



**Biometric study of the Spanish ibex (*Capra pyrenaica*) female horns in Sierra Nevada.
An open book of their model of life.**

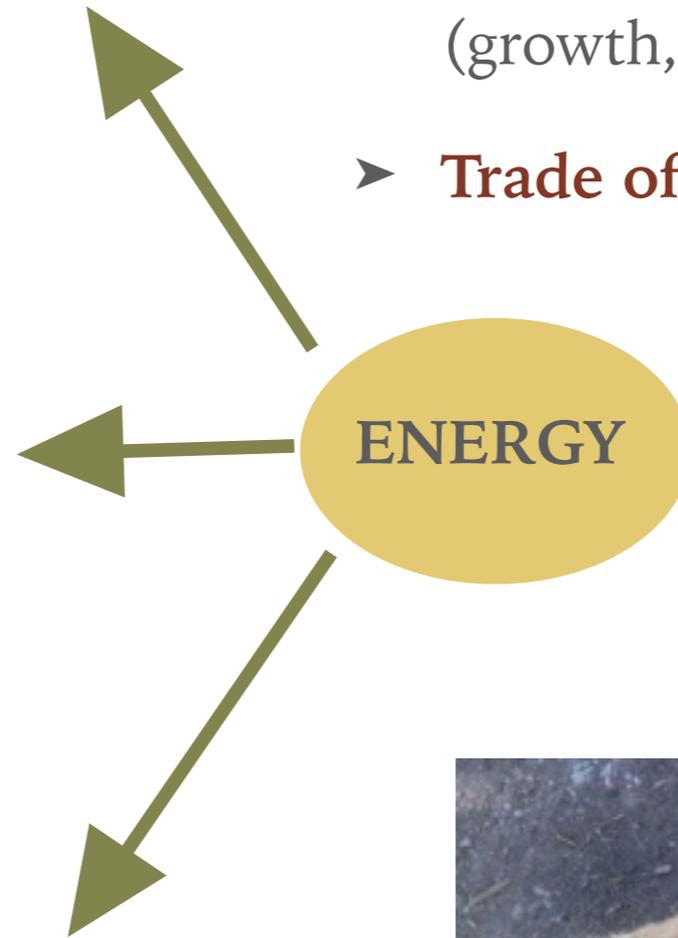
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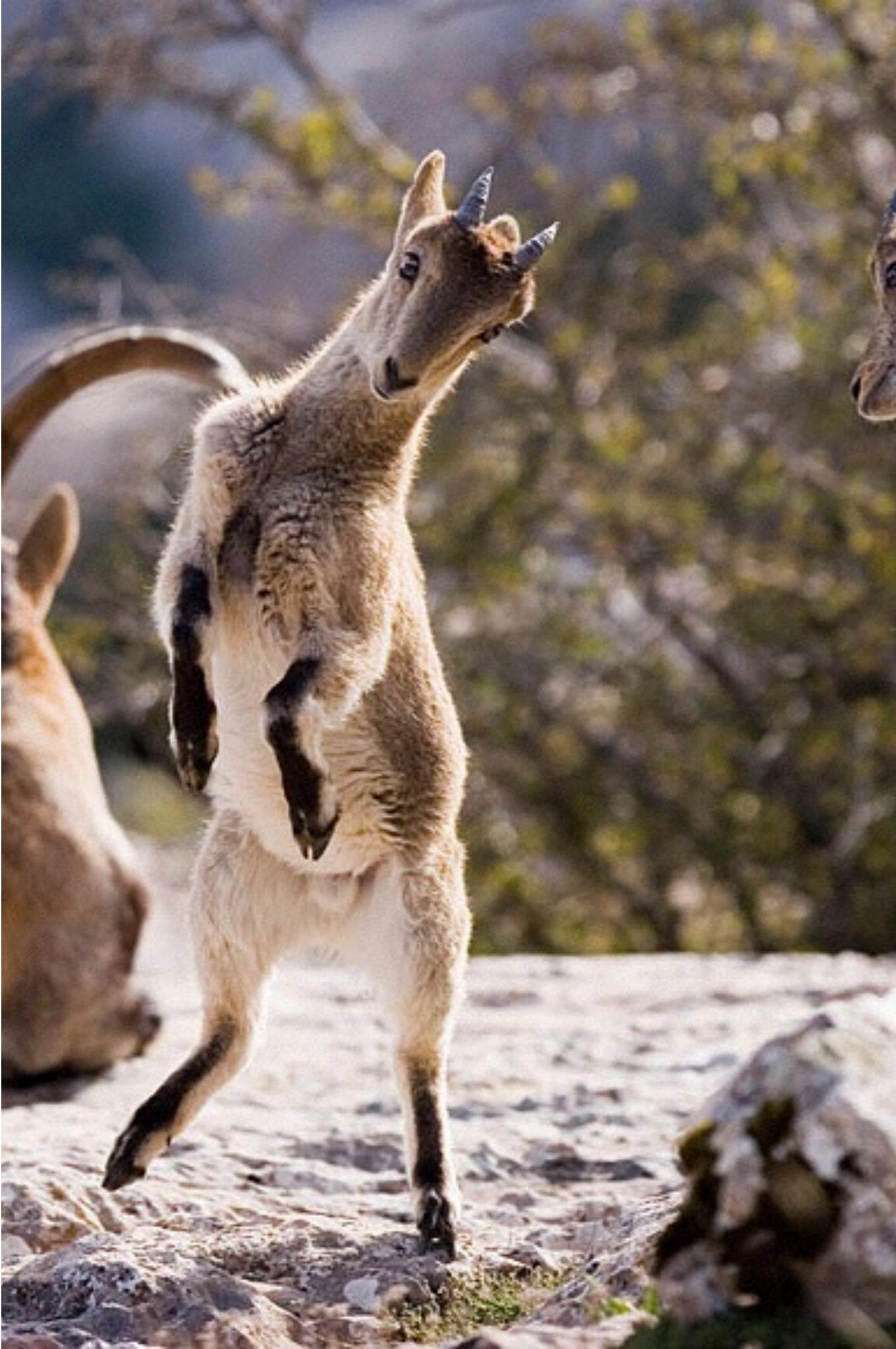
INTRODUCTION

