The Digestive System of the Agouti (*Dasyprocta leporina*) —Gross Anatomy and Histology—

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(1999.12.4 received, 1999.12.24 accepted)

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ABSTRACT. Gross and morphometric studies were undertaken on 10 digestive tracts of the agouti (*Dasyprocta leporina*). The most prominent features included a long small intestine which had a mean length of 700.16 ± 124 cm and formed 49.1 ± 3.9 % of the total weight of the entire digestive tract. The large intestine had a large sacculated caecum which formed 16.8 ± 4.11 % of the total weight of the digestive tract. The colon and rectum had a mean length of 117.0 ± 2.5 cm and formed 18.788 ± 2.11 % of the total weight of the digestive tract. Large anal sac glands had openings into the anus. The histology of the different components of the digestive tract was done on a male agouti and the results suggested that the small intestine has a remarkable proliferation of villi; the epithelium is simple columnar. Numerous intestinal glands were located towards the base of the epithelium, and the glands had numerous goblet cells.

Key Words: Agouti (*D. leporina*), digestive tract, gross anatomy, histology

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INTRODUCTION

Attention is now being given to the large scale domestication and production of indigenous wildlife for meat and other uses. This has become important for many developing countries as the new economic order and its consequent currency devaluations have resulted in increases in the prices of imported meats into these countries. *Dasyprocta leporina* (*D. aguti*) was a valuable protein source for the natives of South and Central America and some parts of the Caribbean before the arrival of the Europeans. Recently, there has been increasing attempts at rearing *D. leporina* in captivity in Trinidad and Tobago [1]. It has also been suggested that this could be an alternative to unprofitable cattle ranching within the cleared forests of Brazil [2]. Large scale production of *D. leporina* is being contemplated because of the relatively small size of the animal which makes it less capital intensive to produce in a region where land is usually a limited production resource. This animal species is also likely to be resistant to many local diseases. In South America, the agouti is also important as a host in the spread of Chagas' disease caused by *Trypanosoma cruzi* [3]. This disease is of importance to mankind and if it is to be properly studied the nutrition and management of the agouti must also form an important part of this effort. Agoutis can survive in a wide range of habitats [4] and can feed on a variety of foods in the wild [5,6]. Meaningful attempts at production would require sufficient information on the biology and behaviour of the agouti which can be used to develop "intensive commercial production systems" for this animal species and even some of the related *Dasyprocta* species. Approaches at developing models for animal production systems has been suggested for wildlife species [7] and this approach could be used as the basis for developing the agouti into a domesticated

species or as a laboratory animal. Interestingly enough there are eleven species of *Dasyprocta* but the literature only contains information mainly on two species, *D. leporina* and *D. punctata*, [8]. Only one anatomical study on *D. leporina* has been found in the literature in which the digestive and reproductive systems has been described and this was done in the last century [9].

It has been suggested that the factors which influence the success of the diets of animals reared in captivity are (i) knowledge of the functional anatomy of the digestive tract; (ii) knowledge of dental adaptations to the natural diet of the species; (iii) knowledge of the diet composition and foraging behaviour of the animal in the wild; (iv) knowledge of the basis of the selection of particular food items by a species; and (v) knowledge of the behavioural implications of food distribution [10]. These authors further concluded that most of the papers dealt with one part of the tract to the exclusion of the rest, with sometimes the stomach attracting attention in a species or group and at other times a part of the intestinal tract. The study being reported herein was undertaken to provide more quantitative information on the digestive system of the agouti, from the dentition to the anus. This would be useful in getting a better understanding for feeding and meeting the nutrient needs of this animal. The main objectives of this paper were the study of the gross anatomy and histology of the digestive system of the agouti.

MATERIALS AND METHODS

Gross Anatomy

The digestive systems of 10 agoutis obtained from a hunter from the Point Fortin District of southern Trinidad (Republic of Trinidad and Tobago, West Indies, the southernmost island in the Caribbean archipelago, 10°-11° North Latitude and eight miles from the South American Mainland) were used for

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this study.

Immediately after the animals had been killed by the hunter they were weighed and their digestive tracts removed and frozen in labelled bags. The tracts were then thawed before use and dissected free of the connective tissue into an uncoiled state. The dissected tracts were stretched out and the various regions were identified. The tracts were sectioned into the esophagus, stomach, small intestine and large intestine. The length and width of each region were then measured and weighed. Observations were made on the various portions of the tract and photographs were taken. The parts were weighed on an electronic scale.

