



SOCIO-ECONOMIC ANALYSIS OF ENTERPRISES ENGAGED IN AYVACIK HORSE BREEDING

*Yakup Erdal Erturk¹, Isa Yilmaz² Ali Ihsan Erendor³ and Orhan Yilmaz⁴

¹Department of Agricultural Economics, Faculty of Agriculture, Iğdir University, Iğdir, Turkey

²Department of Animal Science, Faculty of Agriculture, Iğdir University, Iğdir

³County Directorate of the Ministry of Food, Agriculture and Livestock, Ayvacik, Canakkale

⁴Vocational High School of Technical Sciences, Ardahan University, Ardahan, Turkey

ABSTRACT

Ayvacik horse is reared in Ayvacik county of Canakkale province and its near which is a small size and solid horse breed. According to data of County Directorate of Food, Agriculture and Livestock of Ayvacik, there were about 218 horse holders who had 328 horses. Enterprises of 107 of 218 accepted to reply survey queries which were carried out by a face-to-face survey. According to survey results, all of horse holders were male. In addition, horse holders were 95.3% married and the average age was 52.9 years old which were ranged from 21 to 79 years old age. 67.3% of horse holders were graduated from primary school. The average of horse holding was about 23.7% and numbers of horses kept by holders were for one, two, and more than two horses 65.4, 28, and 6.5%, respectively. In this survey study also some data were obtained about Ayvacik horse rearing so that the structure of Ayvacik horse holders were analyzed by using obtained results.

Keywords: Ayvacik endangered breed, native breed, genetic resource, horse breeding, socio-economic structure.

Jel classification: A13, Q12, Q120, Q190

INTRODUCTION

Horses which played very important roles as food, transportation, carrying and combat vehicles throughout the history were thought to be domesticated by the Central Asian Turks for the first time according to many researchers (Yilmaz and Ertugrul, 2012). Having lived in the Central Asian geography, Turks used horses as immigration and combat vehicles in transportation and carrying in regions from China to Western Europe (Yilmaz and Ertugrul, 2012; Sertkaya, 1995; Alarслан, 2009).

A large majority of the horse population in Turkey is composed by native Anatolian horses (Batu, 1962). Apart from the Anatolian native horse; there are many local horse breeds and types in the country such as Alaca, Ayvacik, Canik, Cirit, Kula of Camardi, Cukurova, Eastern Anatolian, Kolukisa of Hınıs, Malakan, Thracian, Turkish Arabian, and Turkish Thoroughbred horses (Gulec, 2005; Kirmizibayrak *et al.*, 2004; Yilmaz and Ertugrul, 2012). While some of these genetic resources have been extinct, some of them are endangered or endangered of extinction. Ayvacik, Canik, Cukurova,

Kolukisa of Hınıs and Malakan horses have been taken under conservation by TURKHAYGEN-I Project (Arat, 2011).

Ayvacik horse is a small and strong breed reared in the Ayvacik county of the province of Canakkale and its surroundings, it is generally raised as ride and pack animal by smallholders (Yilmaz, 2012a; Yilmaz, 2012b).

It was indicated by some researchers that height at withers of Ayvacik horses reached between 110-126 cm (Boztepe and Aytakin, 2011; Yilmaz, 2012b; Yilmazer, 2007). Also, their chest width is specified between 124-142 cm and body height is between 151-170 cm. Ayvacik horse generally has a chestnut coat color and a load bearing capacity of 150-200 kg. It is a docile animal and breeders usually use them for raw olive carrying and small farm works (Alarслан, 2009). Its mane is long, legs are short and thickset, hooves are wide and nails are rigid and solid. Its is sturdy, height is short, and chest connection is quite deep. Its shoulders are slightly inclined and long. Its front chest is well built and deep. Its abdomen is moderate-sized and flanks are closed. Its most common coat color is chestnut and similar tones, however grey coated horses are also encountered. Due to their ambling routine and enduring nails, they are especially preferred for working

*Corresponding author e-mail: erdal.erturk@igdir.edu.tr

on rocky, harsh and inclined lands. It can keep its swift pace for a long time with heavy loads. In addition to being as durable as a mule in mountainous terrains, they can walk faster than mules with more mastery. Since they are more docile compared to mules, they are easier to handle. They show great affection to their masters and attach them fondly. Additionally, they have a bright potential of being a horse breed by kids for sports and leisure purposes due to their short heights and docile characters (Emiroglu and Yuksel, 2009; Gulec, 2011; Boztepe and Aytekin, 2011; Yilmaz, 2012b; Yilmaz and Ertugrul, 2012).

