*https://dx.doi.org/10.22161/ijaers.6.2.32* *ISSN: 2349-6495(P) | 2456-1908(O)*

# Comparative Anatomy of Abdominal Aorta in Coati (*Nasua nasua*)

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***Abstract*—** *Anatomic studies about Coati (Nasua nasua) are an interesting area, since the contribution to knowledge and development of biological system from this specie that is geographically distributed almost every South American continent, including Brazil. Coati is popularly known as coati, quati, quati-mundéo and quati of stick (terminology attributed with the shape of its nose similar to a trumpet), which belongs the carnivorous order and Procyonidae family. The Nasua gender comprises two species, Nasua nasua and Nasua narica, however only Nasua nasua occurs in Brazil, in the cerrado biome. The present work aimed an anatomical and comparative study of abdominal aorta to verify the structural organization of this vessel on the body and its adaptations to physiological and evolutionary processes, even as possible inherent adaptations to alimentary and reproductive habit. For this, two male and two female specimens obtained from accidental death on the roadsides of Brazilian Southeast of Goiás was used. The arterial system was dissected and inject with Latex Art Glue, colored with red pigment Wandalar, through the femoral artery. Subsequently was made a fixation with aqueous 10 % formaldehyde solution to conservation. The preparation of anatomical pieces was performed under consecrated techniques in Macroscopic Anatomy. The present study demonstrated that in Coati, the anatomic standard of aorta abdominal part and the respective collateral branch shows a similar template to mammalian animals and the detailed analysis of these abdominal vessels reveals particularities to this specie in small arteries as the Phrenic-Abdominal, Suprarenal and Deep Circumflex Iliac.*

***Keywords*— *Coati, Anatomy, Abdominal Aorta and Mesenteric branches.***

## I. INTRODUCTION

The development of anatomic studies about coati shows an interesting area, since it contributes to the knowledge of the biological system from this specie, geographically distributed almost every South American continent. Anatomy, an oldest biomedical science, is an important tool to resolves doubts about the biology and evolution of species, especially in relation to the interaction of habitat environment, feeding and reproduction adaptations. In addition, morphology of anatomical structures reveals the natural history of an individual or specie. Coati (*Nasua nasua*), popularly known as coati, quati, quati-mundéo and quati of stick (terminology attributed with the shape of its nose similar to a trumpet), is widely distributed in the South American continent, including Brazil, which belongs the carnivorous order and Procyonidae family **[1]**. The *Nasua* gender comprises two species, *Nasua nasua* and *Nasua narica*, however only *Nasua nasua* occurs in Brazil. This specie is apparently adapted to Brazilian cerrado biome, were lives and reproduces in small forests and sometimes in communion with humans **[2]**. Forest and Cerrado represents its habitat, where this animal exhibits a semi arboreal behavior, constantly rising and descending in trees, trunks, etc **[3]**.

Coati shows anatomic similarities with domestic carnivores **[4]**, which represents evolutionary proximity to Carnivorous Order **[5]**. An important anatomical segment of all animals is the circulatory system, since the significance efficiency mean of transport and movement of the blood and other substances essential for survival. In this context, the study and description of abdominal aorta anatomy represents an important investigation area, since this vessel is responsible for all blood supply of the abdominal viscera and most abdomen wall, pelvis and pelvic members.