Histology

Dissections similar to the above, were done on a male agouti captured from the wild and reared in captivity for a few weeks. The dissection was however done on this animal immediately after it was killed in the laboratory and sections taken from each part of the digestive tract and the tissues stored in 10% formal saline. They were later processed for normal histological observations using the light microscope.

RESULTS

Gross Anatomy

(1) The mouth

The mouth was divided into the vestibule and the

mouth cavity proper. The vestibule had cheek pouches. The dental formula was: $I^{1/1}$, $C^{0/0}$, $P^{1/1}$, $M^{3/3}=20$. The premolars and molars were approximately of the same size and were closely packed. A wide space (diastema) was found between the incisors and the premolars. The hard palate had seven transverse ridges. The tongue was a large pinkish spatula-shaped organ. The posterior half of the tongue was attached. The dorsal surface of the tongue had a centrally located miniature depression which extended approximately the length of the anterior half of the tongue.

(2) The Esophagus and Stomach

The esophagus had a mean length of 15.4 cm and a mean diameter of 0.5 cm (Table 1). The diameter of the esophagus was almost uniform. The stomach (Figure 1) was piriform-shaped and had a mean length of 13.8 cm. It had a lesser and a greater curvature. Four regions of the stomach were recognized as the cardia, the fundus, the body and the pylorus. The fundus formed a conspicuous bulge in the rostral end of the stomach. It had a mean width of 5.6 cm (Table 3). The body had a diameter of 5.6 cm and was funnel-shaped. The cardia was the junction between the esophagus and the stomach. The pylorus formed the dilated caudal end of the stomach. It was thick-walled and had a mean diameter of 3.2 cm. A thick muscular band, the pyloric sphincter, marked the constricted junc-

Table 1 The lengths of each region of the digestive tracts of *Dasyprocta leporina* samples (cm)

Samples	1	2	3	4	5	6	7	8	9	10	Total	X±S.D
Regions												
Oesophagus	22.0	14.2	19.0	17.0	18.0	10.0	13.2	14.0	17.3	9.0	153.7	15.37±4.05
Stomach	16.5	11.0	14.9	14.0	15.5	11.5	12.9	13.0	13.4	15.3	138.0	13.8±1.78
Small Intestine	844.0	464.5	690.0	809.0	828.0	618.0	610.5	604.4	797.6	735.6	7001.6	700.16±124.4
Caecum	26.5	16.0	20.0	24.0	19.0	19.4	21.0	21.0	29.0	28.8	224.7	22.47±4.41
Colon and Rectum	124.5	70.0	143.3	129.0	135.0	93.5	93.0	109.0	130.0	143.8	1171.1	117.11±24.73
Loops			58.2	52.0	58.0	28.5	20.0	35.7	36.5	45.0	333.9	41.74±13.95
Total	1033.5	575.7	887.2	993.0	1015.5	752.4	750.6	761.4	987.3	932.5		868.91±151.83

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tion between the stomach and the small intestine.

(3) The Small Intestine

The most remarkable part of the tract was the small intestine (Table 1) which had a mean length of 700.16 ± 124.4 cm. It was coiled into a small mass (Figure 2). There were no sharp boundaries between the duodenum, jejunum and ileum. The duodenum had a sigmoid flexure which contained the pancreas. The duodenum and jejunum had a mean diameter of 1.4 cm. The ileum had a mean diameter of 0.4 cm and was the least coiled of the three segments.

(4) The Large Intestine and Caecum

Figure 3 shows the main features of the large intestine which occupied the caudal end of the digestive tract. The large intestine was subdivided into a large caecum, colon and rectum. The most prominent feature of the large intestine was the large, thin-walled greenish-brown caecum. The cranial and caudal parts of the caecum had mean diameters of 4.2 ± 0.8 cm and 2.4 ± 0.4 cm respectively, which made it only slightly smaller in diameter than the stomach (Table 3). The external surface of the caecum had dorsal and ventral longitudinal bands,

Figure 1 Photograph of the Stomach of the Agouti (*Dasyprocta leporina*).
S : stomach, E : Oesophagus, D : Duodenum, F : Fundus, B : Body, P : Pylorus

Table 2 The lengths of each region of the digestive tract as a percentage of the tracts' total lengths for *Dasyprocta leporina* samples

