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THE ANATOMY OF NATRIX VITTATA (L.)

by

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Material and problem

For the investigation of the anatomical pattern of *Natrix vittata,* the same material was used as for the description of the life of this snake. A preliminary question was whether both groups from Surabaia and from Tjimahi may be used for statistical treatment as a single unit or if they represent different varieties. The animals are easily recognisable and there is no outward sign which would indicate a difference between the group from the eastern coastal plains and the one from the western hills although the distance between both localities is about 800 km. The range of the body length is for both groups the same, for adult males in Surabaia 341-441 and in Tjimahi 346-457, and for females 392-560 and 395-555. In none of the other measures did we find any real difference between the groups of these two localities, so that we feel justified in taking the lot together as a single variety for Java.

Length and weight

The difference in body length for both sexes shown by the curve of Galton can be measured by the averages for adult animals, males 397.4 ± 3.84 and females 453.2 ± 4.51. The difference is obvious.

The figures for weight also show a sex difference, the females being heavier, 37.14 ± 1.38 gram versus males 24.25 ± 0.86. The correlation between body length and weight is for females r = 0.79 or Z = 1.05 ± 0.13, for males r = 0.67 or Z = 0.85 ± 0.13. In % of the body length the weight is for males 6 and for females 8.3, the latter are stouter.

In the animals with a complete tail, the relation between tail length and

total length is in both sexes the same, round 25 %, as we have seen before. The females have longer tails because their body is also longer but the difference in tail length is not to be taken as a character of sexual dimorphism.

Scales

In the Tjimahi group the ventral shields have been counted, the results were put together with the figures of de Rooij in Table. 1. There is a low positive correlation between the number of ventral shields and the length of the body; in males r = 0.384 and Z = 0.40 ± 0.15.

TABLE 1. Ventral and Subcaudal shields.

		De Rooij	Kopstein		Tjimahi	
			♂	♀	♂	♀
Ventral shields	N		19	21	37	40
	R	140—149	144—151	141—147	140—154	141—151
	M				148	146
Subcaudal shields	M				78	80
	R	53—84	71—81	71—81	65—91	67—85
	N		18	18	20	23

In the animals with a whole tail the subcaudals were counted and the figures listed in the same table.

The scales are set in 19 rows according to de Rooij. In the Tjimahi group the scales have been counted around the heart, the gall bladder and the kidneys. Around the heart the number 19 is by far the most frequent in both sexes. The females show a tendency to a greater number of rows (Table 2).

TABLE 2. % of individuals with n scale rows around:

	heart		gall bladder		kidneys	
n	♂	♀	♂	♀	♂	♀
20	2.5	2.5	—	—	—	—
19	85.—	94.—	70.—	85.—	33.—	55.—
18	10.—	5.—	20.—	7.5	40.—	25.—
17	2.5	—	10.—	7.5	27.—	20.—
N	40	40	40	40	40	40

Topography

In the animals the position of the heart is easy to measure, on the cranial end the mark is the top of the right atrium and caudally it is the apex of the ventricle. One has to look carefully at the apex as this is often masked if the pericardial sac happens to contain some fluid. A few of the animals

included in the sample died a natural death or were bitten by other snakes and then the heart makes the impression of being slightly distended, principally the atria. The interval between the two measures is of course the length of the organ. This length is for male and female animals clearly different, 13.75 ± 0.07 and 15.61 ± 0.09, but if converted into % of the body length the figures are 3.45 and 3.57; which suggests the same ratio. The heart lies somewhat on the right side, the cranial end in males at 67.8 ± 0.76 mm from the snout and in females at 75.2 ± 0.84. The % values are 17.1 and 16.8, a negligible difference. The values for the caudal end are in mm: 82.1 ± 0.86 and 90.88 ± 0.98 or in % 20.7 and 20.0.

