

读书报告

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Dietary curcumin influences leptin, growth hormone and hepatic growth factors in Tilapia (*Oreochromis mossambicus*)



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1. Introduction

The rising global population requires an additional 23 million tonnes of aquatic foods to maintain atleast the current level of per-capita consumption. Meeting the future demand for food from aqua-

effects in mammals (Londraville et al., 2014; Douros et al., 2014; Won et al., 2012).

Somatic growth is a polygenic trait that is regulated by several physiological pathways that are responsive to environmental and nutritional status (De-Santis and Jerry, 2007). The growth hormone (GH)



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A pink watercolor splash graphic with irregular, feathered edges, centered behind the number 01.

01

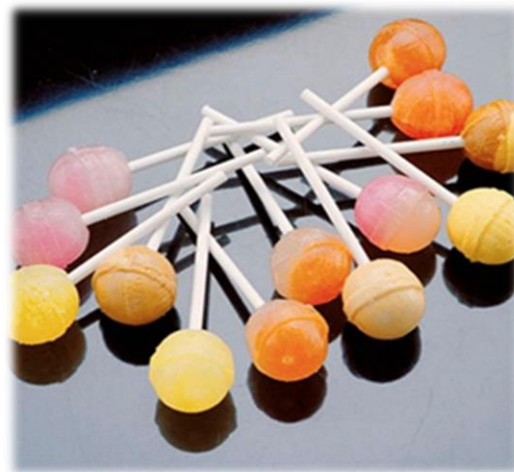
背景介绍

1

背景介绍



姜黄素，是从姜科植物根茎中提取的一种多酚类物质，是研究最广泛的天然化合物之一。



长期以来，姜黄素就作为一种常用的天然色素，在食品工业中被广泛地应用，此外，它还具有抗氧化，抗癌，抗微生物和抗菌的特性。近年来，植物化学物质和中草药在鱼类养殖中的应用已有诸多研究，但有关姜黄素在水产养殖中的研究却是有限的。