Similarly, Ayvacik horse, which played the role of plowing the orchards and olive groves before their mechanical successors, small garden tractors were introduced. It walks on mountainous terrains as easily as a mule because of its small nails. Riders do not tire due to itspace gait. It does not show bad temper, and it is very docile and obedient animal (Emiroglu and Yuksel, 2009). It has been indicated by some researchers that since Ayvacik horse is a contented and easy-to-raise animal fed and kept in primitive and insufficient raising conditions. It is a local native breed with the potential of a good riding horse. It becomes more of an issue to have alternative raising areas in terms of maintaining the variety of domestic animals. This horse breed has got the potential of serving especially in horse tourism if riding can be encouraged in the region (Gumus and Savas, 2008).

The purpose of this study is to determine the conditions, raising characteristics and faced problems of the enterprises where Ayvacik horses are bred in Ayvacik county of the city of Canakkale and its surroundings. In addition this study offers solution proposals to these problems, specifies the target of breeding, helps breeders and creates awareness in terms of maintaining and

protecting our native gene resources, and brings forward suggestions for where Ayvacik horses can be put to good use and how their contribution to the national economy can be increased.

MATERIALS AND METHODS

Materials of this study consisted of 218 enterprises engaged in Ayvacik horse breeding in Ayvacik county of the province of Canakkale and its surroundings and 318 horses kept in these enterprises. According to the records of the County Directorate of Food, Agriculture and Livestock; even though there were 328 Ayvacik horses owned by 218 horse holders (Anonymous, 2012) 107 enterprise owners out of 218 Ayvacik horse breeding enterprises accepted to answer the questions and therefore the questionnaire was conducted with them by using face-to-face interview. Other enterprise owners did not accept to answer questions of questionnaire due to various reasons. Since the number of enterprise owners who accepted to participate in the questionnaire was low, the questionnaire was conducted as complete inventory.

Ayvacik, a county of the province of Canakkale, is located between Mount Ida and Aegean Sea. The county with a long coast line (78 km) has a surface area of 874 km². The county having an average elevation of 270 meters from sea level, and located on a volcanic plateau, is mountainous and hilly in terms of land structure. The county has a population of 30.640, 64 villages and 2 municipalities. Ovine breeding and carpet making are the most important production areas in those villages. Agriculture, tourism and handicrafts occupy a significant place in the county's economy (Anonymous, 2014). Table 1 illustrates names of the villages where questionnaire was conducted, numbers and percentages of horse holders.

Table 1. Villages and Horse owners.

Villages	n	%	Villages	n	%	Villages	n	%
Adatepebasi	17	15.9	Demirci	1	0.9	Kecikaya	1	0.9
Ahmetce	8	7.5	Dibekli	3	2.8	Kucukkuyu	9	8.4
Arikli	7	6.5	Gulpinar	3	2.8	Nusratli	4	3.7
Merkez	2	1.9	Guzelkoy	4	3.7	Pasaköy	1	0.9
Buyukhusun	2	1.9	Ilyasfaki	6	5.6	Sazli	4	3.7
Babakale	2	1.9	Kayalar	7	6.5	Tamis	1	0.9
Bademli	2	1.9	Kisacik	1	0.9	Tuztasi	1	0.9
Bahcedere	1	0.9	Kizilkeçili	1	0.9	Uzunalan	2	1.9
Bektas	1	0.9	Korubasi	1	0.9	Yenicam	4	3.7
Billaller	1	0.9	Kozlu	6	5.6			
Calti	3	2.8	Kulfal	1	0.9			
						Total	107	100

Data were collected by using a questionnaire form prepared to determine descriptive variables of enterprises, Ayvacik horse breeding and relevant information. Information gained through both conducting questionnaires and benefiting from institution records was organized with the help of an Excel spreadsheet program and made ready for examination and analysis. Results were expressed in numbers and percentages for characteristics summarized in two-dimensional tables (Yildiz and Bircan, 2012).

It was aimed to specify the socio-economical and demographical characteristics of Ayvacik horse breeding enterprises and the relationship between these characteristics through the analysis of the obtained data. SPSS 20.0 program was also used to conduct statistical analysis of the study.

