Resumen por el autor, S. Naccarati

Sobre la relación entre el peso de las glándulas de secrección interna y los pesos del cuerpo y cerebro.

En el presente trabajo se consigna el peso de las glándulas de secrección interna de cinco especies de reptiles de la fauna italiana, a saber: *Testudo graeca*, *Emys europaea*, *Tropidonotus natrix*, *Zamenis viridi flavus* y *Lacerta viridis*. Los pesos absolutos de las glándulas, incluyendo también los del hígado, páncreas, riñones y bazo, y sus valores relativos con respecto al peso total y al del cerebro, representan la media de un número de animales examinados.

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ON THE RELATION BETWEEN THE WEIGHT OF THE INTERNAL SECRETORY GLANDS AND THE BODY WEIGHT AND BRAIN WEIGHT

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In a previous work (1), in giving the average weight of the thyroid gland of *Emys europaea*, I pointed out that the individual variations are very great. Weibgen (2), Tenchini and Cavatorti (3), Dustin and Zunz (4), and other investigators, who studied the thyroid in man, found also the same great variability.

In this brief report I am giving the absolute weight of the endocrine glands and their value in relation to the body and brain weight in some species of reptiles of the Italian fauna which I had the occasion to study, namely, *Emys europaea*, *Testudo graeca* (Chelonia), *Lacerta viridis* (Lacertilia), *Tropidonotus natrix*, *Zamenis viridi flavus* (Ophidia). These organs show the same variability that was found in thyroid.

Included in this report are also glands of external secretion, which are believed to possess also an internal secretory function.

In my study ovary was omitted because of the great variability due to the physiological condition of the animals. Pituitary, pineal, and parathyroids were not considered on account of the difficulty of estimating them in the small species of reptiles studied by me.

Liver, pancreas, and spleen were in functional activity when the animals were killed.

Weighing operations were conducted within three hours from death.

The relative weight of each organ is referred to the body and to the brain weight in percentage values.

The data I give on reptiles represent averages from a given number of animals. These and especially those given by Welcker and Brandt (5), which are based sometimes on one or two animals, are too few for conclusions of a general nature.

In order to give an idea of the variability I have reported in table 6 the weight of the thyreoid in thirty *Emys europaeas*. Here, and in the case of the other animals, whose tables I have omitted for the sake of brevity, a positive correlation was found between the weight of the animal and that of the thyreoid.

Those who wish detailed and precise data on weights of viscera in man are referred to the works of Reid (6), Peacock (7), Gluge (8), Boyd (9), Bischoff (10), Blossfeld (11), Dieberg (12), Thoma (13), Gocke (14), Oppenheimer (15), Juncker (16), Richet (17), Kress (18), Buchanan and Daly (19), Greenwood (20), Castor (21), Greenwood and Brown (22), Bean (23), Bean and Baker (24).

In the tables, when not otherwise stated, the first column indicates the absolute weights in grams, the second gives the weight of the organ per 100 grams of body weight, the third represents the weight of the organ corresponding to 100 grams of brain substance.

TABLE 1

Emys europaea (aver. 30 animals)

1. Body weight	250		
2. Brain weight	0.25	0.1	
3. Thyroid	0.025	0.01	10
4. Thymus	0.08	0.03	32
5. Sex glands (testes, 17 animals)	0.61	0.24	244
6. Adrenals	0.028	0.01	11
7. Spleen	0.16	0.06	64
8. Pancreas	0.28	0.11	112
9. Liver	7.3	2.9	2920
10. Kidneys	1.38	0.5	552

TABLE 2

Testudo graeca (aver. 30 animals)

1. Body weight	320		
2. Brain weight	0.3	0.09	
3. Thyroid	0.036	0.011	12
4. Thymus	0.1	0.03	33
5. Sex glands (testes, 20 animals)	0.74	0.23	247
6. Adrenals	0.031	0.01	10
7. Spleen	0.18	0.06	60
8. Pancreas	0.3	0.09	100
9. Liver	8.5	2.65	2833
10. Kidneys	1.55	0.5	517

TABLE 3

Lacerta viridis (aver. from 15 animals)

1. Body weight	50		
2. Brain weight	0.121	0.24	
3. Thyroid	0.008	0.016	7
4. Thymus	0.03	0.06	24
5. Sex glands (testes, 8 animals)	0.2	0.4	165
6. Adrenals	0.02	0.04	16.5
7. Spleen	0.08	0.16	66
8. Pancreas	0.2	0.4	165
9. Liver	2.5	5.	2064
10. Kidneys	0.58	1.15	480

TABLE 4

Tropidonotus natrix (aver. from 20 animals)

1. Body weight	70		
2. Brain weight	0.1	0.14	
3. Thyroid	0.01	0.014	10
4. Thymus	0.015	0.02	15
5. Sex glands (testes, 12 animals)	0.23	0.3	330
6. Adrenals	0.035	0.05	35
7. Spleen	0.12	0.17	120
8. Pancreas	0.25	0.35	250
9. Liver	2.8	4.	2800
10. Kidneys	0.88	1.4	980

TABLE 5

Zamenis viridiflavus (aver. 6 animals)

1. Body weight	220		
2. Brain weight	0.209	0.09	
3. Thyroid	0.045	0.02	21
4. Thymus	0.075	0.03	30
5. Sex glands (testes)	0.48	0.21	230
6. Adrenals	0.08	0.04	38
7. Spleen	0.125	0.06	60
8. Pancreas	0.415	0.18	200
9. Liver	4.825	2.2	2300
10. Kidneys	1.935	0.8	830