*https://dx.doi.org/10.22161/ijaers.6.2.32* *ISSN: 2349-6495(P) | 2456-1908(O)*

The abdominal aorta, in dogs, arises caudally from diaphragm to centimeters above its bifurcation, nearly the edge of the minor pelvis. It supplies visceral and parietal branches, which the main are: The *celiac trunk*, *mesenteric cranial a.*, *phrenic abdominal a.; Lumbar A.a.*, *suprarenal a.; Renal A.a.*, *gonadal A.a.; External iliac A.a.; Internal iliac Aa.* and *finally medium sacral a.* which is the direct caudally continuation of aorta **[6]**. *Celiac trunk* – The celiac trunk arises from ventral superficies of abdominal aorta part, which is the first large visceral branch. Together with its origin, the diaphragmatic pillars are closely associated. *Celiac trunk* ends in: *hepatic a.*, *splenic a.*, *left gastric a.*, and divided into three branches, nevertheless, eventually *left gastric a.* and *splenic a.*, could arises from a common short trunk. *Cranial mesenteric artery* – The *cranial mesenteric a.* is the largest visceral branch of abdominal aorta. It is a unique branch and arises from the front of the aorta below the origin of the celiac trunk. *Cranial mesenteric a.* supplies small and the largest intestine. *Cauldal mesenteric artery* – The *caudal mesenteric a.* arise from the ventral front of aorta, cranially to *external iliac A.a.* and tail-ventrally, in left mesocolon, supplying the final part of cervix. *Renal arteries* – The *renal a.* arises asymmetrically from *aorta* the lateral surfaces. The *right renal a.* arises cranially in relation to the *left renal a.*, in accordance with the more cranial position of the right kidney. *Renal arteries* provide two or three branches to each one adrenal gland. Nearly to the renal hilum, it divides into a dorsal a ventral branch. Christensen in Miller *et al.*, (1964), proposed that *renal arteries* can be divided into two, four or seven branches, before entering the kidney or may not divide. In the left side, the *renal arteries* can particularly double. *Phrenic abdominal artery* – The *phrenic abdominal a.* is a pair of arteries and divides into *phrenic a.* and *cranial abdominal a.*. According to Marthen, cited by Christensen in Miller *et al.*, (1964), it arises from *aorta* lateral surface, between the *mesenteric cranial* and *renal arteries*. The *right phrenic abdominal a.* occasionally arises from the corresponding renal vessel, and the phrenic or abdominal parts could arise apart the *aorta* or *renal artery*. *Suprarenal arteries* – In dog, *suprarenal a.* usually arises from aorta, in a common trunk with *phrenic abdominal a.* or directly from the *renal a.*. Ljubomudrov cited by Christensen in Miller et al (1964) show that could have 30 or more arteries for each adrenal gland. Flren's cited by Christensen in Miller et al (1964) reports that *phrenic a.* and accessory *phrenic* represent the phrenic part of *phrenic abdominal a.* while the lumbar branch is the abdominal part. *Gonadal arteries (Testicular and Ovarian)* – The arteries that supply testicles and ovaries arise from the ventral face of aorta in the middle lumbar region. The right artery usually arises little cranial, in relation to the left. *Lumbar arteries* – The *lumbar arteries* branches of abdominal aorta are in a number of five pairs. It arises on the dorsal surface of the abdominal aorta. Each pair can appear through a common trunk. The fifth lumbar artery branch of the aorta differs from the others, as it may appear as a common trunk from the terminal part of the aorta or the *median sacral a.*. *Deep circumflex iliac artery* – The *deep circumflex iliac a.* is a pair and arises from the lateral surface of the aorta, cranially to the origin of *external iliac artery*. The right artery generally appears little more cranial, in relation to the left. *External iliac arteries* – The *external iliac a.* are the pair of major parietal branch of abdominal aorta. It arises from the lateral surface of the aorta and throws tail-ventrally to pelvic member. *Internal iliac and medial sacral arteries* – The *internal iliac a.*, together with *medial sacral a.*, constitute the terminal branches, that is the direct continuation of aorta. *Median sacral artery* – The *medial sacral a.* is the direct continuation of the aorta, caudally, after the origin of the internal iliac arteries.

Culau, Azambuja & Campos (2008) affirm that *Myocastor coypus* abdominal aorta, arises as first visceral branch the celiac trunk, which in turn trifurcates *hepatic a.*, *left gastric a. and lineal a.*. *Cranial mesenteric artery* arises in a ventral aspect of the aorta, caudally to the celiac trunk and irrigates almost small and large intestines. *Renal arteries* originates laterally and caudally to the *cranial mesenteric a.* They are generally asymmetric, where *right renal a.* is cranial, relative to the *left renal a.*, but eventually arises cranially as unique or eventually a double branch. The *adrenal A.a.* arises from *phrenic abdominal A.a.* or eventually as a *renal a.* branches. The *caudal mesenteric a.* arises from the final segment of aorta in the ventral surface, nearly to the bifurcation in *common iliac A.a.* and eventually arises from others branches, as *iliac* or *cranial mesenteric*. The terminal branches of abdominal aorta are internal *iliac A.a.* and *middle sacral a.*, while in coati, this branches arises dorsally before the *common iliac A.a.* separation.

Getty in Sisson & Grossman (2008), show that abdominal aorta of domestic carnivores animals is a descending aorta part that penetrates abdominal cavity after crossing the aortic hiatus of the diaphragm and along its abdominal path arises the following collateral branches: a) *Parietal branches* and b) *Visceral branches.*

The *parietal branches* are: *Abdominal phrenic a.*, which is a pair, and arises from aorta, between *mesenteric cranial a.* and *renal a.*. The *phrenic abdominal a.* initiation is relatively constant, while the right artery is variable and eventually arises from right *renal a.*. It arise branches to adrenal glands. The *lumbar arteries* are present in abdominal aorta on each body side. The five

