Int. J. Pure Appl. Sci. 3(1): 8-12 (2017)

Research article/Araştırma makalesi

IJPAS
ijpas@munzur.edu.tr
ISSN: 2149-0910

The Analysis of Structural and Bio-Technical Aspects of Rainbow Trout (*Oncorhynchus mykiss*) Hatcheries in Elazığ and Malatya Provinces

Selahattin Gürçay[1*], Kenan Köprücü[2], Timur Demir[1], İlhan Canpolat[1], S. Murat Alkan[1], Gülden Arısoy[1]

[1]*Elazığ Aquaculture Research Institute, Elazığ, Turkey*
[2]*Firat University, Fisheries Faculty, Elazığ, Turkey*
[*]*Corresponding Author: E-mail: s.gurcay23@gmail.com*
Received date: 19.04.2017, Published date:13.06.2017

Abstract

In this study, the structural and bio-technical aspects of rainbow trout (*Oncorhynchus mykiss*) hatcheries in Elazığ and Malatya provinces were investigated by using real-time survey. This study was conducted from December 2013 to March 2014, in 11 active of 12 rainbow trout hatcheries that were registered Directorate of Food, Agriculture and Livestock located within Elazığ and Malatya boundaries. Structural conditions and bio-technical properties (right characteristics, maternal origin, hatching period, the eyed period, food pouch consumption periods, the amount of eggs, hatchability, feed and feeding, supplying of youngs, diseases in the growing medium, used drugs, the project capacities of the hatcheries and actual capacities) of the rainbow trout hatcheries in Elazığ and Malatya provinces were investigated. Data obtained by the real time surveys done face to face from available hatcheries, are used. The total project capacity of available rainbow trout hatcheries was 93 million units/year and the average hatching success was 70%. It was seen that available hatcheries adopted biotechnical applications however in the overall of them there was the lack of keeping data records. In some medium-sized hatcheries, out of season offspring were implemented successfully. Farming young fish at the each season is important for the sustainability of aquaculture, increasing exports and the country's economy. In Sürgü region of Malatya, there were 70-80% deaths in the three hatcheries on same water supply due to the young syndrome in the larval stage so this status should be investigated. The biggest problem of the hatcheries is the lack of organization. During the preparation of the project for rainbow trout hatcheries, determination capacity with scientific data obtained from the current field, have great importance with economic and ecological aspects.
Keywords: Analysis, bio-technic, Elazığ, hatcheries, Malatya, rainbow trout

Elazığ ve Malatya İllerindeki Gökkuşağı Alabalığı (*Oncorhynchus mykiss*) Yavru Üretim Tesislerinin Yapısal ve Biyo-Teknik Analizi

Özet

Bu çalışmada, Elazığ ve Malatya illerinde gökkuşağı alabalığı (*Oncorhynchus mykiss*) kuluçkahanelerinin yapısal ve biyolojik-teknik yönleri, gerçek zamanlı anket kullanılarak araştırılmıştır. Aralık 2013'ten Mart 2014'e kadar Elazığ ve Malatya sınırları içinde yer alan Gıda, Tarım ve Hayvancılık Müdürlüğü'ne kayıtlı 12 gökkuşağı alabalık kuluçkahanesinden 11'inde aktif olarak yürütülmüştür. Yapısal koşullar ve biyolojik-teknik özellikler (kuluçka dönemi, gözlenme periyodu, besin kesesi tüketim süreleri, yumurta miktarı, kuluçka verimi, yem ve besleme, yavruların beslenmesi, yetiştirme ortamındaki hastalıklar, kullanılan ilaçlar), Elazığ ve Malatya illerinde bulunan gökkuşağı alabalığı kuluçkahanelerinin proje kapasiteleri ve gerçek kapasiteleri incelenmiştir. Mevcut kuluçkahanelerde yüz yüze yapılan gerçek zamanlı anketlerle elde edilen veriler kullanılmıştır. Sonuç olarak mevcut gökkuşağı alabalık kuluçkahanelerinin toplam proje kapasitesi 93 milyon adet/yıl ve kuluçkahanelerde ortalama % 70 oranında çıkış başarısı olup mevcut kuluçkahanelerin biyoteknik uygulamaları benimsediği, bununla birlikte genel olarak veri kayıtlarının tutulmamış olduğu görülmüştür. Bazı orta büyüklükteki tesislerin kuluçkahanelerinde, mevsim dışı yavrular başarıyla uygulanmıştır. Her mevsimde yavru balık yetiştirmek; su ürünleri yetiştiriciliğinin sürdürülebilirliği, artan ihracat ve ülke ekonomisi için önemlidir. Malatya'nın Sürgü Bölgesi'nde, larval dönemde fry sendromu denilen hastalık nedeniyle bazen % 70-80 oranında zaiyat olduğunu işletme sahipleri belirtmiştir. Bu durum araştırılmalıdır. Kuluçkahanelerin en büyük sorunu organizasyon eksikliğidir. Gökkuşağı alabalık kuluçkahane projelerinin hazırlanması sırasında, mevcut alanlardan elde edilen bilimsel verilerle kapasitesinin belirlenmesi, ekonomik ve ekolojik açıdan büyük önem taşımaktadır.
Anahtar Kelimeler: Analiz, biyo-teknik, Elazığ, kuluçkahaneler, Malatya, gökkuşağı alabalığı