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- **Life cycle:** birth → death
- **Energy limited** and many functions (growth, survival, reproduction)
- **Trade off:** energy compensation.

ENERGY





INTRODUCTION

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- Horn: secondary sexual structure (high energetic costs).
- Annual growth with a repose period (rut): **MEDRÓN**.

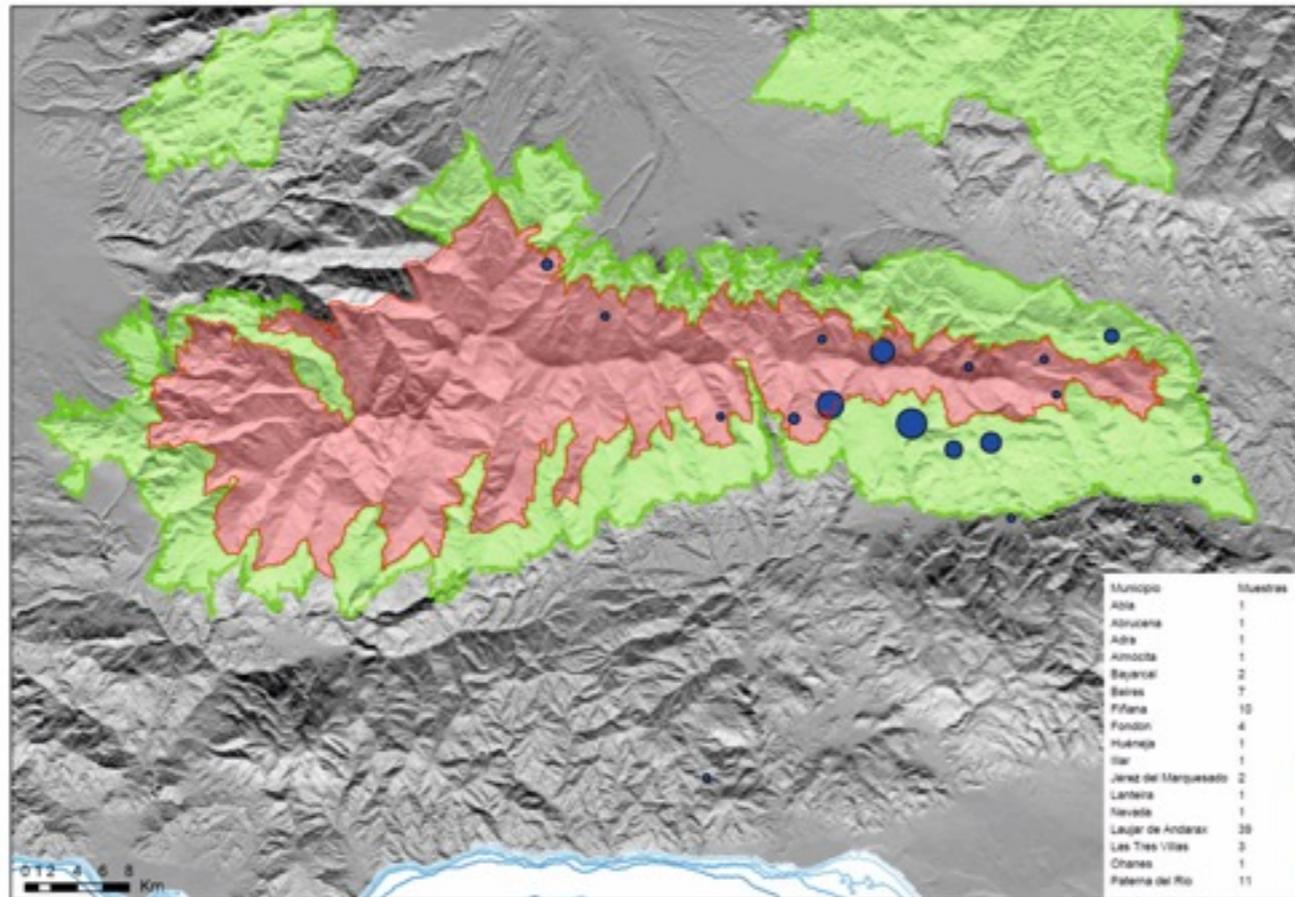


- Influenced by **intrinsic** and **extrinsic** factors.
- **Reflect** conditions which involved the animal.
- Element of biologic information (secondary rings of lactation)

