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Menba Kastamonu Üniversitesi Su Ürünleri Fakültesi Dergisi 2021; 7(1): 6-15 Araştırma Makalesi/Research Article

Bibliometric Analysis of Post-graduate Dissertations in Aquatic Products Area of Turkish Universities (1979-2020)

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Abstract

The aim of this study is to determine the structure of bibliometric post-graduate thesis in the field of Aquatic Products at universities in Turkey between the years 1979-2020. For this purpose, a total of 3819 theses including 2861 master and 958 doctoral on "Aquatic Products" in the Higher Education Council (YÖK) Thesis Center were examined. Studies have shown that a total of 52 universities have post-graduate studies in the field of aquatic products, and 35 universities have both master and doctoral studies. The topics aquaculture, fish biology, fish diseases and fishing were determined to be the most studied subjects in master and doctoral dissertations. It was observed that 60.2% (n = 2.298) of the thesis studies were performed by men and 39.8% (n = 1521) were women, and the top five universities where the master and doctoral studies were completed respectively are; Ege (19.3%, n = 737), İstanbul (9.1%, n = 347), Çukurova (8.4%, n = 319), Fırat (6.1%, n = 233) and Çanakkale Onsekiz Mart University (5.3%, n = 204). While the number of foreign students is 30 for master students, the number for PhD is 19 students. It was also determined that the first three countries where the most foreign students come from are Libya (19), Iraq (7) and Iran (4).

Türkiye Üniversiteleri Su Ürünleri Alanında Yüksek Lisans Tezlerinin Bibliyometrik Analizi (1979-2020)

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Öz

Bu çalışmanın amacı, Türkiye'deki üniversitelerde 1979-2020 yılları arasında su ürünleri alanında yazılmış lisansüstü tezlerin bibliyometrik yapısını ortaya koymaktır. Bu amaçla Yükseköğretim Kurulu (YÖK) Tez Merkezi bünyesinde bulunan "Su Ürünleri" konulu 2861 adet yüksek, lisans 958 adet doktora olmak üzere toplam 3819 tez çalışması incelenmiştir. Yapılan incelemeler sonucunda, toplam 52 üniversitede su ürünleri alanında yüksek lisans çalışması yapıldığı tespit edilirken, 35 üniversitede hem yüksek lisans hem de doktora çalışması yürütüldüğü tespit edilmiştir. Yüksek lisans ve doktora tezlerinde en fazla çalışılan konuların yetiştiricilik, balık biyolojisi, balık işleme, balık hastalıkları ve balık avcılığı olduğu tespit edilmiştir. Tez çalışmalarının % 60.2 (n=2.298)'si erkekler, % 39.8 (n=1521)'i de bayanlar tarafından yapıldığı ve en fazla yüksek lisans ve doktora çalışmasının tamamlandığı ilk beş üniversitenin sırasıyla Ege (%19.3, n=737), İstanbul (%9.1, n=347), Çukurova (%8.4, n=319), Fırat (%6.1, n=233) ve Çanakkale Onsekiz Mart Üniversitesi (%5.3, n=204) olduğu tespit edilmiştir. Yabancı uyruklu öğrenci sayısı yüksek lisans yapanlarda 30 iken, doktora yapanlarda 18 kişidir. En fazla yabancı uyruklu öğrencinin geldiği üç ülkenin ise Libya (19), Irak (7) ve Iran (4) olduğu tespit edilmiştir.

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INTRODUCTION

Governments have realized that the contributions of science and technology are effective in economic growth and that it is inevitable to use the system more effectively in order to be a leader in a competitive environment. Aware of the changes in the world, countries that steer science and technology policies have begun to appear as growing economies in the globalizing world. In this direction, it has become the common working area of all governments to strengthen the educational infrastructure, invest in research and development, and encourage innovative ideas (NSF, 2007).

Aquaculture is one of the fastest growing food production sectors in the world. The most important factors affecting this growth are technological developments as well as dynamic research in the field of fisheries. Aquaculture is a relatively new industry compared to other forms of animal husbandry and has a greater potential for increased productivity through further research and technological development (Asche, 2008). Fish stocks in the natural resources of the world are decreasing rapidly due to overfishing, pollution and other reasons. The rapid increase in the population of the countries has led to an increase in the demand for fish and an increase in the importance given to fishery. With the rise in the number of educational institutions and research centers on fishery, there has been a significant increase in aquaculture production and the number of researches and publications in these areas has increased accordingly.

The beginning of aquatic products and fishery sciences dates back to the 1920s in Turkish universities. French scientist Raymond Hovasse was appointed as a professor at İstanbul Darülfünun Science Faculty in 1926 and established Baltalimanı Zoology Station on the shore of the Bosphorus in 1930. The aim of this station was to offer education and research (Kadıoğlu, 2003). Baltalimanı Zoology Station was attached to İstanbul University in 1933, and Prof. Dr. André Naville worked there for a short time. After Naville's death in 1937, the works stopped, and the Institute was closed. In the following years, a German scientist Prof. Dr. Curt Kosswig came to İstanbul in 1937 and was appointed as the director of the Zoological Institute at İstanbul University Faculty of Science (Mehmedoğlu, 2018). Curt Kosswig made remarkable contributions to the development of science in biology and zoology in Turkey. Curt Kosswig became interested in the former Institute of Fishery in Baltalimanı in 1950 and the Hydrobiology Research Institute was established in 1951 (Doğu & Şahinöz, 2017).

One of the researchers working with Kosswig, Prof. Dr. Remzi Geldiay also led the establishment of a second Hydrobiology Research Center in Izmir in 1964 (Bilecik, 2012). In 1978, in order to carry out the artificial production of carp and trout in Turkey, in the town of Kurtköy, Sapanca, Sakarya, "Sapanca Inland Waters Research and Application Centre" was founded as a result of the intense efforts of Dr. Fethi Akşıray.

