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The future of organıc fısh productıon in the world

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ABSTRACT

One of the fundamental problems of the world humans live in is that the resources human beings have used to meet their needs are limited. These resources, when used correctly, are enough to meet these needs. The main problem here is the mistakes human beings make and them not being aware of making these. In other words, they are consciously or unconsciously destroying the world they live in with every action they have taken to create the civilization. In this study, we will focus on the subjects of damages brought out to the natural sources by agricultural and aquacultural production which is used to meet the need for food, and wiping the effects of these damages. In this context, we will also focus on the conditions of the organic agriculture principle application on aquacultural production, which has emerged as a solution to the threats targeting human health and to the environmental problems brought out by the agricultural production.

Contribution/ Originality
Nature is the source of our life in every sense, and the sources of nature are limited. We must act with this consciousness while meeting our needs or building our civilization. Accordingly, two main objectives of this study are expected to contribute to the literature. The first is to contribute to creating this consciousness. The second is to increase the studies that are inadequate in the field of organic aquaculture.

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1. INTRODUCTION

Organic Agriculture is a system of gaining optimum yield that protects the natural balance, takes control of disease and pests, sustains continuity of living beings, with the optimum use of natural resources and energy. Organic agriculture is an approach which integrates human, environment and economically sustainable agricultural production system (Ak, 2004). Organic farming is an agricultural production method, of which the aim is protecting, repairing, and rehabilitating the degraded ecological balance resulting from activities that people have undertaken for agricultural or other reasons. With this purpose, it develops and ensures the implementation of rules and principles which will protect plant, animal and human health, will provide organic products and production of inputs to be used in production of these, will spread organic production, increase the demand for such products, will serve the customer with healthy and high-quality organic goods, discipline the importation of organic products and inputs, will provide the development of organic product importation, production of vegetable, animal and aquatic products and all kinds of inputs used for these productions will be produced in accordance with organic farming method, will provide the control every stage in marketing both domestically and abroad, processing, packing, labeling, storing and transporting.

Water, which is a primary need to sustain lives of human beings, is not only a basic need in life but also is a basic input in which other living creatures have been produced. It has been known that aquatic products have a significant share in people's diet. However, population growth, excessive and senseless hunting and environmental pollution have unfortunately led to a rapid decline in natural fish resources, and even to the risk of extinction in some species. Even though some measures are tried to be taken after this point, the fact is stated by experts that natural fish stocks will never reach to the desired level, natural fish stocks will gradually decrease and it will be possible to close gap with the culture fishery is important. This puts forward that aquacultural production is an essential activity for the World. Today, approximately 40% of the World's aquacultural production is obtained by breeding. According to scientific researches, it is estimated that the amount of aquacultural products obtained by 2030 will be equal to the amount of aquatic products obtained by hunting, and that the fishing industry in the long term will surpass the hunting industry. This, as the day passes, increases the importance of seas and in-land waters, and indicates that aquacultural production will play an important role in the future. However, the conservation and planned use of water resources is important and necessary with environmental measures to be taken to make aquaculture sustainable. For it to be possible, the need for the implementation or development of various alternative aquaculture methods is emerging. Organic agriculture can be a production method that can respond to this with the help of a sustainable agricultural production philosophy that bans the applications harming human beings and nature. Within this framework, organic agriculture production method has been applied as a new alternative in the field of aquaculture.