MATERIAL AND METHODS

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- Collection sample area: **Sierra Nevada Natural Space.**



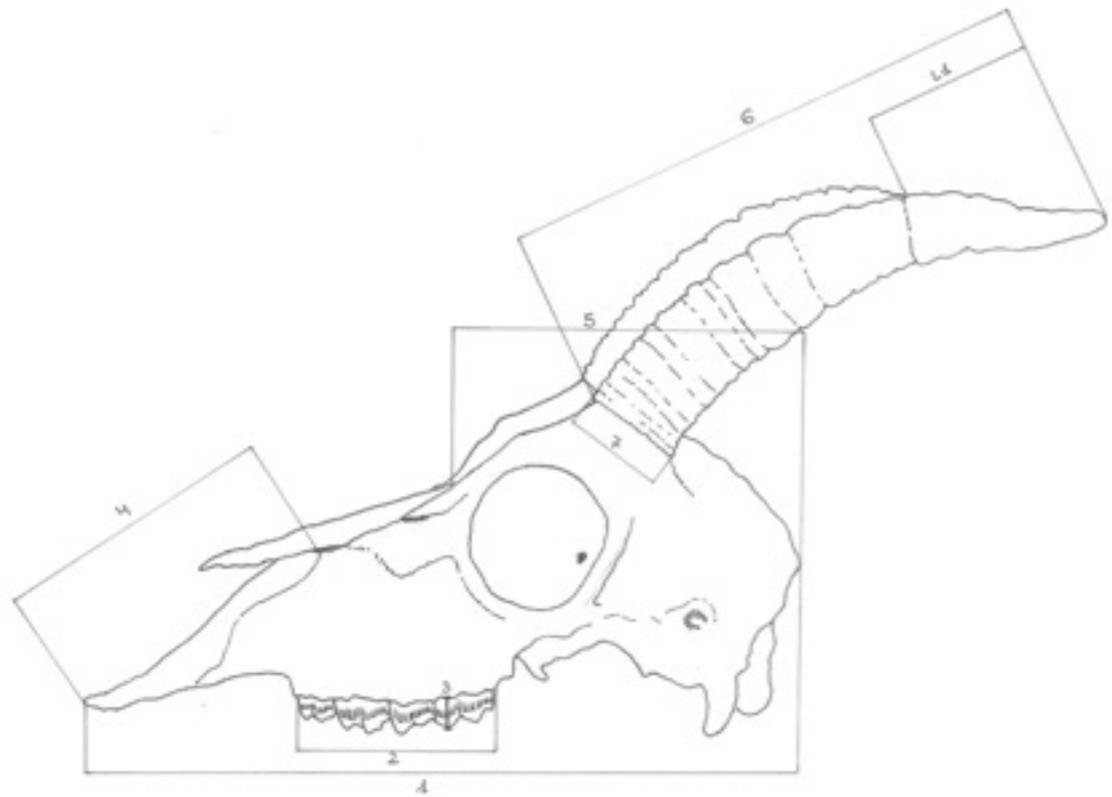
- Sample of **87 skulls** (2003-2006).