Samples	1	2	3	4	5	6	7	8	9	10	Total	X $\pm$ S.D
Regions												
Oesophagus	2.129	2.467	2.142	1.712	1.773	1.329	1.759	1.839	1.752	0.965	17.867	1.79 $\pm$ 0.42
Stomach	1.597	1.911	1.679	1.410	1.477	1.705	1.719	1.707	1.357	1.641	16.203	1.62 $\pm$ 0.17
Small Intestine	81.664	80.684	77.773	81.470	81.536	82.137	81.335	79.380	80.786	78.885	805.650	80.57 $\pm$ 1.42
Caecum	2.564	2.779	2.254	2.417	1.871	2.578	2.798	2.758	2.937	3.089	26.045	2.61 $\pm$ 0.36
Colon and Rectum	12.046	12.159	161.52	12.991	13.294	12.427	12.390	14.316	13.167	15.421	134.363	13.44 $\pm$ 1.42
Loops			6.560	5.237	5.7112	3.788	2.665	4.689	3.697	4.826	37.173	4.65 $\pm$ 1.24
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

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Table 3 The width of each region of the digestive tracts of *Dasyprocta leporina* samples(cm)

Samples	1	2	3	4	5	6	7	8	9	10	Total	X±S.D
Regions												
Oesophagus	0.4	0.2	0.8	0.6	0.5	0.5	2.0	0.5	0.6	0.4	5.0	0.5±0.2
Stomach:												
Pyloric	3.6	3.5	3.7	2.8	2.6	2.5	2.9	2.8	4.4	3.6	32.0	3.2±0.6
Fundus	6.9	4.2	7.4	5.5	5.7	5.0	4.9	3.1	6.0	6.9	56.0	5.6±1.3
Body	7.3	4.4	7.6	5.7	6.2	5.0	5.1	4.0	5.3	5.8	56.0	5.6±1.2
Small Intestine												
Duodenum	0.8	0.2	2.4	2.2	2.0	0.5	1.3	0.5	1.8	2.1	14.0	1.4±0.8
Jejunum	0.4	0.4	0.5	0.7	0.3	0.2	0.5	0.4	0.2	0.4	4.0	0.4±0.2
Large Intestine												
Cranial	4.6	3.5	5.4	4.5	3.7	3.0	3.8	3.9	4.8	5.0	42.0	4.2±0.9
Caudal	2.3	2.2	2.8	2.2	3.0	2.0	1.9	2.8	2.6	2.5	24.0	2.4±0.4
Colon : Cranial	2.8	1.0	3.0	4.5	2.5	2.0	1.6	2.1	2.0	2.4	24.0	2.4±0.9
Caudal	1.2	0.7	1.8	1.5	1.6	0.8	0.9	1.6	1.7	1.6	1.3	13.3±0.4
Rectum	1.0	1.0	1.5	1.8	1.5	1.0	0.9	1.4	1.3	1.5	13.0	1.3±0.3

the teniae. The caecum had 14 saccular outpouchings called haustra. The caecum had a mean length of 22.5 cm. The ileum and colon join the caecum to produce the ileocecolic junction.

The colon and rectum formed a continuous tube without any sharp demarcation. The initial segment

of the colon was enlarged. After the initial segment the rest of the colon decreased gradually in diameter to be continuous with the rectum. The rostral part of the colon had a tightly wound coil consisting of two folds, a centripetal and a centrifugal fold (Figure 3). The mean length of the loop was

Figure 2 Photograph of the Digestive System of the Agouti(*Dasyprocta leporina*)
C : Caecum, L : Colon, S : Small Intestine, M : Stomach, V : Liver, A : Anal Gland

Figure 3 Photograph of the Large Intestine of the Agouti (*Dasyprocta leporina*)

C : Caecum, T : Taenia, A : Spinal coil of the colon, E : Enlarged initial segment of the colon, P : Faecal Pellets, L : Ileum, H : Haustra

Table 4 Weights of each region of the digestive tract of *Dasyprocta leporina* samples (gm)

Samples	1	2	3	4	5	6	7	8	9	10	Total	X±S.D
Regions												
Oesophagus	1.3	0.5	1.5	2.9	2.6	0.8	1.3	1.4	2.2	1.4	15.9	1.59±0.76
Stomach	8.2	3.3	14.5	16.3	14.3	5.7	6.0	4.7	9.2	7.6	89.8	8.98±4.54
Small Intestine	31.7	9.2	36.1	62.2	61.8	19.6	23.0	23.8	43.8	36.0	347.2	34.72±17.39
Caecum	8.7	6.0	11.4	18.1	13.6	8.6	8.0	7.6	12.5	12.8	107.3	10.73±3.63
Colon and Rectum	13.6	3.6	11.7	23.0	22.4	7.8	11.0	8.8	14.6	13.7	130.2	13.02±6.06
Total	63.5	22.6	75.2	122.5	114.7	42.5	49.3	46.3	82.3	71.5	690.4	69.04±31.55