Organic fish production began in the mid-1990s with the certification of the carp in Austria as "organic". This first attempt is followed with the soma and rainbow trout entering the market. The first organic trout was sold in the UK in 1998 (Tacon and Brister, 2002). The organically development of aquaculture which is one of the world's fastest growing food markets, is quite similar to organic agriculture. However, nowadays, certified organic aquaculture is lagging behind the agricultural sector in terms of product variety and quality (Bergleiter, 2001; Brister and Kapuscinski, 2001). Although there is no official statistical data available on the world's organic aquaculture production of these, Atlantic salmon (Salmo salar), shrimp (Penaeus sp.), carp (Cyprinuscarpio) and rainbow trout (Oncorhynchusmykiss) are among the certified species according to organic standards. Studies also show that the fish such as sea bream (Sparusauratus), European seabass (Dicentrarchuslabrax), tilapia (Oreochromis sp.), mussels (Mytilus sp.) the charr (Salvelinusalpinus) and mersin (Acipencer sp.) have started to be organically produced. Studies are continuing to be done to produce new species, including clams (Pecten sp.) and cod (Gadusmorhua) for future organic aquaculture production (Tekinay *et al.*, 2006).

Organic fish production is growing very slowly compared to vegetative organic production, due to difficulties with organic bait and bait material, differences in consumer preferences and market uncertainty (Merdan, 2014). According to the latest statistics, salmon fish, trout, carp, grass carp, sea bream, sea bass, tilapia, mussels, myrtle fish and microalgae are among the most produced organically certified fishery products in the world (Çavdar, 2011).

1.1. Organic agriculture and organic aquaculture in the world

It is known that organic farming first started in the EU and the United States (USA) and later spread to other countries (Demiryurek, 2011). There are a total of 37.2 million hectares of organic farming areas (including transitional areas) in the world. Today, 1.2% of the agricultural area in the world is used as organic farming area (Emir and Demiryurek, 2015; Eryilmaz *et al*., 2015, Willer and Klicher, 2011).

There are no official statistics on the production of organic aquatic products. However, it is reported that production in 2005 was about 25.000 tons (Hilge, 2005). Although there is no official statistical data available on the world's organic aquaculture production. It is reported that the majority (2000 tons) of production, which is about 5000 tons, is produced in European countries. This represents approximately 0.01% of total world aquaculture production or approximately 0.25% of total European aquatic production (Lem, 2004 and Tekinay *et al*., 2006).

Today, salmon (Salmo salar) is the most important organic fish species of good quality. Organic salmon production is mainly done in Ireland and the United States. The first salmon farm in France was certified by the Ecocert certification company in 2001 and sold its first organic products in 2002. Organic carp, brown trout and rainbow trout farms are located in Germany, France, America, Ireland and Australia (Franze, 2004).

Studies are continuing to be done to produce new species, including clams (Pecten sp.) and cod (Gadusmorhua) for future organic aquaculture production. It is estimated that most of the organic aquaculture production will be in developed countries and that the most important markets for produced aquatic products will be Europe and North America in the west and Australia, Japan, New Zealand and Singapore in the east. The future of organic fish production may change further with the introduction of official certificated products from developing countries (Ötles *et al*., 2010). Whereas, the less polluted natural water sources provides Turkey an advantage instead of European countries where the traditional farming methods have been densely implemented and the advanced industrialization is carried out, it also provides a great opportunity in terms of organic production. As a result, many researches on organic fisheries have been carried out and different perspectives have been tried to be put forward (Yılmaz, 2004; Çavdar, 2006; Ural and Yılmaz, 2009). When the studies taken into consideration,it is clear that many water resources and many businesses in Turkey are structurally compatible with organic fisheries and other businesses may adapt to organic fisheries if they are substructured.

1.2. Organic agriculture standards and certification organizations

There are many independent organic certification bodies and standards worldwide. One of them is the "Ecological Agriculture" regulation numbered 2092/91 which entered into force on 24.06.1991. Although the European Union directive has designed standards for organic agriculture, it has not yet established these for organic aquaculture. Within European countries, private organizations such as Naturland (Germany), KRAV (Sweden), Debio (Norway) and SoilAssociation (England) have developed their own standards for organic aquaculture production. These organizations have different standards for organic aquaculture (USDA, 2000; Soil Association, 2001; UKROFS, 2001; Tacon and Brister, 2002; Naturland, 2005).