*https://dx.doi.org/10.22161/ijaers.6.2.32* *ISSN: 2349-6495(P) | 2456-1908(O)*

*lumbar arterioles* arise from dorsal surface of abdominal aorta. The fifth right and left lumbar arteries could form a common trunk that arises from the terminal part of aorta, median sacral a. or internal iliac a.. The *deep circumflex a*. of ileus arises briefly before the terminal aortic branch, at the same level as caudal mesenteric a. Eventually it arises from the *external iliac a.*. The *external iliac arteries* arise from the lateral aspect of the caudal segment of abdominal aorta and flow obliquely in laterocaudal direction, to the cranial border of the pubic bone, where depart abdominal cavity after through the femoral annulus. The *internal iliac arteries* arises from the final part of abdominal aorta, caudally to external iliac, together the medial sacral constitute the terminal branches of aorta. The *internal iliac a.* ends when divides into *gluteal caudal a. and internal pudendal a.*. The *medial sacral a.* is the caudal continuation of aorta abdominal part in the sacrocaudal region. It arises between the two internal iliac arteries.

The visceral branches of abdominal aorta are: The *celiac trunk*, a short vessel arising from the ventral face of the abdominal aorta, at aortic hiatus of diaphragm. It usually divides into *gastric left, hepatic and lineal arteries*. The *left gastric a*. and *splenic a*. eventually arises from a common short trunk. The *cranial mesenteric a*. arises closely and caudally to celiac trunk, from ventral surface of abdominal aorta.

The *caudal mesenteric a.* is small and arises from ventral face of abdominal aorta, cranially to *external iliac arteries*. The *renal arteries* are paired, and arise asymmetrically from lateral surfaces of abdominal aorta, caudally to the origin of *cranial mesenteric a.*. The *right renal a*. is in a cranial position to the corresponding left artery localization. The *right renal* is divided in dorsal branch and ventral branch, closely to ileum. These branches could divide into several interlumbar arteries, or not divide, before penetrate the renal wire. The adrenal arteries arise from different and variable ways, from *phrenic abdominal a., lumbar a., celiac a., cranial mesenteric a.* or *renal a.*. The *gonadal arterioles* are small vessels that arise ventrally and laterally to abdominal aorta, between *renal* and *caudal mesenteric a.*. Their terminal branches have an emission of abdominal aorta branches destined to supply pelvic cavity organs and enteral pelvic limbs, in the different species of domestic animals **[7,8]**.

Silva et al. (2011) describe that in *Saimiri sciureus,* the aorta is named *abdominal aorta* after cross the aortic hiatus. It arises in the abdomen between diaphragm pillars and then emits its first branch, the celiac trunk, which divides into *hepatic, left gastric and lineal arteries*. The next branch is *cranial mesenteric a.*, a large vessel that arises ventrally and irrigates the intestines. The renal arterioles are unique on each side and originate laterally. The *caudal mesenteric a.* is a small branch that originates ventrally, near aortic branch in *iliac A.a*. The *gonadal A.a.* arises in a ventral aspect, cranially to the *caudal mesenteric* a.. The terminal branches of aorta are common *iliac A.a.* and *medial sacral*, representing the continuation of aorta.

Macedo et al. (2013), investigating aorta anatomy of *Tamandua tetradactyla*, describe the *phrenic caudal A.a.* and three pairs of lumbar arteries as parietal branches of abdominal aorta, and visceral branches, the celiac trunk that divides in *hepatic a., left gastric a.* and *lineal a.*, eventually *hepatic a.* arises in a common trunk with *cranial mesenteric a.*. The *cranial mesenteric a.* that origins caudally to celiac trunk can arises in common trunk. The caudal *phrenic A.a.* and *adrenal A.a.* originate from aorta, between the celiac trunk and cranial mesenteric and eventually form a common trunk. The *adrenals A.a.* origins are variable, arising directly from aorta or renal arteries, individually or forming trunks. Further to *adrenal a.*, several small branches arise from renal and penetrate in suprarenal gland. The *renal A.a.* originate ventrolateral and caudally to *cranial mesenteric a.*, which the *right renal a.* cranially localized in relation to *left renal a.*. *Renal arterioles* divides before enter in renal wire. *Renal A.a.* emerges *gonadal A.a.* and eventually an *accessory phrenic a.*. The *caudal mesenteric a.* origin in the ventral face of aorta, nearly to *external iliac A.a.* division. It origin is relatively higher in females. The *gonadal A.a.* arises from renal artery near to renal wire. The caudal part of aorta emits *external iliac A.a.*, laterally and follow small until emitting *internal iliac A.a.*. *Median sacral a.* is generally originated from the left internal Iliac.