RESULTS

Some descriptive information regarding enterprise owners and horse breeding

Table 2 illustrates some descriptive statistics of enterprises such as age, numbers of household members, employed members and children in the family, quantity of land, field parcels, horse breeding years, horses, personal incomes and incomes of household members. Table 2 shows that ages of breeders varies between 21 and 79 and the average age is 52.9.

Evaluating numbers of household members of horse breeding enterprises, it was determined that number of people varied between 2 and 7, and the average number of people was 3.58. Similarly, when the number of working members in families was analyzed, it was determined that it varied between 1 and 5 people and the average was 1.26 persons.

Additionally, it was determined in this study that 67.3% of owners of horse breeding enterprises were primary school graduates, 15.9% were literate, 8.4% were secondary school graduates, 3.7% were high school graduates and 4.7% were illiterate. Besides when the types of enterprises were analyzed, it had been specified that 53.3% of enterprise owners were engaged with vegetative and animal production, whereas 46.7% were only engaged with livestock production.

When the numbers of parcels of enterprises were analyzed, it was determined that enterprise owners had an average of 26 decares of land, and land sizes varied between 0 and 300 decares. Parcel number of these lands was 3.98 decares in average whereas it varied between 0 and 50 decares.

Additionally, it was found out that breeders had kept horses for 23.71 years in average, the newest horse breeding farms had kept horses for 1 year whereas the oldest had kept horses for 62 years. Furthermore, the average number of horses enterprise owners have was 1.41 and it varied between 1 and 3.

58.9% of the horse breeding enterprise owners declared that they did not have any incomes other than agriculture. The average monthly income of these families was calculated to be 1.288 TL whereas their personal average monthly income was calculated as 1.111 TL. While the horse owner families with the lowest income was 200 TL, the highest personal income was 10.000 TL. Additionally, the lowest household income was 200 TL; on the other hand the highest income was 12.000 TL.

Besides, 89.7% of horse breeding enterprises had personal incomes of TRY 1.000 and less. When household incomes were examined, the rate of those with an income

Table 2. Some descriptive statistics of Farmers and Enterprises.

Properties of enterprises	N	$\bar{X} \pm s_{\bar{x}}$	Median	Range	Minimum	Maximum
Age	107	52.93±1.37	52	58	21	79
Number of household members	107	3.58±0.28	3	28	2	30
Number of employed members in the family	107	1.26±0.07	1	4	1	5
Number of children in the family	107	1.82±0.09	2	5	0	5
Amount of land	107	26.09±4.23	10	300	0	300
Number of parcel	107	3.98±0.64	3	50	0	50
Year of horse breeding	107	23.71±1.49	20	61	1	62
Number of horses	107	1.41±0.06	1	2	1	3
Personal income	107	1111.22±169.93	600	9800	200	10.000
Income of household	107	1288.79±191.15	700	11800	200	12.000

Table 3. Distributions of household income and personal income of Horse holders.

Income level	Personal income		Household income	
	n		n	
Less than 500 TRY	43		36	
	40.2	%	33.6	%
501-1000 TRY	53		48	
	49.5	%	44.9	%
1001-2000 TRY	3		13	
	2.8	%	12.1	%
More than 2000 TRY	8		10	
	7.5	%	9.4	%
General Total	107		107	
	100	%	100	%

below TRY 1.000 was 78.5% (Table 3).

When owners of horse breeding enterprises were asked what their problems were, 64.5% of them declared they did not have any problems related to horse breeding. Those who talked about their problems indicated that they had problems regarding horse care, shelter, employment, providing horseshoe makers and veterinarians, horse feed and prices of horse feed (Table 4).

It was determined that only 17 horse holder gave names to their horses. Some of the names given to horses were Cakir, Calar, Dogan, Garip, Idi, Karaman, Kinali, Kistrak, Kocaman, Ruzgar, Sarikiz, Siyah Inci, Seker and Ucan Ruya. When horse owners were asked where they provided their horses from, 72.9% of them declared they bought them from another village or from a neighbor, 10.6% said their horses were their own breeds, 4.7% said they bought them from horse sellers, 0.9% said they bought them from bazaars and 1.9% said they bought horses both from horse sellers and from other villages and neighbors.

Table 4. Problems on Horse breeding.

