

## History of Sericulture in Turkey

Orhan Yilmaz<sup>1\*</sup>, Y. Erdal Erturk<sup>2</sup>, Fusun Coskun<sup>3</sup>, R. Trevor Wilson<sup>4</sup>, Mehmet Ertugrul<sup>5</sup>

<sup>1</sup>Ardahan University, Vocational High School of Technical Sciences, Ardahan, Turkey

<sup>2</sup>Igdir University, Faculty of Agriculture, Department of Agricultural Economics, Igdir, Turkey

<sup>3</sup>Ahi Evran University, Faculty of Agriculture, Department of Animal Science, Kirsehir, Turkey

<sup>4</sup>Bartridge Partners, Umberleigh, Devon EX37 9AS, UK

<sup>5</sup>Ankara University, Faculty of Agriculture, Department of Animal Science, Ankara, Turkey

\*Corresponding author email: zileliorhan [AT] gmail.com

**ABSTRACT**---- According to ancient sources sericulture was started to be produced in China. Silkworm eggs were illegally exported from China by a Chinese Princess who married a royalty out of Chinese Imperial. Turks who were north neighbour nation of Chinese nation carried those silkworm eggs during their long journey to west. Silk used to be a crucial figure in world economy for centuries. The Silk Road was a political actor among powerful nations. Sericulture production was begun in Anatolia which is Asian part of Turkey in A.D. 552 during Byzantium Emperor of Justinianus. The city of Bursa became a textile city which was famous for silk and silk trade centre. In middle of 16<sup>th</sup> century silk textile industry was developed. Apart from city of Bursa, cities of Istanbul, Edirne, Amasya, Denizli, Izmir and Konya were important sericulture centres. After Republic of Turkey has built, silkworm egg production, silkworm care and feed were protected under the Law of 859 in 1926. Some cooperative unions were built in Bursa, Bilecik and Adapazari in 1940 to protect and increase cocoon production. Later than those cooperatives were unified and they built Cocoon Sale Cooperatives Union of Bursa in 11 May 1940. Silkworm Egg Production Management of Cocoon Union which produced silkworm eggs was built in 1963. Turkey is one of the silkworm egg producer countries in the World. In this review history of sericulture was summarized.

**Keywords**---*Bombyx mori*, native breed, genetic resource, Silk Road, cocoon.

### 1. INTRODUCTION

Some animal species and breeds had important place in history of some countries such as Merino sheep in Spain, Angora goat in Turkey and sericulture in China (Ertugrul et al. 2010). Sericulture in the World is generally made in Asian countries. In the World production percentages of China and India are 80% and 15% respectively (Kaya and Tutkun 2012). The production of fresh cocoon is about 134 in 2012 (Table 1). Silk has some unique characteristics in kinds of fabric. It is shiny, soft, strong, and has a fabric can be dyed. It is so sensitive; therefore it is affected by noise, smell, wind, temperature change, even carer's hygiene (Imer 2005). Generally four kinds of silkworm which are Mulberry, Eri, Tasar and Muga are reared in the World. Mulberry silkworm (*Bombyx mori*) (Table 2) has the majority in them which percentage is about 95% (Akbay 1981). In Turkish society silkworm seem cute. A survey study was realized in primary school students. According to study between 9 and 40% of students in different levels rear insects. Students rear silkworm, ant, ladybug and grasshopper which showed that silkworm was one the loveable insect in insect groups (Tezcan et al. 2010).

Table 1. Production of apiculture and sericulture (Anon 2010, Anon 2013a).

Year	Number of Villages Engaged in Sericulture	Number of Families Engaged in Sericulture	Number of Egg Boxes Produced	Production of Fresh Cocoons (tonnes)
1936	2.201	49.338	56.278	2.135
1940	2.422	63.498	73.045	3.014
1950	3.013	69.354	62.927	2.501
1960	2.530	60.370	50.865	2.444
1970	1.559	43.589	64.340	1.461
1980	1.601	43.025	66.042	1.707
1990	1.916	44.541	80.544	2.171
2000	230	2.210	3.147	60
2012	342	2.572	5.576	134

Table 2. Scientific classification of the silkworm (Akabay 1981).

