ESTADÍSTICA PARA CIENCIAS AMBIENTALES

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ERROR ESTÁNDAR

Conceptos transversales de la Estadística:

Entidades: Unidades de cualquier naturaleza que nos interesa aislar de un entorno.

Variables: Característica evaluadas a las entidades.

Población: Agrupación de entidades aisladas respecto a otras agrupaciones.

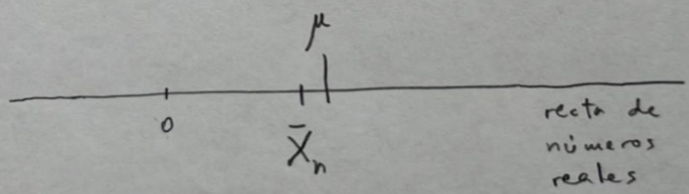
Muestra: Una parte de una población, seleccionada mediante un método que tenga como objetivo la representatividad del todo a partir de esa parte.

Matriz de datos:

Zona	Biomasa Fitoplancton	Biomasa Zooplanct on	Fósforo	Nitrógeno	Diversidad	Presencia especie A
1	34	32,2	36,7	33,7	1,8	1
1	34,4	34,1	46,4	37,3	1,9	1
1	35,2	34,5	46,5	36,6	2,7	1
1	44,6	43,6	45,1	47,4	2,3	1
1	45,6	44,6	48,2	44,9	2,3	0
1	46,1	44,1	65,7	46,4	2,7	0
1	46,6	46,3	57,9	53,9	2,6	0
1	39,8	37,7	52,3	40,1	2,2	1
1	40,3	38,6	48	47,7	2	0
1	41,3	38,8	60,3	45,2	2,1	1
1	42,2	40,8	58,3	47,2	2,3	1
1	42,8	40,8	53,5	41,5	2,4	1
1	43,3	40,9	43,4	47,7	2,6	0
1	43,7	41,2	45,5	43,2	2,6	0
1	43,8	43,4	44,2	48	2,7	1
1	44,6	41,9	47,8	44,4	2,5	1
1	45,6	42,8	53,9	52,2	2,4	1
1	46,1	43,6	46,3	45,8	3,3	1
1	46,6	43,6	54,7	53	3	1
1	47,1	44,4	53,5	44,9	2,8	1
2	47,9	46,5	50,7	54,1	3,3	1
2	47,9	45,4	51,7	49,2	3,2	0
2	48,4	46,7	64,3	54,5	2,8	0
2	52,5	49,9	69,9	56,7	3,6	0
2	53	50,7	57,2	57,2	3,4	0
2	53	52,5	65,3	61,7	3,6	1
2	53,5	51,8	66,7	52,8	3,5	1
2	53,9	51,1	61,3	60,4	3,5	1
2	54,7	52,9	56,3	59	2,8	1
2	51,5	50,2	58	55	3,5	1
2	52,3	51,6	61,4	58,2	3,1	0
2	52,5	52	72	57,2	2,7	0
2	53	52,3	69,8	61,2	3,4	0
2	53	51,1	53,1	59,2	2,7	1
2	55,6	53,1	61,7	60,1	3,4	1
2	53,9	51,5	54	56,6	2,8	1
2	54,7	53	67,8	58,5	3,1	1
2	55,1	52,9	75,2	62,4	3,4	1
2	55,6	54,2	59,2	61,9	3,5	0
2	56	54,2	60,1	61,7	2,8	0

Media

Media: poblacional μ; muestral $\bar{X}_n$



μ es fijo pero desconocido

$\bar{X}_n$ es conocido pero variable

Muestra: $(X_1, X_2, \ldots, X_n)$

$$\bar{X}_n = \frac{X_1 + X_2 + \cdots + X_n}{n}$$

Población: $(X_1, X_2, \ldots, X_N)$

$$\mu = \frac{X_1 + X_2 + \cdots + X_N}{N}$$

Mediana

Es el valor que separa la muestra, previamente ordenada, en dos mitades.

Ejemplo (si n es impar):

(3, 5, 1, 7, 6) Muestra

(1, 3, 5, 6, 7) Muestra ordenada de menor a mayor

50% 50%

Ejemplo (si n es par):

(3, 5, 1, 7, 6, 10) Muestra

(1, 3, 5, 6, 7, 10) Muestra ordenada

50% 50%

Se hace el promedio de los dos valores:

$$\frac{5+6}{2} = 5,5$$

Comparación Media / Mediana:

$(1, 3, 5, 7, 9)$

$$\text{Media} = \frac{1+3+5+7+9}{5} = 5$$

$\text{Mediana} = 5$

$(1, 3, 5, 7, 34)$

$$\text{Media} = \frac{1+3+5+7+34}{5} = 10$$

$\text{Mediana} = 5$

Primer cuartil

Cálculo equivalente al de la Mediana pero separando dos fragmentos: uno del 25% de valores y otro del 75%.

Ejemplos:

$(3, 1, 5, 9)$ Muestra

$(1, 3, 5, 9)$ Muestra ordenada

25% 75%

Primer cuartil $= \frac{1+3}{2} = 2$

$(3, 1, 5, 9, 7)$ Muestra

$(1, 3, 5, 7, 9)$ Muestra ordenada

25% 75%

Primer cuartil $= 3$

Tercer cuartil

Como el primer cuartil pero dejando a la izquierda el 75% de valores y a la derecha el 25% de valores.

Ejemplos:

(3, 1, 5, 9) Muestra

(1, 3, 5, 9) Muestra ordenada

75% 25%

Tercer cuartil $= \frac{5+9}{2} = 7$

(3, 1, 5, 9, 7) Muestra

(1, 3, 5, 7, 9) Muestra ordenada

75% 25%

Tercer cuartil = 7

Rango intercuartílico

Valor del Tercer cuartil menos el valor del primer cuartil.

Ejemplo :

(3, 1, 5, 9) Muestra

(1, 3, 5, 9) Muestra ordenada

Primer cuartil = 2 Tercer cuartil = 7

$Q1$ $Q3$

$IQR = Q3 - Q1 = 7 - 2 = 5$

Mínimo, Máximo y Rango

Valor más grande de la muestra menos el valor más pequeño.

Ejemplo:

$(3, 1, 5, 9)$

Rango $= 9 - 1 = 8$

$(1, 0, 7, 15, 6, 2)$

Rango $= 15 - 0 = 15$

Box-Plot

Box-Plot: Gráfico que resume muchos de los números vistos hasta ahora:

Ejemplo:

(1, 3, 5, 11)

Mínimo = 1

Máximo = 11

Rango = 10

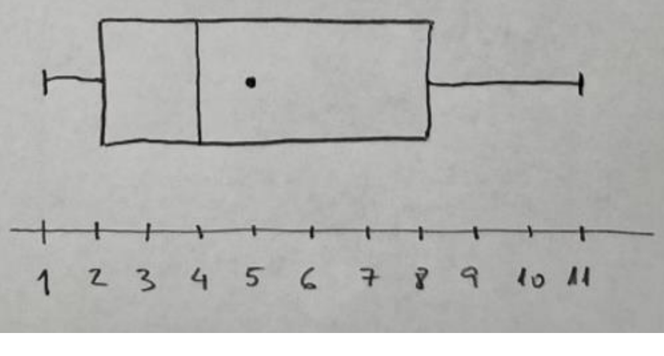
Media = 5

Mediana = 4

Primer cuartil = 2

Tercer cuartil = 8

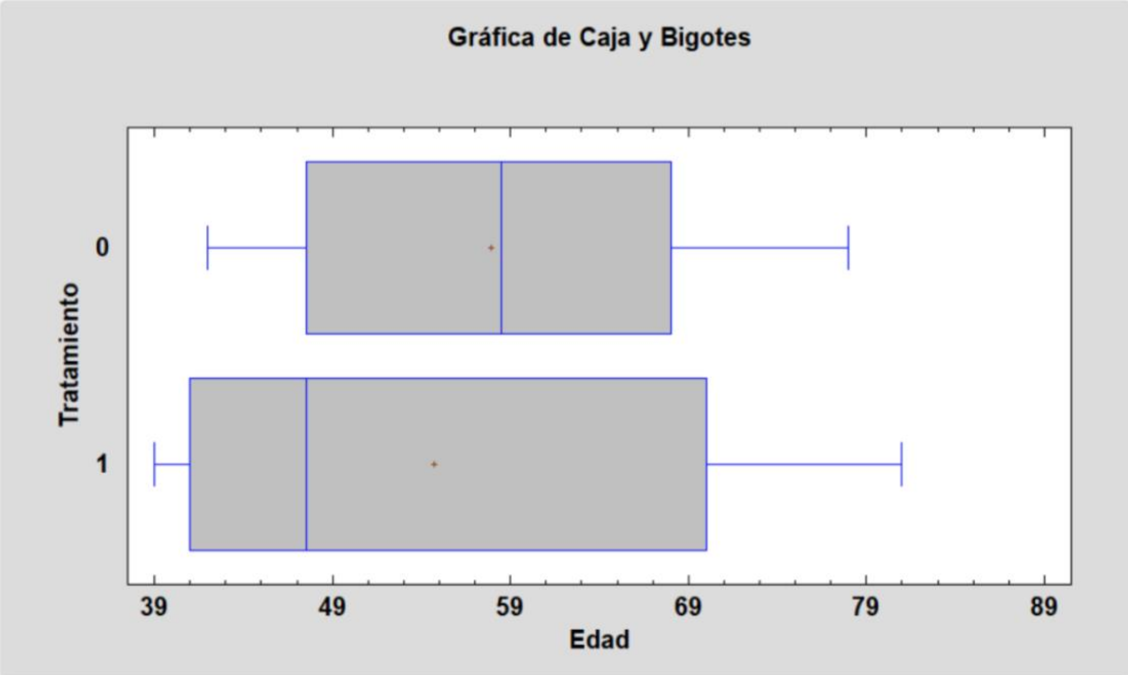
Rango intercuartílico (IQR) = 6



Estadísticas de Resumen
Datos/Variable: Edad

				Desviación			
Tratamiento	*Recuento*	*Promedio*	*Mediana*	*Estándar*	*Mínimo*	*Máximo*	*Rango*
0	20	57,9	58,5	11,8628	42,0	78,0	36,0
1	20	54,75	47,5	15,3584	39,0	81,0	42,0
Total	40	56,325	54,0	13,6389	39,0	81,0	42,0

	Cuartil	*Cuartil*
Tratamiento	*Inferior*	*Superior*
0	47,5	68,0
1	41,0	70,0
Total	44,0	69,0



Desviación estándar

Desviación estándar = Desviación típica

Error estándar

DE : Una medida de la dispersión de una variable.

(4, 4.5, 5, 5.5, 6) DE ↓

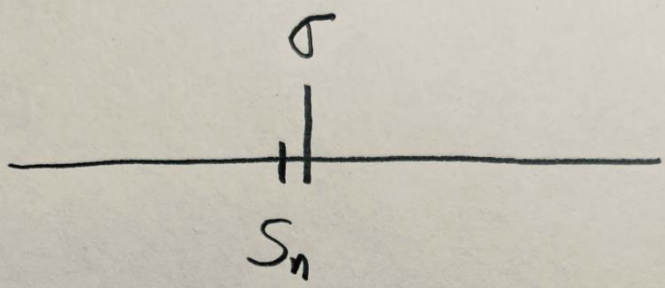
(3, 4, 5, 6, 7) DE ↑

(1, 3, 5, 7, 9) DE ↑↑

(5, 5, 5, 5, 5) DE = 0

S_n : Símbolo típico de la DE

Cálculo Desviación estándar			
Muestra	Resta de la media	Cuadrado	
0	-5	25	
5	0	0	
5	0	0	
10	5	25	
Media	Media	Media	Raíz cuadrada
5	0	12,5	3,54
Muestra	Resta de la media	Cuadrado	
3	-2	4	
5	0	0	
5	0	0	
7	2	4	
Media	Media	Media	Raíz cuadrada
5	0	2	1,41



S_n : Desviación estándar muestral

σ : Desviación estándar poblacional

$\bar{X}_n \pm S_n$

El gran problema de la Desviación estándar es su interpretación.

Pe :

Edad :

60 ± 10

60 ± 1

60 ± 80

Tabla 1. Lista de especies y familias de la Clase Gastropoda con potencial económico asociada al sustrato intermareal rocoso en la región marina prioritaria 32, Guerrero, México. Tallas en largo y ancho / List of species and families of the Class Gastropoda with economic potential associated with intertidal rocky substrate in the marine region priority 32, Guerrero Mexico. Sizes in length and width

	N	Largo (mm)			
		Mín.	Máx.	Avg	Ds
FISSURELLIDAE Fleming, 1822					
Diodora inaequalis (Sowerby, 1835)	33	5,10	25,56	16,78	4,96
LOTTIIDAE Gray, 1840					
Lottia pediculus (Philippi, 1846)	19,9	1,59	27,22	8,29	6,87
Lottia mesoleuca (Menke, 1851)	158	1,56	30,51	15,74	5,57
Tectura fascicularis (Menke, 1851)	584	0,84	30,04	12,68	7,51
TROCHIDAE Rafinesque, 1815					
Tegula (Agathistoma)globulus (Carpenter, 1857)*	1128	3,15	9,72	5,75	2,03
NERITIDAE Rafinesque, 1815					
Nerita (Cymostyla) scabricosta Lamarck, 1822*	26	6,90	17,64	9,86	3,17
Nerita (Theliostyla) funiculata Menke, 1851*	98	3,03	12,35	7,34	2,11
LITTORINIDAE Children, 1834					
Nodilittorina (Nodilittorina) aspera (Philippi, 1846)*	205	1,90	35,10	5,88	3,77
Nodilittorina (Fossarilittorina) modesta (Philippi, 1846)*	109	1,50	15,40	7,31	3,84
RISSOIDAE Gray, 1847					
Rissoina (Rissoina) stricta Menke, 1850*	66	4,63	9,05	6,64	0,72
PLANAXIDAE Lamarck, 1822					
Planaxis obsoletus Menke, 1851*	154	3,68	16,37	10,00	3,04
HIPPONICIDAE Troschel, 1861					
Hipponix delicatus Dall, 1908*	19	2,36	14,09	9,39	3,42
CALYPTRAEIDAE Lamarck, 1809					
Crepidula aculeata (Gmelin, 1791)*	96	2,57	27,32	18,04	5,30
Crepidula incurva (Broderip, 1834)*	50	3,18	16,43	7,31	3,02
Crucibulum (Crucibulum) umbrela (Deshayes, 1830)	230	8,39	57,30	35,51	12,36
Crucibulum (Crucibulum) scutellatum (Wood, 1928)	32	4,30	43,06	16,95	11,37
CYPRAEIDAE Rafinesque, 1815					
Macrocypraea cervinetta (Kiener, 1843)	20	4,51	84,48	35,76	24,61
Mauritia arabicula Lamarck, 1810	44	10,87	31,27	23,04	4,41
OVULIDAE Fleming, 1822					
Jenneria pustulata [Lightfoot, 1786]	24	10,10	18,91	14,48	2,66
MURICIDAE FollowsVokes, 1996					
Mancinella speciosa (Valenciennes, 1832)	228	3,50	28,88	16,37	5,16
Mancinella triangularis (Blainville, 1832)	1117	3,19	18,96	9,90	2,46
Muricopsis (Muricopsis) zeteki Hertlein & Strong 1951*	70	7,73	26,64	16,32	3,43
Plicopurpura pansa (Gould, 1853)	293	3,67	34,53	18,51	4,30
Stramonita biserialis (Blainville, 1832)	749	3,88	50,56	12,45	5,85
Trachypollia lugubris (C.B. Adams, 1852)*	385	2,73	25,88	14,19	4,39
BUCCINIDAE Rafinesque, 1815					
Cantharus (Pollia) sanguinolentus (Duclos, 1833)*	72	10,17	27,58	19,94	3,52
Engina tabogaensis Bartsch, 1931*	131	4,43	14,71	10,35	2,15
COLUMBELLIDAE Swainson, 1840					
Columbella fuscata Sowerby, 1832*	679	4,89	22,84	14,82	4,03
Columbella major Sowerby, 1832*	72	7,65	30,30	21,07	4,20
Columbella sonsonatensis (Mörch,1860)*	27	3,73	26,14	13,17	7,04
Cosmioconcha palmeri (Dall, 1913)*	32	6,71	10,99	8,75	1,11
Costoanachis nigrofusca (Carpenter, 1857)*	643	2,68	23,53	7,08	1,59
Mitrella ocellata (Gmelin, 1791)*	732	3,32	22	10,61	1,43
Mitrella xenia (Dall, 1919)*	190	1,69	25,49	8,35	1,98
FASCIOLARIIDAE Gray, 1853					
Leucozonia cerata (Wood, 1828)	98	5,42	69,13	24,07	11,32
Opeatostoma pseudodon (Burrow, 1815)	65	12,33	45,57	24,12	6,25
MITRIDAE Swainson, 1829					
Mitra (Strigatella) tristis Broderip, 1836*	53	3,51	16,2	9,7	2,94
CONIDAE Fleming, 1822					
Conux nux (Broderip, 1833)	39	9,51	24,03	16,56	4,17
SIPHONARIIDAE Gray, 1827					
Siphonaria (Heterosiphonaria) maura Sowerby, 1835*	791	1,33	19,52	8,13	3,25
Siphonaria (Heterosiphonaria) palmata Carpenter, 1857*	387	1,14	16,08	7,3	2,87

Table 1. Median and IQR of concentrations in nutrients, suspended sediments, and DOC in Manton Creek for each of the four seasons. All values are in mg L^{-1}.

	Total phosphorous	Nitrogen (NO_x-N)	Suspended sediments	DOC
	(IQR) [*n*]	(IQR) [*n*]	(IQR) [*n*]	(IQR) [*n*]
Early storms	0.01	0.004	4.5	5.16
	(0.01–0.02) [43]	(0.002–0.006) [120]	(2–21) [36]	(3.55–6.29) [7]
Wet season	0.005	0.004	4	2.94
	(0.002–0.01) [127]	(0.002–0.006) [341]	(3–5) [110]	(2.24–5.14) [24]
Recession	0.005	0.006	3	1.60
	(0.003–0.007) [26]	(0.003–0.092) [72]	(2–4) [22]	(1.23–2.23) [9]
Dry season	0.01	0.002	3.5	2.52
	(0.007–0.02) [13]	(0.002–0.006) [38]	(2.25–4) [10]	(2.04–4.01) [16]

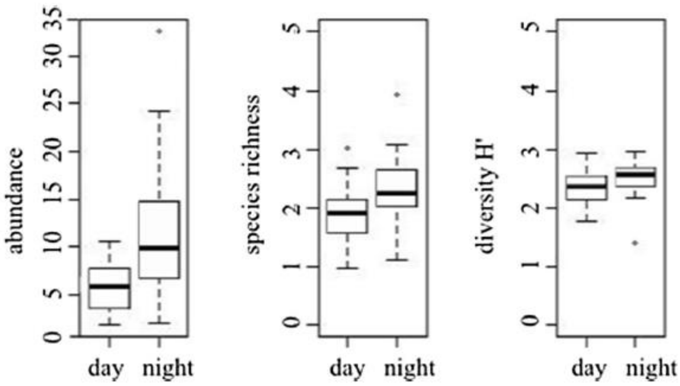


Fig. 10 Box plots representing ranges of mean density ($N/10^4$ m^3), species richness (number of species/taxa), and diversity (Shannon–Wiener Index H') of stations separated into day and night stations. The central box indicates the interquartile range. Significance levels according to Tukey's HSD post-hoc test (** $p < 0.05$ mean density, *** $p < 0.001$ species richness)

Tabla 1. Estadística descriptiva de los parámetros biológicos, índice de condición corporal (Kn) y de la concentración de los metales pesados analizados. Se indica el número de individuos analizados (n), media, mediana, rango y desviación estándar (DE).

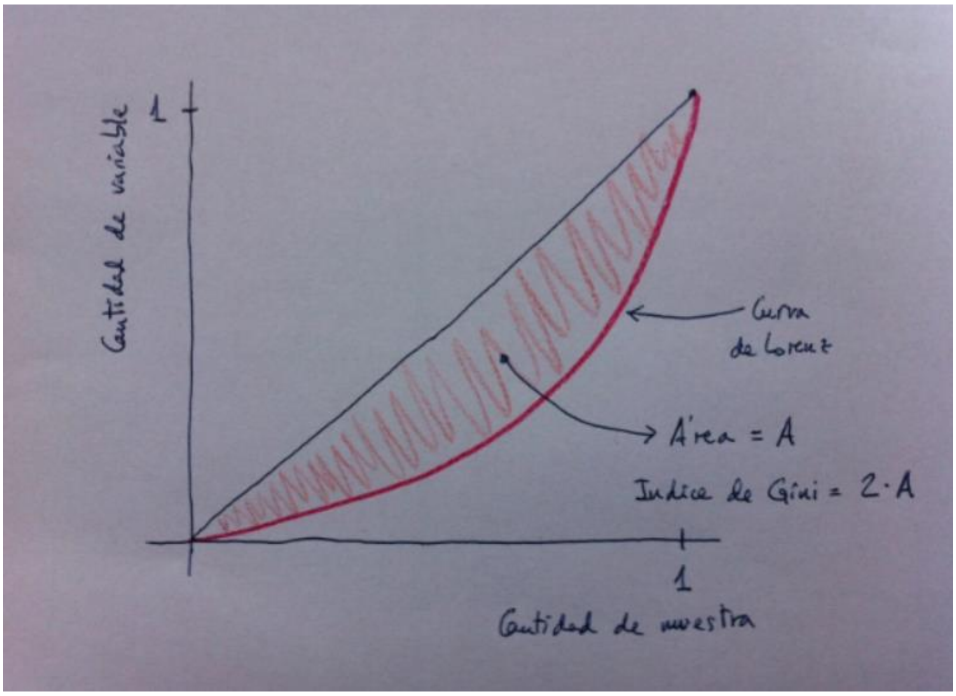
Table 1. Descriptive statistic of biological parameters, body condition index (Kn) and heavy metals concentration. It is shown the sampler number (n), mean, median and standard deviation (DE).

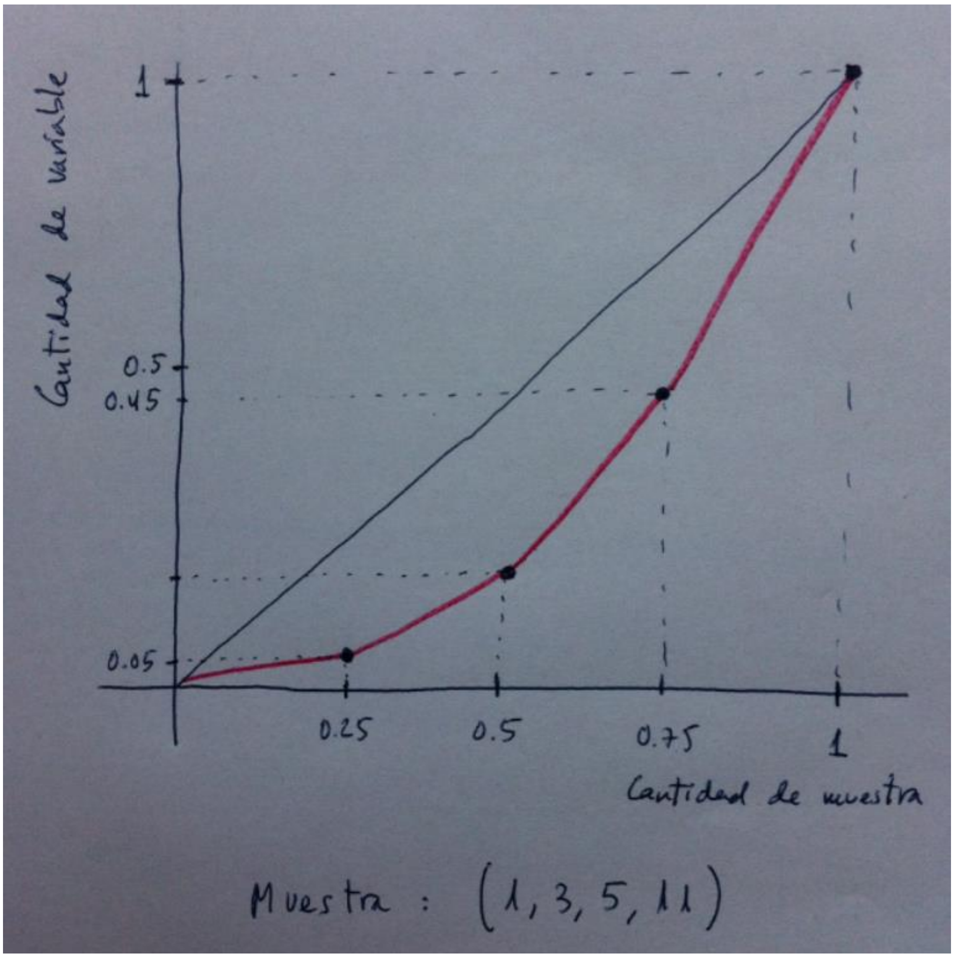
	n	Media	Mediana	Rango	DE
Edad (años)	35	2,91	2,00	0,00 - 13,00	2,69
Talla (cm)	38	115,97	114,20	78,70 - 160,50	19,29
Peso (kg)	38	20,90	19,80	5,80 - 52,00	8,67
Kn	38	0,89	0,88	0,52 - 1,30	0,17
Cd (µg $g^{-1)}$	37	5,72	2,99	0,20 - 29,85	7,56
Cu (µg g^{-1})	33	4,52	3,31	1,08 - 15,22	3,62
Zn (µg g^{-1})	36	22,50	20,90	12,17 - 34,92	4,78

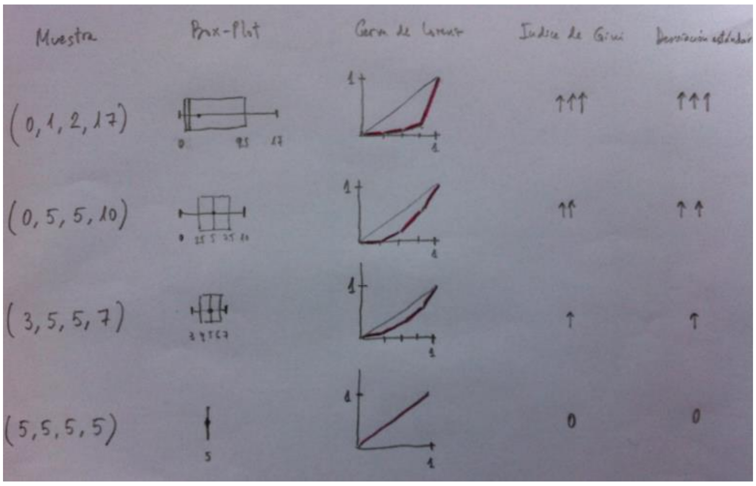
Table 1
Summary statistics for the geochemical dataset under study.

	Average	Min	Max	St dev	Skewness
Al (mg kg^{-1})	47 664	12 605	75 768	17 971	−0.4
Ba (mg kg^{-1})	164	60	307	53	−0.2
Ca (mg kg^{-1})	37 653	16 254	122 007	15 966	3.8
Fe (mg kg^{-1})	33 867	14 787	48 678	9141	−0.5
K (mg kg^{-1})	11 385	3866	17 520	3671	−0.4
Li (mg kg^{-1})	51	13	81	19	−0.5
Mg (mg kg^{-1})	9940	4132	15 166	3088	−0.3
Mn (mg kg^{-1})	474	255	1178	202	1.3
Na (mg kg^{-1})	12 879	2703	36 326	5451	1.5
Ti (mg kg^{-1})	913	703	1072	83	−0.5
Co (mg kg^{-1})	12	4.5	16	2.9	−1.0
Cr (mg kg^{-1})	71	27	124	22	−0.2
Cu (mg kg^{-1})	41	7.1	128	24	1.2
La (mg kg^{-1})	30	18	39	5.5	−0.7
Ni (mg kg^{-1})	34	15	47	8.7	−0.7
P (mg kg^{-1})	1550	525	3706	645	0.7
Pb (mg kg^{-1})	67	15	188	42	1.6
V (mg kg^{-1})	95	36	140	28	−0.4
Zn (mg kg^{-1})	163	41	497	85	1.4
pH	7.3	6.9	7.8	0.2	0.3
<63 µm (%)	29	7.1	48	11.0	−0.2
Sulphate (mg l^{-1})	4551	1473	7298	1436	−0.6
OC (%)	8.4	3.1	13	2.8	−0.4
Carb (%)	4.1	2.2	12	1.5	3.3
Cl (mg l^{-1})	12 411	3681	17 571	3497	−1.0
CEC (ccmol kg^{-1})	68 681	21 037	115 874	23 636	−0.3
CRS (µmol g^{-1})	71	12	212	36	1.3

Curva de Lorenz/Índice de Gini







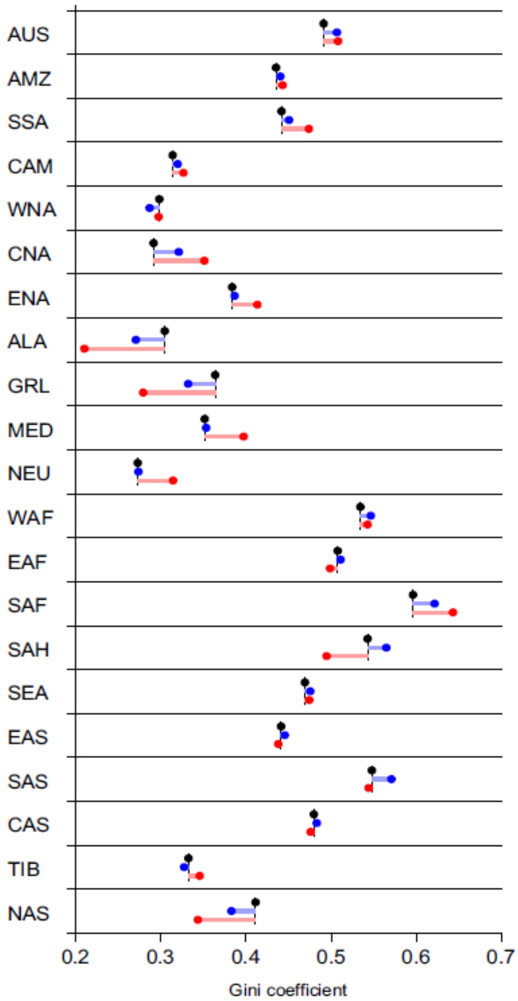


Figure 6. Mean Gini coefficients of major river channel cells in each Giorgi region. Black, blue, and red circles indicate the values for historical data (1960–1989), projected data under RCP 2.6 (2070–2099), and projected data under RCP 8.5 (2070–2099), respectively. Changes with respect to the historical values are indicated by horizontal bars.

Proporción, Frecuencia relativa y Frecuencia absoluta

Es la aplicación de la media a una variable que tenga sólo dos valores: 0 y 1.

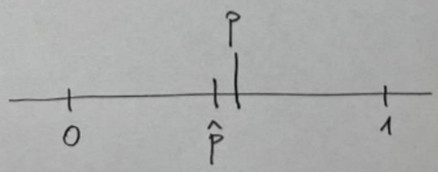
$$(X_1, X_2, \ldots, X_n)$$

$$(0, 1, 1, 0, 0, 0, 1)$$

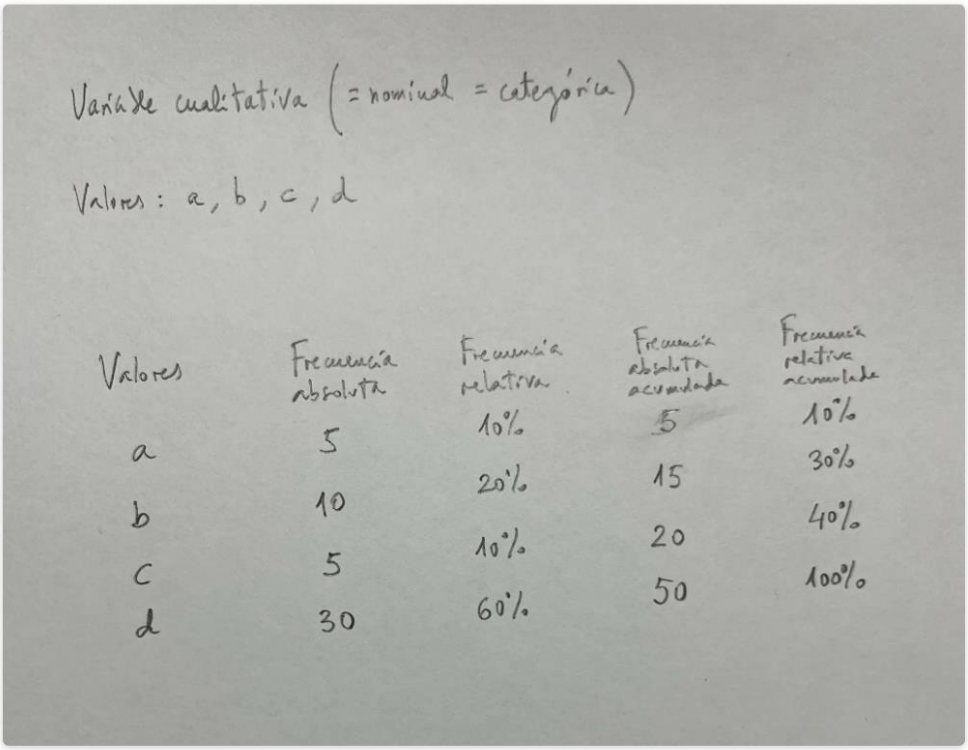
$$\hat{p} = \frac{0+1+1+0+0+0+1}{7} = \frac{3}{7} = 0.428$$

$$\mu \longleftrightarrow \bar{X}_n$$

$$p \longleftrightarrow \hat{p}$$



Veamos un ejemplo con una variable cualitativa con cuatro valores posibles:



Variable cualitativa (= nominal = categórica)

Valores : a, b, c, d

Valores	Frecuencia absoluta	Frecuencia relativa	Frecuencia absoluta acumulada	Frecuencia relativa acumulada
a	5	10%	5	10%
b	10	20%	15	30%
c	5	10%	20	40%
d	30	60%	50	100%

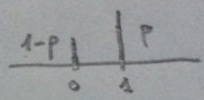
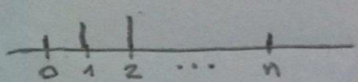
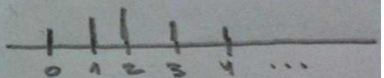
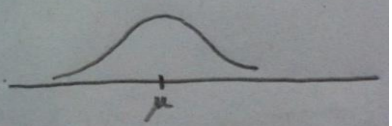
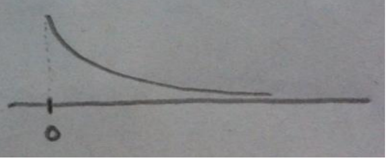
Funciones de distribución

Distribución: Forma de la variabilidad de una variable.

Dos formas de trabajar con distribuciones:

1) Distribuciones prefabricadas.

2) Distribuciones construidas "ad hoc".