In 1974, the Department of Fisheries was established within the Faculty of Agriculture of Ankara University and in 1979-1980, students were accepted to the Department of Fisheries for the first time. With the law numbered 2547 in 1982, Schools of Fisheries were opened in İzmir, İstanbul, Elazığ, Adana, Trabzon, Sinop, and Isparta provinces. These schools have increased their numbers of lecturers in later years and their names were transformed as the Faculty of Fisheries. Today, a total of 25 faculties or departments provides education in almost every region of Turkey. There were 206 universities (130 state and 76 private) in Turkey by the end of 2020. Currently, 52 of these universities have a master degree in the field of fisheries, and 44 of them have both master and doctoral studies.

There are many studies on bibliometric analysis of articles published in the field of fisheries in the world (Natale et al., 2012: Radael et al., 2014; Jaric et al., 2012). Although we see that many studies on bibliometric analysis of post-graduate dissertation in fields of finance (Başel, 2017), tourism and entrepreneurship (Işık et al., 2019), rural development (Gül and Gül, 2018), rural tourism (Albayrak and Tüzünkan, 2020), health tourism (Canik, 2019), gastronomy (Altaş and Acar, 2018), tax auditing (Güney, 2019) and training technology (Erdoğmuş and Çağıltay, 2009) in Turkey, only one master thesis (Gündoğar 2003) in the field of fisheries was found. Gündoğar (2003), at the master level, examined the dissertations conducted on rainbow trout in Turkey between 1998-2003.

In this research, it is aimed to reveal the required information on the number of master and doctoral students, who study in the field of Aquatic Products at the universities in Turkey, by years, gender, main study fields, origin countries, number of the foreign students and the language of the theses. This research is important in that it is the first study to reveal the characteristics of postgraduate dissertations in the field of Aquatic Products in Turkey and it is thought that it will make important contributions to the researchers who will work in this field.

MATERIAL AND METHODS

The Purpose and Importance of the Research

While the teaching of scientific knowledge is the main aim of pre-education and undergraduate education, the production of scientific knowledge goes into the scope of the purpose of graduate education. It is ensured that scientific knowledge is produced systematically with the scientific researches conducted at the universities at the master and doctorate level and postgraduate dissertations constitute the most concrete result of these studies. Theses prepared in a particular field or topics are classified so as not to study the same topics over and over. Bibliographic analysis guide researchers in achieving this goal (Güney, 2019).

In this study, written in the field of aquatic products in Turkey, the bibliometric structure of master and doctoral dissertations was examined. In line with this purpose, a total of 3819 theses, 2861 master and 958 doctoral dissertations on fisheries, were examined within the body of the Higher Education Council (YÖK) thesis center. 2861 of these dissertations are at master and 958 of them are at doctorate-level. This study is important in terms of seeing the development of postgraduate theses in the field of aquatic products over the years, understanding its structure and determining the areas not studied in this field. Analysis of qualitative and quantitative evaluation of scientific publications in the field of aquatic products and making comparisons with their similar studies abroad can be an important source of data for decision-makers and academics in this field in Turkey.

Research Method

In this study, it is aimed to carry out the bibliometric analysis of the postgraduate theses published in the field of "Aquatic Products" in the database of the National Thesis Center of Higher Education Institution (YÖKTEZ) in line with various parameters. For this purpose, all postgraduate theses registered in YÖKTEZ system (https://tez.yok.gov.tr/UlusalTezMerkezi/) since 1979 under the title of "Aquatic Products" have been included in the scope of the research. As a result of the screening, a total of 3819 thesis studies including 2861 master and 958 doctoral theses were examined. In the research, since the process of constantly updating and adding new theses is carried out at the relevant address, the screening process started on 01 December 2020 and ended on 10 February 2021 in order to perform a data collection study. The updates made during this period were transferred to the data file after the necessary checks. Descriptive statistics were applied in the study, percentage and frequency values were determined.

In this study, the following questions searched for an answer:

a) What is the distribution of the dissertations written in the field of Aquatic Products by years?
b) Which universities contributed the most to the field?
c) What is the distribution of the dissertations written in the field of Aquatic Products according to their subjects?
d) What are the most frequently used keywords in the dissertations?
e) What is the gender distribution of the researchers who made the dissertation work?
f) What is the distribution of the languages of the dissertations written in the field of Aquatic Products?
g) What are the origin countries of the foreign students and their distribution by university?

FINDINGS

All master thesis and doctoral dissertations prepared in the field of Aquatic Products at the universities in Turkey are recorded at the Council of Higher Education Dissertation Center System. Since new post-graduate dissertations are continuously added to the Dissertation Center System, the latest data was taken on February 05, 2021 and evaluations were made accordingly. The total number of post-graduate dissertation prepared in the field of Aquatic Products in Turkish universities is 3819 between the years 1979 and 2000. 74.90% (n = 2.861) of these dissertations are master degree and 25.10% (n = 958) of them are doctoral. It was determined that 60.20% (n = 2.298) of the master thesis were prepared by male and 39.80% (n = 1.521) were prepared by female students (Table 1).

Table 1. Academic level, gender and percentage distribution of post-graduate dissertations in the field of Aquatic Products in Turkey (1979-2020) (YÖKTEZ, 2021).

