

Reproducción y comportamiento en el venado de campo



Rodolfo Ungerfeld
Facultad de Veterinaria,
UdelaR

- Estudios no invasivos:

- ⇒ Comportamiento

- Agonístico
- Cortejo y cópula
- Marcación
- Vínculo madre-cría

- ⇒ Anatomía reproductiva

- ⇒ Estacionalidad reproductiva

- ⇒ Estímulos sociales

- Estudios invasivos:

- ⇒ Obtención y preservación de semen

- ⇒ Comunicación química

- ⇒ Estímulos sociales

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Comportamiento agonístico

- Luchas instintivas entre miembros de una especie
- Sirve para resolver los conflictos entre individuos
- Determina estructuras jerárquicas, incluyendo el acceso a individuos del otro sexo

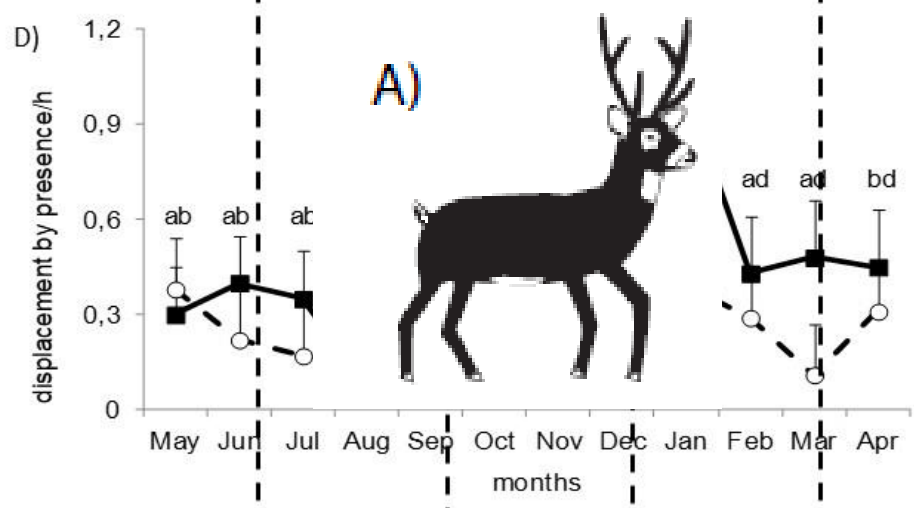
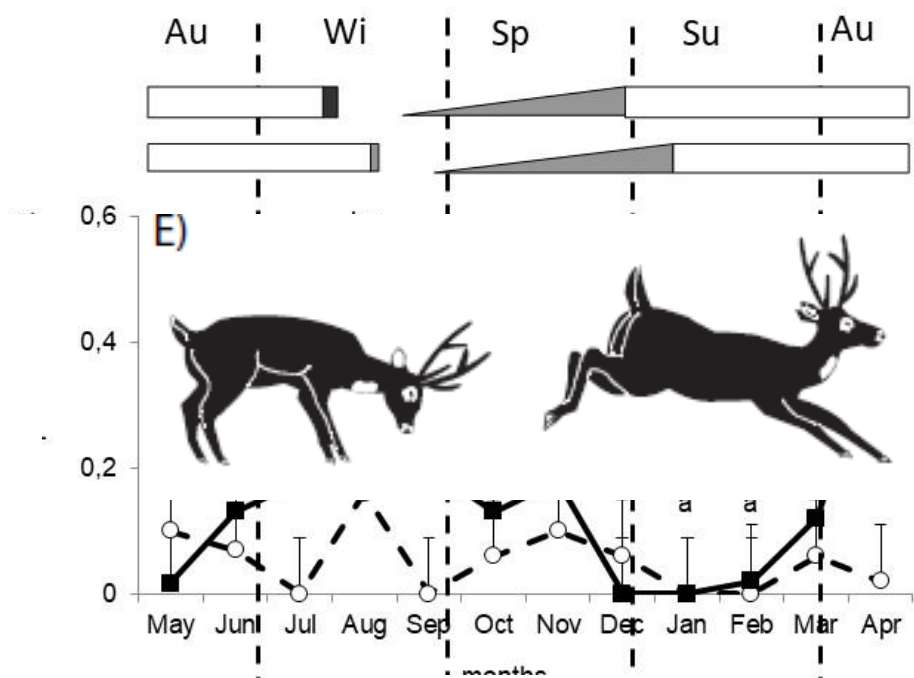
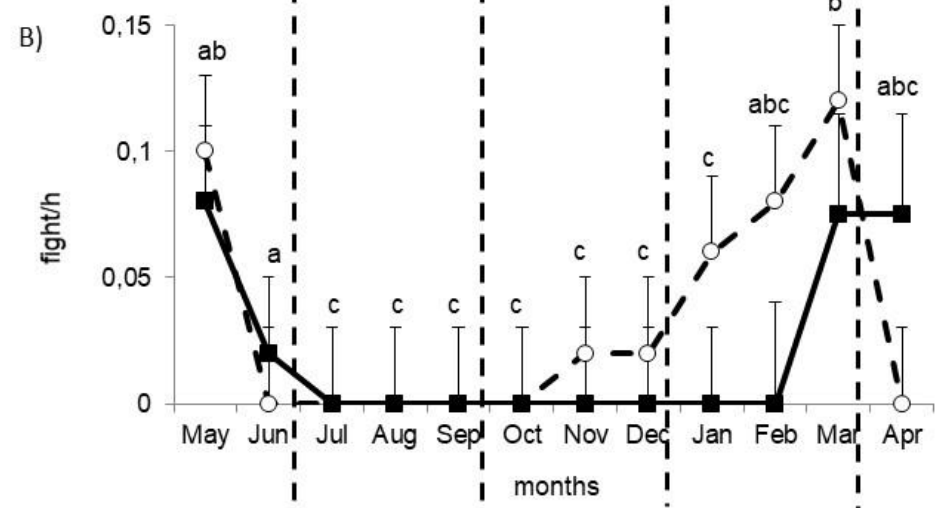
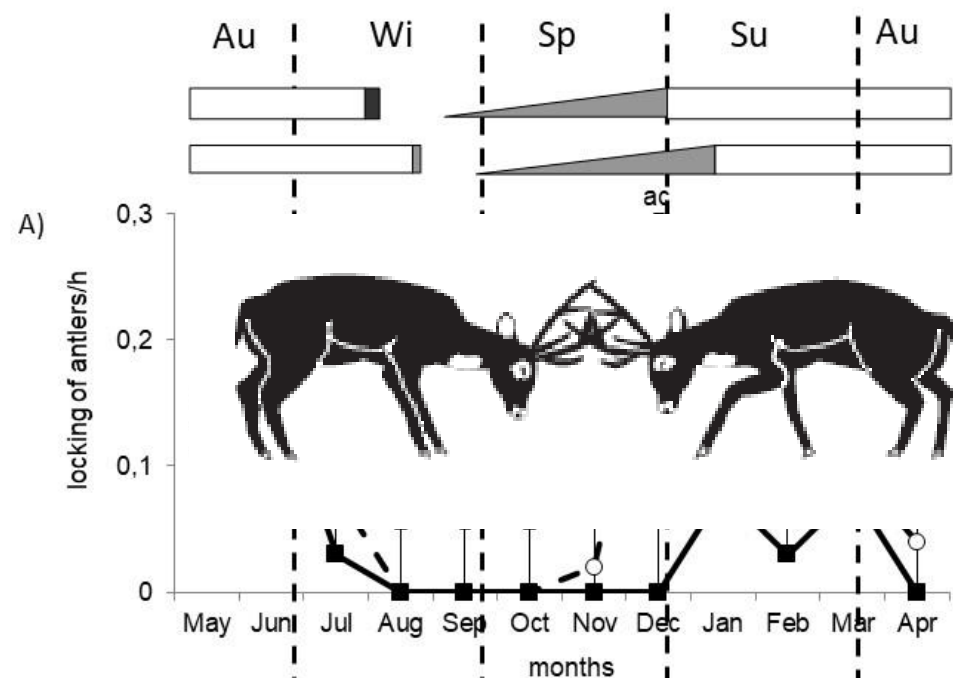


Table 1. Description of pampas deer male-female and female-female agonistic behaviours.

Agonistic behaviour	Description
Presence	The dominant displaces the subordinate(s) by its single presence.
Glare	The dominant looks steadily at the subordinate, and the last moves away. Occasionally the ears are dropped flat along the neck.
Persecute	The dominant walks or runs toward the subordinate with the neck forward and down and with the head in horizontal position.
Directing head	The female, in movement or standing pulls its ears back and steers the head toward any part of the body of the other hind. It may strike the other hind. The male turns down the head and directs it towards the hind, may even touch it. Occasionally the ears are turned back and dropped. This agonistic behaviour may be similar to that described among pampas deer males (Ungerfeld et al. 2008).
Kicking	The female lifts one or two forefoot of the ground and directs them toward the subordinate hind or toward the ground. The male uses the forefoot to strike the floor and displaces the hind.
Boxing	Two females rear on their hind legs and strike with both forefoot, looking steadily at the other with their ears down. It has not been observed in males.

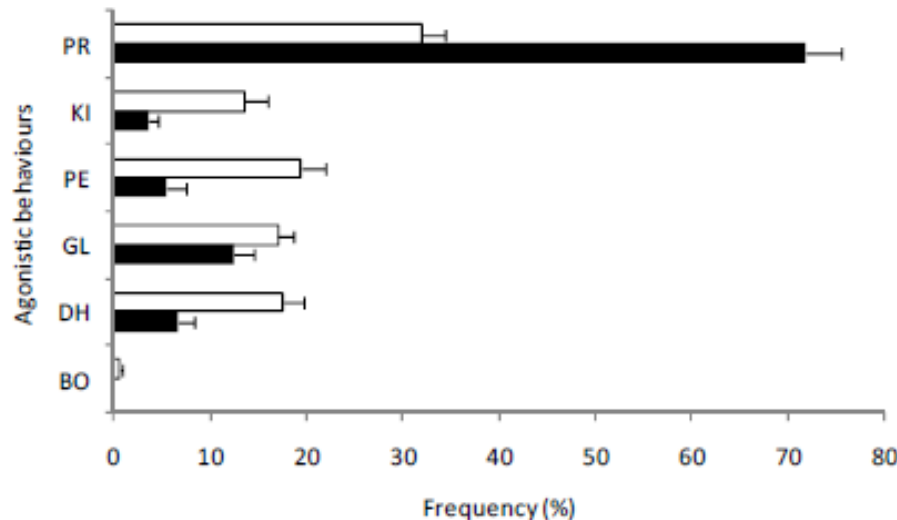


Figure 1. Percentage (mean \pm SEM) of agonistic behaviours used by males against females (filled bar) and by females against females (empty bar) in pampas deer (*Ozotoceros bezoarticus*). PR: Presence; KI: Kicking; PE: Persecute; GL: Glare; DH: Directing head; BO: Boxing.

Table 1 Number of observations in which pampas deer males used each agonistic behavior to displace high- or low-ranked females

Agonistic behavior	High-ranked females	Low-ranked females	<i>P</i>
Presence	20.6±2.7	10.0±2.7	0.0004
Kicking	0.1±0.4	1.1±0.4	0.051
Glare	1.9±0.6	2.4±0.6	ns
Directing head	0.9±0.5	1.3±0.5	ns
Persecute	1.4±1.5	1.8±1.5	ns

acta ethol
DOI 10.1007/s10211-013-0178-9

ORIGINAL PAPER

Pampas deer (*Ozotoceros bezoarticus*) male–female agonistic behavior toward high and low social ranked females

Rodolfo Ungerfeld • Aline Freitas-de-Melo

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Apareamientos: 15 registros

- Período de apareamiento:
 - ⇒ Duración: $8,2 \pm 1,1$ min.
 - ⇒ Cópulas: $2,0 \pm 0,2$ por período de apareamiento.
- Duración de la cópula: $3,9 \pm 0,4$ s

A)



B)



C)



D)



Figure 8

Courtship behavioural events in pampas deer: A) low stretch; B) ostentation; C) anogenital sniffing; and D) smelling urine. See detailed descriptions of each behaviour in Table 1.

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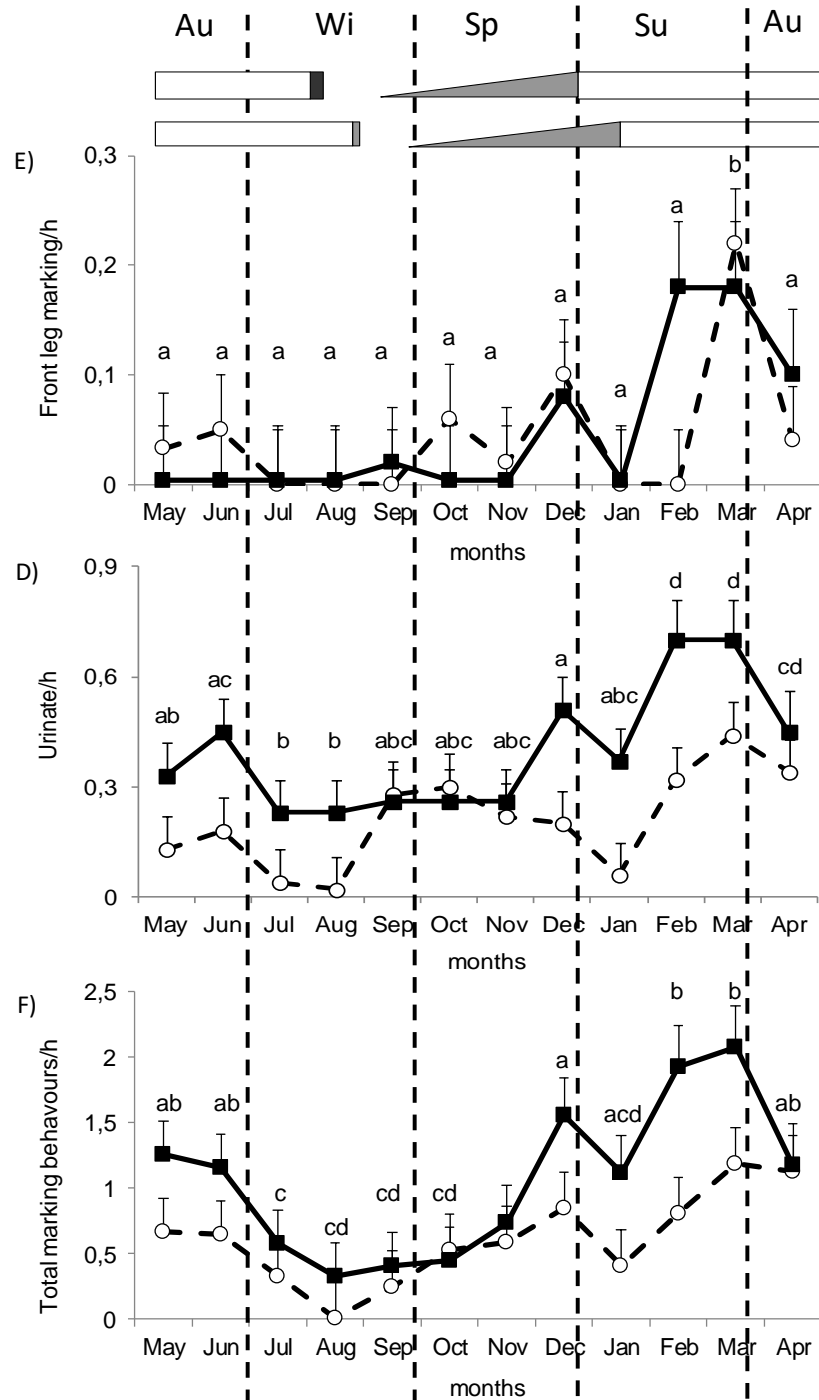
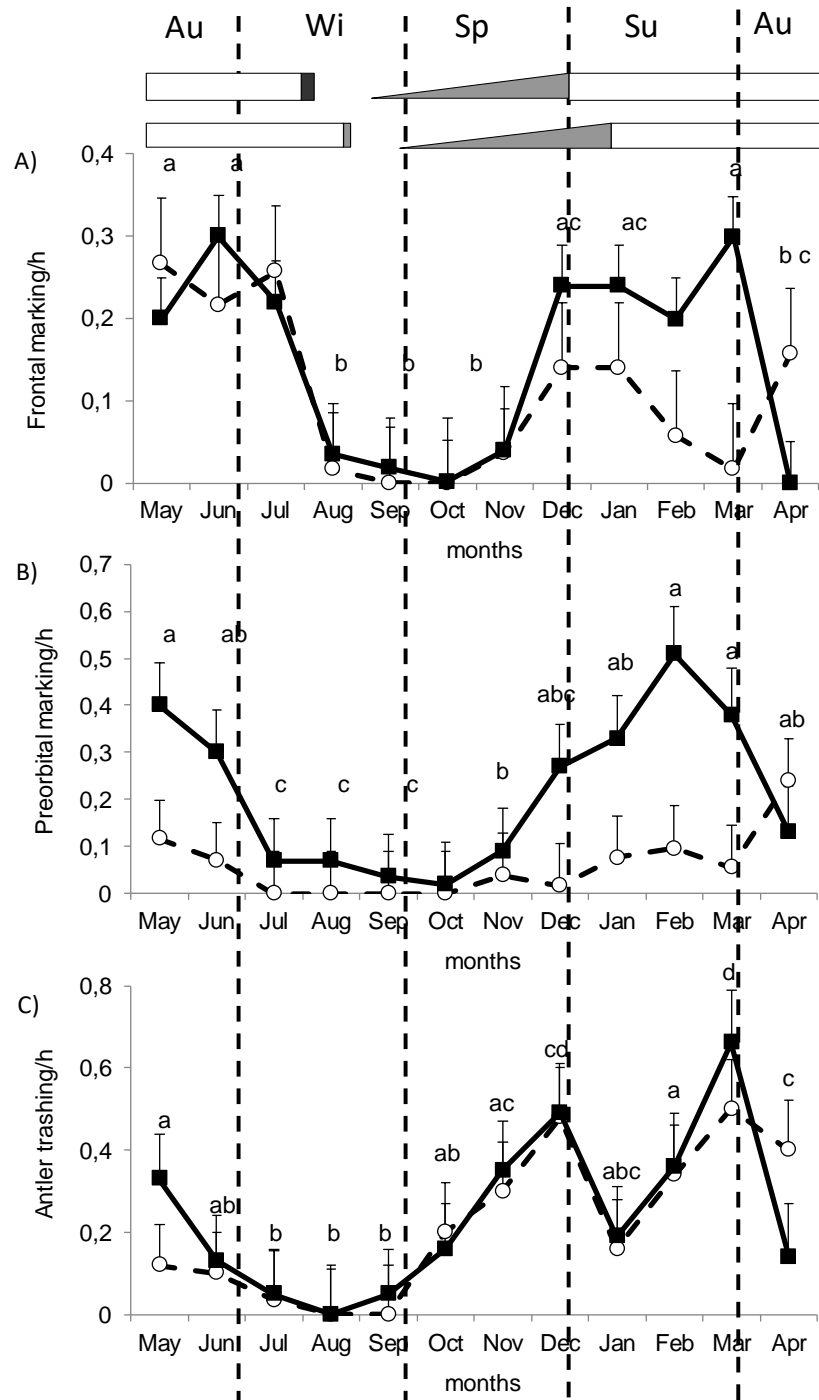
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Table 2. Percentage of time spent in feeding activities by pampas deer (*Ozotoceros bezoarticus*) fawns during 1-5 (trial 1 and 2) and 6-12 weeks of life (trial 1).

