

PASTORSHIP AND THE ROMANIANS' ETNOGENESIS - VALACHIAN CORKSCREW HORNS SHEEP BREED ("RATSCA") - AN INTERESTING BIOLOGICAL AND HISTORICAL DOCUMENT

Condrea DRAGANESCU

University of Agricultural Sciences and Veterinary Medicine Bucharest, 59 Marasti, District 1, Bucharest, 011464, Romania, Phone:+400212227912, Email: condrag2002@yahoo.com

Corresponding author: condrag2002@yahoo.com

Abstract

The Corkscrew horns Valachian sheep it is a breed from the Early Egyptian (Ovis paleoegyptica) philetic group, located in Serbia, Montenegro, Panonia, and Romanian border with Serbia. The tribe was named by Buffon (1780), Darwin (1865) Valachian, by Serbs Corkscrew Horns Valachian (Valaska vitorogta), by Hungarian Racka (=Serbian), by Linnaeus O.a.strepsiceros. The translation of strepsiceros into German=Zackel (Nathusius 1890), produced a confusion with the Valachian philetic group descending from the Thracian philetic group. To avoid confusion, we proposed (1994) to use for this philetic group the Serbian name Valachian Corkscrew Horns. It is a sedentary sheep, not adapted to transhumance and to big flocks, not adapted to support wintering in open field, even to stay in the rain. Have a smaller weight of fine fibbers in the mixed wool, it seem black colour recessive, inverse than in Valachia (Tsurcana) breeds. It is economically not competitive with others local and improved breed and it is in danger of extinction in Serbia and even Romania and well conserved in Hungary. It was considered as an historical document (Dunka 1984) and perhaps it is. Document the former existence of a Valachian tribe in this area, implicit the Valachian contribution to the ethno genesis of nations from this area. As an interesting genetic resource, but also for the aesthetic aspect of his horns and for some cultural reasons it deserves to have a good genetic conservation program.

Key words: biological and historical document, Corkscrew horns sheep, mixed wool, pastorship, preservation, Romanians' etnogenesis, sedentary, Valach, Vlack

INTRODUCTION

"Serbians like Hungarians learnt pastorship from Romanians" (Bogdan Petriceicu Hasdeu, The origins of pastorship in Romanians, 1974).

The Valachian Corkscrew Horns sheep breeds, was first presented by Buffon (1780), after a description of Colinson, under the name Valchian ("**Brebis valachienne**"). Colinson noticed it in the former Yugoslavian space, being perhaps the sheep of some Valachs (Romanians), as in fact, the Serbians call it Valalachian Corkscrew Horns Breed, ("Valaska"- Belic, 1980,"Vlaska vitoroga"- Stojanovici, 2003, "Vlach screwhorn"- Mason, 1988). Many scientists of the 18th, 19th and 20th centuries, including Ch. Darwin (1865) presented it under the name given by Buffon or with the specification that it was about the sharp horned sheep breed (Le

Mouton a Cornes Pointues). The last morpho-descriptive specification is the translation of its descriptive-taxonomic name given by Linnee (**Ovis aries strepsiceros**). Numerous **drawings and photoes, (14 synthetized by N.Crăciun on internet), accompany its presentations.**

In order to avoid a confusion to others breeds named also Valachian, but taxonomically distinguished, we recommended (1994), the use of the Serbian name. The Hungarians name this breed "**Racka**", not noticing that that it means "Serbian"(Raks=Serbian).. The Romanian scientists accepted the Hungarian name "Ratska", except some scientists (Maior, 1899) who understood its correct name of "Serbian". Cornevin (1890), referring to the Balusa breed as called at the moment, presented this bred under the name "from Montenegro". Nathusius (1880) translated into German the term of "strepsiceros" (sharo

horns=zackel), given by Linnee, naming it *Zackel*, an eronated name extented to all the the Valah sheep (Țurcană etc), which in fact have no taxonomic links with the Valahian Corkscrew Horns Breed.

As we can notice, in the classification of this breed, like in the whole zootechnical taxonomy, it still persist names and many errors with negative technical and economical impact. As we affirmed, (1998), it is “a real comedy of errors”.

