Crayfish Cultivation in Turkey: Past, Present and Future

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Abstract. As one of the members of the economic crustaceans; the freshwater lobsters or as they are commonly known as crayfish in Turkey, belong to the Decapoda order of Crustacea class from the phylum of Arthropoda. The freshwater lobsters, which have over 640 species in the world, are generally distributed to the continents of America and Australia. Although the freshwater lobsters have an abundant number of species, the economic importance lies with 3 family (Astacidae, Cambaridae, Parastacidae) and around 10 species from those indicated families. The freshwater lobsters in Turkey are represented by two species. *Astacus leptodactylus*, one of the species is a local one that is abundant around inland water localities while the other species is *Austropotamobius torrentium* whose existence was determined especially in Thrace area within Marmara Region. However, the production of crayfish in our country is practiced only by the means of fishing and the hunted crayfish are imported to various European countries. However, the crayfish cultivation has a great potential in Turkey due to the facts that Turkey is rich in terms of inland waters and the crayfish may be found in various localities.

Keywords: *Astacus leptodactylus,* Crayfish, Turkey.

1 Introduction

The production of freshwater crayfish (*Astacus leptodactylus* Eschscholtz, 1823) (**Fig 1)** began from the mid 1960's around the lakes of Manyas and Uluabat in Turkey (Erençin and Köksal, 1977). The gradually increased production reached to 8000 tons in 1984. Although the production totals showed an increase in later periods, such figures never reached to the levels between 1978 and 1985. Between those years, Turkey became the dominant figure over %70 of the world crayfish market. However, after those years, due to the crayfish plague (fungal disease) and the excessive fishing lead to a serious decline in the production of crayfish (Fürst and Söderhaäll, 1987; Timur and Timur, 1988; Baran and Soylu, 1989). This disease first

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appeared in Turkey within the crayfish stocks in Lake Çivril around the end of 1984 and over time, spread to the lakes of Eğirdir, Beyşehir, Akşehir, Marmara, Apolyont, Manyas, İznik and Sapanca (Timur and Timur, 1988; Baran et al., 1989; Baran and Soylu, 1989). It is thought that the transportation of fishing materials between lakes, transportation of live fish and the migratory birds played an important role regarding the fact that the disease spread to high numbers of water sources in a short period of time (Müller, 1973; Brinck, 1988). In the subsequent years, serious problems were experienced in crayfish stocks and in some localities, the crayfish stocks went to the brink of depletion.

Fig 1. Adult individuals of crayfish (*Astacus leptodactylus*) (Individual on the left is male and on the right is female with eggs).

The crayfish is able live in many water sources, lakes and rivers being first. They are especially found in shallow waters and areas with rocky floor that contains an abundant amount of plantation (Alpbaz, 2005). The crayfish, which use such environments as shelters, became protected from the adverse environmental conditions and especially from the predation and cannibalism. The crayfish are classified as herbivores, detrivores, omnivores and sometimes as a necessity, carnivores (Momot, 1995). The crayfish carry out their life by consuming live or decomposed plants, grains, algae and consuming the remains of thousands of animals ranging from smaller invertebrates to some vertebrate species such as small fish (James and Huner, 1985). In addition, the animal based zooplankton, worms, insects and mollusks may also be the prey of the crayfish.

The production of crayfish in Turkey is only achieved through fishing. In the inland waters of Turkey, the existence of the freshwater lobster has confirmed in 112 localities. Unfortunately, the consumption of crayfish as a food is quite low in Turkey although it is in demand in touristic regions. The crayfish that is produced in Turkey is exported to various European nations such as France and Sweden (TÜİK, 2013) (**Table 1Table 1.** The total exported amounts of the freshwater crayfish (*Astacus leptodactylus*) from Turkey to Europe.).

Table 1. The total exported amounts of the freshwater crayfish (*Astacus leptodactylus*) from Turkey to Europe.

Year	Amount (tons)	Year	Amount (tons)
2001	1634	2008	783
2002	1984	2009	734
2003	2183	2010	1030
2004	2317	2011	610
2005	809	2012	492
2006	797	2013	532.1
2007	816		

Nowadays, the crayfish cultivation in Turkey is mainly limited with the cultivation trials, conducted at universities. In many countries in the word, especially in northern America, China and Australia, the cultivation of crayfish is undertaken. Even by setting up crayfish - rice alternating systems high profits are obtained after receiving the yield of two different products.

Due to the facts that Turkey is rich of inland waters and the crayfish can be found in most of the inland waters, its cultivation can be undertaken with less of a cost compared to the other sea and inland species that are being cultivated. Especially for the crayfish - rice alternating cultivation system, the inland water areas and the paddy fields are highly convenient. Berber et al. (2014) conducted a study in Mahmudiye area (Çanakkale, Turkey) and tracked the rate of survival and growth of the crayfish larvae (initial size: 11.08 mm and initial weight: 0.04±0.01 gr) that they placed to a paddy field for 90 days without any external feeding. As the result, after 90 days, the length of the individuals reached to 37.46 mm and the weight of the individuals reached to 1.46±0.863 gr. The results of the study indicate that the crayfish - rice alternating cultivation method, which is currently employed by many countries, can also be employed in Turkey with ease as well.

2 Results

As the result of the ever increasing world population, the need for nutrient elements, the animal proteins being first, also increase day by day. Crayfish stands as an alternative species compared to many species due to the fats that it is found in many inland waters in Turkey and its nutrient content. In addition to all else, the crayfish cultivation can also be achieved with less costs compared to other cultivated species. There is no need for high cost bearing expenses such as forage. Therefore, its cultivation does not require a serious cost. The rich inland waters of our country have a high potential for employing crayfish cultivation.

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