Academic level	Male	%	Female	%	Total	%
Master	1.706	59.63	1.155	40.37	2.861	74.90
Doctorate	592	61.80	366	38.20	958	25.10
Total	**2.298**	**60.20**	**1.521**	**39.80**	**3.819**	**100**

The first master thesis on Aquatic Products in Turkey was prepared at Ege University in 1979. The number of master thesis prepared in the following years is seen as; 2 in 1980, 4 in 1983, 2 in 1984, 2 in 1985 and 4 in 1986. From 1979 to 2020, the number of master thesis prepared in the field of Aquatic Products in Turkish universities is shown in Figure 1.

Between the years 1979-2000, the number of doctoral dissertations prepared in the field of Aquatic Products at the Turkish universities is 958 and the numbers of them are shown in Figure 1 by year. The first doctorate study was prepared in 1979 and there were fluctuations in the number of theses prepared in the following years and it was observed that the highest number of doctoral studies was in 2011 (n = 57). The number of doctoral dissertation studies was 30 in 2015 and 2016. While the number increased to 46-50 in the years 2017, 2018 and 2019, it decreased to 26 again in 2020 (Figure 1).

When looked at distribution of the master thesis prepared in the field of Aquatic Products between the years of 1979-2020 in Turkey by university, it is seen that the master thesis studies are performed at a total of 51 universities. It was determined that the top five universities with the most master thesis works were respectively; Ege (15.9%, n = 455), İstanbul (8.4%, n = 241), Çukurova (7.4%, n = 212), Fırat (6.2%, n = 176) and Çanakkale Onsekiz Mart University (5.3%, n = 152). Considering the gender distribution of the students in the master thesis studies, it was found that 59.6% (n=1.706) were male and 40.4% (n = 1.155) were female (Figure 2).

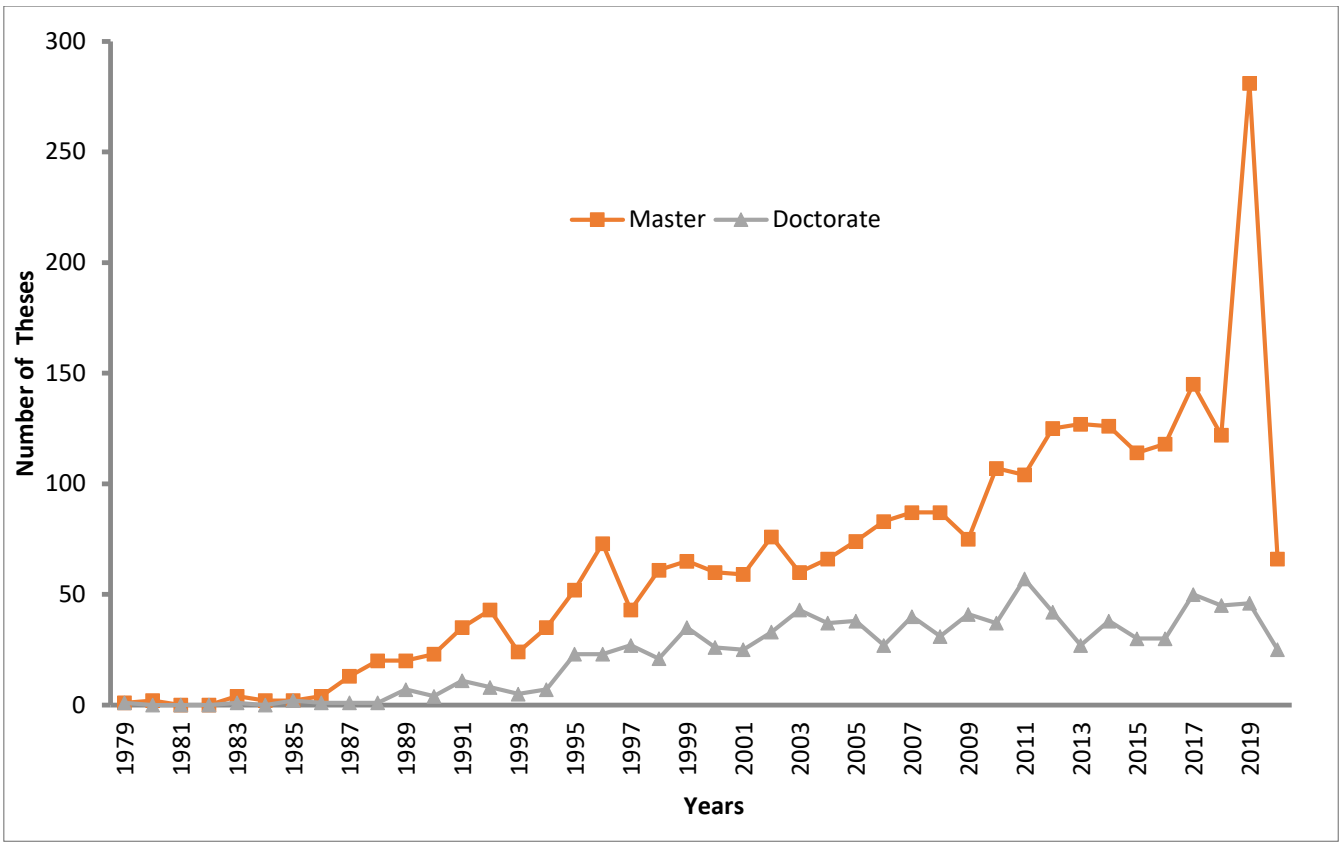

Figure 1. Numbers of written master thesis and doctorate dissertations in the field of Aquatic Products in Turkey (1979-2020)