41.74±13.95 cm. The distal end of the colon appeared beaded because of the faecal pellets within the lumen. The mean diameter of the colon at the cranial and caudal ends were 2.4±0.9 cm and 1.3±0.4 cm respectively. The rectum had a fairly uniform diameter having a mean diameter of 1.3±0.3 cm. The mean length of the colon and rectum was 117±2.5 cm. Two pinkish, bean-shaped anal sacs opened into the anus. The glands had a firm consistency. The weight of the sacs ranged between 1.3 and 3.5 g. The length of the sacs ranged between 1.8 and 3.0 cm and the width between 1.3 cm and 1.8 cm.

The left anal sacs were heavier than the right.

(5) Relative Weights and Percentages of the Components of the Digestive Tract

Table 5 gives the weights of each region on the digestive tract as a percentage of the entire digestive tract. The small intestine was remarkable in this respect as it was 49.1±3.9 % of the total weight of the tract. This almost equaled the combined weights of the remaining segments of the digestive tract. The large intestine formed about 36% of the digestive tract (Table 5). The stomach and the oesophagus formed a small part of the

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Table 5 Weights of each region of the digestive tract as a percentage of the tract's total weight for *Dasyprocta leporina* samples

Samples	1	2	3	4	5	6	7	8	9	10	Total	X±S.D(%)
Regions % weight												
Oesophagus	2.047	2.212	1.995	2.367	2.267	1.882	2.637	3.024	2.673	1.958	23.062	2.3062±0.37
Stomach	12.913	14.602	19.282	13.306	12.467	13.412	12.170	10.151	11.179	10.629	130.111	13.0111±2.59
Small Intestine	49.921	40.798	48.005	50.776	53.880	46.118	46.653	51.404	53.220	50.350	491.035	49.1035±3.90
Caecum	13.701	26.549	15.160	14.776	11.857	20.235	16.227	16.415	15.188	17.902	168.01	16.801±4.11
Colon and Rectum	21.417	15.929	15.560	18.776	19.529	18.353	22.312	19.007	17.740	19.161	187.784	18.7784±2.11
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Table 6 The weight of each region of the digestive tract as a percentage of the animals' body weight for *D. leporina* samples

Samples	1	2	3	4	5	6	7	8	9	10	Total	X±S.D
Regions												
Oesophagus	0.041	0.111	0.041	0.095	0.078	0.046	0.087	0.093	0.08	0.062	0.734	0.0734±0.02
Stomach	0.259	0.729	0.401	0.534	0.429	0.326	0.400	0.311	0.333	0.336	4.058	0.4058±0.14
Small Intestine	1.001	2.033	0.997	2.037	1.852	1.12	1.533	1.576	1.587	1.593	15.329	1.5329±0.39
Caecum	0.275	1.326	0.315	0.593	0.408	0.491	0.533	0.503	0.453	0.566	5.463	0.5463±0.29
Colon and Rectum	0.433	0.796	0.323	0.753	0.671	0.446	0.733	0.583	0.529	0.606	5.873	0.5873±0.16
Total	2.009	4.995	2.077	4.012	3.438	2.429	3.286	3.066	2.982	3.163	31.457	3.1457±0.9

digestive tract. Table 6 showed that the weight of the total digestive tract as a percent of the animal's body weight was 3.15 ± 0.9 %.

Histology

(1) Esophagus

The epithelial lining was made up of stratified squamous keratinised epithelium. The muscular mucosa was prominent and the tunical muscularis was made up of two muscle layers: inner circular and outer longitudinal smooth muscle (Figure 4).

(2) Stomach

The mucosa was lined by simple columnar epithelium. Almost the entire epithelial lining was made up of chief cells. A few parietal cells were found. Mucus secreting cells were rare. The tunica muscularis was made up of inner circular and outer longitudinal muscles (Fig. 5).

(3) Small Intestine

The epithelium had numerous villi. The epithelium

was simple columnar. Numerous intestinal glands were located towards the base of the epithelium. The gland had numerous goblet cells.