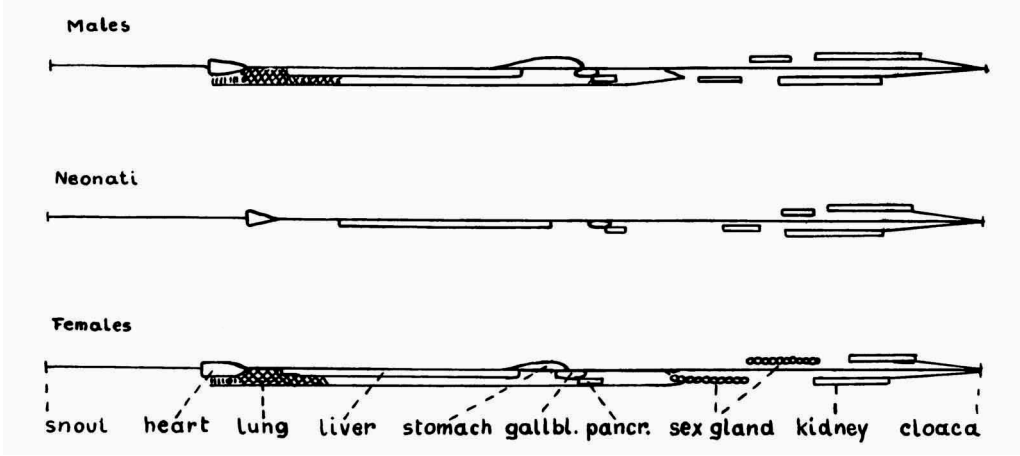
The liver also is very easy to locate in the right side of the body, hard en sharply contoured. In this snake the medial part, on the caudal end, projects somewhat farther than the lateral. For measurement the most distant point has been taken. The length is in males 98.65 ± 1.22 and in females 114.58 ± 1.43, or procentually 24.8 and 25.3, so the same reasoning applies as with the heart. In males the position is between 103.9 ± 1.14 and 200.6 ± 2.26; in females 113.25 ± 1.07 and 228.24 ± 2.14, or procentually in males between 26 and 50, in females between 25 and 50 % of the body length.

The gall bladder does not present any real difficulty. In most animals, and certainly in those that have not been fed for a couple of days, the colour is dark green. This colour diffuses very easily and one has to be careful not to take the coloured area for the one occupied by the gall bladder; this would give too high values. The real boundaries of the gall bladder stand markedly out as soon as a little pressure is exerted upon it. The neck begins on the cranial end of the bladder and the bile duct turns sharply down, running along the medial side of the bladder between the latter and the stomach, then turns to the right between gall bladder and pancreas to run further downward on the lateral surface of the pancreas in a small groove, often marked by a thin green stripe, to the place halfway down the pancreas where the bile ducts sink into the gland en through it into the duodenum.

In a few animals, probably after a rather heavy meal, the gall bladder is filled with a very light green or almost colourless liquid. The length of the gall bladder from neck to bottom is in males 9.73 ± 0.22 and in females 11.23 ± 0.24, or in % of the body length 2.4 and 2.5. The position is on the right side, in males between 223.65 ± 2.44 and 233.13 ± 2.48 from the snout and in females between 248.30 ± 2.24 and 260.77 ± 2.32; in procent of the body length for males 55.9—58.2 and for females 55.2—57.9. For part of its length, sometimes more than half of it, the gall bladder is

embedded in the cranial part of the pancreas, but both can easily be separated.

The pancreas in *Natrix vittata* is a solid organ, more or less triangular in shape, with the base on the cranial end flattened out between gall bladder and intestine, and a more obtuse top on the caudal end. As we have seen, the cranial half of the free external surface is divided into a ventral and a dorsal part by a thin groove where the bile ducts run before they dive straight into the pancreatic tissue. In the cranial border, sometimes on the



Topographical Pattern of Natrix vittata in % of body length

Fig. 1.

external surface, sometimes between gall bladder and intestine, lies the spleen.

The pancreas measures in length 9.35 ± 0.14 in males and 9.73 ± 0.26 in females, procentually 2.34 and 2.16.