Feeding activity	Week 1 to 5 (%)		Week 6 to 12 (%)
	Exp 1	Exp 2	Exp 1
Suckling	36.2 ± 6.7	65.9 ± 5.0	3.0 ± 1.2
Grazing	47.1 ± 6.4	29.8 ± 4.5	57.9 ± 3.3
Browsing	4.3 ± 2.4	0.8 ± 0.4	2.8 ± 1.0
Ruminating	11.5 ± 4.2	2.4 ± 1.3	25.0 ± 3.1
Drinking water	0.0 ± 0.0	0.8 ± 0.3	1.6 ± 1.2
Consumption of ration	0.9 ± 0.7	0.3 ± 0.2	9.7 ± 2.0

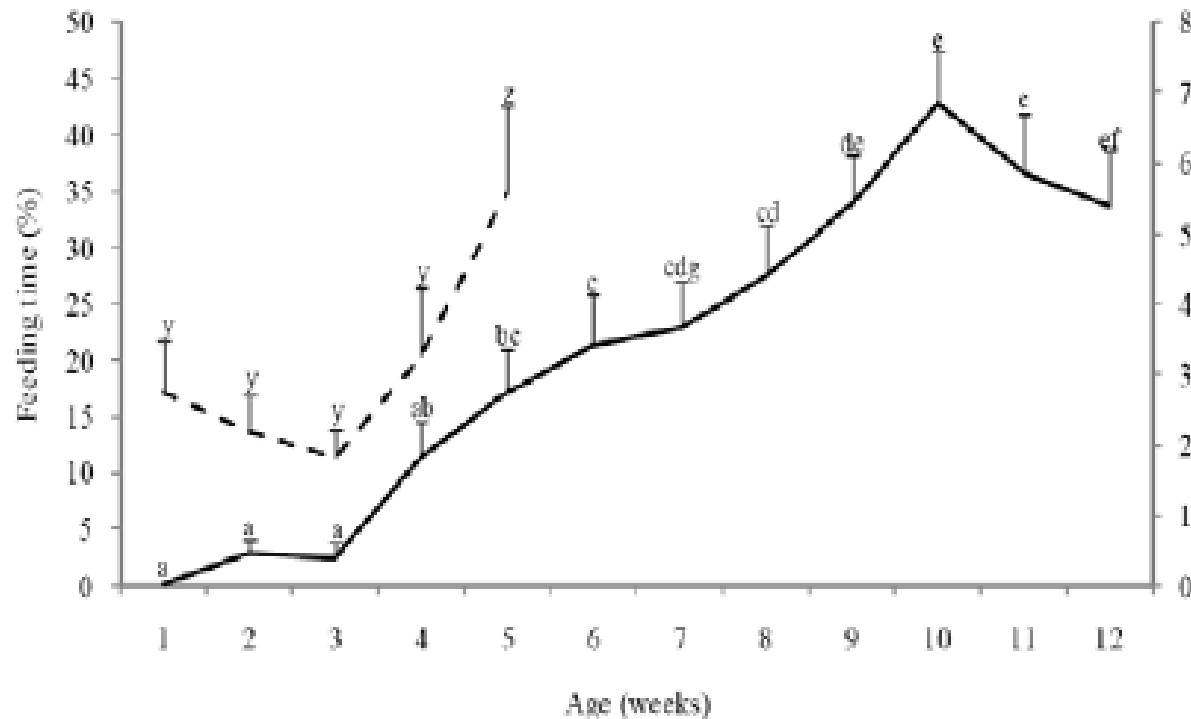


Figure 1. Percentage of feeding time (sum of suckling, grazing, browsing, eating ration, drinking water and ruminating) related to observation time in first five (---; Trial 2) and twelve (—; Trial 1) weeks of life of pampas deer (*Ozotoceros bezoarticus*) fawns. Letters represent trials where $P < 0.05$.

Table 1 Pattern of activity during the first 60 postpartum days

Postpartum days	1-4	5-19	20-39	40-60
Distance between mother (M) and fawn (F) (% of total time)				
<1 m	10 ± 3	10 ± 2	10 ± 2	11 ± 2
2-4 m	16 ± 5 a	11 ± 3	10 ± 3	7 ± 2
5-7 m	39 ± 6 b	20 ± 5	17 ± 4	13 ± 5
>7 m	35 ± 7 b	59 ± 6 a	63 ± 6	69 ± 5
Time lying, standing, walking and running (% of total time)				
Lie M	48 ± 6	48 ± 4	56 ± 7	56 ± 6
Lie F	85 ± 6*	82 ± 4*	72 ± 2*	63 ± 5 b
Stand M	24 ± 5	29 ± 4	21 ± 4	22 ± 4
Stand F	5 ± 2*	6 ± 2*	10 ± 2*	18 ± 4 b
Walk M	20 ± 3	17 ± 3	15 ± 4	20 ± 5
Walk F	7 ± 5 a*	6 ± 1 a*	11 ± 1	16 ± 2
Run M	0.2 ± 0.2	0.4 ± 0.1	0.3 ± 0.1	0.3 ± 0.1
Run F	0.1 ± 0.1	0.5 ± 0.1	2.4 ± 0.7 b*	0.9 ± 0.3

Significant difference (ANOVA repeated measures) between the group with the letter 'a' versus 40-60 ($p < 0.05$) tested separately (no significant difference was found among the other intervals); significant difference (ANOVA repeated measures) between the group with the letter 'b' and all other intervals ($p < 0.05$) tested separately (no significant difference was found among the other intervals). Data expressed as mean ± SE

* $p < 0.05$ significant difference (t test) between mother and fawn for that interval

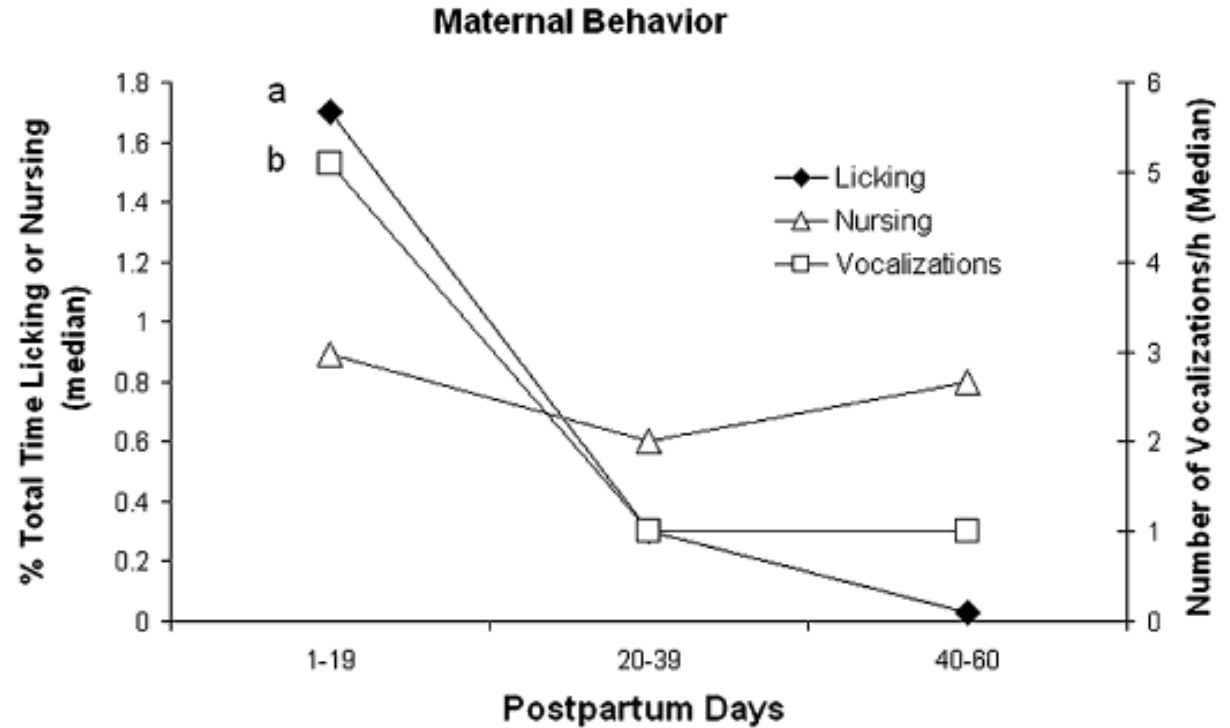
J Ethol (2013) 31:323-330
DOI 10.1007/s10164-013-0383-z

ARTICLE

Maternal behavior and early development of pampas deer (*Ozotoceros bezoarticus*) fawns in a semi-captive environment

Daniel E. Olazábal · Matías Villagrán · Solana X. González-Pensado · Rodolfo Ungerfeld

Fig. 2 Number of vocalizations and percentage of total time (1 h) the mother licked and nursed the fawn during the first 2 months after parturition (*a* $p < 0.05$ significantly different compared to interval 40–60; *b* significantly different to interval 20–39)



J Ethol (2013) 31:323–330
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Solana X. González-Pensado · Rodolfo Ungerfeld

Social rank had no

effect on calving success, relative calving dates, sex ratio or body weight at birth. In this study, the success index was related with females' age, and the reproductive performance did not differ between females of different social ranks.

Table 1

Sex ratios of pampas deer were born in the Estación de Cría de Fauna Autóctona Cerro Pan de Azúcar in relation to their mothers' success index.

	HR ^a (n = 25)	LR ^b (n = 23)
Number of males	16	10
Number of females	9	13
Males/total	0.64	0.43

^a High ranked.

^b Low ranked.

Behavioural Processes 105 (2014) 49–52



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Behavioural Processes

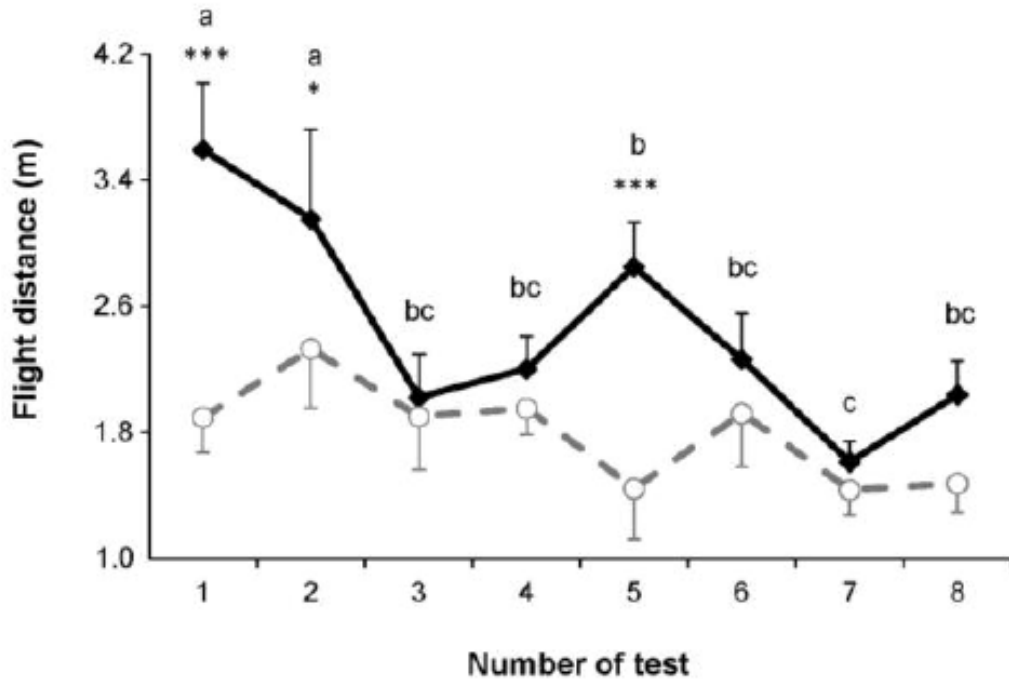
journal homepage: www.elsevier.com/locate/behavproc



Social rank and reproductive performance of pampas deer females (*Ozotoceros bezoarticus*, Linnaeus, 1758)

Jéssica Tatiana Morales-Piñeyrúa^a, Gabriel Ciappesoni^b, Rodolfo Ungerfeld^{a,*}





Flight distance recorded over 8 days in high (—◆—) and low (—○—) ranked pampas deer females.

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Anatomía del tracto reproductivo

Los estudios se realizaron con los animales que murieron naturalmente, por vejez, o por enfermedad

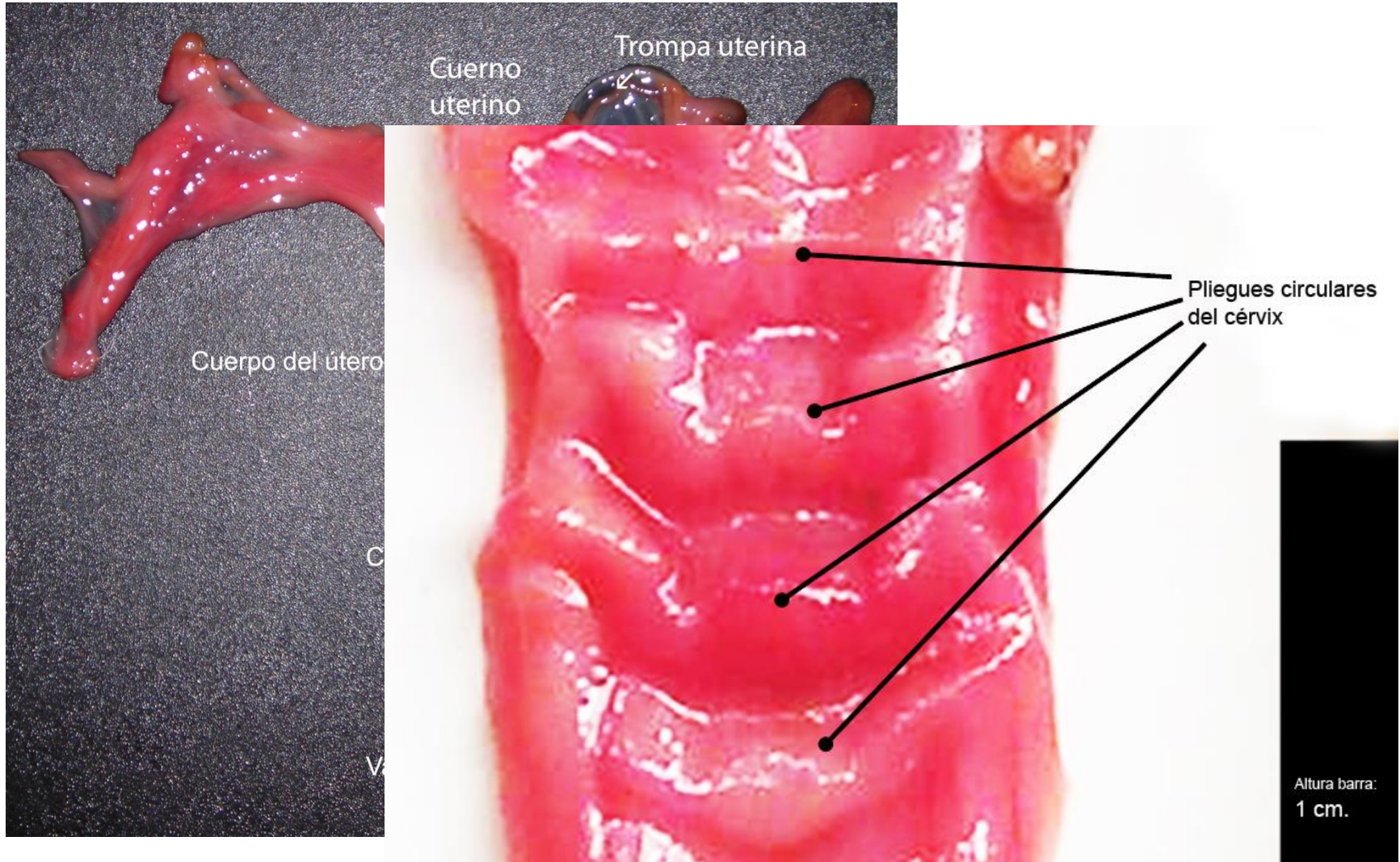


Tracto reproductivo de la hembra

ORIGINAL ARTICLE

Gross Anatomy of the Female Genital Organs of the Pampas Deer (*Ozotoceros bezoarticus*, Linnaeus 1758)

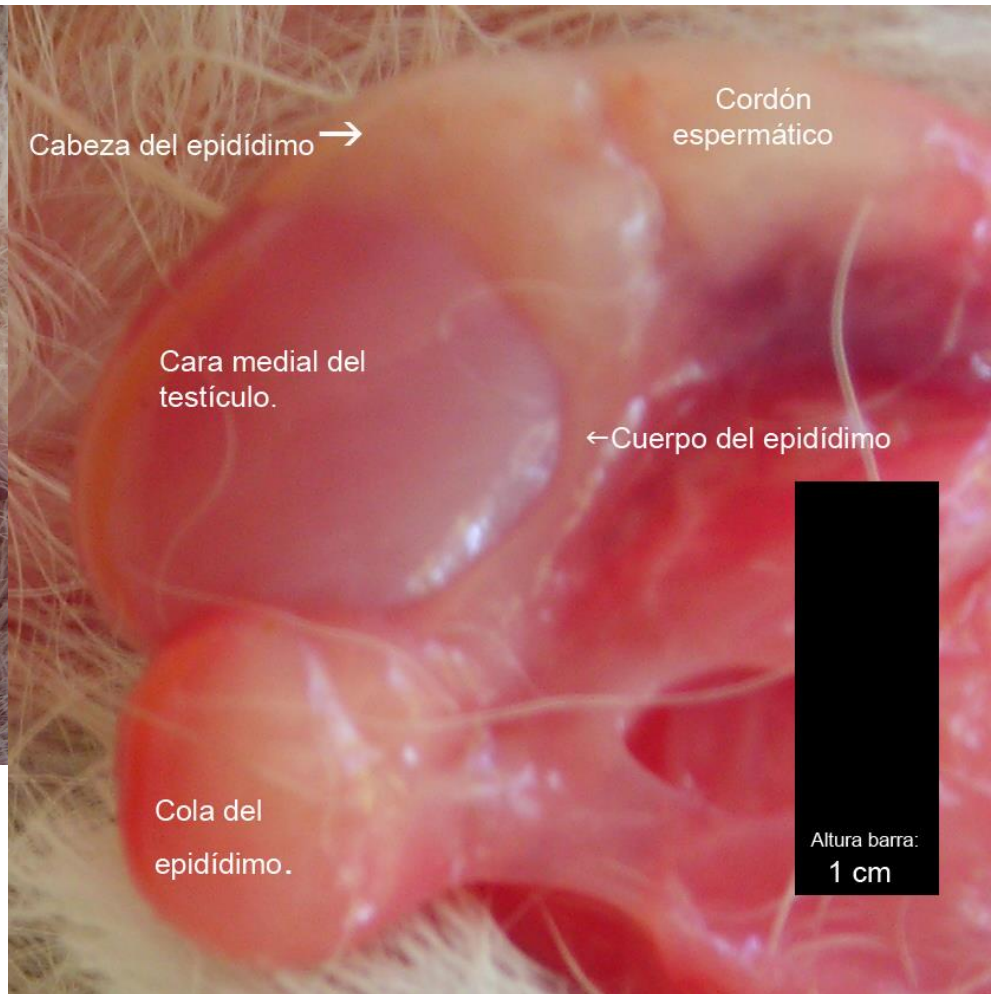
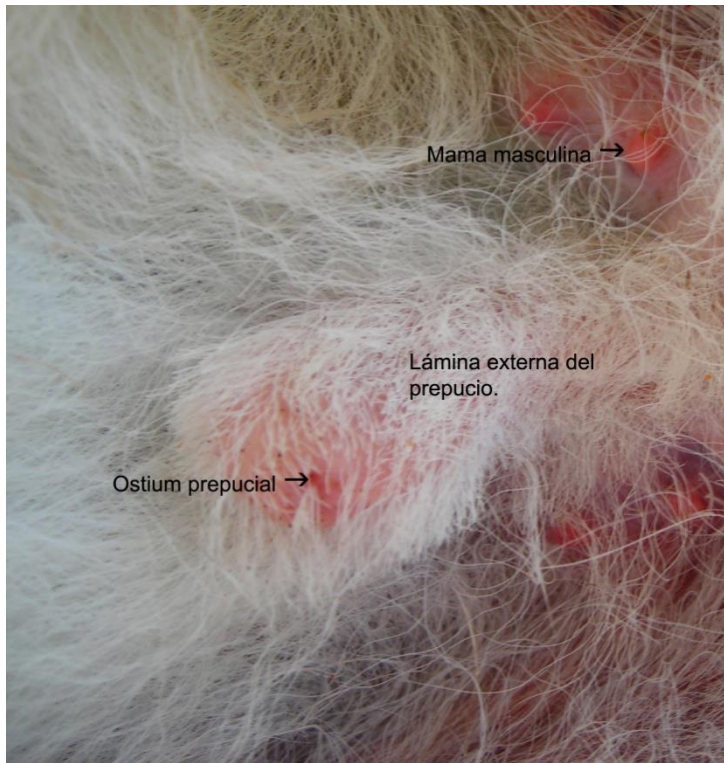
W. Pérez^{1*}, N. Vazquez¹ and R. Ungerfeld²



Tracto reproductivo del macho

Gross anatomy of the male genital organs of the pampas deer (*Ozotoceros bezoarticus*, Linnaeus 1758)