Distribución	Nomenclatura	Forma
BERNOUILLI	$B(p)$	
BINOMIAL	$B(n,p)$	
POISSON	$P(\lambda)$	
NORMAL	$N(\mu,\sigma)$	
EXPONENCIAL	$E(\alpha)$	

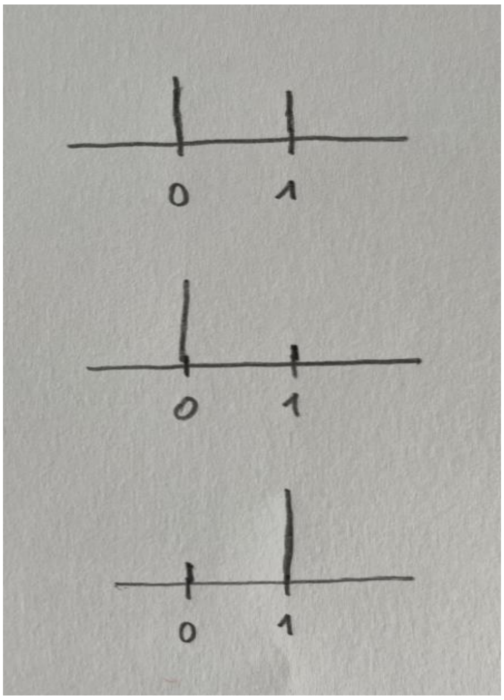
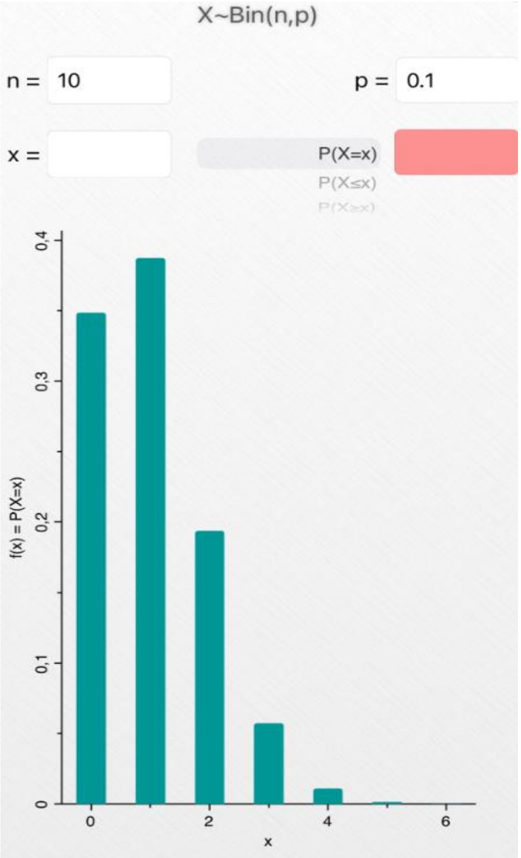


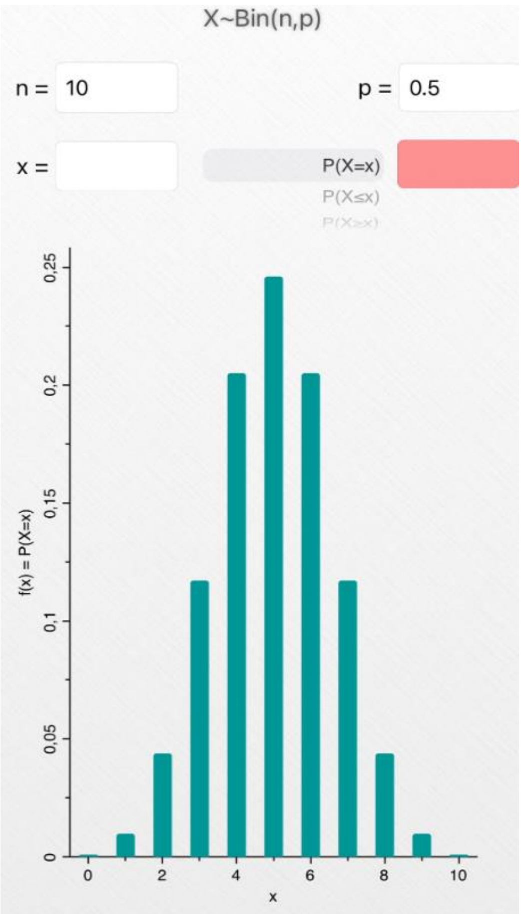
Tabla 1: Función de distribución de la variable Binomial(n, p)

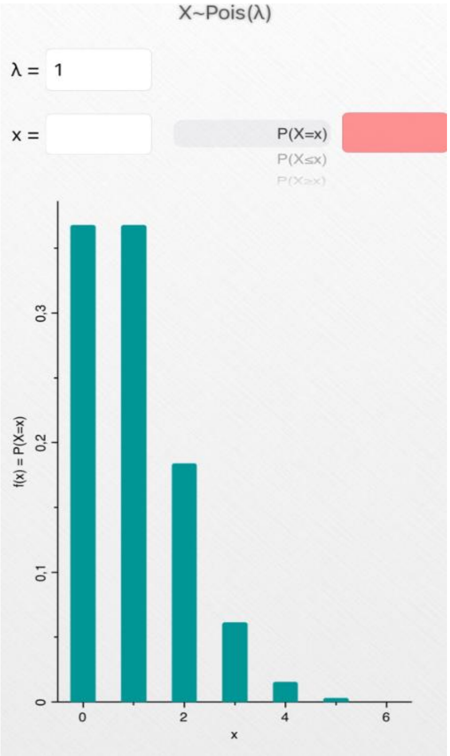
							p					
		0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
$n = 1$	0	0.9500	0.9000	0.8000	0.7000	0.6000	0.5000	0.4000	0.3000	0.2000	0.1000	0.0500
	1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
$n = 2$	0	0.9025	0.8100	0.6400	0.4900	0.3600	0.2500	0.1600	0.0900	0.0400	0.0100	0.0025
	1	0.9975	0.9900	0.9600	0.9100	0.8400	0.7500	0.6400	0.5100	0.3600	0.1900	0.0975
	2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
$n = 3$	0	0.8574	0.7290	0.5120	0.3430	0.2160	0.1250	0.0640	0.0270	0.0080	0.0010	0.0001
	1	0.9928	0.9720	0.8960	0.7840	0.6480	0.5000	0.3520	0.2160	0.1040	0.0280	0.0073
	2	0.9999	0.9990	0.9920	0.9730	0.9360	0.8750	0.7840	0.6570	0.4880	0.2710	0.1426
	3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
$n = 4$	0	0.8145	0.6561	0.4096	0.2401	0.1296	0.0625	0.0256	0.0081	0.0016	0.0001	0.0000
	1	0.9860	0.9477	0.8192	0.6517	0.4752	0.3125	0.1792	0.0837	0.0272	0.0037	0.0005
	2	0.9995	0.9963	0.9728	0.9163	0.8208	0.6875	0.5248	0.3483	0.1808	0.0523	0.0140
	3	1.0000	0.9999	0.9984	0.9919	0.9744	0.9375	0.8704	0.7599	0.5904	0.3439	0.1855
	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
$n = 5$	0	0.7738	0.5905	0.3277	0.1681	0.0778	0.0313	0.0102	0.0024	0.0003	0.0000	0.0000
	1	0.9774	0.9185	0.7373	0.5282	0.3370	0.1875	0.0870	0.0308	0.0067	0.0005	0.0000
	2	0.9988	0.9914	0.9421	0.8369	0.6826	0.5000	0.3174	0.1631	0.0579	0.0086	0.0012
	3	1.0000	0.9995	0.9933	0.9692	0.9130	0.8125	0.6630	0.4718	0.2627	0.0815	0.0226
	4	1.0000	1.0000	0.9997	0.9976	0.9898	0.9688	0.9222	0.8319	0.6723	0.4095	0.2262
	5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

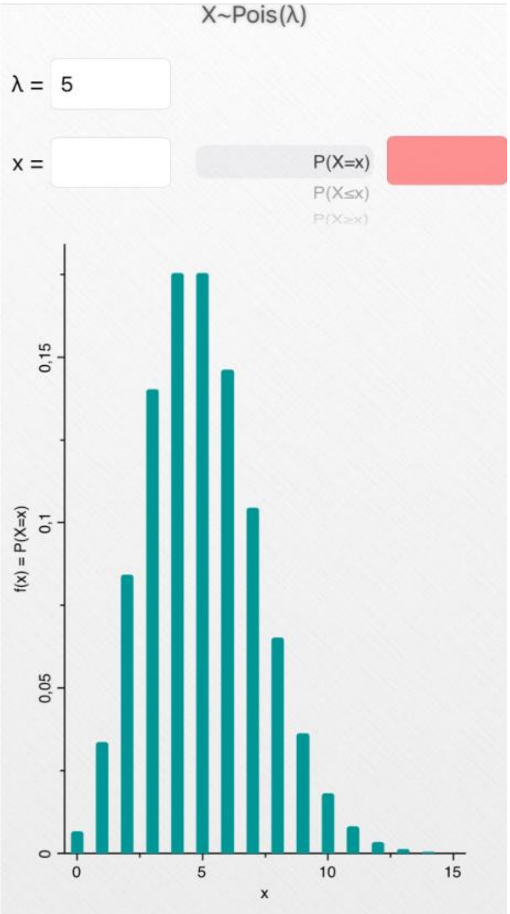
Tabla 7: Función de distribución de la variable Poisson(λ)

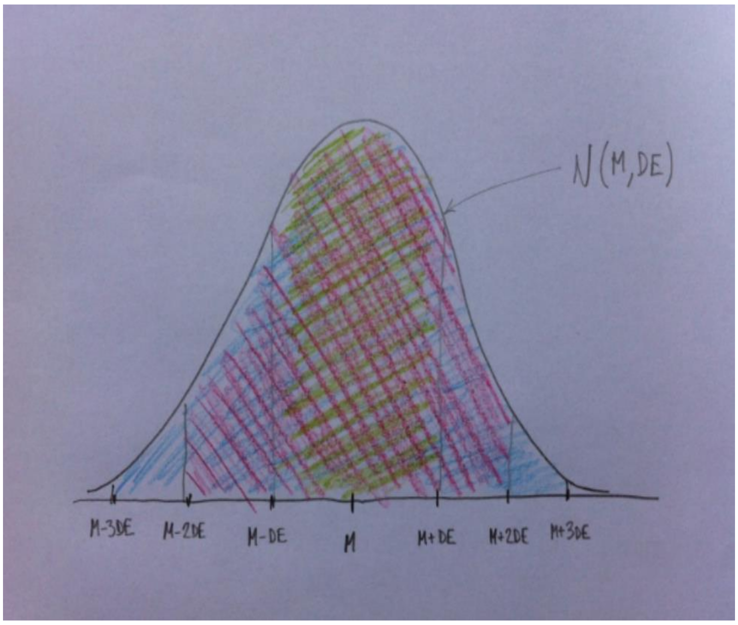
	λ									
x	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
0	0.9048	0.8187	0.7408	0.6703	0.6065	0.5488	0.4966	0.4493	0.4066	0.3679
1	0.9953	0.9825	0.9631	0.9384	0.9098	0.8781	0.8442	0.8088	0.7725	0.7358
2	0.9998	0.9989	0.9964	0.9921	0.9856	0.9769	0.9659	0.9526	0.9371	0.9197
3	1.0000	0.9999	0.9997	0.9992	0.9982	0.9966	0.9942	0.9909	0.9865	0.9810
4	1.0000	1.0000	1.0000	0.9999	0.9998	0.9996	0.9992	0.9986	0.9977	0.9963
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998	0.9997	0.9994
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00
0	0.3329	0.3012	0.2725	0.2466	0.2231	0.2019	0.1827	0.1653	0.1496	0.1353
1	0.6990	0.6626	0.6268	0.5918	0.5578	0.5249	0.4932	0.4628	0.4337	0.4060
2	0.9004	0.8795	0.8571	0.8335	0.8088	0.7834	0.7572	0.7306	0.7037	0.6767
3	0.9743	0.9662	0.9569	0.9463	0.9344	0.9212	0.9068	0.8913	0.8747	0.8571
4	0.9946	0.9923	0.9893	0.9857	0.9814	0.9763	0.9704	0.9636	0.9559	0.9473
5	0.9990	0.9985	0.9978	0.9968	0.9955	0.9940	0.9920	0.9896	0.9868	0.9834
6	0.9999	0.9997	0.9996	0.9994	0.9991	0.9987	0.9981	0.9974	0.9966	0.9955
7	1.0000	1.0000	0.9999	0.9999	0.9998	0.9997	0.9996	0.9994	0.9992	0.9989
8	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9998	0.9998
9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00
0	0.1225	0.1108	0.1003	0.0907	0.0821	0.0743	0.0672	0.0608	0.0550	0.0498
1	0.3796	0.3546	0.3309	0.3084	0.2873	0.2674	0.2487	0.2311	0.2146	0.1991
2	0.6496	0.6227	0.5960	0.5697	0.5438	0.5184	0.4936	0.4695	0.4460	0.4232
3	0.8386	0.8194	0.7993	0.7787	0.7576	0.7360	0.7141	0.6919	0.6696	0.6472
4	0.9379	0.9275	0.9162	0.9041	0.8912	0.8774	0.8629	0.8477	0.8318	0.8153
5	0.9796	0.9751	0.9700	0.9643	0.9580	0.9510	0.9433	0.9349	0.9258	0.9161
6	0.9941	0.9925	0.9906	0.9884	0.9858	0.9828	0.9794	0.9756	0.9713	0.9665
7	0.9985	0.9980	0.9974	0.9967	0.9958	0.9947	0.9934	0.9919	0.9901	0.9881
8	0.9997	0.9995	0.9994	0.9991	0.9989	0.9985	0.9981	0.9976	0.9969	0.9962
9	0.9999	0.9999	0.9999	0.9998	0.9997	0.9996	0.9995	0.9993	0.9991	0.9989
10	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9998	0.9998	0.9997
11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

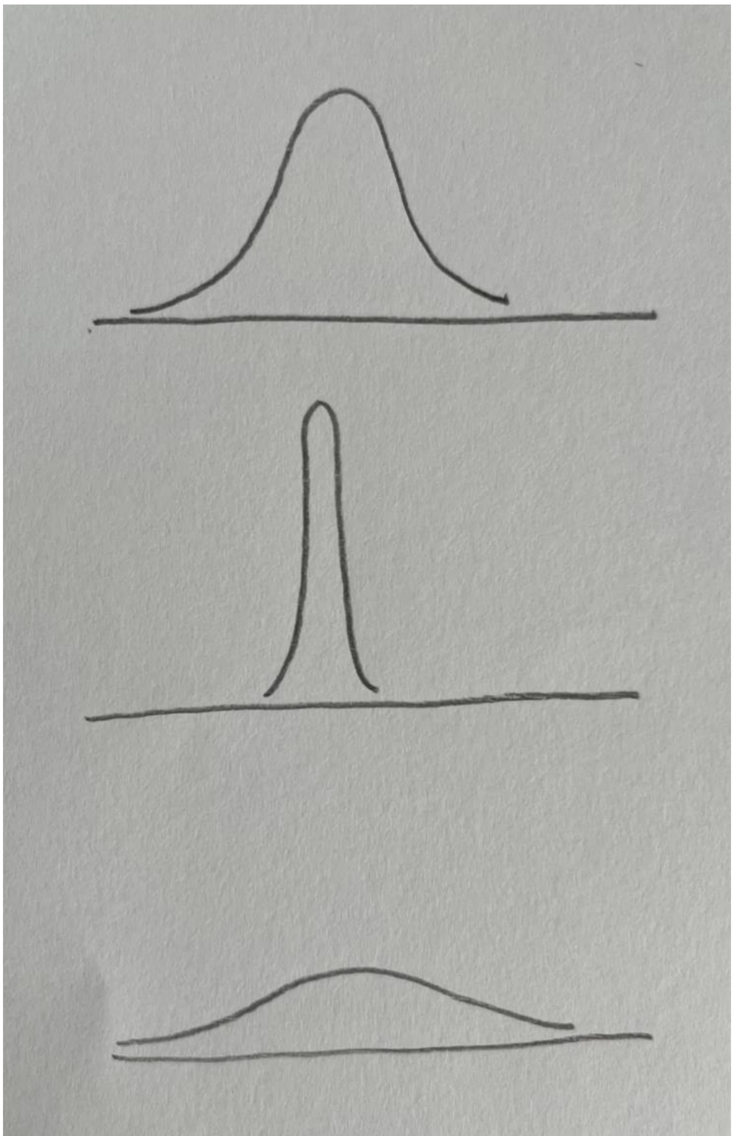

X~Bin(n,p)
n = 10
p = 0.1
x =
P(X=x)
P(X≤x)
f(x) = P(X=x)
0
0,1
0,2
0,3
0,4
0
2
4
6
x

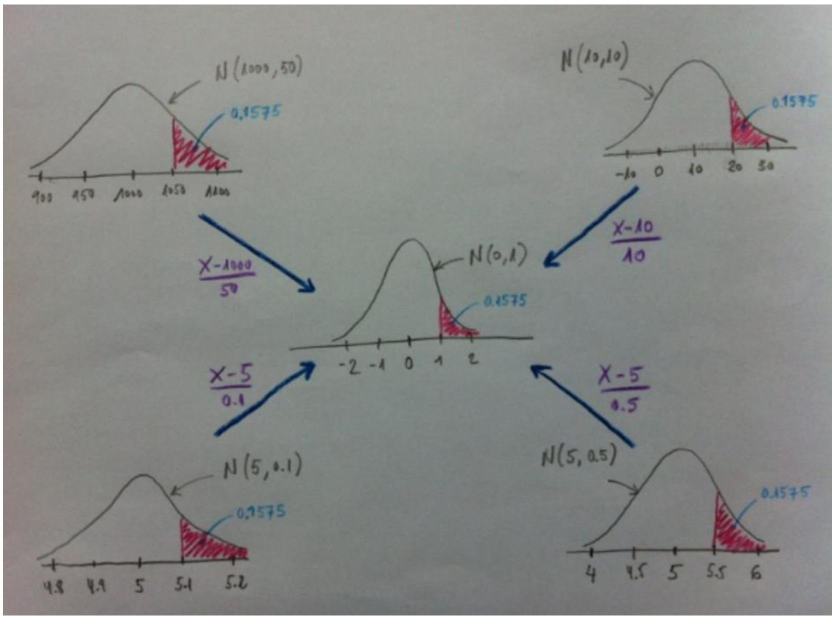

X~Bin(n,p)
n = 10
p = 0.5
x =
P(X=x)
P(X≤x)
f(x) = P(X=x)
0
0,05
0,1
0,15
0,2
0,25
0
2
4
6
8
10
x


X~Pois(λ)
λ = 1
x =
P(X=x)
P(X≤x)
f(x) = P(X=x)
0,3
0,2
0,1
0
0
2
4
6
x


X~Pois(λ)
λ = 5
x =
P(X=x)
P(X≤x)
f(x) = P(X=x)
0,15
0,1
0,05
0
0
5
10
15
x


N(M,DE)
M-3DE
M-2DE
M-DE
M
M+DE
M+2DE
M+3DE

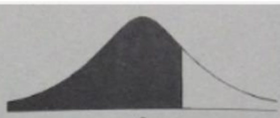




μ = Media

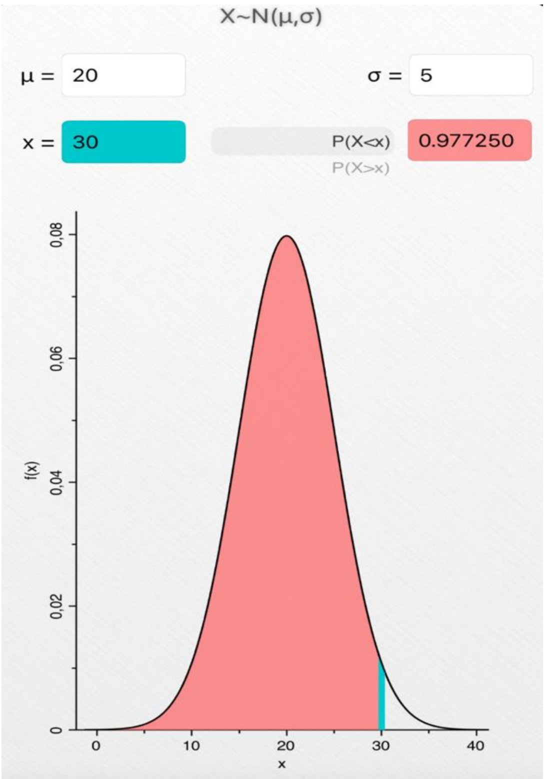
σ = Desviación típica

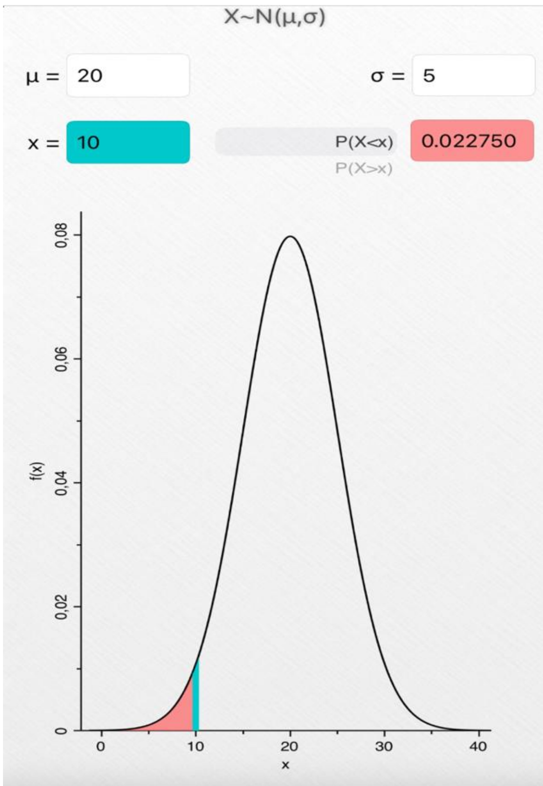
$$P(z \leq z_0) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{z_0} e^{\frac{-z^2}{2}} dz$$



Tipificación: $z_0 = \dfrac{x - \mu}{\sigma}$

z_0	0,00	0,01	0,02	0,03	0,04	0,05	0,06	0,07	0,08	0,09	z_0
0,0	0,5000	0,5040	0,5080	0,5120	0,5160	0,5199	0,5239	0,5279	0,5319	0,5359	0,0
0,1	0,5398	0,5438	0,5478	0,5517	0,5557	0,5596	0,5636	0,5675	0,5714	0,5753	0,1
0,2	0,5793	0,5832	0,5871	0,5910	0,5948	0,5987	0,6026	0,6064	0,6103	0,6141	0,2
0,3	0,6179	0,6217	0,6255	0,6293	0,6331	0,6368	0,6406	0,6443	0,6480	0,6517	0,3
0,4	0,6554	0,6591	0,6628	0,6664	0,6700	0,6736	0,6772	0,6808	0,6844	0,6879	0,4
0,5	0,6915	0,6950	0,6985	0,7019	0,7054	0,7088	0,7123	0,7157	0,7190	0,7224	0,5
0,6	0,7257	0,7291	0,7324	0,7357	0,7389	0,7422	0,7454	0,7486	0,7517	0,7549	0,6
0,7	0,7580	0,7611	0,7642	0,7673	0,7704	0,7734	0,7764	0,7794	0,7823	0,7852	0,7
0,8	0,7881	0,7910	0,7939	0,7967	0,7995	0,8023	0,8051	0,8078	0,8106	0,8133	0,8
0,9	0,8159	0,8186	0,8212	0,8238	0,8264	0,8289	0,8315	0,8340	0,8365	0,8389	0,9
1,0	0,8413	0,8438	0,8461	0,8485	0,8508	0,8531	0,8554	0,8577	0,8599	0,8621	1,0
1,1	0,8643	0,8665	0,8686	0,8708	0,8729	0,8749	0,8770	0,8790	0,8810	0,8830	1,1
1,2	0,8849	0,8869	0,8888	0,8907	0,8925	0,8944	0,8962	0,8980	0,8997	0,9015	1,2
1,3	0,9032	0,9049	0,9066	0,9082	0,9099	0,9115	0,9131	0,9147	0,9162	0,9177	1,3
1,4	0,9192	0,9207	0,9222	0,9236	0,9251	0,9265	0,9279	0,9292	0,9306	0,9319	1,4
1,5	0,9332	0,9345	0,9357	0,9370	0,9382	0,9394	0,9406	0,9418	0,9429	0,9441	1,5
1,6	0,9452	0,9463	0,9474	0,9484	0,9495	0,9505	0,9515	0,9525	0,9535	0,9545	1,6
1,7	0,9554	0,9564	0,9573	0,9582	0,9591	0,9599	0,9608	0,9616	0,9625	0,9633	1,7
1,8	0,9641	0,9649	0,9656	0,9664	0,9671	0,9678	0,9686	0,9693	0,9699	0,9706	1,8
1,9	0,9713	0,9719	0,9726	0,9732	0,9738	0,9744	0,9750	0,9756	0,9761	0,9767	1,9
2,0	0,9772	0,9778	0,9783	0,9788	0,9793	0,9798	0,9803	0,9808	0,9812	0,9817	2,0
2,1	0,9821	0,9826	0,9830	0,9834	0,9838	0,9842	0,9846	0,9850	0,9854	0,9857	2,1
2,2	0,9861	0,9864	0,9868	0,9871	0,9875	0,9878	0,9881	0,9884	0,9887	0,9890	2,2
2,3	0,9893	0,9896	0,9898	0,9901	0,9904	0,9906	0,9909	0,9911	0,9913	0,9916	2,3
2,4	0,9918	0,9920	0,9922	0,9925	0,9927	0,9929	0,9931	0,9932	0,9934	0,9936	2,4
2,5	0,9938	0,9940	0,9941	0,9943	0,9945	0,9946	0,9948	0,9949	0,9951	0,9952	2,5
2,6	0,9953	0,9955	0,9956	0,9957	0,9959	0,9960	0,9961	0,9962	0,9963	0,9964	2,6
2,7	0,9965	0,9966	0,9967	0,9968	0,9969	0,9970	0,9971	0,9972	0,9973	0,9974	2,7
2,8	0,9974	0,9975	0,9976	0,9977	0,9977	0,9978	0,9979	0,9979	0,9980	0,9981	2,8
2,9	0,9981	0,9982	0,9982	0,9983	0,9984	0,9984	0,9985	0,9985	0,9986	0,9986	2,9
3,0	0,99865	0,99869	0,99874	0,99878	0,99882	0,99886	0,99889	0,99893	0,99896	0,99900	3,0
3,1	0,99903	0,99906	0,99910	0,99913	0,99916	0,99918	0,99921	0,99924	0,99926	0,99929	3,1
3,2	0,99931	0,99934	0,99936	0,99938	0,99940	0,99942	0,99944	0,99946	0,99948	0,99950	3,2
3,3	0,99952	0,99953	0,99955	0,99957	0,99958	0,99960	0,99961	0,99962	0,99964	0,99965	3,3
3,4	0,99966	0,99968	0,99969	0,99970	0,99971	0,99972	0,99973	0,99974	0,99975	0,99976	3,4
3,5	0,99977	0,99978	0,99978	0,99979	0,99980	0,99981	0,99981	0,99982	0,99983	0,99983	3,5
3,6	0,99984	0,99985	0,99985	0,99986	0,99986	0,99987	0,99987	0,99988	0,99988	0,99989	3,6
3,7	0,99989	0,99990	0,99990	0,99990	0,99991	0,99991	0,99992	0,99992	0,99992	0,99992	3,7
3,8	0,99993	0,99993	0,99993	0,99994	0,99994	0,99994	0,99994	0,99995	0,99995	0,99995	3,8
3,9	0,99995	0,99995	0,99996	0,99996	0,99996	0,99996	0,99996	0,99996	0,99997	0,99997	3,9


X~N(μ,σ)
μ = 20
σ = 5
x = 30
P(X<x)
P(X>x)
0.977250
f(x)
0,08
0,06
0,04
0,02
0
0
10
20
30
40
x


X~N(μ,σ)
μ = 20
σ = 5
x = 10
P(X<x)
P(X>x)
0.022750
f(x)
0,08
0,06
0,04
0,02
0
0
10
20
30
40
x

Distribución construida "ad hoc"

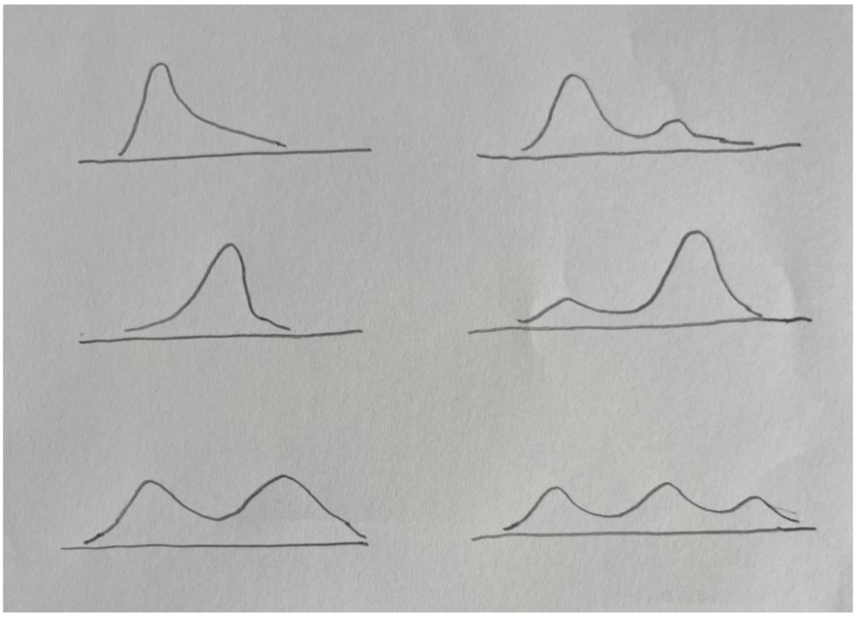


Table 1. Clinical Characteristics of 214 Women With Anorexia Nervosa*

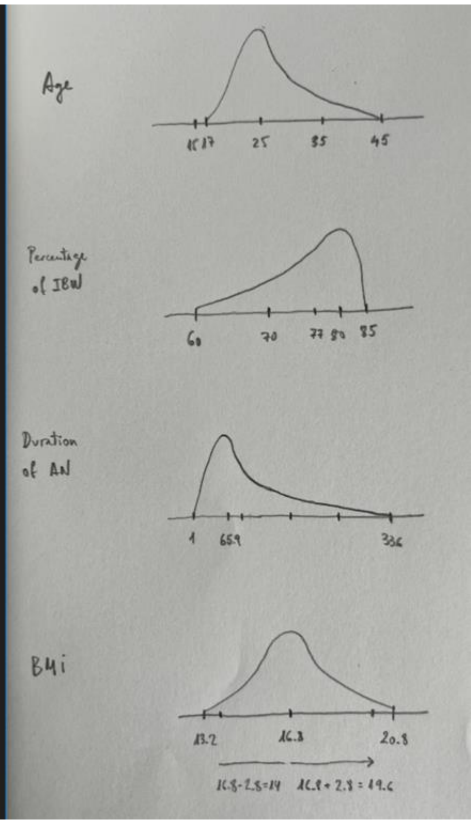
Characteristic	Values
Age, y	25.0 ± 6.4 (17-45)
Percentage of IBW	77 ± 6 (60-85)
Duration of AN, mo	65.9 ± 70.4 (1-336)
Age at onset of AN, y	19.5 ± 5.6 (9-40)
Women who purge, %	24.1
No. of purges/wk†	1.6 ± 15.9 (1-70)
BMI	16.8 ± 1.4 (13.2-20.8)
LBM, kg	34.3 ± 3.9 (24.5-45.5)
Fat mass, kg	8.0 ± 3.3 (2.6-20.3)
Percentage of body fat	17.7 ± 5.9 (6.3-32.4)
LMP, mo	27.1 ± 38.9 (3-300)
Amenorrhea, mo	54.6 ± 61.2 (4-324)
Age at menarche, y	13.6 ± 0.48
Women with primary amenorrhea, %	14.8
Women engaging in vigorous exercise, %	74.6
No. of hours of vigorous exercise/wk †	5.9 ± 4.8 (0.67-23.5)
Women consuming alcohol, %	41.6
No. of drinks/wk†‡	2.6 ± 4.1 (0-28.0)
Women who smoke, %	16.4
No. of cigarettes/d†	11.6 ± 9.0 (0.3-40)
Women who incurred fractures, %	30.1

Abbreviations: AN, anorexia nervosa; BMI, body mass index (calculated as weight in kilograms divided by the square of height in meters); IBW, ideal body weight; LBM, lean body mass; LMP, length of time since last menstrual period.

*Values are given as mean ± SD (range) unless otherwise indicated.

†The frequency reported is the mean for all patients who engaged in the activity.

‡Social drinkers who did not specify a number of drinks were assigned zero drinks per week.



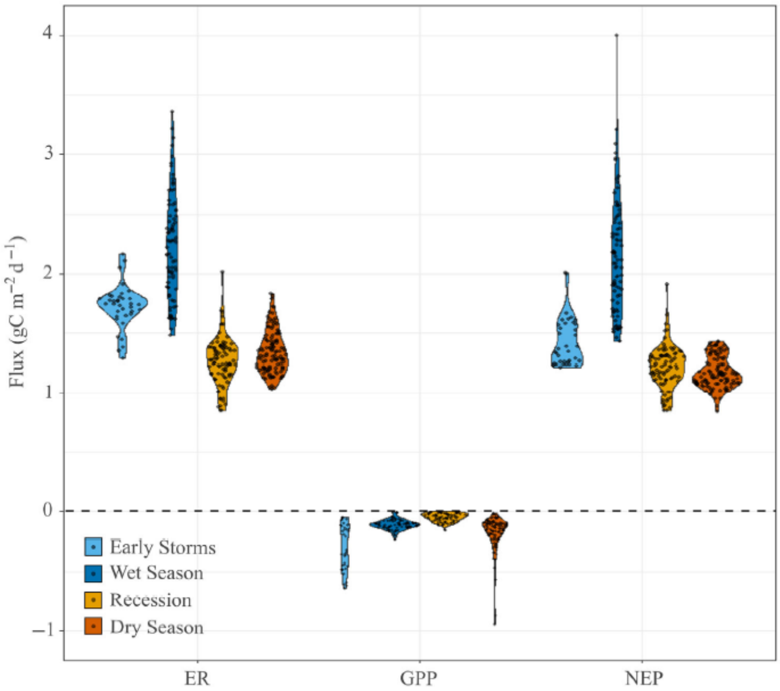
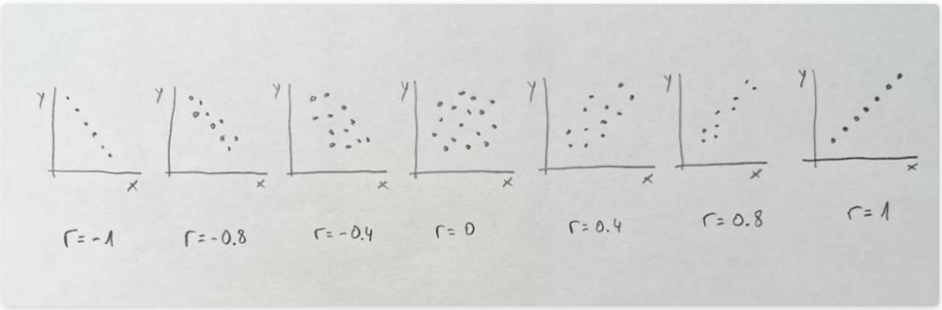
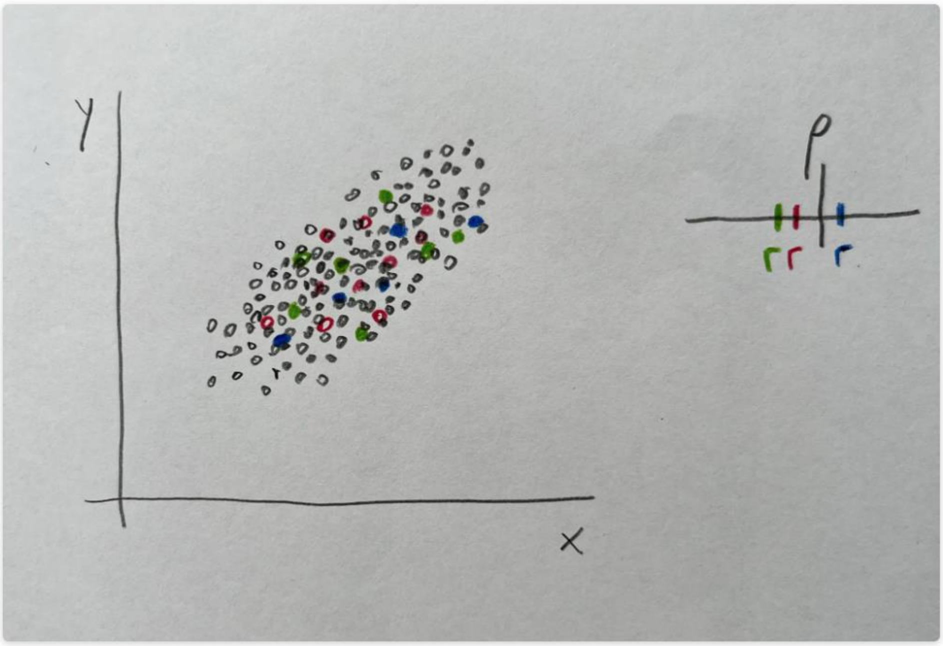


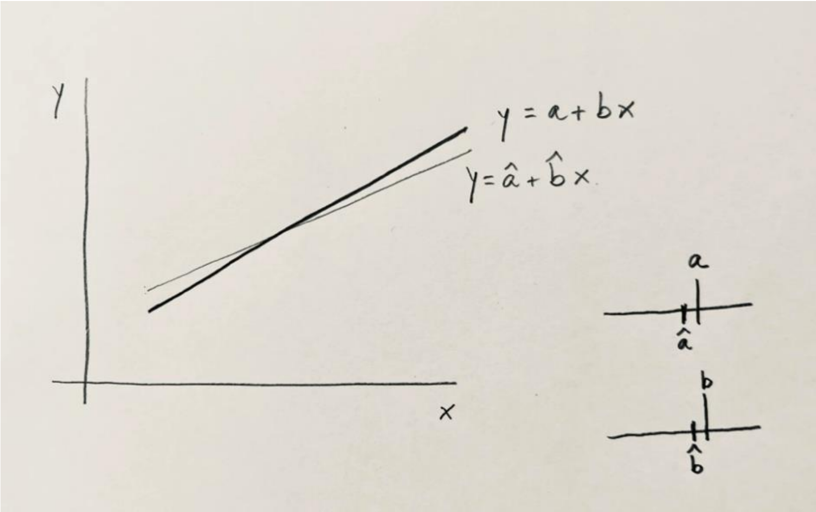
Fig. 2. Distribution of daily ER, GPP and NEP rates estimated for 322 d at Manton Creek.

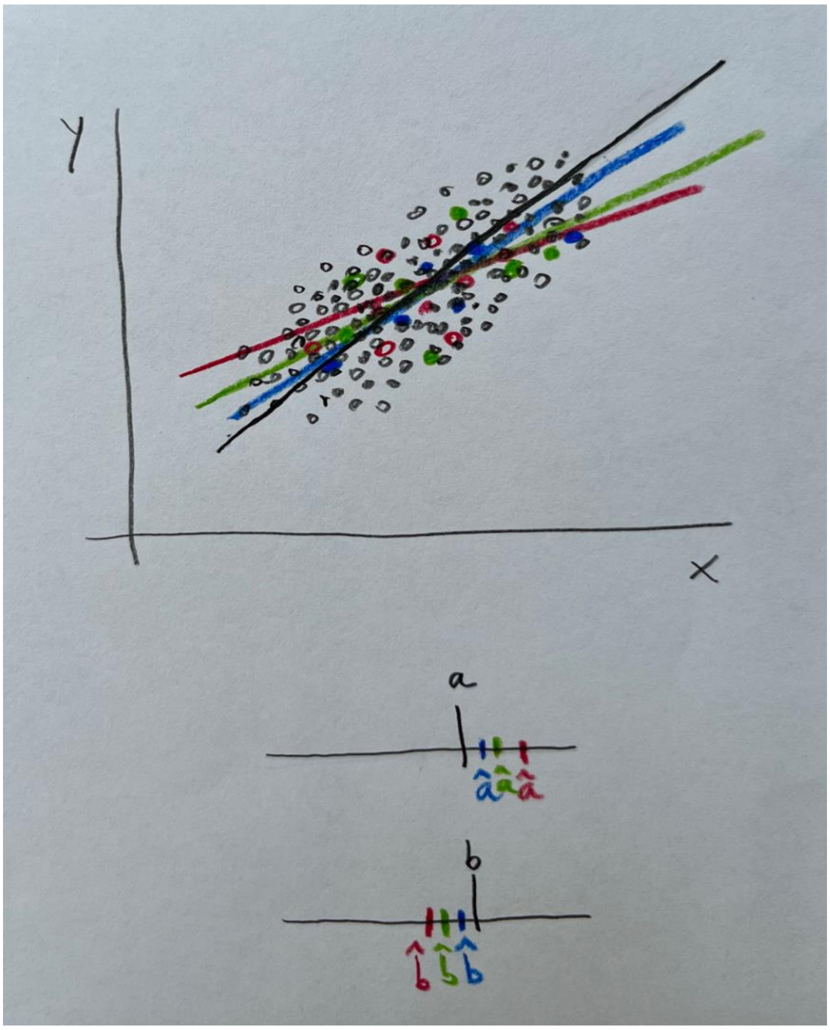
Correlación

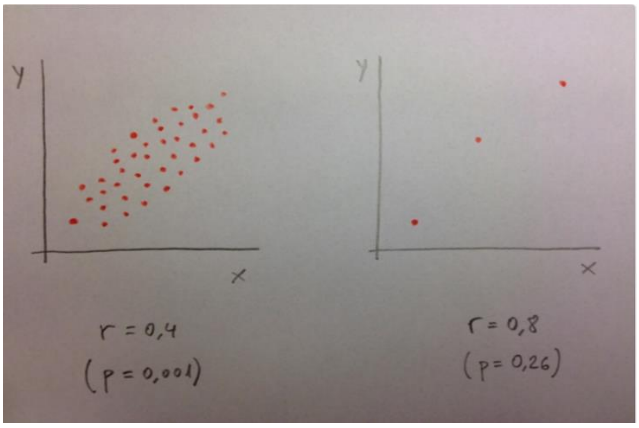


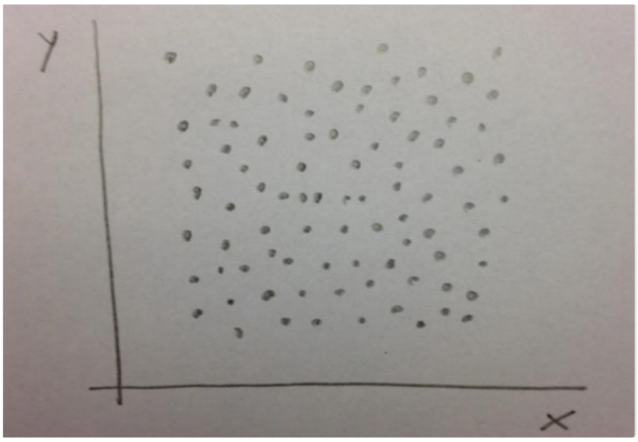


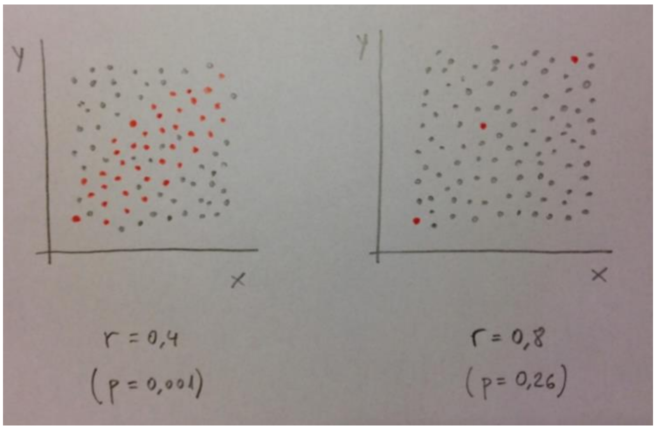
Regresión lineal






y
x
r = 0,4
(p = 0,001)
y
x
r = 0,8
(p = 0,26)


y
x


y
x
r = 0,4
(p = 0,001)
y
x
r = 0,8
(p = 0,26)

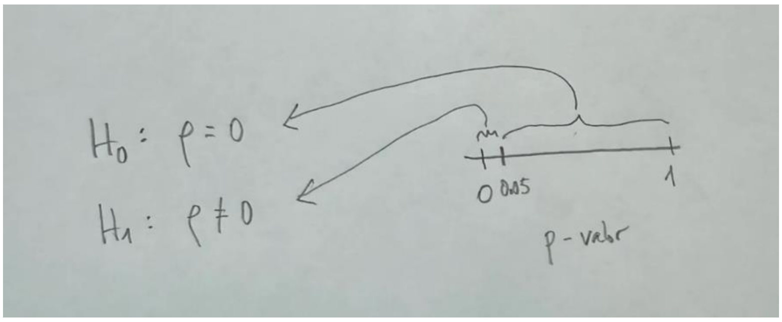

H0 : ρ = 0
H1 : ρ ≠ 0
0 0,05
1
p - valor

Table 2. Coefficients (r) obtained by Pearson correlation analysis between abiotic factors (salinity, organic matter and fine sediments) and the most abundant species in the estuary of the Cachoeira River, Ilhéus, Bahia, Brazil / Coeficientes (r), obtenidos por análisis de correlación de Pearson entre factores abióticos (salinidad, materia orgánica y sedimentos finos) y las especies más abundantes en el estuario del río Cachoeira Brasil, Ilhéus, Bahía, Brasil

	Factors and species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Salinity																	
2	Organic matter	**-0,62**																
3	Silt-clays	-0,43	**0,76**															
4	NE	**-0,59**	-0,09	0,06														
5	Cc	**-0,90**	**0,62**	**0,60**	**0,69**													
6	Hf	**-0,59**	0,04	0,26	**0,92**	**0,78**												
7	HC	0,35	**-0,50**	**-0,83**	-0,44	**-0,69**	**-0,62**											
8	On	0,43	0,21	**0,57**	-0,49	-0,21	-0,26	-0,44										
9	Dr	0,37	0,02	**0,54**	-0,16	-0,07	0,08	**-0,65**	**0,91**									
10	Nv	0,38	-0,23	-0,34	0,12	-0,26	-0,20	0,16	-0,23	-0,29								
11	Lz	**0,51**	-0,28	-0,28	0,04	-0,35	-0,25	0,11	-0,06	-0,12	**0,98**							
12	Ao	**0,57**	-0,31	-0,37	-0,01	-0,42	-0,30	0,17	-0,06	-0,12	**0,96**	**0,99**						
13	Mc	0,07	-0,40	-0,30	-0,20	-0,35	-0,30	**0,61**	-0,27	-0,32	-0,15	-0,18	-0,21					
14	Te	**-0,93**	**0,54**	**0,58**	**0,58**	**0,91**	**0,67**	**-0,50**	-0,26	-0,14	-0,42	**-0,56**	**-0,61**	0,04				
15	Tp	**-0,60**	0,05	0,23	**0,92**	**0,79**	1,00	**-0,63**	-0,27	0,07	-0,19	-0,24	-0,29	-0,31	**0,68**			
16	Ib	**-0,51**	-0,16	0,14	**0,91**	**0,65**	**0,95**	-0,46	-0,33	0,04	-0,23	-0,28	-0,34	-0,02	**0,65**	**0,95**		
17	Om	**0,75**	-0,18	0,03	-0,26	-0,43	-0,37	-0,14	**0,54**	0,46	**0,67**	**0,79**	**0,79**	-0,30	**-0,65**	-0,37	-0,42	
18	Ta	0,44	-0,31	-0,43	0,09	-0,33	-0,22	0,23	-0,25	-0,30	**0,99**	**0,97**	**0,98**	-0,15	**-0,50**	-0,22	-0,25	**0,66**

Abbreviations of species /abreviaciones de las especies: Ab = *Anomalocardia brasiliana*, Ao = *Anachis obesa*, Cc = *Capitella* cf. *capitata*, Dr = *Drilonereis* sp., Hc = *Hemipodia californiensis*, Hf = *Heteromastus filiformis*, Lz = *Littorina ziczac*, Mc = *Mactra constricta*, Ne = Nemertea n. id., Nv = *Neritina virginea*, Om = *Olivella minuta*, On = *Onuphis* sp., Ta = *Tricolia affinis*, Te = *Tellina* sp., Tp = *Tagelus plebeius*

Table 2

Pearson product moment and *Spearman rank* (in italics) correlations between each pair of variables. The correlation coefficient (r) and statistical significance (p) are shown. A total of 26 pairs of data were used.