- Allometric measures

- Medron Index

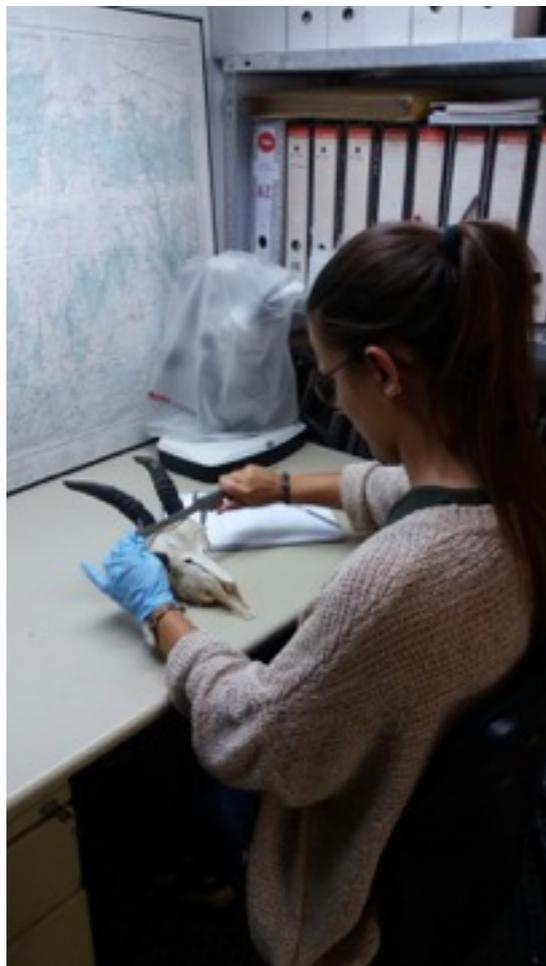
- Ovarian Index





MATERIAL AND METHODS

- Collection sample area: Sierra Nevada Natural Space.
- Sample of 87 skulls (2003-2006).
- **Allometric measures**
 - **Medron Index** n° secondary rings / n° medrones -2
 - **Ovarian Index** ovarian volume estimated
 - **Statistic analysis** R program



RESULTS

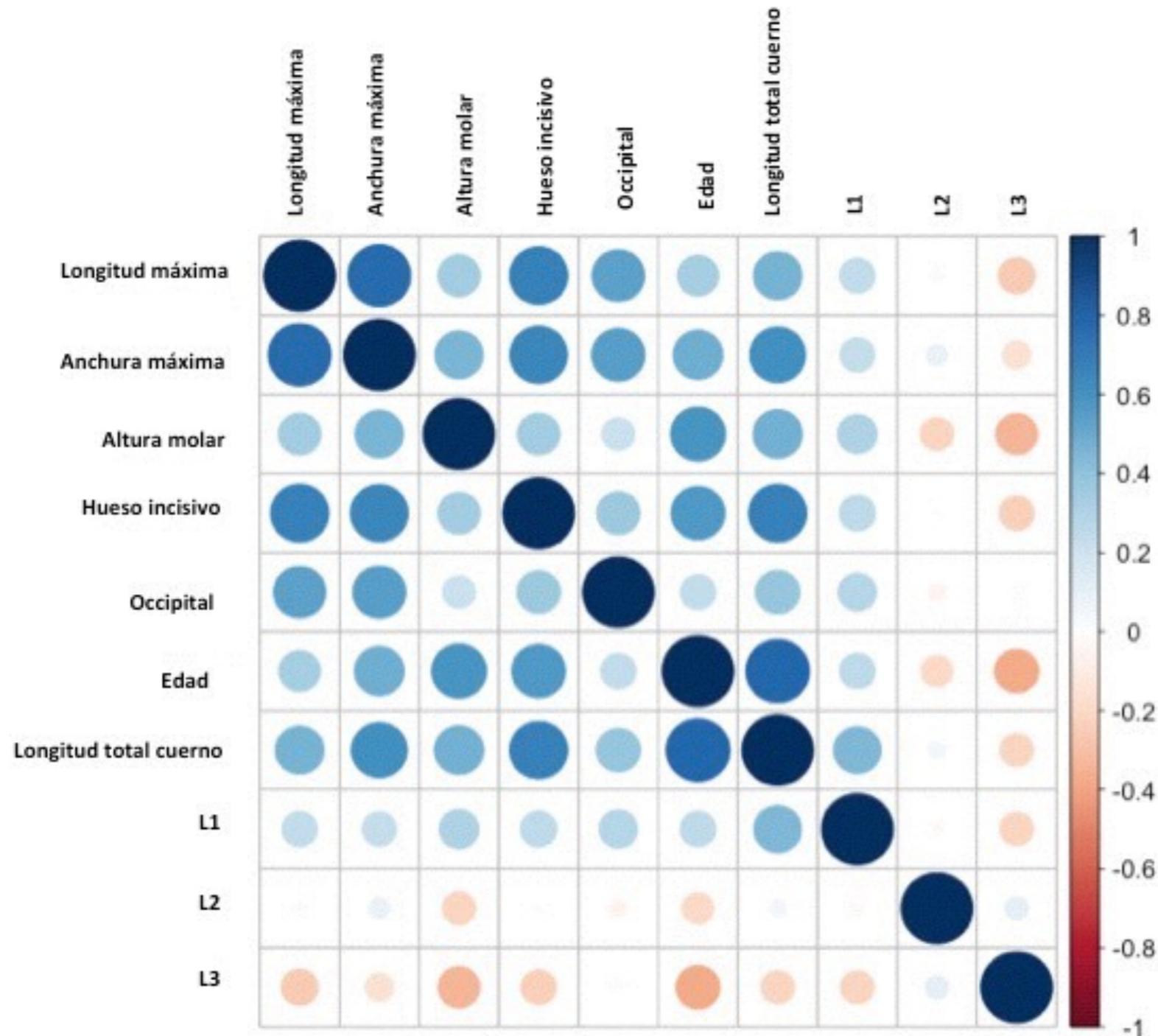
► Basic statistics

TYPE	VARIABLES	MEAN	SD	n
SKULL	LENGHT	22.70958	1.056516	71
	WIDTH	122.49659	6.344580	82
	OCCIPITAL	114.04159	5.267290	82
	MOLAR LENGHT	64.93728	4.993236	81
	MOLAR HEIGHT	10.26901	2.641489	81
	INCISOR BONE	86.81100	4.893059	70
HORN	L1	48.01321	10.088245	81
	L2	25.32241	8.812148	79
	L3	17.64139	6.639708	79
	DIAMETER BASE	30.71256	3.465959	82
	TOTAL LENGHT	131.20413	23.861617	80