IJPAS
ijpas@munzur.edu.tr
ISSN: 2149-0910

Research article/Araştırma makalesi

INTRODUCTION

Aquaculture is an essential industry which supplies important part of the world' food need. It has been identified by FAO as the fastest growing food sector in the world. Especially in the last 10-15 years, our country has been significant progress in aquaculture parallel with rapid growth of aquaculture in the world and be considered as an alternative food source.

Aquaculture of rainbow trout realized in 123.018 tonnes (Turkish Statistical Institute) according to the data of 2013 in Turkey and in the production the first place settled by Elazığ 15,000 tons/year while in Malatya 4,677 tons/year, respectively. According to information received from the Food, Agriculture and Livestock Provincial Directorate, in terms of production of young, businesses in Elazığ approved annual capacity of 42 million units and 51 million units/year in Malatya that have an important share in Turkey (TUIK,2013).

In region, trout is has been an export as well as great importance both in terms of region and the national economy. In aquaculture of trout that is essential industry with elements of employment, with increasing production and when it is considered that comes to continue further increase, has become very important, in terms of obtain quality eggs and youngs, the detection of structural and bio-technical characteristics of businesses.

For using more efficiently of the production facilities in the region, bio-technical analysis, how to improve the hatchery capacity and the actual production of business and updating the current structural state properties is required.

The aim of this study is to investigate the maximum possible aquaculture with the facilities in Elazığ and Malatya provinces. Before deciding what to do for achieve this purpose, it is necessary to know the problems and owned facilities of the businesses. To determine the current situation of businesses, identify problems and determine the harmony to the basic rules of aquaculture and develop strategies for solving these problems has acquired basic aims.

MATERIAL AND METHOD

Material

This study was conducted from December 2013 to March 2014 in 11 production facilities of 12 that located Elazığ and Malatya provinces and recorded to Food, Agriculture and Livestock Provincial Directorate. It has not been studied in one business that is not active.

The data obtained from questionnaires constitutes research material because that aims to analyze aspects of bio-technical and propound the structural condition of young production businesses located within Elazığ and Malatya boundaries.

Method

The questionnaire used in this survey, consists of 3 parts. Prepared questions to determine the structural and bio-technical characteristics of the business were conducted through face to face with managers. The questionnaire consists of the manager informations, technical and the physical structure of the hatcheries, water input and output availability and water quality, marketing strategy and encountered problems.

Bio-Technical Data

Milking characteristics, origin, the hatching and eyed period, consumption periods of food pouch, the amount of eggs, hatchability, feed and feeding, baby supplies, disease seen in the growing medium, used drugs, project capacity of the business and actual capacities were investigated.