Diam	r	0.6600								
	p	0.0002*								
GI1	r	0.0914	0.1267							
	p	0.6571	0.5372							
GI2	r	0.1235	0.2375	0.808						
	p	0.5477	0.2428	0.0000*						
GI3	r	*0.0794*	*0.1948*	*0.7567*	*0.9867*					
	p	*0.6913*	*0.3301*	*0.0002**	*0.0000**					
GI4	r	*−0.0687*	*−0.0639*	*0.7778*	*0.9145*	*0.9018*				
	p	*0.7311*	*0.7492*	*0.0001**	*0.0000**	*0.0000**				
G Hum	r	0.0215	−0.1332	−0.0157	−0.5726	*−0.5104*	*−0.4449*			
	i	0.9171	0.5166	0.9392	0.0022*	*0.0107**	*0.0261**			
G Vol	r	0.1813	0.3737	0.6986	0.5535	*0.3978*	*0.4944*	−0.0282		
	p	0.3755	0.0600	0.0001*	0.0034*	*0.0467**	*0.0102**	0.8912		
Spaw (%)	r	*−0.1548*	*−0.2103*	*−0.3116*	*−0.6485*	*−0.6495*	*−0.6221*	*0.6382*	*0.0104*	
	p	*0.4390*	*0.2930*	*0.1193*	*0.0012**	*0.0012**	*0.0019**	*0.0014**	*0.9585*	
Temp	r	*0.0859*	*0.1249*	*−0.7671*	*−0.4231*	*−0.4341*	*−0.526*	*−0.1166*	*−0.4538*	*0.0852*
	p	*0.6677*	*0.5325*	*0.0001**	*0.0344**	*0.0300**	*0.0085**	*0.5598*	*0.0233**	*0.6701*
		Alt	Diam	GI1	GI2	GI3	GI4	G Hum	G Vol	Spaw (%)

* Significant correlations (95%).

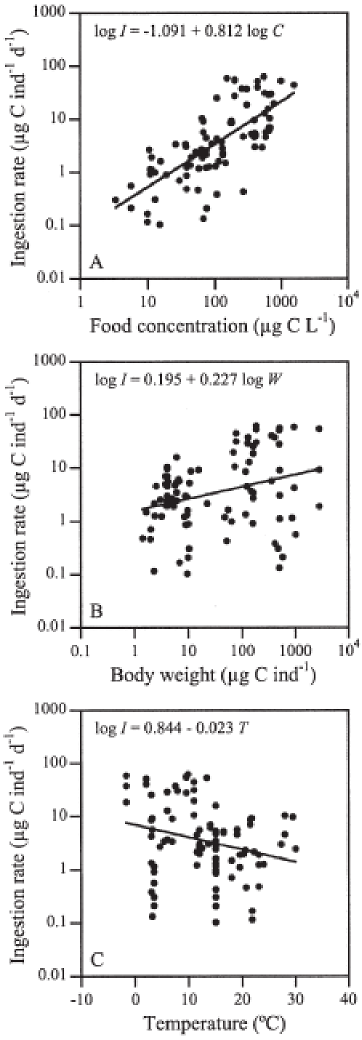


Fig. 1. Bivariate plots of ingestion rates of calanoid copepodites (including adults) as a function of, respectively, (A) food concentration, (B) body weight, and (C) temperature. Linear regression equations fitted to the logarithmically transformed data are given and drawn in each panel. *See Table 2* for further details.

Table 2. Regression analysis of calanoid copepod ingestion rates (I, μg C ind^{-1} d^{-1}) from field studies. Summary of fit, F-test of ANOVA of the model, and parameter estimates are provided. C, food concentration, μg C L^{-1}; T, temperature, °C; W, body mass, μg C ind^{-1}; W_{res}, residuals of the log W–T relationship; RMSE, root mean square error; MR, mean of response; 95% CI, 95% confidence interval. Standardized regression coefficients in multiple regression analyses are indicated as a', b', c', and d', respectively.

a) $\log(I)=a+b\log(C)$

$R^2=0.52$, RMSE$=0.487$, MR$=0.544$, $F_{1,88}=93.62$, $p<0.001$
$a=-1.091$ (95% CI, -1.442 to -0.740), $t=-6.18$, df$=88$, $p<0.001$
$b=0.812$ (95% CI, 0.645 to 0.978), $t=9.68$, df$=88$, $p<0.001$

b) $\log(I)=a+b\log(W)$

$R^2=0.09$, RMSE$=0.666$, MR$=0.544$, $F_{1,88}=9.02$, $p<0.004$
$a=0.195$ (95% CI, -0.075 to 0.465), $t=1.44$, df$=88$, $p>0.1$
$b=0.227$ (95% CI, 0.077 to 0.377), $t=3.00$, df$=88$, $p<0.004$

c) $\log(I)=a+b\,T$

$R^2=0.06$, RMSE$=0.677$, MR$=0.544$, $F_{1,88}=6.11$, $p<0.016$
$a=0.844$ (95% CI, 0.564 to 1.123), $t=6.00$, df$=88$, $p<0.001$
$b=-0.023$ (95% CI, -0.042 to -0.005), $t=-2.47$, df$=88$, $p<0.016$

d) $\log(I)=a+b\log(W)+c\log(C)$

$R^2_{adj}=0.81$,* RMSE$=0.296$, MR$=0.582$, $F_{2,84}=182.02$, $p<0.001$
$a=-1.751$ (95% CI, -2.003 to -1.500), $t=-13.86$, df$=84$, $p<0.001$, $a'=0$
$b=0.355$ (95% CI, 0.287 to 0.423), $t=10.31$, df$=84$, $p<0.001$, $b'=0.492$
$c=0.893$ (95% CI, 0.790 to 0.996), $t=17.31$, df$=84$, $p<0.001$, $c'=0.826$

e) $\log(I)=a+bW_{res}+c\log(C)+dT$

$R^2_{adj}=0.81$,† RMSE$=0.297$, MR$=0.582$, $F_{3,83}=120.80$, $p<0.001$
$a=-0.820$ (95% CI, -1.061 to -0.578), $t=-6.76$, df$=83$, $p<0.001$, $a'=0$
$b=0.382$ (95% CI, 0.280 to 0.485), $t=7.40$, df$=83$, $p<0.001$, $b'=0.356$
$c=0.897$ (95% CI, 0.794 to 1.001), $t=17.23$, df$=83$, $p<0.001$, $c'=0.830$
$d=-0.031$ (95% CI, -0.039 to -0.022), $t=-7.27$, df$=83$, $p<0.001$, $d'=-0.345$

* Three outlier data points were not used in this analysis. The inclusion of these values did not modify significantly the regression coefficient estimates, but R^2_{adj} decreased to 0.67 and RMSE increased to 0.397.

† Three outlier data points, which extended away >1.5 times the interquartile range for W_{res}, were not used in this analysis. The inclusion of these values did not significantly modify the regression coefficient estimates, but R^2_{adj} decreased to 0.67 and RMSE increased to 0.398.

Table 3 Multiple regression statistics of the relationship between non-native species richness and cover and environmental variables that had a significant correlation with occurrence (presence/absence) of non-native species (see Table 2 and text) from NRI and TNC data sets at Yosemite National Park, California

NRI data — species richness
Adjusted $R^2 = 0.391$, d.f. = 6.29, $P = 0.002$

Variable	Coefficient	Coefficient SE	t	*P*
Elevation	−0.001	0.0001	2.420	0.022
Tree species	−0.025	0.0150	1.730	0.094
Shrub species	−0.005	0.0200	0.238	0.814
Herbaceous species	0.020	0.0040	4.396	0.000
Sand (%)	0.001	0.0110	0.069	0.945
Loam (%)	−0.002	0.0120	0.132	0.896

NRI data — % cover
Adjusted $R^2 = 0.063$, d.f. = 6.29, $P = 0.251$

Variable	Coefficient	Coefficient SE	t	*P*
Elevation	0.000	0.0000	0.103	0.919
Tree species	−0.028	0.0270	1.041	0.307
Shrub species	0.008	0.0360	0.225	0.823
Herbaceous species	0.015	0.0080	1.845	0.075
Sand (%)	−0.033	0.0190	1.673	0.105
Loam (%)	0.031	0.0210	1.450	0.158

TNC data — species richness
Adjusted $R^2 = 0.242$, d.f. = 4.51, $P = 0.001$

Variable	Coefficient	Coefficient SE	t	*P*
Elevation	−0.001	0.0001	4.540	0.000
Slope	0.006	0.0050	1.099	0.277
Cobble (%)	0.007	0.0170	0.431	0.668
Herbaceous cover	0.002	0.0010	1.940	0.058

TNC data — % cover
Adjusted $R^2 = 0.324$, d.f. = 4.51, $P = 0.000$

Variable	Coefficient	Coefficient SE	t	*P*
Elevation	−0.001	0.0001	4.965	0.000
Slope	0.004	0.0120	0.352	0.727
Cobble (%)	−0.008	0.0400	0.204	0.840
Herbaceous cover	0.007	0.0020	3.417	0.001

Table 1. Egg production rate of *Acartia grani* (EPR, eggs ind.$^{-1}$ d^{-1}) as a function of either RNA content (μg RNA ind.$^{-1}$) or RNA : DNA ratio at each experimental temperature. Values for the parameters (±SE) of simple linear regression fits (EPR $= a + bX$) are shown (*, $P < 0.001$).

	17.8°C	23.3°C
a. RNA content as regressor		
a	−11.8±3.66	−40.8±6.95
b	38.7±4.50	126.0±10.65
r^2	0.88*	0.93*
b. RNA : DNA as regressor		
a	−19.4±3.52	−29.6±4.69
b	1.76±0.159	3.41±0.223
r^2	0.92*	0.96*

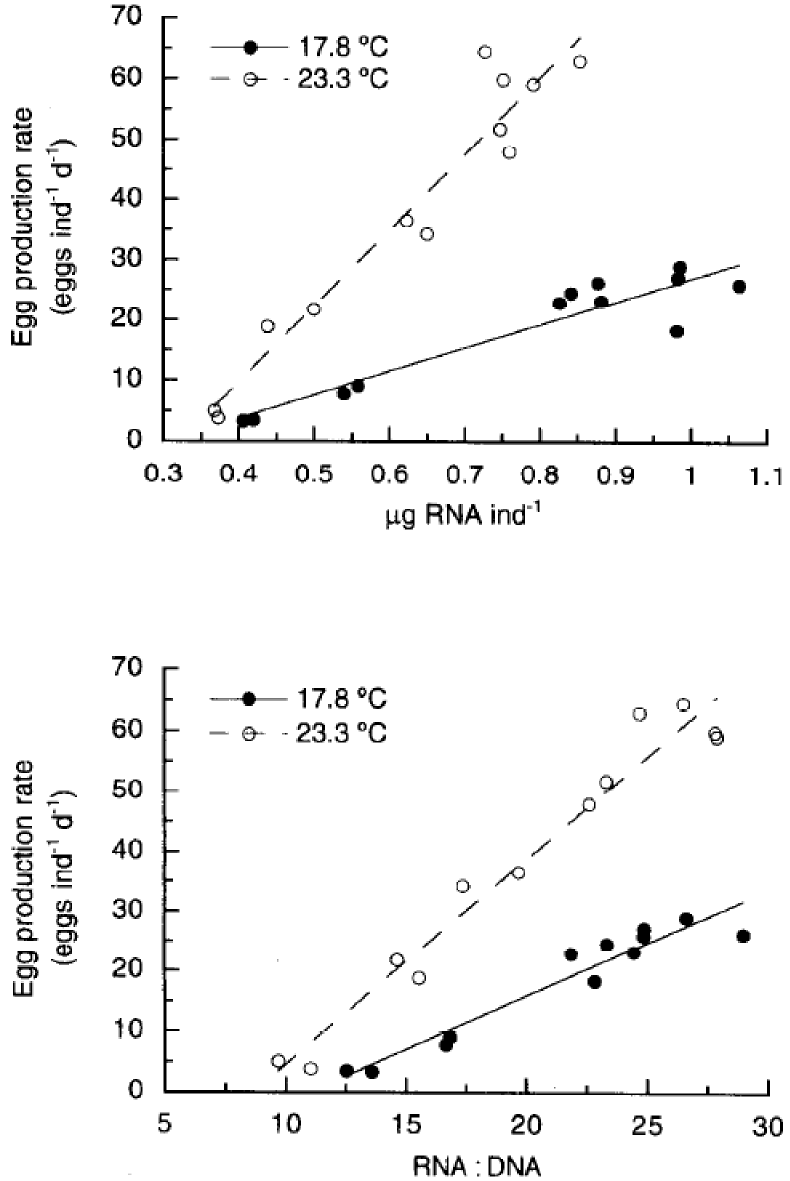
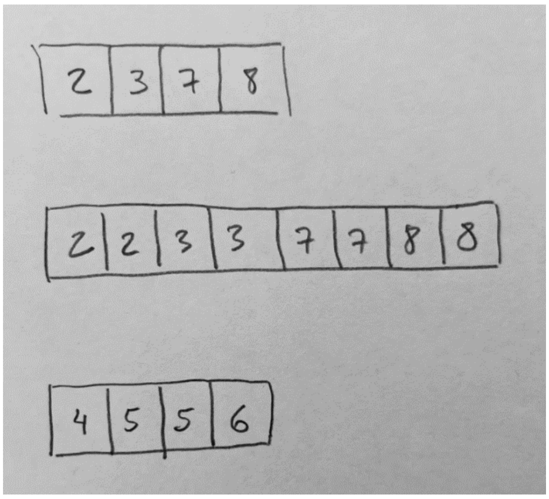
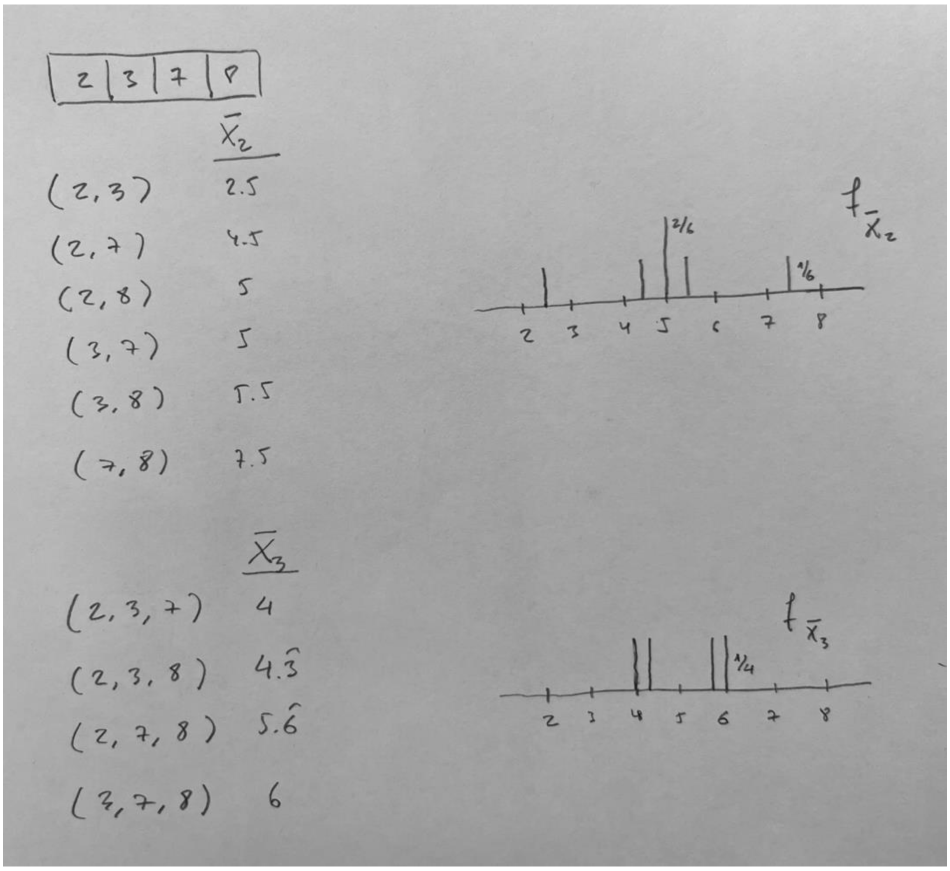


Fig. 3. Linear relationship between egg production rate and RNA content per copepod (top panel, μg RNA ind.$^{-1}$) and RNA : DNA ratio (bottom panel) at both experimental temperatures.

ERROR ESTÁNDAR

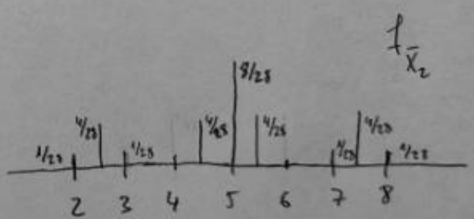




2	2	3	3	7	7	8	8

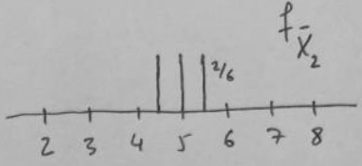
	$\bar{X}_2$
(2, 2)	2
(2, 3)	2.5
(2, 3)	2.5
(2, 7)	4.5
(2, 7)	4.5
(2, 8)	5
(2, 8)	5
(2, 3)	2.5
(2, 3)	2.5
(2, 7)	4.5
(2, 7)	4.5
(2, 8)	5
(2, 8)	5
(3, 3)	3
(3, 7)	5
(3, 7)	5
(3, 8)	5.5
(3, 8)	5.5
(3, 7)	5
(3, 7)	5
(3, 8)	5.5
(3, 8)	5.5

	$\bar{X}_2$
(7, 7)	7
(7, 8)	7.5
(7, 8)	7.5
(7, 8)	7.5
(7, 8)	7.5
(8, 8)	8



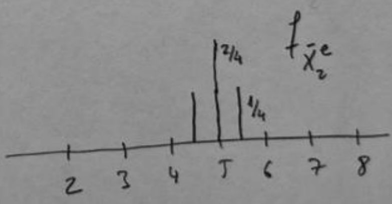
4	5	5	6

	$\bar{X}_2$
(4, 5)	4.5
(4, 5)	4.5
(4, 6)	5
(5, 5)	5
(5, 6)	5.5
(5, 6)	5.5



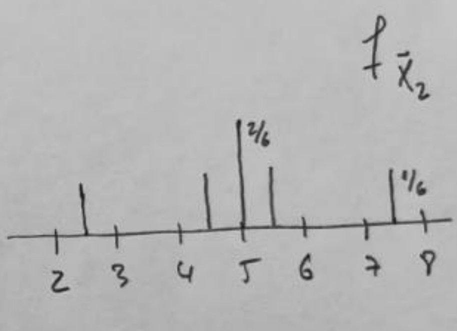
2	3	7	8

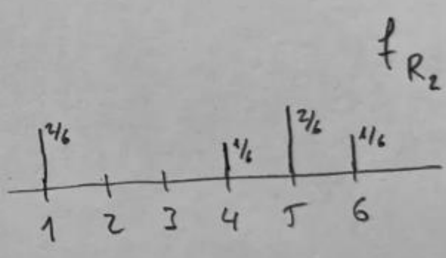
	$\bar{X}_2^e$
(2, 7)	4.5
(2, 8)	5
(3, 7)	5
(3, 8)	5.5



2	3	7	8

	$\bar{X}_2$	R_2
(2, 3)	2.5	1
(2, 7)	4.5	5
(2, 8)	5	6
(3, 7)	5	4
(3, 8)	5.5	5
(7, 8)	7.5	1



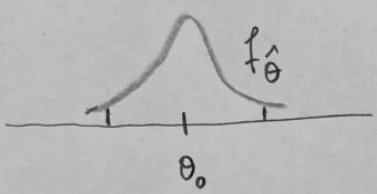


CONTRASTE DE HIPÓTESIS

$H_0: \theta = \theta_0$

$H_1: \theta \neq \theta_0$

$\mu = 170$	$p = 0.5$	$\mu_1 - \mu_2 = 0$	$p_1 - p_2 = 0$	$\rho = 0$	$\chi^2 = 0$	$b = 0$	$OR = 1$
$\mu \neq 170$	$p \neq 0.5$	$\mu_1 - \mu_2 = 0$	$p_1 - p_2 \neq 0$	$\rho \neq 0$	$\chi^2 > 0$	$b \neq 0$	$OR \neq 1$



Aceptamos Ho como cierta:

$E(\hat{\theta}) = \theta_0$

$EE(\hat{\theta})$ conocido

Distribución $f_{\hat{\theta}}$ localizada

Si $\hat{\theta}$ cae aquí $p < 0.05$

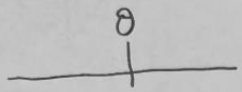
$\underbrace{\hspace{3em}}$ Si $\hat{\theta}$ cae aquí dentro $p > 0.05$

Si $\hat{\theta}$ cae aquí $p < 0.05$

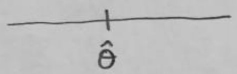
$p \geq 0.05 \longrightarrow$ Mantenemos Ho

$p < 0.05 \longrightarrow$ Rechazamos Ho y aceptamos H_1

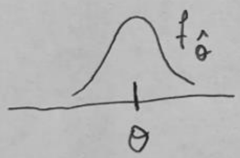
INTERVALO DE CONFIANZA



Valor poblacional — Fijo pero desconocido



Valor muestral — Conocido pero variable

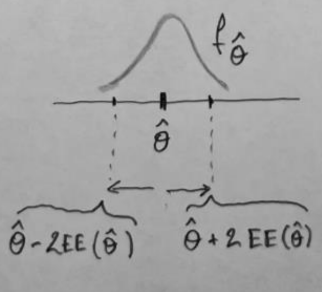


Distribución de $\hat{\theta}$

$E(\hat{\theta}) = \theta$

$EE(\hat{\theta})$ conocido

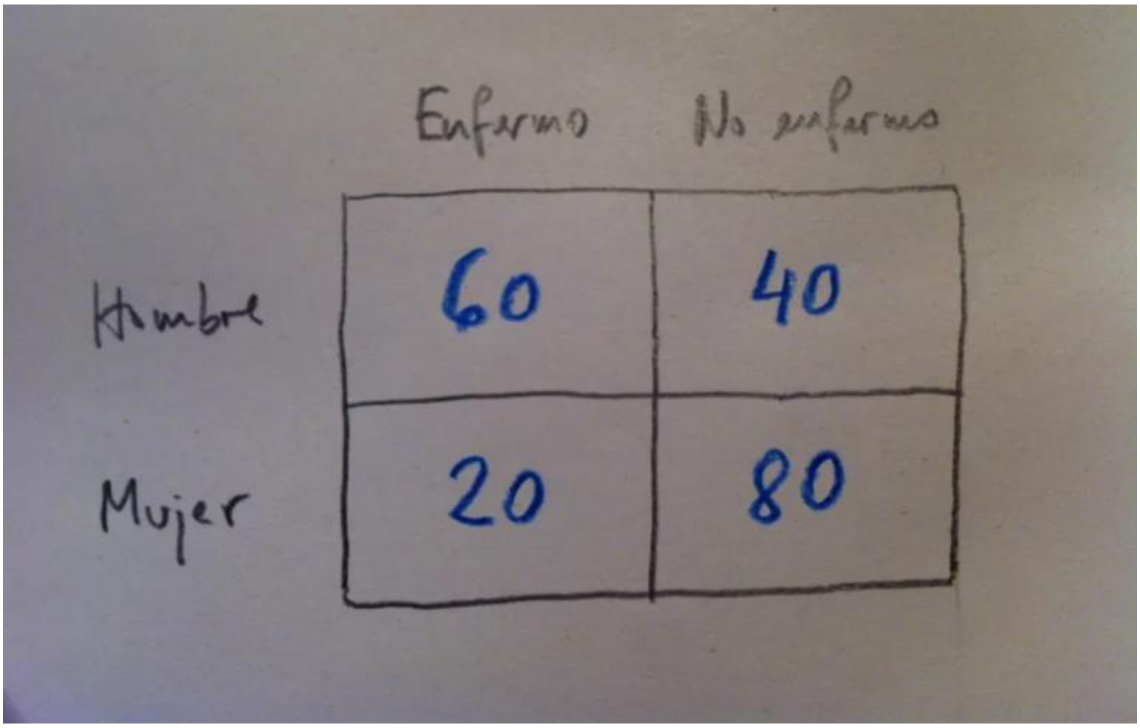
localización desconocida



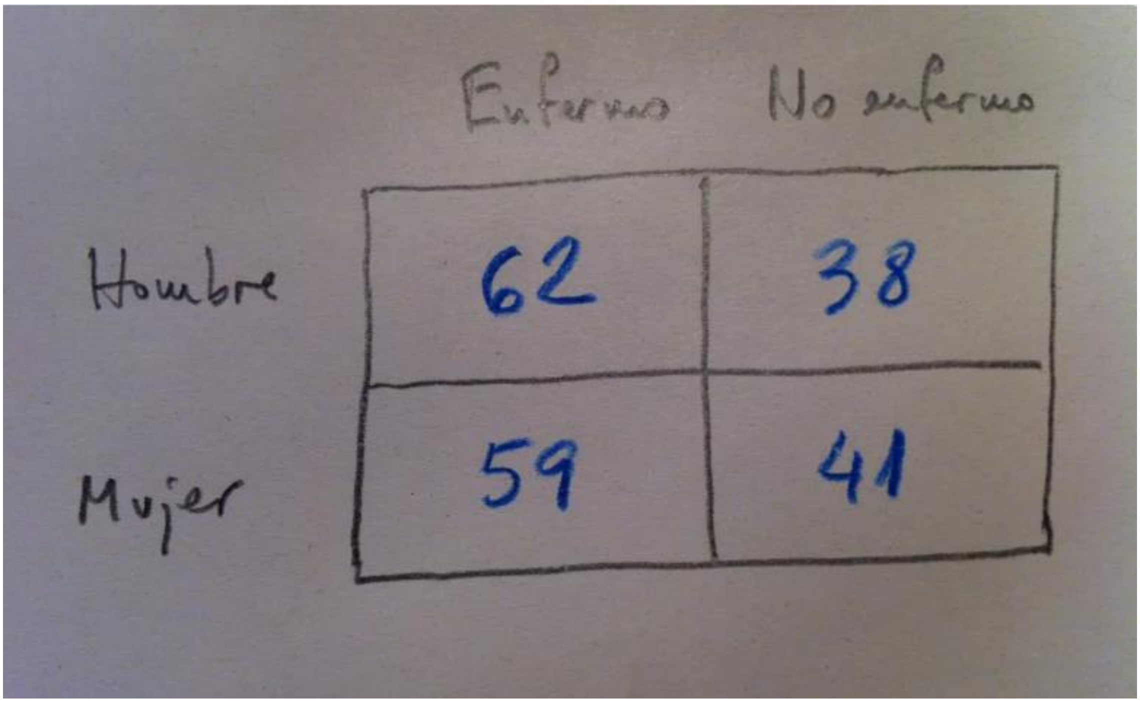
Desplazamos sobre $\hat{\theta}$, que es un valor conocido, la distribución de $\hat{\theta}$ de localización desconocida pero de distribución conocida.

Le sumamos y le restamos $2\ EE(\hat{\theta})$ para delimitar un IC 95%.

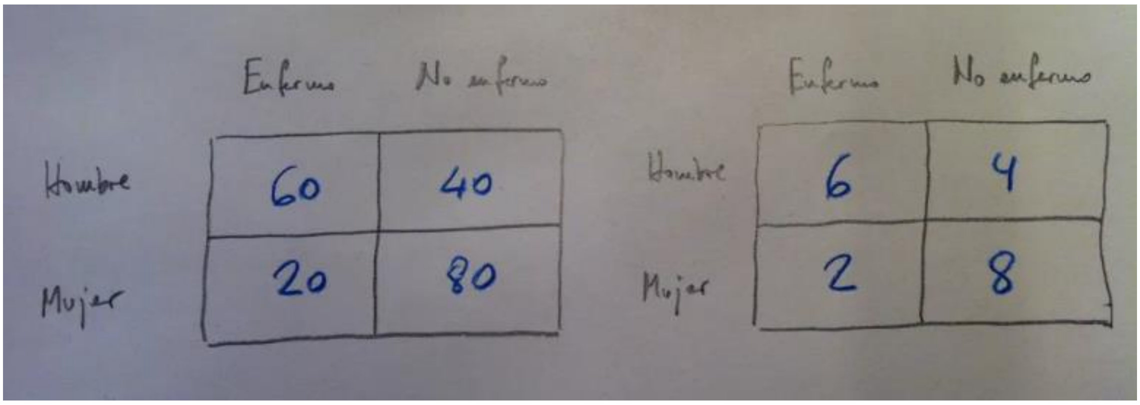
Ji-cuadrado



	Enfermo	No enfermo
Hombre	60	40
Mujer	20	80

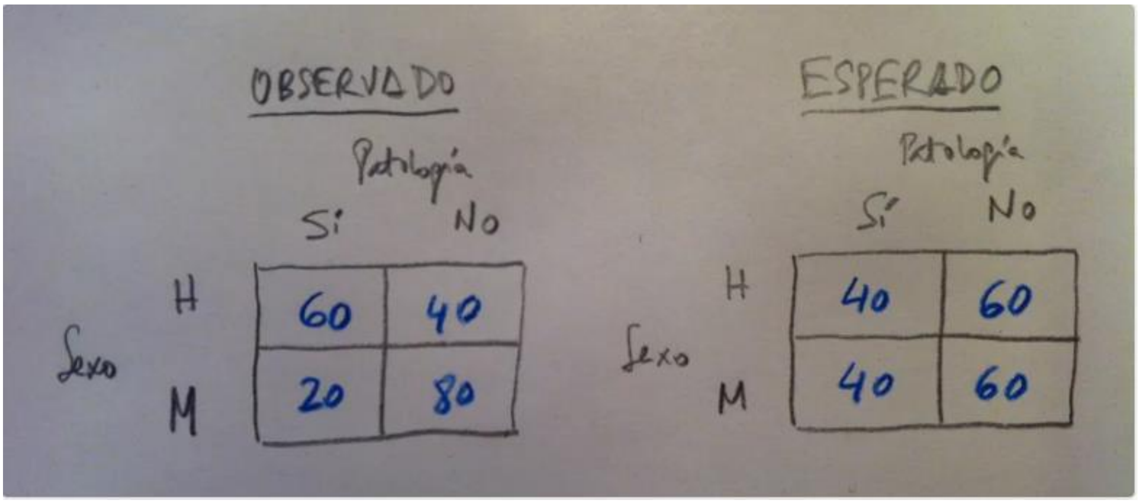


	Enfermo	No enfermo
Hombre	62	38
Mujer	59	41



	Enfermo	No enfermo
Hombre	60	40
Mujer	20	80

	Enfermo	No enfermo
Hombre	6	4
Mujer	2	8

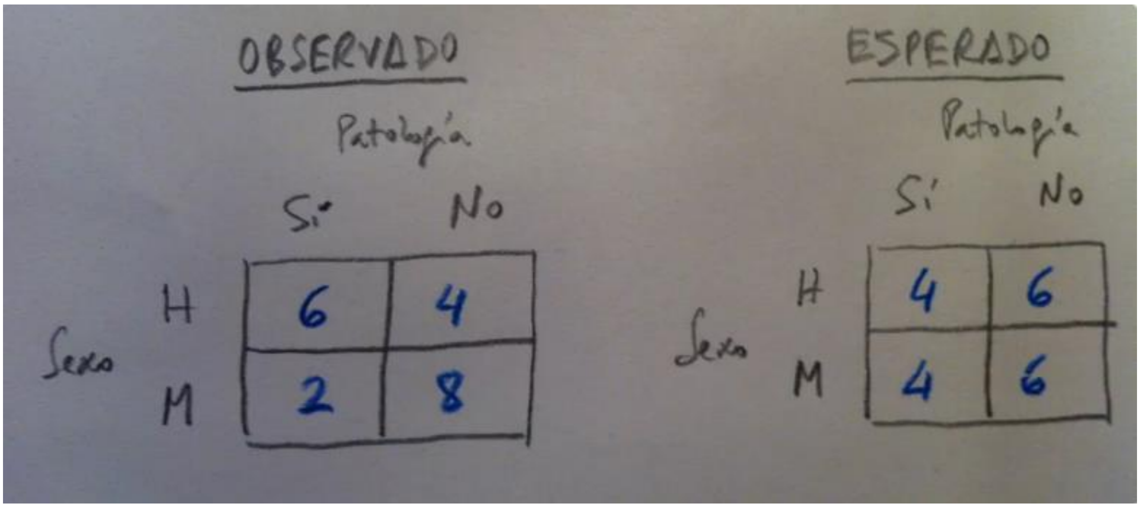


OBSERVADO

Sexo	Patología Sí	Patología No
H	60	40
M	20	80

ESPERADO

Sexo	Patología Sí	Patología No
H	40	60
M	40	60

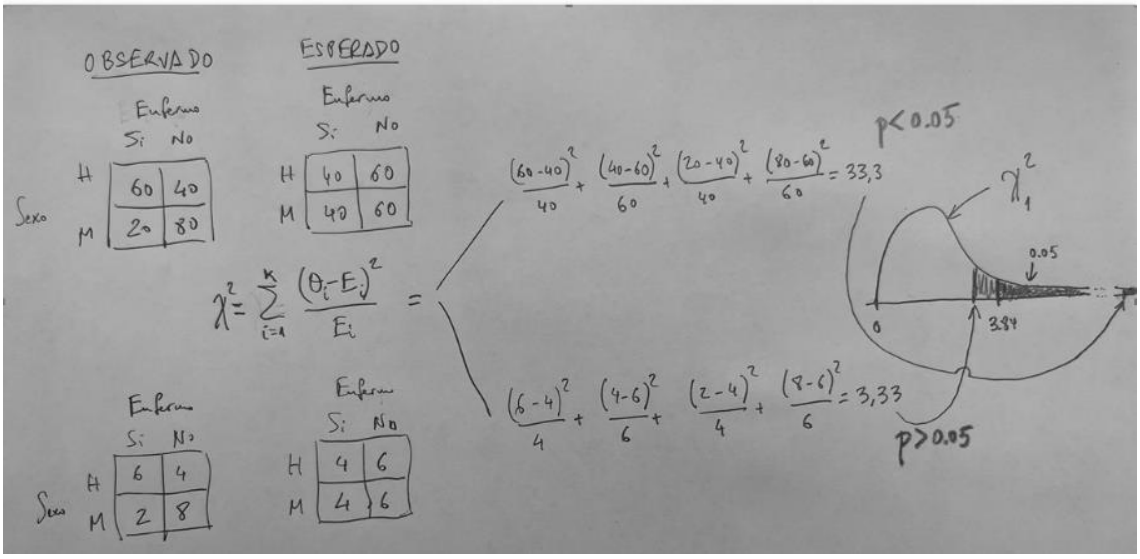


OBSERVADO

Sexo	Patología Sí	Patología No
H	6	4
M	2	8

ESPERADO

Sexo	Patología Sí	Patología No
H	4	6
M	4	6



Grupos sanguíneos	Valores teóricos (%)		Observado	Esperado	
A	32		377	320	
B	25		264	250	
AB	9		101	90	
O	34		258	340	
Total	100		1000	1000	
			ji-cuadrado=	32,06	

Table 9. Critical Values For The Chi-Square Distribution (Continued)

ν	α = .10	.05	.025	.01	.005	.001	.0005	.0001
1	2.7055	3.8415	5.0239	6.6349	7.8794	10.8276	12.1157	15.1367
2	4.6052	5.9915	7.3778	9.2103	10.5966	13.8155	15.2018	18.4207
3	6.2514	7.8147	9.3484	11.3449	12.8382	16.2662	17.7300	21.1075
4	7.7794	9.4877	11.1433	13.2767	14.8603	18.4668	19.9974	23.5127
5	9.2364	11.0705	12.8325	15.0863	16.7496	20.5150	22.1053	25.7448
6	10.6446	12.5916	14.4494	16.8119	18.5476	22.4577	24.1028	27.8563
7	12.0170	14.0671	16.0128	18.4753	20.2777	24.3219	26.0178	29.8775
8	13.3616	15.5073	17.5345	20.0902	21.9550	26.1245	27.8680	31.8276
9	14.6837	16.9190	19.0228	21.6660	23.5894	27.8772	29.6658	33.7199
10	15.9872	18.3070	20.4832	23.2093	25.1882	29.5883	31.4198	35.5640
11	17.2750	19.6751	21.9200	24.7250	26.7568	31.2641	33.1366	37.3670
12	18.5493	21.0261	23.3367	26.2170	28.2995	32.9095	34.8213	39.1344
13	19.8119	22.3620	24.7356	27.6882	29.8195	34.5282	36.4778	40.8707
14	21.0641	23.6848	26.1189	29.1412	31.3193	36.1233	38.1094	42.5793
15	22.3071	24.9958	27.4884	30.5779	32.8013	37.6973	39.7188	44.2632
16	23.5418	26.2962	28.8454	31.9999	34.2672	39.2524	41.3081	45.9249
17	24.7690	27.5871	30.1910	33.4087	35.7185	40.7902	42.8792	47.5664
18	25.9894	28.8693	31.5264	34.8053	37.1565	42.3124	44.4338	49.1894
19	27.2036	30.1435	32.8523	36.1909	38.5823	43.8202	45.9731	50.7955
20	28.4120	31.4104	34.1696	37.5662	39.9968	45.3147	47.4985	52.3860
21	29.6151	32.6706	35.4789	38.9322	41.4011	46.7970	49.0108	53.9620
22	30.8133	33.9244	36.7807	40.2894	42.7957	48.2679	50.5111	55.5246
23	32.0069	35.1725	38.0756	41.6384	44.1813	49.7282	52.0002	57.0746
24	33.1962	36.4150	39.3641	42.9798	45.5585	51.1786	53.4788	58.6130
25	34.3816	37.6525	40.6465	44.3141	46.9279	52.6197	54.9475	60.1403
26	35.5632	38.8851	41.9232	45.6417	48.2899	54.0520	56.4069	61.6573
27	36.7412	40.1133	43.1945	46.9629	49.6449	55.4760	57.8576	63.1645
28	37.9159	41.3371	44.4608	48.2782	50.9934	56.8923	59.3000	64.6624
29	39.0875	42.5570	45.7223	49.5879	52.3356	58.3012	60.7346	66.1517
30	40.2560	43.7730	46.9792	50.8922	53.6720	59.7031	62.1619	67.6326
31	41.4217	44.9853	48.2319	52.1914	55.0027	61.0983	63.5820	69.1057
32	42.5847	46.1943	49.4804	53.4858	56.3281	62.4872	64.9955	70.5712
33	43.7452	47.3999	50.7251	54.7755	57.6484	63.8701	66.4025	72.0296
34	44.9032	48.6024	51.9660	56.0609	58.9639	65.2472	67.8035	73.4812
35	46.0588	49.8018	53.2033	57.3421	60.2748	66.6188	69.1986	74.9262
36	47.2122	50.9985	54.4373	58.6192	61.5812	67.9852	70.5881	76.3650
37	48.3634	52.1923	55.6680	59.8925	62.8833	69.3465	71.9722	77.7977
38	49.5126	53.3835	56.8955	61.1621	64.1814	70.7029	73.3512	79.2247
39	50.6598	54.5722	58.1201	62.4281	65.4756	72.0547	74.7253	80.6462
40	51.8051	55.7585	59.3417	63.6907	66.7660	73.4020	76.0946	82.0623
50	63.1671	67.5048	71.4202	76.1539	79.4900	86.6608	89.5605	95.9687
60	74.3970	79.0819	83.2977	88.3794	91.9517	99.6072	102.6948	109.5029
70	85.5270	90.5312	95.0232	100.4252	104.2149	112.3169	115.5776	122.7547
80	96.5782	101.8795	106.6286	112.3288	116.3211	124.8392	128.2613	135.7825
90	107.5650	113.1453	118.1359	124.1163	128.2989	137.2084	140.7823	148.6273
100	118.4980	124.3421	129.5612	135.8067	140.1695	149.4493	153.1670	161.3187

Table 1. *Summary statistics of delta-mean calculation of abundance (number* 100 m^{-3}*) and chi-square frequency test for day and night samples*

	Mean	s^2	m	n	**Delta-mean**	o	e	**Chi-square**
Day	5.79	3.90	317	1213	**591**±222	317	378.39	9.96
Night	5.69	3.12	427	1172	**507**±139	427	365.61	10.31
Totals			744	2385		744	744	**20.27**

The delta-means are accompanied by 95% confidence intervals. The chi-square test statistic = 20.27; degrees of freedom = 1; chi-square$_{0.95}$ = 8.84; mean is the mean of log-transformed non-zero data; s^2 = variance of log-transformed non-zero data; m = number of non-zero observations; n = total number of samples; o = observed frequency of occurrence; e = expected frequency of occurrence.

