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EPIDEMIOLOGICAL STUDY OF SCRAPIE DISEASE IN LOCAL SHEEP POPULATION IN ALGERIA.

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Abstract

The aim of this study is to carry out a field survey for a better knowledge of the current state of our sheep population in Algeria; especially Tlemcen region in relation to scrapie and and the factors favoring their appearance (Nedroma, Ghazaouet, Honain, Bab El Assa, Maghnia, El Gor, Sebdou, Sid Jilali and Laaricha) This survey is carried out according to phenotypic observations of the individuals to detect possible presence of Symptoms of scrapie. Down results obtained show that there are no signs of prion disease in the surveyed herds.

Keywords: Epidemiology; Scrapie; sheep; Algeria

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Introduction

Scrapie is an insidious, degenerative disease affecting the central nervous system (CNS) of sheep and goats. The disease is also called la tremblante (French:trembling), Traberkrankheit (German: trotting disease), or rida (Icelandic: ataxia or tremor); it is also known by numerous other names. The disease was first recognised as affecting sheep in Great Britain and other countries of Western Europe over 250 years ago. The first reports of the existence of scrapie appear in eighteenth and nineteenth century literature from England and Germany. According to McGowan (1922), the earliest definite record of the occurrence of scrapie in Britain was in 1732.

The economic impact of scrapie may range from individual producer losses within a marketing area to the loss of export markets for the entire country. Specifically, scrapie has limited the international trade in live sheep, embryos, semen and other ovine products. Theories on the cause of scrapie have been debated for many years and the discussion continues today. Initially, arguments over cause centred around a genetic versus infectious origin. The various hypotheses for agent structure and the characteristics of the scrapie agent are dealt with fully by Bennett and colleagues in this issue (Bennett et al., 1992). Scrapie infectivity is associated with an abnormal form of a cellular sialoglycoprotein PrP0 coded by the host PrP gene. There are two concepts to consider: firstly, genetic variation in the agent and secondly, genetic variation in the host (Detwiler 1992**)**.

In Algeria, very little work on this subject of the disease of scrapie. In addition, the first study in Algeria and the fourth in Africa on the variability of Prp gene in the sheep population was carried out by a group of Algerian researchers from the Laboratory of Physiopathology and Biochemistry of Nutrition, Tlemcen and other Italian 'Istituto Supériori di Sanita with 213 samples of 8 local Algerian sheep breeds, the Prp gene were sequenced to detect the genotype types of these individuals. Indeed, this study showed the total absence of the VRQ haplotype, associated with a greater susceptibility to scrapie in all the samples analyzed, while the ARQ K176 haplotype was observed in all the Algerian breeds with A

frequency ranging from 5% to 15% and the ARQ / ARQ genotype was the most frequent in all breeds with an average ranging from 11% to 40%.

The aim of this work is to carry out an epidemiological investigation of scrapie in the Temcen region to see if our results compare with the genetic study conducted by Djaout et al. 2017). This work will be used like reference to make a genetic proximity of the sheep breeds of the Mediterranean to the resistance to prion diseases and give the possibility to the researchers of the southern shore to exploit the Genetic data obtained to manage our ovine genetic resources

Materials and methods

This study it is carried out by direct and indirect approach. Direct approach concern; using a survey how contain a question especially about prion disease characteristics directly with a breeder. Indirect approach it's to use the same survey with a breeder by using social network.

Study zone:

In this paper, we describe only the region concerned by the direct approach. The region of Tlemcen: the wilaya of Tlemcen is in the north west of Algeria, on the seashore of the Mediterranean, bounded by the wilaya of Naama and Saida in the south, Morocco to the west and Sidi Belabbes to the east, with 4 zones, which distinguishes the relief of the wilaya:

- Zone of Traras: containing two links oriented southeast and northeast (Djbel Zendel and Djbel Felawcen).
- Heterogeneous zone: the plateau cut by the valleys of the Tafna and Isser (Maghnia, Sid Abdelli, ain Tellout)
- Monts de Tlemcen: Djbel assfour, Djbel dar chikh, Djbel tenouchfi. Steppic zone: located to the south of the wilayaelle extends on the 1/3 of the surface of the wilaya (Sebdou, Sid jilali, Laaricha).
- The mountain range of the Tlemcen Mountains separates the area into two regions.