IJPAS
ijpas@munzur.edu.tr
ISSN: 2149-0910

Research article/Araştırma makalesi

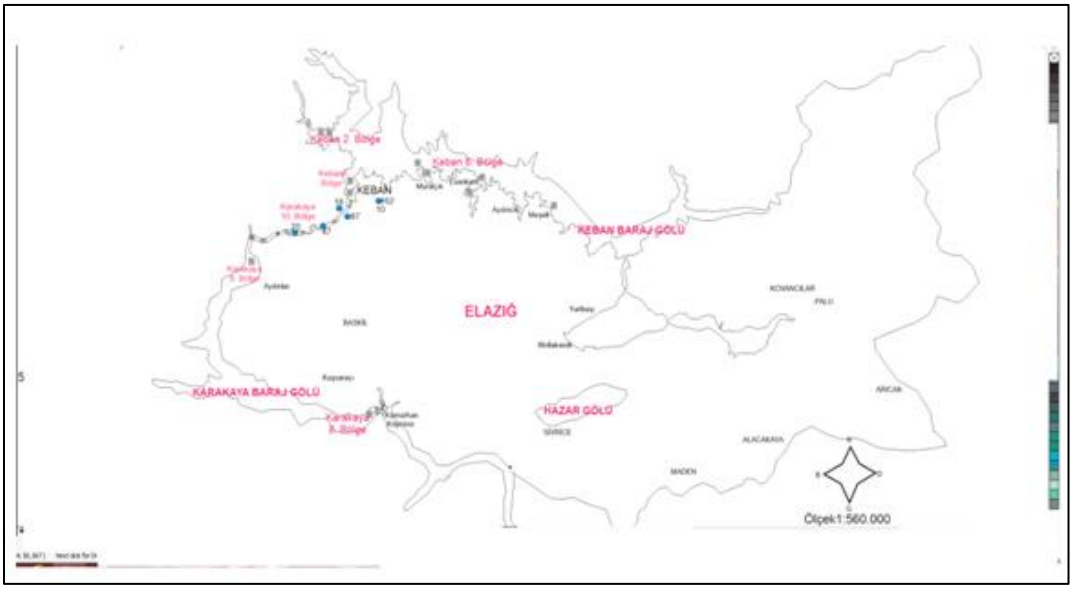

Figure 1. Position of Elazığ province hatcheries on the map (URL-1)

RESULTS AND DISCUSSION

In this study, it has been seen that the total project capacity of 12 registered hatcheries were 93 million units/year, although despite their declaration, produce much higher than the capacity. Most businesses used hatchery screens with stocking more than normal. Some businesses give priority to hatcheries investment and some of them produced in system was established years ago. In hatcheries, an average of 70% output success was achieved, obtained eggs with photoperiod methods tried to be met the eggs and youngs. In addition, some businesses produced egg and young with unprojected primitive methods for their needs. Most of businesses supplied need of young fishes from owns body and some part of them from other business in the same region.

The business used spring water in the production activities and one of them used spring and artesian water both. Water temperature in business used spring water is reported as 8-16 °C during a year in Elazığ and Malatya. There was not any reduction in water and water was coming with PVC pipe. There were precipitation-stilling basins in all business.

The young output troughs (made from concrete and fiberglass), fiberglass table eggs hatching cabinets (vertical flow), pre-young survival pools (concrete and fiber) were available in all the existing hatcheries. Cold and yersiniosis disease reported as generally seen similar disease on young period in hatcheries. Antibiotics available on the market are used intensively in these diseases. The dose of formaldehyde is not known, used randomly in most businesses.

Business owners pointed out 70-80% casualties due to the disease called fry syndrome in three hatcheries at the larval stage on a single water source in Malatya, Sürgü region. When fish larvae absorbed to food pouch, they began feeding and initially powder feed gived to the fish then with growing the shape of the food started to increase. They divided fish food into 5-6 meals, when fish grows, the number of meals is reduced. Most of the businesses indicated that they done feeding 3 times a day.

Businesses in Elazığ and Malatya, female fishes are milked becoming milking mature in the reproductive period with checking regularly. Milking is done by usually dry method uses stun. In big businesses while milking is done at least two times for a week, in the small businesses only once a week. In the hatcheries, average weight of the rootstocks were 3.5±2 kg used in the production for 3-4 years, some

IJPAS
ijpas@munzur.edu.tr
ISSN: 2149-0910

businesses made rootstock renew (fresh blood) extensively.