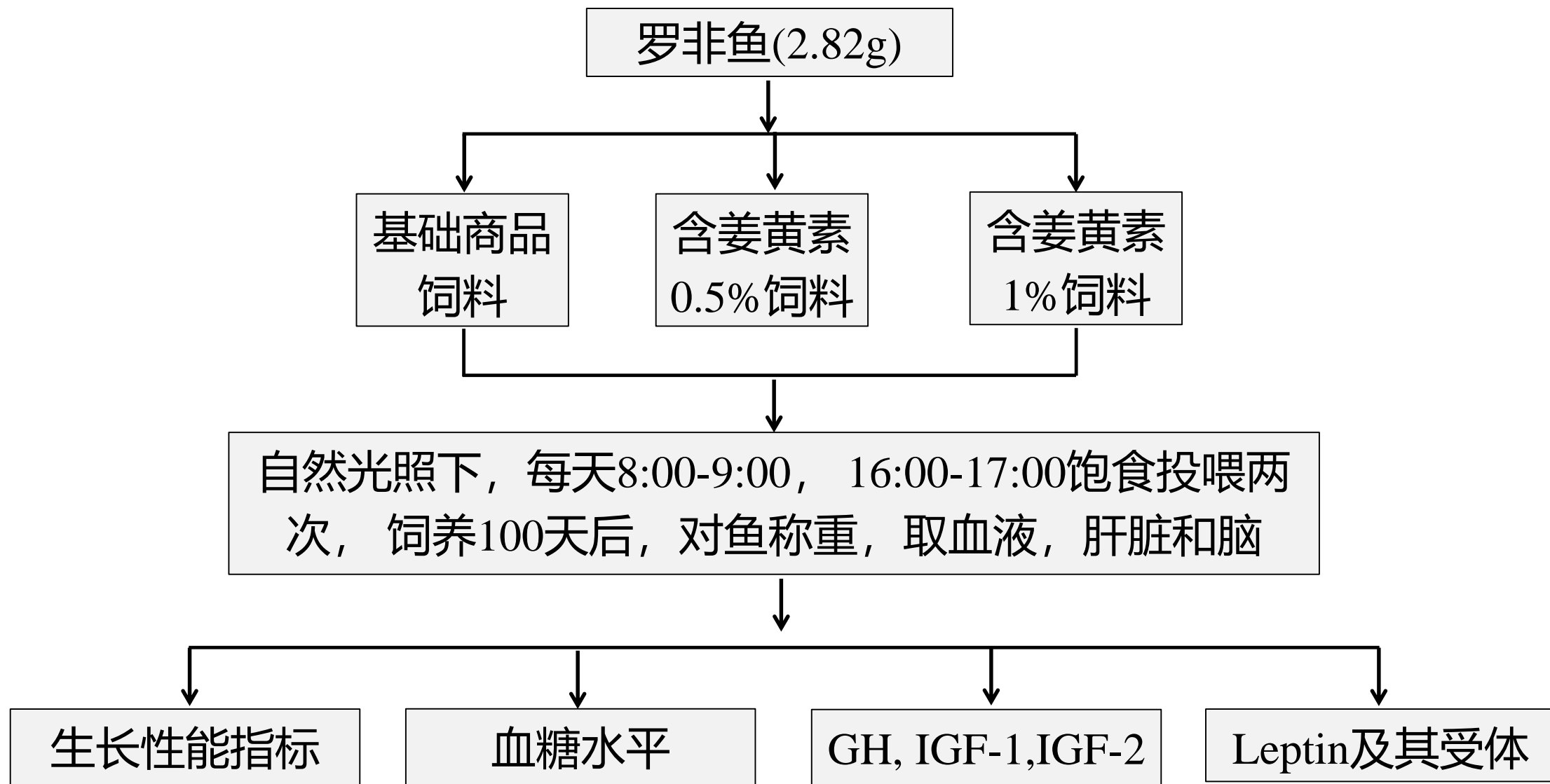


本文以罗非鱼为研究对象，旨在探究长期摄取姜黄素对罗非鱼摄食、代谢和生长的影响及其与瘦素和GH-IGF轴的相互作用。



02

材料与amp;方法





03

研究内容与结果



引物序列

Table 1

Details of primers.

Name of gene	Forward primer	Reverse primer
GH	AGCAACGTCAGCTCAACAAA	CGATCGGGCTGATGATGTA
IGF-1	GGGAAGGAACAAATGGACAA	TTACAGTGAACCATTCCACAGG
IGF-2	CAACAGGCCAGTATGGGAAA	ACAGGAGATGGGAGGACAGAT
Leptin	AAAGTGAAGTGGATGGCTGA	TGGGACCTGTACGTCTTTGTC
Leptin receptor	AAAAGTGAAGTGGATGGCTGA	TGGGACCTGTACGTCTTTGTC
β Actin	ACCCACACAGTGCCCATC	CAGGTCCAGACGCAGGAT

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生长性能指标

Table 2

Effects of dietary curcumin on growth performance in *Oreochromis mossambicus*.

Item/group	Control	0.5% Curcumin	1% Curcumin
IBW(g) 初重	2.82 ± 0.02 ^a	2.85 ± 0.01 ^a	2.84 ± 0.02 ^a
FBW(g) 末重	21.36 ± 0.1 ^a	34.63 ± 0.39 ^c	27.51 ± 0.17 ^b
Weight gain(g) 增重	18.54 ± 0.09 ^a	31.78 ± 0.39 ^c	24.66 ± 0.16 ^b
Weight gain(%) 增重率	657.66 ± 4.52 ^a	111.48 ± 1.44 ^c	868.77 ± 6.9 ^b
SGR(%/day) 特定生长率	2.25 ± 0.01 ^a	2.77 ± 0.01 ^c	2.52 ± 0.01 ^b
FCR(g) 饵料系数	1.36 ± 0.01 ^c	0.808 ± 0.01 ^a	1.04 ± 0.01 ^b
FI(g) 食物摄取量	5.51 ± 0.2 ^a	4.58 ± .09 ^b	4.26 ± 0.003 ^c