The position from the snout on is in males 232.5 ± 2.49 to 240.71 ± 2.6, in females from 257.56 ± 2.33 to 267.22 ± 2.34, or in % 58.1 — 60.2 and 57.2 — 59.4.

The spleen is sometimes a very small, sometimes a more conspicuous spherical nodule, in the cranial border of the pancreas. The top is always easily found, but the caudal end, buried in the pancreatic tissue, is less clear. The border of the pancreas often goes down a little where the spleen is located and the exact spot where the tangens to the circle of the spleen is supposed to be in the pancreas can reasonably well be estimated. However, the final value will not be very strongly affected, because in com-

parison with the smallness of the organ, the mm used as a measure, is a relatively coarse one. Both these factors may cause the relatively high coefficient of variation found here.

The length is for males 2.26 ± 0.13 and for females 2.68 ± 0.32, in % of body length 0.56 and 0.59 respectively. The position in males is from 230.9 ± 2.51 to 233.46 ± 2.6 and in females from 255.82 ± 2.48 to 260.10 ± 2.37; procentually 58 to 58.5 and 56.7 to 58.

On the left side of the heart, liver, gall bladder and pancreas runs the oesophagus and the stomach. There is a marked difference between the nearly transparent wall of the oesophagus with the very fine folds of the thin mucosa and the thick wall of the stomach with its mucosa in coarse folds, but the line between both is very irregular, on the medial side the mucosa of the stomach creeps higher up than on the lateral side, the difference can be considerable, sometimes more than 20 mm. Outwardly this limit is not visible and the measure has not been taken. The distal end of the stomach is more clearly marked, it is mostly visible as a little groove, and always palpable as a thin but compact muscular ring. It is to be found near the cranial end of the gall bladder, in males at 225.45 ± 3.3 mm from the snout and in females at 249.83 ± 2.98 mm, or in % of the body length at 56.4 and 55.5.

The lung is situated dorsally from the other organs, the top behind the heart is well defined, the end is only recognisable when the wall of the air sack is not injured, because then an air bubble can be pushed into the end and make it stand out. If the wall has been injured, which happens sometimes while cutting the ventral wall of the snake, it is very difficult to find and in these cases the measure has been discarded as unreliable. After taking these two points, the respiratory part of the lung has been opened to show where the trabecular wall ends in the air sack, this is well marked, but it is more a zone than a line, the change from the trabecular wall of the respiratory part to the smooth and thin wall of the air sack is very gradual and covers from 5 to 10 mm. The end of the trachea is sharp and the opening of the very short ventral blind sack of the lung can also easily be marked in the ventral wall of the trachea, just above the end of the latter.

The top of the lung is found in 32 males at 74.31 ± 1.08 and in 42 females at 81.88 ± 1.13, or at 18.6 and 18.2 % of the body length from the snout. The trachea ends in males at 84.4 ± 1.27, in females at 90.4 ± 1.12, or in % at 21 and 20. The ventral opening in the trachea in males ends at 83.2, in females at 88.9, or in % also 21 and 20. The end of the trabecular or respiratory part in males is at 125.13 ± 2.16, in females at 134.25 ± 1.47, in % 31 and 30. The end of the sack in 11 males (with an average body

length of 404 mm) is at 273 mm and in 24 females (with an average body length of 457) at 315, or in % at 68 and 69, so there is no difference.

Of the sex organs the testes are very conspicuous, massive and homogeneous organs, elongated oval. The right testis is always straight, the left often somewhat curved, and then nearly always fitting in between two loops of the small intestine. A well marked ductus deferens goes down towards the medial border of the kidneys.

The length of the right testis is 17.16 ± 0.28, that of the left 16.3 ± 0.18, which is very near to a significant difference.

The position is right from 276.81 ± 2.94 to 294.52 ± 3.1 and left from 296.8 ± 3.0 to 314.19 ± 3.12, the extreme limits from top right to end left in % being 69.2 and 78.6.