Problems	n	%
No opinion	69	64.49
Care	6	5.61
Shelter	2	1.87
Employment	4	3.74
Finding horseshoe maker	1	0.93
Veterinary service	2	1.87
Procurement and price of feed	23	21.50
Total	107	100.00

When the question, "Why do you use Ayvacik horse?" was asked, 38.3% of horse holders said it was because it is short, 9.3% said it was because it has a strong grip on the ground, 5.6% said it was because it can live with less feed, 3.7% said it was because it is a good-natured horse, 2.8% said it was because it has all the mentioned

characteristics and 40.2% said it was because of other reasons. When the other reasons were described, 21.5% of those who said other reasons expressed it was because it is ideal on their land, 9.3% said it was because it is enduring, 6.5% said it was because it is a native animal and 2.8% said they preferred Ayvacik horse because there is plenty of herbs in the region. When the question, "Would you consider breeding another horse instead of Ayvacik horse?" was asked, 91.6% of horse holders replied the question with the answer "No, I would not".

When they were asked if they bred any animals other than horses, 33.6% of horse holders replied the question with the answer "no". Among the 66.4% of the horse holders who answered as "yes", 50.5% declared they also raised sheep and goats, 4.7% said they also raised cattles, 0.9% said they raised mules and 10.3% said they raised both cattles and sheep and goats.

Horse holders mostly used their horses for olive carrying and cultivating the olive grove and they thought they could not use any other tools for what they do. They expressed that Ayvacik horse was ideal on the land since it was short and had a strong grip on the ground. They did not consider breeding any horses other than Ayvacik horse. All horse holders declared that they were registered at associations or federations related to horse breeding. All horse holders expressed that they preferred feeding their horses primarily with barley in addition to dried herbs. They also declared that they also used wheat, bitter vetch, concentrate feed, dried herbs and clovers in addition to meadows. Three-quarters of horse holders did not earn any incomes from their horses whereas one-quarter of them used their horses for gardening, carrying load and olives. 94.4% of horse holders indicated that they would call veterinarians when their horses get sick, whereas 85% stated that their horses did not catch any diseases before. While 56.1% of horse holders indicated that they would sell their horses if the animal becomes incapable of working, 39.3% said they would take care of the animal until it died and 4.67% indicated they would leave the animal on the meadow or the land.

According to the results of the study; most of the horse holders lived in villages and the villages they spent most of their life were mountainous area. One-quarter of horse holders were not land owners. 43.9% had family-run businesses on lands under 50 decares. 72.9% of enterprise owners used all their lands for themselves. While 53.3% of enterprises made vegetative and animal production, 46.7% were engaged in livestock. The average horse breeding time was 23.71 years. The rate of those breeding horses for more than 20 years was 45.8%, 65.4% of horse holders had one horse, 28% two horses and 6.5% three or more horses. The factors that affect having horses are that they live in a village, the village is located in mountainous area, and they use all their lands for themselves in addition to the time they have had horses are.

They indicated their problems related to horse breeding as horse care, shelter, employment, providing horseshoe makers and veterinaries, procurement of horse feed and high prices of feed. As a solution, they indicated that they expected support for horse breeding from the government and they demanded that prices of the feed were decreased and horse breeding was encouraged.

Ayvacik horses, seen as a local value by their breeders partake of the lives of their breeders as docile and enduring friends that ease their lives. Using Ayvacik horses in different fields such as tourism along with carrying olives and cultivating the soil on olive lands especially in harsh land conditions seems necessary for continuing their existence and diversifying incomes. Even a small payment to be made per animal may create difference in life standards of horse holders whose incomes are low and will contribute to the continuation of the race of Ayvacik horses that are on the verge of extinction.

While 72.9% of enterprise owners who were asked about their way of using their lands indicated they used all their lands for themselves, 1.9% said they rented lands, and 0.9% said they rented out some of their lands to hirers/ sharecrop farmers.

The number of horses declared by horse holders who answered the questionnaire was 151. While 64 of these horses were female, 87 were male. The youngest horse was 2 years old whereas the oldest one was 20 years old. While the number of horses aged between 1 and 5 was 56, the number of horses aged between 6 and 10 was 69 and the number of horses above the 10 was 40.