William Pérez · Noelia Vazquez · Rodolfo Ungerfeld



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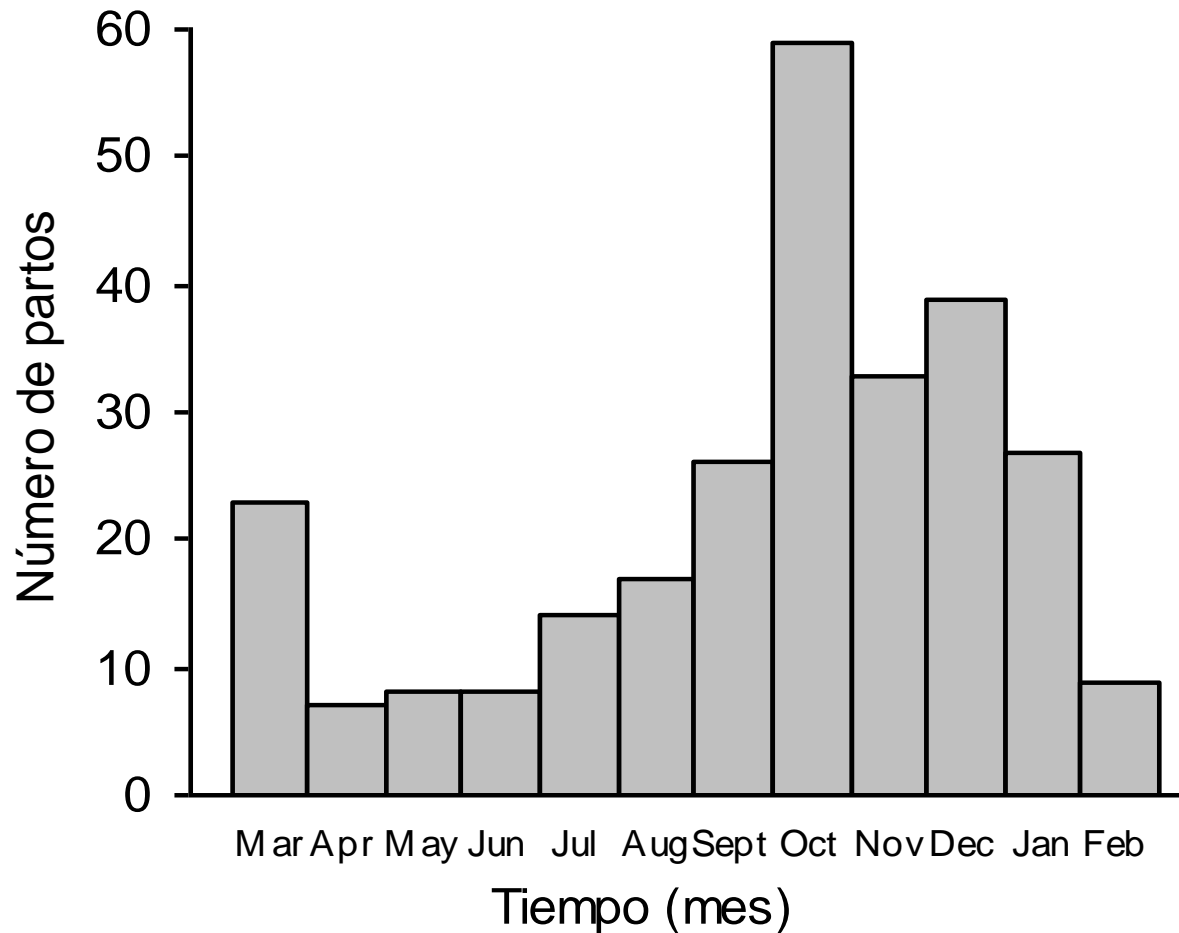
- ⇒ Estacionalidad reproductiva

Estacionalidad reproductiva: partos de las hembras

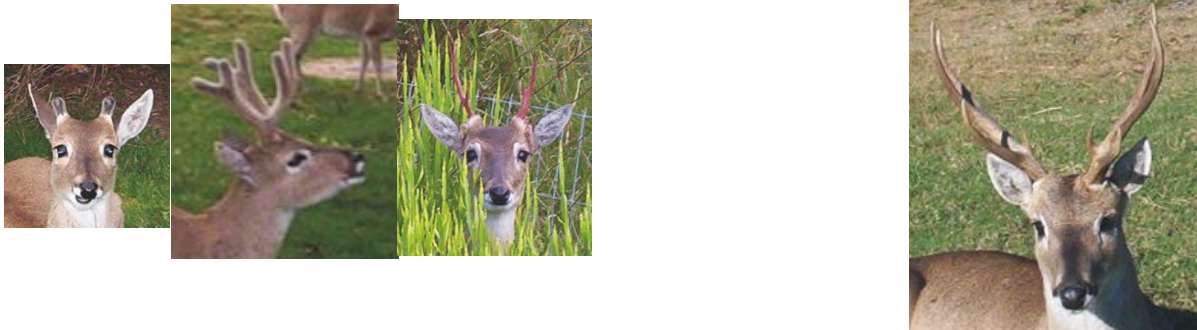
Reproduction in a semi-captive herd of pampas deer *Ozotoceros bezoarticus*

Rodolfo Ungerfeld, Uruguay Tabaré González-Sierra & José Piaggio

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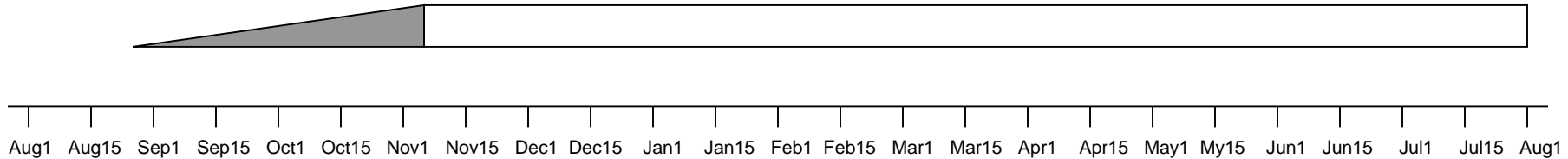


Ciclo de las astas



felpa

asta dura



Mammalian Biology
Zeitschrift für Säugetierkunde

www.elsevier.de/mambio



ORIGINAL INVESTIGATION

Seasonal antler cycle in a herd of pampas deer (*Ozotoceros bezoarticus*)
in Uruguay

Rodolfo Ungerfeld^{a,*}, Uruguay T. González-Sierra^b, Alejandro Bielli^c

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Female effect on antlers of pampas deer (*Ozotoceros bezoarticus*)

R. Ungerfeld, J.P. Damián, M. Villagrán, and S.X. González-Pensado

Efecto hembra

isolated females

Caída de astas = 21,8 de julio vs 2 de agosto $P=0,08$

Peso de astas = $121,3 \pm 8,0$ vs $148,7 \pm 7,4$ g $P=0,018$

Vol de astas = $68,8 \pm 6,3$ vs $85,8 \pm 5,3$ cm³ $P=0,04$

Perlas = $106,7 \pm 29,3$ vs $299,8 \pm 48,1$ $P=0,02$

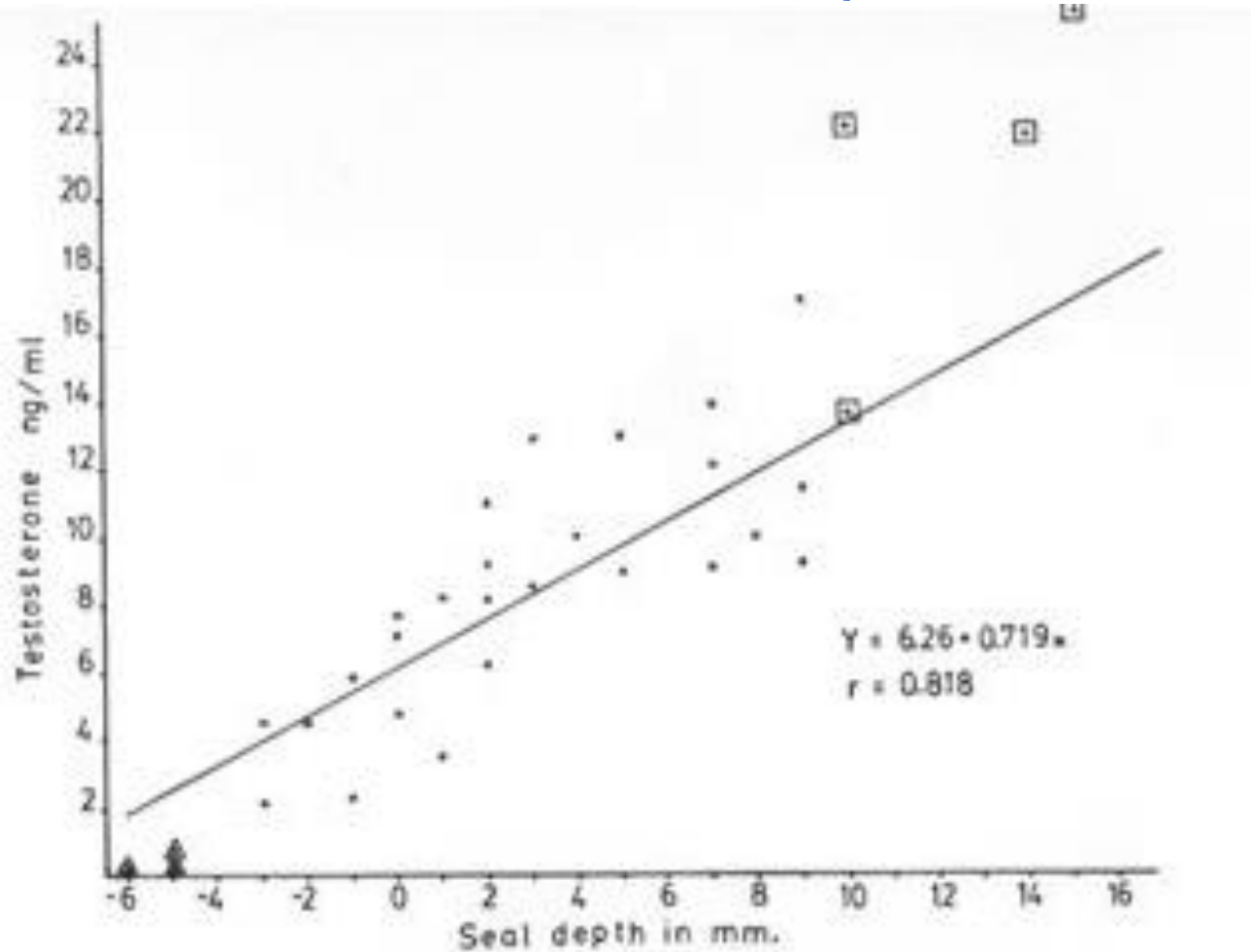
Astas en machos con o sin contacto directo con hembras



Machos con
hembras

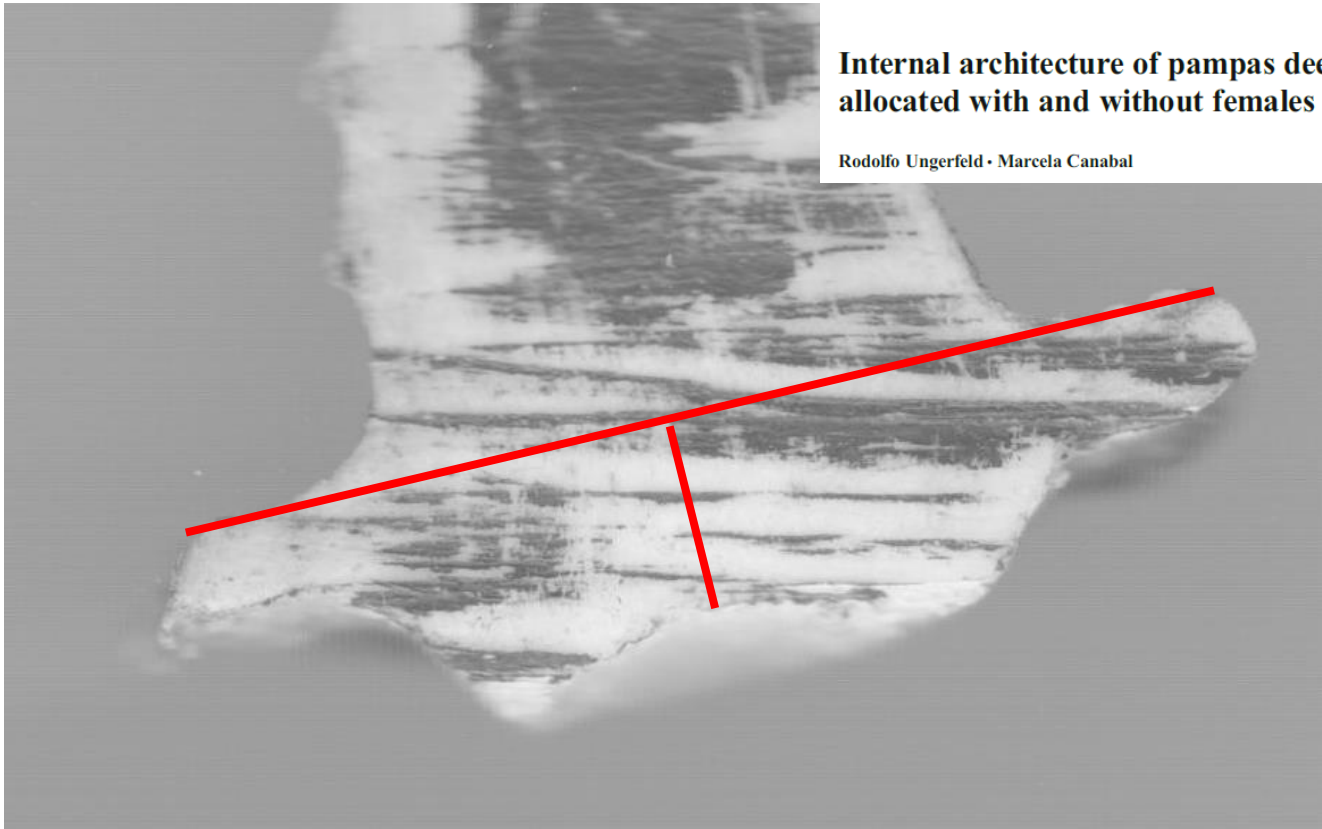
Machos
separados de
hembras

Ciervo cola blanca (Bubenik, unpublished)



Internal architecture of pampas deer antlers differs in males allocated with and without females

Rodolfo Ungerfeld · Marcela Canabal



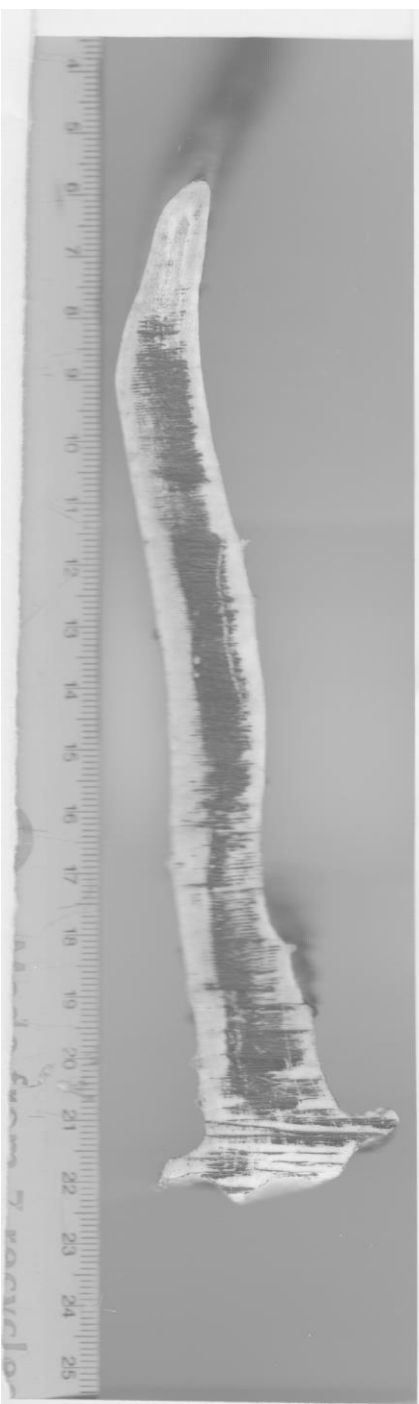
Machos con
hembras

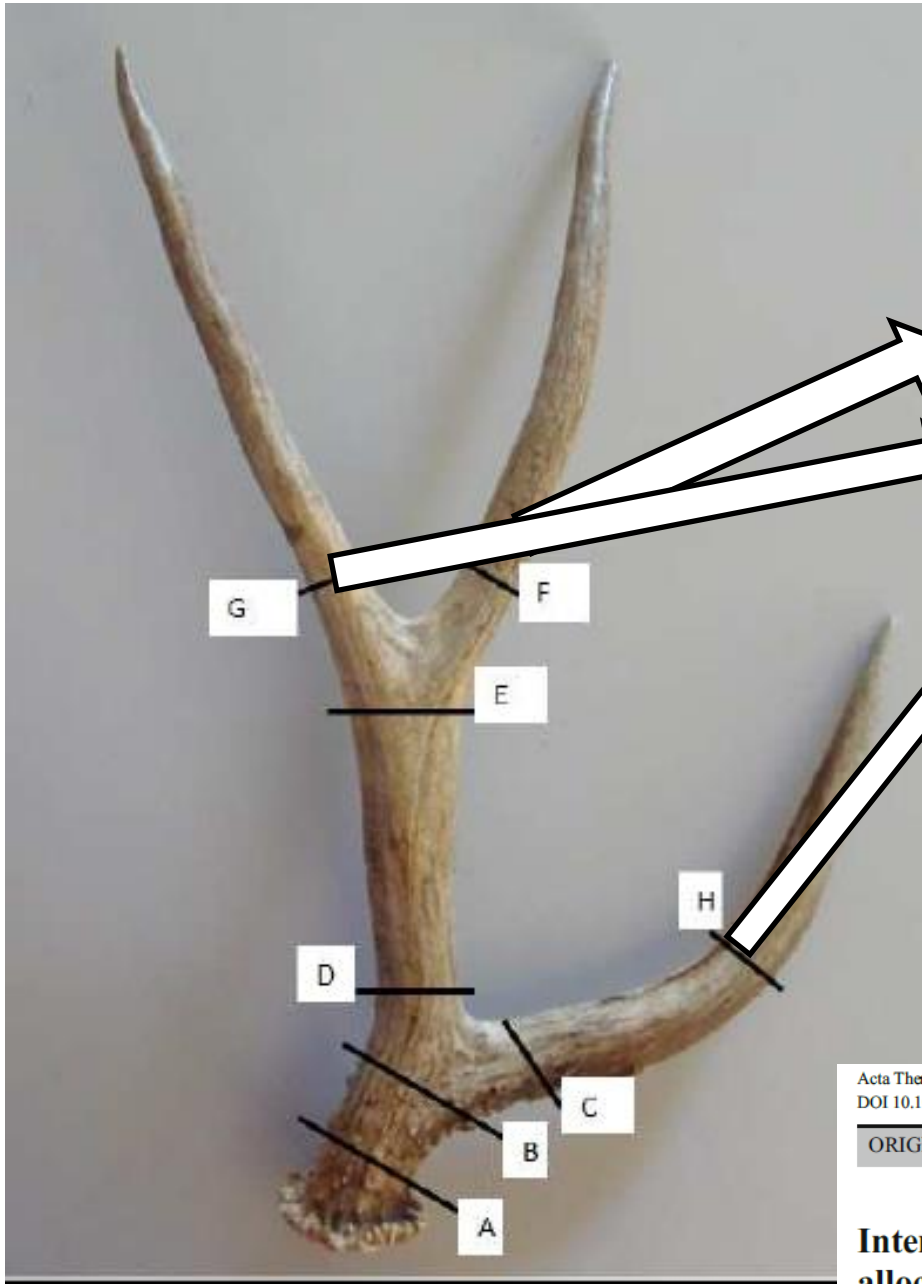
$0,86 \pm 0,07$

Machos sin
hembras

$0,64 \pm 0,05$

$P=0,006$





Machos con hembras	Machos sin hembras	P
86.6 ± 3.0	76.7 ± 3.8	0.02
80.6 ± 3.3	75.4 ± 3.3	0.1
78.6 ± 3.0	72.4 ± 2.3	0.06

Acta Theriol (2014) 59:347–351
 DOI 10.1007/s13364-013-0171-8

ORIGINAL PAPER

Internal architecture of pampas deer antlers differs in males allocated with and without females