We note that naturalists, such **Buffon and Linnaeus**, established valid systems of identification, classification and nomenclature for the extraordinary diversity of plant and animal species, a common language for all biologists. Linnee tried to put order also in the kingdom of domestic animals. He used a binary denomination for the sheep breeds (*O. aries: rustica, hispanica, anglica, policerata, africana, laticauda guinesis, strepsiceros*).



Photo 1. Les moutons a cornes pointues (A.E.Brem, Le Merveilles de la nature, Les Mamiferes, p.642)

The great diversity of domestic animals, the lack of clear and satisfactory criteria for classification could not solve the problem till nowadays. FEZ (Federation Europeene de Zootechnie) tried to approach the problem from a scientifically. FAO did not do this. An important contribution was brought by Mason, who warned about the need of a taxonomy, but because of the difficulties to obtain comparable information about all the breeds characters and the variation of the names for the same breed, he was forced to set up a “Dictionary of Breeds”(1951, 1969,1988, 1999).

The objective of this paper was to illustrate and correct some taxonomical and cultural errors (nomenclature, description, classification) connected with this breed. It aimed especially to present studies regarding

the breed from Romania. Practically, we were obliged to make concerns to the breed of Serbia and Hungary too, because they are similar breeds and probable not reproductively isolated as in the 1960s, Hungary imported sheep nuclei from Romania. We mention that in Hungary, for scientific reasons and/or historical reasons, this breed is well preserved and studied (Bodo study, for example).

MATERIALS AND METHODS

Our researches started in years 1994, being encouraged by some data presented in a brochure written by Dunka Bela, Nathusius' book and the visit in the Hungarian rezervation where Racka Sheep is preserved, it si about Hortobagyí Nemzeti Park of

genetic resources. The documentation continued with visits and studies carried out together with Palas Research Institute for Sheep Production and Caransebes Research Station. The visits were done in small peasant households raising this breed in 4 communes of the Dogneci area, close to the border with Serbia. We tried to also see the breed in Serbia and at the Caransebes Research Station we noticed that it was established a small nucleus of this breed. Some direct investigations made there have been of much help to set up some papers and communications.

RESULTS AND DISCUSSIONS

(I) Breed origin and classification. Related to the origin of the Valahian Corkscrew Horns Sheep Breed, there are two suppositions.

(I.1.) Breed origin

(a) The first supposition, resulted from the first name, given by Buffon and maintained practically by all scientists of 18-th, 19-th even 20-th century, starting with Colinson-Buffon, Darwin. This name point out that this sheep has been the sheep of some Valachian, respectively Romanian, being known that this name was given to the Proto-Romanians and Romanians after the power change in Constantinopol (in the year 641, the Latin, the official language was replaced by Greek language), and the Slavians coming. The location attested by Serbians and Hungarians, is a proof that the Valahians, the owners of this breed, had the origin in the Panonico-North Serbian space, and the one registered by Cornevin included the Montenegro and Serbian-Panonic space. We suppose that the breed was brought in Romania during the Roman occupation, therefore before the period of migrations, before the coming of Serbians and Hungarians. The Romanians brought some animals from the Middle East (Merino and probable Tsigaia breeds). The Thrako-Geto-Dacs, the other ancestors of the Valachians and inhabitants of this area, had not this sheep like any other people in Europe (Greeks, etc). We note that their "Valachian" breeds (Țsurcana breed), like the two breeds

brought by Romans (Țsigaia and Ruda breeds) also attest the actual and old location of the Romanians.

This supposition is attested by **Ryder și Stephenson** (1968), cited by Vicovan (2006). Ryder and Stephenson studied the origin of the Valahian Corkscrew Horns Sheep Breed, mentioning that in antiquity there were only two groups of sheep with this type of horns: (1). 5,000 years ago, in **Mesopotamia** (Iran, at present), there were sheep breeds where only the rams had corkscrew horns. (2) In the same period of time, in **Egypt**, there were corkscrew horns sheep breeds for the both sexes. *Ryder noted that the Valahian bred remnants of the Egyptian one*, despite that there are no differences between them. The Egyptian breed had lumpy ears, short wool and long legs. A breed of such a type still exists somewhere in the North-Eastern Africa, mentioned Ryder.