Table 2. *Seasonal delta-means and chi-square test*

	Mean	s^2	m	n	**Delta-mean**	o	e	**Chi-square**
Spring	5.98	2.95	210	691	**517**±192	210	215.56	0.14
Summer	6.26	3.61	151	471	**987**±490	151	146.93	0.11
Autumn	5.69	3.40	250	819	**486**±182	250	255.49	0.12
Winter	4.83	2.97	133	404	**177**±80	133	126.03	0.39
Totals			744	2385		744	744	**0.76**

Winter was defined as January–March; spring, April–June; summer, July–September; autumn, October–December. The chi-square value of 0.76 is less than chi-square$_{0.95}$ = 7.82. Degrees of freedom = 3.

Table 3. *Delta-mean and chi-square tests by month*

	Mean	s^2	m	n	**Delta-mean**	o	e	**Chi-square**
January	4.19	1.61	19	49	**54**±39	19	15.29	0.90
February	4.56	3.66	18	53	**160**±176	18	16.53	0.13
March	5.05	2.90	96	302	**204**±106	96	94.21	0.03
April	5.49	3.32	78	284	**333**±208	78	88.59	1.27
May	6.29	2.24	87	304	**461**±214	87	94.83	0.64
June	6.22	3.17	45	103	**988**±741	45	32.13	5.15
July	6.85	3.22	60	181	**1469**±1000	60	56.46	0.22
August	5.73	3.67	76	245	**559**±376	76	76.42	0.002
September	6.60	2.28	15	45	**666**±633	15	14.04	0.07
October	5.99	4.36	127	414	**1036**±633	127	129.15	0.04
November	5.51	1.91	67	210	**199**±94	67	65.51	0.03
December	5.22	2.62	56	195	**188**±118	56	60.83	0.38
Totals			744	2385		744	744	**8.87**

Chi-square = 8.87; chi-square$_{0.95}$ = 19.68.

Table 4. Delta-mean and chi-square statistics by year, 1977–1986

	Mean	s^2	m	n	**Delta-mean**	o	e	**Chi-square**
1977	5.72	3.45	87	271	**633**±386	87	84.54	0.07
1978	6.66	2.85	42	189	**669**±492	42	58.96	4.88
1979	5.75	2.44	73	263	**285**±151	73	82.04	1.00
1980	5.41	2.50	93	325	**217**±105	93	101.38	0.60
1981	5.73	2.11	100	346	**250**±106	100	107.93	0.58
1982	5.82	3.14	102	295	**541**±290	102	92.03	1.08
1983	5.14	5.02	36	98	**625**±664	36	30.57	0.96
1984	5.96	4.48	119	345	**1181**±755	119	107.62	1.20
1985	5.49	4.87	86	239	**916**±707	86	74.56	1.76
1986	5.42	4.96	6	14	**516**±802	6	4.37	0.61
Totals			744	2385		744	744	**12.84**

Chi-square statistic = 12.84; chi-square$_{0.95}$ = 16.92; degrees of freedom = 9.

Table 5. Delta-mean and chi-square test results by station depth (m)

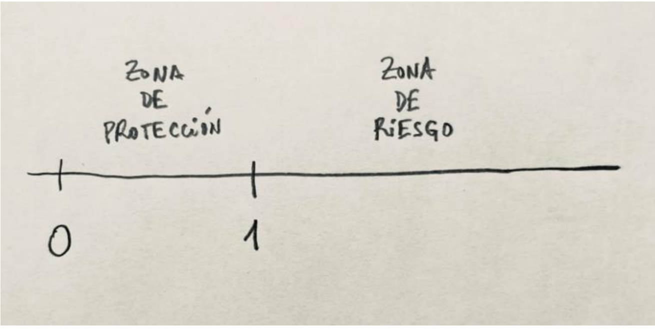
Depth	Mean	s^2	m	n	**Delta-mean**	o	e	**Chi-square**
≥ 29	6.93	5.40	54	76	**9184**±8868	54	23.71	38.70
30–39	6.52	3.69	143	231	**2563**±1304	143	72.68	69.84
40–49	6.55	2.69	143	233	**1601**±650	143	72.68	68.02
50–59	5.53	1.83	92	222	**256**±102	92	69.25	7.47
60–69	5.46	1.57	109	299	**186**±63	109	93.27	2.65
70–79	5.26	1.72	72	252	**127**±55	72	78.61	0.55
80–89	4.61	1.63	55	253	**40**±24	55	78.92	7.25
90–99	3.44	2.72	24	195	**20**±22	24	60.83	22.30
> 100	3.94	2.14	52	624	**12**±8	52	194.65	104.55
Totals			744	2385		744	744	**321.34**

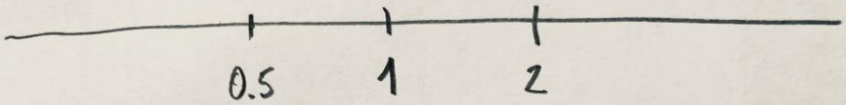
Chi-square = 321.34; chi-square$_{0.95}$ = 15.51; degrees of freedom = 8.

Odds ratio

	Casos	Controles
Expuestos	a	b
No expuestos	c	d

$$OR = \frac{\frac{a}{b}}{\frac{c}{d}}$$





	CA	CO
E	10	100
No E	20	100

$$OR = \frac{\frac{10}{100}}{\frac{20}{100}} = 0.5$$

	CA	CO
E	20	100
No E	10	100

$$OR = \frac{\frac{20}{100}}{\frac{10}{100}} = 2$$

TABLE 2. Prospective Associations Between Total Amount of Exercise at Baseline and Later Depression or Anxiety

Total Amount of Exercise Per Week	Depression[a]		Anxiety[b]	
	Odds Ratio	95% CI	Odds Ratio	95% CI
Model 1[c]				
None	1.69	1.39–2.06	1.16	0.96–1.41
Up to 30 minutes	1.29	1.10–1.52	1.16	0.99–1.35
31–59 minutes	1.14	0.96–1.35	1.15	0.99–1.34
1–2 hours	1.00		1.00	
2–4 hours	1.08	0.86–1.35	1.20	0.98–1.45
More than 4 hours	1.03	0.81–1.29	1.21	0.99–1.48

Actividad	Depresión	No depresión
Ninguna	169	10000
Hasta 30 min	129	10000
31-59 min	114	10000
1-2 h	100	10000
2-4 h	108	10000
Más de 4 h	103	10000

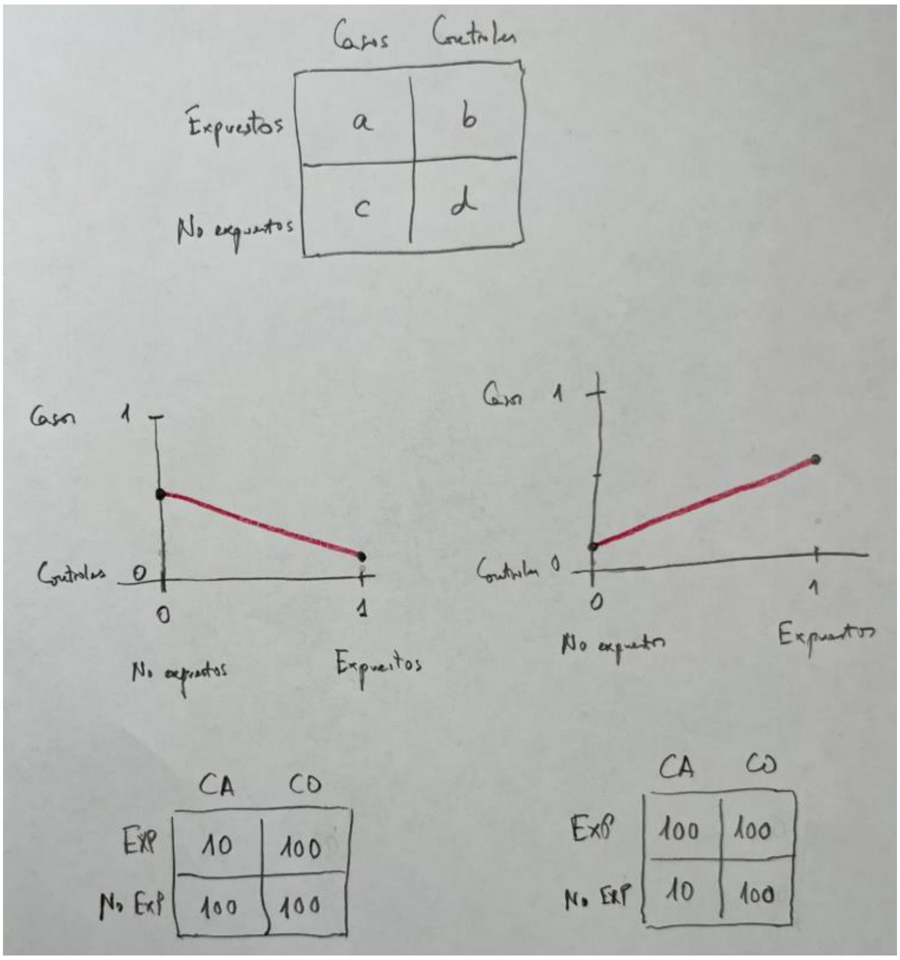
	Casos	Controles	
Exp	169	10000	Ninguna
No exp	100	10000	1-2 h.

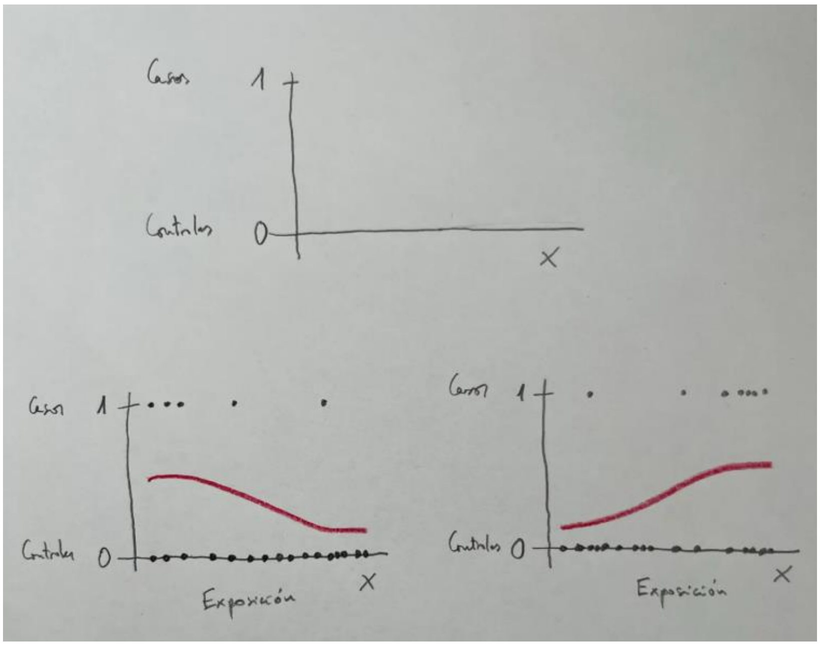
OR = 1.69

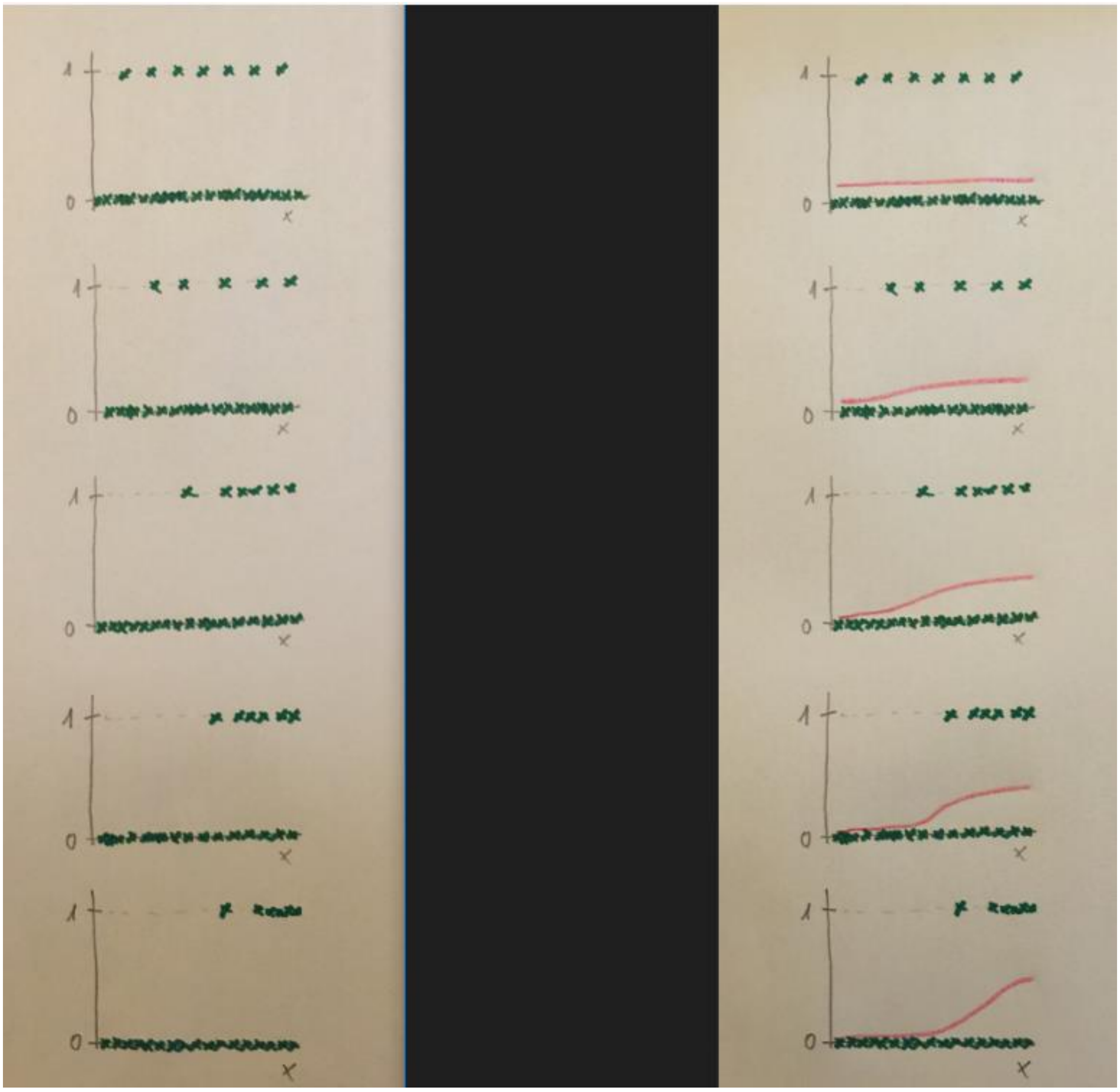
	Casos	Controles	
Exp	100	10000	1-2 h
No exp	169	10000	Ninguna

OR = 0.59

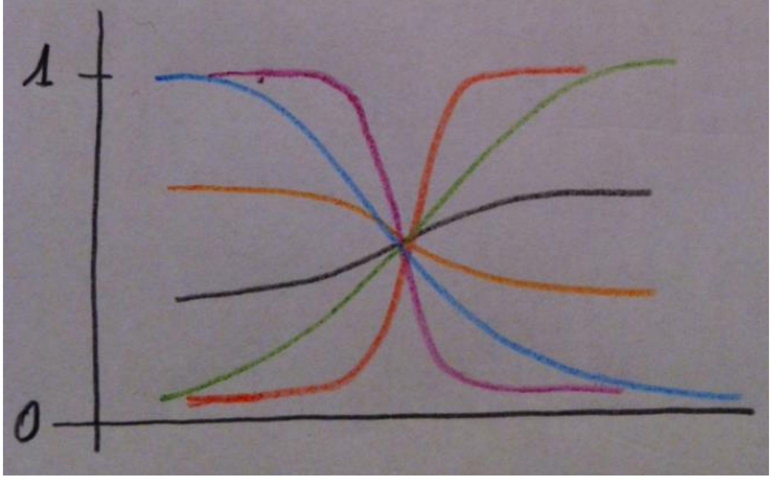
Regresión logística

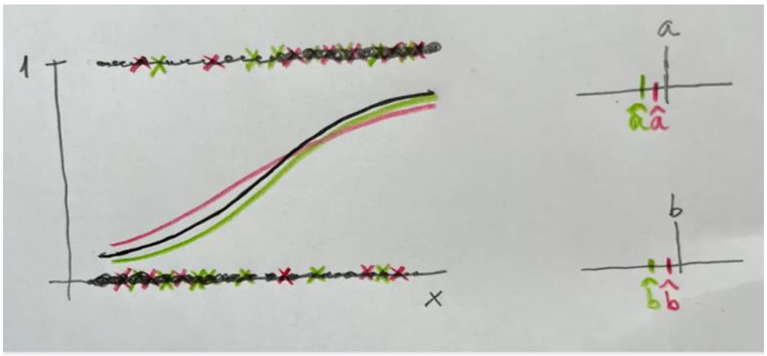






$$y = \frac{e^{a+bx}}{1+e^{a+bx}}$$





$$OR = e^{b}$$

Table 2. Logistic regression analysis of risk factors for leptospirosis in stranded California sea lions, California, 2004.

Risk factor[a]	Odds ratio	95% confidence interval	p
Season			
Winter	1.00	0.00	–
Spring	0.43	0.08–2.31	0.329
Summer	16.74	4.32–64.90	0.000
Autumn	11.61	2.95–45.71	0.000
Dog-park density per stranding site hydrologic unit	1.95	1.18–3.22	0.009
Distance to dog park (km)	0.75	0.60–0.93	0.009

[a] Adjusted for age class and sex.

Table 5. Associations between phytoplankton cell counts and incident illness occurring during the 10- to 12-day period between the beach visit and the follow-up telephone interview among beachgoers who reported body immersion in water.

	Gastrointestinal illness (n = 11,832)		Respiratory illness (n = 11,160)		Eye irritation (n = 12,013)		Rash (n = 11,857)		Earache (n = 11,947)	
Phytoplankton group	Cases (%)	OR (95% CI)	Cases (%)	OR (95% CI)	Cases (%)	OR (95% CI)	Cases (%)	OR (95% CI)	Cases (%)	OR (95% CI)
All groups combined										
≤ Q1	174 (5.0)	1	227 (6.9)	1	114 (3.2)	1	156 (4.5)	1	57 (1.6)	1
> Q1 to < Q3	211 (4.5)	0.91 (0.74, 1.12)	315 (7.1)	1.03 (0.86, 1.23)	144 (3.0)	0.93 (0.72, 1.19)	199 (4.2)	0.95 (0.77, 1.18)	96 (2.0)	1.25 (0.90, 1.74)
≥ Q3	178 (4.9)	1.00 (0.80, 1.24)	244 (7.1)	1.02 (0.85, 1.24)	155 (4.2)	1.30 (1.01, 1.66)	206 (5.6)	1.27 (1.02, 1.57)	76 (2.1)	1.25 (0.88, 1.77)
Bacillariophyta										
≤ Q1	142 (4.4)	1	189 (6.1)	1	110 (3.3)	1	170 (5.2)	1	54 (1.6)	1
> Q1 to < Q3	281 (5.0)	1.13 (0.92, 1.39)	405 (7.7)	1.28 (1.07, 1.54)	223 (3.9)	1.18 (0.94, 1.49)	279 (5.0)	0.97 (0.80, 1.18)	118 (2.1)	1.29 (0.93, 1.79)
≥ Q3	140 (4.7)	1.06 (0.83, 1.35)	192 (6.8)	1.10 (0.89, 1.35)	80 (2.7)	0.78 (0.58, 1.05)	112 (3.8)	0.73 (0.57, 0.94)	57 (1.9)	1.15 (0.79, 1.68)
Cyanobacteria										
≤ Q1	173 (5.0)	1	187 (5.8)	1	114 (3.3)	1	144 (4.2)	1	55 (1.6)	1
> Q1 to < Q3	226 (4.4)	0.87 (0.71, 1.06)	354 (7.4)	1.30 (1.08, 1.56)	161 (3.1)	0.96 (0.75, 1.22)	236 (4.6)	1.12 (0.90, 1.39)	101 (2.0)	1.25 (0.89, 1.74)
≥ Q3	164 (5.0)	0.98 (0.79, 1.22)	245 (7.8)	1.37 (1.12, 1.67)	138 (4.1)	1.25 (0.97, 1.62)	181 (5.5)	1.32 (1.05, 1.66)	73 (2.2)	1.35 (0.95, 1.93)
Picocyanophytes										
None	397 (4.8)	1	527 (6.7)	1	281 (3.3)	1	407 (4.9)	1	155 (1.8)	1
Any	166 (4.7)	0.96 (0.80, 1.16)	259 (7.8)	1.13 (0.97, 1.32)	132 (3.7)	1.10 (0.89, 1.36)	154 (4.3)	0.90 (0.74, 1.09)	74 (2.1)	1.11 (0.83, 1.47)
Dinophyta										
≤ Q1	128 (4.5)	1	192 (7.2)	1	96 (3.3)	1	151 (5.3)	1	64 (2.2)	1
> Q1 to < Q3	275 (5.3)	1.22 (0.98, 1.51)	358 (7.2)	1.01 (0.84, 1.21)	185 (3.5)	1.04 (0.81, 1.33)	243 (4.6)	0.84 (0.68, 1.04)	87 (1.6)	0.72 (0.52, 1.01)
≥ Q3	160 (4.3)	0.97 (0.76, 1.23)	236 (6.7)	0.95 (0.78, 1.15)	132 (3.5)	1.05 (0.80, 1.37)	167 (4.4)	0.82 (0.65, 1.03)	78 (2.1)	0.93 (0.67, 1.30)

Abbreviations: CI, confidence interval; OR, adjusted odds ratio; Q1, 25th percentile; Q3, 75th percentile. Models adjusted for age (as a continuous variable) and sex. Denominator for the case percentage is the total number in the exposure group.

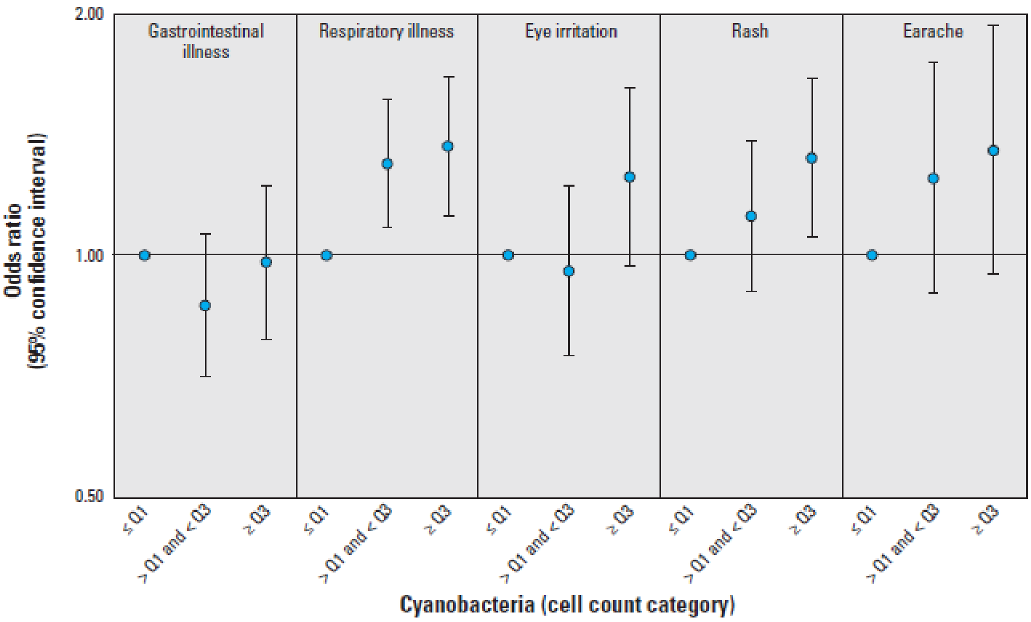


Figure 2. Associations between Cyanobacteria cell count and illness among beachgoers who reported body immersion in water. Models adjusted for age (as a continuous variable) and sex. Q1 = 25th percentile; Q3 = 75th percentile.

Table 1. Associations with sanitation indicators, estimated using the best-fitting geostatistical models

Variable	Natural floor,[†] odds ratio (95% CrI)	No piped water,[‡] odds ratio (95% CrI)	No toilet facility,[‡] odds ratio (95% CrI)
Maternal education vs. no education	0.30 (0.26, 0.34)	0.25 (0.21, 0.28)	0.23 (0.20, 0.27)
Maternal age in years*	0.99 (0.94, 1.05)	1.01 (1.05, 1.07)	1.08 (1.03, 1.14)
No. members in household*	0.86 (0.82, 0.90)	0.91 (0.87, 0.97)	0.88 (0.84, 0.92)
Rural vs. urban	3.46 (3.03, 3.90)	10.80 (9.58, 12.42)	3.71 (3.16, 4.31)

*Variables were standardized to have mean = 0 and SD = 1.
[†]Cubic model. CrI, credible interval.
[‡]Quadratic model.

Table 2. Associations with prevalence of schistosomiasis in children in Burkina Faso, Ghana, and Mali, estimated using the best-fitting geostatistical models considering estimation uncertainty of sanitary indicators at parasitological survey locations

Variable	*S. hematobium*, odds ratio (95% CrI)	*S. mansoni*, odds ratio (95% CrI)
Female vs. male	0.75 (0.70, 0.80)	0.63 (0.52, 0.76)
Age 10–19 vs. 5–9 y	1.48 (1.35, 1.62)	1.55 (1.28, 1.86)
DPWB	0.23 (0.18, 0.48)	0.01 (0.0003, 0.46)
LST	0.97 (0.53, 1.70)	34.81 (0.84, 1248.88)
NDVI	0.69 (0.47, 0.96)	0.91 (0.50,1.77)
Natural floor vs. other floor type	1.43 (0.29, 8.17)	1.31 (0.17, 34.12)
No piped water vs. with piped water	4.18 (1.22, 17.81)	2.16 (0.06, 57.97)
No toilet facility vs. with toilet	0.39 (0.09, 1.58)	0.05 (0.003, 0.70)
ϕ, rate of decay of spatial correlation	2.60 (1.86, 3.53)	2.98 (1.26, 8.29)
σ^2, variance of spatial random effect	5.20 (3.97, 7.82)	13.37 (8.14, 21.87)

CrI, credible interval; DPWB, distance to perennial water body; LST, land surface temperature; NDVI, normalized difference vegetation index.

Table 2
Results of logistic regression[a]

Variables	Mean	S.D.	Coeff	SE	p	OR	Low 95%	High 95%
W_d (m)	59	75	−0.0080	0.0031	0.0096	0.99	0.986	0.998
S_t	0.92	0.27	0.15	0.51	0.77	1.2	0.42	3.2
A_n	0.37	0.48	−0.079	0.28	0.78	0.92	0.53	1.6
C_r	0.44	0.50	0.58	0.27	0.033	1.8	1.1	3.0
pH	6.9	1.0	−0.98	0.15	0.0018	0.38	0.28	0.50

[a] SD—standard deviation; Coeff—coefficient of logistic regression; SE—standard error; p-value for Wald chi-square statistic with respect to a chi-square distribution; OR—odds ratio; Low95% or High95%—upper and lower confidence levels.

Table 2 Results of logistic regression analysis of the occurrence (presence/absence) of non-native plant species in NRI and TNC plots at Yosemite National Park, California. t = standardised logit coefficient

Regression statistics — NRI data (1989–93)

Parameter	Coefficient	SE coefficient	t	*P*	Odds ratio	95% CI Odds ratio
Elevation	–0.001	0.000	6.03	< 0.001	1.00	±0.001
Tree species	0.495	0.224	2.21	0.027	1.64	±0.740
Shrub species	0.534	0.270	1.98	0.048	1.71	±0.945
Herbaceous species	0.198	0.046	4.31	< 0.001	1.22	±0.105
Sand (%)	–0.315	0.105	3.02	0.003	0.73	±0.151
Loam (%)	0.315	0.144	2.19	0.029	1.37	±0.068

Classification table — NRI data (1989–93)

	Predicted classification		
Non-native species	Present	Not present	Total number of plots
Present	19	17	36
Not present	17	303	320

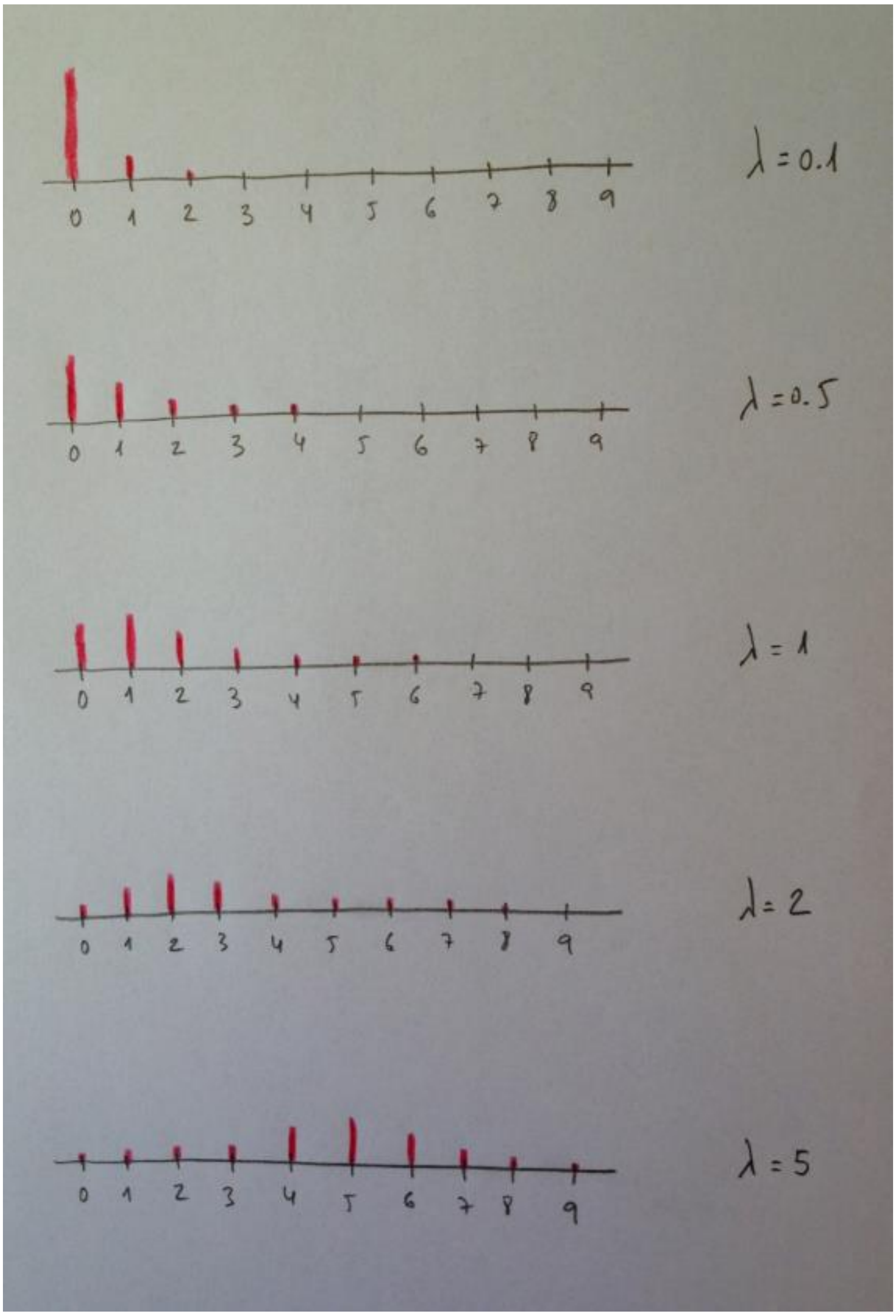
Regression statistics — TNC data (1998–99)