The ovaries are less well defined, they are long peritoneal folds, bearing along their whole length a row of small globular eggs, with a more or less uniform diameter somewhere around 3 mm. As an egg is ripening, it becomes elongated, and when the length reaches 10 mm it is easily recognisable as different from the resting eggs. While growing, the eggs remain in the ovary until they are of full size, and then they go over into the uterus which caps the cranial end of the ovary with a very thin membranaceous infundibulum. When the eggs leave the ovary they leave a small scar, the peritoneal fold of such ovaries seem to be swollen and sometimes they contain a more or less clear fluid.

The limits of the ovaries are not very clearly defined, the peritoneal fold is coming up gradually from the back towards the eggs; mostly, however, the difference or the distance between the limit of the egg-ridge and the place where the fold disappears is not more than one or two mm. When the ovary bears long eggs, the latter often reach farther down than the end of the peritoneal fold. In these cases, the end of the fold has been measured.

The length of the right ovary is 39.53 ± 1.2 and that of the left 33.02 ± 1.55. The difference is statistically significant. The position on the right side is between 303.62 ± 2.96 and 342.34 ± 3.12; on the left side it is from 340.79 ± 3.24 to 374.93 ± 3.51, the outer limits of both, in % 67.5 and 83.3, not exceeding very much those of the male glands. However, the testes do not follow each other directly, while the ovaries slightly overlap each other.

The kidneys again are sharply outlined and massive. In both sexes the caudal half of the right overlaps the cranial end of the left. The length is in males right and left 45.16 ± 2.5 and 43.65 ± 2.3; in females 37.48 ± 0.98 and 32.44 ± 0.67 with a significant difference. For both kidneys the figures are for males 88.5 mm and for females 68.8 mm, or in % of their body

length 22.1 and 15.2 which also seems a very large difference. The coefficient of variation is of the same order as for other organs.

The position in males is on the right side between 307.6 ± 3.9 and 352.55 ± 3.6, on the left side between 325.34 ± 3.3 and 369.3 ± 3.7; in females right between 373.06 ± 3.4 and 409.64 ± 3.8 and left between 388.93 ± 3.1 and 421.69 ± 3.8. The upper limit right and the lower limit left in % of the body length is for males 76.9 and 92.3 and for females 82.9 and 93.8, the main difference being a displacement of the cranial end towards the cloaca in females.

In view of the problems of growth it can be useful to consider the intervals or "free spaces" between the organs separately. More or less they can be seen as individual factors in the same way as an organ itself can be considered as an entity apart from the whole wherein it is included.

There are different groups of such free spaces, one in the cranial half of the body, comprising the distance from the snout to the top of the heart, the distance from the end of the heart to the top of the liver and from the end of the liver to the top of the gall bladder.

In the caudal part of the body there are two more groups, a series on the right side and one on the left side, both including the distance from the end of the pancreas to the top of the sex gland, the distance from the end of the sex gland to the top of the kidney and the distance from the end of the kidney to the cloaca.

For the first free space, the interval from the snout to the top of the heart, the figures are for males 67.64 ± 0.71 and for females 75.2 ± 0.87, or in % 16.9 and 16.7.

Between heart and liver the intervals are for both sexes 22.78 ± 0.66 and 22.3 ± 0.51, or in % 5.6 and 5.0. Between liver and gall bladder 21.60 ± 0.79 and 21.11 ± 1.23, or in % 5.3 and 4.7. The % figures are not far from indicating real differences. These cranial intervals together count in males 110.8 ± 1.44 and in females 121.98 ± 1.57, or in % 27.7 and 27.1.

In the caudal half on the right side the distance between pancreas and sex gland is in males 36.05 ± 0.95; in females 35.5 ± 1.38, in % 9.0 and 7.9. Between sex gland and kidneys 13.0 ± 0.21 and 30.83 ± 1.58, or in % 3.2 and 6.8 which is a big difference, and the intervals between kidney and cloaca 44.8 ± 0.78 and 44.5 ± 1.04, or in % 11.2 and 10. These differences are due to the shorter kidney in female animals. Taken together the intervals caudal and on the right side are 93.77 ± 2.34 and 111.72 ± 1.56, or in % 23.4 and 24.8.