A complication of the problem which needs a historical and scientific analysis is given by the fact that another Corkscrew Horns Sheep Breed named "**Balusa**" (Baljusha-Stojanovici, 2003) situated in Kosovo-Metohia, in the way to Montenegro, only the rams have horns, the ewes being hornless (like the old breed from Mesopotamia). ***Were there two Proto-Romanian tribes, one in Pannonia and another one in Kosovo-Montenegro?*** The document is certain and the problem is interesting from a historical point of view. Darwin (1865), citing Youatt (1841) mentioned only the breed where the both sexes had horns. The sheep seen by Colinson belonged to the Panonian tribe and the sheep mentioned by Cornevin (1890) was in Kosovo-Montenegro?

(b) The second supposition is done and accepted by some Hungarian scientists. In the formulation of Dunka (1984), who used Brummel (1900) and Hanko's ideas (1937), cited by Bokonyi, the breed "***entered the Carpathian Basin in the period of the great migrations, arriving either with the Conquerors Hungarians or with other people or tribes***". As an argument, he mentioned the existence of a **similar Moldavian or Russian breed; such a breed does not exist and did**

not existed either in Russia or in Moldavia. Bela Dunka (1984) indicates also that “the breed is primarily indigenous to the Hungarian Plain.” Even though it is not attested by Buffon, he could be right. **Cavalli-Sforza** (2001), a great expert in European paleogenesis, suggested the existence in the Pontic steppe “before its conquest and the imposing of the Hungarian language by the Magyar monarchy. It is about a “local Romance-speaking population in this area which was a Roman province”. It is possible, but less probable, as the Proto-Romanian population from the ex-Roman-Panonian province to have had the Valahian Corkscrew Horns Sheep Breed, before or at the same time with the Subpanonic Space (Serbia) different from the one of Kosovo.

Kukovics (2005) sustain Dunka’s opinions affirming that Racka (White Valahian corkscrew horns breed) would have, according to **the majority of opinions** (p.208), *an "Asian origin, and arrived in Europe with the Hungarian people in the 9th century "* (p.210). For the Black Racka he accepted however that just “to several opinions arrived to Europe with the Hungarian people in the 9th century”(p 208). Perhaps the last affirmation is true. It is also attested the name of the breed supported by the Hungarian authorities in 1996 on the “Racka” bred box at an animal exhibition in Utrecht, the Netherlands, *“Racka ou Valache”*(Photo).

The thesis regarding the bringing of this breed in the 9th century has probable **subjective explanations**. According to Dunka, this bred disappeared in Transilvania in the 13th century when the Romanians who came from the Balkans brought the Țsurcana and Țsigaia breeds!!. In fact, the Valahian Corkscrew Horns breed does not resist in the mountain area in Transilvania. In 1970, a breeder tried to intorudce this breed in Bistrita area and his intention colapsed. Objectively, it is more interesting a deduction from the paleogenetic true, demostrated by Sforza-2001, that Hungarians are genetically just some 10 percent Magyars, and a great proportion of their genes are...brothers with the assimilated

Romanians, ex-owners of the sheep from Panonia. The problem has one more complication. Baltay (1994) showed that up to 17-th century the Valahian Corkscrew Horns breed was more important in Hungary, which is an argument of its old presence. The great Hungarian archeologist mentioned that its bones appeared just in the 17th century.

Subjective approaches of the name. In the South Eastern Europe, during the last decades, it has been and still exist a trend to change the name of breeds for political reasons or by accident. F instance, FAO published a paper where the globe breeds were inventoried in 2000 (FAO, WWL III). According to FAO material, the “Serbian” breed, recently and officialy named “Vlaska vitoroga” in Serbia, (Stojanovic 2003), was called **“Zackel vitoroga”**. *And this is not the only subjective change of name that we noticed.* In Greece, it is avoided to call this breed “Vlahico”. In Poland, it is used the term of “Valahian Breed..Polish of Mountain”. Therefore, a scientific zootechnical taxonomy is compulsory, as the zoologists made. This would have not onpy scientific favorable effects, but also socil and historical effects. In addition, we mention Hasdeu’s remark (1873): "Serbians like Hungarians learnt pastorship from Romanians" and may b not only them.