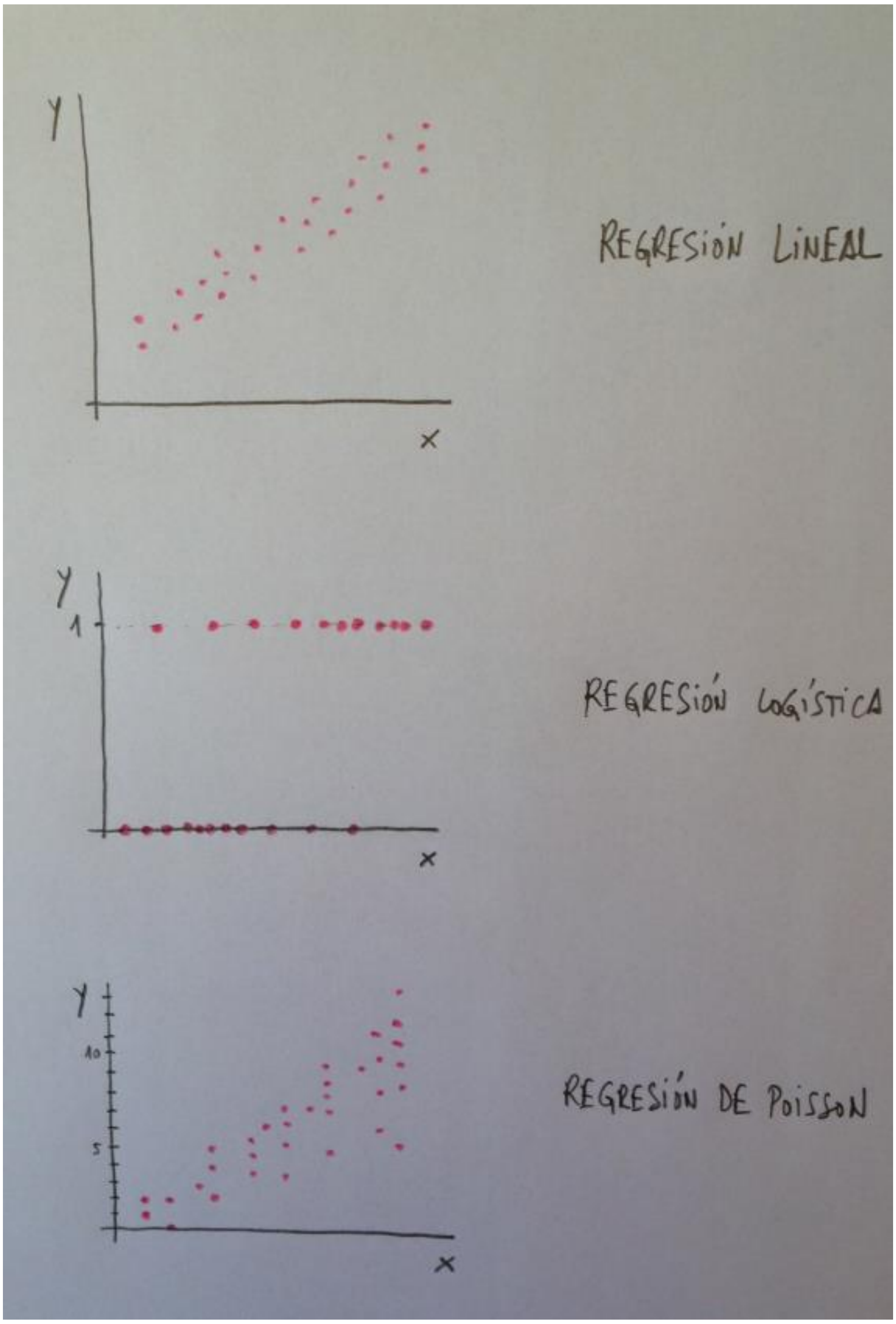
Parameter	Coefficient	SE coefficient	t	*P*	Odds ratio	95% CI odds ratio
Elevation	–0.004	0.001	5.54	< 0.001	0.996	±0.002
Slope	–0.092	0.043	2.15	0.031	0.912	±0.077
Cobble (%)	–0.409	0.154	2.65	0.008	0.664	±0.204
Herbaceous Cover (%)	0.018	0.009	1.95	0.051	1.018	±0.017

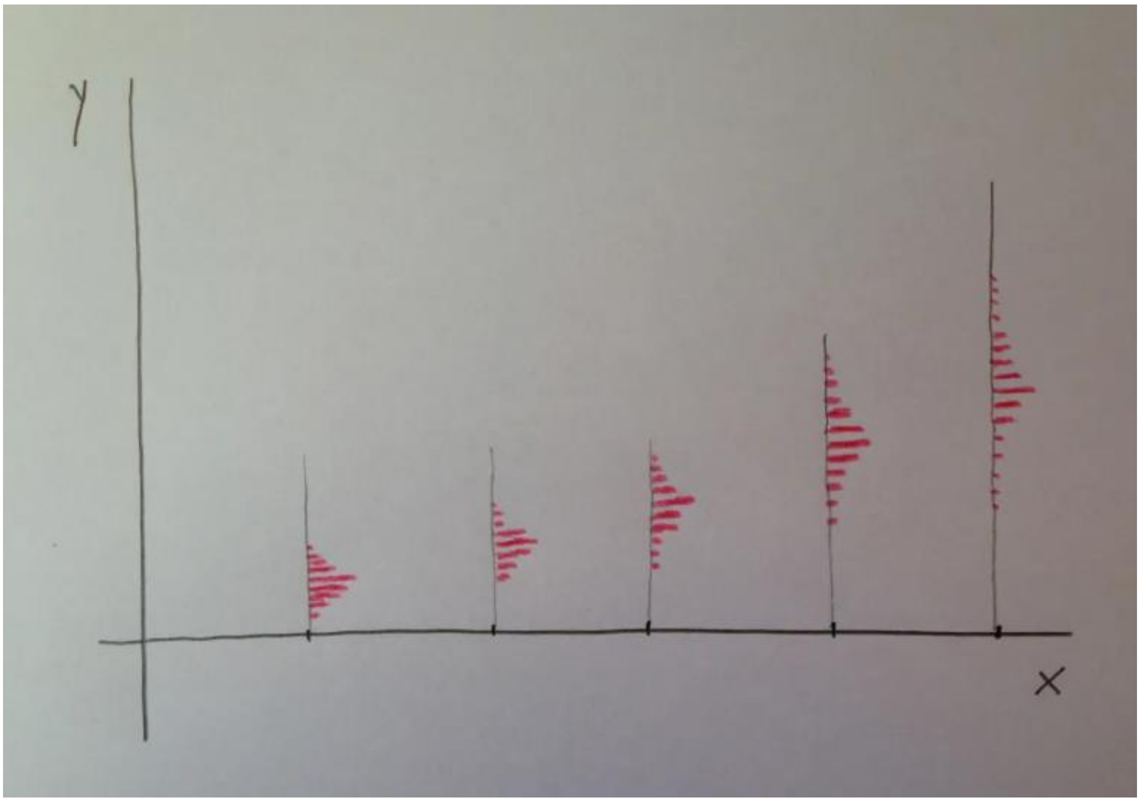
Classification table — TNC data (1998–99)

	Predicted classification		
Non-native species	Present	Not present	Total number of plots
Present	36	20	56
Not present	20	160	180

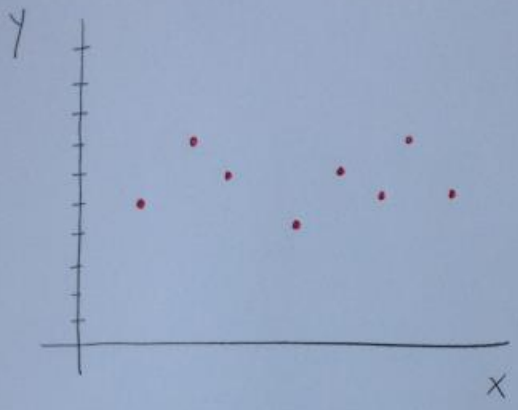
Regresión de Poisson




Y
X
REGRESIÓN LINEAL
Y
1
X
REGRESIÓN LOGÍSTICA
Y
10
5
X
REGRESIÓN DE POISSON



$$y = e^{ax+b}$$



$y = e^{ax+b}$

$a = 0.008$

$b = 1,7$

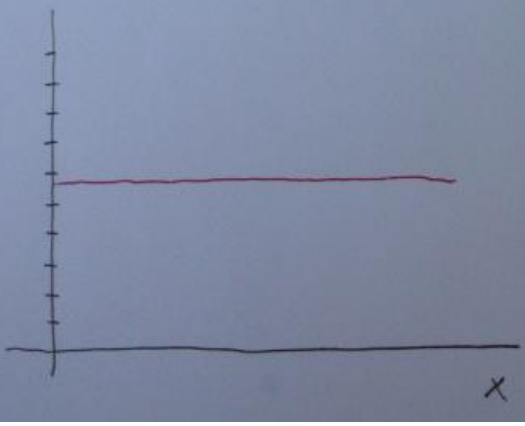
$H_0 : a = 0$

$H_1 : a \neq 0$

$p = 0,89$

Modelo final:

$y = e^{1,7} = 5,47$



$$y = e^{ax+b}$$

$a = 0{,}15$

$b = 0{,}53$

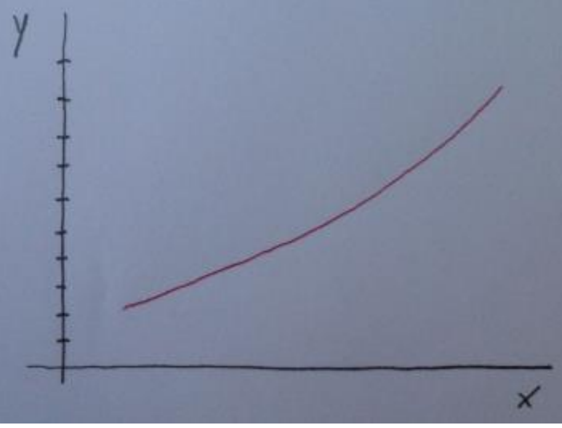
$H_0 : a = 0$

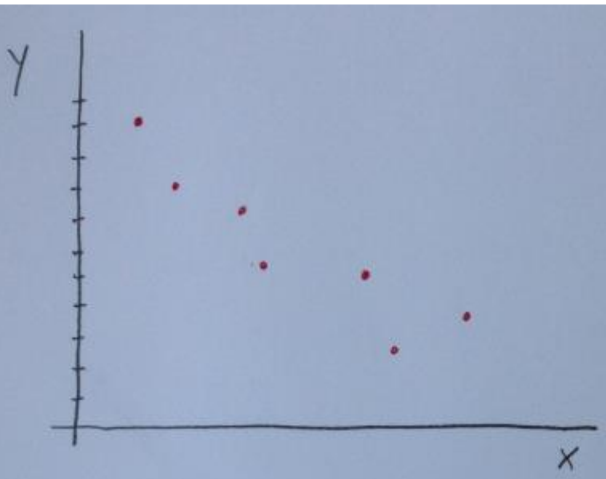
$H_1 : a \neq 0$

$p = 0{,}03$

Modelo final:

$$y = e^{0{,}15x + 0{,}53}$$





$$y = e^{ax+b}$$

$a = -0{,}15$

$b = 2{,}18$

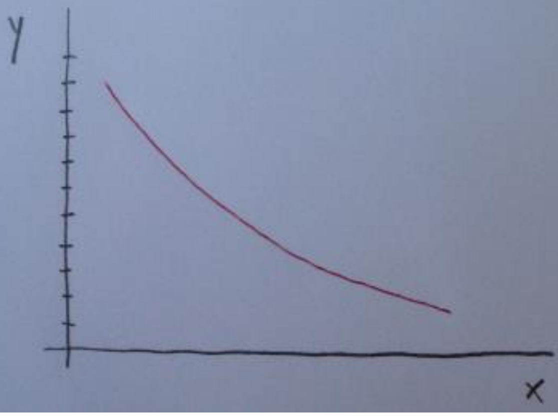
$H_0 : a = 0$

$H_1 : a \neq 0$

$p = 0{,}02$

Modelo final :

$$y = e^{-0{,}15x + 2{,}18}$$



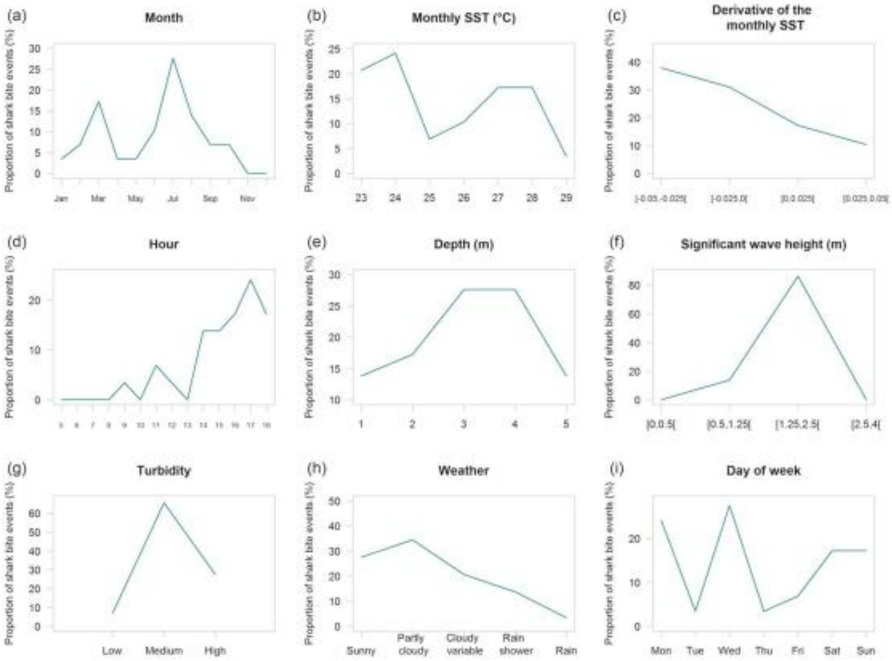


Figure 4. Frequency distribution of shark bites incidence (surfers only) across nine temporal and environmental variables: month (**a**), monthly SST (**b**), derivative of the monthly SST (**c**), hour (**d**), depth (**e**), significant wave height (**f**), turbidity (**g**), weather (**h**) and day of week (**i**).

	Estimate	Df	Deviance	Residual Df	Residual Dev	P-value	
(intercept)	-964.4 ± 213.9			1391	259.8	—	—
Year	0.5 ± 0.1	1	0.3	1390	259.4	0.560	
Substrate	1187.7 ± 221.9	1	8.3	1389	251.2	0.004	**
Period of day	-283.0 ± 224.8	1	7.0	1388	244.1	0.008	**
Derivative of the monthly SST	-17.3 ± 5.3	1	8.3	1387	235.8	0.004	**
Substrate:Year	-0.6 ± 0.1	1	44.2	1386	191.6	2.9E-11	***
Year: Period of day	0.1 ± 0.1	1	2.4	1385	189.2	0.120	

Table 1. Analysis of deviance table for the generalized linear model of shark bite incidence rate in La Réunion. Df: degree of freedom, Dev: deviance. P-value significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

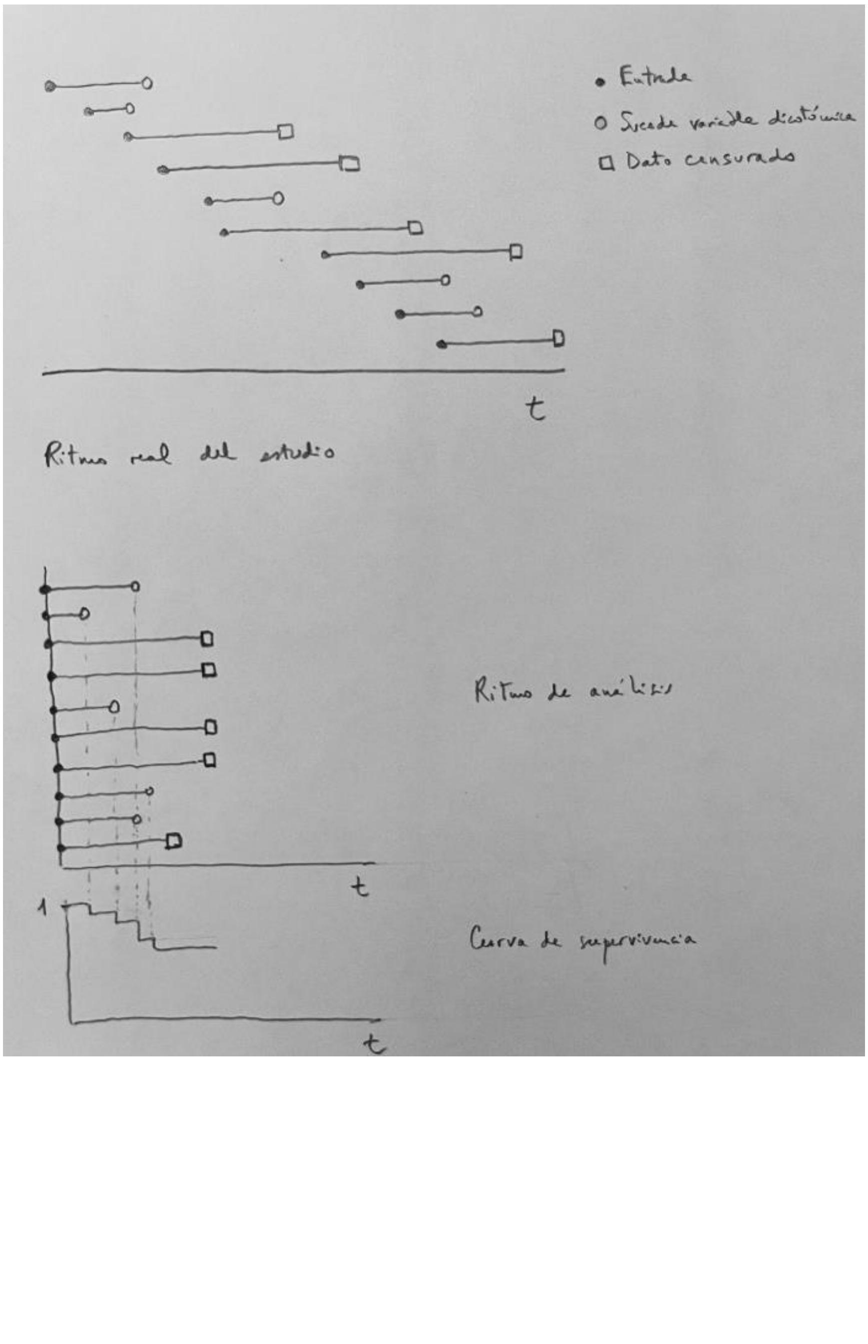
Curvas de supervivencia

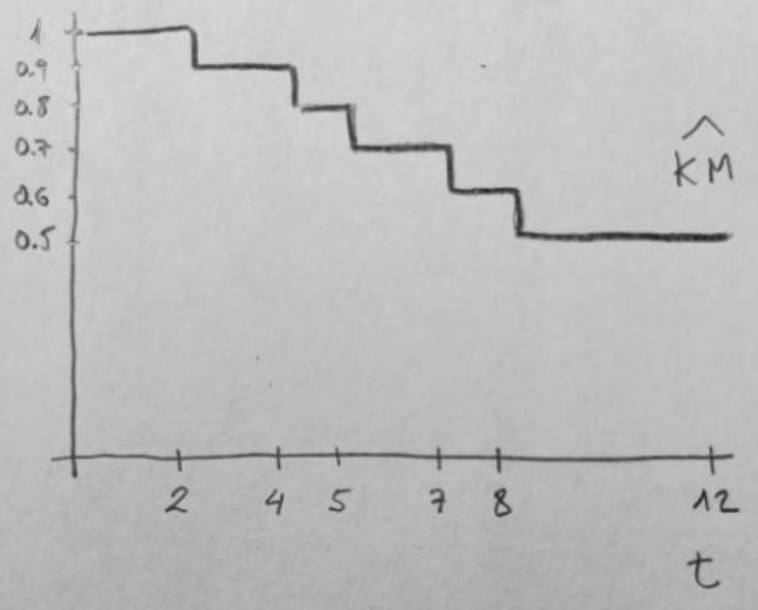
Elementos fundamentales en una Curva de supervivencia:

1) Variable dicotómica

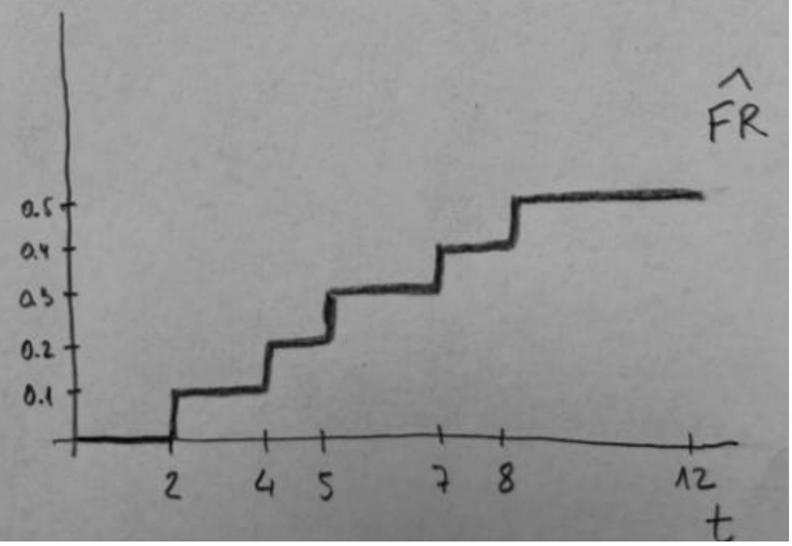
2) Tiempo

3) Seguimiento (Monitorización)





1
0.9
0.8
0.7
0.6
0.5
$\widehat{KM}$
2
4
5
7
8
12
t



$\widehat{FR}$
0.5
0.4
0.3
0.2
0.1
2
4
5
7
8
12
t

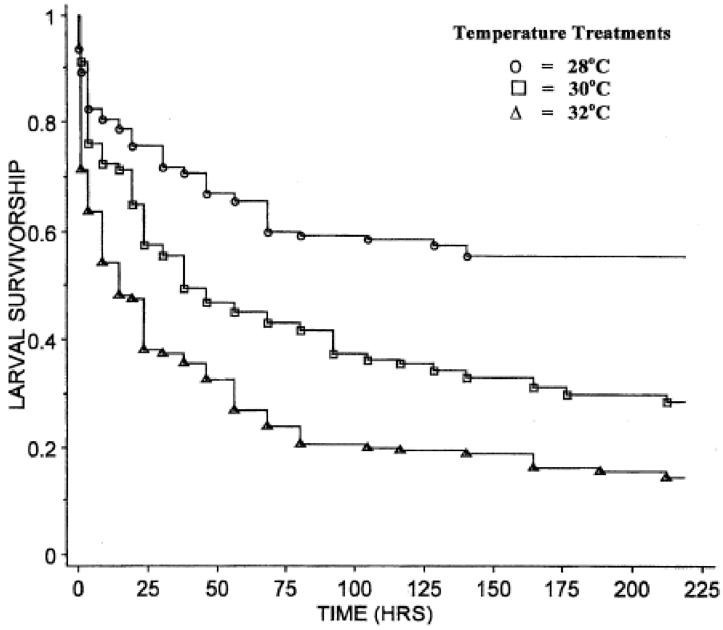


Fig. 3 *Diploria strigosa*. Survivorship in larvae under conditions of three experimental seawater temperatures (28°C, 30°C, and 32°C) through time. Step-wise curves calculated and generated using Kaplan–Meier product-limit analysis (see Parmer and Machin 1995; also see Fernandez-Pato et al. 1992 for explanation). Data pooled over ammonium-enriched treatments and shown as a function of time after exposure. Significant difference between temperature treatments (Breslow–Gahan–Wilcoxon rank test, $P < 0.001$)

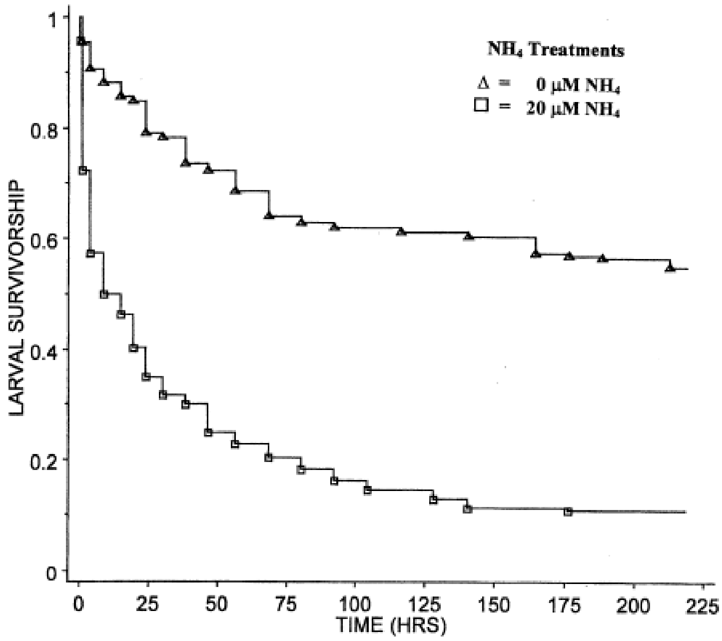
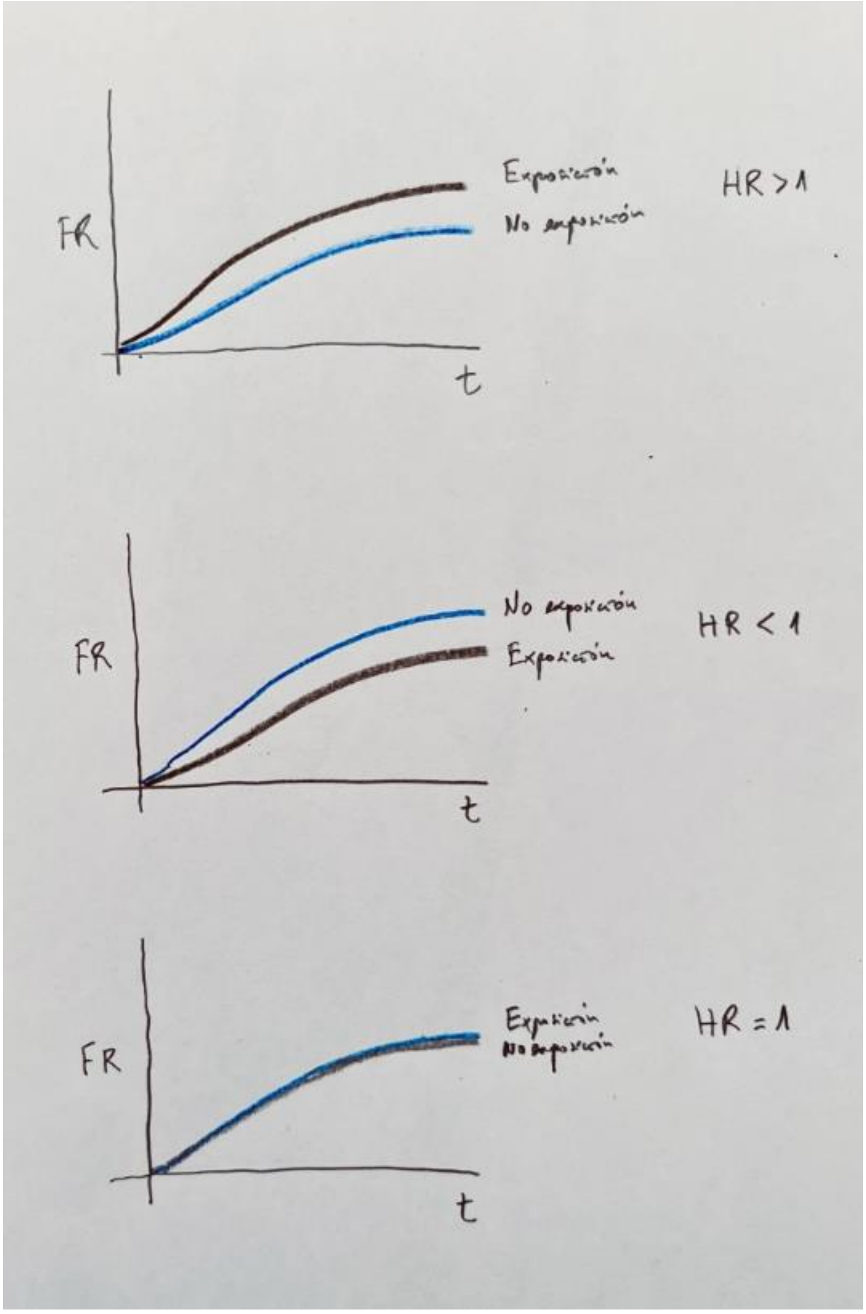


Fig. 4 *Diploria strigosa*. Survivorship in larvae under control and ammonium-enriched conditions. Curves calculated and generated using Kaplan–Meier product-limit analysis (see Parmer and Machin 1995; also see Fernandez-Pato et al. 1992 for explanation). Data pooled over temperatures and shown as a function of time after exposure. Significant difference between nutrient treatment and control (Breslow–Gahan–Wilcoxon rank test, $P < 0.001$)

Regresión de Cox



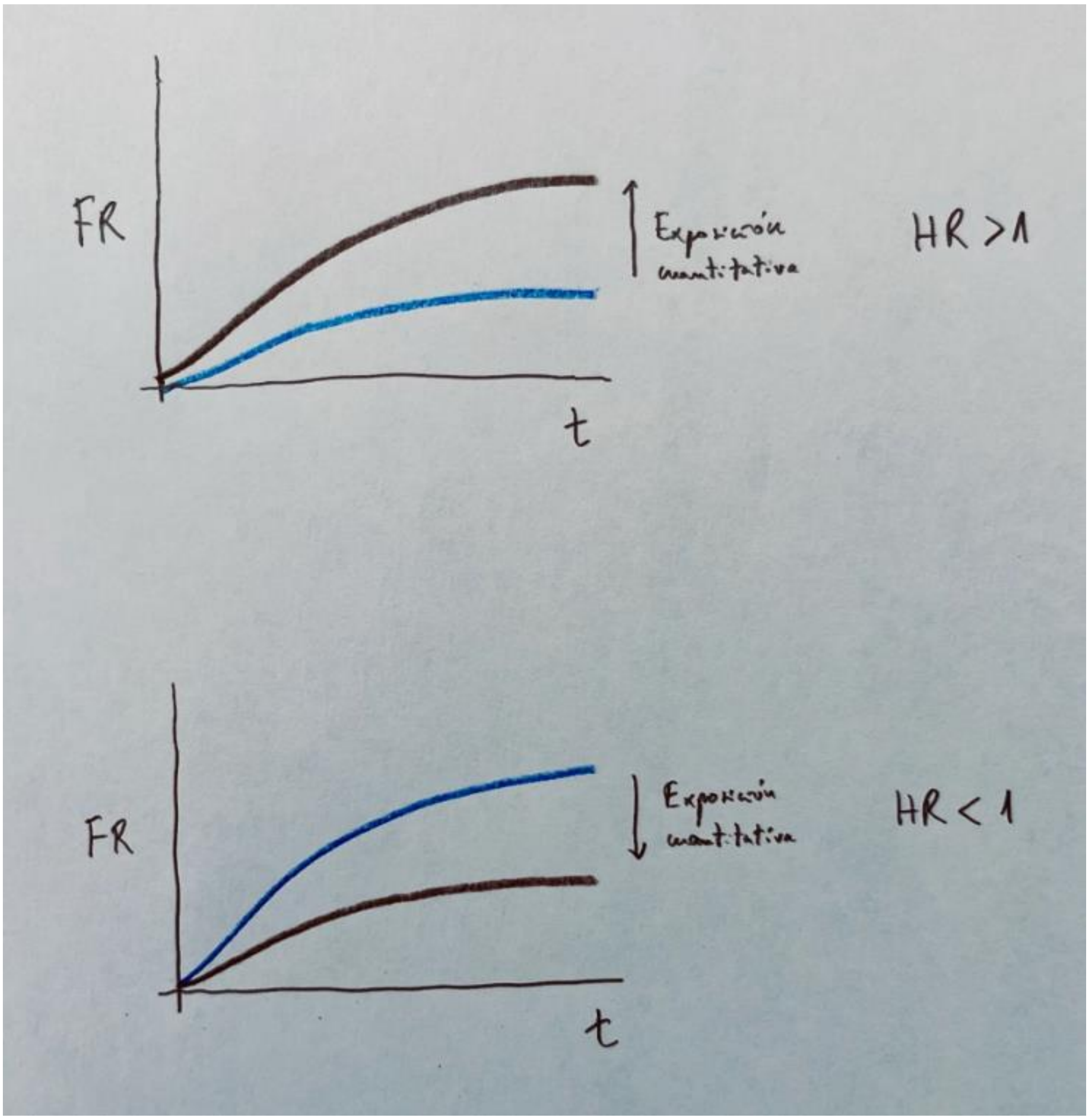

FR
Exposición cuantitativa
HR > 1
t
FR
Exposición cuantitativa
HR < 1
t

Table 4
Predictor variables in Cox regression analysis and calculated hazard ratios of the odds of reaching health-ratings of interest (≤ 3) for the Bulk-oil and WAF–oil exposure series. Significant differences based on Wald test statistics; Low concentration is not present because values are constant or linearly dependent. Hazard ratios were calculated relative to the control water treatment, 0 mg/L concentration and the species *C. delta*, respectively. Significant *p*-values ($p < 0.05$) in bold.

Variable	Cox regression variables					
	Level	**Wald**	**df**	***p***	**Hazard ratio**	**Standard error**
Bulk-oil						
Treatment	Treatment	14.908	3	**0.002**	–	–
	Bulk-oil	0.011	1	0.918	0.963	0.355
	Dispersant	7.067	1	**0.008**	2.322	0.317
	Oil/disp.	0.123	1	0.725	1.133	0.367
Concentration	Concentration	19.279	2	< **0.001**	–	–
	Medium conc.	0.272	1	0.602	0.833	0.350
	High conc.	10.795	1	**0.001**	2.500	0.279
Species	Species	0.745	2	0.689	–	–
	Paramuricea B3	0.013	1	0.908	1.027	0.231
	L. glaberrima	0.645	1	0.422	1.212	0.239
WAF–oil						
Treatment	Treatment	95.263	3	< **0.001**	–	–
	WAF–oil	0.026	1	0.872	0.957	0.276
	Dispersant	27.407	1	< **0.001**	3.404	0.234
	Oil/disp.	41.745	1	< **0.001**	4.417	0.230
Concentration	Concentration	10.977	2	**0.004**	–	–
	Medium conc.	3.912	1	**0.048**	1.342	0.149
	High conc.	10.977	1	**0.001**	1.608	0.143
Species	Species	15.701	2	< **0.001**	–	–
	Paramuricea B3	1.807	1	0.179	0.817	0.137
	L. glaberrima	4.617	1	**0.032**	1.342	0.151

Curva ROC

		Predicción	
		+	−
Realidad	+	a	b
	−	c	d

a = VP

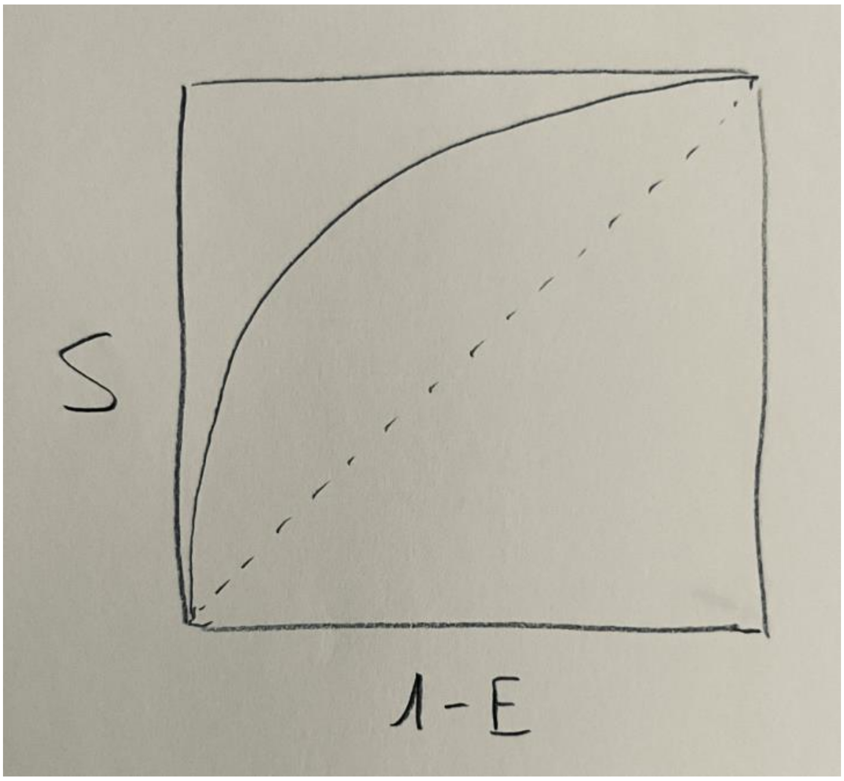
b = FN

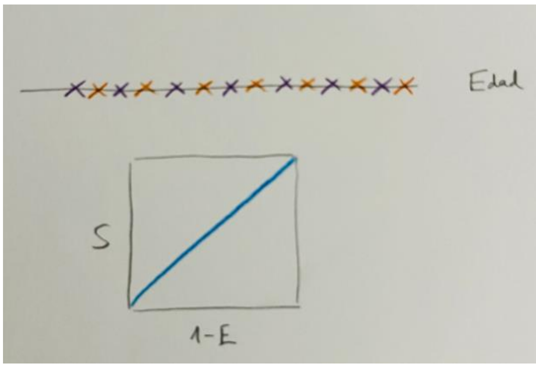
c = FP

d = VN

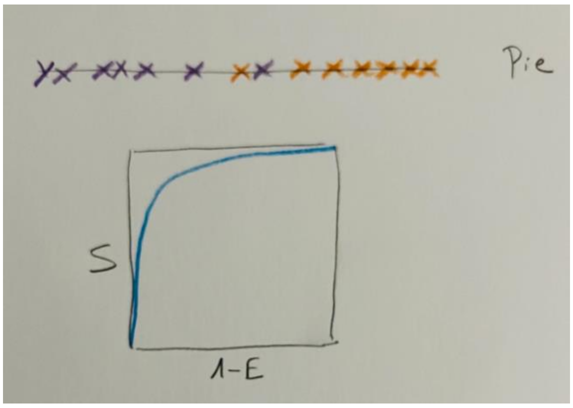
$$S = \frac{a}{a+b} \qquad E = \frac{d}{c+d}$$

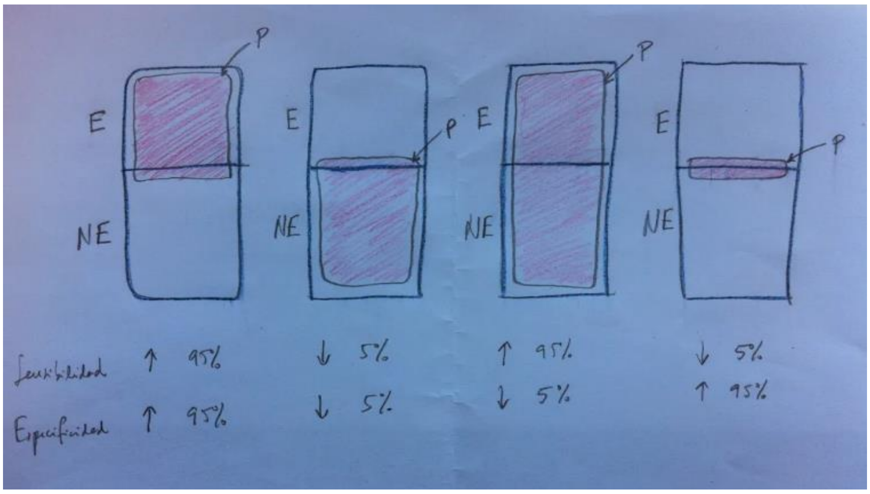
$$VPP = \frac{a}{a+c} \qquad VPN = \frac{d}{b+d}$$