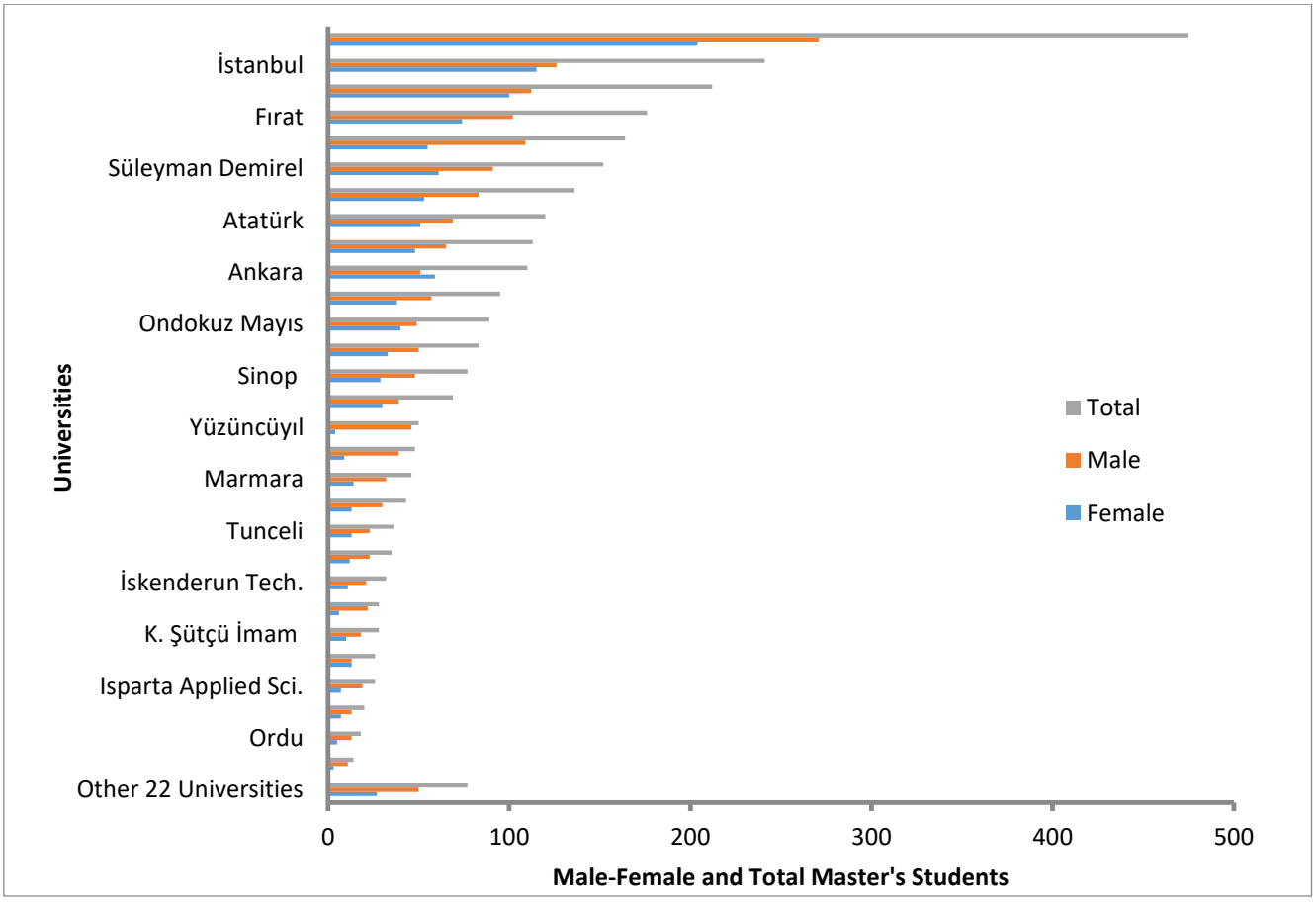

Figure 2. Ranking of master thesis in the field of Aquatic Products by university in Turkey between 1979-2020 (Female-Male)

958 doctorate dissertations prepared in the field of Aquatic Products was conducted at 34 universities in Turkey between the years 1979-2020. The top 5 universities with the highest number of doctorate dissertations were; Ege University (28.1%, n = 269), Çukurova University (11.0%, n = 105), İstanbul University (10.6%, n = 102), Fırat University (5.9%, n = 57) and Atatürk University (5.1%, n = 49) respectively. Considering the gender distribution of the students in the master thesis, it was determined that 61.8% (n = 592) were male and 38.2% (n = 366) were female (Figure 3).