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姜黄素对肝脏指数的影响

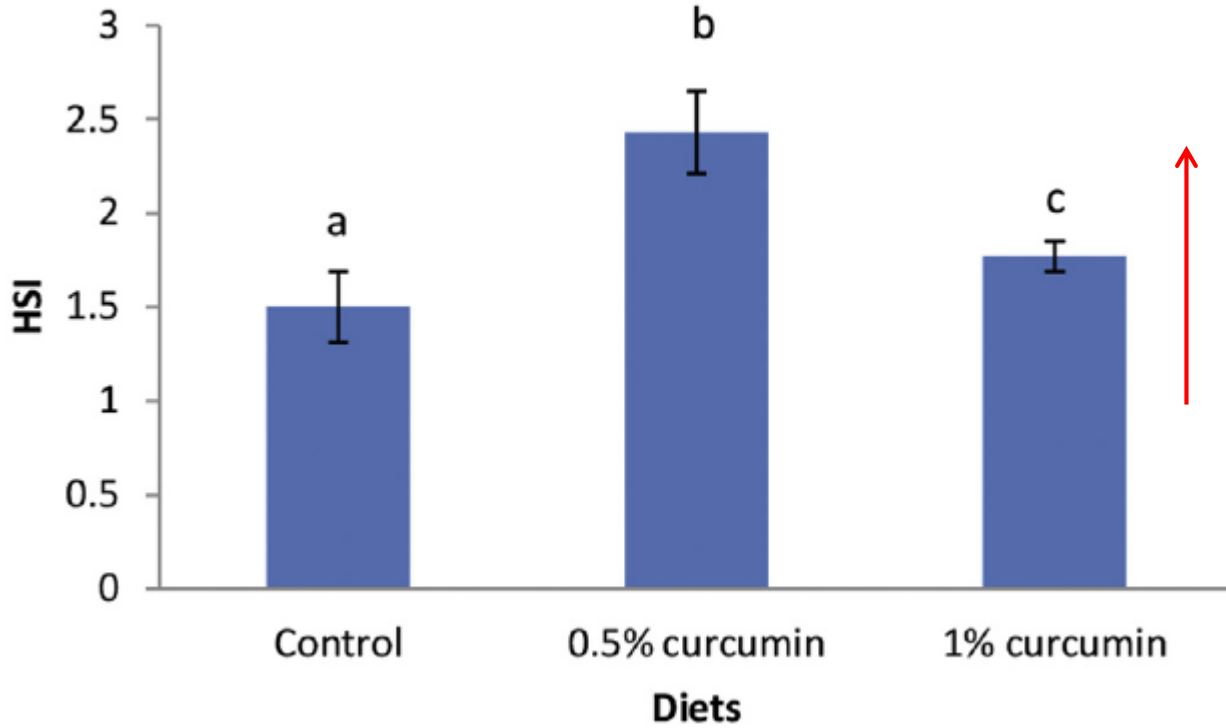


Fig. 1. Effect of dietary curcumin on Hepato Somatic Index (HSI) in *O. mossambicus*.

Values are means \pm SE. Those having different letters are significantly different as determined by one way ANOVA in Duncun's multiple range test ($P \leq 0.05$). Control- fish fed with basal feed; 0.5% curcumin- 0.5% curcumin supplemented with basal feed; 1% curcumin- 1% curcumin supplemented with basal feed.