TABLE 6

Weight of thyroid in Emys europaea

NO.	SEX	WEIGHT OF THE ANIMAL	ABSOLUTE WEIGHT OF THYROID	RELATIVE WEIGHT OF THYROID (PER 100 GRAMS OF BODY WEIGHT)
1	F	179	0.025	0.014
2	M	195	0.009	0.005
3	M	200	0.016	0.008
4	M	205	0.020	0.010
5	M	207	0.023	0.011
6	F	220	0.018	0.008
7	F	228	0.029	0.013
8	M	231	0.035	0.015
9	M	232	0.018	0.007
10	F	238	0.026	0.010
11	M	244	0.021	0.009
12	M	246	0.030	0.012
13	M	248	0.025	0.010
14	M	250	0.020	0.008
15	F	255	0.028	0.011
16	F	260	0.025	0.009
17	M	265	0.027	0.010
18	F	271	0.023	0.008
19	F	274	0.033	0.012
20	M	276	0.029	0.010
21	M	279	0.041	0.015
22	F	281	0.032	0.011
23	F	288	0.034	0.012
24	M	290	0.037	0.013
25	F	296	0.038	0.013
26	F	298	0.031	0.010
27	M	309	0.044	0.014
28	M	326	0.039	0.012
29	M	349	0.042	0.012
30	F	375	0.075	0.020

BIBLIOGRAPHY

- 1 NACCARATI, S. 1922 Contribution to the morphologic study of the thyreoid gland in *Emys europaea*. Jour. Morph., vol. 36, no. 2, p. 279.
- 2 WEIBGEN, K. 1921 Zur Morphologie der Schilddrüse des Menschen. Münchener medizinische Abhandlungen, Serie I, No. 8.
- 3 TENCHINI, L., e CAVATORTI, P. 1908 Sulla morfologia della ghiandola tiroide normale nell'uomo. Roma.
- 4 DUSTIN, A. P., ET ZUNZ E. 1918 A propos des correlations fonctionnelles entre le Thymus et le corps thyroïde. Journal de Phys. et de Path. gén., T. 17, no. 6, p. 905.
- 5 WELCKER, H., UND BRANDT, A. 1903 Gewichtswerthe der Körperorgane bei dem Menschen und den Thieren. Archiv für Anthropologie, Bd. 28, S. 1-89.
- 6 REID, J. 1843 Tables of the weights of some of the most important organs of the body at different periods of life. The London and Edinburgh Month. Journal Med. Sciences, vol. 3, p. 295.
- 7 PEACOCK, T. 1846-47 Tables of the weights of some of the organs of the human body. London and Edinburgh Monthly Journal Medical Sciences, vol. 7, new series 1.
- 8 GLUGE, G. 1849 Poids des organes dans le choléra épidémique à Bruxelles. Mém. de L'Acad. de Bruxelles, T. 23, p. 64.
- 9 BOYD, J. 1861 Tables of weight of the human body and internal organs in the sane and insane of both sexes at various ages, arranged from 2614 post-mortem examinations. Philos. Trans. R. Soc. London, vol. 151, pt. 1, p. 241.
1841-1861 Pathological contributions. The Edinburgh Medical and Surgical Journal, vols. 55, 57, 58, 59, 60, 61, 67, 68. Edinburgh Medical Journal, vols. 2, 3, 6.
- 10 BISCHOFF, E. 1863 Einige Gewichts und Trocken-Bestimmungen der Organe des menschlichen Körpers. Zeitsch. f. rationelle Mediz., Bd. 3, S. 20.
- 11 BLOSFELD, G. 1864 Organostatmologie oder Lehre von den Gewichtsverhältnissen der wichtigsten Organe des menschlichen Körpers. Henke's Zeitsch. f. d. Staatsarzneikunde, Bd. 24, S. 88, p. 1.
- 12 DIEBERG, C. 1864 Das Gewicht des Körpers und seiner einzelnen Organe. Casper's Viertelj. für gericht. u. öffentl. Medicin, Bd. 25, S. 127.
- 13 THOMA, R. 1882 Untersuchungen über die Grösse und das Gewicht der anat. Bestandtheile des menschlichen Körpers im gesunden und im kranken Zustande, S. 182. Leipzig.
- 14 GOCHE 1883 Ueber die Gewichtsverhältnisse normaler menschlichen Organe. München.
- 15 OPPENHEIMER, K. 1889 Ueber die Wachstumsverhältnisse des Körpers und der Organe. Zeitsch. f. Biologie, Bd. 25, S. 328.

- 16 JUNCKER, H. 1894 Beitrag zur Lehre von den Gewichten der menschlichen Organe. Münchener Mediz. Abhandl., Serie J, No. 20.
- 17 RICHTER, C. 1895 Poids du cerveau, du foie et de la rate des mammifères. Travaux du Laboratoire, T. 3, p. 173.
- 18 KRESS 1902 Ueber Organgewicht bei Kindern. München.
- 19 BUCHANAN, W. J., AND DALY, F. T. 1902 Weights of human viscera (in natives of Bengal). Indian Med. Gazette, vol. 27, p. 56.
- 20 GREENWOOD, M. 1904 Weights of human viscera. Biometrika, vol. 3, pp. 63, 83.
- 21 CASTOR, R. H. 1912 Weights of organs. Journal Trop. Med. and Hyg., vol. 15, no. 2.
- 22 GREENWOOD, M., AND BROWN, J. W. 1913 A second study of the weight, variability and correlation of the human viscera. Biometrika, vol. 9, p. 473.
- 23 BEAN, R. BENNETT. 1916-17 The weight of the organs in relation to type, sex, stature and age. Anat. Rec., vol. 11, p. 26.