

Acknowledgements

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EFFECT OF THE BIOGENIC PERFORMANCE ENHANCER (ASCOGEN "S") ON GROWTH RATE OF TILAPIA FISH

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Introduction

Many data are available on the use of ascogen "S" as a growth factor in sows, broilers, layer breeders, laying hens, breeding calves, fur-bearing animals, dogs, cats, cows, buffaloes and sheep (1). No literature were found about its effect on fish growth. This initiated the study of growth promoting effect of ascogen "S" in tilapia and its effect on some blood criteria and histopathology of internal organs.

Materials and methods

Ascogen "S", was kindly supplied from Chemoforma Co., BASEL-Switzerland. It consists of a biological active multicomponent complex of the metabolites of nucleotide metabolism (pyrimidine and purine). Thermolysed dry yeast and distillers waste act as carrier of the active complex. Six hundred cross monosex of Tilapia hybrids, 21 day old were used. The fish were divided into 3 equal groups (200 each). Fish of group I were fed on drug-free feed and kept as control, whereas those of group II and III were fed on rations mixed with ascogen "S" 2 g/kg and 5 g/kg feed, respectively.

The effect of feeding ascogen "S" on absolute body weight, body weight gain, average daily growth rate of individual fish, total length and feed efficiency were estimated every two weeks till the end of the 16th week. The length-weight relationship was calculated (2), where the Fulton's condition factor (K) and instantaneous growth rate (IGR) for weights and length were calculated every two weeks till 16 weeks. The effect of ascogen "S" on blood criteria (RBCs, WBCs count, PCV and haemoglobin percent), survival percent as well as histopathological changes in some internal organs were also studied.

Results

Ascogen "S" showed a significant effect on absolute body weight, body weight gain and total length; whereas the feed efficiency, average daily growth rate, survival percent were improved and the K and IGR value (mean \pm SEM) were increased as shown in Table 1.

Table 1. Mean effects of ascogen "S" on growth parameters of Tilapia fish

| Parameters (per 2 weeks) | Units | Control | Ascogen "S" | | |
|--|-------|--------------------|---------------------|---------------------|---|
| | | | 0 | 2 | 5 |
| Dose (g/kg feed) | | | | 2 | 5 |
| Absolute body weight* | g | 12.024 \pm 0.106 | 16.084 \pm 0.142* | 18.836 \pm 0.196* | |
| Body weight gain* | g | 4.670 \pm 0.040 | 6.340 \pm 0.049* | 7.440 \pm 0.091* | |
| Av.daily growth rate [‡] /16 wks. | g/day | 0.311 \pm 0.098 | 0.423 \pm 0.130 | 0.496 \pm 0.151 | |
| Total length* | cm | 7.795 \pm 0.044 | 8.308 \pm 0.053* | 8.644 \pm 0.047* | |
| Feed conversion ratio [§] | | 2.140 \pm 0.078 | 2.090 \pm 0.081 | 2.060 \pm 0.083 | |
| Survival percent [‡] /16 weeks | % | 90.5 | 95.0 | 97.0 | |
| Condition (K) value* | | 1.724 \pm 0.010 | 1.806 \pm 0.010* | 1.855 \pm 0.017* | |
| IGR value* for: | | | | | |
| - weight | | 0.041 \pm 0.001 | 0.045 \pm 0.001* | 0.048 \pm 0.001* | |
| - length | | 0.014 \pm 0.0002 | 0.015 \pm 0.0002* | 0.017 \pm 0.0002* | |

* Significant at (P<0.001); + (n = 50); § (n = 200).

RBCs, WBCs count, PCV and haemoglobin percent were significantly increased after 8 and 16 weeks supplementation as illustrated in Figure 1. No pathological changes were observed after ascogen "S" supplementation.

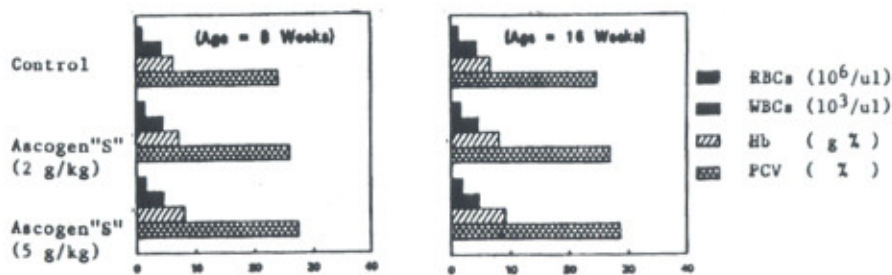


Figure 1. Effect of dietary ascogen "S" on blood picture of Tilapia fish (n=25).

Discussion

Our results revealed that ascogen "S" under the ^{typical & subtropical} ~~Equatorial~~ environmental conditions significantly increased the growth parameters in growing tilapia fish. This positive response of ascogen "S" is better than that of anabolic steroids(3), methyltestosterone(4), somatotropin(5) and somatomedin-C(6), respectively. The effect of ascogen "S" is based on the use of naturally arising metabolites as active

substances for a nutritional performance promotion. As it has been shown previously in higher animals, such as swine, cows and poultry, these biogenic performance promoters have a positive effect on the intestinal flora, thereby improving the digestion (7). Ascogen "S" ameliorates the availability of natural feed, the supply of nutrients and the utilisation of energy influencing the growth of animals as confirmed by (8). The results of this study show that a similar mechanism could exist in fish as well.

The highly significant positive effect of ascogen "S" on blood parameters was also monitored in poultry (1) and swine (9).

No pathological changes were observed in the tissues of fish fed with ascogen "S" for 16 weeks, indicating its safety when used as growth promoter for longer periods. This may be due to safety of ascogen "S" and its higher content of essential substances stimulating growth of tissue cells (7). Ascogen "S" is thus recommended to be used successfully as replacement for hormones and other drugs used in fish breeding with no harmful side effects.

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