DISCUSSION

In this study, the average age of owners of enterprises where the questionnaire was conducted was found to be 52.90. This showed that breeders comprised of old people. Similarly, in another study conducted in the city

of Erzurum (Yılmaz, 2005), the number reached for the average age of enterprise owners who had imported animals (50.40) was close to the number found in this study. However, it was found to be higher than the number found in cooperative farms (44.80) again in the same study. The average number of household members in horse breeding farms (3.58) in this study was lower than the average number of household members in the study conducted in the city of Kars (7.17) (Tilki *et al.*, 2013a) and was similar to the average number of household members in the city of Burdur (3.80) (Elmaz *et al.*, 2012).

The rate of literacy of the horse breeding enterprise owners in this study (95.30%) was found to be lower than the rates of literacy obtained in livestock farms in the city of Canakkale (Calis, 1999), in Thrace region (Yavuz, 1994), in the city of Erzurum (Yılmaz, 2005) and in the city of Kars (100.00, 98.20, 97.60 and 96.12%) (Tilki *et al.*, 2013a). However, the rate obtained for the rate of literacy in this study was higher than the rate of literacy found in the study conducted in the city of Hatay (91.00%) (Tapki, 1996).

43.90% of horse holders were small family-run business on lands less than 50 acres and the average area of lands was 26.09 acres. This rate was lower than the land surface area specified in the city of Van (52 acres) (Sahin and Yılmaz, 2008). The rate of the land of over 51 acres indicated in the city of Kars was 72.05% (Tilki *et al.*, 2013b).

When types of the horse breeding enterprises were taken into account, it was determined in this study that 53.3% of the enterprise owners were engaged in vegetative and livestock production. This rate was significantly lower compared to the rates of cattle raising farms in the city of Hatay (Tapki, 1996), and imported heifer enterprises and cooperative enterprises in the city of Erzurum (90, 61.1 and 90%) (Yılmaz, 2005). Rates specified in the same studies conducted for only enterprises engaged in animal production with the same order (5.0, 2.80 and 5.0%) were found to be lower than the rate of enterprises engaged in horse breeding (46.7%).

Consequently, when contributions of livestock farming to economy were examined, concepts such as nourishment, clothing, exportation, labor force, sports and horse riding came into prominence. In Turkey, as in the whole world, even though a fast mechanization in labor force decreases the role of animals in agriculture, animals have still maintained their importance as power sources in agricultural activities such as plowing, threshing and carrying works in small farms with economically insufficient power operating in rough terrains (Emsen, 2011).

Additionally, horse breeding should also be encouraged for sports, horse riding and tourism. Since horses play an important role for racing and riding, they are required for security guards working in formal ceremonies organized for welcoming statesmen, in tourism areas and big cities in Turkey as well as in developed countries. When it is considered that today adults spend most of their time between their homes and workplaces and children spend most of their time between school and their homes, the importance of having close relationships with animals can be better understood.

Therefore, more place should be given to Ayvacik horse, a source of joy and amusement for millions of people including children and young and old alike in zoos, circuses, tourism areas, street fairs and recreational local contests to have people spend more time with animals. In addition, breeding of Ayvacik horses should be encouraged and these horses should be taken under protection in order to preserve our native genetic resources.