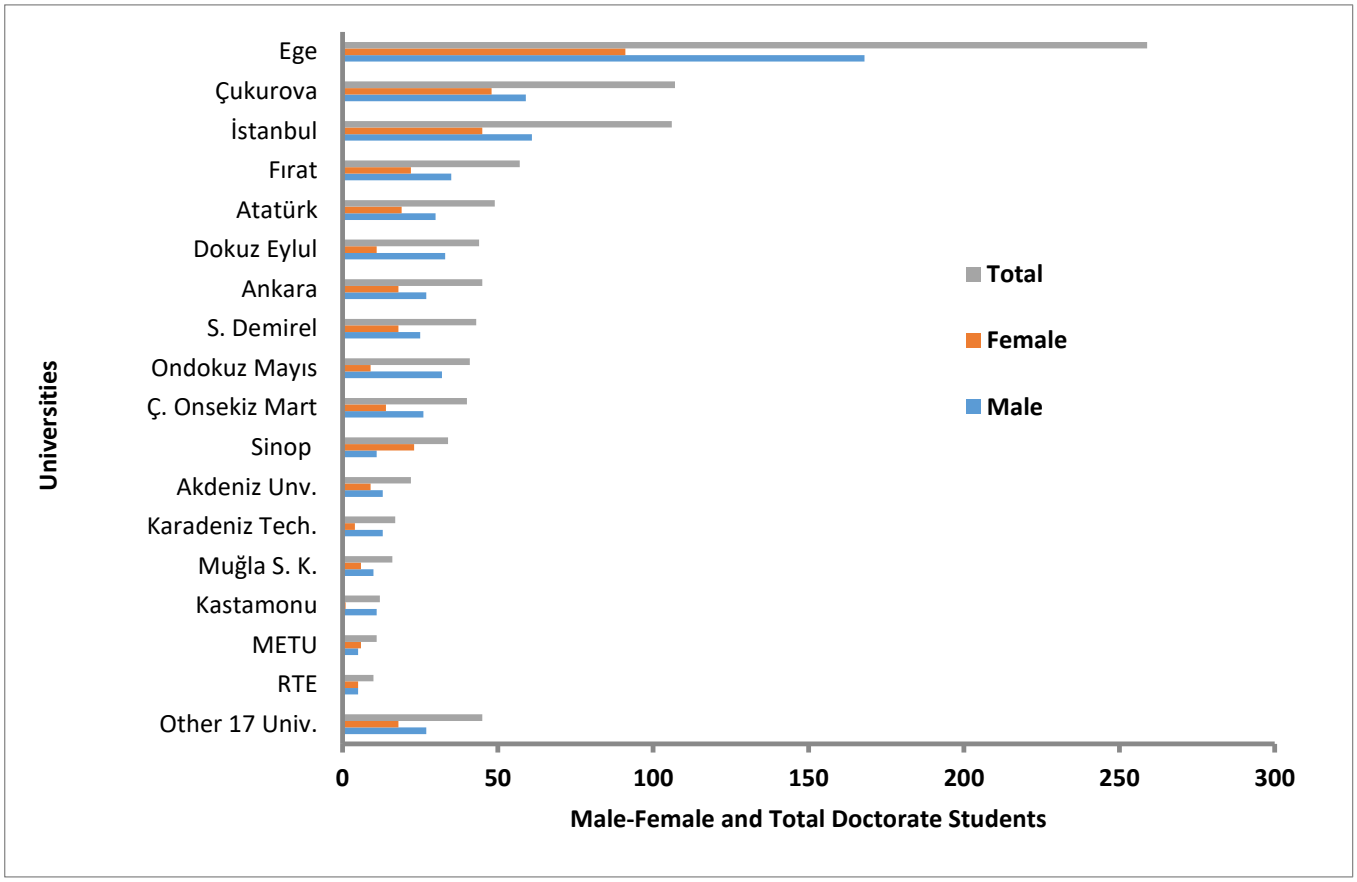

Figure 3. Ranking of doctorate dissertation studies in the field of Aquatic Products by university in Turkey between 1979-2020 (Female-Male).

When looked at the master and doctorate dissertations studies carried out in Turkey between the years of 1979-2020, the top five topics were seen as; aquaculture, fish biology, fish processing, fish diseases and fishing (Figure 4). In the doctoral dissertations, it was determined that the most studied fish on culture are rainbow trout (*Oncorhynchus mykiss*), sea bass (*Dicentrarchus labrax*) and sea bream (*Sparus aurata*), respectively. The most frequently repeated keywords in the doctorate dissertations are fish, growth, lake, rainbow trout, feed, Black Sea, quality, fishery, water and reproduction respectively (Figure 5).

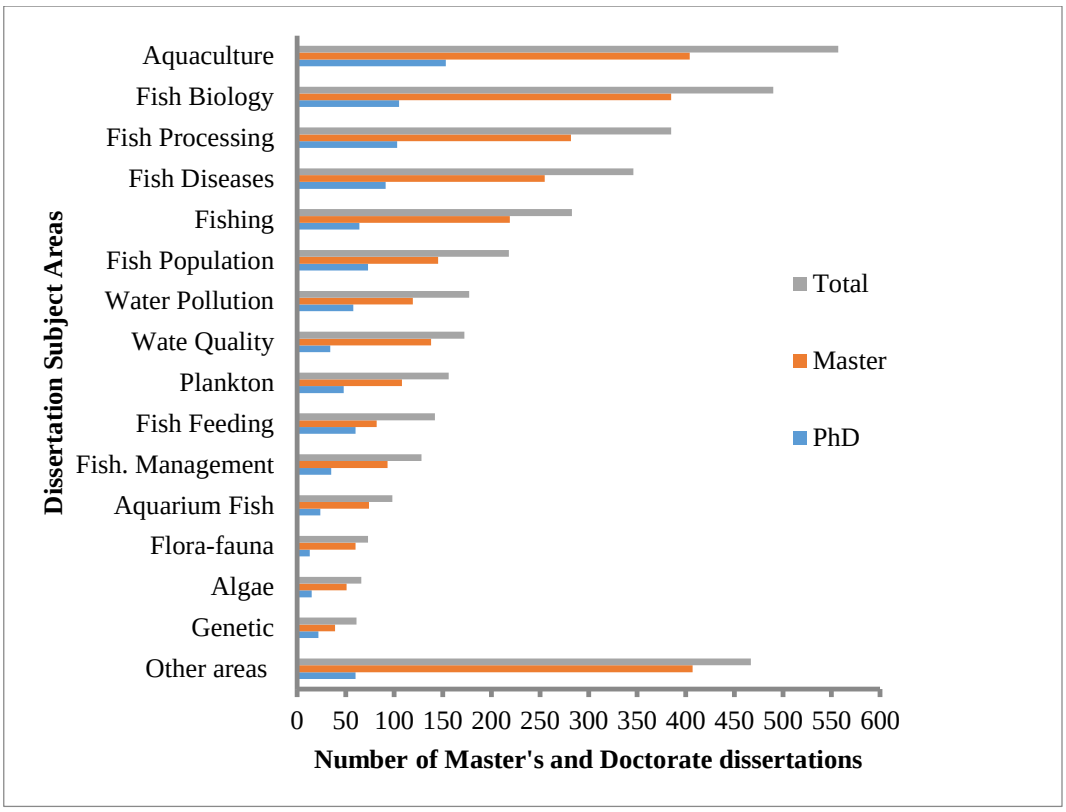

Figure 4. The distribution of master thesis and doctorate dissertations written in the field of Aquatic Products in Turkey (1979-2020)