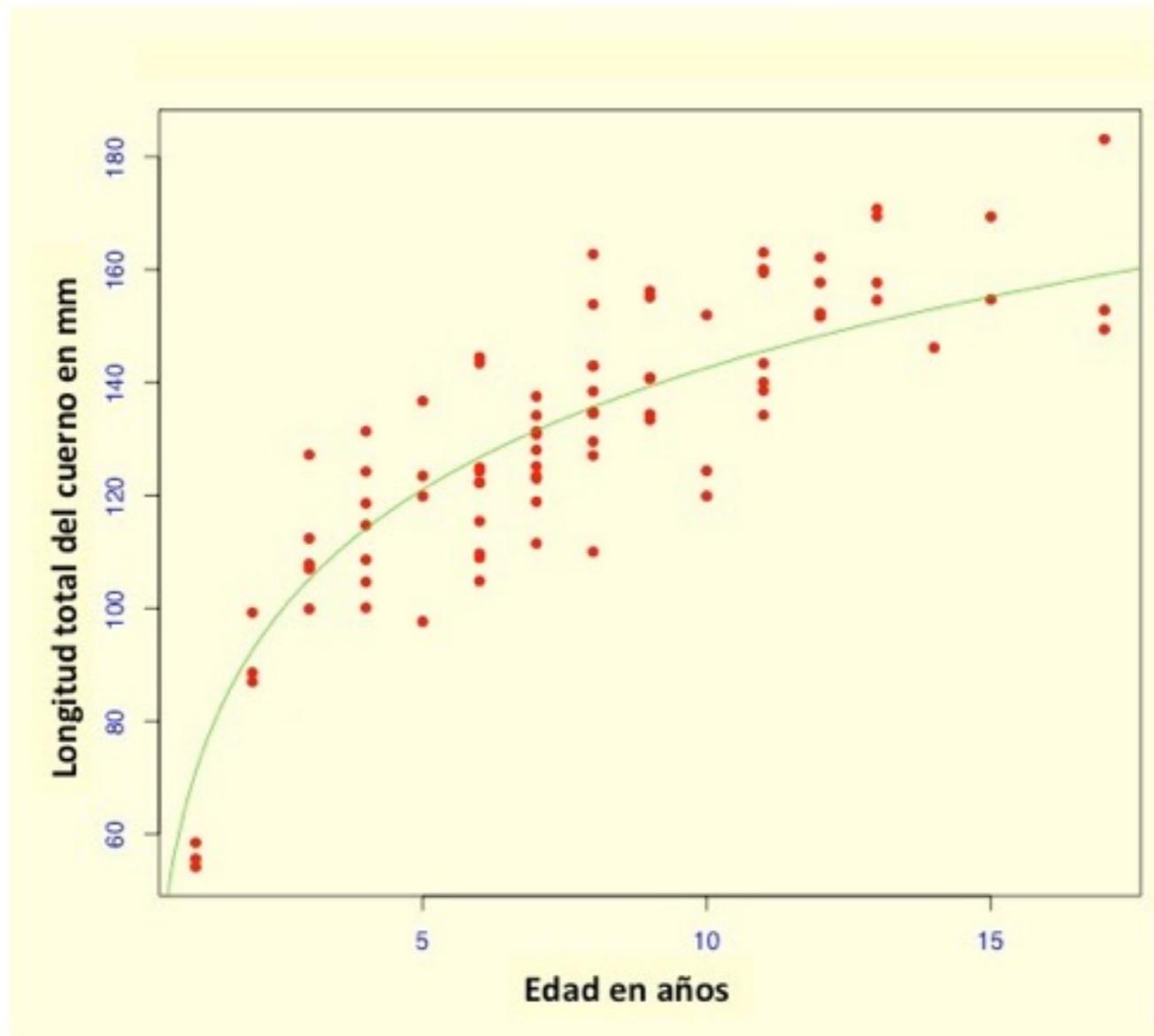
RESULTS

► Correlations between variables



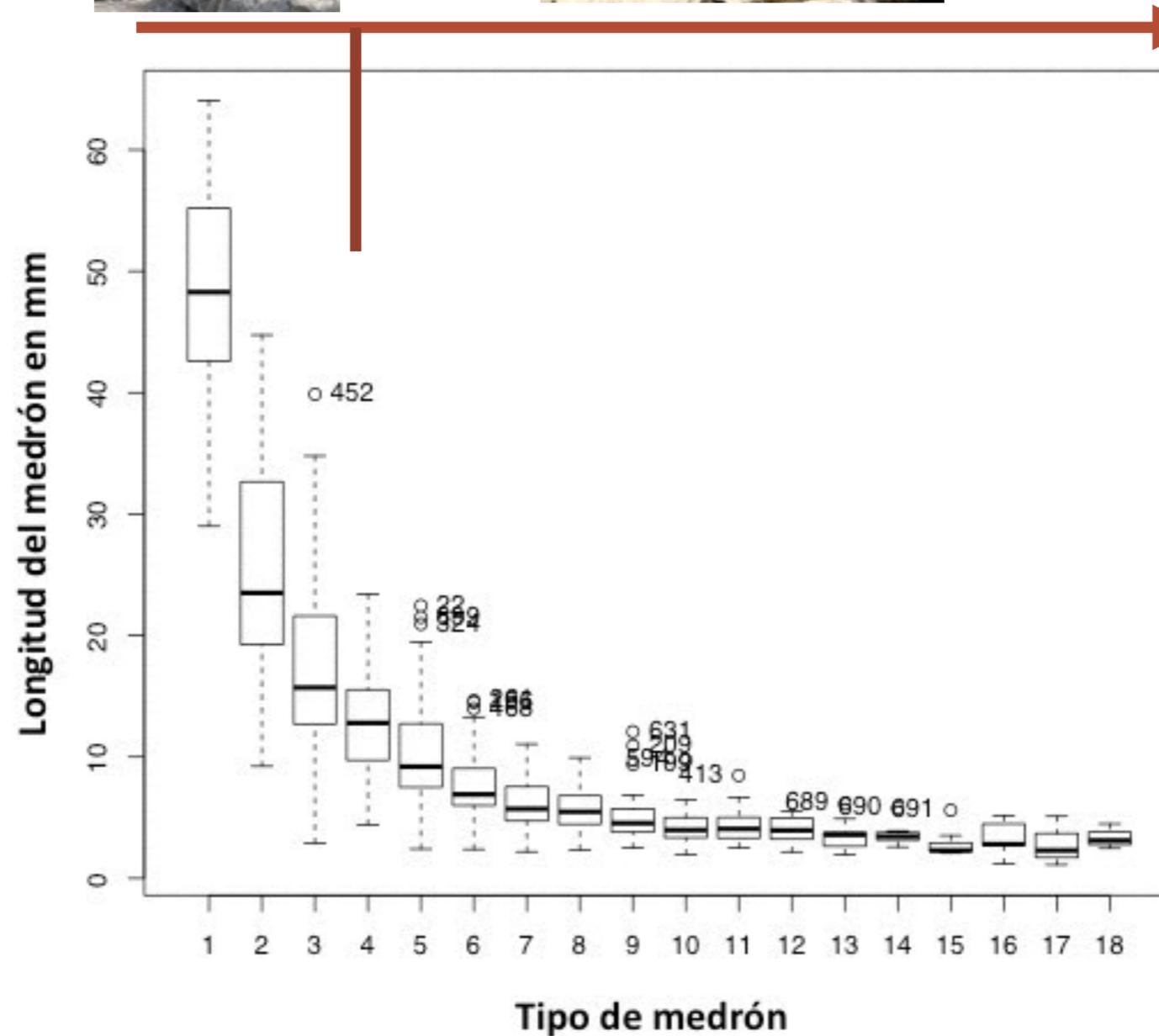
RESULTS

- Relation between **horn length** and **age**



RESULTS

- Medrón length according to type (position regarding the tip)



RESULTS

- How affect **mange** and **reproduction** to the horn growth (using GLM)