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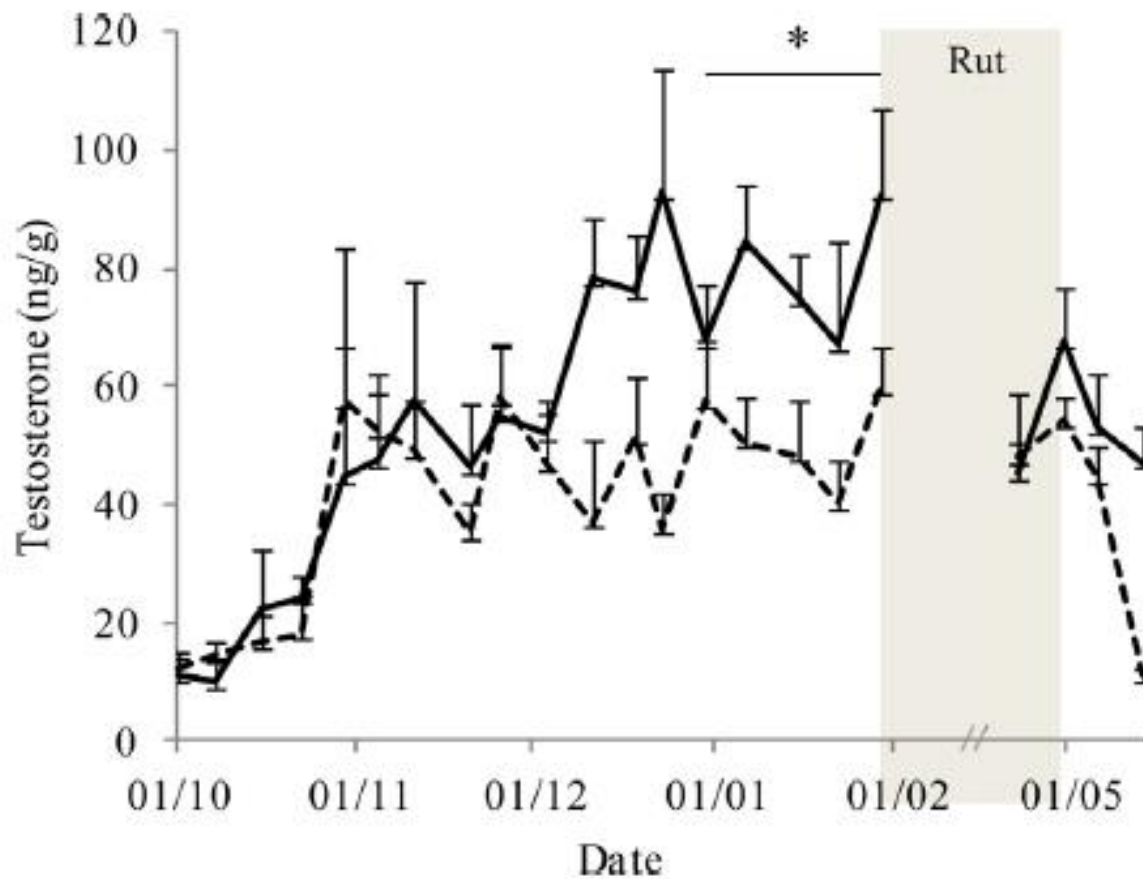
Testosterona fecal en machos en contacto permanente o aislados de hembras

Permanent contact with females increases testosterone and improves fresh semen traits in pampas deer (*Ozotoceros bezoarticus*) males

M. Villagrán¹, R. Ungerfeld



M. Villagrán, R. Ungerfeld / *Animal Reproduction Science* 143 (2013) 85–90



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Soto, A. T. et al. 1



Soto, A.T. et al. 1995

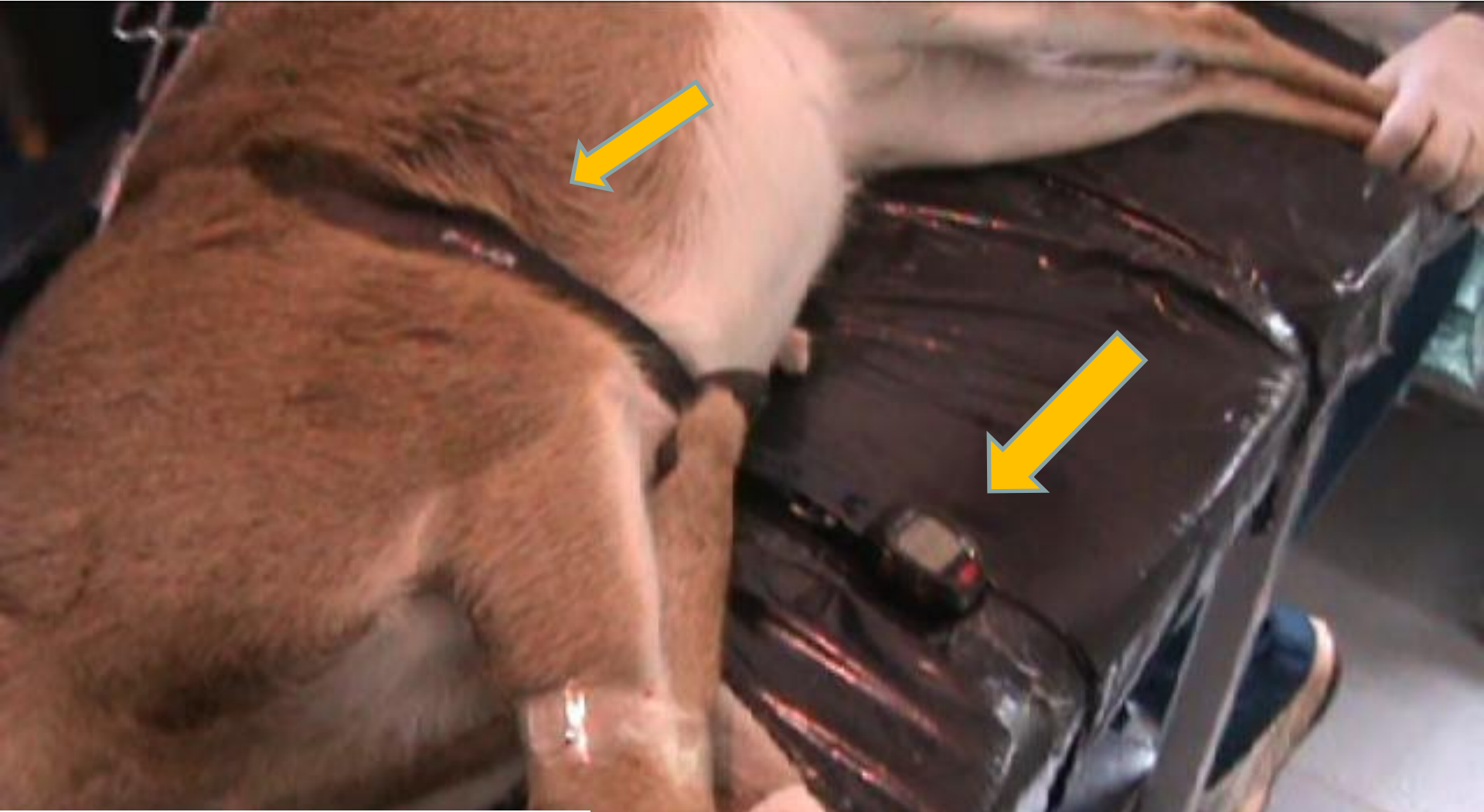




Anestesia y electroeyaculación



Anesthesia



Reproduction in Domestic Animals

Reprod Dom Anim doi: 10.1111/j.1439-0531.2011.01859.x
ISSN 0936-6768

Physiological and Biochemical Parameters in Response to Electroejaculation in Adult and Yearling Anesthetized Pampas Deer (*Ozotoceros bezoarticus*) Males

F Fumagalli^{1,2}, M Villagrán², JP Damían³ and R Ungerfeld²

Reproduction in Domestic Animals

Reprod Dom Anim doi: 10.1111/jrds.12404
ISSN 0936-6768

Vocalizations During Electroejaculation in Anaesthetized Adult and Young Pampas Deer (*Ozotoceros bezoarticus*) Males

F Fumagalli¹, JP Damían² and R Ungerfeld³

Recuperación anestésica: 0,26 mg/kg de yohimbina iv



Physiological and Biochemical Parameters in Response to Electroejaculation in Adult and Yearling Anesthetized Pampas Deer (*Ozotoceros bezoarticus*) Males

F Fumagalli^{1,2}, M Villagrán², JP Damián³ and R Ungerfeld²

Venado de campo: caracterización de la respuesta

Table 1. Induction and recovery times and total time (min) during which adult (CA) and yearlings (CJ) pampas deer males remain anesthetized and were electroejaculated. Results are expressed as means \pm SEM

	CA	CJ
Induction time	16.7 \pm 6.8	16.8 \pm 9.5
Recovery time	3.0 \pm 2.5	1.5 \pm 1.2

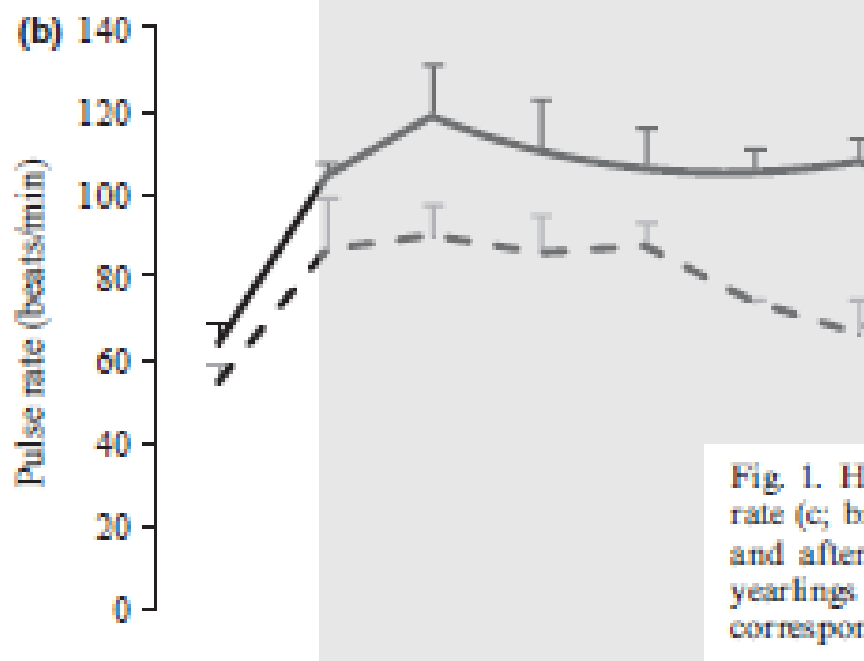
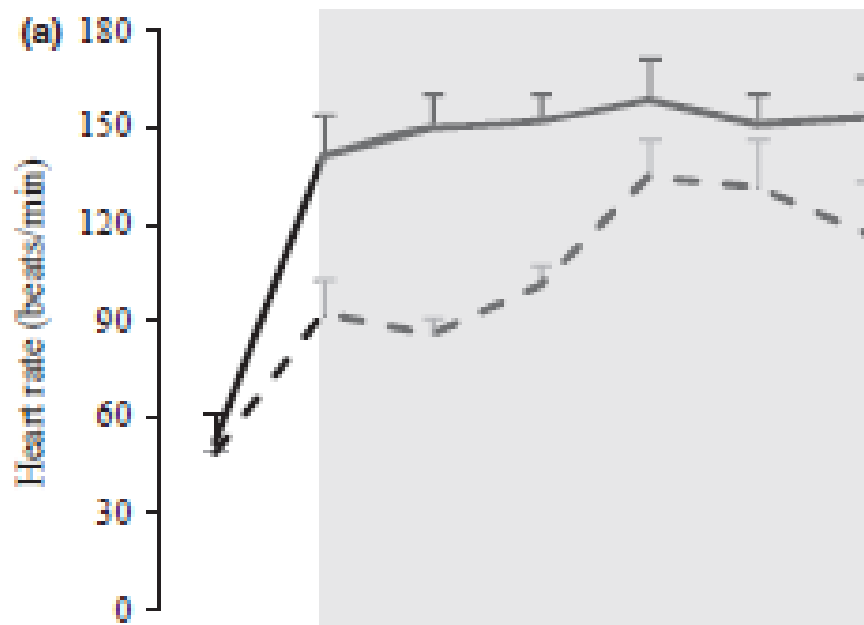


Fig. 1. Heart rate (a; beats/min), pulse rate (b; beats/min), respiratory rate (c; breaths/min), oxygen saturation (d; %) before (BEE), during and after (AEE) electroejaculation in adults (continuous lines) and yearlings (discontinuous lines) anesthetized pampas deer. Grey area corresponds to the period of electroejaculation

Table 2. Rectal temperature, blood enzymes and cortisol concentration obtained before and after electroejaculation (BEE and AEE) in adult (CA) and yearlings (CJ) anaesthetized pampas deer. The results are presented as mean \pm SEM

	CA		CJ		Tr	P	Int
	BEE	AEE	BEE	AEE			
RT (°C)	37.5 \pm 0.8	36.7 \pm 0.7	37.6 \pm 0.4	37.1 \pm 0.4	NS	0.0001	NS
AP (U/L/l)	251 \pm 8.5	323 \pm 118	404 \pm 8.5	444 \pm 96	<0.05	<0.001	NS
CK (U/L/l)	157 \pm 125	370 \pm 40	303 \pm 56	788 \pm 251	<0.05	<0.01	NS
AST (U/L/l)	71 \pm 24	75 \pm 12	76 \pm 19	99 \pm 18	NS	<0.05	NS
Cortisol (μ g/dl)	0.21 \pm 0.08	0.99 \pm 1.01	0.45 \pm 0.31	0.87 \pm 0.90	NS	NS	NS

RT, rectal temperature; AP, alkaline phosphatase; CK, creatine kinase; AST, aspartate aminotransferase; Tr, effect of categories (adults vs yearlings); T, time effect (BEE vs AEE); Int, interaction between categories and time.

- Hubo una clara respuesta de estrés y posiblemente dolor a pesar de estar los animales anestesiados

Vocalizations During Electroejaculation in Anaesthetized Adult and Young Pampas Deer (*Ozotoceros bezoarticus*) Males

F Funagalli¹, JP Damián² and R Ungerfeld³

¹Clinica Semiótica, Facultad de Veterinaria, Universidad de la República, Montevideo, Uruguay; ²Departamento de Biología Molecular y Celular, Facultad de Veterinaria, Universidad de la República, Montevideo, Uruguay; ³Departamento de Fisiología, Facultad de Veterinaria, Universidad de la República, Montevideo, Uruguay

Vocalizaciones

- Análisis de:
 - ✓ Cantidad
 - ✓ Duración
 - ✓ Características del sonograma
 - ✓ Efectos del voltaje



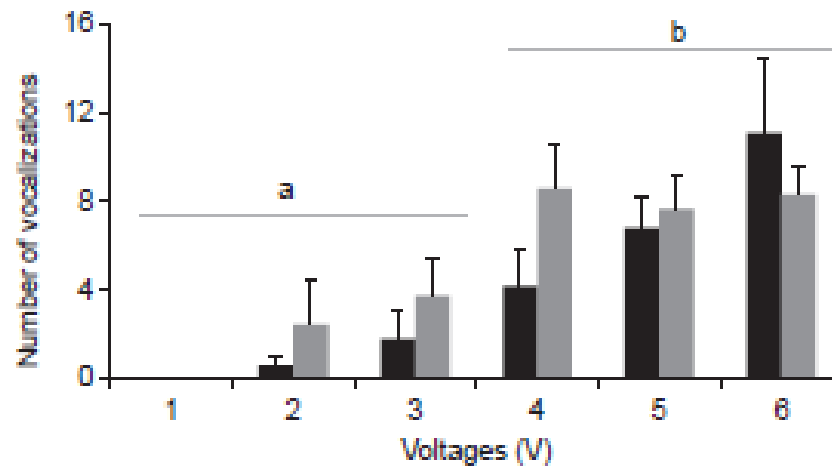


Fig. 1. Number of vocalizations emitted in each voltage used during electroejaculation in adults (black column $n = 13$) and young (grey column $n = 13$) anaesthetized pampas deer males. Values are expressed as mean \pm SEM. a vs b: $p < 0.05$

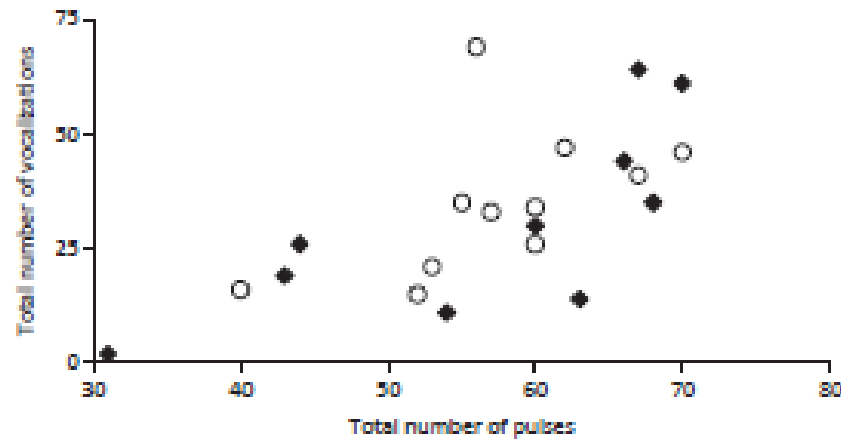


Fig. 2. Relationship between the total number of pulses during electroejaculation and the total number of vocalizations in adult (\blacklozenge) and young (\circ) pampas deer males. Adult males: $R^2 = 0.55$; $p = 0.014$ young males: $R^2 = 0.28$; $p = 0.09$

Repetibilidad

- Determinar si la respuesta a la EE es afectada por la repetición del procedimiento en forma estacional (otoño, invierno, primavera, verano, y nuevamente en otoño)
- 53 capturas y electroeyaculaciones de 10 venados
- Frecuencia trimestral
- Mismas variables

Emerging Animal Species 4 (2022) 100010



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Emerging Animal Species

journal homepage: www.elsevier.com/locate/eas



The repetition of semen collection does not affect the physiological and biochemical response to electroejaculation of anesthetized adult and yearling pampas deer (*Ozotoceros bezoarticus*) males

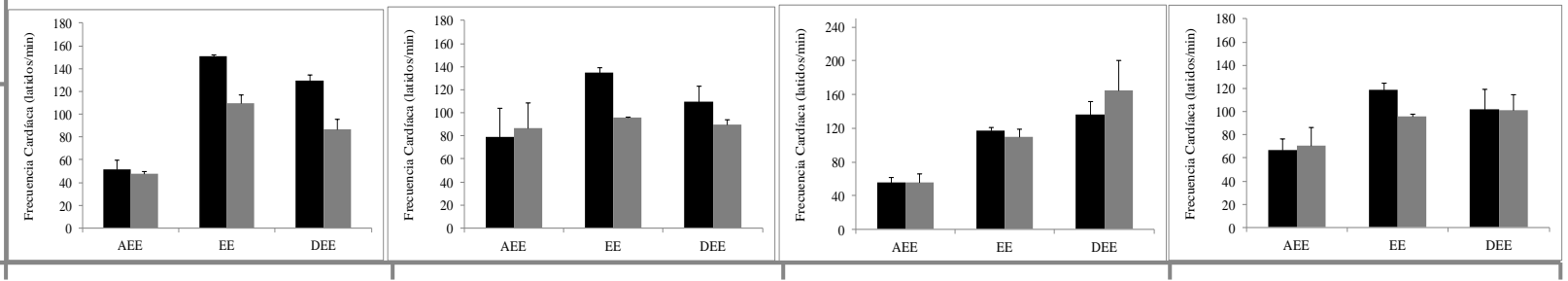
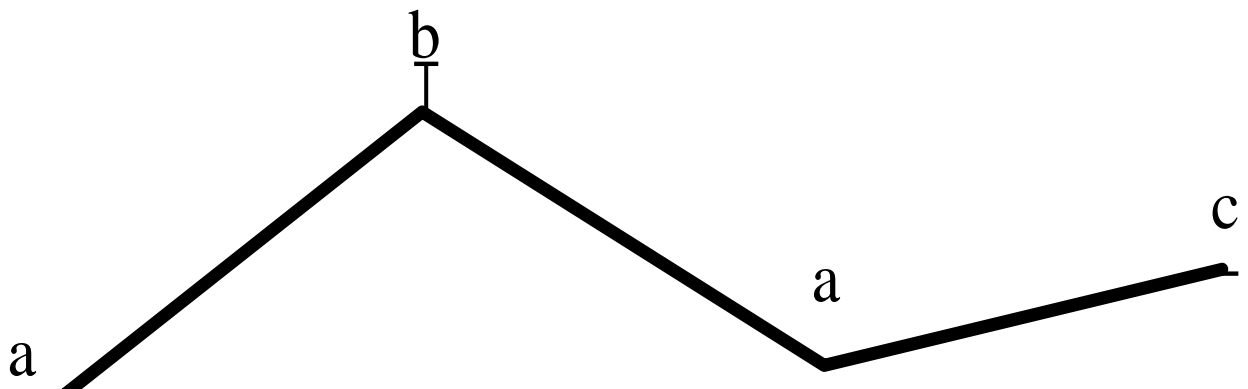
Fernando Fumagalli ^{a,*}, Matías Villagrán ^b, Rodolfo Ungerfeld ^b