(I.2.)Classification of the Valahian Corkscrew Horns Breed. The present considerations also suggest the philogenetic classification presented below for the Valahian Corkscrew Horns Breed.

Classification errors. the Valahian Corkscrew Horns Breeds have been and are still erroneously included in philetic Zackel group. Tis classification includes two errors as follows: (1). No breed from Zachel group is named Zackel. These breeds are descendant from the Traco-Geto-Dacians’ sheep 1,000 years B.Ch. brought by them from Mesopotamia and are or were named “Valahian breeds”. This is the corrcet name of the sheep group (Drăgănescu, 1994). Only Tsurcana breed bears a name of Sanskrit origin, meaning “sheep and goat”; (2). Valahian Corkscrew Horns Breed has no

philogenetic links with the Valahian Breeds; **in fact, it is the only breed** which deserve the name Zackel, meaning “sharp horns”, the translation into German of the Latin “strepsiceros” name.

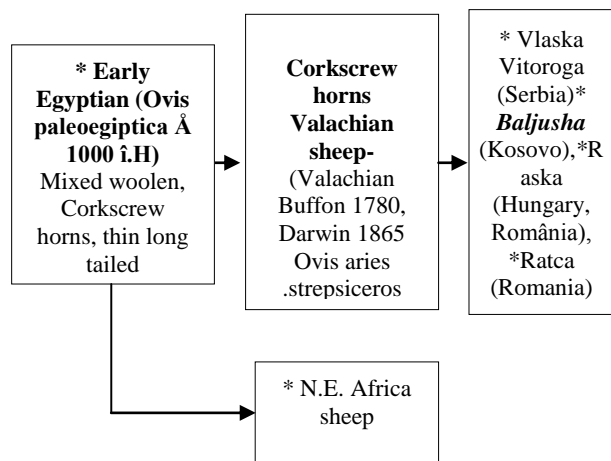


Fig.1. Cladograma of the Valahian Corkscrew Horns Breed (Drăgănescu,1998, Reader, 1968)

Classification errors. the Valahian Corkscrew Horns Breeds have been and are still erroneously included in philetic Zackel group. Tis classification includes two errors as follows: (1). No breed from Zachel group is named Zackel. These breeds are descendant from the Traco-Geto-Dacians’ sheep 1,000 years B.Ch. brought by them from Mesopotamia and are or were named “Valahian breeds”. This is the corrcet name of the sheep group (Drăgănescu, 1994). Only Tsurcana breed bears a name of Sanskrit origin, meaning “sheep and goat”; (2). Valahian Corkscrew Horns Breed has no philogenetic links with the Valahian Breeds; **in fact, it is the only breed** which deserve the name Zackel, meaning “sharp horns”, the translation into German of the Latin “strepsiceros” name.

The explanation of this error is the following one. Nathusius (1880) made a history of identification and breed denomination. He translated in German the name given by Linnaeus to the breed O. a. strepticeros and called it Zackel, because probable this term looked to be more scientific than the term of Valahian given by Buffon. The Nathusius (1880) innovation favored a major error: the

denomination of all breeds named Valachian (Valakhaskaia, Valassky, Zoslachtena Valaska, Walachenschaf, Vlahikos, etc.)were included by the German experts in Zackel group. The error could be induced by the fact that the term Zackel signified “mountain peasant” from Romania, respectively “Vlah” (German-Transilvanian Saxon Dictionary). The error goes on. A Țsurcana breed (Valahian) “GhimesȚsurcana” is called “Gymes Racka” in Hungary, therefore its is obviously “Racka”, can not live (be raised) in the Gymeș Mountains. The error is justified by the fact that the Valahian sheep have mixed wold like the Valahian Corkscrew Horns Breed. The scientits did not remarked that it is not about the same breedm because “wool structure” is different.