In the caudal group on the left side the distance between pancreas and sex gland is in males 56.12 ± 1.20; in females 74.22 ± 1.62, or in % 14

and 16.5. Between sex gland and kidney 12.82 ± 0.5 and 16.05 ± 1.35, or in % 3.2 and 3.5. Between kidney and cloaca 28.79 ± 1.97 and 30.9 ± 0.82, in % 7.2 and 6.9.

Here also, the sex differences are due to the longer sex glands and the shorter kidneys in the females. All together these left intervals are 96.92 ± 1.43 in males and 121.40 ± 2.54 in females, or in % 24.2 and 27.0.

Looking at the sum of the intervals on the right and left sides in males, the figures are practically identic, 203.9 ± 2.57 and 205.5 ± 2.18, 50.9 % and 51.4 %. In female animals there is more difference: right side 229.5 ± 2.22 and left 240.0 ± 2.93, wherein D = 11.5 and σ D = 3.68 and the product 3.5. In % the figures are 51 and 53.

The t otal length of all the organs together is for males 64 % of the body length and for females 65.4 %. However, if the sex glands are subtracted, the figures are 55.6 and 49.7, certainly a notable difference, accounted for by the different size of sex glands and kidneys.

Coefficient of variation

The variability of the length of the organs is very interesting. For the cranial part of the body there is no sex difference. The differences start with the pancreas and the spleen, both sex glands and the right kidney.

In males the variability is on both sides, right and left the same, in females the left ovary is decidedly more variable than the right.

Excepting the spleen, the variability is greater in the female group. For the spleen it seems the other way round.

The variability in the topography of the organs is very low and practically constant in males and females for every one of the organs, equally on the top end and on the caudal end.

The most variable elements in the anatomy of *Natrix vittata* are the intervals between the organs, not when considered together as a whole, but certainly if taken separately. In female animals these coefficients are much higher than in males. The most impressive difference is between both sexes for the interval from sex gland to kidney on the right side.

Djakarta, June, 1948.

TOPOGRAPHY

Adult males

Top of:	N	R	M	σ	V	‰ of body length
heart	61	55— 84	67.8 ± 0.76	5.98 ± 0.53	8.8 ± 0.8	170
liver	61	86—122	103.9 ± 1.14	8.95 ± 0.81	8.6 ± 0.78	261
gall bladder	60	184—271	223.7 ± 2.44	18.90 ± 1.72	8.4 ± 0.76	562
spleen	55	193—274	230.9 ± 2.51	18.60 ± 1.8	8.1 ± 0.77	580
pancreas	58	191—277	232.5 ± 2.49	18.90 ± 1.74	8.1 ± 0.75	583
testis R	61	240—325	276.8 ± 2.94	22.95 ± 2.08	8.3 ± 0.75	696
testis L	61	258—346	296.8 ± 3.0	23.4 ± 2.12	7.9 ± 0.72	747
kidney R	61	266—359	307.6 ± 3.9	25.3 ± 2.30	8.2 ± 0.74	773
kidney L	61	278—377	325.3 ± 3.3	25.60 ± 2.33	7.9 ± 0.72	820
End of:						
heart	61	69—102	82.1 ± 0.86	6.75 ± 0.61	8.2 ± 0.74	207
liver	61	171—241	200.6 ± 2.26	17.70 ± 1.60	8.8 ± 0.80	503
gall bladder	60	192—280	233.1 ± 2.48	19.17 ± 1.74	8.2 ± 0.75	585
spleen	55	194—277	233.5 ± 2.6	18.9 ± 1.8	8.1 ± 0.77	586
pancreas	58	198—284	240.7 ± 2.6	19.80 ± 1.8	8.2 ± 0.76	603
testis R	61	255—343	294.5 ± 3.1	24.20 ± 2.20	8.2 ± 0.74	740
testis L	61	272—367	314.2 ± 3.1	24.3 ± 2.20	7.7 ± 0.70	790
kidney R	61	303—409	352.6 ± 3.6	28.0 ± 2.54	7.9 ± 0.71	886
kidney L	61	321—427	369.3 ± 3.7	28.7 ± 2.60	7.8 ± 0.71	930
Lung:						
top	32	61— 86	74.3 ± 1.1	6.12 ± 0.76	8.3 ± 1.04	188
ventral	31	68— 95	83.2 ± 1.2	6.48 ± 0.82	7.8 ± 0.99	210
trachea	30	68— 96	84.4 ± 1.3	6.96 ± 0.87	8.2 ± 1.05	213
trabeculae	32	92—148	125.1 ± 2.2	12.25 ± 1.53	9.8 ± 1.23	315
end	11	239—319	273.— —	— —	— —	690
Stomach end	57	165—279	225.5 ± 3.3	24.8 ± 2.3	11.0 ± 1.03	566