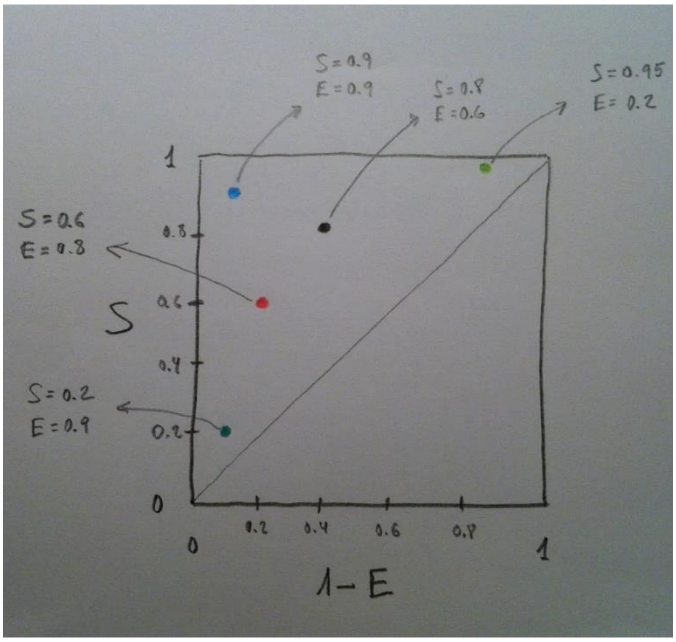

S
1-E

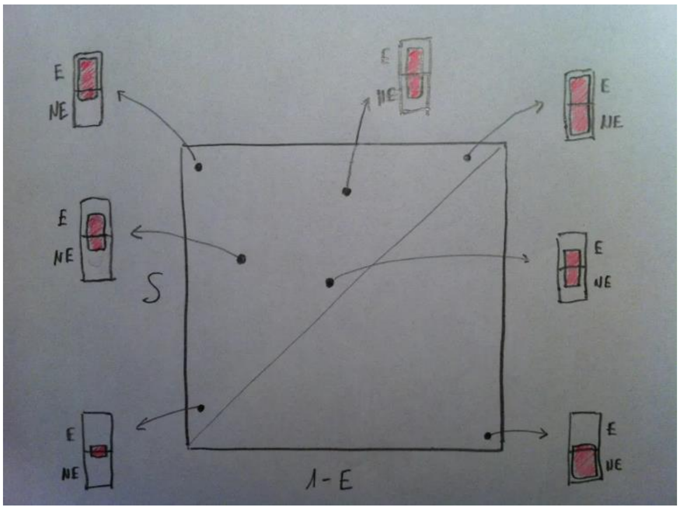

Edad
S
1-E


Altura
S
1-E

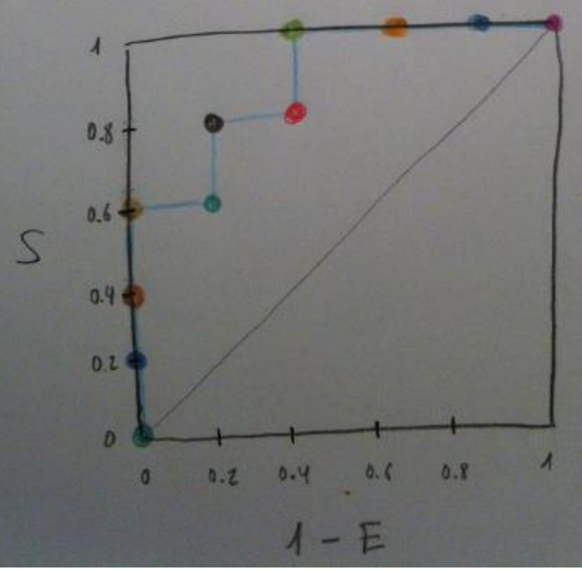

Pie
S
1-E


P
E
NE
Sensibilidad ↑ 95%
Especificidad ↑ 95%
↓ 5%
↓ 5%
↑ 95%
↓ 5%
↓ 5%
↑ 95%

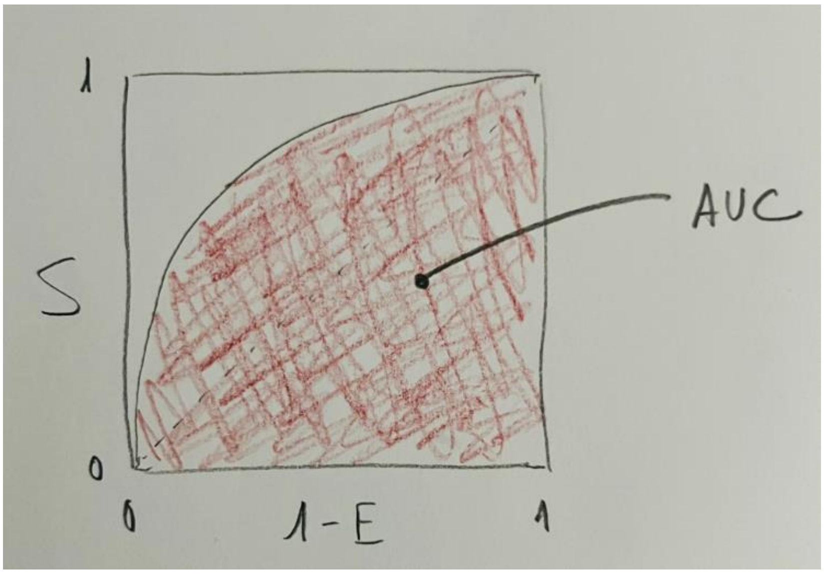

S = 0.9
E = 0.9
S = 0.8
E = 0.6
S = 0.95
E = 0.2
S = 0.6
E = 0.8
S = 0.2
E = 0.9
S
1 - E
0
0.2
0.4
0.6
0.8
1

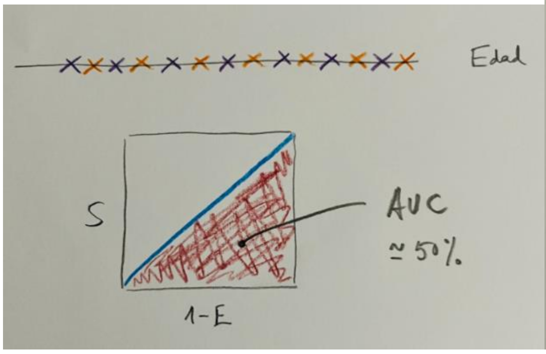

E
NE
S
1 - E

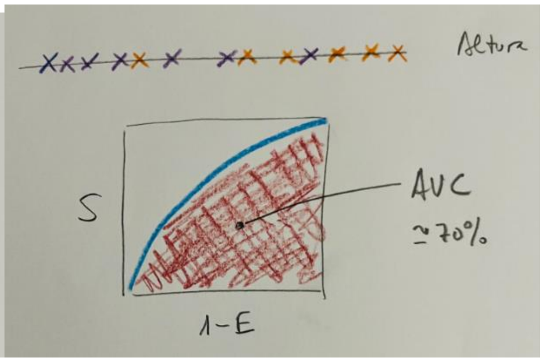
	Cutoff	S	E	1-E
♂ 185 cm	Cutoff < 160 →	1	0	1
♂ 180 cm	160 < Cutoff < 163 →	1	0.2	0.8
♂ 173 cm	163 < Cutoff < 165 →	1	0.4	0.6
♂ 169 cm	165 < Cutoff < 166 →	1	0.6	0.4
♂ 166 cm	166 < Cutoff < 168 →	0.8	0.6	0.4
♀ 172 cm	168 < Cutoff < 169 →	0.8	0.8	0.2
♀ 168cm	169 < Cutoff < 172 →	0.6	0.8	0.2
♀ 165cm	172 < Cutoff < 173 →	0.6	1	0
♀ 163cm	173 < Cutoff < 180 →	0.4	1	0
♀ 160 cm	180 < Cutoff < 185 →	0.2	1	0
	Cutoff > 185 →	0	1	0

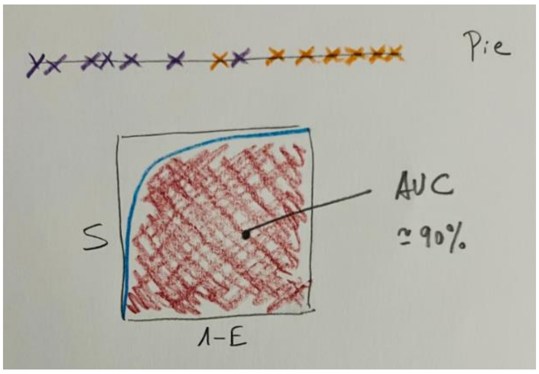


Área bajo la curva (AUC)









Índice Kappa

Medidas de la concordancia

Concordancia inter-técnicas.

Concordancia inter-operadores.

Concordancia intra-operadores (Test-retest).

Índice Kappa (K).

Técnica 2 / Operario 2 / Operario (t_2)

Técnica 1 / Operario 1 / Operario (t_1)

	V1	V2
V1	a	b
V2	c	d

	V1	V2	V3
V1	a	b	c
V2	d	e	f
V3	g	h	i

	V1	V2
V1	25	25
V2	25	25

	V1	V2	V3
V1	10	10	10
V2	10	10	10
V3	10	10	10

K bajo

	V1	V2
V1	40	10
V2	10	40

	V1	V2	V3
V1	20	5	5
V2	5	20	5
V3	5	5	20

K media

	V1	V2
V1	48	2
V2	2	48

	V1	V2	V3
V1	29	1	0
V2	1	29	0
V3	0	1	29

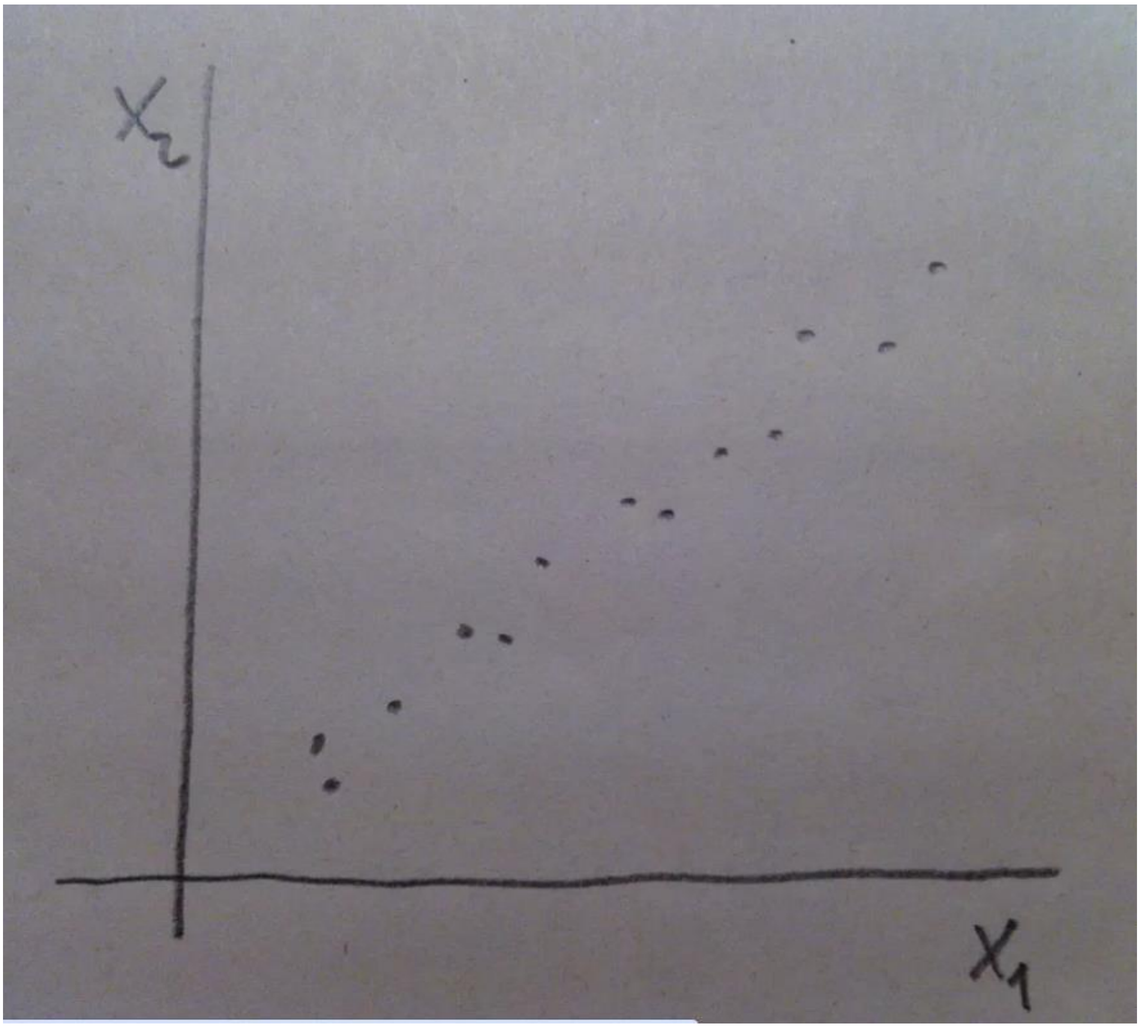
K alta

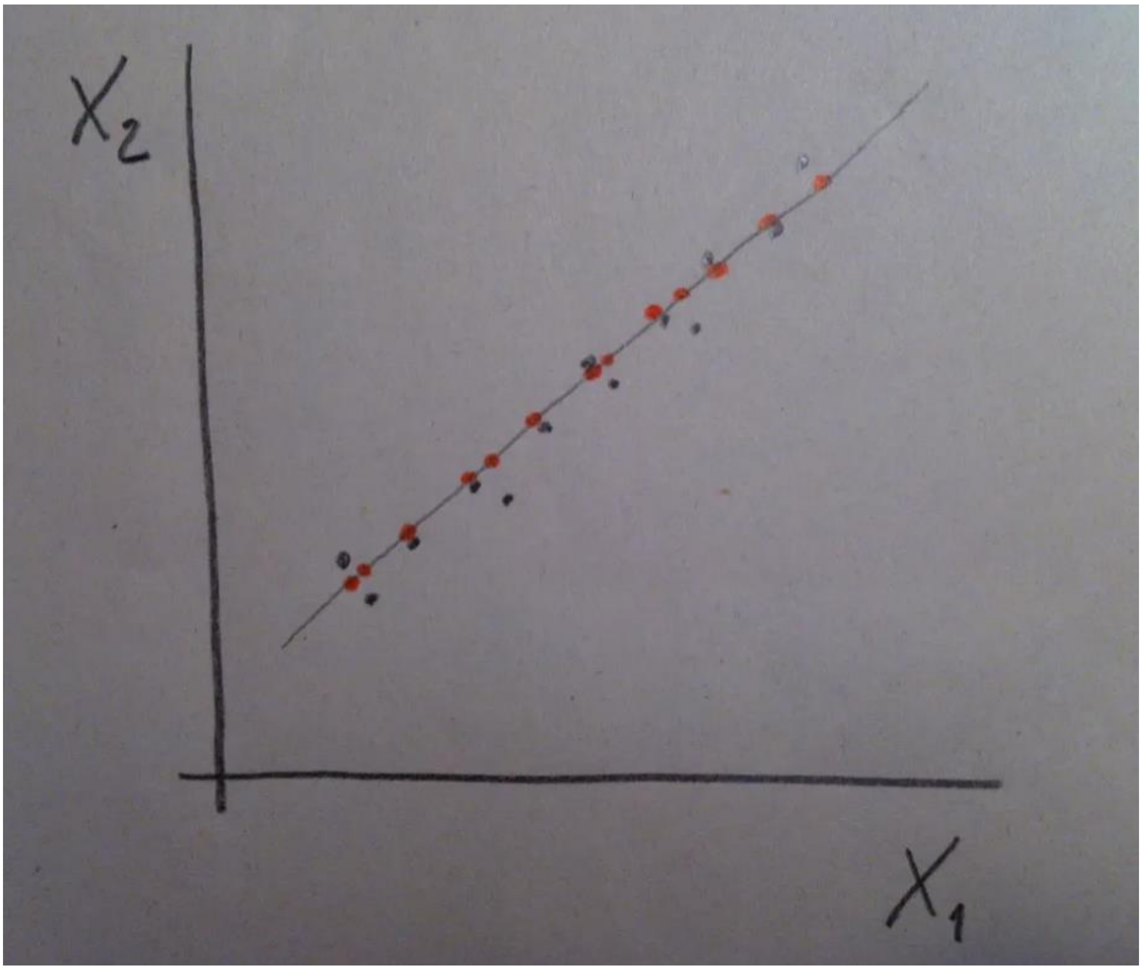
Tabla 2.

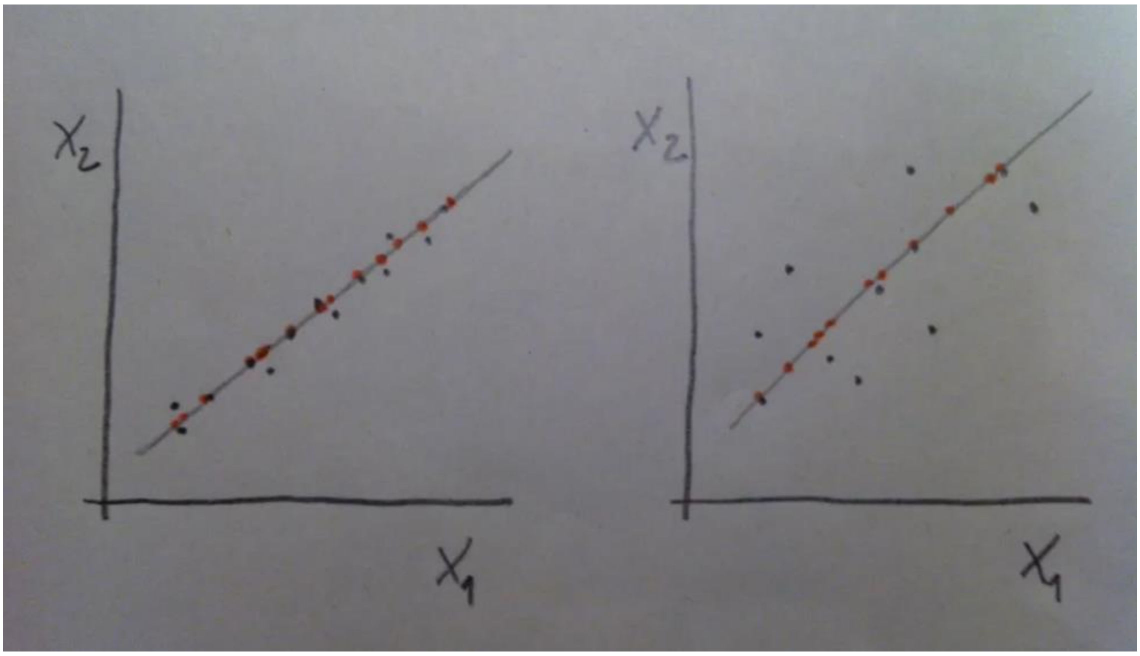
Kappa (κ)	Grado de acuerdo
< 0,00	Sin acuerdo
0,00-0,20	Insignificante
0,21-0,40	Mediano
0,41-0,60	Moderado
0,61-0,80	Sustancial
0,81-1,00	Casi perfecto

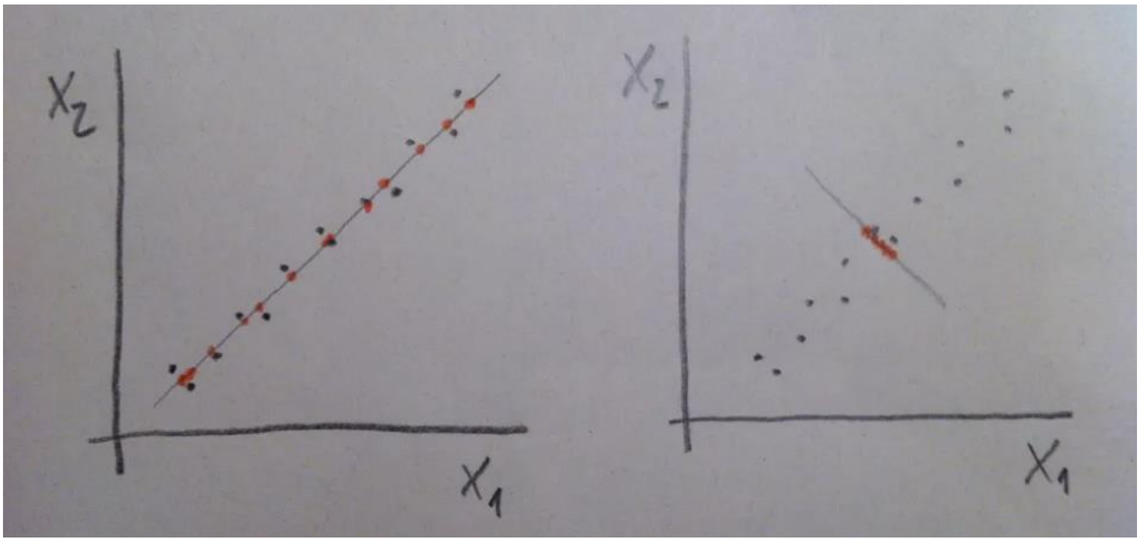
Componentes principales

ALUMNO	LENGUA	MATEMÁTICAS	FÍSICA	INGLÉS	FILOSOFÍA	HISTORIA	QUÍMICA	EDUCACIÓN FÍSICA
1	5	5	5	5	5	5	5	5
2	7	4	3	8	4	7	3	8
3	5	8	7	6	5	6	7	5
4	7	2	4	8	7	7	3	6
5	8	9	10	8	8	7	9	4
6	4	9	8	4	3	4	7	5
7	6	4	4	6	5	5	3	7
8	4	7	8	3	3	2	8	3
9	5	5	4	5	6	5	5	1
10	7	4	5	7	8	8	4	6
11	7	8	8	7	7	6	7	9
12	4	3	3	4	3	2	1	4
13	7	4	4	7	8	7	4	5
14	3	5	5	2	3	3	5	7
15	5	6	6	5	5	5	6	6

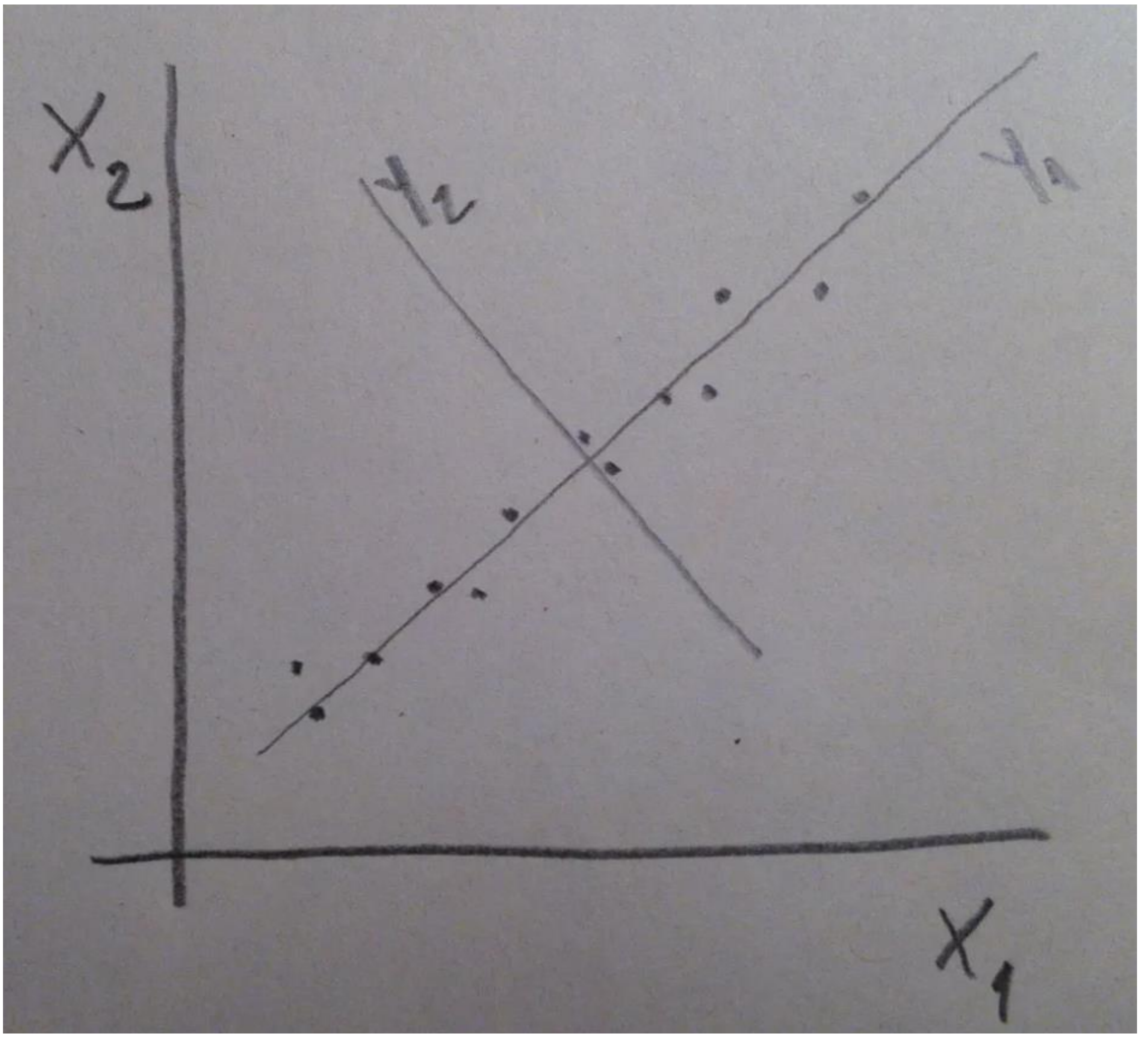



X2
X1


X2
X1
X2
X1



X2
X1
X2
X1

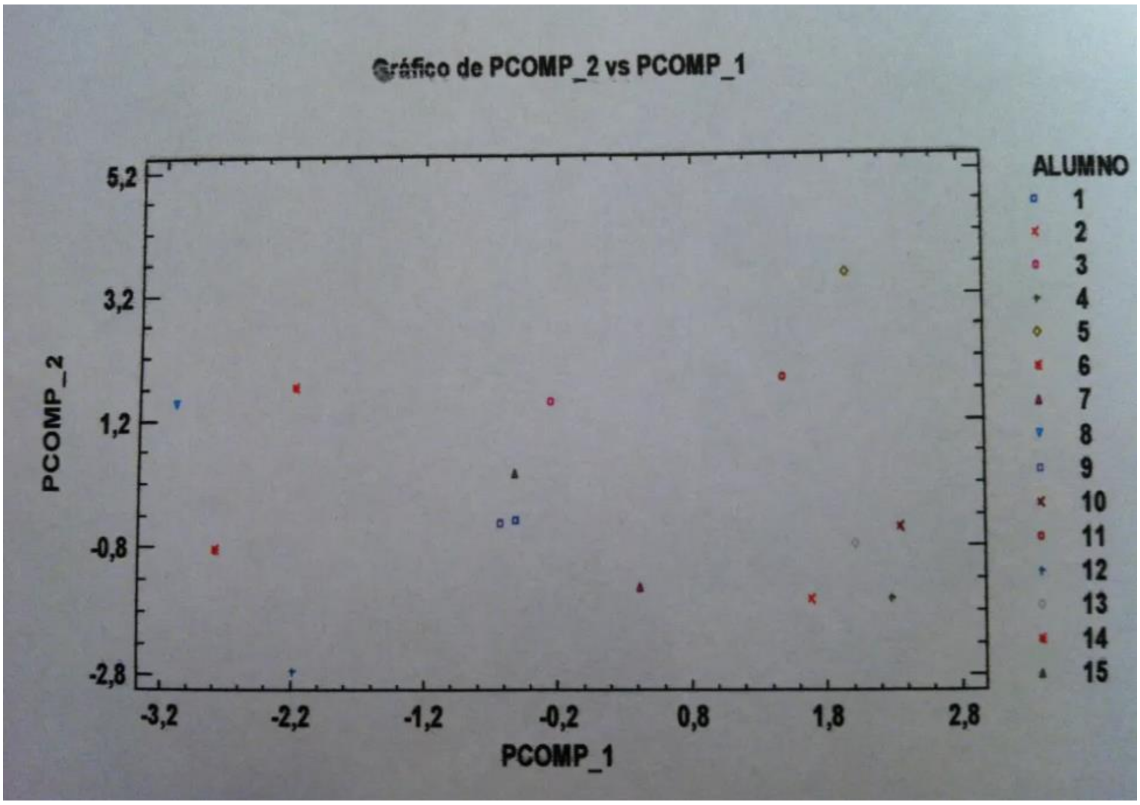


X2
Y2
Y1
X1

$$Y_1 = a_{11} X_1 + a_{12} X_2$$

$$Y_2 = a_{21} X_1 + a_{22} X_2$$

$$
\begin{aligned}
Y_1 &= a_{11} X_1 + a_{12} X_2 + \cdots + a_{1d} X_d \\
Y_2 &= a_{21} X_1 + a_{22} X_2 + \cdots + a_{2d} X_d \\
&\vdots \\
Y_d &= a_{d1} X_1 + a_{d2} X_2 + \cdots + a_{dd} X_d
\end{aligned}
$$



Análisis de Componentes Principales

Componente		*Porcentaje de*	*Porcentaje*
Número	*Valor propio*	*Varianza*	*Acumulado*
1	3,71043	46,380	46,380
2	2,86078	35,760	82,140
3	0,953481	11,919	94,059
4	0,215574	2,695	96,753
5	0,151316	1,891	98,645
6	0,0628091	0,785	99,430
7	0,0317443	0,397	99,827
8	0,0138659	0,173	**100,000**

Tabla de Pesos de los Componentes

	Componente	*Componente*
	1	2
LENGUA	0,500113	0,0853043
MATEMATICAS	-0,112909	0,555049
FÍSICA	-0,0517681	0,574789
INGLÉS	0,498752	0,036556
FILOSOFÍA	0,450292	0,121881
HISTORIA	0,49264	0,0635768
QUIMÍCA	-0,0726488	0,573763
EDUCACIÓN FÍSICA	0,187002	-0,0694516

Tabla de Pesos de los Componentes

	Componente	*Componente*
	1	2
Temperatura media anual	0,521913	-0,0282158
Precipitaciones	-0,0551489	0,590282
Humedad	0,0470988	0,621072
Velocidad Viento	0,1257	-0,486115
Media temperaturas máximas	0,461348	0,0936507
Media temperaturas mínimas	0,49067	-0,0585732
Altitud	-0,502939	-0,128579

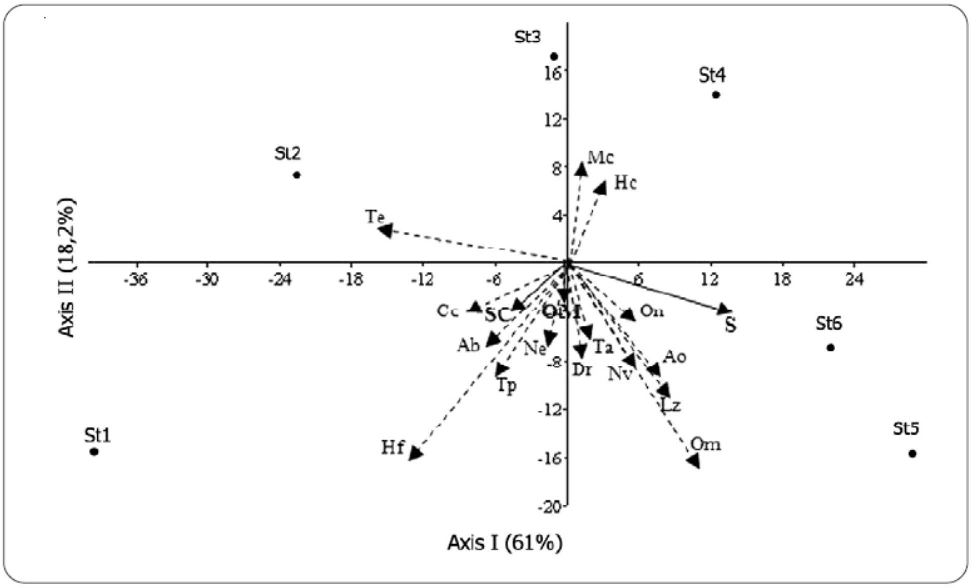
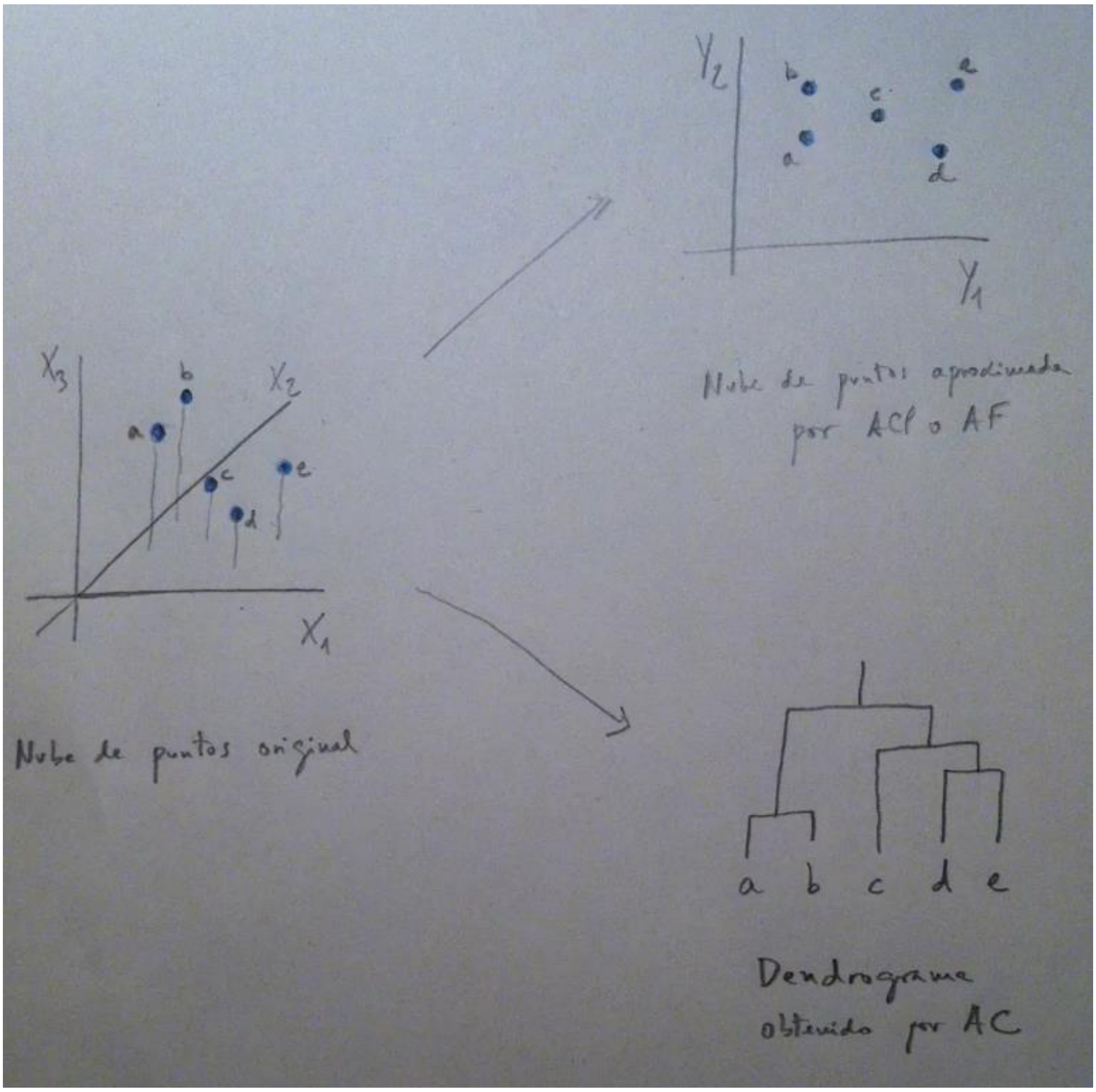


Figure 3. Graphical result of principal components analysis (PCA) with the projection of the vector-variables (abiotic factors and species) and observations (sampling stations: St1-St6) on factorial plans. Abbreviations as in Table 1 / Gráfico del análisis de componentes principales (ACP) con la proyección del vector de las variables (factores abióticos y especies) y las observaciones (estaciones de muestreo: St1-St6) sobre los planos factoriales. Abreviaciones como en la Tabla 1

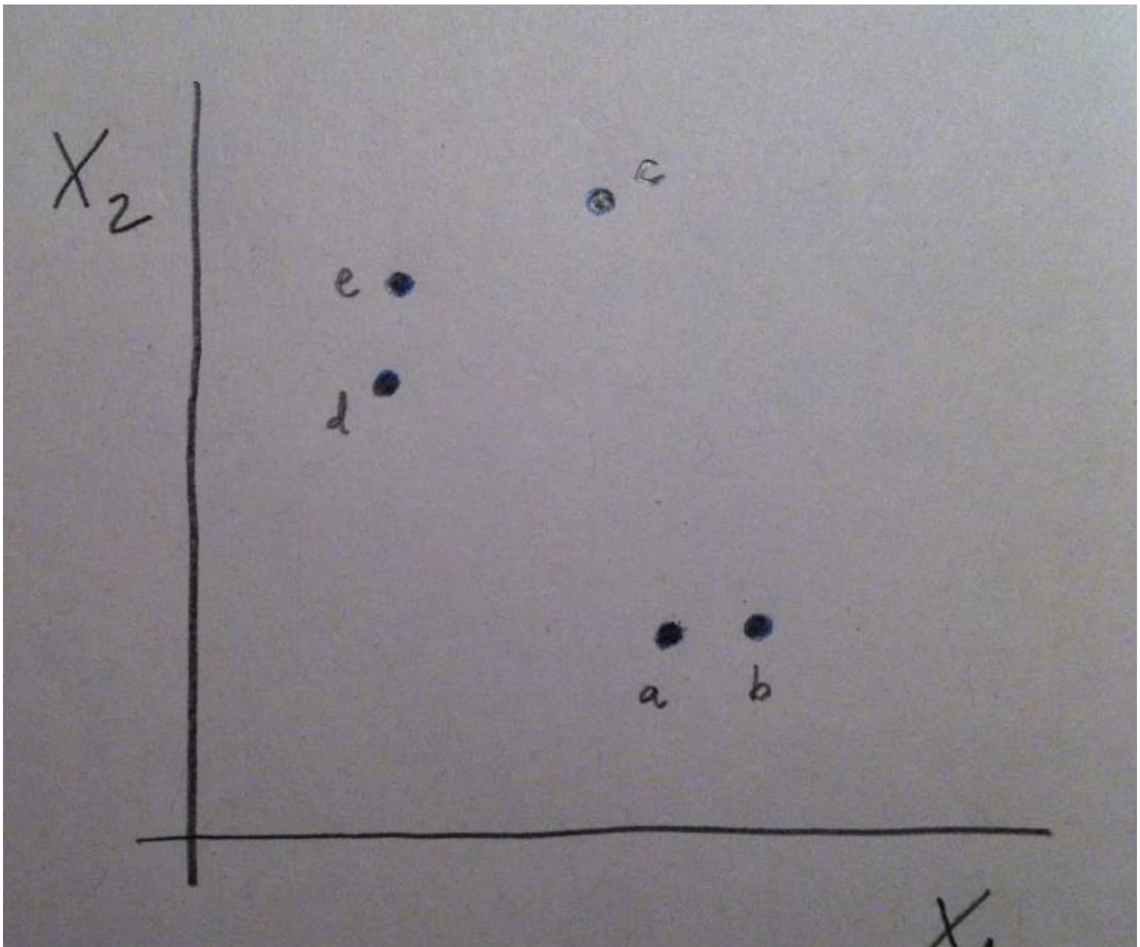
Table 4
The results of a PCA carried out on a dataset where metal concentrations are corrected for the influence of grain size using normalisation to Al.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Variance explained	**51%**	**12%**	**11%**	**6%**	**5%**
Ba/Al	**0.784**	0.553			
Ca/Al	**0.950**				
Fe/Al	**0.895**				
K/Al	**0.909**				
Li/Al			0.565	0.428	
Mg/Al	**0.909**				
Mn/Al	**0.715**				
Na/Al	**0.726**				
Ti/Al	**0.984**				
Co/Al	**0.917**				
Cr/Al	**0.774**	0.438			
Cu/Al		**0.789**			
La/Al	**0.978**				
Ni/Al	**0.887**				
P/Al	0.494		−0.587		
Pb/Al		**0.903**			
V/Al	**0.926**				
Zn/Al		**0.918**			
pH					**0.862**
<63 μm	**−0.928**				
Sulphate			**0.889**		
OC	**−0.895**				
Carbonate				**0.902**	
Cl			**0.826**		
CEC	**−0.841**				
CRS	**−0.650**				