1.3. Organic agriculture and organic aquaculture in Turkey

Organic agriculture in Turkey began unsystematically in 1985's due to the development of organic agriculture in the world and the demand for organic products from abroad and developed parallel to the changes in the world's consumption of healthy foods. The regulation on "Production, processing and marketing of vegetable and animal products produced by Organic Farming Methods" prepared by the Ministry of Agriculture and Rural Affairs on December 18, 1994 was published in the Official Gazette. Organic Agriculture in Turkey is done within the frame of "Regulation for Organic Agriculture Principles and Implementation", which is in accordance with EU Organic Farming Regulation, published in the August 18, 2010 dated and 27676 numbered issue of the Official Gazette. Organic agricultural production in Turkey is carried out under the control, inspection and certification organizations. Certification organisations such as ECOCERT, IMO, SKAL, BCS, ETKO and EKOTAR have been active in Turkey. In Turkey, ecologic agriculture is getting newly widespread, whereas organic aquaculture is in beginning level. As of February 2010, in Turkey, 6 enterprises in Rize province have started to produce organic trout under the supervision of the authorized inspection and certification body by obtaining "entrepreneur certificate". The total project capacity of the said 6 enterprises is 456 tons/year. An important part of this capacity (431 tons / year) is taken up by the rainbow trout, and 25 tons / year is the Turkish local species, the Black Sea trout. In some countries, polycultural studies integrated with organic vegetable production in organic aquaculture are also being implemented. The first organic trout bait was produced commercially with the first and only organic aquacultural production project which is registered in the organic farming database launched on November 12, 2006 in Çayeli, Rize by the Provincial Directorate of Agriculture (Guner, 2011). The value of aquatic products as a food for human beings is increasing every day, and consequently, consumption is increased and different requirements are needed. Generally, demand for products obtained from aquaculture is socially low. The reason of this is that the culture fish are fed with bait deemed artificial by people, and the fact that there is no selective nutrition possibility in the nature (Çaklı, 1995). Although individuals raised in a culture environment are superior in terms of food quality, natural individuals who are superior in terms of only textures are preferred by humans to those of culture individuals.

1.3. Principles of organic aquaculture products

The basic criteria for organic aquaculture production have been derived and produced from organic farming principles (Bergleiter, 2001). Due to the different ecology and special problems of the aquatic environment, these basic original principles have been renewed or new ones get added. A good example of this is that fishmeal is accepted as bait material in organic fish production, whereas this is not allowed in organic farming principles. Some of the basic principles necessary for the production of aquaculture to be organic are summarized below.

The production stoichiometry, especially the herbal bait ingredients and additives used in the bait, should not be genetically modified (GMO),
The stock intensity should be lower than in the conventional production method, the use of pesticides and anti-fouling paints is prohibited,
According to the management procedure, the natural environment should be minimally affected and the environmental effects should be monitored,
In case of diseases, natural medicines should be preferred,
The products must be processed according to organic principles and the final product must be organically certified.

2. RESULT

The principles and rules of organic farming have been slower to develop in organic fish farming than vegetal organic production. The main reason for this is that the problems threatening the environment and human health caused by agricultural production are beginning to be recognized in aquaculture. Organic aquaculture production, which is the branch of the aquaculture of organic

farming practices, is the emerging sector. As mentioned before, efforts by various countries to make international legislation and standards related to this issue continue.

In the countries such as Germany, England and USA legislation and standardization studies are still in progress and some issues (organic feedstuffs, fighting diseases) have not yet been resolved. In addition to all these, in order for "Organic Aquaculture" to develop both in Turkey and the World, international organic aquacultural production standard has to be established, organic product sales need to get more attractive, and more scientific research on organic aquaculture is needed to be done. Also, if economic analysis and market research of organic production based on potential species are done and the uncertainties in business owners' prejudices are eliminated, organic aquacultural production will be an important opportunity in terms of Turkish fishery industry getting a place in worldwide market.

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