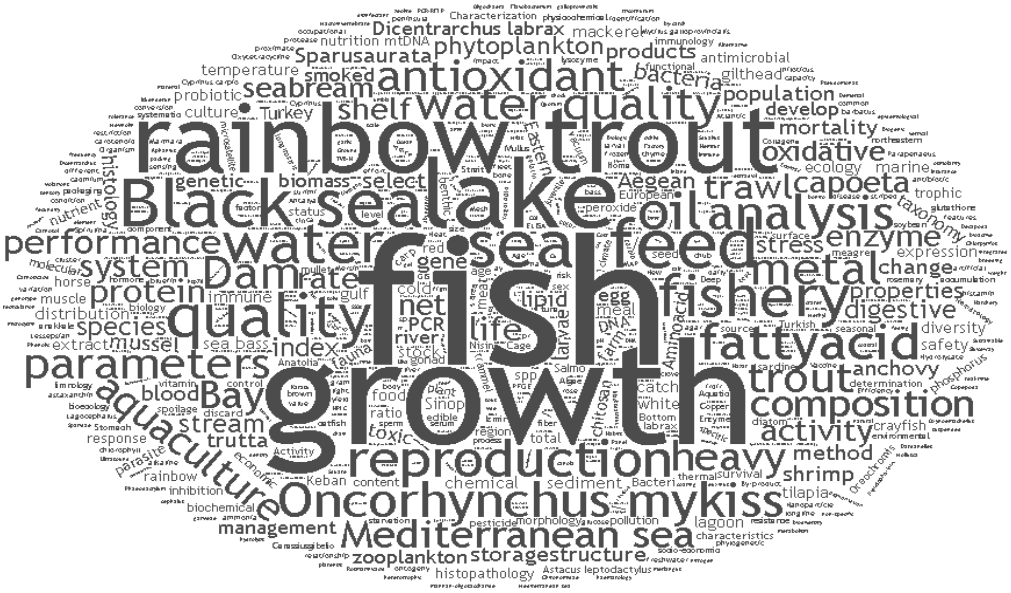

Figure 5. The frequency of keywords in doctorate dissertations in Turkey (1979-2020). The size of the word is proportional to its frequency. Source: wordcloud.timdream.org

The most frequently repeated words are fish, growth, lake, rainbow trout, feed, Black Sea, quality, fishery, water and reproduction respectively.

It was determined that 30 master thesis and 19 doctoral dissertations written in the field of Aquatic Products were prepared by foreign students in Turkey between 1979 and 2020. Considering the ranking of foreign students by country; it was seen that most of the students came from Libya (19), and the countries following Libya is Iraq (7), Iran (4), Sudan (2), Ghana (2), Tanzania (1), Syria (1), Mairitius (1), Ethiopia (1), Central Afr. Rep. (1), Bangladesh (1) and Azerbaijan (1), Kosovo (1) and country not determined (7) (Figure 6). Between these years, the highest number of foreign students were seen at Kastamonu University (20), followed by Ege (11), Fırat (5) Van Yüzüncü Yıl (4) and İstanbul University (4) (Figure 7). It was determined that 46 master thesis and 15 doctoral dissertations were written in the English language in the field of Aquatic Products in Turkey between 1979 and 2020.

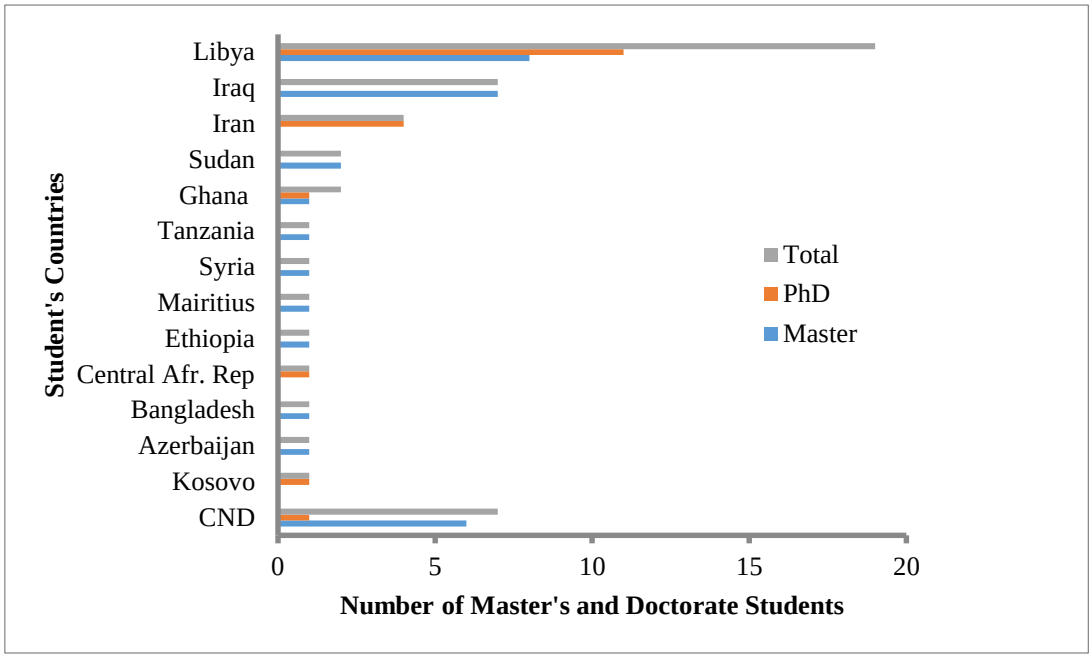

Figure 6. The number of foreign master and doctorate students in Turkey by country (1990-202O). (CND= the country could not be determined)