Phylum	Artropoda
Class	Insecta/Hexapoda
Ordo	Lepidoptera
Subordo	Macro Lepidoptera-Heterocera
Super Family	Bomycoiden
Family	Bomycidae
Genus	Bombyx
Species	B. mori

## 2. ORIGIN

Silk is known in Turcoman communities for thousands years. Some archaeological ruins in Sapalli Hill, Kampir Hill and Surhanderya near Syr Darya (Seyhun) River showed that sericulture was an important business in this territory. Silk is called as ‘ipek’ in Turkish, ‘yipek’ in Mameluke and Kipchak Turkish and ‘cipek’ in other Asian Turcoman communities (Imer 2005). The silk was always a symbol of status political, social, and richness in human history (Yildirim 2013<sup>a</sup>). Before Ottoman Empire, silk was an expensive material in Byzantium Empire lands. Justinian who was an emperor of Byzantium Empire sent two Nestorian monks to China to search about sericulture A.D. 552 (Sahin and Cengiz 2010, Kirpik 2012, Tas 2013). The monks learned how to produce silkworm and silk and brought some silkworm eggs inside of their bamboo walking sticks (Sahin and Cengiz 2010). There were not too much references and information about sericulture in Byzantium Empire period which showed sericulture is not widespread in empire lands. After Byzantium, Turks ruled in Anatolia and they developed sericulture. Schiltberger reported that there was a developed silk textile industry in beginning of 15<sup>th</sup> century. Broquiere mentioned about plenty of fabric made from silk in Bursa bazaars in 1432 (Tasligil 1996).

## 3. HISTORY

In Middle Age (during Byzantium period) Lyon was the most important floss silk trade centre in Europe. Ottoman Empire and Iran weremost important sericulture producers in the World (Tasligil 1996, Sahin and Cengiz 2010). In Ottoman Empire lands, sericulture was one of the most important sectors in economy together withwheat, raisin, angora hair and opium (Bayram 2013). On the other hand Bursa was the most important city not only on sericulture, but also on floss silk trade between Iran and Europe (Ersevinc 2013). Hence Bursa was a stopover between Iran and Europe (Sahin and Cengiz 2010). Main sericulture centres were Bursa, Erzincan, Tokat, Diyarbakir, Amasya (Figure 1) and Aleppo (Altun 2007, Hunter 2013, Soysaldi and Ozdemir 2013, Yucekaya 2013). Ottoman Archive presented two books dated in 1531 and 1575 which mentioned about some mulberry trees in Demirci county of Manisa Province (Adamaz 2013). Fehim-i Kadim Divan which is a famous ancient book on animals mentioned about silkworm and sericulture (Durkaya 2010).

