	
T6	2,74Aa	28,45Ba	69,72Cc	
Test F	590,26**			T x P = 2,68*
CV (%)	21,44			

Table 3 - Mean values of the analysis of progressive tear leather fish fed diets with different levels of addition of the SL491*

Variables	Progressive tearing						CV(%)
	T1	T2	T3	T4	T5	T6	
F. max(N)	15,00a	16,25a	18,57a	15,86a	14,50a	14,00a	20,76
P. tearing (N/mm)	40,57 ^a	43,27a	49,94a	38,06a	34,70a	51,08a	23,74
Thickness (mm)	0,370ab	0,376ab	0,377ab	0,423a	0,428a	0,352b	11,51

Table 4 - Mean values of the analysis of resistance of leather tilapia longitudinal length of the body, fed diets with different levels of addition of the SL491*

Variables	Traction and elongation						CV(%)
	T1	T2	T3	T4	T5	T6	
F. Max (N)	50,00a	65,62a	69,75 ^a	58,43a	56,60a	55,14a	22,50
Traction	16,94a	20,02a	20,91a	14,96a	14,44a	17,69a	28,36
Elongation (%)	52,86a	61,50 ^a	62,37a	60,14a	71,00a	62,43a	10,39

CONCLUSIONS

The addition of SL491* based on propolis promoted a positive effect on the weight of fish in weight gain and thickness of leather.

The feed conversion ratio, average total apparent consumption of food, the average yield and average weight of the fillet, the average yield, average weight of the skin area and resistance of the leather were not influenced by the addition of the SL491*.

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