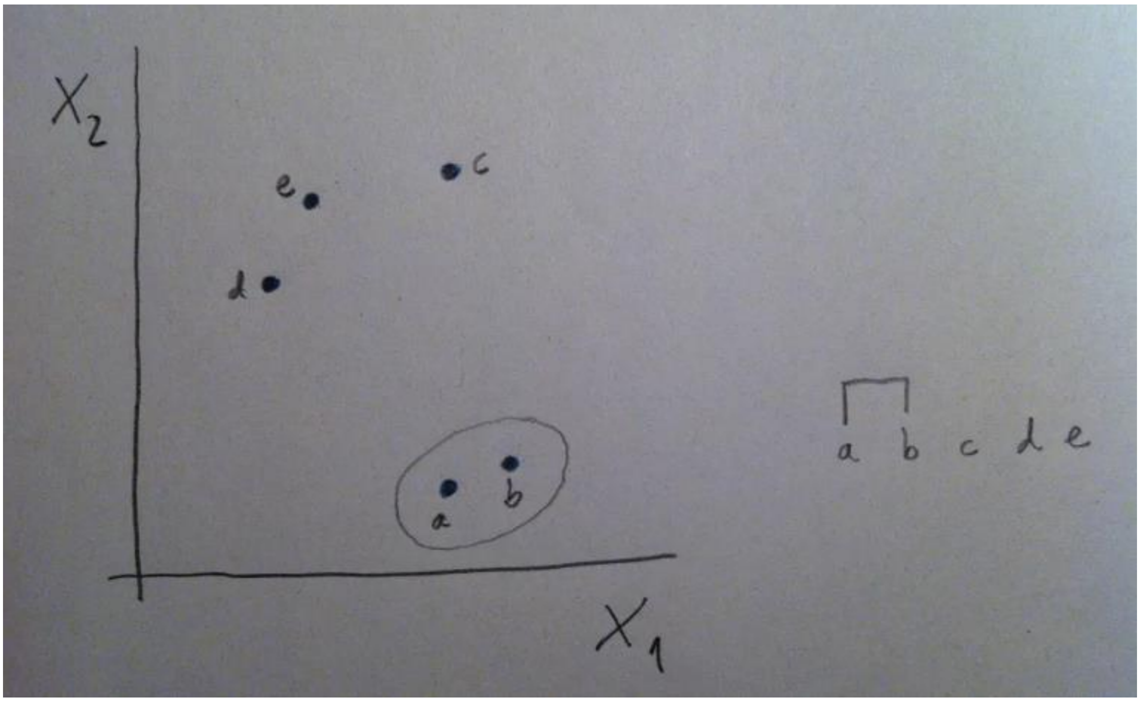
Dendrograma

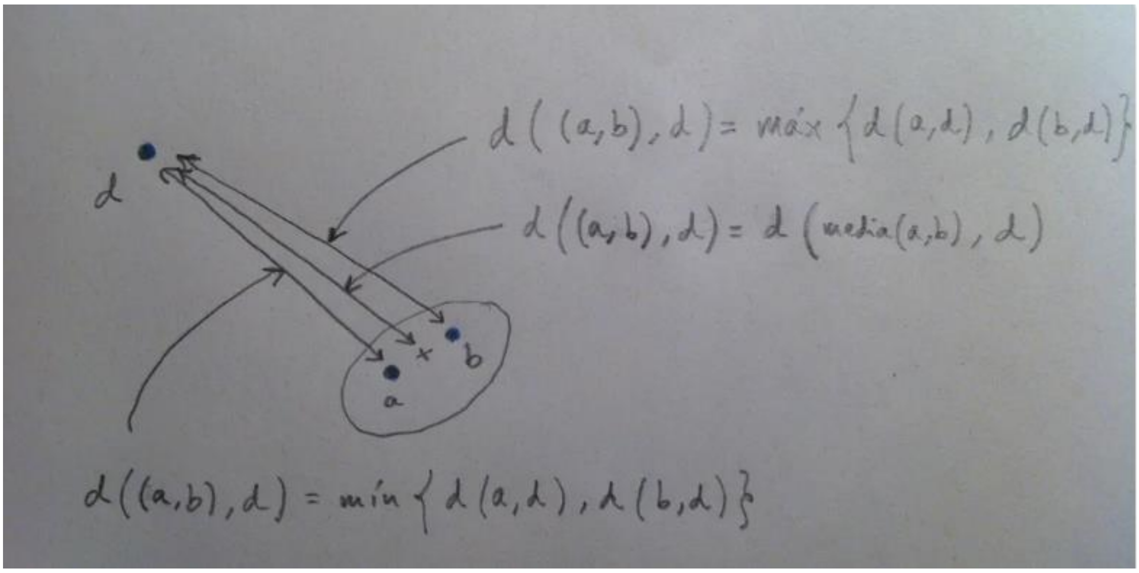


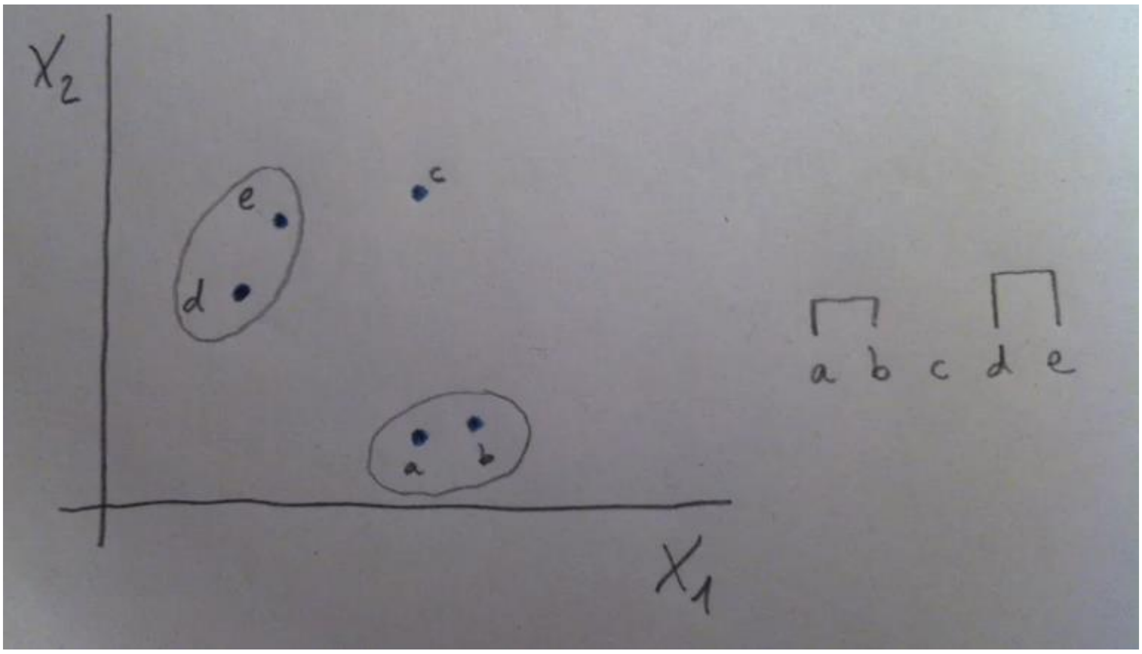
$$d(i,j) = \sqrt{\sum_{k=1}^{d} (x_{ik} - x_{jk})^2}$$

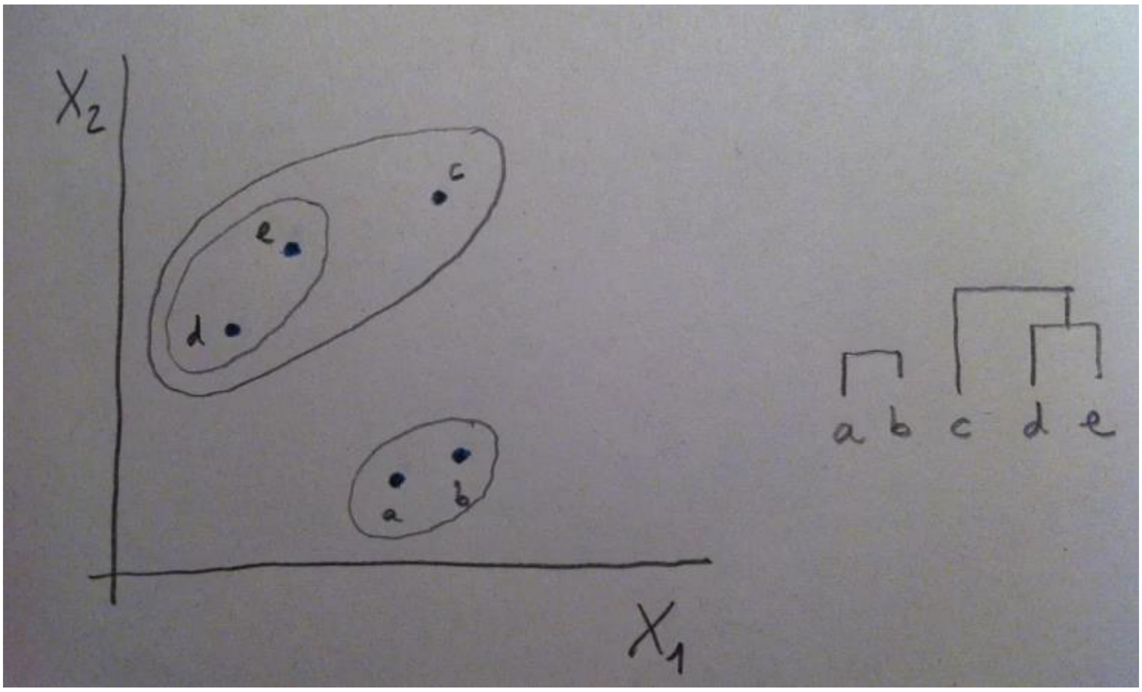


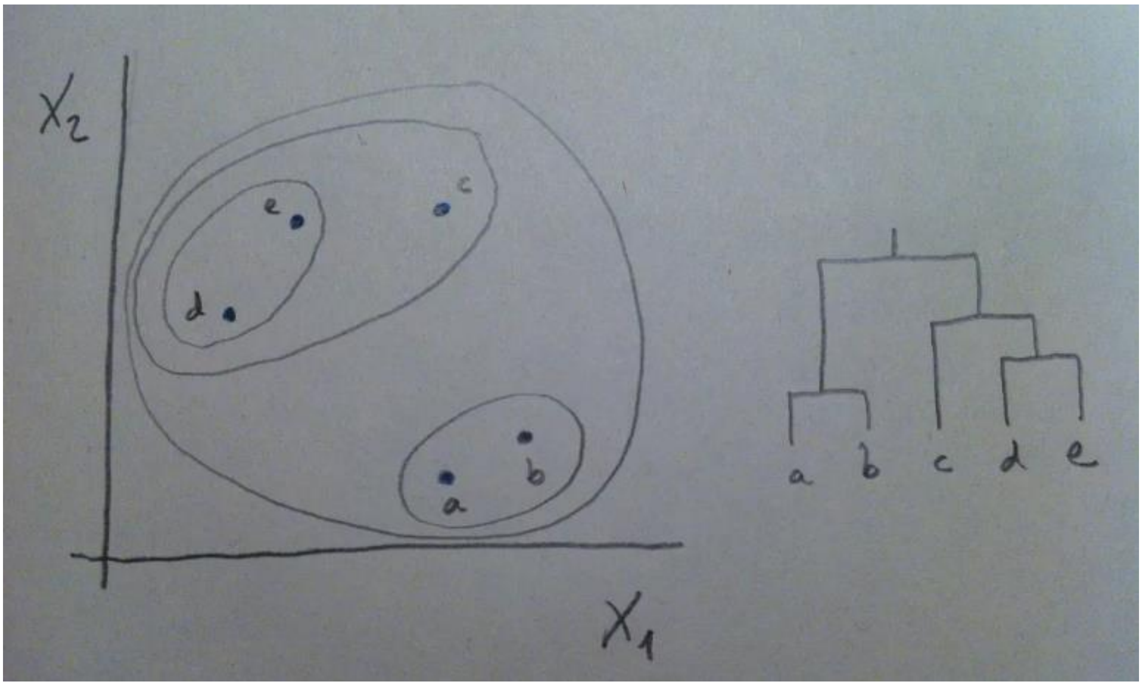
	a	b	c	d	e
a	0	1	10	7	8
b	1	0	10	8	9
c	10	10	0	5	4
d	7	8	5	0	2
e	8	9	4	2	0

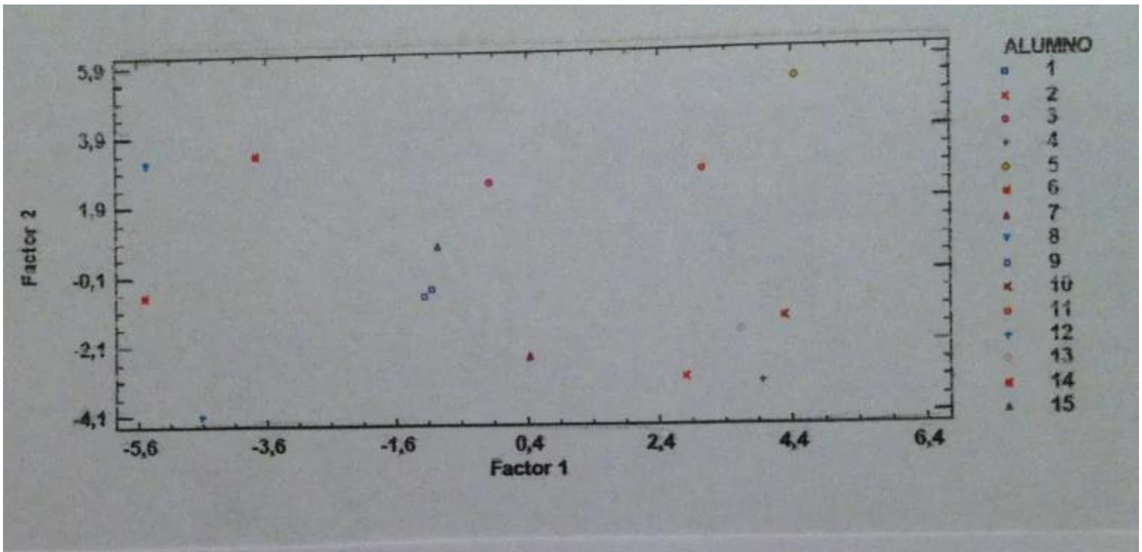


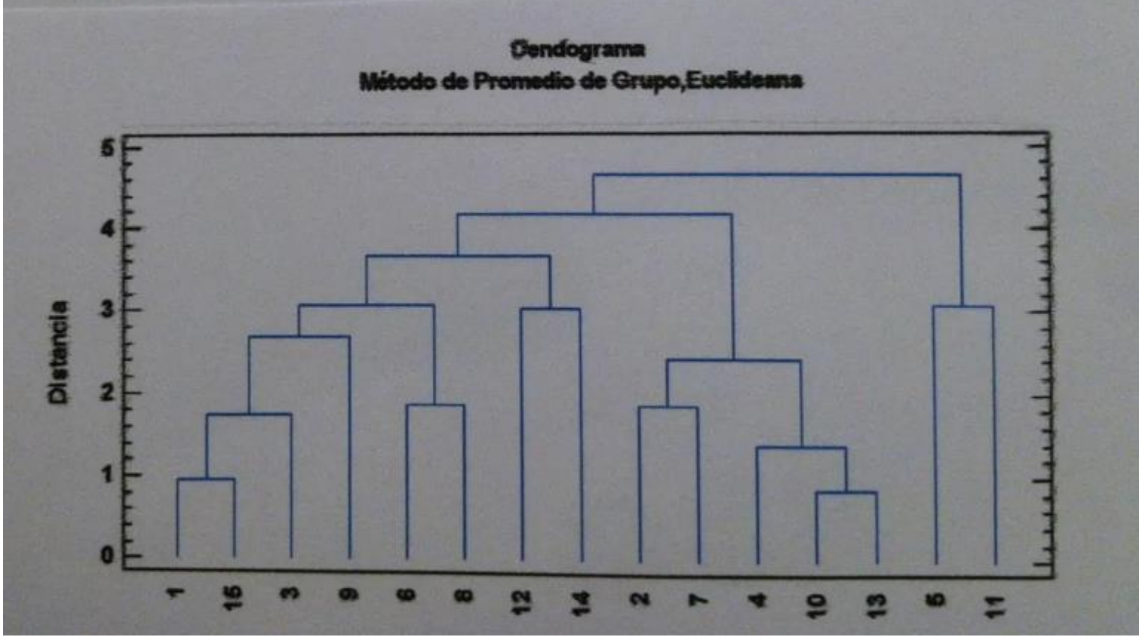

d((a,b),d) = máx {d(a,d), d(b,d)}
d((a,b),d) = d(media(a,b), d)
d
a
b
d((a,b),d) = mín {d(a,d), d(b,d)}

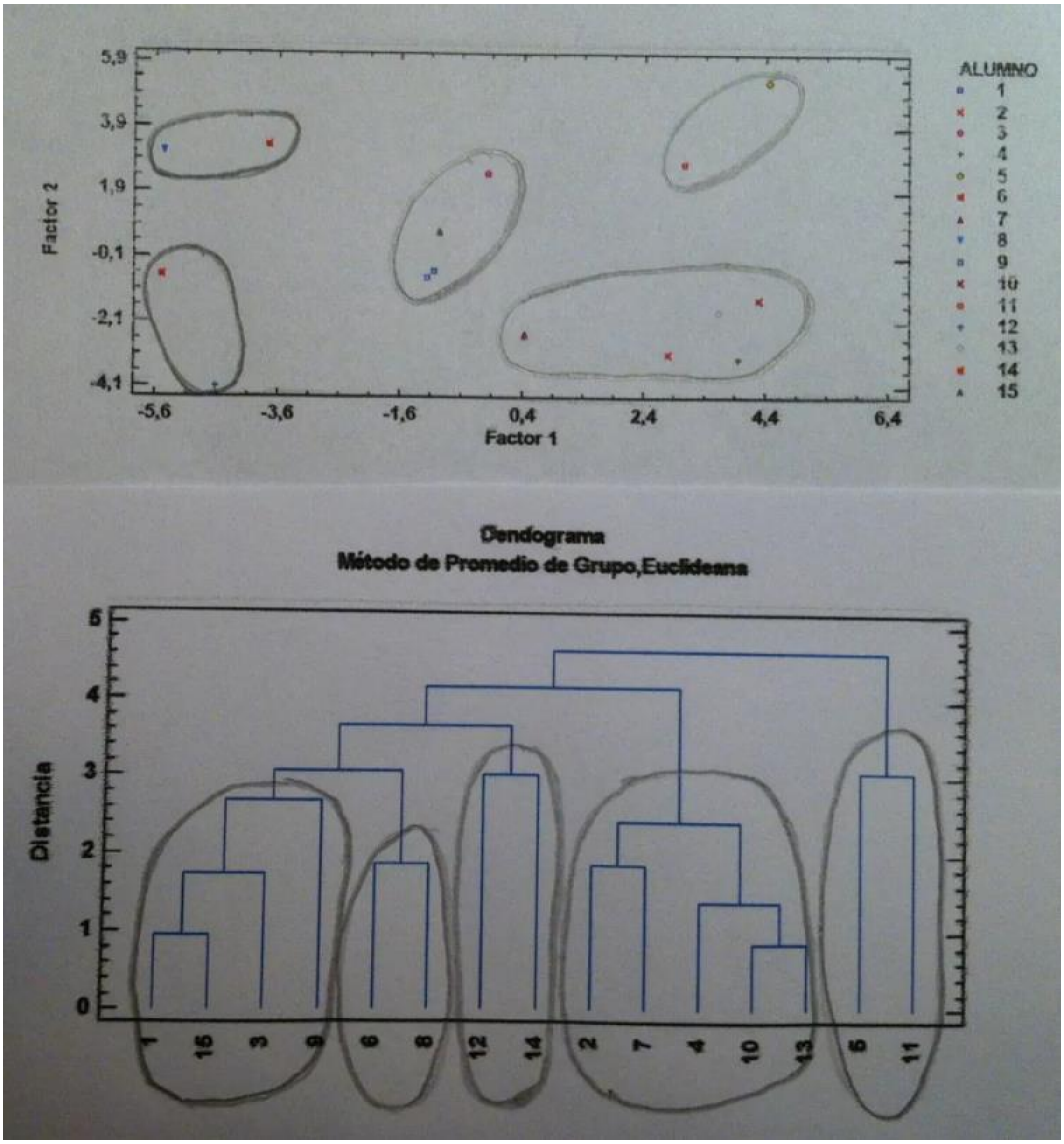

X2
X1
c
e
d
a
b
a b c d e


X_2
X_1
c
e
d
a
b
a b c d e


X_2
X_1
c
e
d
a
b
a b c d e


ALUMNO
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Factor 2
5,9
3,9
1,9
-0,1
-2,1
-4,1
-5,6
-3,6
-1,6
0,4
2,4
4,4
6,4
Factor 1


Dendograma
Método de Promedio de Grupo,Euclideana
Distancia
0
1
2
3
4
5
1
15
3
9
6
8
12
14
2
7
4
10
13
5
11


ALUMNO
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Factor 2
5,9
3,9
1,9
-0,1
-2,1
-4,1
-5,6
-3,6
-1,6
0,4
2,4
4,4
6,4
Factor 1
Dendograma
Método de Promedio de Grupo,Euclideana
Distancia
5
4
3
2
1
0
1
15
3
9
6
8
12
14
2
7
4
10
13
5
11

Comparación de medias, medianas y proporciones

COMPARACIÓN DE MEDIAS, MEDIANAS Y PROPORCIONES

1. Una población respecto a un valor de referencia

- a. Variables cuantitativas
  - r. Normalidad — **Test t de Student de una población**
  - s. No normalidad — **Test de los signos/Test de Wilcoxon**
- b .Variables cualitativas
  - r. Dos valores — **Test de una proporción/Test Ji-cuadrado**
  - q. Más de dos valores — **Test Ji-cuadrado**

2. Dos poblaciones

- a. Variables cuantitativas
  - p. Muestras independientes
    - r. Normalidad
      - x. Varianzas iguales — **Test t de Student de varianzas iguales**
      - y. Varianzas distintas — **Test t de Student de varianzas distintas**
    - s. No normalidad — **Test de Mann-Whitney**
  - q. Muestras relacionadas
    - r. Normalidad — **Test t de Student de datos apareados**
    - s. No normalidad — **Test de los signos/Test de Wilcoxon**
- b. Variables cualitativas
  - p. Muestras independientes
    - r. $n \geq 30$ y esperado ≥ 5 — **Test de proporciones/Test Ji-cuadrado**
    - s. $n < 30$ ó esperado < 5 — **Test exacto de Fisher**
  - q. Muestras relacionadas — **Test de McNemar**

3. Más de dos poblaciones

- a. Variables cuantitativas
  - p. Muestras independientes
    - r. Normalidad — **ANOVA**
    - s. No normalidad — **Test de Kruskal-Wallis**
  - q. Muestras relacionadas
    - r. Normalidad — **ANOVA de medidas repetidas**
    - s. No normalidad — **Test de Friedman**
- b. Variables cualitativas
  - p. Muestras independientes — **Test Ji-cuadrado**
  - q. Muestras relacionadas — **Test de la Q de Cochran**

Comparación en una población

$$H_0: \mu = \mu_0$$

$$H_1: \mu \neq \mu_0$$

$$T = \frac{\bar{X}_n - \mu_0}{\frac{S_n}{\sqrt{n}}} \underset{H_0}{\equiv} t_{n-1}$$

$$\left(\bar{X}_n - t_{\frac{\alpha}{2}} \frac{S_n}{\sqrt{n}} , \bar{X}_n + t_{\frac{\alpha}{2}} \frac{S_n}{\sqrt{n}} \right)$$

$H_0 : \mu = 13$

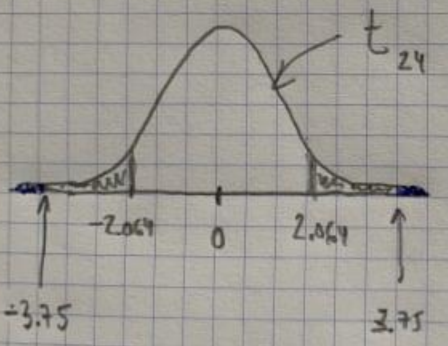
$H_1 : \mu \neq 13$

$n = 25$

$\bar{x}_n = 12.25$

$S_n = 1$

$$T = \frac{12.25 - 13}{\frac{1}{\sqrt{25}}} = \frac{-0.75}{0.2} = -3.75$$



p-valor = 0.001

$$IC\ 95\% : \left(12.25 - 2.064 \frac{1}{\sqrt{25}} ,\ 12.25 + 2.064 \frac{1}{\sqrt{25}}\right)$$

$$(11.83 ,\ 12.66)$$

$H_0: p = p_0$

$H_1: p \neq p_0$

$$Z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} \underset{H_0}{\overset{\substack{n \geqslant 30 \\ np_0 \geqslant 5}}{\equiv}} N(0,1)$$

$$\left(\hat{p} - Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \, , \, \hat{p} + Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \right)$$

$H_0: p = 0.1$

$H_1: p \neq 0.1$

$n = 100$

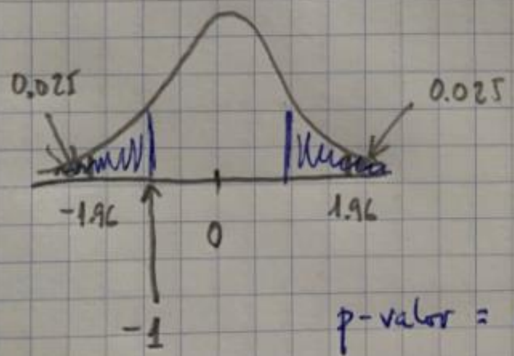
$7 \mid 93 \longrightarrow \hat{p} = 0.07$

$$\left(0.07 - 1.96\sqrt{\frac{0.07 \cdot 0.93}{100}}\ ,\ 0.07 + 1.96\sqrt{\frac{0.07 \cdot 0.93}{100}}\right)$$

$$(0.07 - 0.05\ ,\ 0.07 + 0.05)$$

$$(0.02\ ,\ 0.12)$$

$$Z = \frac{0.07 - 0.1}{\sqrt{\frac{0.1 \cdot 0.9}{100}}} = -1$$



p-valor = 0.3174

$H_0 = \text{Mediana} = m_0$

$H_1 = \text{Mediana} \neq m_0$

$(X_1 - m_0, \ldots, X_n - m_0)$

Se ponen en rangos según el valor absoluto.

$$T = \min(T_+, T_-) \underset{H_0}{\overset{n>25}{\equiv}} N\left(\frac{n(n+1)}{4}, \sqrt{\frac{n(n+1)(2n+1)}{24}}\right)$$

T_+ = Suma de los rangos con restas positivas.

T_- = Suma de los rangos con restas negativas.

H_0 : Mediana $= 0$

H_1 : Mediana $\neq 0$

$(5, 1, -2, 3, 7, -3, 4, 6, 8, 12)$

$(6, 1, 2, 3.5, 8, 3.5, 5, 7, 9, 10)$

$T_- = 5.5$

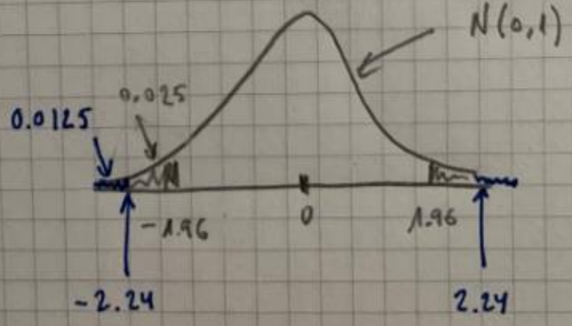
$T_+ = 49.5$

$T = \min(5.5, 49.5) = 5.5$

$$T \overset{n>25}{\underset{H_0}{\equiv}} N\left(\frac{10 \cdot 11}{4}, \sqrt{\frac{10 \cdot 11 \cdot 21}{24}}\right) = N(27.5, 9.81)$$

$$Z = \frac{5.5 - 27.5}{9.81} = -2.24$$

p-valor $= 0.0250$



Comparación de dos poblaciones

$$H_0 : \mu_1 = \mu_2$$

$$H_1 : \mu_1 \neq \mu_2$$

$$T = \frac{\bar{X}_1 - \bar{X}_2}{S_T \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \underset{H_0}{\equiv} t_{n-2}$$

$$S_T^2 = \frac{(n_1 - 1) S_1 + (n_2 - 1) S_2}{n_1 + n_2 - 2}$$

$$\left((\bar{X}_1 - \bar{X}_2) - t_{\frac{\alpha}{2}} S_T \sqrt{\frac{1}{n_1} + \frac{1}{n_2}} \, , \, (\bar{X}_1 - \bar{X}_2) + t_{\frac{\alpha}{2}} S_T \sqrt{\frac{1}{n_1} + \frac{1}{n_2}} \right)$$

$H_0: \mu_1 = \mu_2$

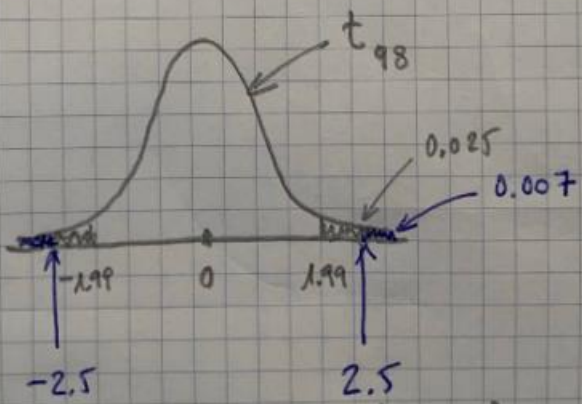
$H_1: \mu_1 \neq \mu_2$

$n_1 = 50 \qquad \bar{X}_1 = 14 \qquad S_1 = 1$

$n_2 = 50 \qquad \bar{X}_2 = 13.5 \qquad S_2 = 1$

$$T = \frac{14 - 13.5}{1 \cdot \sqrt{\frac{1}{50} + \frac{1}{50}}} = 2.5$$

p-valor = 0.014

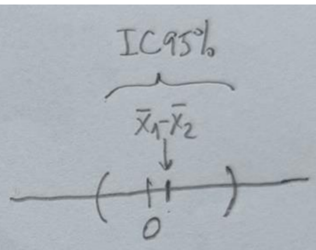


IC 95% de la diferencia de medias $(\mu_1 - \mu_2)$:

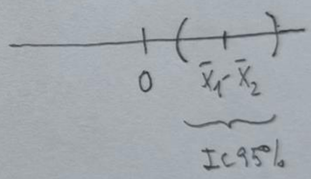
$$\left((14-13.5) - 1.99 \cdot 1 \cdot \sqrt{\frac{1}{50} + \frac{1}{50}} \; , \; (14-13.5) + 1.99 \cdot 1 \cdot \sqrt{\frac{1}{50} + \frac{1}{50}} \right)$$

$(0.103 \; , \; 0.897)$

$H_0: \mu_1 = \mu_2 \quad (\mu_1 - \mu_2 = 0)$ $\qquad p \geq 0.05$



$H_1: \mu_1 \neq \mu_2 \quad (\mu_1 - \mu_2 \neq 0)$ $\qquad p < 0.05$



$H_0: p_1 = p_2$

$H_1: p_1 \neq p_2$

$$Z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\frac{\hat{p}(1-\hat{p})}{n_1} + \frac{\hat{p}(1-\hat{p})}{n_2}}} \underset{H_0}{\overset{\substack{n_1, n_2 \geq 30 \\ n_1\hat{p}_1,\, n_2\hat{p}_2 \geq 5 \\ \downarrow}}{\equiv}} N(0,1)$$

$$\hat{p} = \frac{n_1\hat{p}_1 + n_2\hat{p}_2}{n_1 + n_2}$$

$$\left((\hat{p}_1 - \hat{p}_2) - Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n_1} + \frac{\hat{p}(1-\hat{p})}{n_2}} \,,\; (\hat{p}_1 - \hat{p}_2) + Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n_1} + \frac{\hat{p}(1-\hat{p})}{n_2}} \right)$$

$H_0: p_1 = p_2$

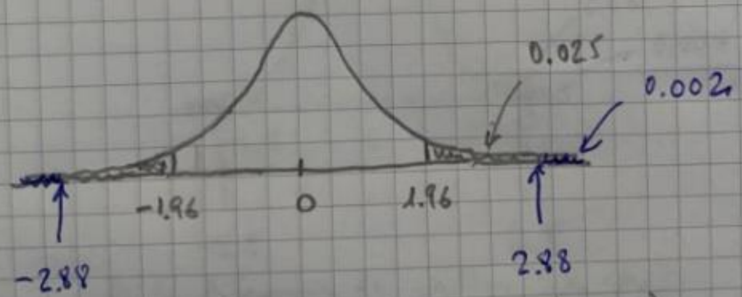
$H_1: p_1 \neq p_2$

$n_1 = 100 \quad \hat{p}_1 = 0.5$

$n_2 = 100 \quad \hat{p}_2 = 0.3$

$$Z = \frac{0.5 - 0.3}{\sqrt{\frac{0.4 \cdot 0.6}{100} + \frac{0.4 \cdot 0.6}{100}}} = 2.88$$

p-valor = 0.004



IC 95% de la diferencia de proporciones $(p_1 - p_2)$:

$$\left((0.5-0.3) - 1.96\sqrt{\frac{0.4 \cdot 0.6}{100} + \frac{0.4 \cdot 0.6}{100}},\ (0.5-0.3) + 1.96\sqrt{\frac{0.4 \cdot 0.6}{100} + \frac{0.4 \cdot 0.6}{100}} \right)$$

$(0.067, 0.333)$

$(X_1, \dots, X_n)$

$(Y_1, \dots, Y_m)$

H_0 : Mediana (X) = Mediana (Y)

H_1 : Mediana $(X) \neq$ Mediana (Y)

$$U = \sum_i \sum_j Z_{ij} \underset{H_0}{\overset{n,m>20}{\equiv}} N\left(\frac{nm}{2}, \sqrt{\frac{nm(n+m+1)}{12}}\right)$$

$$Z_{ij} = \begin{cases} 1 & \text{si } X_i < Y_j \\ 0 & \text{si } X_i \geq Y_j \end{cases}$$

H_0: Mediana (1) = Mediana (2)

H_A: Mediana (1) $\neq$ Mediana (2)

Muestra 1: (7.3, 8.0, 9.5, 10.8, 11.7, 12.4, 15.1)

Muestra 2: (9.8, 13.6, 16.5, 17.1, 25.2, 40.3, 40.5)

$U = 44 \equiv N(\mu, \sigma)$

$E(U) = \frac{7 \cdot 7}{2} = 24.5 \qquad var(U) = \frac{7 \cdot 7\,(7+7+1)}{12} = 61.25$

$Z = \frac{44 - 24.5}{\sqrt{61.25}} = 2.49$

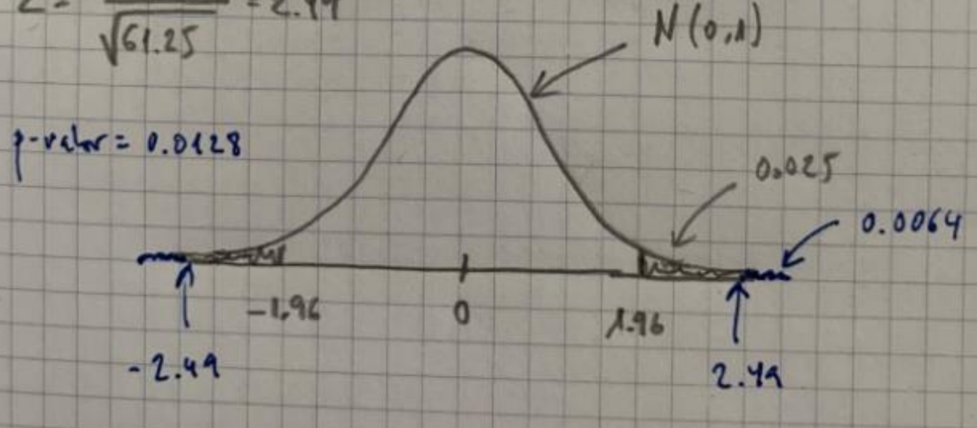


Table 4. Results of Correlation and Paired Sample T-Test

No.	Pairs	Correlation	Mean Difference	P-value of Paired T-test
1	M_CHL_LNA & M_CHL_NOR	0.92	0.058	0.00
2	M_CHL_NOR & M_CHL_ENO	0.92	-0.081	0.00
3	**M_CHL_LNA & M_CHL_ENO**	**0.88**	**-0.023**	**0.29**
4	M_NFL_LNA & M_NFL_NOR	0.86	0.009	0.00
5	M_NFL_NOR & M_NFL_ENO	0.94	-0.007	0.00
6	**M_NFL_LNA & M_NFL_ENO**	**0.87**	**0.002**	**0.32**
7	M_POC_LNA & M_POC_NOR	0.89	6.046	0.00
8	M_POC_NOR & M_POC_ENO	0.75	-26.953	0.00
9	M_POC_LNA & M_POC_ENO	0.73	-20.907	0.00
10	M_SST_LNA & M_SST_NOR	0.86	0.632	0.00
11	M_SST_NOR & M_SST_ENO	0.95	0.372	0.00
12	M_SST_LNA & M_SST_ENO	0.77	1.004	0.00

Bold characters indicate pairs with an insignificant mean difference

Table 6
The paired T test between Chlorophyll *a* and selected nutrients.

Paired Samples Statistics (a)

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Chl surface	1.02	21	2.53	0.55
	Nitrate surface	1.87	21	1.52	0.33
Pair 2	Chl surface	1.02	21	2.53	0.55
	Nitrite surface	0.505	21	0.62	0.14
Pair 3	Chl surface	1.02	21	2.53	0.55
	NH3	15.26	21	12.53	2.73

Paired Samples Test (b)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Chl surface – Nitrate surface	−0.86	3.24	0.71	−2.33	0.62	−1.21	20	0.24
Pair 2	Chl surface – Nitrite surface	0.51	2.40	0.52	−0.58	1.61	0.98	20	0.34
Pair 3	Chl surface – NH3	−14.24	13.11	2.86	−20.21	−8.28	−4.98	20	0.00

Table 7
The independent T test was conducted between Chlorophyll *a* and salinity.

Group Statistics (a)

Chlorophyll	1.0	21	1.01	2.53	0.55
	2.0	21	28.67	4.64	1.01

Independent Samples Test (b)

		Levene's Test for Equality of Variances		*t*-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Chlorophyll	Equal variances assumed	27.32	0.00	−23.96	40	0.00	−27.66	1.15	−29.99	−25.33
	Equal variances not assumed			−23.96	30.92	0.00	−27.66	1.15	−30.02	−25.30

Table 8
The independent T test between Chlorophyll *a* and SST.

Group Statistics (a)

Parameter	Cholorophyll	21	1.02	2.53	0.55
	SST	21	28.84	1.52	0.33

Independent Samples Test (b)

		Levene's Test for Equality of Variances		*t*-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Parameter	Equal variances assumed	0.17	0.68	−43.14	40	0.00	−27.83	0.65	−29.12	−26.52
	Equal variances not assumed			−43.14	32.83	0.00	−27.83	0.65	−29.13	−26.51

Table 4
Comparison of the abundance (ind meal^{-1}) of the food items found in chick meals as well as meals biomass (mg meal^{-1}) and energy (kJ meal^{-1}) from Hornsund and Magdalenefjorden colonies. Q_1–Q_3 – first and third quartile. Statistically significant ($p < 0.050$) U-test values in bold.