Adult females

Top of:	N	R	M	σ	V	‰ of body length
heart	64	64—100	75.2 ± 0.6	7.00 ± 0.82	9.3 ± 0.82	166
liver	64	97—134	113.3 ± 1.07	8.60 ± 0.74	7.5 ± 0.65	250
gall bladder	64	202—298	248.3 ± 2.24	17.91 ± 1.6	7.2 ± 0.64	547
spleen	64	192—303	255.8 ± 2.48	19.80 ± 1.9	7.7 ± 0.74	564
pancreas	64	195—306	257.6 ± 2.33	18.64 ± 1.7	7.2 ± 0.64	568
ovary R	64	255—363	303.6 ± 2.96	23.37 ± 2.0	7.2 ± 0.64	670
ovary L	64	282—424	340.8 ± 3.24	25.87 ± 2.28	7.6 ± 0.67	750
kidney R	64	332—460	373.1 ± 3.40	27.17 ± 2.40	7.3 ± 0.64	820
kidney L	64	344—473	388.9 ± 3.10	28.47 ± 2.5	7.3 ± 0.64	859
End of:						
heart	64	72—118	90.9 ± 0.98	7.85 ± 0.69	8.6 ± 0.76	218
liver	64	194—279	228.2 ± 2.14	17.15 ± 1.5	6.1 ± 0.54	507
gall bladder	64	211—310	260.8 ± 2.32	18.54 ± 1.6	7.0 ± 0.62	576
spleen	64	197—307	260.1 ± 2.37	19.00 ± 1.8	7.3 ± 0.71	574
pancreas	64	204—319	267.2 ± 2.34	18.80 ± 1.7	7.1 ± 0.62	590
ovary R	64	296—424	342.3 ± 3.12	24.90 ± 2.2	7.2 ± 0.63	755
ovary L	64	324—463	374.9 ± 3.51	28.10 ± 2.48	7.5 ± 0.66	825
kidney R	64	362—516	409.6 ± 3.83	30.60 ± 2.70	7.5 ± 0.66	900

Adult females

Length of:	N	R	M	σ	V	‰ of body length
kidney L	64	373—517	421.7 ± 3.83	28.47 ± 2.5	7.3 ± 0.64	930
Lung:						
top	42	69—99	81.9 ± 1.13	7.32 ± 0.8	8.9 ± 0.97	179
ventral	38	78—106	88.9 ± 1.19	7.35 ± 0.83	8.3 ± 0.94	194
trachea	39	78—108	90.3 ± 1.12	7.00 ± 0.79	7.8 ± 0.88	205
trabeculae	42	120—159	134.3 ± 1.47	9.52 ± 1.04	7.1 ± 0.77	294
end	24	247—383	315.1 ± 7.17	35.10 ± 5.1	11.2 ± 1.62	690
Stomach end	64	200—312	249.8 ± 2.98	23.87 ± 2.32	9.6 ± 0.83	552

