Growth and Feed Conversion Ratios of Albino and Normal Pigmented Rainbow Trout (*Oncorhynchus mykiss*)

Tayfun Karataş, Esat Mahmut Kocaman

Abstract

Here, we have compared the growth performance, daily feed consumption and feed conversion ratio of albino, normally pigmented rainbow trout (*Oncorhynchus mykiss*) and mixed group (albino and normally pigmented rainbow trout) which was subject to pure and mixed species culture conditions. In the study, initial average fish weights were 1.64±0.1g. Groups were normal pigmented rainbow trout (50), mixed (normal (25), albino (25)) and pure albino (50). The 120 day experiment was conducted as three groups and two replicates for each group. At the end of the study, average final weights were 19.3 g (pure normal), 17.2 g (pure albino) and 15.3 g mixed (normal and albino) were significantly different (P<0.05). Mean feed conversion ratios and specific growth ratios were not statistically significant among the groups (P>0.05). But, feed conversion ratio in mixed group was found slightly lower than others.

Keywords: Rainbow trout, *Oncorhynchus mykiss*, albino pigmentation, growth performance, feed conversion ratio.

1. Introduction

The purpose of industrial fish farming is to obtain maximum product from water. On this subject is conducted many researches both in the world and in our country. These researches particularly have concentrated on species with high economic value [1]. Rainbow trout is one of the most extensively reared species in Turkey and in other parts of the World [2]. The most important reason for the choice of rainbow trout for rearing shows the performance of the high development and the short duration of the incubation period and the adaptation to environmental conditions of these fish [3].

Albinism is a genetic disorder produced by an autosomal recessive gene in the homozygous state caused by the deficiency in melanin production [4]. The true albinism is recognized by the total lack of melanin, thus determining the pink or yellowish body color and red eyes [5]. However, there is another form of depigmentation considered partial albinism [6]. A recent term, known as leucism, has also been introduced to the animals with abnormal skin pigmentation but normal eye color [7]. In natural environment, there are several reports of total or partial albinism in freshwater fishes [9, 10] and marine fishes [11, 12, 13]. Some cases of total or partial albinism in *Siluriformes* have been reported, e.g., *Ictalurus punctatus* [4], *Trichomycterus itacarambiensis* [14], *Rhamdella minuta* [5] *Schizolecis guntheri* [15], *Ameiurus catus* [16] and *Phreatobius cisternarum* [17].

In this study, the growth, daily feed consumption and feed conversion, specific growth of the albino along with normally pigmented rainbow trout which were cultured in tanks as pure normal, pure albino, and mixed groups were compared.

2. Materials and method

2.1 The Experimental animals and feeding

Fish, with an average weight of 1.64±0.1 g, was obtained Atatürk University, Faculty of Fisheries Inland water fish breeding and Research Center. The fish were acclimated to the experimental conditions for one week prior to the start of the experiment. Fish taken randomly from each group were fed in controlled manner. Fish were weighed with a sensitive scale in every 15 days throughout 120 days and amounts of the daily feed given to
2. Water quality parameters

Water parameters of tank water are: temperature (9.6-10.5°C); pH (7.4 and 7.9±0.5); dissolved oxygen (10.5±0.6 mg/L); water hardness (174.1±3.21 mg/L).

Table 1: The experimental groups and replications in the study.

<table>
<thead>
<tr>
<th>Groups or Treatments</th>
<th>Replications</th>
<th>Number of Fish</th>
</tr>
</thead>
<tbody>
<tr>
<td>normally pigmented rainbow trout (pure normal)</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>all albino (pure albino)</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>mixed (N+A)</td>
<td>2</td>
<td>50</td>
</tr>
</tbody>
</table>

2.2 Experimental design

50 fish for each group were placed in the tanks (six fiberglass tanks with 0.9 m wide, 0.7 m deep) with a volume of about 260 L water. Each tank was given to spring water with a flow ratio 5 L/min, and they were controlled regularly every day.

Table 2: The results belonged to mean weight, specific growth ratio (SGR), feed conversion ratio (FCR).

<table>
<thead>
<tr>
<th></th>
<th>Pure Normal</th>
<th>Pure Albino</th>
<th>Mixed (A-N)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial weight (g)</td>
<td>1.64±0.1 a</td>
<td>1.64±0.1 a</td>
<td>1.64±0.1 a</td>
<td>NS</td>
</tr>
<tr>
<td>Final weight (g)</td>
<td>19.3±0.02 a</td>
<td>17.2±0.03 a</td>
<td>15.3±0.05 b</td>
<td>*</td>
</tr>
<tr>
<td>SGR (%)</td>
<td>2.2 a</td>
<td>2.0 a</td>
<td>1.9 a</td>
<td>NS</td>
</tr>
<tr>
<td>FCR (%)</td>
<td>1.22 a</td>
<td>1.25 a</td>
<td>1.32 a</td>
<td>NS</td>
</tr>
</tbody>
</table>

Results are given as mean ± standard deviation. There is significant difference between parameters given as different superscripts (p<0.05) NS: not significantly different

4. Discussion

There were differences in term of growth performance between albino and normally pigmented rainbow trout varieties. Growth ratios, daily feed consumption, feed conversion ratios and consumer preferences of albino, and normally pigmented varieties of rainbow trout were done in the variable temperatures from 9.6 to 10.5°C during rearing period. Fish were between mean 15.3 g to 19.3 g at the end of the trial period of four months. The normally pigmented rainbow trout were showed a higher growth ratio than albino trout. Further detailed studies are needed for resolving the exact cause(s) of this practical result.
5. Acknowledgement
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6. References