Climate: the north with a Mediterranean climate, and the south with a desert climate

Type of study:

An analytical and field-based survey based on a simple principle based on careful observation of sheep behavior and the presence of scallop limb disease from known symptoms: Locomotors disorders, herd isolation, hyperexcitability and scratching of the skin. The survey was carried out over a period of 76 days in which we carried out direct observations involving 83 breeders with mixed sheep / goat herds) whose sheep breeds are the breeds of Ouled djellal and Rembi mixed by other cross breeds And distributed between the northern regions (Nedroma, Ghazaouet, Honain, Bab El Assa, Maghnia) and the southern regions (El Gor, Sebdou, Sid Jilali, Laaricha) of the wilaya of Tlemcen.

Other indirect observations were envisaged with the aim of extending the study area to other wilayas through social networks: creation of a forum on the Facebook site which brings together several Algerian breeders from different regions of the country.

Results and discussion

Awareness of the risks of the disease has prompted the breeders to do their utmost to give assistance in order to have information about their herds: taking pictures and videos of all cases that represent rare diseases, Is the case of the scrapie one moves towards this zone (wilaya) for the taking of the blood. The majority of breeders have prior knowledge of the diseases of the sheep. All the breeders surveyed say they have never seen these symptoms in their herds. We also noticed during our investigation that the notion of race is not respected by the majority of the breeders.

No cases of scrapie were observed in the herds studied, either in the Wilaya of Tlemcen (table.4)

or at the level of other wilayas according to the breeders (Table.5).

Table.1: Result of the direct survey in the wilaya of Tlemcen

Areas	**Breeds**	**Number**	**Sex**		**Cases of scrapie**
			Male	**Female**	
Nadroma	Ouled-Djellal+ Cross breed	750	120	630	negative
Bab ElAssa	Cross breed	72	6	66	negative
Honain	Cross breed	63	5	58	negative
Ghazaout	Cross breed	235	22	213	negative
Maghnia	Cross breed	632	112	520	negative
ElGor	Cross breed	1200	350	850	negative
Sebdou	Rambi	420	41	379	negative
Sii Djillali	Cross breed	460	46	414	negative
Laaricha	Rambi	960	61	899	negative

Table 2. Result of the indirect survey in other regions of the country**...**

Wilayas	Breeds	Number	Sex		Cases of scrapie
			male	Female	
Biskra	Ouled-Djellal	350	80	320	negative
M'sila	Cross breed	180	34	149	
Laghouat	Hamra	213	35	178	negative
Borj Bou-arrerij	Berber	143	21	112	negative
Ouergla	Barbarine	197	19	178	negative
Tindouf/Bechèr	Dmen	102	11	97	negative

These results confirm the data from the only genetic study on scrapie in Algeria and the fourth study on polymorphisms at the level of Studies in other countries in Europe have shown the presence of the disease in herds with high frequencies, for example in France, 287 cases have been detected in the Charente region in the Doubs and in the Cher region in the Hautes-Pyrénées by The clinical surveillance network in July 2016 (Jeff, 2016), which led to a significant prevalence of scrapie in this country. In Great Britain (Country of origin of the disease) the surveillance program showed the presence of the disease in 213 flocks with a prevalence of 12 cases per 1000 animals in 2014 (Atkinson 2001).

The PrP gene in african sheep breeds. Indeed, this study showed the total absence of the VRQ haplotype, associated with a greater susceptibility to scrapie in all the samples analyzed, whereas the ARQ K176 haplotype was observed in all the Algerian breeds with a Frequency ranging from 5% to 15% and the ARQ / ARQ genotype was the most common in all breeds with an average ranging from 11% to 40%.

Conclusion

Our work has demonstrated that the genetic study on the resistance of sheep flocks in Algeria and very reliable. This study also showed us the possibility of using data on the Prp gene (carried out on exotic breeds) in selection on our local ovine breeds. The absence of the disease in our herds can also be the result of a continental isolation of Algeria compared to the foci of origin of the disease. It is essential to preserve Algerian herds from the risks of contamination and genetic pollution over time, It would be interesting if there is genetic analysis from the blood will let us know if the lamb is resistant or not to the malice from this birth

Acknowledgment

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