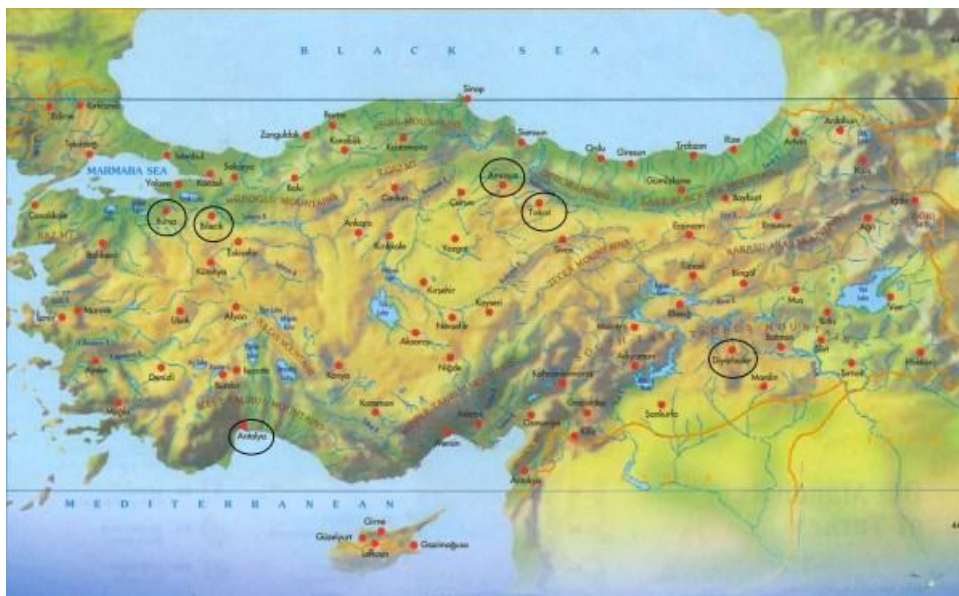


Figure 1. Map of Turkey by showing main sericulture centres.

During Ottoman Empire silk was important material because of three processes which are producing cocoons, filature, and textile (Yildirim 2013<sup>b</sup>). After Turks conquered Bursa in 1326, they experienced sericulture in this region. First

Turks ignored sericulture and focused on floss silk trade, because it provided high income because of taxes. In this period silk fabric was equal to gold as a trade material (Sahin and Cengiz 2010). In late 16<sup>th</sup> century there were some wars between Ottomans and Iran which affected a decreasing trade between two countries (Yildirim 2013<sup>a</sup>). In 17<sup>th</sup> century the floss silk was one of the most important import materials for European countries together with Ottoman Empire (Yildirim 2013<sup>a</sup>).

Until 1824 filature industry was realized by human power by using some tools, but in 1824 a steam engine invented in Lyon which led high production numbers in filature industry (Yasayanlar 2013). In 1938 there was a Balta Port Free Trade Agreement between Ottoman-English governments. After this agreement Ottomans gave some trade privileges to English merchants which caused development of sericulture in Ottoman lands. English consul of Bursa, D. Sandison, the Earl of Aberdeen, reported lots of information about life and sericulture in Bursa (Dortok-Abaci 2006). Ottoman King of Abdulmecid provided to be opened a filature factory, Harir Fabrika-i Humayun, in Bursa in 1852. The factory had 80 cocoon spinning wheels (Dortok-Abaci 2006, Cakici 2013). In middle of 19<sup>th</sup> century sericulture industry went worse because of two reasons. First diseases of Pebrine and Flacherie spread out to Ottoman Empire lands from France and Italy (Dortok-Abaci 2006, Tas 2013, Yasayanlar 2013, Yildirim 2013<sup>a</sup>). Secondly Suez Canal was opened in 1869 and European merchants started to import floss silk from China and Japan by using the Suez Canal (Yildirim 2013<sup>a</sup>). In 1881 sericulture industry increased again because of establishment of Public Debts (Duyun-i Umumiyye) Institution (PDI). PDI started to collect some taxes related with sericulture, therefore it supported to sericulture industry (Table 3) (Dortok-Abaci 2006, Yildirim 2013<sup>a</sup>). In late 19<sup>th</sup> century there was not only floss silk export but also silkworm egg export. 3.212 kg silkworm egg produces and 508 kg exported in 1892. Export number increased up to 5.547 kg in 1889 (Yildirim 2013<sup>a</sup>). Before 1<sup>st</sup> World War, Ottomans had a good level about sericulture but during 1<sup>st</sup> World War between 1914 and 1918 and Independence War between 1919 and 1923, sericulture production decreased again because huge amount of men lost in the wars (Table 4) (Boykoy 2013).

Table 3. Numbers of fresh cocoon and tax between 1888 and 1919 (Yildirim 2013<sup>a</sup>).