Bavaresco, Culau and Campos (2013), described in collateral-visceral of rabbit abdominal aorta, the Celiac Trunk; *cranial mesenteric a.*; *renal a.*; *gonadal a.* and *caudal mesenteric a.* as directs branches of aorta. *Umbilical* and *Adrenal arteries* is described as indirect branches. The *celiac trunk* is described as the first visceral branch of abdominal aorta and divides *in hepatic a. left gastric a.* and *lineal a.*. The second branch of abdominal aorta is *cranial mesenteric a.* that arises caudally to celiac Trunk, in the same ventral face of aorta. The third branch is *renal arerioles* that arises laterally, originating the *right renal A.a.* more cranially than *left renal A.a.*. The *renal A.a* can emerges as collaterals, *phrenic abdominal a.* and eventually *adrenal a.*. The *gonadal A.a.*, that generally originate cranially to *caudal mesenteric a.* and eventually caudally. The *mesenteric caudal a.*, is unique, but, eventually can be double. The *suprarenal arterioles* frequently arises from *phrenic caudal a.*. These branches vary from 6 to 7 small arteries that originate from

*https://dx.doi.org/10.22161/ijaers.6.2.32* *ISSN: 2349-6495(P) | 2456-1908(O)*

different sources. The *median sacral a.* is the last collateral of abdominal aorta and originates from the dorsal surface, cranially to *common iliac A.a*. The terminal branches of abdominal aorta are common *iliac A.a.*, which divides into *external* and *internal iliac*. Pinheiro et al., (2014) describe the abdominal aorta of Jaguatirica (*Leopardus pardalis*) as the continuation of descending aorta after it crossing the aortic hiatus of diaphragm. It emits as first branch the *celiac trunk*, which divides into *hepatic a.*, *left gastric a.* and sequentially to *cranial mesenteric a.* as the largest branch of abdominal aorta. The *right* and *left suprarenal A.a.*, originate from the aorta, caudally *cranial mesenteric a.*. Then *renal arterioles* arises, were right renal a. is lightly cranial to the left in males, while in females the opposite occurs. Both emit small branches for peri and pararenal fat. The *gonadal arterioles* arises from the ventral aspect of aorta, with some distancing between them, were the *left gonadal a.* is lightly more cranial. Then *caudal mesenteric a.* arises, closed to the terminal part of aorta. The abdominal aorta emits some parietal branches, were the *phrenic-abdominal a.*, which is pair, arises between *cranial mesenteric* and *renal arteries*. The *left phrenic-abdominal* arises laterally while the right ventrally. Six *lumbar arterioles* are present in Jaguatirica, which arises from the dorsal surface of abdominal aorta. It also originates from abdominal aorta, laterally to *profound iliac circumflexes* and then *external* and *internal iliac arterioles*. They are the terminal branches of aorta, with *median sacral a.*.

Based on anatomical comparative observations to the development of anatomic studies and considering that the anatomy of abdominal part of aorta of Coati (*Nasua nasua*), were not until described and will contributes to the knowledge of the biological system, the present study was designed to dissected and describe these abdominal vessels of this specie distributed almost every South American.

## II. MATERIAL AND METHODS

The present paper is a descriptive anatomical study with two male and two female specimens of Coati (*Nasua nasua*), obtained from accidental death on the roadsides of Brazilian Southeast of Goiás, under authorization of SISBIO nº 37072-2. Considering the descriptive approach of this work, statistical analysis is not necessary. All procedures were conducted in accordance with ethical principles and were approved by the Institutional Ethics in Research Committee at the Federal University of Uberlândia (CEUA/UFU nº 067/12).

The study was made in the research laboratory of human and comparative anatomy from the Federal University of Goiás – RC, were the arterial system was dissected and inject with Latex Art Glue, colored with red pigment *Wandalar*, through the *femoral artery*. Subsequently was made a fixation with aqueous 10 % formaldehyde solution to conservation. The preparation of anatomical pieces was performed under consecrated techniques in Macroscopic Anatomy. For this, after trichotomy of anterolateral abdomen region, an incision was made along *Linea Alba*, from xiphoid process to cranial extremity of the pubic symphysis. Other incisions were performed laterally, accompanying costal border of each side and inguinal region approximated of inguinal ligament. The abdominal wall was laterally open to visceral exposure, then all abdominal part and digestive system secluded, exposing the dorsal wall of abdomen. With an anatomical forceps, the adipose tissue and other tissues were removed to expose abdominal aorta artery and its branches.

The Sony Cyber® digital camera was used to the photographical documentation and the description nomenclature adopted is the standard of *Nomina Anatomica Veterinaria* (2012) **[9]**, elaborated by the International Committee on Veterinary Gross Anatomical Nomenclature.