LENGTH

Adult males

Length of:	N	R	M	σ	V	‰ of body length
body	65	341—457	397.4 ± 3.84	30.9 ± 2.7	7.8 ± 0.6	1000
heart	61	10—21	13.8 ± 0.26	2.04 ± 0.18	14.9 ± 1.35	35
liver	61	79—120	98.7 ± 1.22	10.74 ± 0.97	10.8 ± 0.98	248
gall bladder	60	6—14	9.7 ± 0.22	1.74 ± 0.16	17.8 ± 1.62	25
spleen	55	1—5	2.3 ± 0.13	0.95 ± 0.09	42.0 ± 4.00	6
pancreas	58	5—13	9.4 ± 0.14	1.28 ± 0.12	13.6 ± 1.30	24
testis R	66	13—22	17.2 ± 0.28	2.22 ± 0.18	12.9 ± 1.20	43
testis L	61	13—20	16.3 ± 0.18	1.98 ± 0.18	12.2 ± 1.10	41
both testes	60	25—41	33.4			84
kidney R	61	34—61	45.2 ± 2.5	5.85 ± 0.53	13.0 ± 1.18	114
kidney L	61	33—59	43.7 ± 2.3	5.67 ± 0.51	13.0 ± 1.18	110
both kidneys	61	68—120	88.5			224
All organs	58	194—309	256.1 ± 2.83	21.60 ± 2.0	8.4 ± 0.78	647
general:						
body length	39	150—457	401.7 ± 4.98	31.2 ± 3.55	7.8 ± 0.89	1000
tail length	39	45—174	136.0 ± 2.33	14.6 ± 1.6	10.8 ± 1.2	338
body length	61	341—457	397.0 ± 3.86	31.0 ± 2.81	7.8 ± 0.7	1000
weight	61	24.0	24.0 ± 0.88	6.8 ± 0.62	28.5 ± 2.58	
r length/weight		r = 0.670		Z = 0.85	0.13	

Adult females

Length of:	N	R	M	σ	V	‰ of body length
body	65	392—560	453.2 ± 4.51	36.30 ± 3.17	8.0 ± 0.70	1000
heart	64	11—20	15.6 ± 0.29	2.34 ± 0.21	15.0 ± 1.33	35
liver	64	92—145	114.6 ± 143	11.40 ± 1.01	10.0 ± 0.88	258
gall bladder	64	6—15	11.2 ± 0.24	1.89 ± 0.17	17.8 ± 1.57	25
spleen	64	1—5	2.7 ± 0.32	0.82 ± 0.07	30.4 ± 2.69	5
pancreas	64	6—19	9.7 ± 0.26	2.12 ± 0.19	21.8 ± 1.93	22
ovary R	64	22—64	39.5 ± 1.20	9.66 ± 0.86	24.4 ± 2.16	89
ovary L	64	13—59	33.0 ± 1.55	12.40 ± 1.10	37.6 ± 3.33	74
both ovaries	64	38—129	70.5 ± 2.40	19.18 ± 1.70	27.4 ± 2.43	159
kidney R	64	27—60	37.5 ± 0.98	7.86 ± 0.69	21.0 ± 1.96	85
kidney L	64	19—42	32.4 ± 0.67	5.1 ± 0.45	15.7 ± 1.39	73
both kidneys	64	46—96	68.8 ± 1.26	9.90 ± 0.87	14.4 ± 1.28	156

Adult females

Length of:	N	R	M	σ	V	‰ of body length
All organs	64	233—392	294.2 ± 4.24	34.0 ± 3.01	11.5 ± 1.02	663
general:						
body length	30	234—560	443.0 ± 6.1	33.6 ± 4.35	7.6 ± 0.98	1000
tail length	30	103—183	160.5 ± 2.5	13.65 ± 1.76	8.5 ± 1.10	362
body length	63	392—560	453.0 ± 4.65	36.9 ± 3.30	8.2 ± 0.73	1000
weight	63	19—70	37.6 ± 1.53	12.1 ± 1.08	32.2 ± 2.87	
r length/weight			r = 0.790	Z = 1.08	0.13	