II.Location and breed size

In **Romania**, the breed was raised, as we noticedin 1997, in 4 villages (Biniș, Comorâște, Forotic, Doclin) in Caraș-Severin County, Banat-Dognecea region, (20-50 km from the borders with Serbia). That time, there were 209 ewes and 18 rams of pure sure origin, raised in 22 subzistence households. In other 35 farms, there were 671 ewes and 28 rams but not of pure origin. In 1999, there were regieterd 2,058 sheep in the whole area. Based on these data, Vicovan (2006) estimated that the effective breed size is 160.1 heads, meaning a critical situation of this breed in danger to disappear. In 1990s, it was made an export of animals in Hungary in order to support the conservation nuclues.

In **Hungary**, the breed is well conserved and selected, It was studied and presented the firts time by (Bodo 1996). In 2002-2003, the production stock had 1,300 black and 10,000 white sheep. In 2005, the registered livestock counted 2,400 white sheep in 30 farms and 1,450 black sheep in 35 farms. The production system was a traditional extensive one. The production characters were prolificacy 1,1-1,2, weight gain 220-240 g/day/ewe and 250-300 g/day/ram; at one year age, body weight was 30-34 kg/ewe and 42-46 kg/ram raised in an extensive traditional system of eco-farm. Wool production was 2-3 kg having a fineness of 24-32 microns, respectively 50-60

microns and 14-27 cm length.

In **Serbia**, the breed is in a critical situation. In 2003, the stock counted about 50 sheep (47 ewes, 3 rams) located in the Northern Serbia, Voivodina, especially in the Vârșet area. The ram body weight was 40 kg and the one of ewes 35 kg/head. Baliasa Breed grown in the South-West Serbia, in Kosovo and Metohia, representing about 3-4 % of the local sheep. The breed is in decline being in a critical situation. The rams have 65 kg and ewes 55 kg. They are white sheep, but their head is black (Stojanovic, 2003).

III. Some morpho-productive characteristics of the Valachian Corkscrew Horns Breed

As now the breed is erroneously and frequently included in the Valachian sheep philetic group, descendant from the Tracic sheep and erroneated called "Zackel", it is important to point out the characters which determine this confusion and the ones which attest the economic and genetic differences between them. At a superficial observation, it seems that the only major difference between the Tsurcana breed (Valachian, erroneated named Zackel) amd the Valahian Corkscrew Horns Breed is the horns shape. In reality, the differences are many and much more complicated.

Table 1. Procentage of different fibres for the Valchian Corckscrew Horns Sheep Breed and Tsurcana Breed (Stefănescu *et. al.*,1958)

Breed	Type of fibres		
	Fine (18-30 microns)	Medium (30-45 microns)	Thick (45 microns)
Valachian Corkscrew Horns Sheep Breed	34.95	40.68	24.37
Tsurcana Sheep Breed	55.0.2	24.36	16.62

The Valachian Corkscrew Horns Sheep is a **sedentary sheep, not adapted to transhumance**, even not to the simple movement (plain meadows to alpine meadows). It is not adapted to live in flocks and also **does not support wintering in open field (wintering lasts about 30-60 days) and**

even rains (when it is rains, the sheep are looking for a shelter), while Tsurcana breed avoid staying in sheds. One of explanation of this difference is the smaller weight of fine fibers in the Corkscrew Horns sheep compared to the thick fibers characterizing Tsurcana breed. This could justify its low adaptation to cold and rain (Tabel 1).

The Valachian Breed is used for milk, meat and wool production. There are not too many comparative research results for these characters for the two breeds. Saurer (1999) foound that the live weight of the Valachian Corkscrew Horn Sheep is 50.15 kg (Caransebes Tsurcana, 46.43 kg not significant difference), wool production 1.44 kg (Tsurcana 2.45 kg), washed wool proportion 75% (Tsurcana 68.2%), milk fat 6.4% (Tsurcana 7.2%), milk protein 6.15% (Tsurcana 5.75%), wool length 28.2 cm (Tsurcana 26.4 cm), average wool finesse 38.11 microns (Tsurcana 40.5 microns). Some data are confirmed by some earlier researches (Table 2, Stefănescu, 1956).