(4) Large Intestine

The epithelial layer was made up of densely packed mucosal glands. The glands were lined with large goblet cells and most of the epithelial layer was composed of these glands. Only a small part of the luminal surface of the epithelium was made up of exclusively simple columnar ciliated epithelium. Lymphocytes were loosely distributed between the glands in the deeper parts of the epithelial lining. The muscularis mucosa was prominent. The submucosa had numerous blood vessels and Peyer's patches were few (Figure 6).

(5) Anal Gland

The gland was lobulated and each lobule was made up of seromucous glands. Each lobule had several large ducts lined with a single layer of low

Figure 4 Section of the esophagus of the Agouti (*Dasyprocta leporina*) showing stratified squamous keratinised epithelium.

Arrows indicate keratinised layer. HE $\times 20$

cuboidal to stratified cuboidal epithelium. The smaller ducts were lined with stratified cuboidal epithelium (Figure 7).

DISCUSSION

The dentition of *D. leporina* (agouti) was found to be similar to that described for the Dasyproctidae [8]. The dentition is suited to a herbivorous type diet [4,5]. The cheek pouches of agouti may serve as temporary storage of food and for the transporta-

tion of food between the sites of collection and storage. Food hoarding is a characteristic feature of the agouti; the food is stored in several small holes dispersed throughout the communal home range by burying separately a single load of food in each hole [4, 11]. It is not known whether the cheek pouches also play a role in chemical digestion, this is therefore an area for further work. The palatine ridges are presumably involved in the movement of food in the oral cavity.

The esophagus is perhaps not modified for any special functions beyond mechanical transport. Its weight as a percentage of the total weight of the alimentary canal was $2.3 \pm 0.37\%$ which made it the smallest segment of the alimentary canal (Table 5). Agouti has a monogastric stomach which is mainly a storage organ. It is also important in mechanical and chemical digestion of food. Its weight of 8.98 ± 4.54 g made it $13.0 \pm 3.90\%$ of the total weight of the digestive tract (Table 5).

The small intestine was seen as the most remarkable part of the alimentary canal both by length and weight (Tables 1 to 4). This was consistent with the earlier observations made in 1834 [9]. That report suggested that it was 87.8 % of the total length of the tract of the one male agouti and whose bodyweight was only 1.8 kg. The weight of the small intestine alone compared to the total body weight was $1.53 \pm 0.39\%$ (Table 6). The relative lengths of the small intestine of various animal species vary greatly and the small intestine accounts for most of the absorption of the nutrients of the gastrointestinal tract [12]. The small intestine was therefore found to be the most significant portion of the digestive tract from the anatomy and feeding standpoint. It is the known site of digestion and absorption of monosaccharides. The amount of time food will spend in the small intestine as it passes through the digestive tract would likely be much longer than the amount of time it will remain in the

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Figure 5 Section of the gastric epithelium of the Agouti (*Dasyprocta leporina*)
Arrows indicate parietal cells. HE $\times 10$

Figure 6 A Section showing the mucosal glands of the large intestine of the
Agouti (*Dasyprocta leporina*) (Arrowed). HE $\times 20$

remaining segments of the digestive tract. The small intestine can permit only small bits of food passing through it at a time because of the small

diameter. This may be to expose the food to large quantities of digestive enzymes. The efficiency of digestion and absorption here is likely to be high

Figure 7 Anal sac glands of the Agouti (*Dasyprocta leporina*).
The lobules are arrowed. A duct (D) is shown. HE $\times 20$

because of the length of time the food remains in the small intestine [13]. The histological findings support this as the extent and amount of villi appear remarkable. The thick pyloric sphincter controls the amount of food that passes to the small intestine at a time. A better understanding of the workings of the small intestine of the agouti could therefore hold the key to the efficient feeding of the agouti. A few studies have been conducted to determine the nutrient requirements of rodents kept in zoos [14]. A good topic to begin with could possibly be to compare the information on the nutrition and physiology on the order Rodenta, Super-family Cavioidae. This super-family include the following:

Family : Caviidae — Guinea pigs (*Cavia porcellus*)

Family : Diomyidae — Capybaras (*Hydrochoerus hydrochaeris*)

Family : Dasyproctidae — Agoutis (*Dasyprocta leporina* or *D. aguti*) and Pacas (*Aguti paca*) [15].

This is also a group which already has one very important domesticated species, Guinea pigs. This animal has been well domesticated in Peru and the Cameroon and Sub-Saharan Africa, and has been used as food for humans [16, 17]. The largest rodent, the Capybara, has been semi-domesticated in South America [18].