$p = 0,001$

Frecuencia Cardíaca (latidos/min)

120
100
80
60
40
20
0

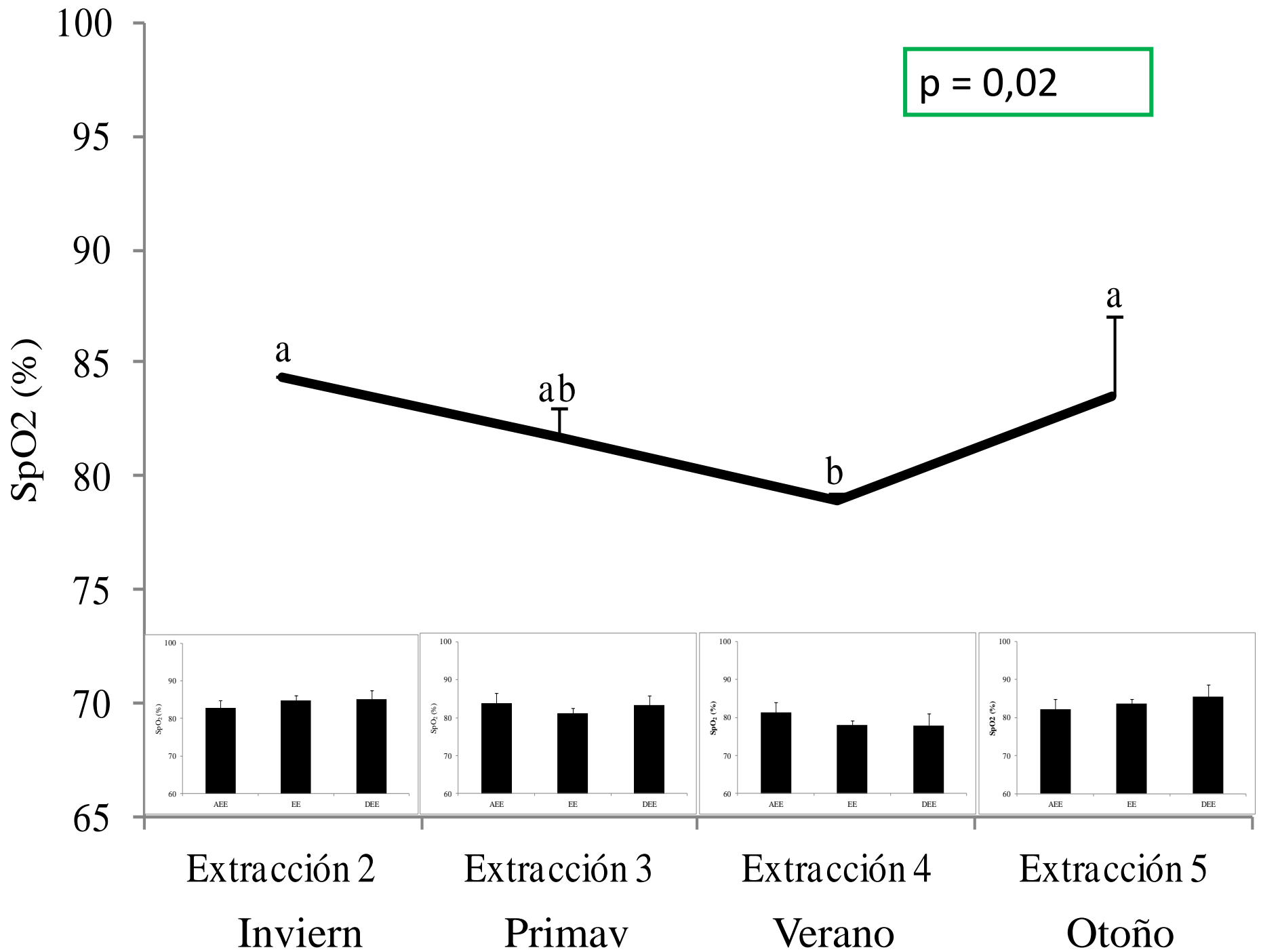


Extracción 2
Inviern

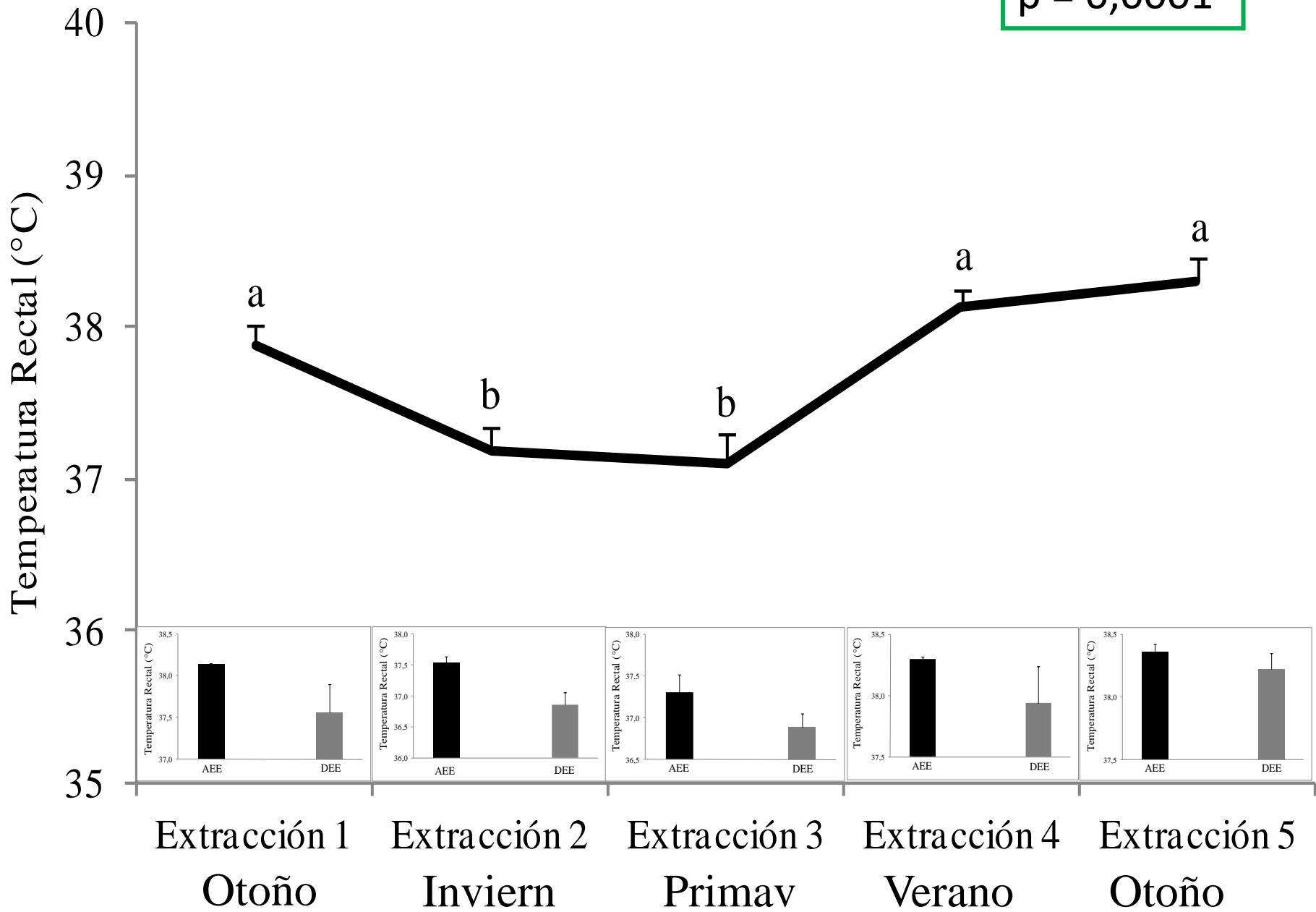
Extracción 3
Primav

Extracción 4
Verano

Extracción 5
Otoño



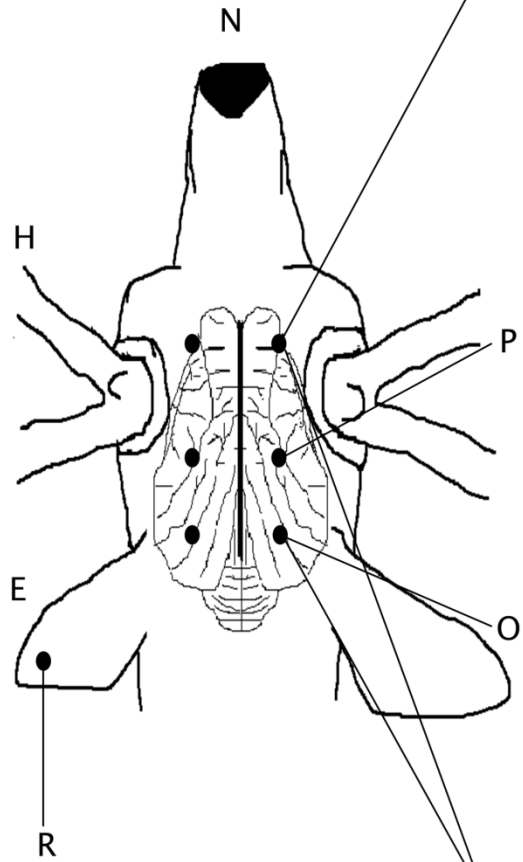
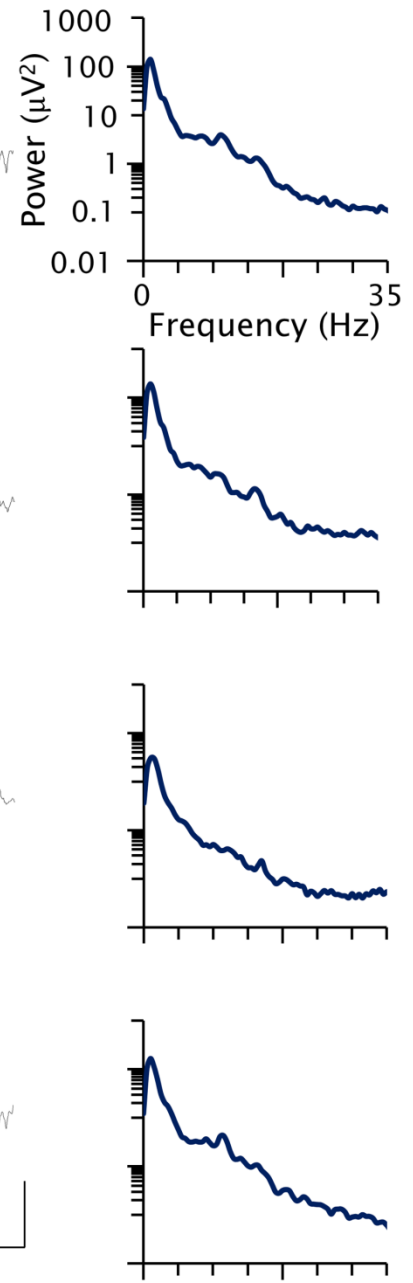
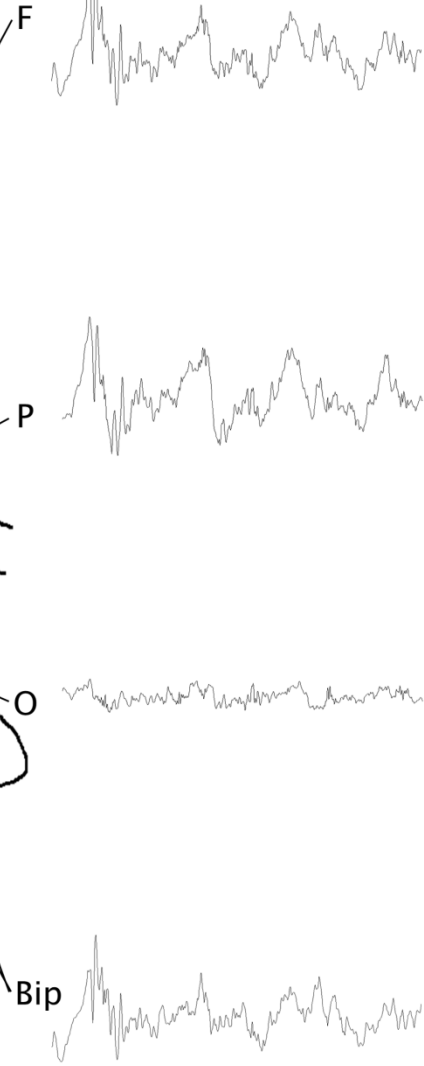
p = 0,0001



- La repetición del procedimiento en venados de campo machos, adultos y juveniles anestesiados no afectó en forma sostenida los parámetros de respuesta a la EE.
- Los efectos fueron adjudicables al momento o a la estación en que se realizó la extracción.
- La EE bajo AG puede ser utilizada en el mismo macho de venado de campo de forma reiterada, sin que esto sea un perjuicio para la salud del animal.

Protocolo anestésico

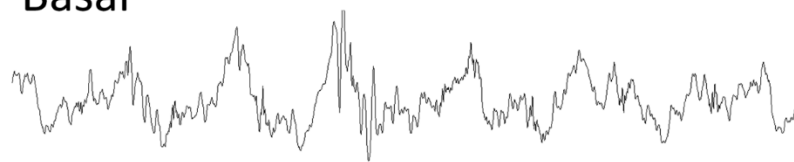
- Venados vocalizan bajo anestesia general
- Alternativa: analgesia epidural
- Fentanilo y bupivacaína
- Dificultad para evaluar dolor:
 - ✓ percepción subjetiva
 - ✓ falta de indicadores específicos
 - ✓ respuestas similares al estrés

A**B**

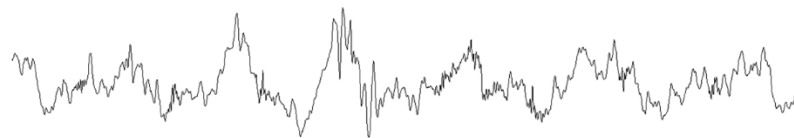
No Fentanyl

Basal

Fr



Par



Stimulus

Fr



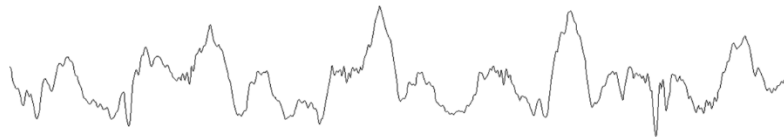
Par



Fentanyl

Basal

Fr

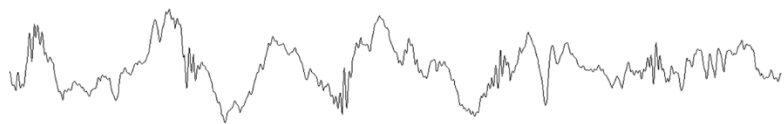


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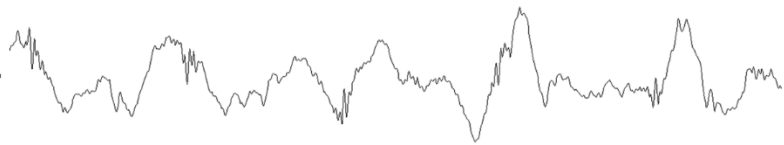


Stimulus

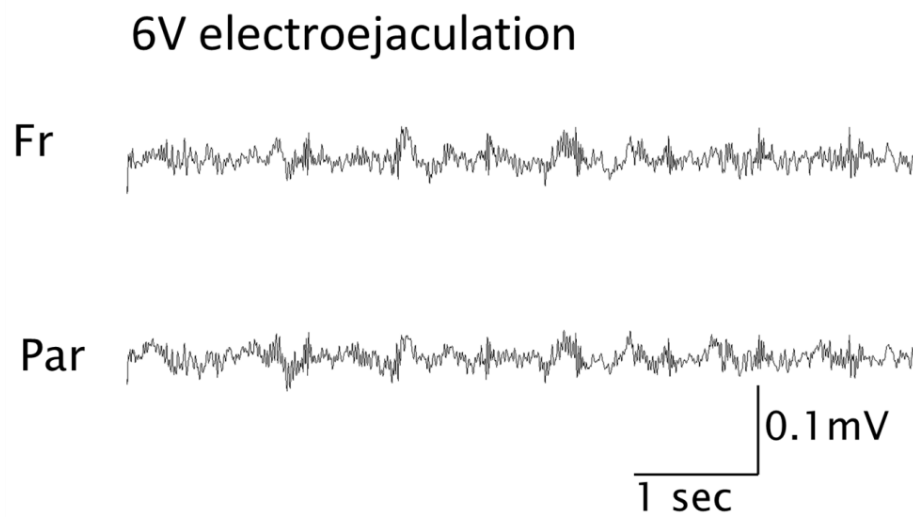
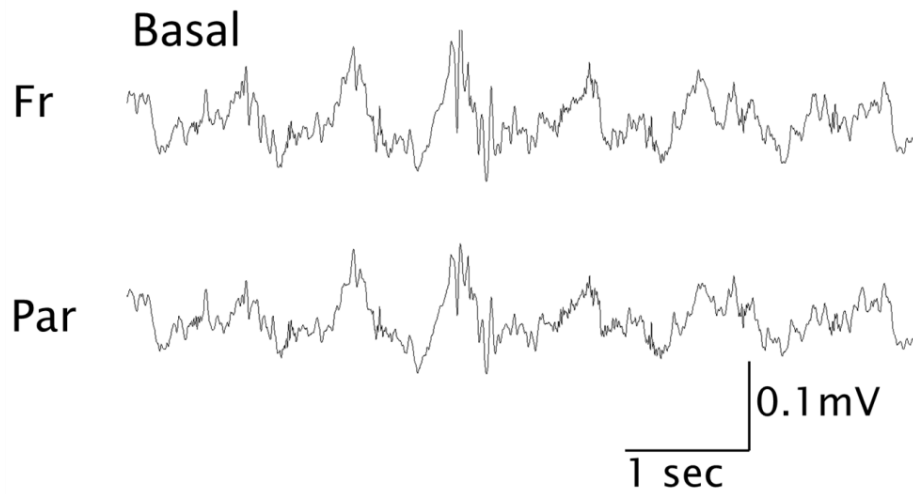
Fr



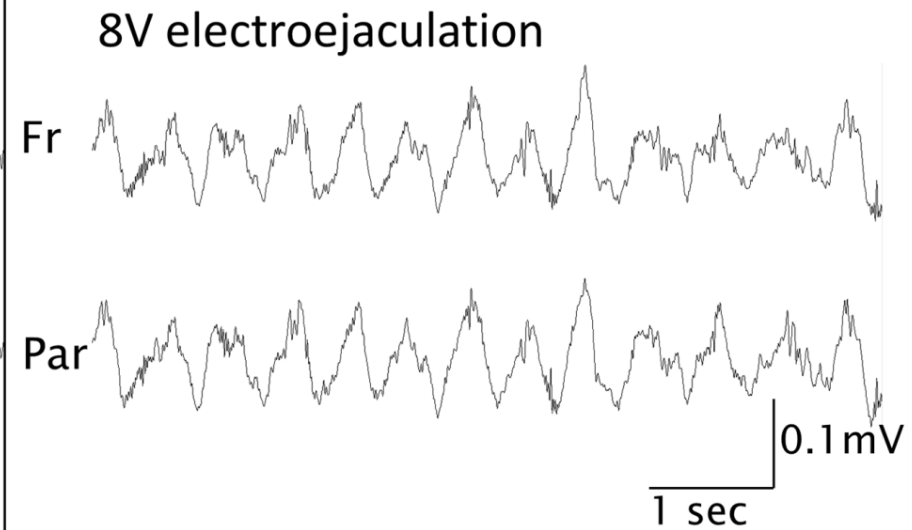
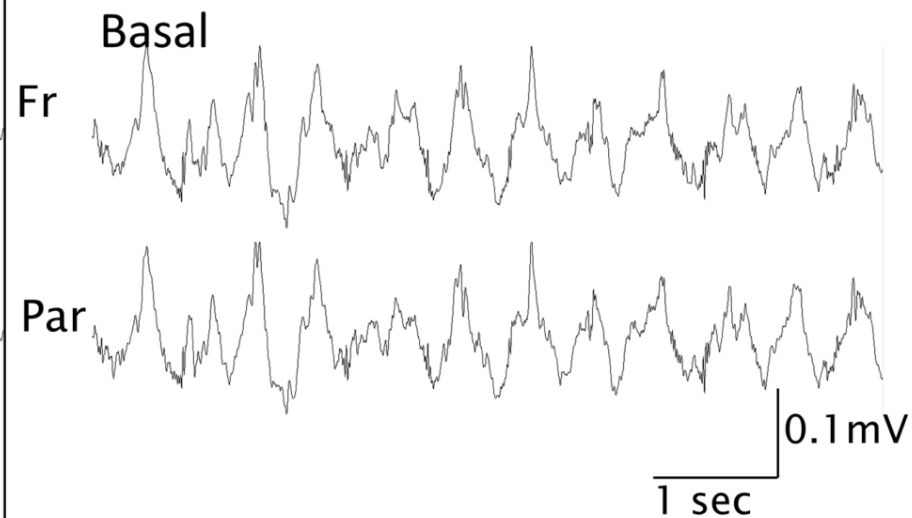
Par



No fentanyl



Fentanyl



Alfa agonistas

Considering this information, the aim of this study was to compare the effectiveness of ketamine/detomidine (KD) or ketamine/xylazine (KX) combinations for semen collection by EE in pampas deer males.