ORGAN INTERVALS

Adult males

from-to:	N	R	M	σ	V	‰ of body length
A						
snout—heart	61	55—84	67.6 ± 0.70	5.64 ± 0.51	8.3 ± 0.70	170
heart-liver	61	14—36	22.8 ± 0.70	5.12 ± 0.46	22.5 ± 2.0	58
liver — gall bladder	60	6—36	21.6 ± 0.8	6.12 ± 0.56	28.4 ± 2.6	54
cranial group						
(A) together	60	82—138	110.8 ± 1.4	11.20 ± 1.01	10.1 ± 0.9	280
B						
pancreas — testis R	58	20—56	36.1 ± 0.9	7.26 ± 0.67	21.0 ± 1.9	91
testis — kidney R	61	3—25	13.0 ± 0.2	1.65 ± 0.15	12.7 ± 1.2	33
kidney R — cloaca	61	30—62	44.8 ± 0.8	6.06 ± 0.55	13.5 ± 1.2	113
caudal group						
R together (B)	58	70—119	93.8 ± 2.3	10.80 ± 0.99	11.5 ± 1.1	237
All intervals						
Right side (A + B)	58	157—245	203.9 ± 2.6	19.80 ± 1.83	9.7 ± 0.90	515
C						
pancreas — testis L	58	39—77	56.1 ± 1.2	9.05 ± 0.85	16.1 ± 1.5	142
testis — kidney L	61	3—27	12.8 ± 0.5	4.20 ± 0.38	32.0 ± 3.0	32
kidney L — cloaca	61	20—41	28.8 ± 2.0	4.89 ± 0.45	16.9 ± 1.5	73
caudal group						
L together (C)	58	79—123	96.9 ± 1.4	10.90 ± 1.01	11.3 ± 1.1	245
All intervals						
Left side (A + C)	58	169—249	205.5 ± 2.2	16.56 ± 1.53	8.0 ± 0.8	520

Adult females

from-to:	N	R	M	σ	V	‰ of body length
A						
snout — heart	64	64—100	75.2 ± 0.87	7.00 ± 0.60	9.3 ± 0.82	166
heart — liver	64	1—43	22.3 ± 0.51	6.37 ± 0.56	28.5 ± 2.52	49
liver — gall bladder	64	1—37	21.1 ± 1.23	9.75 ± 0.86	46.0 ± 4.06	46
cranial group						
(A) together	64	85—137	122.0 ± 1.57	12.55 ± 1.11	10.3 ± 0.91	269
B						
pancreas — ovary R	63	4—58	35.5 ± 1.38	10.90 ± 0.96	30.6 ± 2.70	78
ovary — kidney R	64	13—72	30.8 ± 1.58	12.60 ± 1.11	40.6 ± 3.60	68
kidney R — cloaca	64	14—60	44.5 ± 1.04	8.32 ± 0.74	18.6 ± 1.64	98

Adult females

from-to	N	R	M	σ	V	‰ of body length
caudal group						
R together (B)	63	71—135	111.7 ± 1.56	12.45 ± 1.06	11.2 ± 0.96	246
All intervals						
R side (A + B)	63	175—260	229.5 ± 2.22	17.82 ± 1.6	7.5 ± 0.66	503
C						
pancreas — ovary L	63	41—105	74.2 ± 1.62	12.88 ± 1.14	17.4 ± 1.54	163
ovary — kidney L	63	1—43	16.1 ± 1.35	10.79 ± 0.95	67.0 ± 5.90	35
kidney L — cloaca	63	14—41	30.9 ± 0.82	6.49 ± 0.57	21.0 ± 1.89	68
caudal group L						
together (C)	63	68—163	121.4 ± 2.54	20.3 ± 1.8	15.9 ± 1.41	267
All intervals						
Left side (A + C)	63	182—288	240.0 ± 2.93	23.4 ± 2.06	9.7 ± 0.86	530