Year	Fresh Cocoon (tonnes)	Tax (Ottoman Lira)
1888	4.104	45.593
1890	7.485	90.096
1895	8.860	84.138
1900	10.580	116.379
1905	16.500	206.343
1910	10.812	184.851
1915	2.942	41.254
1919	1.510	181.090

Table 4. Numbers of floss silk in some countries before 1<sup>st</sup> World War (Yildirim 2013<sup>a</sup>).

Country	Floss Silk (tonnes)
Japan	10.818
China	7.282
Italy	4.100
Ottoman	1.200
Iran	500
France	500
Caucasian (Region)	400
Austria-Hungary	300
Balkan (Region)	200
India	180
Spain	80

Kevork Torkomyan was sent to Lyon by Ottoman King of Abdulhamid II to learn sericole. An Institute of Sericole (Harir Darut Talimi)(Figure 2) opened in 14 April 1888 in Bursa by leading Kevork Torkomyan (Ciftci 2013<sup>a</sup>, Mermutlu 2013, Yildirim 2013<sup>a</sup>). He also wrote a book of ‘Ipekbocegi Beslemek ve Ipekbocegi Tohumu Islah Etmek Usul ve Kavaidi’ (Methods and Rules of Silkworm Feeding and Breeding) in 1898 (Ciftci 2013<sup>a</sup>). Also some articles related with sericulture were published in Journal of Asri Ciftci between 1927 and 1928 (Kadioglu 2005).



Figure 2. Institute of Sericicole (Harir Darut Talimi)

After Republic of Turkey was established by following Ottoman Empire, there was a people exchange between Turkey and Greece under the Exchange Agreement dated 1924. Some Turks who lived in eastern Greece and some Greeks who lived in western Turkey were swapped by two governments (Mermutlu 2013). After the exchange, there was a deficiency of sericulture business because of experienced Greeks who knew sericulture business. The Turks who came from eastern Greece to Bursa region knew tobacco cultivation instead of sericulture business. They cut all mulberry trees and started to cultivate tobacco. Hence sericulture production decreased sharply in this time (Boykoy 2013, Mermutlu 2013). Although 122.000 acres of mulberry gardens were in Bursa before the Exchange Agreement, there were only 58.000 acres of mulberry gardens after the Exchange Agreement. 44 silk filature factories worked in Bursa before the Exchange Agreement, but there were only 13 silk filature factories after the Exchange Agreement (Mermutlu 2013). The Exchange Agreement also changed worker profile. Before the Exchange Agreement, mainly women workers worked (94%) in sericulture business (Figure 3) but after the Exchange Agreement, generally men workers worked (4%) in sericulture business in Bursa region (Karakulak 2011, Basaran 2013, Boykoy 2013, Yildiz 2013). During Ottoman period owners and operators of factory were generally non-Turkish Ottoman citizens such as Armenian, Greek or non-Muslim Ottoman citizens such as Jewish (Akkus 2013, Boykoy 2013, Yildiz 2013). Jewish people were not in floss silk or silk fabric production, but they dealt with floss silk and silk fabric trade (Akkus 2013).



Figure 3. Women workers in sericulture business in 1890 (Photo by J. D. S. Papazyan).

After Republic of Turkey was established instead of Ottoman Empire in 2913, sericulture got worse year by year. The crisis of 1929 reduced prices thus sericulture, later than sericulture continued to worsen in 1930s because of starting to import artificial silk fabrics from Far East countries. In 1940s government supported to rear polyhyrid eggs instead of native monohybrid eggs. In 1970s and 1980s fresh cocoon trade was supported by governments to develop sericulture (Tas 2013).