Many of morphological research results are missing for the Valachian Corkscrew Horns Sheep Breed in Romania compared to the one from Hungary, Serbia and Tsurcana. Regarding colour, the Valachian Corkscrew Horns Sheep Breed is recesive against white, the reverse like at Tsurcana breed. It seems that regarding the body development and conformation, the Valachian Corkscrew Horns Sheep Breed from Hungary (prezented by Bodo) is more uniform and of higher quality due to a systematic selection. This aspect is simply demonstrated by *horn position*. The Hungarian breed has unifom horns in V shape, while te breed from Romania has the horns oriented straight lateral.

In Hungary, the color is more uniform (white wool on face and reddish legs; black wool, face and legs). More detailes about the morpho-productive characters of the Hunagrian breed are presented in Kukovics questionnaires (2005).

IV. Production systems, genetic management

Most of the Valachian Corckscrew Horns Sheep from Romania belong to the subsistence farms having about 1-20 sheep. The sheep are pastured around the village, the owners being associated and organize flocks of about 100 sheep, the shepard being employed. The sheep are brought home in the evening, where they milked in the evening

and also in the morning by every owner. In general, each sheep breeder uses to have his own rams and reproduction is done within the community, the breeders exchanging rams between them in order to avoid consanguinisation. There are also some elite farms where rams are assured from in the own farm practicing a certain consanguinisation.

Table 2. Wool and milk production for the Valchian Corckscrew Horns Sheep Breed and Tsurcana Breed (Stefănescu *et. al.*,1958)

Breed	Wool production(kg)			Milk production(kg)				Lactation (days)	
	No.	Average (kg)	Limits (kg)	No.	Average	Limits	% fat	Average	Limits
Valachian Corckscrew Horns Sheep Breed	20	1.8	1.5- 3.9	22	134.13	23.84-269.29	7.05 (5.9-8.2)	161.12	138-177
Tsurcana Sheep Breed	216	2.06	1.2-4	-	-	-	-	-	-



Photo 2. A ram of the Valachian Corckscrew Horns Breed, the sheepbreeder and research team in Dogneciu area, Banat region.

Breed conservation.

After the forced cooperativization in the period 1950-1964, Tsurcana breed was introduced in the cooperative farms of the Valachian Corckscrew Horns Breed. The owners noticed that the Tsurcana has some advantages compared to the Valachian Corckscrew Horns Breed and decided to replace the breed. As a result, the livestock of the Valchian Corckscrew Horns Breed declined and continue to do this. **It entered in a critical period being in danger to**

disappear, probable in Serbia. According to tradition, some peasants, especially the old ones, still conserve it, but this is not a solution. *The genetic need to preserve this breed and in addition cultural and social heritage linked to its raising impose the setting up and implementation of a scientific programme for its preservation and this has to be done by the public authorities.* Besides the breeders organization by technical and economic cooperation, the breed has to be conserve in national ecological parks. The Hungarian experience is a good example and should be urgently considered.

CONCLUSIONS

Valachian Corkscrew Horns sheep is a breed from the Early Egyptian (*Ovis paleoegyptica*) philetic group, named by Buffon (1780), Darwin (1865) Valachian, by Serbs Corkscrew Horns Valachian (*Valaska vitoroga*), by Hungarian Racka (Serbian), by Linnaeus *O.a.strpsiceros*. It is located in Serbia, Montenegro, Panonia, and Romanian border with Serbia.

It is a document of the former existence of a Valachian tribe in this area, implicitly it attests the Valachian contribution to the ethnogenesis of other nations in this area.

A breed with similar horns, but just in rams, it is a possible document for a former existence of a different Valachian tribe in Kosovo.

It must be avoided the confusion between the Valahian Corckscrew Horns breed and the Valachian ("Tsurcana") breed, erroneously named Zackel, originated from old Thraco-Geto-Dacian sheep breed.