## III. RESULTS

The *Abdominal Aorta* begin is called as the part of *aorta artery* that crosses the diaphragm through the aortic gap and between diaphragmatic pillars, at about the level of *T. V. 12*. It descends cranially to caudal on the median sagittal plane and deviates slightly to the left along dorsal wall of abdomen. The *abdominal aorta* descends two important large groups of branches that can be classified as *visceral* and *parietal branches*.

### Visceral Branches

The first visceral branch of *Abdominal Aorta* is the *Celiac Trunk*. It arises through the ventral aspect of aorta, between diaphragmatic pillars and partially covered by these pillars. The *Celiac Trunk* is divided into three main arteries: *splenic*, *left gastric left* and *common hepatic arteries*. The second large visceral branch of *Abdominal Aorta* is *cranial mesenteric a.* that is the largest visceral branch of *abdominal aorta* and also arises in ventral aspect of *abdominal aorta*, caudally to *Celiac Trunk*.

The *cranial mesenteric a.* supplies blood to small intestine and most of large intestine. Close to it, caudally, arise on each side of *abdominal aorta*, a large artery destined for renal supply, the *right* and *left renal arteries*. Both in the same level and caudally originate the origin of *cranial mesenteric a.*. The *renal A.a.* enter in the kidney without large branches, however, emits small branches to suprarenal gland nearly to the kidney. Caudally to *renal*

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*A.a*. origin, arises from the ventrolateral face, the *gonadal A.a*., were the left artery is larger and relatively caudally in comparison to the right. Along the path, they emit small branches to adjacent tissues.

Then, on ventral side and close the origins of *external* and *internal iliac arteries*, emerges the *caudal mesenteric a*., a small branch in relation to *cranial mesenteric a*., and arises in the caudal-ventral direction irrigating descending and sigmoid parts of the colon.

**Parietal Branches**

Along the trajectory of *abdominal aorta* in abdominal cavity, it emits six pairs of *lumbar arteries*, which emerges from dorsal wall of aorta and supply the dorsolateral structures of the of abdomen wall, where produces the irrigation of structures of that region. The first pair of lumbar arteries arises at the same localization of *celiac trunk* origin, between the diaphragmatic pillars. The second pair arises in the eminence of renal arteries and the other pairs arises between the origin of external and *internal iliac A.a*..

The male specimens, in the left antimere, there is no evidence of *phrenic abdominal a*., but a *phrenic caudal a*. that origin in ventral aspect of aorta and follow to ipsilateral diaphragmatic pillar, without collateral emission in its course. On the other hand, in the right antimere, there is a *phrenic abdominal a*. that emerges in the cranial face of *renal ipsilateral a*. and emits collateral branches to suprarenal gland, abdominal wall and diaphragm. In contrast, females specimens, the *left phrenic abdominal a*. is present on the ventral-lateral face of aorta, slightly caudal to *cranial mesenteric a*. origin and in a shot space divides into *phrenic*, *abdominal* and *adrenal branches*.

Caudally to *caudal mesenteric a*. origin, arises the *left deep circumflex iliac A.a*., while the *right* arises from *external iliac a*. in a distal origin.

The largest branches of abdominal aorta are *external iliac A.a*., which arise from the lateral side on the terminal segment of aorta asymmetrically, and follow caudal-laterally to pelvic limb. The first branch of *right external iliac* is the *deep circumflex iliac a*. and the *left deep femoral*.

After *external iliac A.a*. origin, the aorta is slight thinner and follows caudally in the sagittal plane in a short interval until emits the terminal branches represented by *internal iliac A.a*. and *median sacral a*.

## IV. DISCUSSION

Anatomical studies on wild animals have a considerable importance to the contribution and knowledge of species biology, since the body morphology structures reveal the natural history of the individual, including diet, reproduction and survival. Herein, we present the novelty of description of abdominal aorta branches of Coati (*Nasua nasua*), performed on dissection technique and comparative anatomical observations, contributing to the knowledge of the biological system from this specie.

The analysis of the anatomical material dissected in Coati reveals that descending aorta crosses diaphragm through aortic hiatus in agreement with the literature compiled in domestic and wild animals (Miller *et al*., (1964) in dog [6]; Culau *et al*., (2008) in *Myocastor coypus* **[10]**; Getty in SISSON & GROSSMAN (2008) in carnivorous domestic animals **[11]** ; da Silva *et al*., (2011) in *Saimiri sciureus L.***[12]**; Macedo *et al*., (2013) in *Tamandua tetradactyla* **[13]**; Bavaresco *et al*., (2013) in rabbit **[14]** and Pinheiro *et al*., (2014) in *Leopardus pardalis* **[15]**). This literature also shows the same parietal and visceral branches of abdominal branches dissected on the specimens of this study.