$p = 0,78$

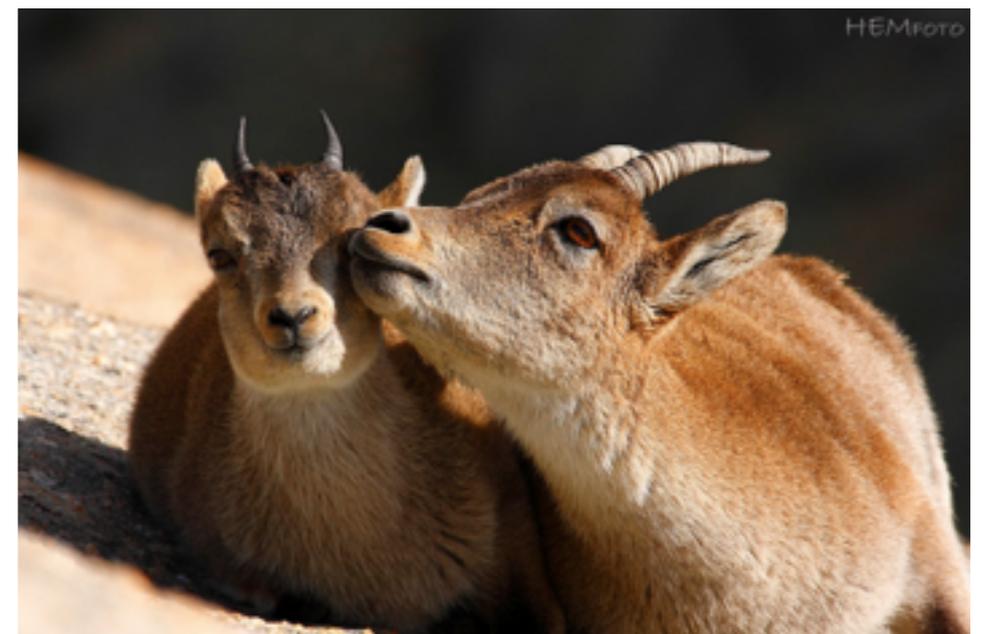
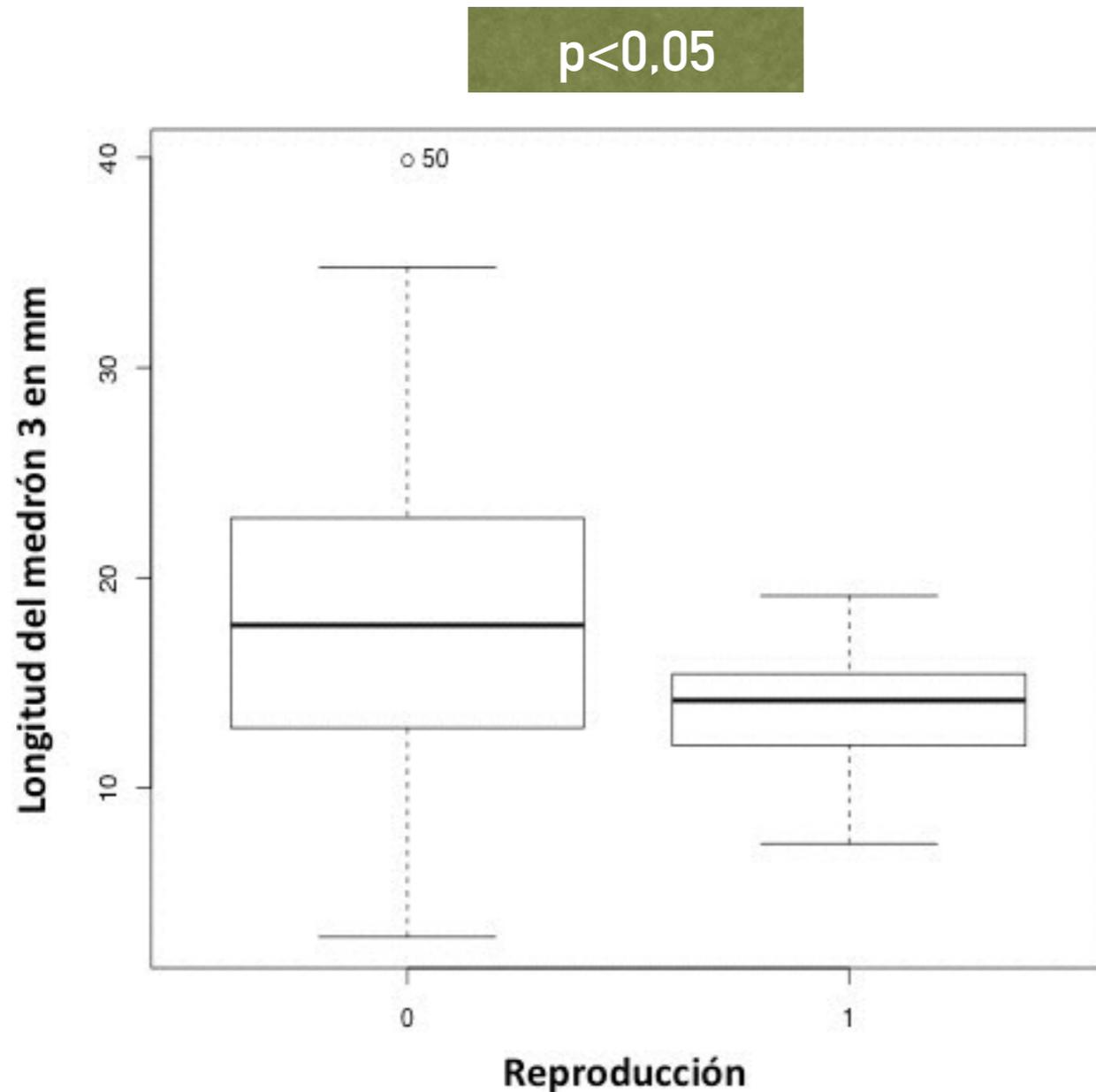
No significant differences