#### 4. CONCLUSIONS

Silk used to be an important trade material which was struggled for domination of main trade routes for centuries. During Ottoman Empire the city of Bursa was not only a textilecentre for silk but it was also main silk trade centre. Raw silk was provided from Bursa to Europe because of being Bursa was a city where the best quality silk was produced there. Besides that raw silk which was imported from Iran helped to increase income both people of Bursa and people who lived near to the Silk Road (Yildirim, 2013a). The silk textile industry was developed in middle of 16<sup>th</sup> century. Besides city of Bursa, cities of Istanbul, Edirne, Amasya, Denizli, Izmir and Konya were important sericulture centres. Silkworm egg production, silkworm care and feed were protected under the Law of 859 in 1926 after the Republic of Turkey has built in 1923. Some cooperative unions were built in Bursa, Bilecik and Adapazari in 1940 to protect and increase cocoon production. Later than those cooperatives were unified and they built Cocoon Sale Cooperatives Union of Bursa in 11 May 1940. Silkworm Egg Production Management of Cocoon Union which produced silkworm eggs was built in 1963 (Anon, 2013b). Even though sericulture is made in small quantity at present, sericulture is still a traditional, historical and economical statute in Turkey.

#### 5. REFERENCES

- Adamaz, K. 2013. Fruit and Vegetable Production in Demirci District in XVI<sup>th</sup> Century. Akademik Tarih ve Düşünce Dergisi. 1 (1): 1-18.
- Akbay, R. 1981. İpekboceği Yetistirme. Ankara Üniversitesi, Ziraat Fakültesi, Ders Notları, 54. Ankara.
- Akkus, T. 2013. Bursa İpekciliğinde Gayrimuslimler. Bursa'da Yaşam Dergisi, Aralık: 136-147.
- Altun, D. 2007. XIX. Yüzyılda Bursa'da İpek Bocekçılığı. Balıkesir Üniversitesi, Fen Edebiyat Fakültesi Tarih KulübüBülteni, 2007/1: 102-108.
- Anonymous. 2010. Statistical Year Book 2010. Turkish Statistical Institute, Prime Ministry: Ankara.
- Anonymous. 2013a. Livestock Statistics, Statistics by Theme. Turkish Statistical Institute, Prime Ministry, Ankara. (accessed on 3.1.2014)
- Anonymous. 2013b. 2013 YılıİpekböceğiRaporu.T.C. Gümrük ve TicaretBakanlığı, Kooperatifçilik Genel MüdürlüğüRaporları, Şubat, Ankara.
- Basaran, H. Z. 2013. Bursa İpekciliğinde KadınlarıRolu. Bursa'da Yaşam Dergisi, Aralık: 114-117.
- Bayram, N. 2013. The Socio-Economie Analysis of Silk Industry in Bursa in Proecess 1837-1923. Uludağ Üniversitesi, Fen Edebiyat Fakültesi, Sosyal Bilimler Dergisi, 2013/1, 14 (24): 45-58.
- Boykoy, S. 2013. The Silk Cocoon Production and The Silk Textile Industry in the Process of 1908-1923 in Bursa. Uludağ Üniversitesi, Fen Edebiyat Fakültesi, Sosyal Bilimler Dergisi, 2013/1, 14 (24): 19-44.
- Cakici, M. 2013. Bursa İpekÇekimFabrikası ve İstihdamSorunu (1851-1873). Bursa'da Yaşam Dergisi, Aralık: 56-66.
- Ciftci, C. 2013<sup>a</sup>. Cocoon Farming and Silk Weaving in Bursa in Process 1837-1908. Uludağ Üniversitesi, Fen Edebiyat Fakültesi, Sosyal Bilimler Dergisi, 2013/1, 14 (24): 1-18.
- Dortok-Abacı, Z. 2006. Bursa Economy According to the British Consular Reports (1848-1896). Uludağ Üniversitesi, Fen Edebiyat Fakültesi, Sosyal Bilimler Dergisi, 2006/2, 7 (11): 159-171.
- Durkaya, H. 2010. An Analyze on the Animals in Fehîm-i Kadim Divan. Uluslararası Sosyal Araştırmalar Dergisi, 3 (15): 13-27.
- Ersevinc, M. 2013. 19-20. Yüzyıllarda Bursa'da İpekçilik. Bursa'da Yaşam Dergisi, Aralık: 92-101.
- Ertugrul, M., Dellal, G., Elmaci, C., Akin, A. O., Pehlivan, E., Soysal, M. I. & Arat, S. 2010. Conservation Of Farm Animal Genetic Resources And Their Sustainable Use. Turkish Agricultural Engineering Technical Congress VII, 11-15 January 2010. Ankara.
- Hunter, W. 2013. Bursa Mektubu - Mayıs 1792 (Cev: Ekiz, C. ve Ulutas, C.). Bursa'da Yaşam Dergisi, Aralık: 396-401.
- Imer, Z. 2005. MiladiDonemOncesinde Orta Asya'daİpek.Bilig, Turk Dünyası Sosyal Bilimler Dergisi, 32: 1-32.
- Kadioglu, S. 2005. Bursa Ziraat Cemiyeti (1927) ve yayiniAsrıCiftci.OsmanlıBilimiAraştırmaları Dergisi, 6/2: 265-286.
- Karakulak, A. 2011. AktifİsgucuPolitikalarınınKadınİstihdamiUzerindekiEtkisi. KadınEmegiKonferansı, 3 Mayıs 2011, Ankara.
- Kaya, R. and Tutkun, M. 2012. Türkiye'deİpekbocekçılığı. 8th National Congress of Animal Science Students, 22-23 May 2012, Sanliurfa.