The first visceral branch of abdominal aorta is the *Celiac Trunk*, which leaves aorta through the ventral side, between diaphragm pillars, a similar condition described in dogs by Miller et al. (1964). The *Celiac Trunk* of Coati is divided into *hepatic a., left gastric a.* and *lineal a*.. The three arteries exhibit individual origin, in agreement with Culau *et al*., (2008) descriptions in *Myocastor coypus,* da Silva et al., (2011) in *Saimiri sciureus L. and* Pinheiro et al., (2014) in *Leopardus pardalis.* On the other hand, are reports of common trunks formation between branches of *Celiac Trunk*, as Miller *et al*. (1964) and Getty in Sisson & Grossman (2008) that showed in dog, a common trunk that eventually establishes between the left *gastric a*. and *lineal a*.. Macedo *et al*., (2013) demonstrated in *Tamandua tetradactyla*, that sometimes *hepatic a*. can arises from *cranial mesenteric a*., a condition not observed in Coati.

The second visceral branch of abdominal aorta in Coati is the *cranial mesenteric a*. that arises in the ventral face of aorta, caudally *Celiac Trunk* origin, supplying small and large intestines. This finding unanimous corroborate the compiled authors (Miller *et al*., (1964) in dog **[6]**; Culau *et al*., (2008) in *Myocastor coypus* **[10]**; Getty in SISSON & GROSSMAN (2008) in carnivorous domestic animals **[11]**; da Silva *et al*., (2011) in *Saimiri sciureus L.* **[12]** and Macedo *et al*., (2013) in *Tamandua tetradactyla* **[13]**).

Close and caudally to *cranial mesenteric a*., arises from the lateral side aorta, a renal artery in each side. The right renal a. appears more cranially than it contralateral. The right enters in the kidney without branching, whereas the left bifurcate in ventral and dorsal branches before enter in the kidney and sometimes emits small branches in its pathway, mainly for suprarenal

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gland. The observations in this research are in accordance with Miller *et al*., (1964) when they mention that in dog the *renal A.a.* origin are asymmetric, where the right is slight cranial in relation to the left, however the affirmation that each *renal a.* provides two or three branches to suprarenal gland, is not a condition observed in Coati. Other discordant affirmation is that each *renal artery* divides in dorsal and ventral branch, since this occurrence is present only in the left antimere of a specimen, therefore, is not a rule. Christensen in Miller *et al*., (1964) affirm that *renal A.a.* can be divided into seven branches before enter in the kidney, even as, in dog the *left renal A.a.* can be double.

The *Myocastor coypus renal A.a.* are asymmetric, where the right is cranial in relation to the left, although eventually the left could be cranial. They are generally unique but can be doubled **[10]**. Getty in Sisson & Grossman (2008), affirms that *renal A.a.* of domestic carnivores are asymmetrical, the right is more cranial and can be divided into dorsal and ventral branch, however in Coati such occurrence in the left antimere is verified only once. Macedo *et al*., (2013) affirm that in *Tamandua tetradactyla* both renal arteries divides before enter in the kidney. Pinheiro *et al*., (2014) describe that the *right renal A.a.* in male *Leopardus pardalis* is cranial in relation to the left, but the opposite occurs in females.

Coati *gonadal arteries* originate from the ventral aspect of abdominal aorta, between *renal A.a.* and *mesenteric caudal A.a.*, where the left is more caudal in relation to the right. These observations are in agreement with Miller et al. (1964) in dogs; Getty in Sisson & Grossman (2008) in domestic carnivores; da Silva et al., (2011) in *Saimiri sciureus L.*; and Bavaresco *et al*., (2013) in rabbit. Meanwhile, Macedo *et al*., (2013) shows that *gonadal A.a.* of *Tamandua tetradactyla* originate from *renal A.a.*.

The *caudal mesenteric a.* in Quati is a small vessel that arises in ventral face of abdominal aorta nearly *external iliac A.a.* origin and is intended for the final part of descending and sigmoid colon, in accordance with Miller *et al*., (1964) in dog; Getty in Sisson & Grossman (2008) in domestic carnivores; da Silva *et al*., (2011) in *Saimiri sciureus*; Macedo *et al*., (2013) in *Tamandua tetradactyla*; Pinheiro *et al*., (2014) in *Leopardus pardalis*. On the other hand, Bavaresco *et al*., (2013) cited that the rabbit *caudal mesenteric a.* is in rule single but eventually double, when in Coati this branch is every unique.

For Getty in Sisson & Grossman (2008), in domestic carnivores; Miller *et al*., (1964) in dogs; Culau *et al*., (2008) in *Myocastor coypus*; Bavaresco *et al*., (2013) in rabbit; and Pinheiro *et al*., (2014) in *Leopardus pardalis*, the *phrenic-abdominal* have eclectics origin and distribution, which can originate from *aorta*, *celiac trunk*, *cranial* or *renal mesenteric*, but frequently arises from aorta. Its ramifications is variable although commonly ramify into *phrenic caudal a.* and *cranial abdominal a.*, apart from provide branches to suprarenal gland and adjacent tissues. Coati dissections and analysis reveal consistent data with the literature.

