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THE USE OF GRAPE POMACE IN FEEDING COMMON CARP (CYPRINUS CARPIO L.)

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Abstract :

This study investigated the effects of incorporating grape pomace into fish diets on the growth performance, physiological parameters, and biochemical composition of carp (*Cyprinus carpio* L.). A total of 100 carp, with an average initial weight of 50 g, were reared in a recirculating aquaculture system. They were divided into a control group, fed with a diet containing 0% grape pomace, and two experimental groups (R1 and R2), fed with diets containing 5% and 10% grape pomace, respectively.

The experiment lasted for ten weeks, results revealed that most growth parameters were not significantly affected by grape pomace inclusion. The biochemical evaluation of carp meat confirmed considerable variations in moisture, fat, protein, salt and collagen. Furthermore, the oxidative reputation evaluation indicated that grape pomace supplementation modulates oxidative strain and lipid peroxidation pathways in carp, improving their antioxidant defenses and ordinary health.

• Introduction

Aquaculture production has been increasing in recent years, showing a positive trend. It is the sector with the highest growth. Grape pomace is the leftover from making wine and consists of squashed grape skins, grape pulp, and seeds. The percentage of grape pomace generated from wine production is 30%. The primary benefit of using grape pomace in carp food are its antioxidant properties, fatty acid and protein content, fiber and mineral content, affordability, and contribution to promoting a circular economy. The primary drawbacks of using grape pomace in carp feed include the existence of antinutrients, decreased tastiness, and the requirement for it to be dehydrated prior to being added to feeds. Numerous studies have indicated that grape pomace can prevent the growth of bacteria, fungi, and protozoa in different animal species, and it also has anti-viral properties.

• Material and method

We carried out a controlled natural breeding experiment using *Cyprinus carpio* L., parent fish, obtained from our research facility. The fry that hatched were raised for four months in a pond made of earth. After this time, in September, 150 samples were chosen for additional testing. The chosen fish were moved to a recirculating aquaculture system furnished with fiberglass tanks.

%	Grape Pomace	
	Dried	Fresh
Protein	17.00%	18.50%
Moisture	8.86%	21.04%
Ash	9.92%	0.80%
Fat	7.34%	8.93%
Fiber	8.97%	5.06%
Starch	19.21%	15.83%
Sugar	10.21%	5.14%
Ca	0.33%	5.89%

Table 1. Chemical
Composition of Grape
Pomace

Ingredient %	Control (%)	R1 (5%)	R2 (10%)
Corn	15	10.5	8.6
Sunflower meal	40	40	39.3
Peas	17	17	17
Soybean oil	3	3.3	3.3
Barley	5	4.3	4.3
DDGS	9	9	9
Grape pomace	0	5	10

Table 2. Experimental Diets
Recipes with Grape
pomace for Carp.