体重的增加与肝脏指数值的显著升高有关

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血糖水平

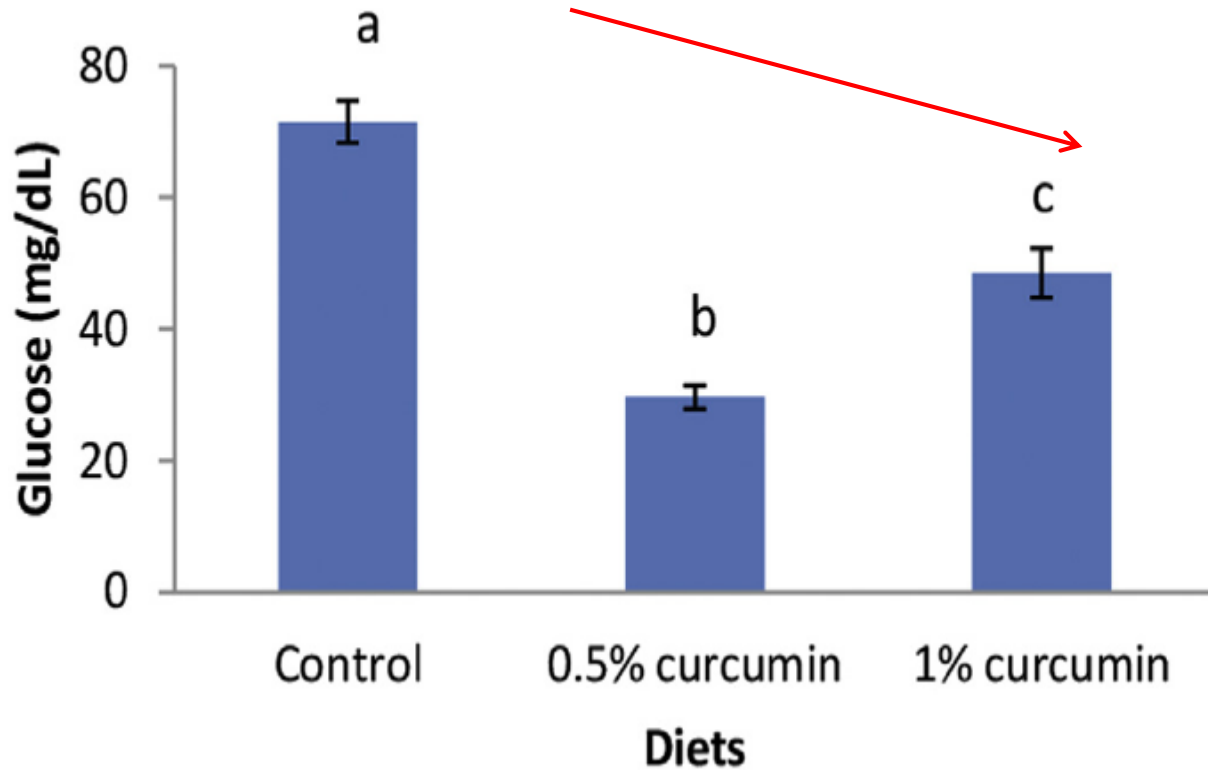
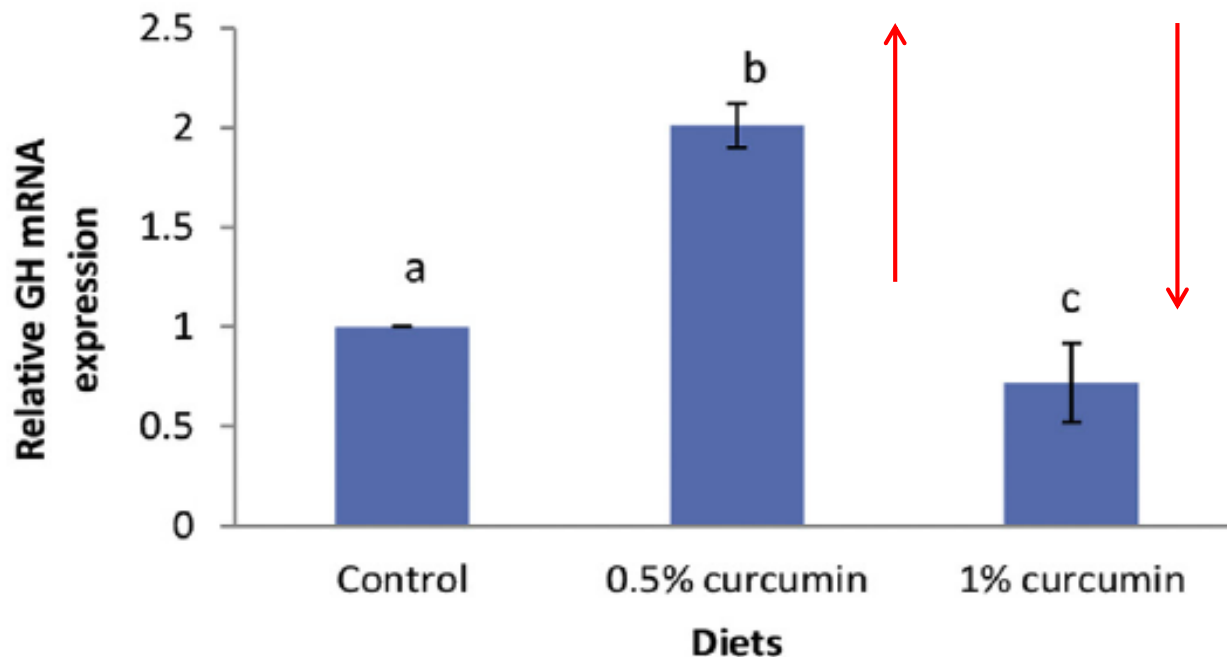