- Kirpik, G. 2012. Haclilar ve IpekYolu.Bilig, Turk Dunyasi Sosyal Bilimler Dergisi, 61: 173-200.
- Mermutlu, B. 2013. The Status of Manufacturers and Small Tradesmen in Bursa After the Exchange. UludagUniversitesi, Fen Edebiyat Fakultesi, Sosyal Bilimler Dergisi, 2013/2, 14 (25): 267-288.
- Soysaldi, A. ve Ozdemir, H. A. 2013.Bursa KizCeyizindeIpeginYeri. Bursa'da Yasam Dergisi, Aralik: 156-165.
- Sahin, A. ve Cengiz, S. 2010. The Effects of the 16th Century Price Revolution and the Ottoman-Iran Wars on the Ottoman Silk Industry.Isletme ve EkonomiArastirmalari Dergisi. 1 (1): 69-82.
- Tas, H. 2013. Bursa FolklorundaIpek ve Koza. Bursa'da Yasam Dergisi, Aralik: 136-147.
- Tasligil, N. 1996.From Past to Date Sericulture in Bursa. Marmara Cografya Dergisi. 1 (1): 237-246.
- Tezcan, S., Tezcan, F., Gulpercin, N., Karababa, A. O., Kanlioglu, A., Uzum, A., Tanyeri, N., Yolcu, F., Ozcan, N. D., Ilhan, I., Duman, R., Onucar, A., Birgucu, A. K. Atalay, M., Eraslan, V., Oruc, S., Baybora, T. ve Ersoy, M.C. 2010. The Importance of BOFYAP Projects in Raising the Awareness of Insectsin the Society of Turkey.BiyolojiBilimleri Arastirma Dergisi. 3 (1): 101-106.
- Yasayanlar, D. 2013. Bursa ve Cevresinde Koza Uretimi. Bursa'da Yasam Dergisi, Aralik: 126-135.
- Yildirim, M. A. 2013a. On the Development of Sericulture Production After the Establishment of Public Debts (Duyun-i Umumiyye) Institution. Mustafa Kemal Universitesi Sosyal Bilimler Enstitusu Dergisi. 10 (23): 65-83.
- Yildirim, M. A. 2013b. Sericulture Education in the Ottoman Empire: The Opening of Harir Dâruttalim and Dârulharirs. Turkish Studies. 8/5: 577-594.
- Yildiz, H. Z. 2013. Bursa'ninIpekIscileri. Bursa'da Yasam Dergisi, Aralik: 108-113.
- Yucekaya, H. 2013. On the Silk Production of Amasya (1750-1900).Gazi Akademik Bakis Dergisi. 13: 269-284.