5. Conclusion

Both anesthetic protocols allowed to applied safely the procedures, including capture and semen collection with EE in pampas deer. The use of KX induced less physiological changes, and appears as probably advantageous in semen quality.

Theriogenology Wild 2 (2023) 100033

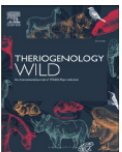


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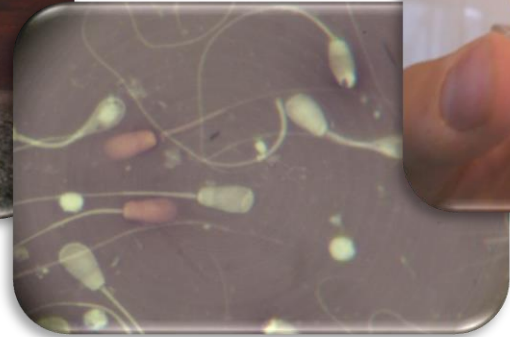
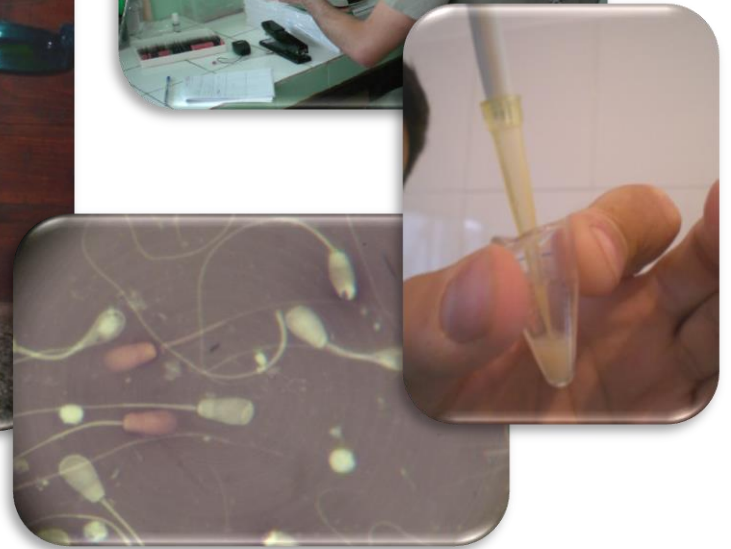
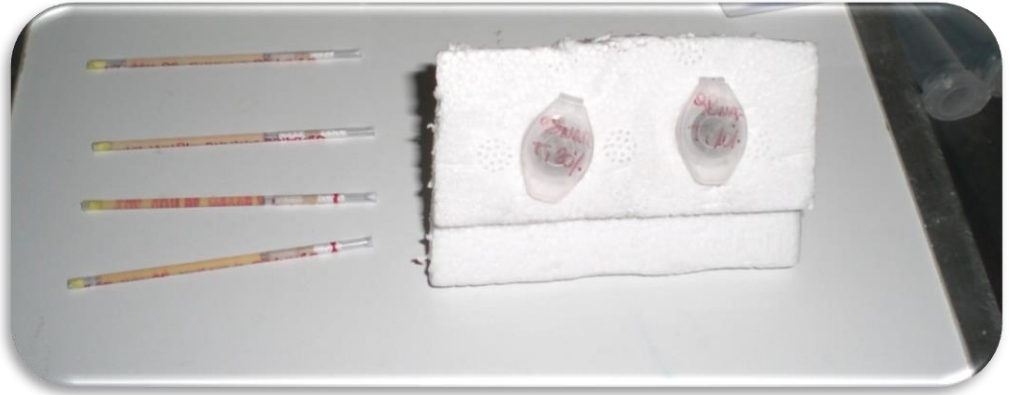
Use of ketamine associated with detomidine or xylazine for semen collection with electroejaculation in pampas deer (*Ozotoceros bezoarticus*)



Fernando Fumagalli^{a,*,1}, Florencia Beracochea^b, Rodolfo Ungerfeld^b

Colección de semen

- Banco de conservación de gametos
- Influencias externas
- Uso de diferentes diluyentes
- Morfometría de espermatozoides
- Ultraestructura de espermatozoides



The semen color varied from transparent, yellow to white, and the average pH was 7.5 ± 0.4 (range 7.0–8.5). The volume of the ejaculate was $413.9 \pm 51.0 \mu\text{l}$ (range: 50–1655 μl), sperm concentration $792.2 \pm 96.2 \times 10^6$ sperm/mL (range: 55.6–1890 $\times 10^6$) and total sperm in the ejaculate (volume \times sperm concentration) $321.2 \pm 55.4 \times 10^6$ (range: 20.1–1324.8 $\times 10^6$).

The motility score was 3.4 ± 0.2 (range: 1.5–5.0), overall motility $69.1 \pm 3.2\%$ (range: 25–90%), and progressive motility $59.4 \pm 3.7\%$ (range: 5–90%). In 78.8% and 39.4% of the samples the motility score was equal or greater than 3 and 4, respectively. There were 93.4% and 63.4% of the samples with at least 50% and 70% overall motility, respectively. The percentage of progressive motility equal or greater than 60%, 70% and 80% were 57.6%, 39.4% and 15.1%, respectively. Mean percentage of sperm with intact membranes of samples evaluated with E–N was $80.2 \pm 6.9\%$ (range: 72–93%) and with the HOS test $90.9 \pm 1.1\%$ (85–96%).

Animal Reproduction Science 149 (2014) 224–230



Contents lists available at ScienceDirect

Animal Reproduction Science

journal homepage: www.elsevier.com/locate/anireprosci



Sperm characterization and identification of sperm sub-populations in ejaculates from pampas deer (*Ozotoceros bezoarticus*)

F. Beracochea^{a,*}, J. Gil^b, A. Sestelo^c, J.J. Garde^d, J. Santiago-Moreno^e, F. Fumagalli^a, R. Ungerfeld^a



Table 3Morphometric descriptors of sperm head sub-population obtained with clusters analysis (mean \pm SEM) (n = 1700 sperm head).

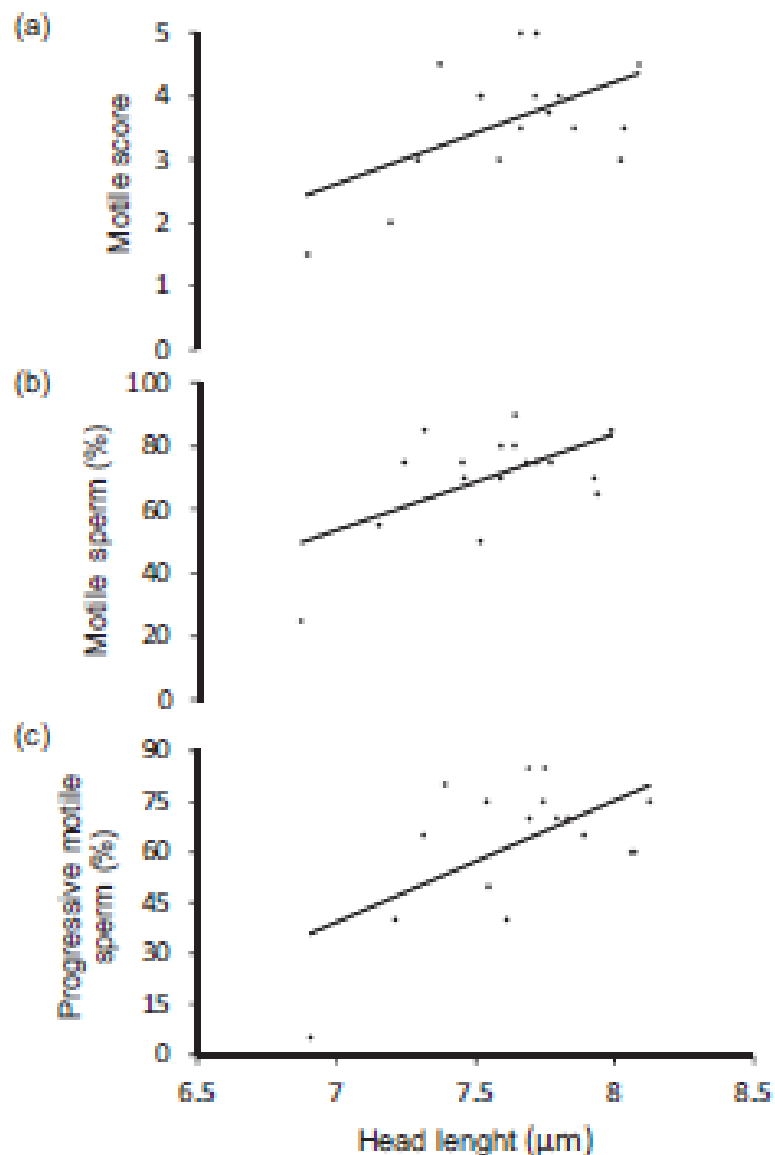
Morphometric descriptors	Sperm sub-population		
	SP1	SP2	SP3
Length (μm)	8.19 \pm 0.03 ^a	7.77 \pm 0.01 ^b	7.24 \pm 0.02 ^c
Width (μm)	4.75 \pm 0.02 ^a	4.44 \pm 0.01 ^b	4.16 \pm 0.01 ^c
Area (μm^2)	32.41 \pm 0.09 ^a	28.86 \pm 0.04 ^b	25.16 \pm 0.06 ^c
Perimeter (μm)	24.07 \pm 0.09 ^a	22.25 \pm 0.03 ^b	20.52 \pm 0.04 ^c
Ellipticity	1.73 \pm 0.01	1.76 \pm 0.007	1.75 \pm 0.008
Rugosity	0.71 \pm 0.004 ^a	0.73 \pm 0.002 ^b	0.75 \pm 0.002 ^c
Elongation	0.26 \pm 0.003	0.27 \pm 0.002	0.27 \pm 0.002
Regularity	0.94 \pm 0.003	0.94 \pm 0.002	0.94 \pm 0.002
p2a	1.43 \pm 0.01 ^a	1.37 \pm 0.004 ^b	1.34 \pm 0.004 ^c
N	309	769	622

Shape value: p2a consider a minimum value of 1.0 for a circle.

Values with different superscripts (a, b, c) in the same row were different.

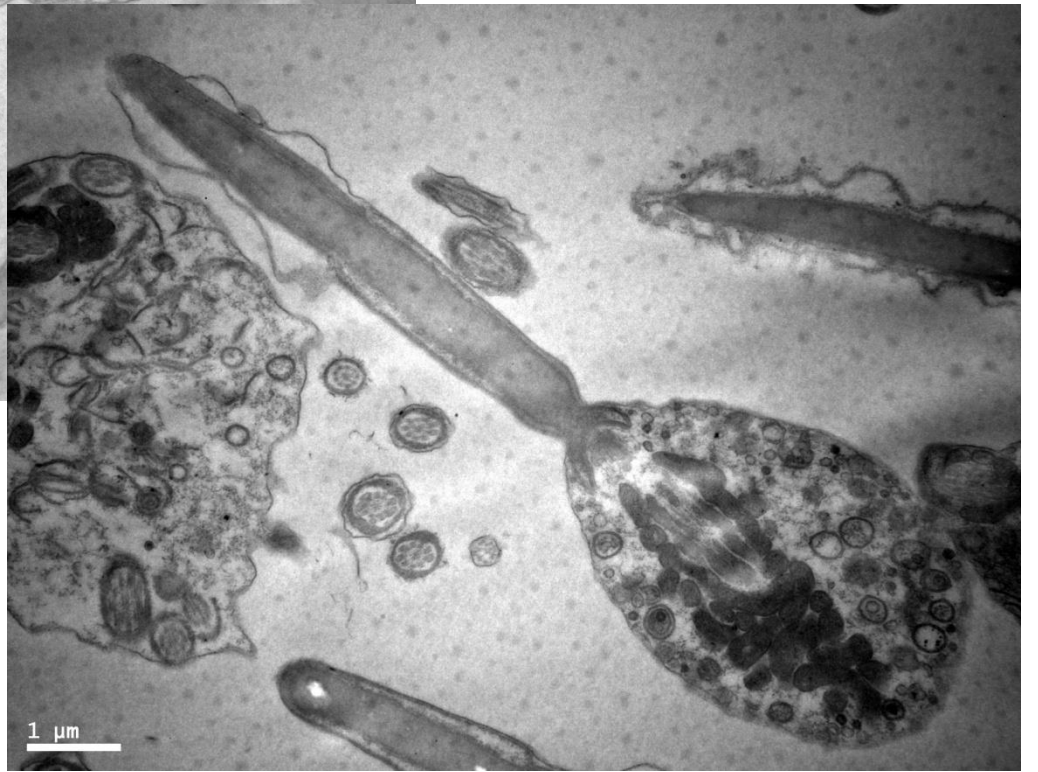
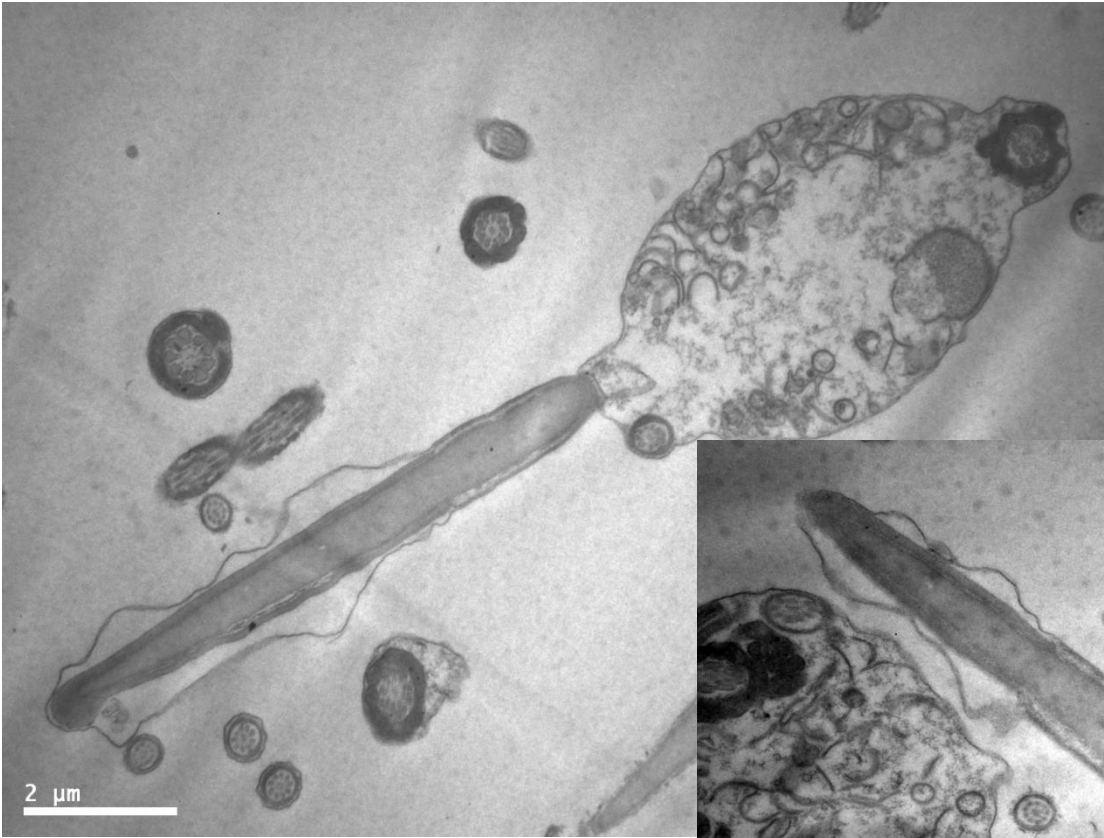
P < 0.001.





a) $R = 0.54$, $P = 0.03$; b) $R = 0.54$, $P = 0.03$; c) $R = 0.53$, $P = 0.03$.

Fig. 1. Positive relationship between (a) motility score, (b) percentage of motile spermatozoa, and (c) percentage of spermatozoa with progressive motility and sperm head length of pampas deer (*Ozotoceros bezoarticus*; $n = 17$ males).