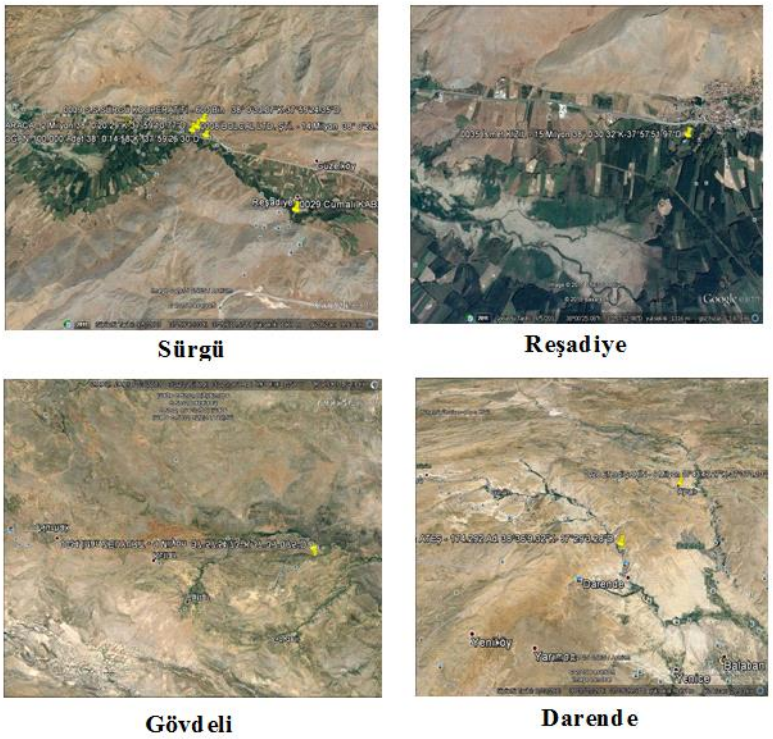

Figure 2. Position of Malatya hatcheries on the satellite (URL-2)

Table 1. Bio-technical data of hatcheries

Businesses number	Output Time from Egg (Day)/ºC	Observation Times (Day)/ºC	Food Pouch Consumption Times (Day)/ºC	Hatchability (%)	Number of Eggs (Piece)
1	29	13	7	60	90.000.000
2	35	15	9	90	8.000.000
3	43	21	12	70	7.000.000
4	40	20	15	80	20.000.000
5	25	14	8	60	1.000.000
6	Not Active				
7	30	20	10	70	2.000.000
8	32	23	7	65	700.000
9	21	14	10	50	3.000.000
10	30	15	17	50	650.000
11	30	12	10	90	5.000.000
12	21	13	15	90	2.000.000
Average	**31**	**16**	**11**	**70**	**12.668182**

IJPAS
ijpas@munzur.edu.tr
ISSN: 2149-0910

Questionnaire of Hatcheries

Questionnaire are composed of the general information of manager and the hatchery, owned technical-physical structure, compliance of water input and output and characteristics of water quality, common diseases, marketing strategy of young fish and the bio-technical data of hatcheries. The names of the hatcheries are not mentioned in the report but they are numbered.

CONCLUSION

The starting point of the production in aquaculture is eggs and sperm obtained from fish breeding. However we can talk about economic production when quality sperm and egg used and the quality young production can be done by hatcheries with superior technological features. Therefore, hatcheries that the starting point of production is important in terms of providing added value (Uysal and Alpbaz, 2003).

It is seen that the businesses in the region, adopted to bio-technology applications but there were lack of such phase of evaluation and keep records. Keeping records allows you to have information about fish also give idea to business and prevent to estimate the results.

Determination capacity is important in both economic and ecological aspects with the scientific data obtained from the current field in preparing projects for rainbow trout young production business.

In some medium business, uptaking progeny is applied successfully with fotoperiod in non-seasonal. The continuity of these work and providing youngs in all seasons is important for the national economy and export. Because of disease called fry syndrome in one water source at three hatcheries and sometimes it is noted that the casualty rate was 70-80% in Malatya-Sürgü Regions so it should be investigated that began in the larvae period and caused serious losses.

The biggest problem of the business is the lack of organization. In terms of giving direction to the young fish production in Turkey, coming together of the producers and organizations has great importance.

In the meantime installing hatchery should provide relief in official transactions and increase the incentives and prevent illegal eggs and young called under the counter in the primitive conditions.

In order to increase hatchery efficiency of business, should monitor the physicochemical properties of water used, keep clean the materials and control the drugs and chemicals continuously.

REFERENCES

TUİK, 2013. Su Ürünleri İstatistikleri 2013. TÜİK.

URL-1.https://www.turkcebilgi.com/harita/elazığ.2004-2017.

URL-2. http://www.uydu.info/malatya.2017.

Uysal, İ., Alpbaz, A., 2003. Abant alabalığı (*Salmo trutta abanticus* T., 1954) ile gökkuşağı alabalığı (*Oncorhynchus mykiss* W., 1792) yumurtalarının dllenme, gözlenme, larva çıkış ve yaşama oranlarının karşılaştırılması. *Ege Üniversitesi Su Ürünleri Dergisi*, 20(1-2):95-101.