Fig. 2. Effect of dietary curcumin on blood glucose level in *O. mossambicus*. Values are means \pm SE. Those having different letters are significantly different as determined by one way ANOVA in Duncan's multiple range test ($P \leq 0.05$). Control- fish fed with basal feed; 0.5% curcumin- 0.5% curcumin supplemented with basal feed; 1% curcumin- 1% curcumin supplemented with basal feed.

姜黄素可能通过促进葡萄糖摄取和糖原生成来降低血糖水平，进而调控罗非鱼的生长。

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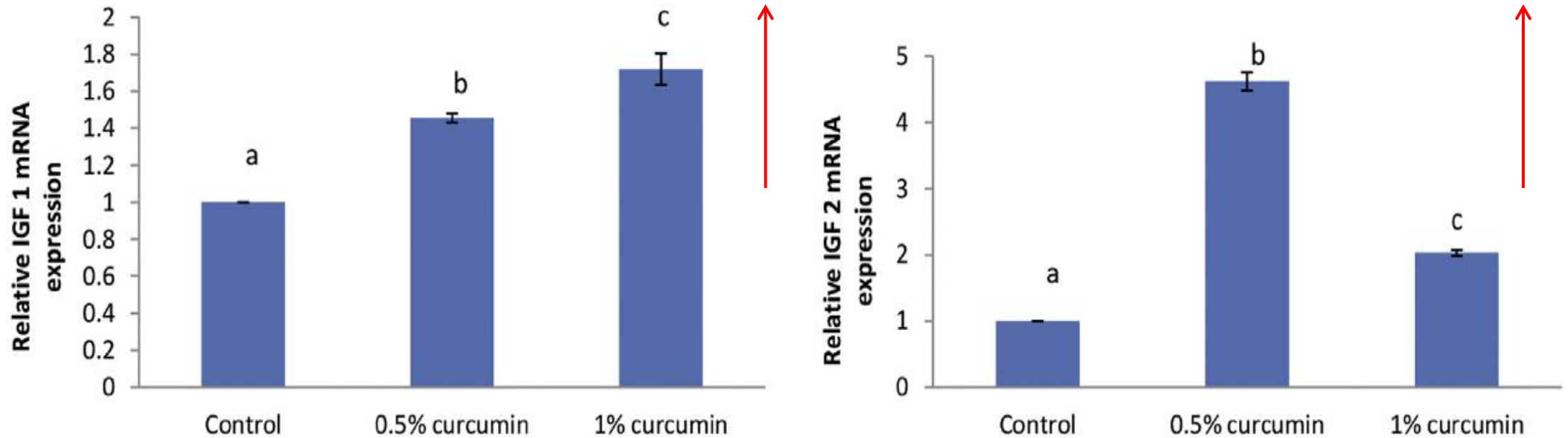
姜黄素对脑GH表达量的影响