Lateralidad gonadal

TABLE 1 Weight, size and density of right testis and left testis of 12 adult pampas deer males

	Right	Left	<i>p</i>
Adult animals			
Weight (g)	7.07 ± 0.81	6.78 ± 0.81	0.002
Length (cm)	3.71 ± 0.64	3.70 ± 0.60	ns
Thickness (cm)	2.03 ± 0.13	2.00 ± 0.09	ns
Width (cm)	1.27 ± 0.09	1.13 ± 0.09	0.007
Volume (cm ³)	14.5 ± 1.9	13.0 ± 1.6	0.04
Offspring			
Weight (g)	0.112 ± 0.016	0.100 ± 0.014	0.02

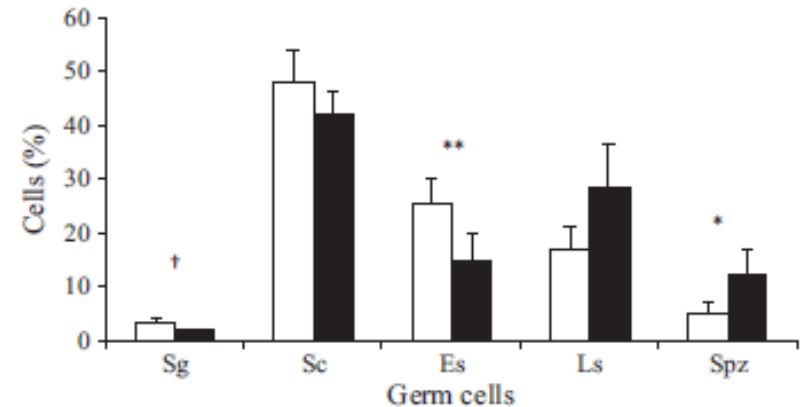


FIGURE 3 Percentage of germ cells of left (white bars) testis and right (black bars) testis from seven pampas deer males (*Ozotoceros bezoarticus*) in samples collected by fine needle aspiration. Germ cells were classified as spermatogonia (Sg), spermatocyte (Sc), early spermatid (Es), late spermatid (Ls) and spermatozoa (Spz). **p* ≤ .05; ***p* ≤ .01; †0.05 < *P* < 1.0

Received: 27 March 2017 | Accepted: 17 August 2017
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ORIGINAL ARTICLE

WILEY ANATOMIA HISTOLOGIA EMBRYOLOGIA

Asymmetrical size and functionality of the pampas deer (*Ozotoceros bezoarticus*) testes: Right testis is bigger but left testis is more efficient in spermatogenesis

Rodolfo Ungerfeld¹ | Matías Villagrán¹ | Lorena Lacuesta¹ | Noelia Vazquez² | William Pérez²

- Estudios no invasivos:

- ⇒ Comportamiento

- Agonístico
 - Cortejo y cópula
 - Marcación
 - Vínculo madre-cría

- ⇒ Anatomía reproductiva

- ⇒ Estacionalidad reproductiva

- ⇒ Estímulos sociales

- Estudios invasivos:

- ⇒ Obtención y preservación de semen

- ⇒ Comunicación química

- ⇒ Estímulos sociales

- ⇒ Estacionalidad reproductiva

Comunicación química



Chemical profile of the cutaneous gland secretions from male pampas deer (*Ozotoceros bezoarticus*)

CARMEN ROSSINI* AND RODOLFO UNGERFELD

- Fuentes de señales:
 - ⇒ Orina
 - ⇒ Heces
 - ⇒ Saliva
 - ⇒ Glándulas cutáneas
- Marcaje:
 - ⇒ Entorno
 - ⇒ Organismo propio o de con-específico



Secreciones cutáneas

1. Glándula preorbital
2. Glándula tarsal
3. Glándula interdigital
4. En torno a las astas

Presentes en ambos sexos

Los machos marcan
activamente

Muestras:

Blancos (grupa, nuca)

Glándulas anteorbitales, tarsales e interdigitales

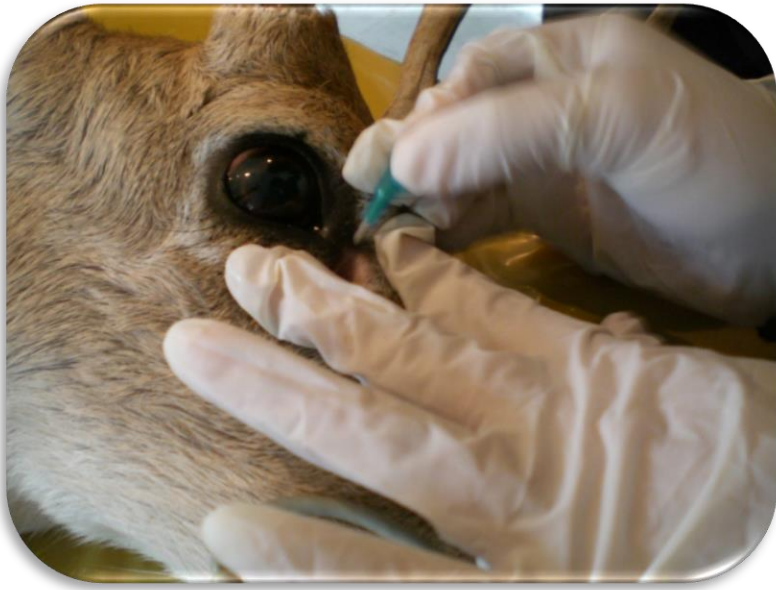
Marcaje

1. Patas frontales
2. Astas
3.

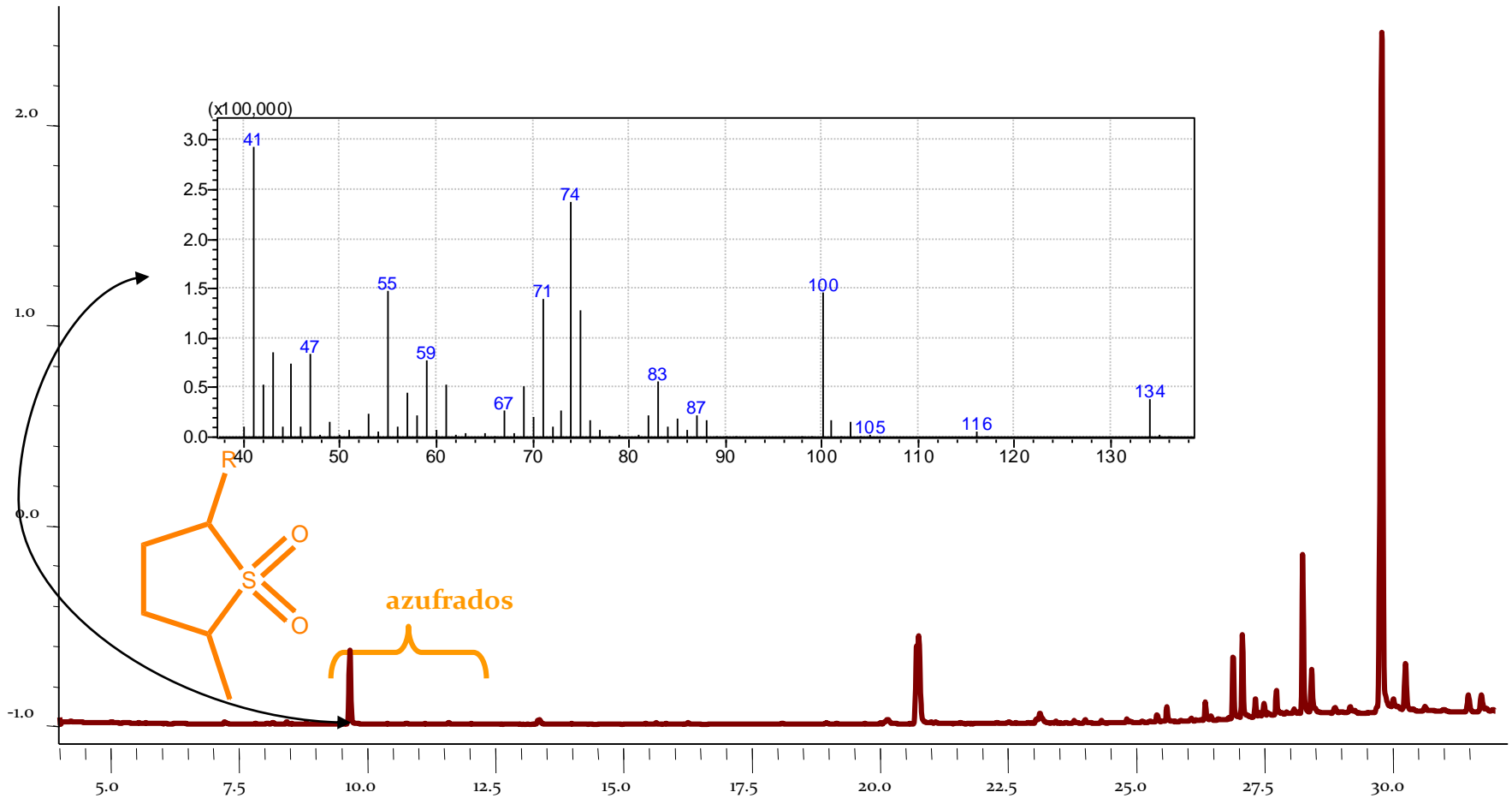
Variaciones estacionales

Análisis:

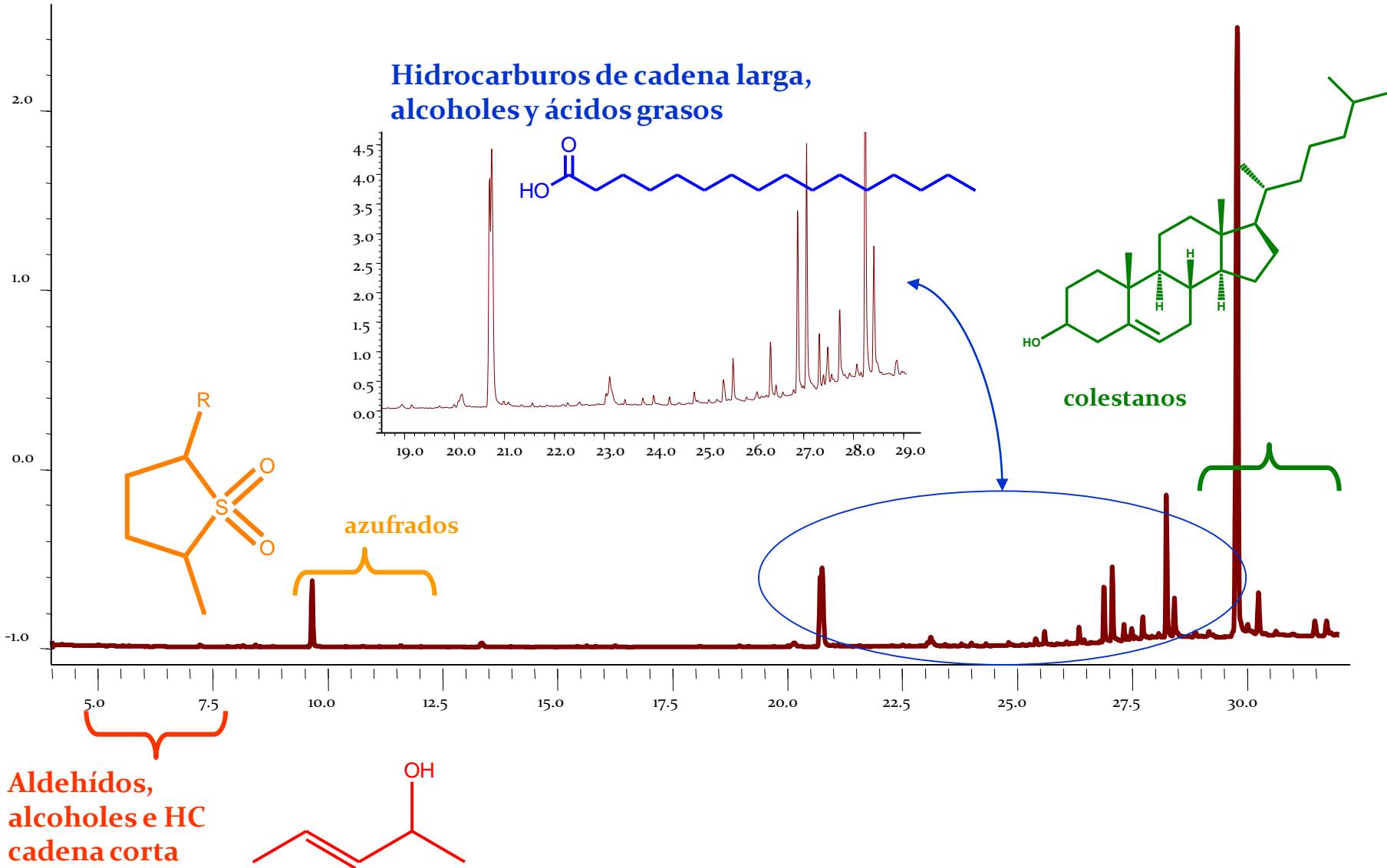
Cromatografía gaseosa acoplada a espectrometría de masas



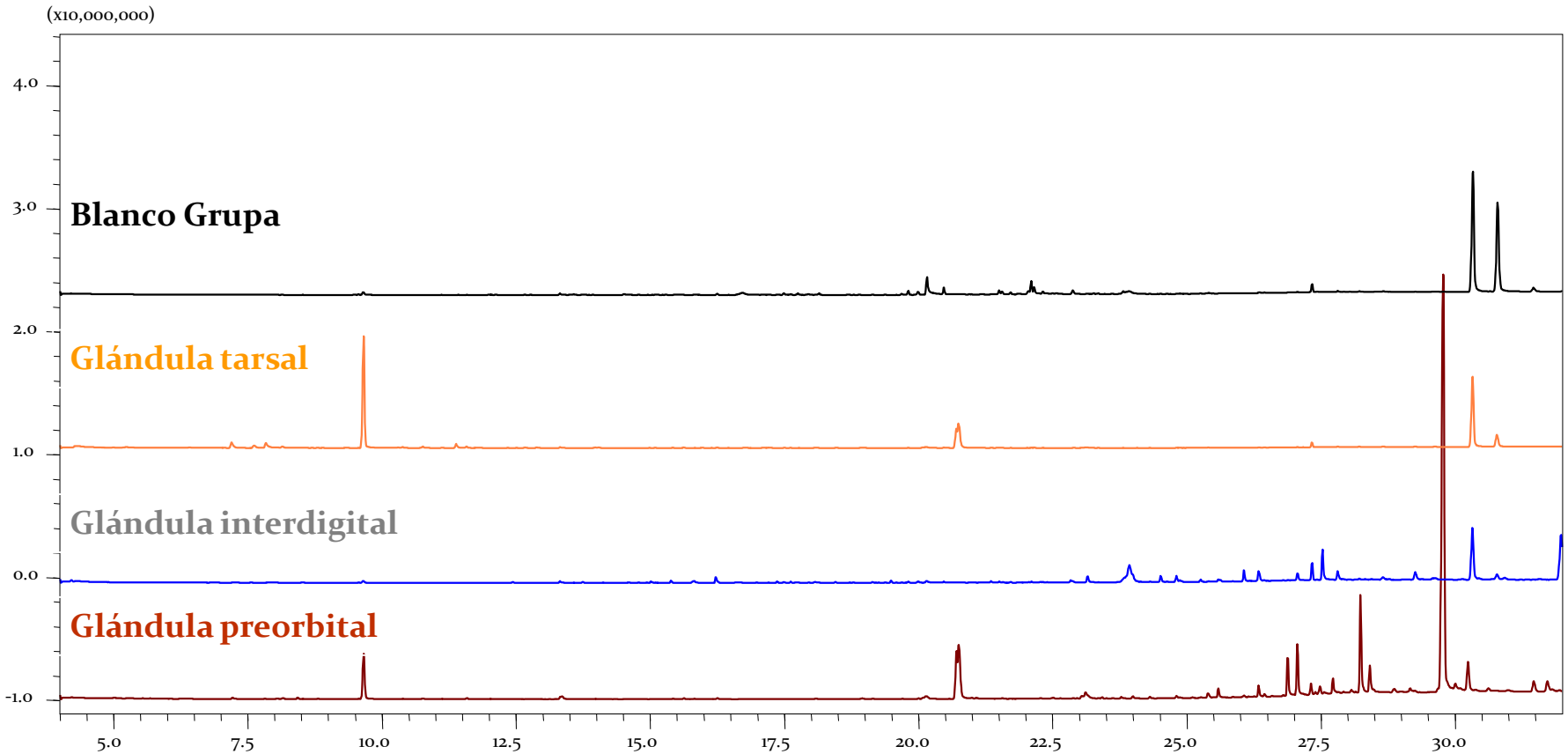
Ejemplo: glándula preorbital



Ejemplo: glándula preorbital

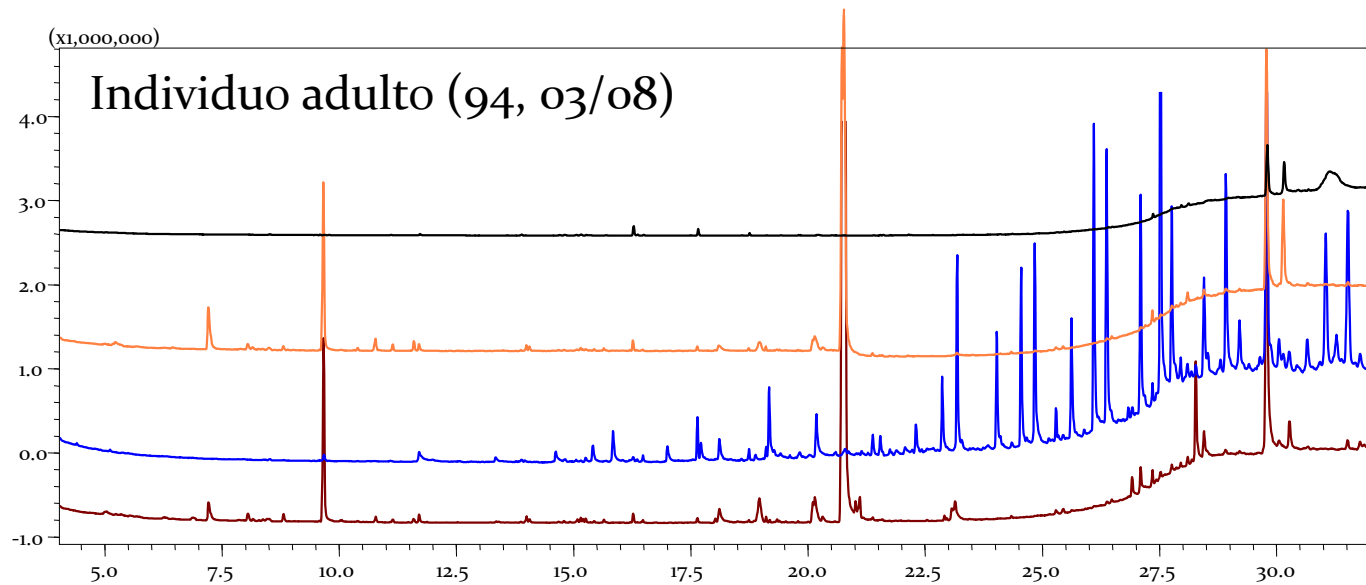
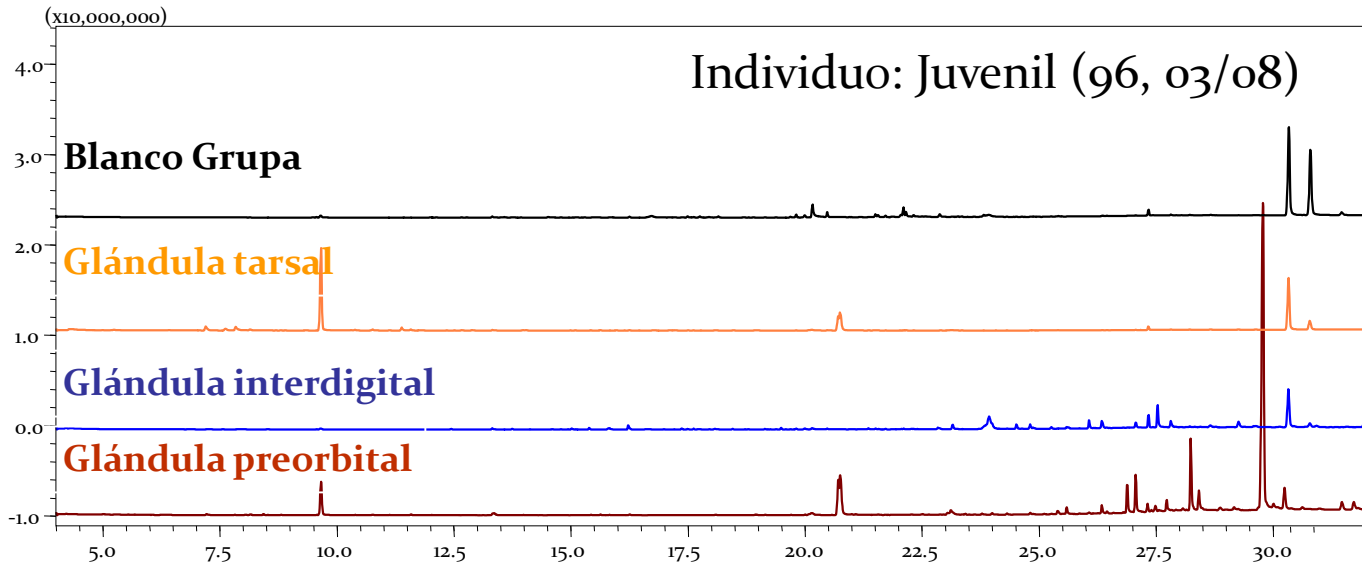