The macroscopic features of the large intestine of agouti were typical of the mammalian large intestine [19]. The large caecum is a typical feature of a hindgut fermenter. The mean weight of the caecum as a percentage of the weight of the digestive tract was $16.80 \pm 4.11\%$. The mean weight of 10.73 ± 3.63 g of the caecum was greater than the weight of the stomach which was 8.98 ± 4.54 g (Table 4) and formed $13.01 \pm 2.59\%$ of the weight of the entire digestive tract. The mean length of the caecum was 22.47 ± 4.4 cm which was almost twice the length of the stomach which had a length of 13.8 ± 1.78 cm. The width of the Caecum (4.2 ± 0.8 cm) was comparable to the width of the stomach which was about 5.6 cm in the largest regions.

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This suggests that the capacity of the caecum alone may therefore be much more than that of the stomach, and that the caecum may play as important a role as the stomach in the digestion of the agouti. This has already been shown to be so for the capybara, the largest rodent [18]. The weight of the combined large intestine formed about 35.8 % of the weight of the entire digestive tract. The colon was also large. The combined weights of the colon and rectum compared to the weight of the entire digestive tract was 19.0 ± 2.0 gm (Table 5). The colon and rectum had a length of 117.0 ± 2.5 cm. The role of the colonic loops in the digestive process need to be investigated since a similar centripetal and centrifugal arrangement of the loops of the colon which were found in the agouti also occurred in the ox [20]. The colonic loops probably reduce the rate of passage of undigested food in the colon thus permitting a greater amount of water reabsorption in this organ. Anal sacs in the agouti were large. The importance of these glands needs to be investigated.

CONCLUSIONS AND RECOMMENDATIONS

The small intestine of the agouti is by far the largest component of the digestive tract in which there were abundant villi. This probably is a useful area for future comparative anatomy and physiology work to quantify the number of villi/unit area of the digestive tract across species and to determine the implications of this in the digestion and feeding of each species. The role and function of the anal gland should also be investigated. The caecum after the small intestine seems to be the next important component of the digestive system of agouti. Finally it is recommended that the comparative anatomy of the digestive systems of the eleven *Dasyprocta* species be studied.

要 約

ヨーロッパ人が入る前には南米、中米およびカリブ海諸国の一部ではアグーチが重要な蛋白資源であった。最近トリニダード・トバゴではアグーチを飼育繁殖して食肉その他として利用するようになっている。飼育に重要な餌付けのために、消化器官の解剖学的知見が必要であるが、これまでの文献は、数少なくまた、胃、腸など個々の部分について述べているので、本報では全体を概観して口腔、食道、胃、小腸、大腸、各部分の構造と長さおよび相対的重量を記載した。材料はトリニダード島南部のハンターから入手した10頭のアグーチを用いた。現場で採材後凍結し、解剖はそれを解凍して行った。歯式は $\frac{1}{1} \frac{0}{0} \frac{1}{1} \frac{3}{3} = 20$ で、犬歯と前臼歯の間隙が広い。食道は長さ15.4 cm、直径0.5 cm位で、胃の長さは平均13.8 cmであった。小腸の長さは全体で 700 ± 124 cmであった。十二指腸と空腸の直径は1.4 cmで回腸の直径は0.4 cmであった。大腸のなかで特徴的なのは盲腸でその頭部の直径は 4.2 ± 0.8 cm、尾部の直径は 2.4 ± 0.4 cmと太く、胃よりやや小さい程度で、盲腸の長さは平均22.5 cmであった。結腸の直径は近位部は 2.4 ± 0.9 cmとやや太いが遠位部は 1.3 ± 0.4 cmと細くなっており、これは直腸とほぼ同じ太さである。結腸と直腸の長さは 117 ± 2.5 cm。肛門腺が一对みられ、長さ1.8~3.0 cm、幅1.3~1.8 cm、重さ1.3~3.5 gであった。左側の腺の方が右側よりも重い。アグーチは小腸が長いのが特徴で、絨毛の密度の比較解剖学の材料に好適である。今後の盲腸、肛門腺の比較解剖学的研究にも役立つであろう。

キーワード：アグーチ、消化器官、盲腸、肛門腺

ACKNOWLEDGEMENTS

The authors would like to thank the hunters who assisted us. We also wish to thank the secretaries of the School of Veterinary Medicine and the Department of Food Production, The University of the West Indies, St Augustine, Trinidad and Tobago, for typing the manuscript. Finally we thank Mr. Roger John, the anatomy technician at the School of Veterinary Medicine, UWI.

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