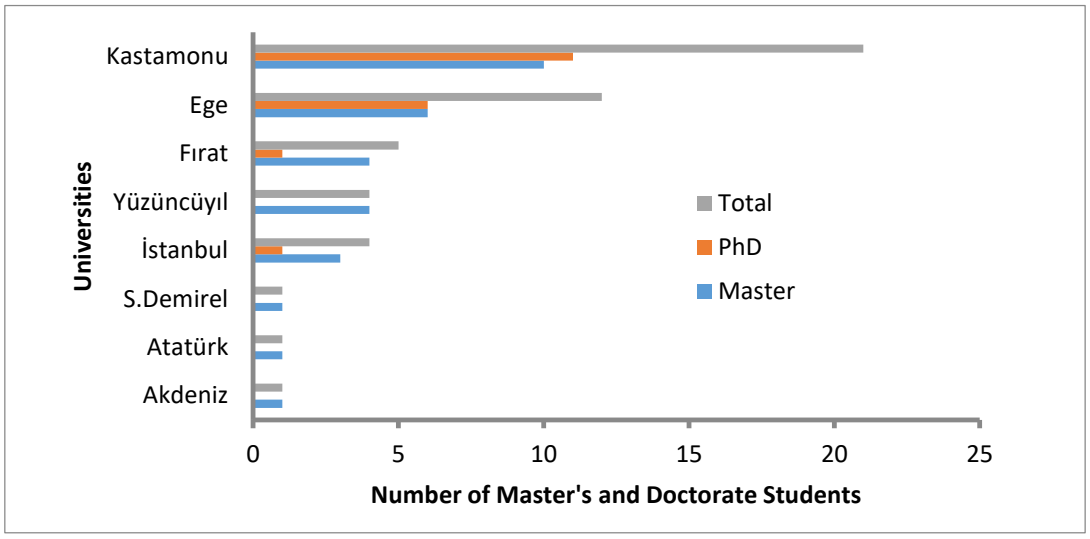

Figure 7. Number of foreign master and doctorate students by university in Turkey (1990-2020)

DISCUSSION

People and societies produce new technologies using knowledge and become superior in the economic field. As in every field, also in the field of fisheries, new knowledge production, technology development and innovation are performed through R&D activities. Universities and research centers contribute to the solution of existing problems with the basic findings they obtain as a result of regional and international researches. Educational institutions operating in the field of fisheries in Turkey also play an important role in the formation of the national policies and the development of the country.

It is seen that in the field of Aquatic Products, master thesis work was performed in 56 universities, and both master thesis and doctoral dissertation work was conducted at 32 universities in Turkey between 1979 and 2020. According to data taken from Turkey's Council of Higher Education Dissertation Center official web address, the first master thesis in the field of Aquatic Products in Turkey, was prepared by Oguz UÇAL at Ege University with the title; "The observations of larval development of Sole fish (*Solea solea* L.)". Although there was not much increase in the years when graduate studies in the field of fisheries at universities started, this number started to increase after 1987. The biggest reason for this increase is that the students who graduated from Fisheries Schools, which completed their establishment in 1980 and started to accept students, started to pursue a master degree in the field of fisheries (Figure 1). At the same time, the increase in the number of academic staff working in the Faculty of Fisheries, Department of Fisheries, and Faculty of Agriculture played an important role in the increase of graduate studies in Turkey.

The number of master thesis prepared in the field of Aquatic Products is 2861 at the universities in Turkey between 1979-2020. While the number of master thesis prepared in 2018 was 122, it reached 281 in 2019 by recording a rapid leap

forward. The biggest reason for this increase is the removal of the foreign language score requirement from students in graduate student admissions at many universities since 2015. Another reason for this increase is thought to be due to the fact that many students enrolled in graduate programs since 2015-2016 graduated in 2019. It is thought that the fluctuations in the number of students who will receive postgraduate education in the field of fisheries will not be that much in the coming years.

According to the records of the National Dissertation Center of Higher Education Institution of Turkey, the first doctorate dissertation in the field of Aquatic Products is a study titled "Studies on the yield characteristics of Gölmarmara carp (*Cyprinus carpio* L.) and mirror carp (*Cyprinus carpio* L. var: Royal) in Aegean region cultural conditions" was prepared by Hikmet HOŞSUCU at Ege University. The number of the doctoral dissertation was 958 pieces in the field of Aquatic Products prepared at universities in Turkey between the years 1979-2000. The number of doctoral dissertations in the field of Aquatic Products in Turkey did not increase much until 1994. However, as some of the students who graduated from master programs continued their doctoral programs, it started to increase from the year 1995 and the number of graduates increased to 57 in 2011. In the following years, the number of graduating students fluctuated depending on the years, and in 2019, the number of graduates was 48. The biggest reason for the increase in the number of students in master and a doctorate in the field of Aquatic Products in Turkey, is the rapid development of the increase in the number of lecturers in universities as well as graduate and increase the number of doctoral programs. The rapid development of the fisheries sector could be another factor after 1990 (Figure 1).

