Forest pasture with Ripollesa sheep breed for the prevention of forest fires

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Introduction

A great extension of forests can be found in Catalonia and most of this area is private. Currently there is less incidence of fires but the fact that farmers are abandoning forests implies that fires today have a broader extension.

The **objective** of this study is to analyze the role of extensive Ripollesa sheep farming in fire prevention by reducing flammable vegetation in Mediterranean forests.

Materials and methods

The study took place in a private forest of *Pinus halepensis* and *Quercus Ilex* in Olives, Vilademuls (Girona).

Ten ewes and one ram of Ripollesa breed sheep were used for pasture in this area.

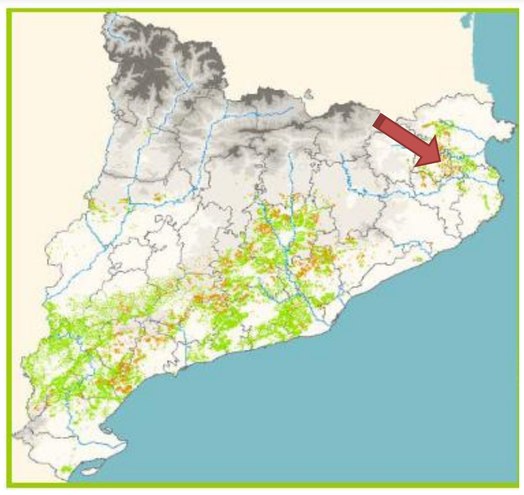


Figure 1: The red arrow shows the area of the study. *Pinus halepensis* forests are shown in green and the forests of *Pinus halepensis* and *Quercus Ilex* are shown in orange.
Source: Beltrán et al., 2011

Gathering the samples

Three transects (Fig. 3) were defined across the area to study the vegetation of this forest once every season (autumn, winter and spring).

Sheep faeces were collected from four different animals twice each season (Fig. 2)

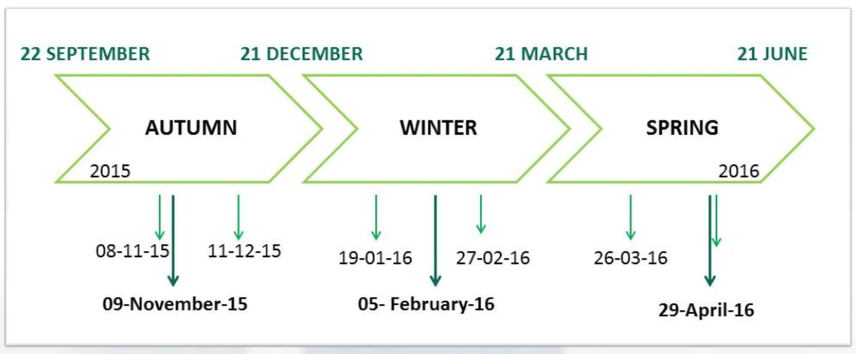


Figure 2: The long arrow shows the days of sampling plants. The short arrow shows the days of faeces collection.

The processing of the samples

A microhystologic analysis of the plants and faeces was carried out following the model *Stewart D.R.M, 1967*. The microscope was used to observe the samples.

Statistical analysis

Descriptive statistic, ANOVA, Fisher test, Spearman correlation and ilvev index were used.

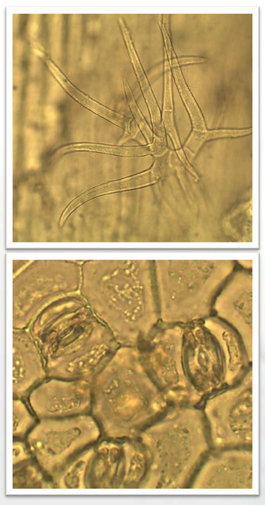
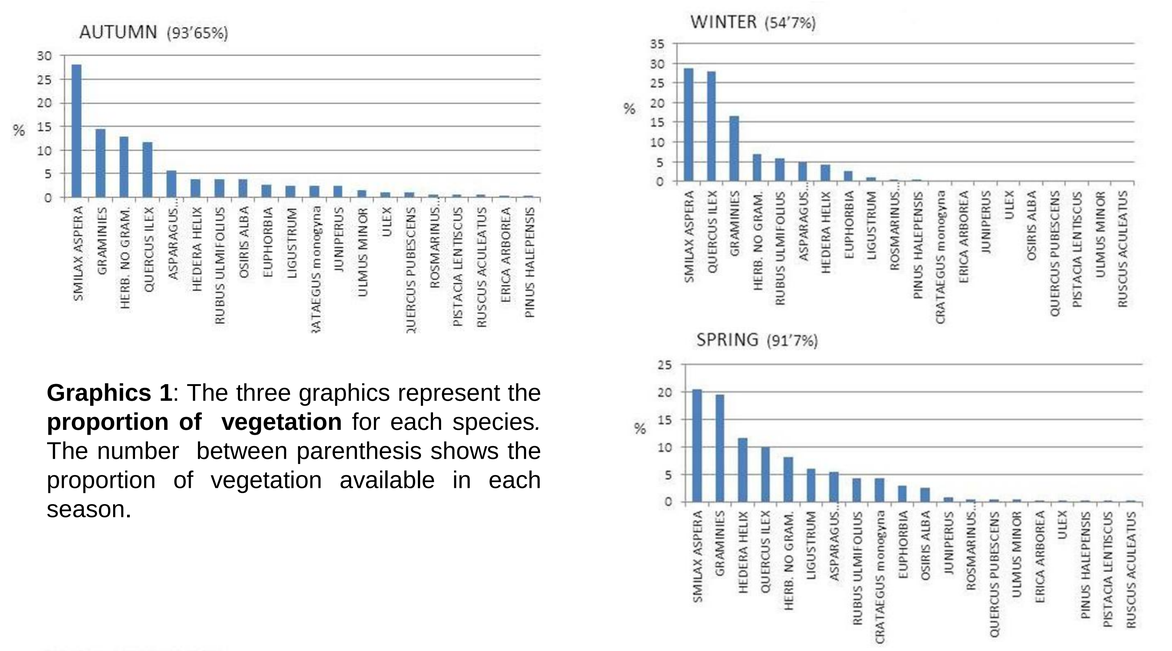