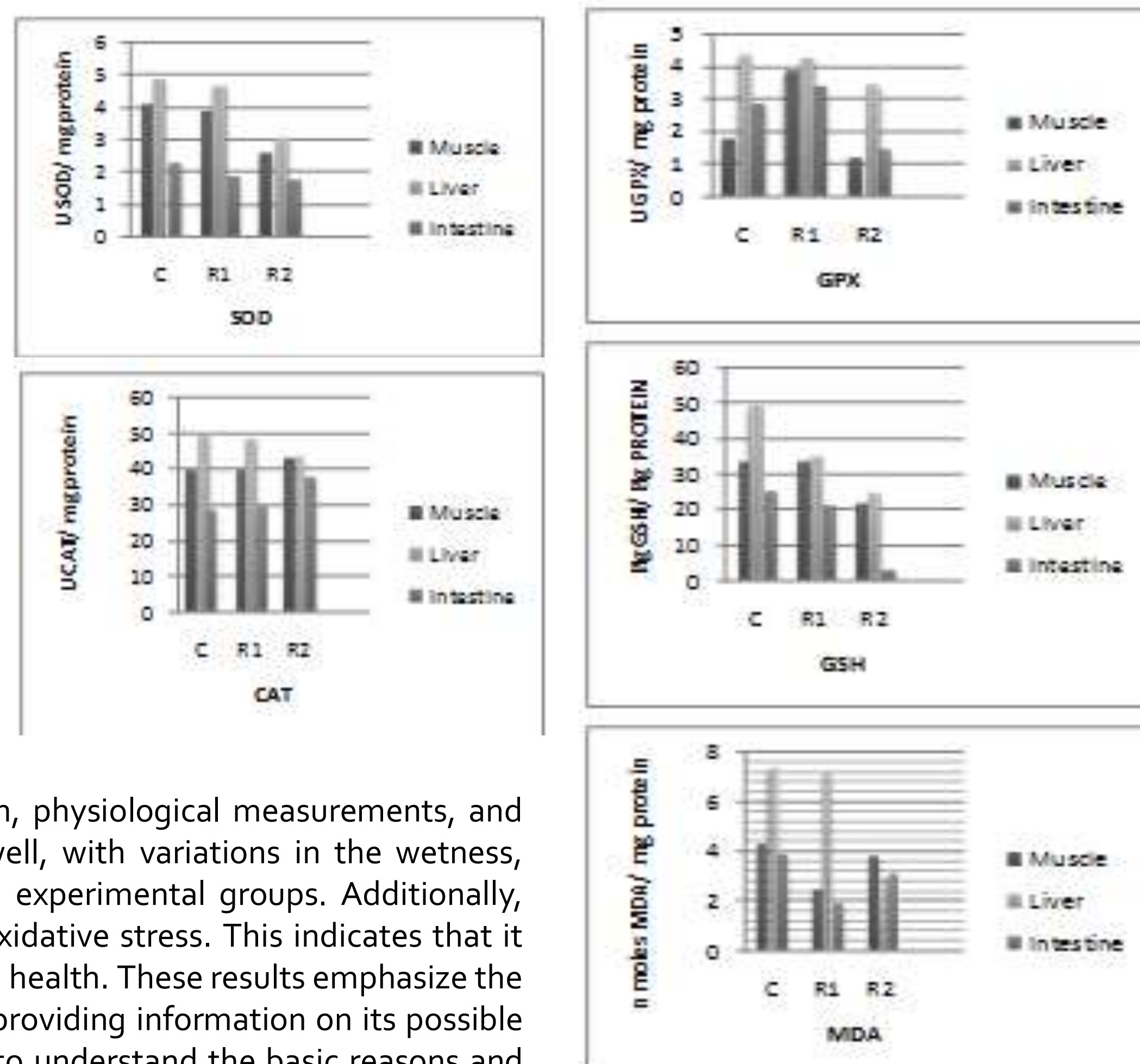
• Results and discussions

The growth characteristics and physical reactions were examined under different conditions using grape pomace, as outlined in Table 3. In general, there were no major differences noted in the majority of the measures. However, there was a noticeable difference in hepatosomatic index among treatments, with a significant variation being found.

Table 3. Chemical composition of carp meat.

Diets	Control (0%)	R1 (5%)	R2 (10%)
Protein	13.5	12.34	15.2
Fat	7.23	12.98	7.93
Moisture	73.4	71.2	72.34
Salt	2.96	2.39	2.48
Ash	1.32	1.9	2.4
Collagen	0.6	1.30	0.3

Figure 1. The impact of grape pomace on the levels of oxidation in the muscle, liver, and intestine tissues of *Cyprinus carpio*. The enzyme factors included measuring SOD, CAT, and GPx particular activities, while the non-enzymatic factors included estimating the levels of GSH and MDA.



• Conclusions

Adding grape pomace to carp diets had different effects on their growth, physiological measurements, and biochemical makeup. The chemical makeup of carp meat changes as well, with variations in the wetness, protein, collagen, fat, and salt levels observed between the control and experimental groups. Additionally, using grape pomace as a supplement has shown promise in controlling oxidative stress. This indicates that it may help to improve antioxidant defenses and have an impact on intestinal health. These results emphasize the significance of grape pomace as a sustainable ingredient in fish farming, providing information on its possible advantages for the health and nutrition of fish. More research is needed to understand the basic reasons and improve the amount of grape pomace in fish food to maximize its nutritional and health benefits.