It was seen that the universities with the highest number of graduate studies in Turkey are mostly the universities with the Faculty of Fisheries, the Faculty of Marine Sciences and the Faculty of Aquatic Sciences or the Faculty of Agriculture with the Department of Fisheries Engineering. It was also seen that 2861 master thesis were registered in the Board of Higher Education Dissertation Center system between 1979-2020. When we look at the rankings of universities where the highest number of post-graduate dissertation studies were conducted among these dates, we find that the first five universities are Ege University (475), İstanbul University (241), Çukurova University (212), Fırat University (176) and Çanakkale Onsekiz Mart University (152) respectively. The biggest factor in the ranking can be explained by the fact that the establishment dates of the Faculties of Fisheries in these universities are older than other universities and the number of academic staff is higher.

Besimoğlu (2015), stated that most of the research in the field of Aquatic Products was made in of the Fisheries Faculty, relatively less research was performed within the Faculty of Agriculture, Fisheries Departments in Turkey. In the field of Aquatic Products, it is seen that most of the master and doctorate dissertations are conducted in universities that have a Faculty of Fisheries (Figure 5).

In our study, on the other hand, it is seen that while aquaculture is the most studied topic in master and doctoral studies, fish biology, fish processing, fish diseases and fishing are studied respectively in Turkey between 1979-2020. Other study topics are, in order of importance; fish population, water quality, water pollution, plankton, fish feeding, fisheries management, aquarium fish, flora-fauna, algae, genetics and other fields (ecology, statistics, economics, fish consumption, taxonomy, invasive species, EU and fisheries etc.) (Figure 4). In general, we recognize that the subjects examined in master studies were studied more comprehensively in doctoral studies, but it is seen that some areas were not studied. For example, it was determined that while 35 master dissertations on fish consumption in Turkey and 7 master dissertations on the European Union and Fisheries were conducted, we saw that there were no studies on these subjects in doctoral studies.

The universities that has Faculty of Fisheries and Department of Fisheries in Turkey, have research units and laboratories. The subjects mostly emphasized and studied in these research units vary according to the geographical structure of the region, fishing and aquaculture activities. Fish production in ponds in Turkey amounted to 421,411 tonnes in 2020 (TUİK, 2021). The most produced fish types in the ponds were; trout (*Oncorhynchus mykiss*), with 34.8% (146,594 tons), sea bass (*Dicentrarchus labrax*) with 35.3% (148,907 tons) and sea bream (*Sparus aurata*) with 26.0% (109,749 tons). It was determined that doctoral dissertations were about the most produced fish types in Turkey and they were rainbow trout sea bass and sea bream, respectively. Other species were; shrimp, carp, crayfish, phytoplankton, salmon, sturgeon, algae, catfish, natural trout species, yellowtail, grass carp, turbot, tongue and others.

It was determined that 59.6% of the master dissertation studies in the field of Aquatic Products were prepared by men, 40.4% by women, and 61.8% of the doctoral studies were prepared by men and 38.2% by women in Turkey between 1979-2020. It has also been found that the gender distribution rates of master and doctoral students do not differ by region and university. It was found that 46 of the master dissertations (1.64%) and 15 of the doctoral studies (1.62%) were prepared in English. The gender distribution of graduate students in the field of Aquatic Products and the rates of the manuscript language of the dissertations are parallel with the rates in other disciplines in Turkey.

In recent years, there has been an increase in the number of master and doctorate students in the field of Aquatic Products at the universities in Turkey. When looked at the rankings of the Turkish universities regarding to the number of foreign master and doctorate students, it was seen that Kastamonu University (21) ranked first, followed by Ege University (11), Fırat University (5) Van Yüzüncü Yıl University (4) and İstanbul University (4). At Kastamonu University, the number of foreign students studying for a post-graduate degree in the field of fisheries has increased rapidly after 2016 with a percentage of 35.5% (n = 1o) for master degree and 91.7% (n = 11) for doctoral. It was also seen that these foreign students who completed their dissertation studies, were all from Libya. Within the framework of a cooperation protocol signed between Turkish and the Libyan government, we learned that these students complete their education at the Kastamonu University. According to the data received on 02.02.2021 from Council Higher Education, Management Information System, the number of students enrolled the graduate

level in the Faculties of Fisheries in Turkey was 71 (56 F / 15) and there has also been an increase in the number of students coming from abroad in recent years (Anonymous, 2021). It is anticipated that if some of these students continue their postgraduate education after faculty studies, the number of foreign students will increase in the following years.

CONCLUSION

In conclusion, this study seems important because it is the first study to demonstrate the structure of the graduate dissertations in the field of Aquatic Products in Turkey. It has been observed that the universities with the most post-graduate studies in the field of Aquatic Products are those that have a Faculty of Fisheries or a Department of Fisheries. It has been determined that the most studied topics in master and doctoral levels are aquaculture, fish biology, processing, fish diseases and fish catching. It is thought that more attention should be paid to issues such as new species, invasive fish, water pollution and ecology. All these issues have become important in the world and in our country in recent years. Aquaculture production in Turkey is increasing rapidly every year. In 2020, aquaculture production increased by 13% compared to the previous year and increased to 421,411 tons, while capture fisheries values decreased by 21.3% to 364,400 tons in Turkey. From 2002 to 2020, aquaculture production grew by more than 500% in Turkey. According to 2018 data, Turkey ranks 19th in aquaculture in the world in and 2nd among European Union countries (28 countries). Scientific studies on topics such as the use of new technologies in aquaculture, the production of new species, fish feed, fish nutrition, fish diseases and fish biology have contributed to the increase in production in Turkey as well as in the world. Since the study is limited to postgraduate dissertations, it will be beneficial to make new studies, including articles, papers and related books, which have been increasing in number in recent years to contribute to the subject.

Ethical Statement
Not applicable.

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Conflict of Interest
The author declares that there are no conflicts of interest regarding the publication of this article

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