Image 1 and 2:
Trichome and stomas

Figure 3:
Map of the land

Results and discussion



Graphics 1: The three graphics represent the **proportion of vegetation** for each species. The number between parenthesis shows the proportion of vegetation available in each season.

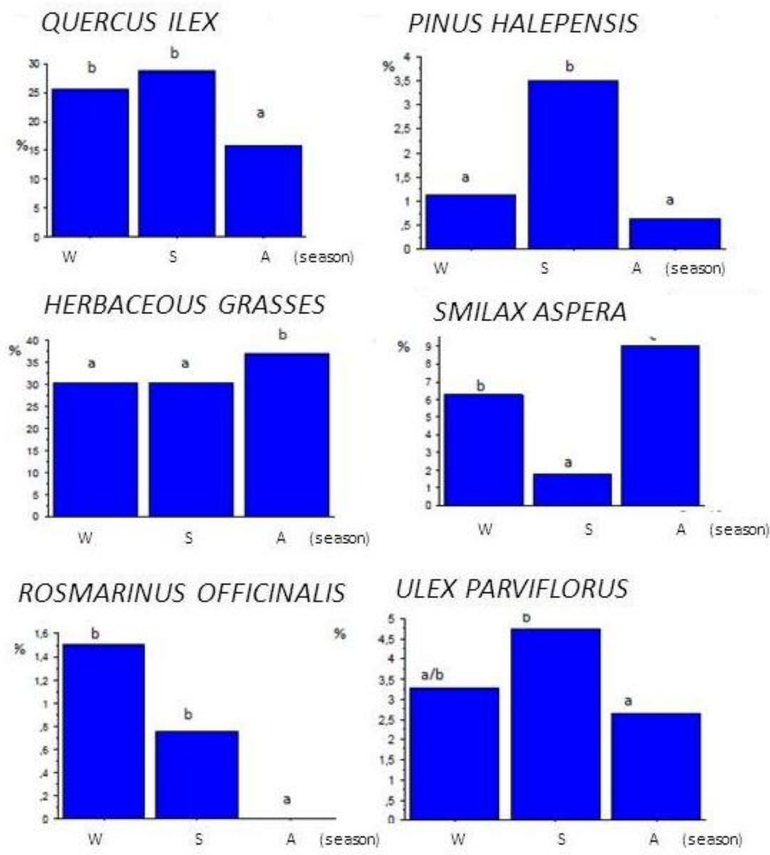


Image 3: Ripollesa ewe with his 3 days old lamb.

Graphics 2: These graphics show the proportion of some specie in the **ewes diet** during the three seasons. Different letters over the bars indicate statistically significant differences (5% Fisher test)

Table 1: Comparison of vegetation with diet

Spearman rank correlation		
SEASON	**Rho**	**P-Value**
AUTUMN	0,739	0,0013
WINTER	0,615	0,0073
SPRING	0,495	0,0309

Graphic 1 shows that *Quercus ilex*, herbaceous grasses and *Smilax aspera* are the most abundant plants among the vegetation. Sheep diet is generally based on *Quercus ilex* and herbaceous grasses whereas *Smilax aspera* – which is not related with forest fires – is hardly ever consumed by sheep (Graphics 2).

Other flammable species such as *Pinus halepensis*, *Rosmarinus officinalis* and *Ulex paraviflorus* are infrequent among vegetation but also take little part in sheep diet.

Spring is the season when there is more vegetal diversity. Therefore, we can observe lower correlation between diet and vegetation (table 1) because sheep increase plant selection.

Conclusions

Sheep are animals that have preferences in their diet, however , they easily adjust to the availability of vegetation.

Therefore Ripollesa sheep breed is a viable option as a method of reducing the fuel load in Mediterranean forests of *Pinus halepensis* and *Quercus ilex* .

REFERENCES

Beltrán M., Piqué M., Vericat P. i Cervera T. 2011. *Models de gestió per als boscos de pi blanc (Pinus halepensis Mill): producció de fusta i prevenció d'incendis forestals*. Sèrie: Orientacions de Gestió Forestal Sostenible per a Catalunya (ORGEST). Centre de la Propietat Forestal.Generalitat de Catalunya.

Stewart, D.R.M 1967. *Analysis of plant epidermis in faeces: a technique for studying the food preferences of grazing herbivores*. J. App Ecol. 4:83-111

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