The Valachian Corkscrew Horns Sheep Breed is a sedentary sheep, not adapted to transhumance and to big flocks, not adapted to support wintering in open field, even to stay in the rain. It has a smaller weight of fine fibbers in the mixed wool, it seems that its black colour is a recessive one, the inverse than in Valachian (Tsurcana) breeds.

This breed is economically not competitive with other local and improved breeds and it is in danger of extinction in Serbia and even in Romania, while in Hungary it is well conserved.

As an interesting genetic resource, but also for the aesthetic aspect of his horns and for some cultural reasons, it deserves to have a good genetic conservation program.

REFERENCES

- [1] Baconyi, S., 1974, History of Domestic Mamals in Central and Eastern Europe. Akad. Kiado, Budapest
- [2] Bodo, I., 1944, The Hungarian Racka, AGRI 13: 83-91
- [3] Crăciun, N., 2012, <http://nelucracion.wordpress.com>
- [4] Darwin, C., 1865, Variația animalelor și plantelor sub influența domesticirii, p.138
- [5] Drăgănescu, C., 1994, An attempt to a filetic classification of Valachian and Tsigai breeds. Stocarstvo 48:9-19:395-401;
- [6] Drăgănescu, C., 1995, Origine and relationship between Valachian and Tsigai breeds from the Danubian area. Stocarstvo 49:9-10:321-327 Int.Simp, Naples.EAAP Public.85:101-106
- [7] Drăgănescu, C., 1997, Note on the Corkscrew Horns Sheep Name Dagen Symp
- [8] Drăgănescu, C., 1998, The Buffon Valachian sheep. Book of abstracts, EAAP, 49 meeting, S2.33
- [9] Drăgănescu, C., 1997, Rasele de oi din centrul și sud-estul european-puncte de reper în istoria românilor, Acad.Rom. Studii de istorie economică III. Ed. Acad,
- [10] Drăgănescu, C., 2001, An attempt to a phyletic Classificatio of Balkan Nativ Breeds. Tekirdag-Turkiye;

- [11] Drăgănescu, C., 2005, Corkscrew Horns Valchian breed in: Poossible way of conservation...RFP EURPE (Questionaire)
- [12] Drăgănescu, C., 2003, Romanian Strategy for the management of AnGR Bucharest, 97 pag
- [13] Dunka, B., 1984, A Maghiar Racka (The Hungarian Racka) Hortobaghy Nemzet Park Debretin
- [14] Kukovics, S., 2005, Hortobagyi Racka -Blak variant (pp.208-209); White variant (pp.210-211) in: Poossible way of conservation...RFP EURPE (Questionaire)
- [15] Mason, I.L., 1988, World Dictioary of Livestock Beeds CAB Int.
- [16] Nathusius, H.V., 1890, Vortrage uber Schafzuct p 396-398,201, Berlin Wiegendt
- [17] Rider, M.L., Stephenson S.K., 1968, Wool Growth. Acad Press London. New York
- [18] Sauer, I., *et al.*, 1999, Studiul parametrilor morfo-productivi la rasa Ratca.; 1998 Corckscrew horns Walachian sheep breed (Racka) in Romania –Dagene-Budapesta
- [19] Ștefănescu, C., Angelescu, L., Taftă, V., Trifu, G., 1958, Rezultate Experimentale asupra metișilor G2 Merinosx Țurcană (Varietatea Albă și Rațca). An.ICZ XV:298-319
- [20] Stoianovic Sredan, Dordevic-Milosevic Suzana , 2003, Autochthnous breeds ..in Serbia and Montenegro Beograd
- [21] Teodoreanu N., Derlogea V., Ștefănescu C., 1952, Cercetări asupra însușirilor lânii la metișii G1 Merinos x Țurcană, varietatea Rațca. Com.Acad.II, 7-8
- [22] Vicovan G., Vicovan A., Radu R., 2006, Rasa Valaha cu coarne in tirbuson p.99-104 in: Evaluarea Statusului de risc...Ed. Europolis Constanta
- [23] FAO WWL III ed.2000
- [24] Pau Ion (Doclin), 2011, Interviu acordat la Tamagraim, Internet.