	Hornsund colony $n = 29$			Magdalenefjorden colony $n = 29$			Intercolony difference Mann–Whitney U-test	
	Median	Q_1–Q_3	Min–Max	Median	Q_1–Q_3	Min–Max	Z	p
Total abundance (ind meal^{-1})	1724	1325–2313	943–2794	1346	1129–1688	816–3135	**2.20**	**0.028**
C. finmarchicus AF	4	0–16	0–64	15	8–30	0–70	**−2.36**	**0.018**
C. finmarchicus CV	144	104–224	16–360	180	120–285	45–590	−1.58	0.114
C. glacialis AF	4	0–8	0–128	3	1–11	0–30	−0.20	0.840
C. glacialis CV	1480	1040–1856	336–2576	770	535–1144	75–2450	**3.73**	**0.000**
C. glacialis CIV	48	20–128	0–256	20	4–45	0–90	**3.08**	**0.002**
C. hyperboreus CV	0	0–1	0–40	40	15–93	0–375	**−5.80**	**0.000**
C. hyperboreus CIV	0	0–0	0–16	20	10–50	0–343	**−6.12**	**0.000**
Pagurus zoea	32	3–88	0–320	0	0–1	0–2	**5.10**	**0.000**
T. abyssorum	6	2–15	0–104	73	34–145	3–2010	**−4.84**	**0.000**
Total biomass (mg meal^{-1})	992	807–1385	599–1640	809	696–985	417–1750	**2.36**	**0.018**
Total energy (kJ meal^{-1})	30	24–42	18–51	22	18–27	12–52	**3.40**	**0.001**

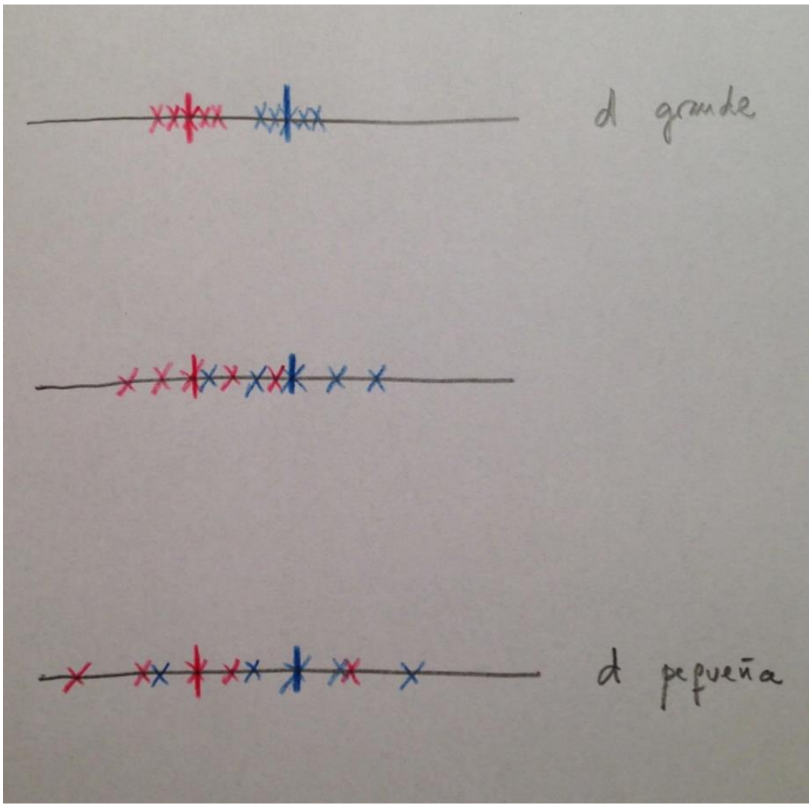
La d de Cohen

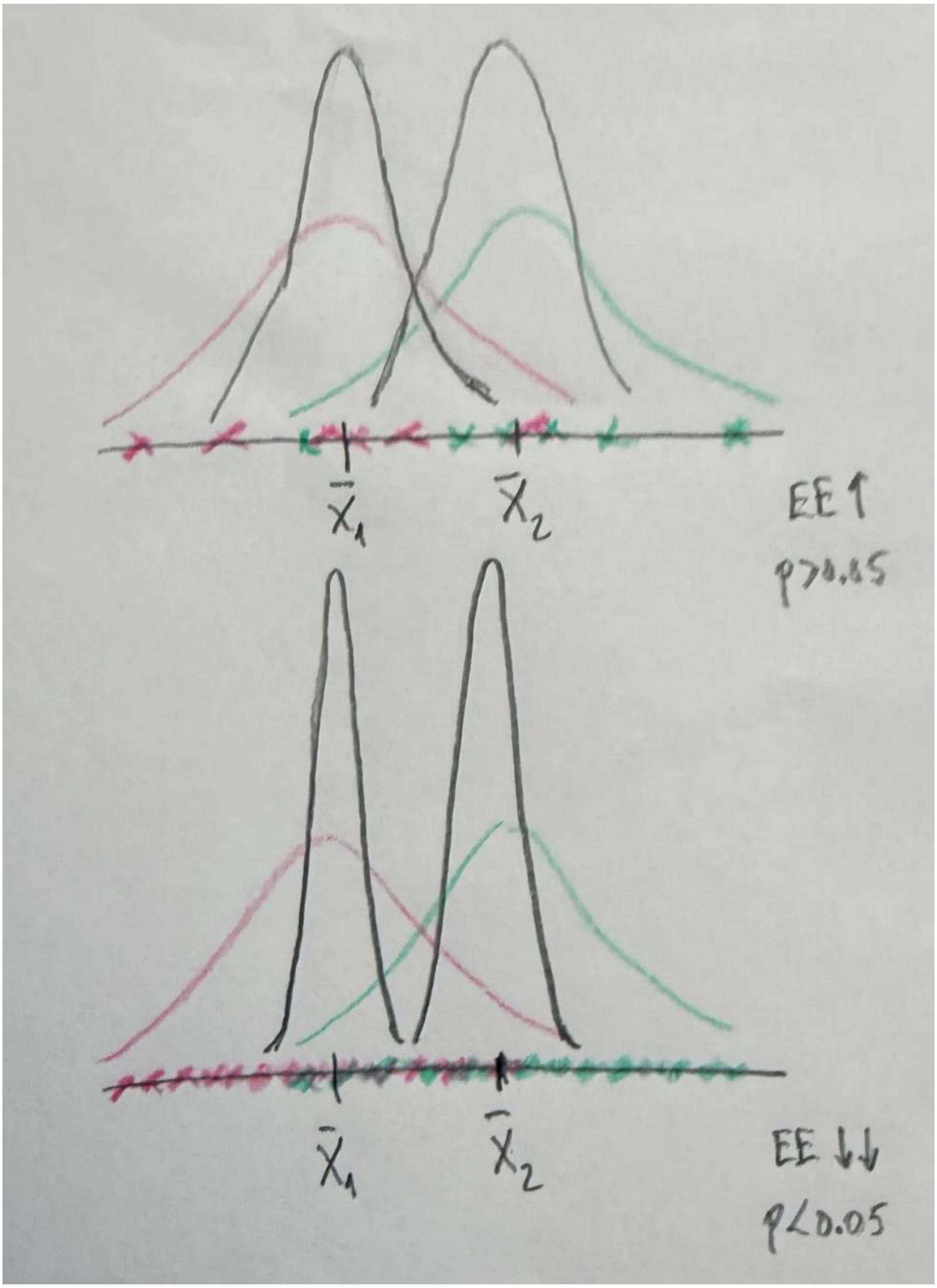
$$d = \frac{\bar{X}_1 - \bar{X}_2}{S}$$

$\bar{X}_1$ = Media muestral del grupo 1

$\bar{X}_2$ = Media muestral del grupo 2

S = Desviación estándar muestral promedio de las dos muestras




$\bar{X}_1$
$\bar{X}_2$
EE ↑
$p>0.05$
$\bar{X}_1$
$\bar{X}_2$
EE ↓↓
$p<0.05$

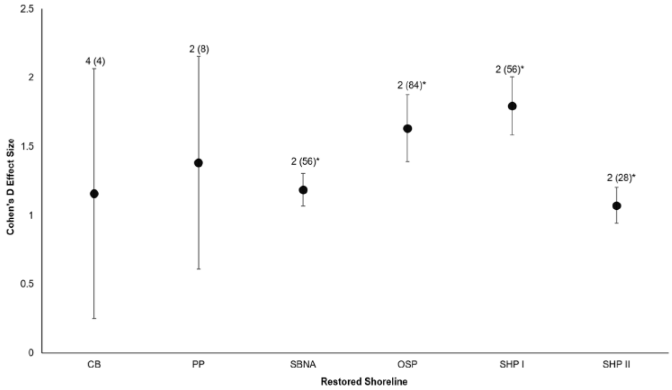


Figure 3 Cohen's *D* Effect Sizes (±SE for error bars) across six restored sites of Puget Sound used in the analysis (site acronyms same as in Table 1). Data labels show the number of coastal biota types monitored and the sample sizes (the number of effect sizes for each site). Effect sizes with asterisks were significantly different from zero. Full-size DOI: 10.7717/peerj.4275/fig-3

Comparación de más de dos poblaciones

Vamos a hacerlo introduciendo unos conceptos que constituyen la columna vertebral de la inmensa urbe ANOVA. Se trata de los siguientes conceptos:

1. Factor
2. Nivel
3. Factor fijo/Factor aleatorio
4. Comparaciones múltiples/Componentes de la varianza
5. Factores cruzados/Factores anidados
6. Interacción entre factores
7. Factor intersujeto/Factor intrasujeto
8. Variable respuesta/Vector respuesta
9. Variable/Covariable
10. Efectos

Alumno	InglésEscrito	InglésOral	Grupo	Nivel	IO1	IO2	IO3	IO4
1	12	11	1	1	14	17	20	23
2	18	14	1	1	17	20	23	26
3	25	18	1	1	23	28	33	38
4	14	7	1	1	12	17	22	27
5	19	10	1	1	14	18	22	26
6	36	30	1	2	37	44	51	55
7	34	26	1	2	32	38	44	48
8	35	27	1	2	27	27	27	27
9	22	22	1	2	30	38	46	54
10	25	19	1	2	21	23	25	27
11	10	7	2	1	12	17	22	27
12	20	16	2	1	24	32	40	48
13	27	22	2	1	25	28	31	34
14	16	12	2	1	17	22	27	32
15	21	15	2	1	16	17	18	19
16	28	21	2	2	21	21	21	21
17	36	27	2	2	29	31	33	35
18	34	30	2	2	32	34	36	38
19	50	44	2	2	46	48	50	52
20	28	24	2	2	34	44	54	64
21	14	7	3	1	18	29	40	47
22	20	11	3	1	18	25	32	39
23	9	7	3	1	11	20	25	30
24	10	9	3	1	20	23	30	37
25	21	19	3	1	34	49	55	58
26	28	25	3	2	44	60	65	73
27	36	32	3	2	39	55	66	78
28	47	39	3	2	44	49	54	80
29	34	30	3	2	46	52	55	84
30	35	29	3	2	40	50	66	75

Hay dos factores fijos: Grupo y Nivel. Grupo a tres niveles y Nivel a dos niveles. Los dos factores son fijos y están cruzados. Pero hay un tercer factor: el factor ESO, con cuatro niveles fijos. La variable estudiada es el nivel de inglés oral. Los factores Grupo y Nivel son intersujetos. El factor ESO es intrasujetos. Las variables InglésEscrito e InglésOral a finales de primaria podría tratarse como covariable.

ANOVA de un factor

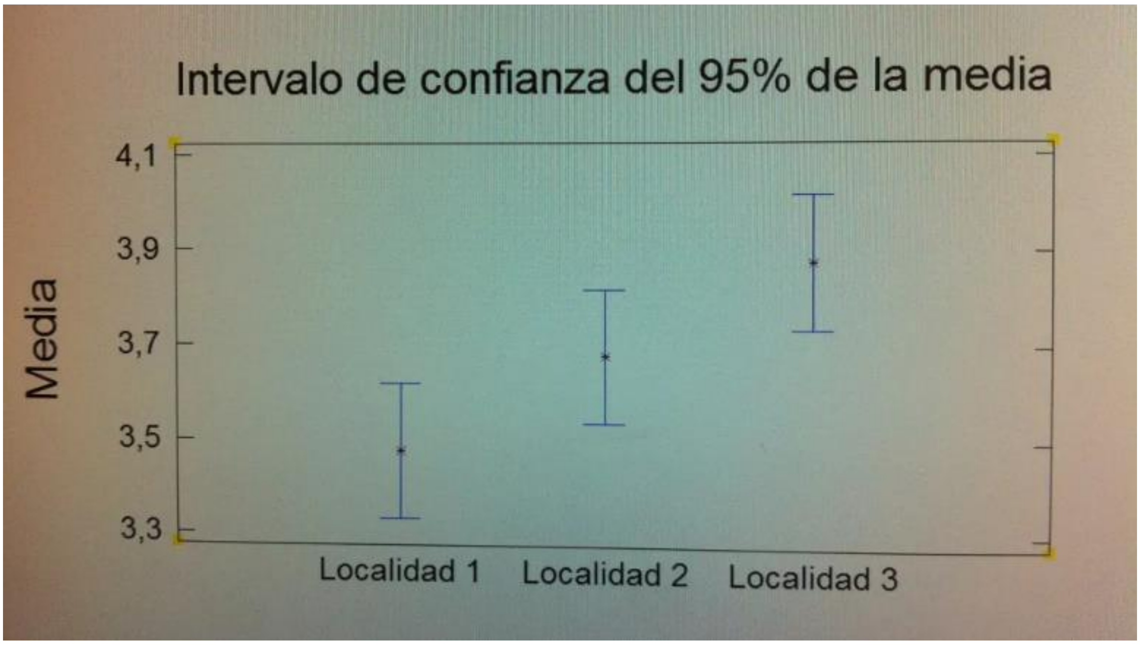
Factor localidad

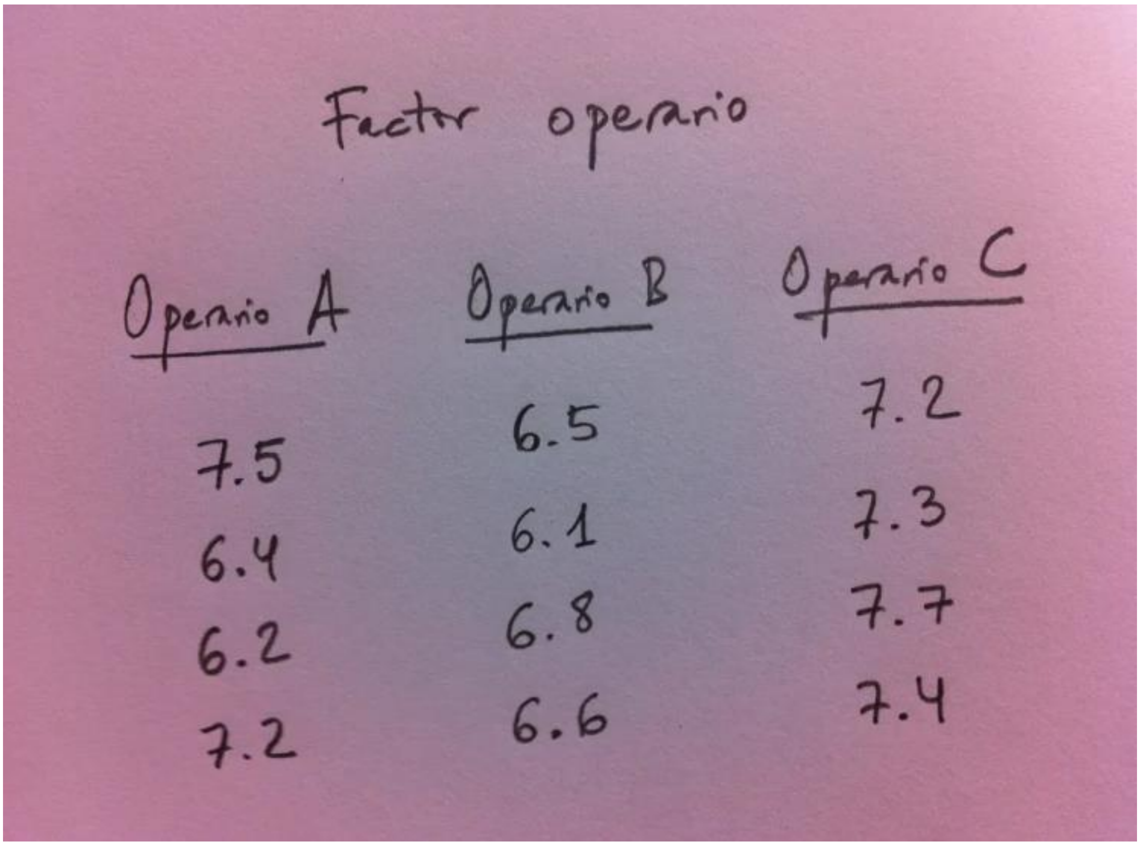
Localidad 1	Localidad 2	Localidad 3
3.7	3.7	3.9
3.2	3.8	3.8
3.6	3.7	4.1
3.4	3.5	3.7

Tabla ANOVA

Análisis de la Varianza

Fuente	Sumas de cuad.	Gl	Cuadrado Medio	Cociente-F	P-Valor
Entre grupos	0,32	2	0,16	5,10	0,0331
Intra grupos	0,2825	9	0,0313889		
Total (Corr.)	0,6025	11			





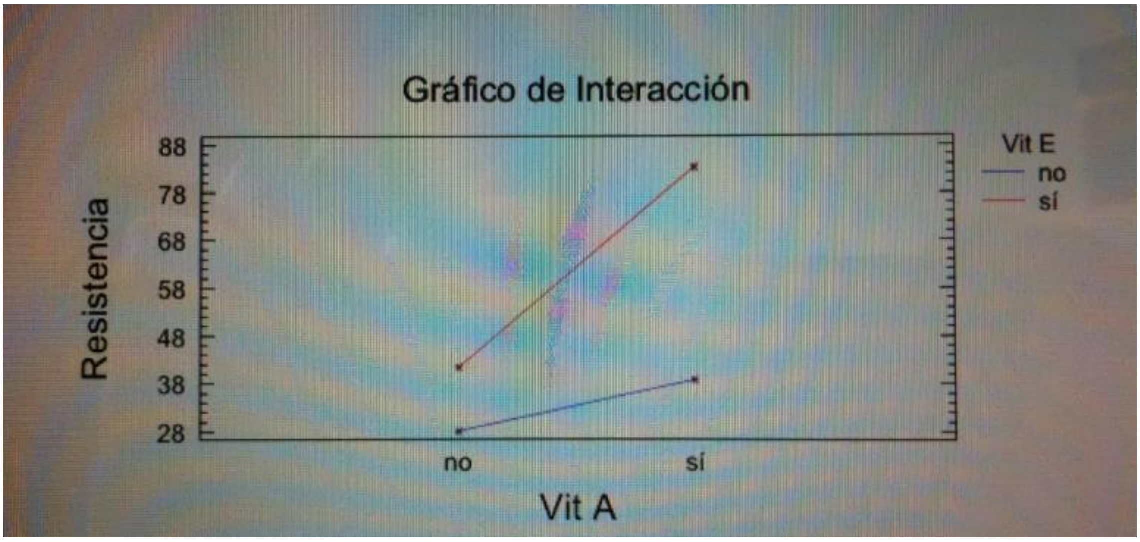
Factor operario

Operario A	Operario B	Operario C
7.5	6.5	7.2
6.4	6.1	7.3
6.2	6.8	7.7
7.2	6.6	7.4

ANOVA de dos factores

Se ha realizado un estudio clínico para ver si las vitaminas A y E mejoran la resistencia de la mucosa ante la afonía. Para ello se han seleccionado 12 profesores con problemas de afonía y con un nivel de resistencia de la mucosa muy similar. Se han distribuido en cuatro grupos. Durante tres meses un grupo tomó placebo, otro sólo vitamina A, otro grupo sólo vitamina E y finalmente el cuarto grupo tomó vitamina A y vitamina E conjuntamente. Se midió un índice de resistencia de la mucosa que va del 0 al 100. Los resultados obtenidos fueron los siguientes:

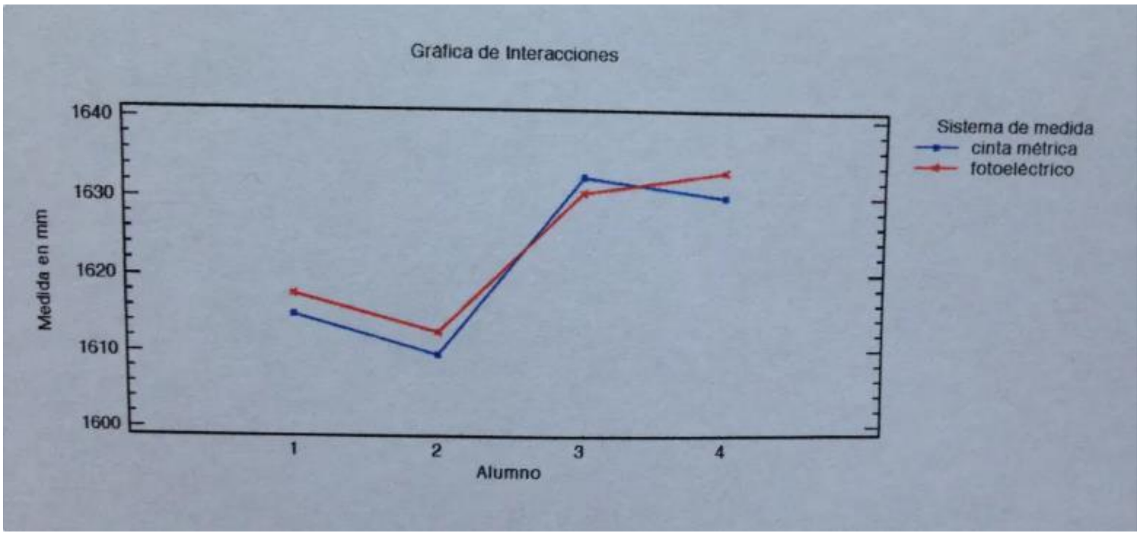
	No Vitamina E	Vitamina E
No Vitamina A	25 28 31	40 43 41
Vitamina A	38 38 40	87 82 81



	Sistema fotoeléctrico	Cinta métrica
Alumno 1	1620	1615
	1615	1618
	1618	1612
Alumno 2	1612	1607
	1615	1610
	1611	1612
Alumno 3	1631	1633
	1633	1631
	1628	1634
Alumno 4	1633	1627
	1635	1631
	1632	1632

Tabla ANOVA

Fuente	*Suma de Cuadrados*	*gdl*	*Cuadrado Medio*	*Razón-F*	*Valor-P*
Sistema de medida	18,375	1	18,375	1,94	0,2582
Alumno	2006,13	3	668,708	121,58	0,0000
Sistema de medida*Alumno	28,4583	3	9,48611	1,72	0,2021
Residuo	88,0	16	5,5		
Total (corregido)	2140,96	23			



IECA

ARA II	no	sí
no	70 65 62 60	62 58 60 57
si	63 60 60 58	57 60 60 55

Maquinas

Operario		1	2	3	4
	A	6.1 6.3 6.7 6.2	6.4 6.3 6.7 6.1	7.0 7.2 7.3 7.7	6.6 6.2 6.1 6.4
	B	5.3 5.8 5.9 5.2	6.2 6.3 6.7 6.2	7.1 7.3 7.5 7.1	6.2 6.3 6.6 6.9

Máquinas

1	2	3	4
Operario A	Operario A	Operario B	Operario B
6	5	6	4.9
6.3	5.3	6.1	5.5
6.1	5.7	6.7	5.2
6.7	5.5	6.2	5.1

ANOVA de tres factores

	Hospital 2º nivel			Hospital 3er nivel		
	Sala 1	Sala 2	Sala 3	Sala 1	Sala 2	Sala 3
Ap 1	50	70	81	35	25	51
	54	74	84	32	21	48
Ap 2	60	80	89	41	30	61
	63	83	93	43	35	57

Tabla ANOVA

Fuente	*Suma de Cuadrados*	*Gl*	*Cuadrado Medio*	*Razón-F*	*Valor-P*
Hospital	6733,5	1	6733,5	8,16	0,0461
Aparato	504,167	1	504,167	1512,50	0,0000
Sala(Hospital)	3299,33	4	824,833	128,55	0,0000
Hospital*Aparato	0,0	1	0,0	0,00	1,0000
Aparato*Sala(Hospital)	1,33333	4	0,333333	0,05	0,9943
Residuo	77,0	12	6,41667		
Total (corregido)	10615,3	23			

Hospital 1				Hospital 2			
Aparato 1		Aparato 2		Aparato 1		Aparato 2	
Op.1	Op.2	Op3	Op.4	Op.5	Op.6	Op.7	Op.8
52	60	58	48	60	60	53	65
55	64	63	52	64	55	58	61

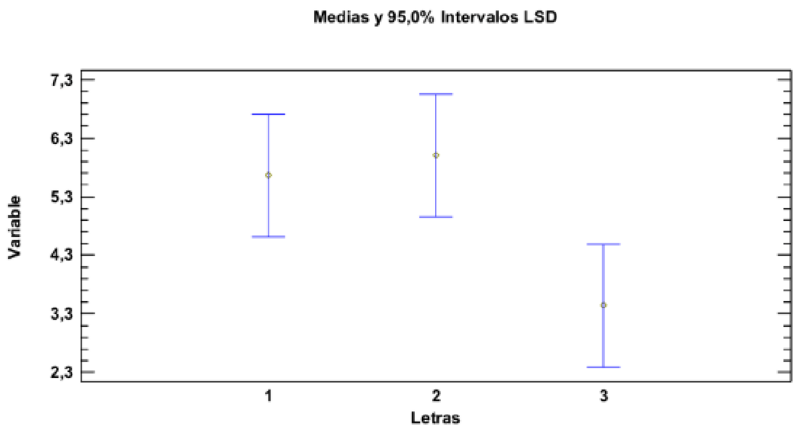
Tabla ANOVA

Fuente	*Suma de Cuadrados*	*Gl*	*Cuadrado Medio*	*Razón-F*	*Valor-P*
Hospital	36,0	1	36,0	0,56	0,4973
Aparato	9,0	1	9,0	0,14	0,7282
Hospital*Aparato	4,0	1	4,0	0,06	0,8159
Operario(Hospital*Aparato)	259,0	4	64,75	7,00	0,0100
Residuo	74,0	8	9,25		
Total (corregido)	382,0	15			

C1						C2						C3					
L1		L2		L3		L1		L2		L3		L1		L2		L3	
A1	A2	A1	A2	A1	A2	A1	A2	A1	A2	A1	A2	A1	A2	A1	A2	A1	A2
5	7	4	7	3	3	8	5	6	5	2	5	4	8	6	8	5	4
5	7	3	8	3	3	7	3	7	5	3	4	3	8	5	7	5	3
6	6	5	7	2	4	6	3	7	7	3	4	4	7	6	5	3	3

Tabla ANOVA

Fuente	*Suma de Cuadrados*	*Gl*	*Cuadrado Medio*	*Razón-F*	*Valor-P*
Ciencias	1,03704	2	0,518519	0,07	0,9354
Letras	69,4815	2	34,7407	4,51	0,0440
Ciencias*Letras	3,40741	4	0,851852	0,11	0,9757
Alumno(Ciencias*Letras)	69,3333	9	7,7037	11,24	0,0000
Residuo	24,6667	36	0,685185		
Total (corregido)	167,926	53			



	Pub		Priv		Conc	
	G1	G2	G1	G2	G1	G2
M1	5	3	7	5	3	7
	6	5	7	4	5	6
	6	4	6	4	5	7
	4	3	5	3	5	7
	5	5	6	4	4	5
M2	7	6	8	6	6	8
	6	6	7	6	5	7
	8	7	7	5	5	7
	8	6	7	5	7	6
	7	5	8	7	5	7

Tabla ANOVA

Fuente	*Suma de Cuadrados*	*Gl*	*Cuadrado Medio*	*Razón-F*	*Valor-P*
Centro	0,833333	2	0,416667	0,03	0,9693
Método	32,2667	1	32,2667	107,56	0,0019
Grupo(Centro)	39,7	3	13,2333	19,85	0,0000
Centro*Método	3,03333	2	1,51667	5,06	0,1095
Método*Grupo(Centro)	0,9	3	0,3	0,45	0,7185
Residuo	32,0	48	0,666667		
Total (corregido)	108,733	59			

Medias y 95,0% Intervalos LSD

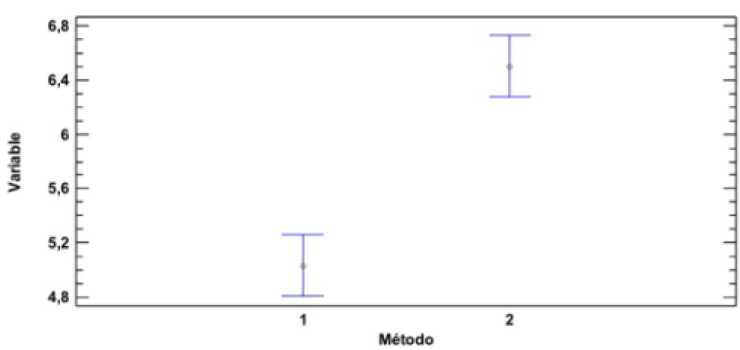


Table 5
The one way ANOVA of Chlorophyll a along estuary, near-shore, offshore.

Descriptives (a)

Chlorophyll_a

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max	Between- Component Variance
						Lower Bound	Upper Bound			
Estuary		9	2.04	3.72	1.24	−0.81	4.90	0.051	11.51	
Nearshore		6	0.17	0.17	0.072	−0.01	0.36	0.055	0.51	
Offshore		6	0.31	0.36	0.15	−0.07	0.70	0.039	1.03	
Total		21	1.01	2.53	0.55	−0.13	2.16	0.039	11.51	
Model	Fixed Effects			2.49	0.543	−0.12	2.15			
	Random Effects				0.63	−1.71	3.74			0.307

ANOVA (b)

Chlorophyll_a

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16.62	2	8.31	1.34	0.29
Within Groups	111.60	18	6.20		
Total	128.22	20			

Table 1. Analysis of variance of respiration rates between days and months. Days nested in months.

Species	df	SS	MS	*F*	*P*
D. avara					
Day	17	0.20	0.17	0.29	0.990
Month	5	10.18	3.39	58.03	<0.001
Error	452	7.37	0.06		
H. papillosa					
Day	17	0.06	0.03	0.22	0.800
Month	5	2.49	0.62	5.10	<0.001
Error	321	14.28	0.12		
P. clavata					
Day	17	0.24	0.12	0.18	0.830
Month	5	13.41	1.12	5.72	0.040
Error	254	115.08	0.65		

df, degrees of freedom; SS, sums of squares; MS, mean square; *F*, *F* ratio; *P*, probability.

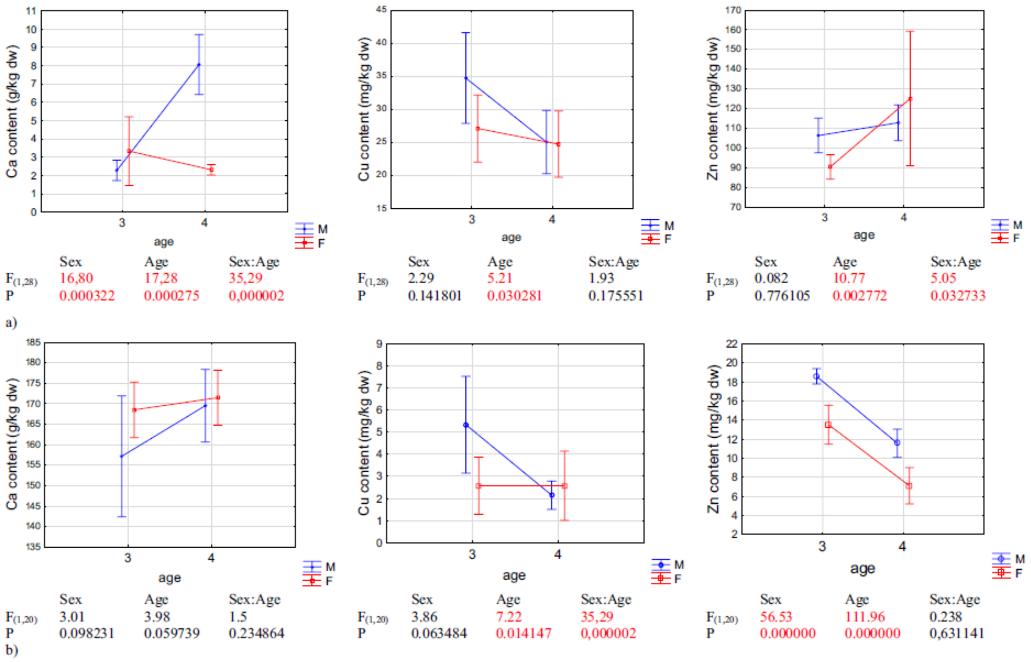


Fig. 2 Result of two-way ANOVA for each metal (Ca, Cu, and Zn) and sex in the meat (**a**) and exoskeleton (**b**) of spiny-cheek crayfish (*Faxonius limosus* Raf.) from Głowińsk reservoir (Poland)

Tabla 1. Análisis de varianza de dos vías para evaluar el efecto de la densidad [1 (D1) y 2 (D2) semillas cm^{-2}] y el sustrato [con (TA) y sin arena (TSA)] y sobre el crecimiento en la longitud de la valva (mm) y la supervivencia en semillas pequeñas de la almeja *Mulinia edulis* / Two way analysis of variance to evaluate the effect of the spat density [1 (D1) and 2 (D2) spats cm^{-2}] and the substrate [with (TA) and without (TS) sand] on the growth in shell length (mm) and survival in spats of the *Mulinia edulis* clam

	g.l	MS	F	*P*
Crecimiento				
Densidad (D1-D2)	1	0,002	0,22	0,640
Sustrato (TA-TSA)	1	7,648	1084,52	0,000*
Densidad* Sustrato	1	0,060	8,51	0,004*
Dentro del grupo	356	0,007		
Total	359			
Supervivencia				
Densidad (D1-D2)	1	139,707	1,34	0,281
Sustrato (TA-TSA)	1	4181,921	40,00	0,000*
Densidad* Sustrato	1	72,656	0,69	0,429
Dentro del grupo	8	104,535		
Total	11			

* indican diferencias significativas

Eta cuadrado

$$\eta^2 = \frac{SS_{efecto}}{SS_{total}}$$

$$\eta_p^2 = \frac{SS_{efecto}}{SS_{efecto} + SS_{error}}$$

Factor

A	B	C
3	4	5
4	5	6
5	6	7

Factor

A	B	C
0	1	2
4	5	6
8	9	10

Fuente	Suma de Cuadrados(SS)	Gl	Cuadrado Medio	Razón-F	Valor-P
FACTOR	6,0	2	3,0	3,00	0,1250
ERROR	6,0	6	1,0		
TOTAL	12,0	8			

$\boxed{\eta^2}$ $\boxed{\eta_p^2}$

$\frac{6}{12} = 0.5$ $\frac{6}{6+6} = 0,5$

Fuente	Suma de Cuadrados(SS)	Gl	Cuadrado Medio	Razón-F	Valor-P
FACTOR	6,0	2	3,0	0,19	0,8337
ERROR	96,0	6	16,0		
TOTAL	102,0	8			

$\boxed{\eta^2}$ $\boxed{\eta_p^2}$

$\frac{6}{102} = 0,0588$ $\frac{6}{6+96} = 0,0588$

Factor 1

Factor 2	A	B
P	1 2 3	3 4 5
Q	5 6 7	12 13 14

Factor 1

Factor 2	A	B
P	0 2 4	2 4 6
Q	4 6 8	11 13 15

Fuente	*Suma de Cuadrados(SS)*	*Gl*	*Cuadrado Medio*	*Razón-F*	*Valor-P*
FACTOR 1	60,75	1	60,75	60,75	0,0001
FACTOR 2	126,75	1	126,75	126,75	0,0000
INTERACCIÓN	18,75	1	18,75	18,75	0,0025
ERROR	8,0	8	1,0		
TOTAL	214,25	11			

$\boxed{\eta^2}$ $\boxed{\eta_p^2}$

$\frac{60,75}{214,25} = \underline{0,28}$ $\frac{60,75}{60,75+8} = \underline{0,88}$

$\frac{126,75}{214,25} = \underline{0,59}$ $\frac{126,75}{126,75+8} = \underline{0,94}$

$\frac{18,75}{214,25} = \underline{0,08}$ $\frac{18,75}{18,75+8} = \underline{0,7}$

Fuente	*Suma de Cuadrados(SS)*	*Gl*	*Cuadrado Medio*	*Razón-F*	*Valor-P*
FACTOR 1	60,75	1	60,75	15,19	0,0046
FACTOR 2	126,75	1	126,75	31,69	0,0005
INTERACCIÓN	18,75	1	18,75	4,69	0,0623
ERROR	32,0	8	4,0		
TOTAL	238,25	11			

$\boxed{\eta^2}$ $\boxed{\eta_p^2}$

$\frac{60,75}{238,25} = \underline{0,25}$ $\frac{60,75}{60,75+32} = \underline{0,65}$

$\frac{126,75}{238,25} = \underline{0,54}$ $\frac{126,75}{126,75+32} = \underline{0,79}$

$\frac{18,75}{238,25} = \underline{0,078}$ $\frac{18,75}{18,75+32} = \underline{0,37}$

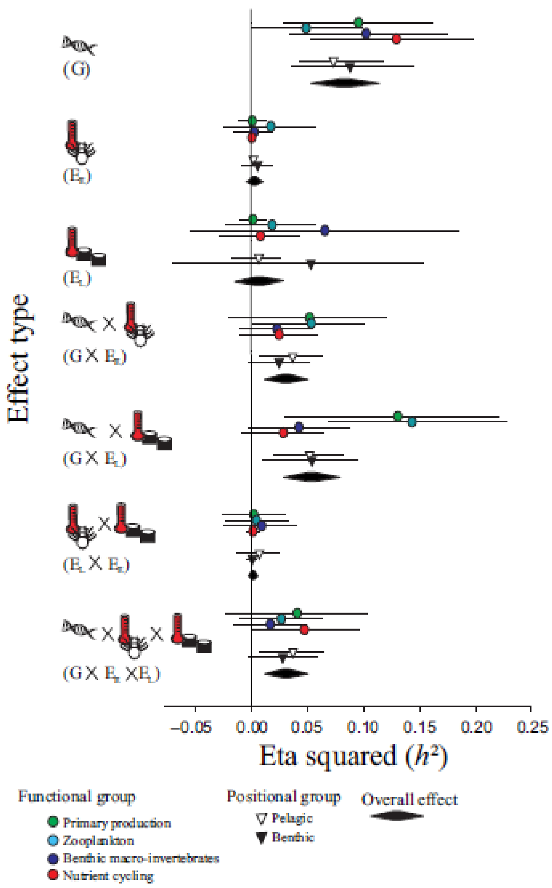


FIGURE 3 Eta-squared effect sizes for the genetic (G), early developmental environment (E_E), late developmental environment (E_L) and interactive (G × E_E, G × E_L, E_E × E_L) contributions to the effects induced by *Crocothemis erythraea* larvae on the community and ecosystem properties measured in the mesocosms. For each effect type, the combined effect size with 95% CI is given, together with the 95% CIs of the effect sizes split up according to the positional group (pelagic vs. benthic) and according to the functional group (primary production, zooplankton, benthic macro-invertebrates or nutrient cycling) of the variables quantified in the mesocosms