$p = 0,82$



RESULTS

- How affect **reproduction** to the horn growth using medrón type 3



RESULTS

- **Ovarian** Index and **Medrón** Index: linear regression

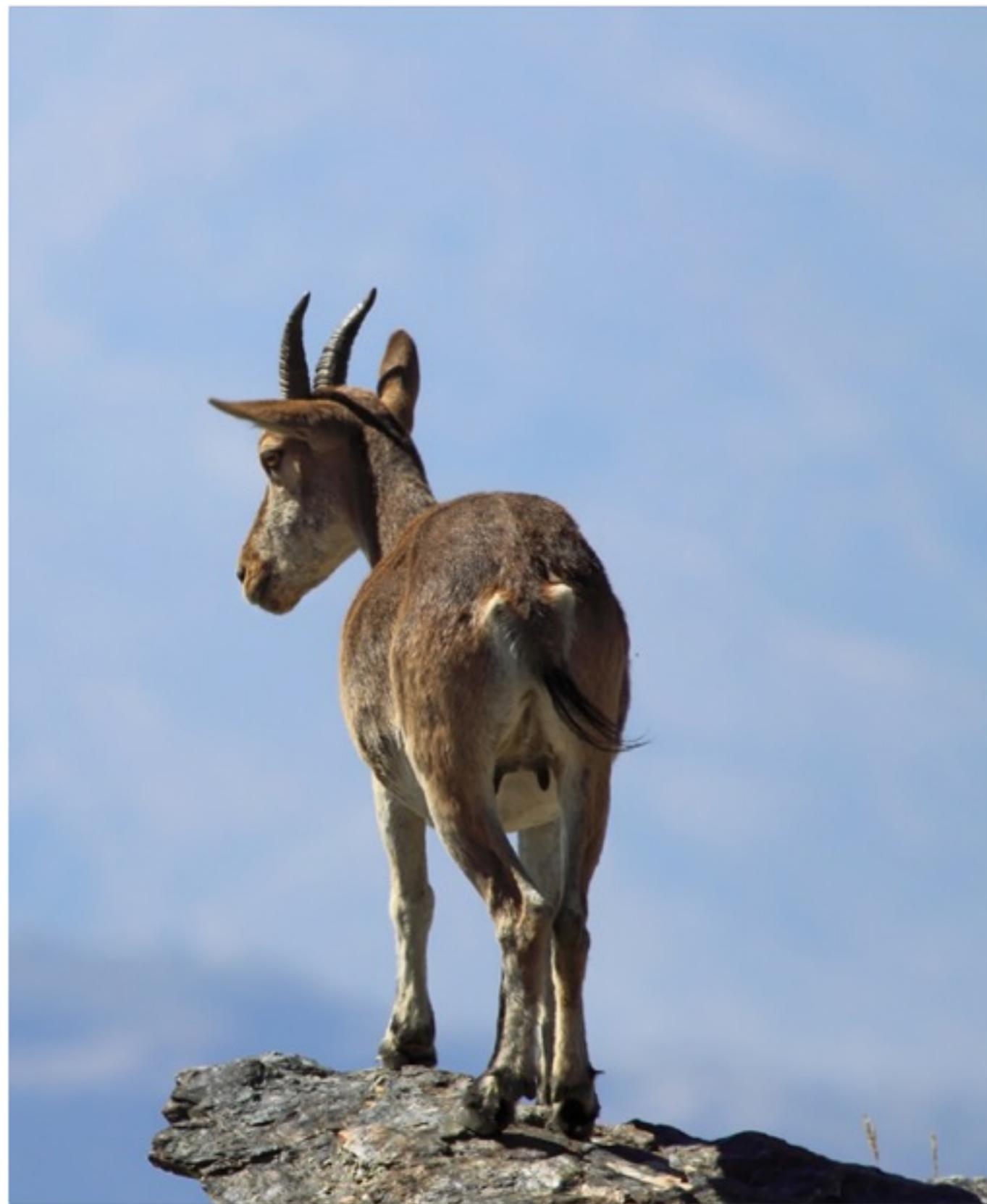


Estimated volume

$p < 0,05$



Reproduction performance



DISCUSSION

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- Horn parameters show higher variability, because **horn grows throughout life.**
- Type: 1, 2 y 3 with highest variability. Animal invest in **growth.**
- Type 3 y 4, females 24kg and **sexual maturity** so invest in growth decreases



DISCUSSION

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- ▶ Mange doesn't affect horn length. It is a **one-time disease** but horn grows throughout life.
- ▶ Medrón length is influenced by **reproduction on type 3**. At this age there are females in reproduction (24kg) and others still growing.
- ▶ Medrón Index allows to **determine reproductive events** and the date when they happen.

A photograph of a brown mountain goat with small, curved horns, standing in a field of green bushes. The goat is looking towards the camera. The background is a blurred landscape with a rocky hillside and more greenery.

Grazie per l'attenzione
Merci pour votre attention
Gracias por vuestra atención!!