Regarding Coati *suprarrenal A.a.*, are also observed a variable origin and distribution, since it arises from aorta, *phrenic-abdominal* or *renal A.a.*, corroborating the compiled literature citations **[6, 10, 11, 12, 13, 14, 15]**.

The parietal branches of Coati abdominal aorta are *lumbar A.a.*, in a number of six pairs. The first pair arises from dorsal face of aorta together the *celiac trunk*. The second, third and fourth pairs arises in regular distances along the aorta and the sixth pair arises between the external and internal *iliac A.a.*, all then in individual branches, without trunk formation. Miller *et al*., (1964) describe that *lumbar A.a.* in dog are five pairs, where arises from a common trunk and the last can arises from a *sacral median a.*. Getty in Sisson & Grossman (2008), describe that carnivorous animals also have five pairs of *lumbar A.a.*, Where the last pair can arises from a common trunk of *aorta*, *internal iliac* and *sacral median*.

The *deep circumflexes A.a.* of ileum are small vessels intended for dorsolateral wall of abdomen. The left circumflex arises from the lateral aspect of the aorta, cranial or caudally to the origin of caudal *mesenteric a.*, while the right arises in the dorsal face of the *external iliac* near to *mesenteric a.* origin. Miller *et al*., (1964) state that dog *deep circumflex of ileum a.* arises from *cranial aorta* and *caudal mesenteric*, while Getty in Sisson & Grossman (2008) on domestic carnivores and Macedo *et al.* (2013) shows that in *Tamandua tetradactyla* this artery can arises from *external iliac*.

*External iliac A.a.* are the largest branches of abdominal aorta of Coati and arise asymmetrically from each lateral face and follow caudal and laterally to pelvic limb, without emerges other collateral branches in their path, in addition, *deep circumflex a.* of the right ileum and *deep bilateral femoral a.* that are its branches. Miller *et al*., (1964) in dogs and Getty in Sisson & Grossman (2008) in domestic carnivores animals shows concordant affirmations that corroborate the observations of Coati, except in relation to *deep circumflex iliac a.* that the authors refer arises from aorta. Culau *et al*., (2008) in *Myocastor coypus* and Bavaresco et al., (2013) in rabbit, affirms that a *common iliac* occurs before divides in *external* and *internal*, arising *sacral median a.* direct from aorta, on its dorsal face, cranially to iliac origin. Pinheiro *et al*., (2014) affirm that in *Leopardus pardalis*, the terminal branches of aorta are *external iliac a.*, *internal*

*https://dx.doi.org/10.22161/ijaers.6.2.32* *ISSN: 2349-6495(P) | 2456-1908(O)*

*iliac a.* and *median sacral a.* that represents a trifurcation of the aorta.

To Miller *et al.*, (1964) in dog and Getty in Sisson & Grossman (2008) in domestic carnivore animals, after arises *iliac A.a.* the abdominal aorta is begin slight and laterally divides in *internal iliac A.a.* continuing as *sacral median a.*, corroborating to Coati observations. Summarizing the present study demonstrated unpublished data about Coati anatomy and particularities specifications of the abdominal part of aorta, thus contributing to biological sciences development and description of important vessels on a comparative anatomical observation.

## V. CONCLUSION

In conclusion, the present study demonstrated that the anatomic standard of abdominal part of aorta and the respective collateral branches in Coati, shows a similar template to mammalian animals and the detailed analysis of these abdominal vessels reveals particularities to this specie in small arteries as the *Phrenic-Abdominal*, *Suprarenal* and *Deep Circumflex Iliac*. Our findings contribute to the description and knowledge of a specifically important vessel in biological system of Coati.

## CONTRIBUTORS

Marcos Paulo Batista de Assunção and Thalles Anthony Duarte Oliveira were responsible for acquisition, analysis and interpretation of data.

Thiago Sardinha de Oliveira and Lanussy Porfiro de Oliveira were responsible for preparation and revision of the manuscript.

Roseâmely Angélica de Carvalho Barros, Daniela Cristina de Oliveira Silva and Zenon Silva were responsible for concept and design, and for preparation of the manuscript.

All authors read and approved the final version of manuscript.

## FUNDING

This work was supported by institutional grants from Federal University of Goiás and Federal University of Uberlândia.

## CONFLITS OF INTERESTS

The authors declare no conflicts of interest associated with this manuscript.