Ejemplo: diferentes glándulas de un mismo individuo

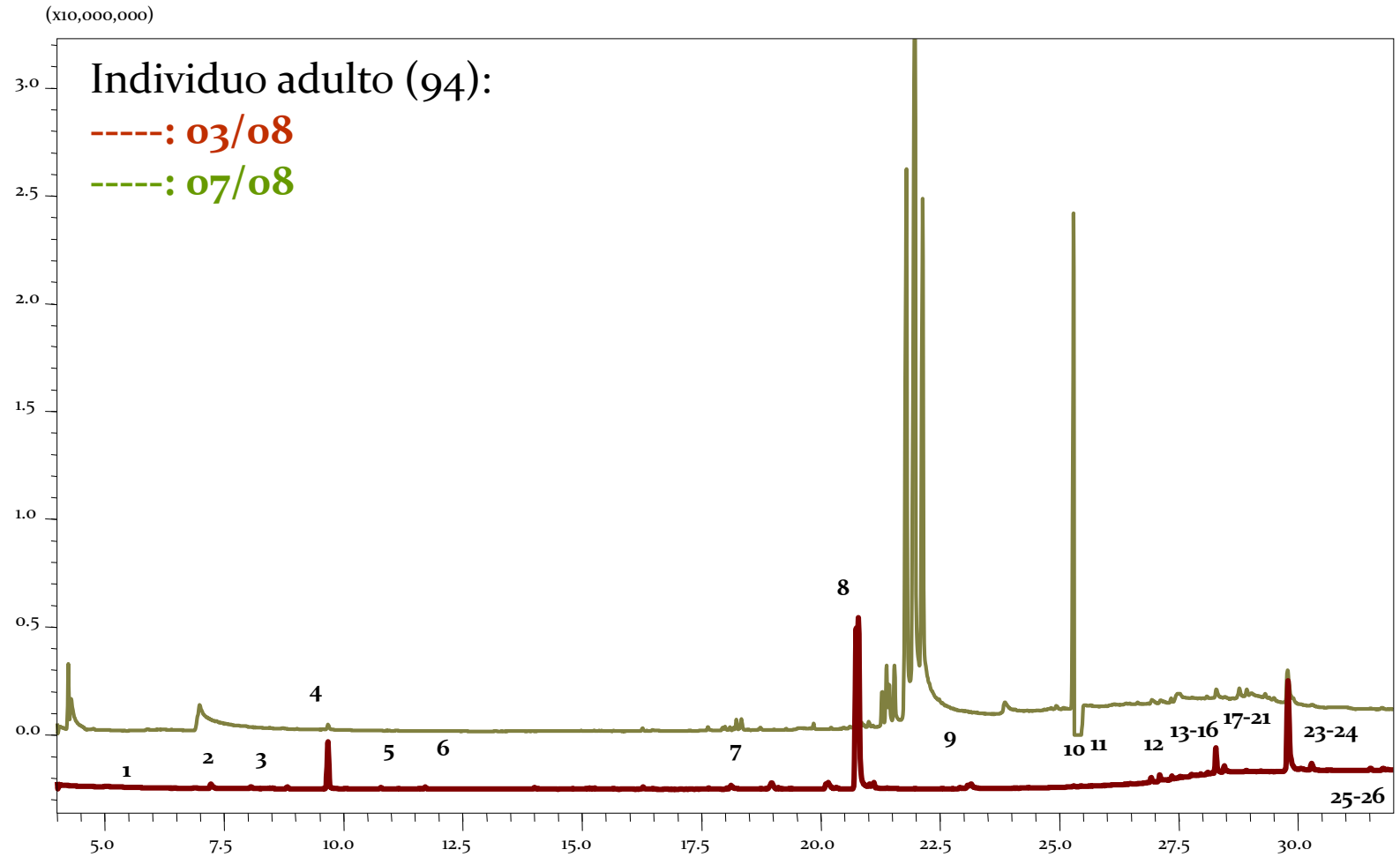


Individuo: Juvenil (96, 03/08)

Ejemplo 2: diferencias entre adultos y juveniles



Ejemplo: diferencias estacionales



- Estudios no invasivos:

- ⇒ Comportamiento

- Agonístico
 - Cortejo y cópula
 - Marcación
 - Vínculo madre-cría

- ⇒ Anatomía reproductiva

- ⇒ Estacionalidad reproductiva

- ⇒ Estímulos sociales

- Estudios invasivos:

- ⇒ Obtención y preservación de semen

- ⇒ Comunicación química

- ⇒ Estímulos sociales

- ⇒ Estacionalidad reproductiva



Permanent contact with females increases testosterone and improves fresh semen traits in pampas deer (*Ozotoceros bezoarticus*) males

M. Villagrán*, R. Ungerfeld

Machos con hembras

Machos sin hembras

• Astas

Caída	Agosto $2,0 \pm 4,4$	Julio $21,8 \pm 3,9$
Peso (g)	$148,7 \pm 7,4$	$121,3 \pm 8,0$
Volumen (cm ³)	$85,8 \pm 5,3$	$68,8 \pm 6,3$

• Semen

Volumen (mL)	$0,55 \pm 0,06$	$0,35 \pm 0,08$
Calidad	$4,0 \pm 0,3$	$3,1 \pm 0,3$
Spz MP (%)	$58,0 \pm 9,0$	$31,4 \pm 6,8$

- Estudios no invasivos:

- ⇒ Comportamiento

- Agonístico
- Cortejo y cópula
- Marcación
- Vínculo madre-cría

- ⇒ Anatomía reproductiva

- ⇒ Estacionalidad reproductiva

- ⇒ Estímulos sociales

- Estudios invasivos:

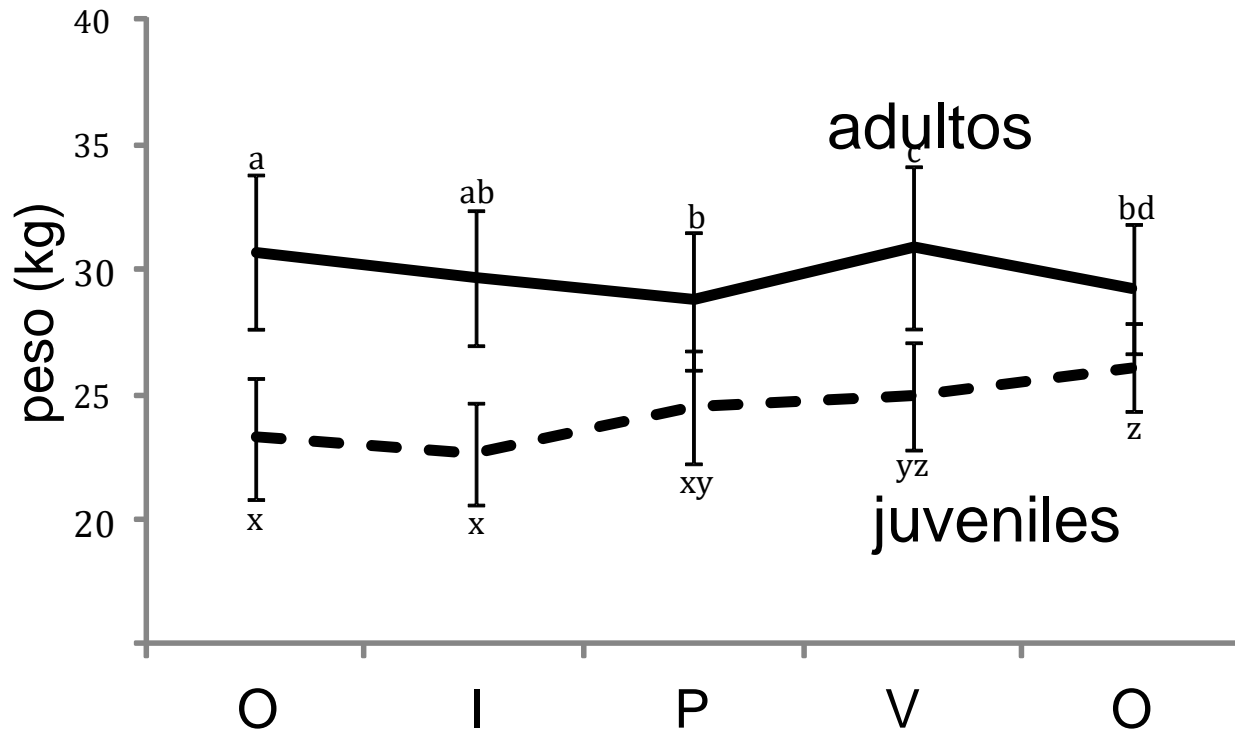
- ⇒ Obtención y preservación de semen

- ⇒ Comunicación química

- ⇒ Estímulos sociales

- ⇒ Estacionalidad reproductiva

Estacionalidad reproductiva: machos

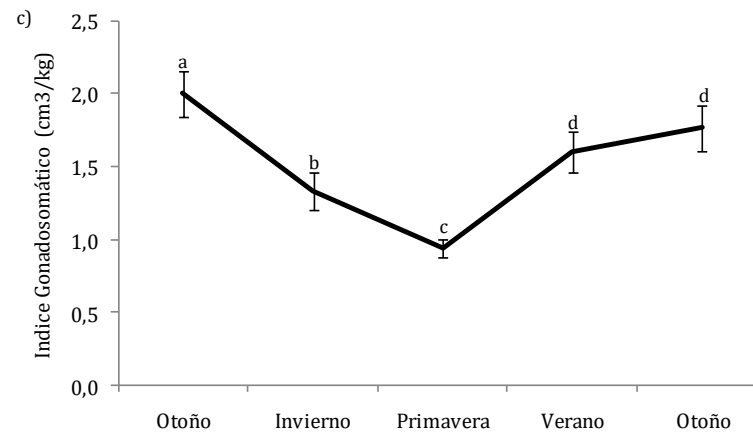
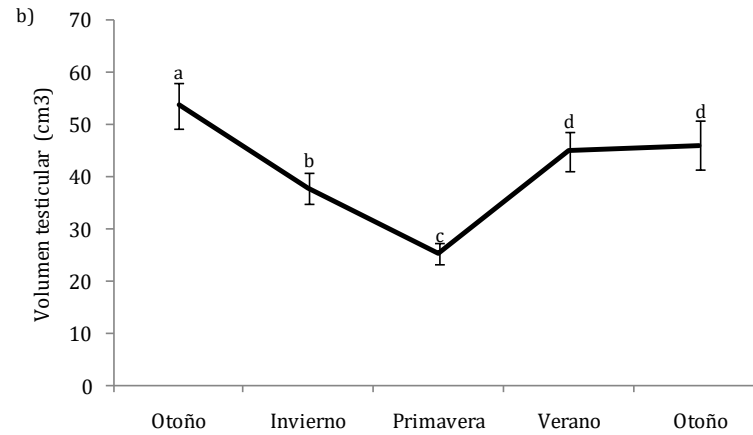
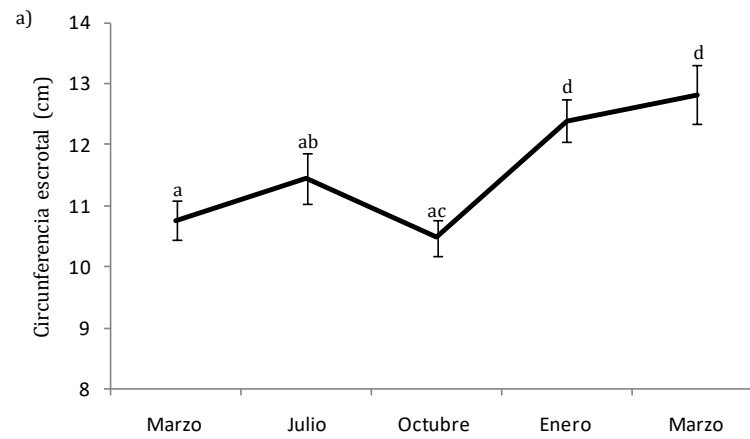


ORIGINAL ARTICLE

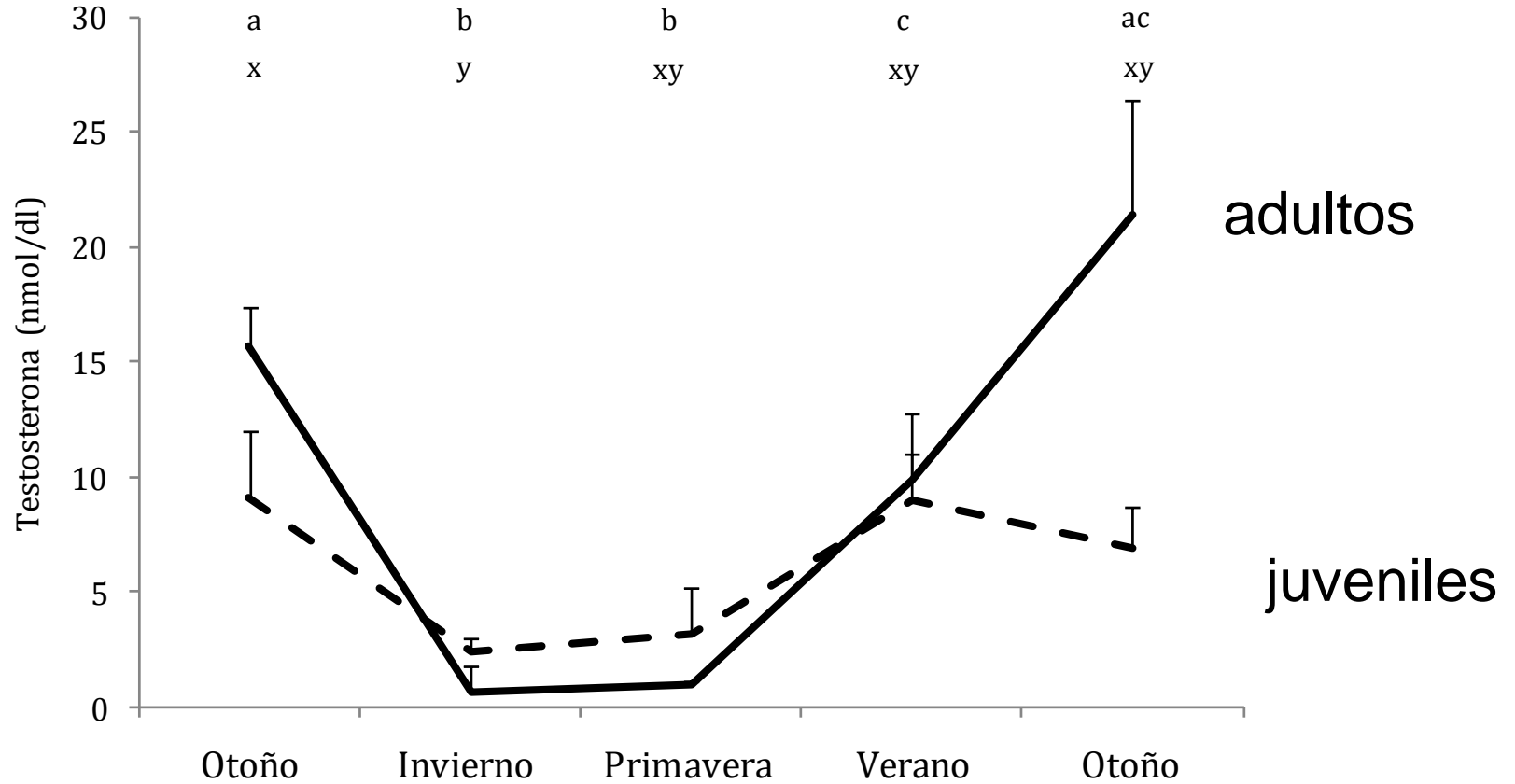
Adult and yearling pampas deer stags (*Ozotoceros bezoarticus*) display mild reproductive seasonal patterns with maximum values in autumn

Rodolfo Ungerfeld^{1*}, Matías Villagrán¹, Jorge Gil-Laureiro², Adrián Sestelo³,
Florencia Beracochea¹, Fernando Fumagalli⁴, Alejandro Bielli¹

Tamaño testicular



Testosterona sérica



Características seminales

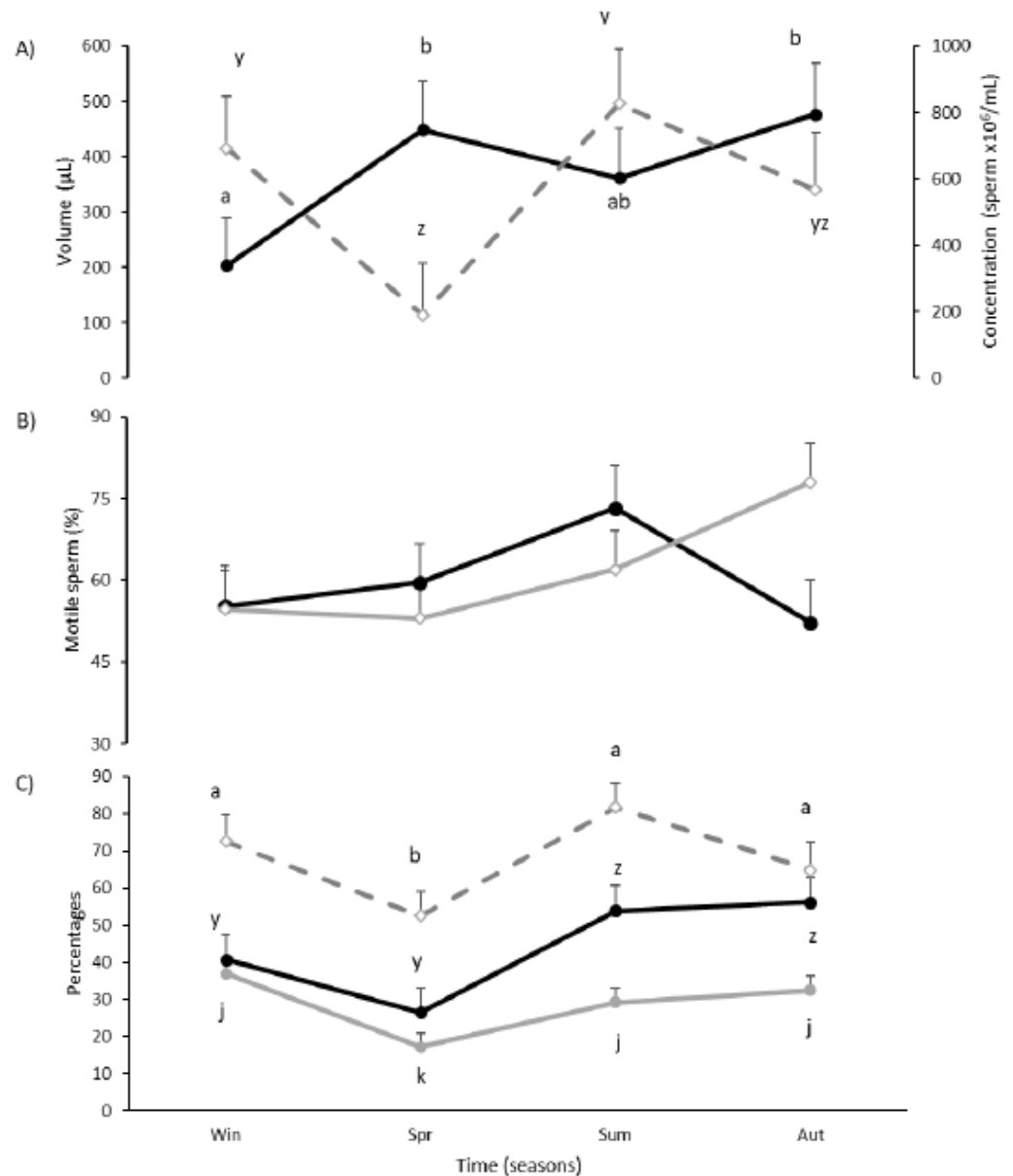


Figure 2. Semen characteristics in pampas deer (*Ozotoceros bezoarticus*) males during different seasons in Uruguay (SH): (A) semen volume (—●—) and concentration (—◇—); (B) percentage of motile sperm in adult (—●—) and yearling (—◇—) males; (C) percentages of alive sperm (—◇—), motile sperm (—●—), and morphological normal sperm (—●—). Different letters indicate significant differences in time (P < 0.05) for each line of the graphic.



Facultad de Veterinaria



- Unidad A. Fisiología
- Unidad A. Anatomía
- Unidad A. Histología
- Unidad A. Bioquímica
- Unidad A. Semiología
- Unidad A. Reproducción
- Laboratorio de Análisis Clínicos
- Unidad A. Inmunología
- Unidad A. Parasitología

Instituciones involucradas

- Facultad de Veterinaria
- Facultad de Química
- Facultad de Medicina
- Facultad de Ciencias
- Zoológico de Bs As-Fundación Bioandina, Argentina
- Facultad de Veterinaria de la UNLP, Argentina
- Área de Producción Animal, UCLM, España
- University of Life Sciences, Praga, República Checa
- Universidad de Zurich, Suiza

Uruguay

Investigadores

- Alejandro Bielli
- William Pérez
- Carmen Rossini
- Juan Pablo Damián
- Pedro Martino
- Daniel Olazabal
- Rodrigo Puentes

Estudiantes

- Matías Villagrán
- Fernando Fumagalli
- Tatiana Morales
- Florencia Beracochea
- Solana González
- Lucía Delbene
- Leticia de la Fuente
- Marcela Canabal
- Estefanía Mesa
- Helen Viotti

Exterior

Investigadores

- George Bubenik
- Mark Clauss
- Julián Garde
- César Savignone
- Adrián Sestelo
- Julián Santiago-Moreno
- Francisco Ceacero

Estudiantes

- Belén Ceballos
- Natalie Citón
- Miguel Coloma
- Aline Freitas de Melo
- Bruno Lunardeli
- Eloisa Carla Bach
- Flavia Franchini



muchas
gracias