REFERENCES

- Alarслан, E. 2009. The structure of traditional horse breeding in villages in Ercis County of Van Province. M.Sc. Thesis. Institute of Science and Technology, Yuzuncu Yil University, Turkey.
- Anonymous. 2012. Year Briefing Notes. Ayvacik District Directorate of Food Agriculture and Livestock, Ayvacik. Canakkale.
- Anonymous, 2014. Aegean and the Marmara Sea combine a city; Ayvacik. Ayvacik Municipality Website. <http://www.canakkaleAyvacik.bel.tr/pages/Ayvacik/> (accessed in 15 Ocak 2014).
- Aral, N. 1974. Animal Species Grown in Turkey, Breeding History and Technology (1923-1931). Jockey Club of Turkey Publications. Ankara.
- Arat, S. 2011. In Vitro Conservation and Preliminary Molecular Identification of Some Turkish Domestic Animal Genetic Resources (Turkhaygen-I). Genetic Engineering and Biotechnology Institute, Gebze, Kocaeli, Turkey. <http://www.turkhaygen.gov.tr/data> (accessed in 22.12.2011).
- Batu, S. 1962. Turkish Horses and Horse Breeding Information. Faculty of Veterinary Medicine, Ankara University. Publications 13. Ankara.
- Boztepe, S., ve Aytakin, I. 2011. Horse Breeding. Department of Animal Science, Faculty of Agriculture, Selcuk University, Konya.
- Calıs, E. 1999. Village of central country of Canakkale city Holstein race import dairy cows feeding condition to the problems. M.Sc. Thesis. Trakya University, Tekirdag.
- Elmaz, O., Sipahi, C., Saatci, M. and ve Ozcelik, M. 2012. Determining the current status of the dairy cattle enterprises in the Mediterranean region. Outlook on Agriculture, Turkey. 41(2):133-138.
- Emiroglu, K. and ve Yuksel, A. 2009. Our comrade horse. Yapı Kredi Kültür Publications. No:1744. Istanbul.
- Emsen, H. 2011. Principles of Animal Husbandry. Faculty of Agriculture Offset Facilities, University Publication No. 720. Ataturk University, Erzurum.
- Gulec, E. 2005. Turkish Horse Breeds. Anatolia Horse Races Survival and Development Association Publication, Ankara.
- Gulec, E. 2011. Horse Breeds Anatolia protected by the State. Knowledge Consulting and Engineering Publications. Ankara.
- Gümüş, M. and ve Savas, T. 2008. Leveraging Opportunities for Tourism from ayvacik horse. Ayvacik Values Symposium (29-30 August 2008) Proceedings. Canakkale. 261-270.
- Kirmizibayrak, T., Aksoy, AR., Tilki, M. and Saatci, M. 2004. An Investigation on Morphological Characteristics of Turkish Native Horses in Kars Region. Kafkas Univ. Vet. Fac. J. 17: 69-72.
- Sertkaya, O. 1995. In ancient Turkish culture. Horse: In Turkish Culture and Contemporary Horse Equine Symposium Book. 11 to 14 May 1994. Photo Printing House. Resim Matbaacilik. Istanbul.
- Sahin, K. and ve Yılmaz, İH. 2008. A Research on Forages Cultivation, Rangeland Usage and Socio-Economical Structure of Van Province. Journal of Agricultural Sciences, Van. 14 (1):16-21.
- Tapki, I. 1996. Technical, economic and the structural features of agricultural enterprises made cattle fattening and of dairy cattle breeding in the environment and the province of Hatay. M.Sc. Thesis. Graduate School of Science, Mustafa Kemal University, Antakya.
- Tilki, M., Aydın, E., Sarı, M., Aksoy, AR. and Onk, K. 2013^b. Current Status of Cattle Shelters in Livestock Enterprises and Breeder Demands in Kars: II. Breeder Demands. Kafkas Univ. Vet. Fac. J. 19(2):191-197.
- Tilki, M., Sarı, M., Aydın, E., Isık, S. and Aksoy, AR. 2013^a. Current Status of Cattle Shelters in Livestock Enterprises and Breeder Demands in Kars. Kafkas Univ. Vet. Fac. J. 19 (1):109-116.
- Yavuz, E. 1994. A study on the some milk and fertility characteristics of holstein of dairy cattle imported from Agricultural Credit Cooperatives on the region of Thrace. M.Sc. Thesis. Graduate School of Science, Trakya University, Tekirdag.

Yildiz, N., Akbulut, O. and Bircan, H. 2012. Introduction to Statistics. (8th edi.) Active Publishing House. Erzurum.

Yılmaz, İ. 2005. Analysis of breeding of exotic cattle brought from different sources in Erzurum province. Ph.D. Thesis. Graduate School of Science, Ataturk University, Erzurum.

Yılmaz, O. and ve Ertugrul, M. 2012. Marking on Horses. Iğdir Univ. J. Inst. Sci. & Tech. 2(1):83-90.

Yılmaz, O. 2012^a. Turkish Native Horse Breeds and A Conservation Policy. Hundredth Year University. Journal of Faculty of Agriculture. 22(2):117-133.

Yılmaz, O. 2012^b. Horse Breeding (Race, Coat, Mark and Walking Varieties). Veni Vidi Vici Publications. 12. Konak Kirtasiye, Ankara.

Yilmazer, O. 2007. Ayvacık Midillisi. Graduate School of Science, Canakkale University, Canakkale.

Received: Dec 28, 2014; Accepted: Jan 31, 2015