饲料中添加0.5%姜黄素促进了GH的表达量，可推断出姜黄素可以对GH基因的转录发挥正调节作用，从而提高生长速率。

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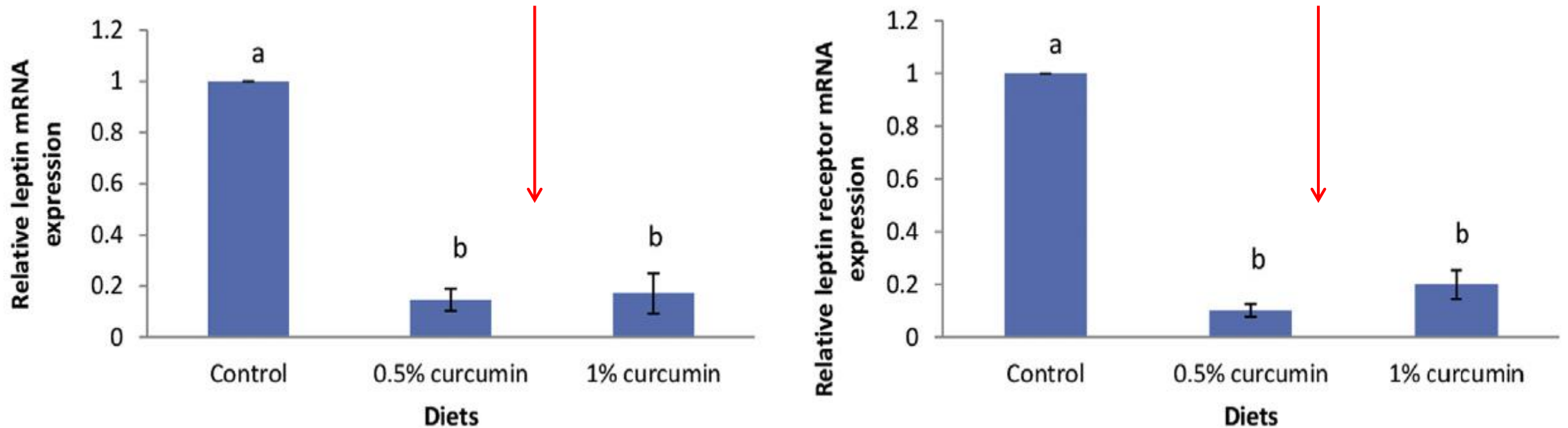
姜黄素对肝脏IGF表达量的影响



姜黄素可通过促进IGF1和IGF2的表达来刺激体细胞的增殖变大，进而促进罗非鱼的生长。

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姜黄素对肝脏leptin及其受体表达量的影响



姜黄素可通过抑制leptin及其受体的表达来调控罗非鱼的摄食和生长。



04

结 论

1. 0.5%和1%剂量的姜黄素均可改善罗非鱼的生长性能，但添加0.5%姜黄素的FCR最小，表明饲料中添加0.5%的姜黄素可实现最大增长的最小饲料消耗量。
2. 姜黄素可能通过抑制瘦素及其受体基因的表达来促进葡萄糖摄取，进而起到降血糖的作用，这表明姜黄素可通过增加营养吸收来促进生长。
3. 姜黄素可通过促进GH，IGF-1和IGF-2的表达来调控生长。



05

思 考

通过本文，我对leptin与摄食，生长之间的关系有了更进一步的了解，这对我更好地完善和执行课题研究有很大帮助。

请各位老师批评指正