## ACKNOWLEDGEMENTS

The authors thanks the “Centro de Triagem de Animais Silvestres de Catalão” for animal management.

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**FIGURES**

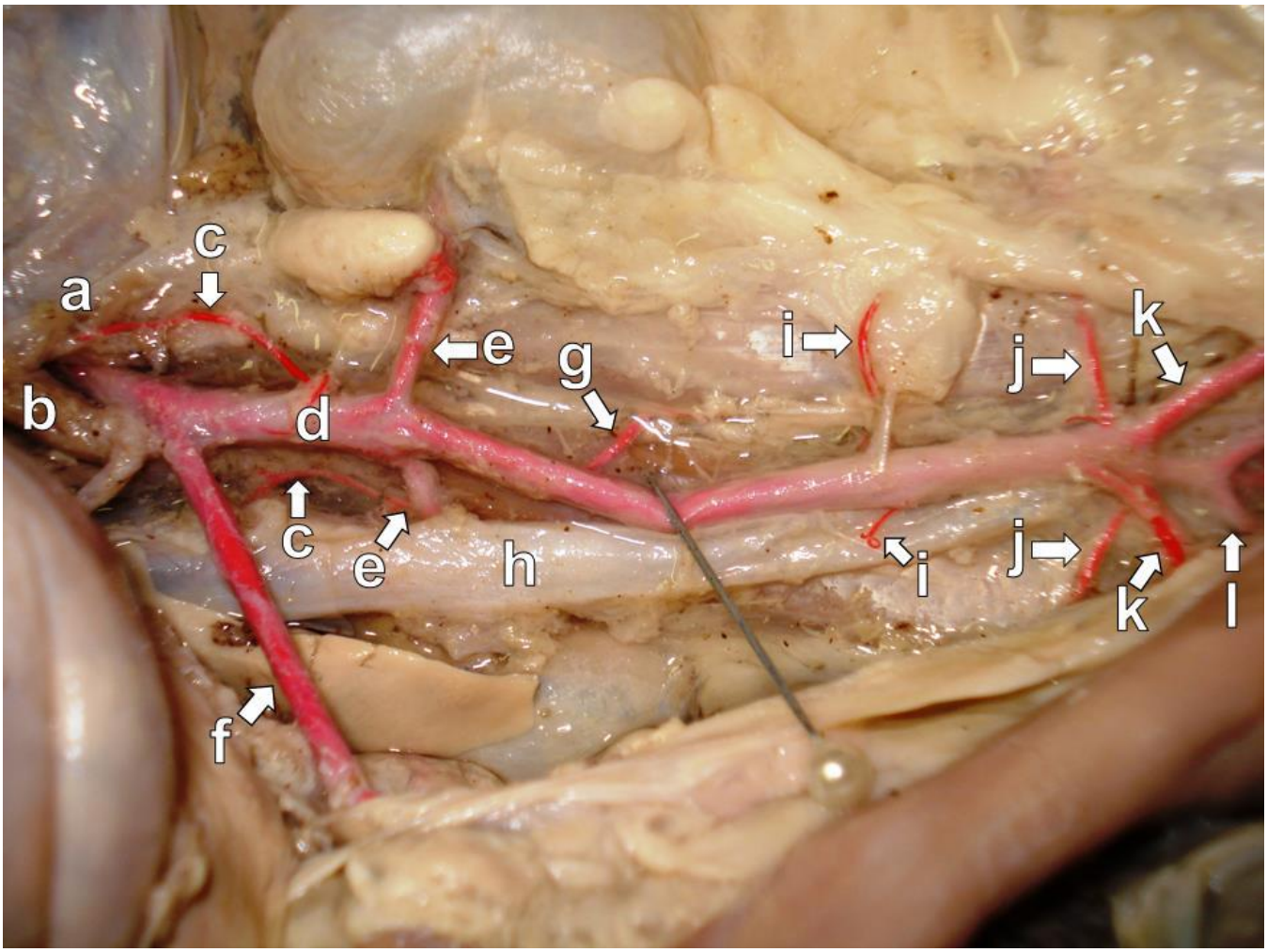


*Fig.1: Ventral vision of dorsal wall in the abdominal cavity of Coati (Nasua nasua). a) left diaphragmatic pillar; b) right diaphragmatic pillar; c) right and left phrenic a.a.; d) abdominal aorta a.; e) right and left renal a.; f) cranial mesenteri c a.; g) lumbar a.; h) caudal cava vein; i) right and left ovarian a.a.; j) right and left circumflex abdominal a.a.; k) right and left external iliac a.a.; l) right and left internal iliac a.a..*

*https://dx.doi.org/10.22161/ijaers.6.2.32* *ISSN: 2349-6495(P) | 2456-1908(O)*

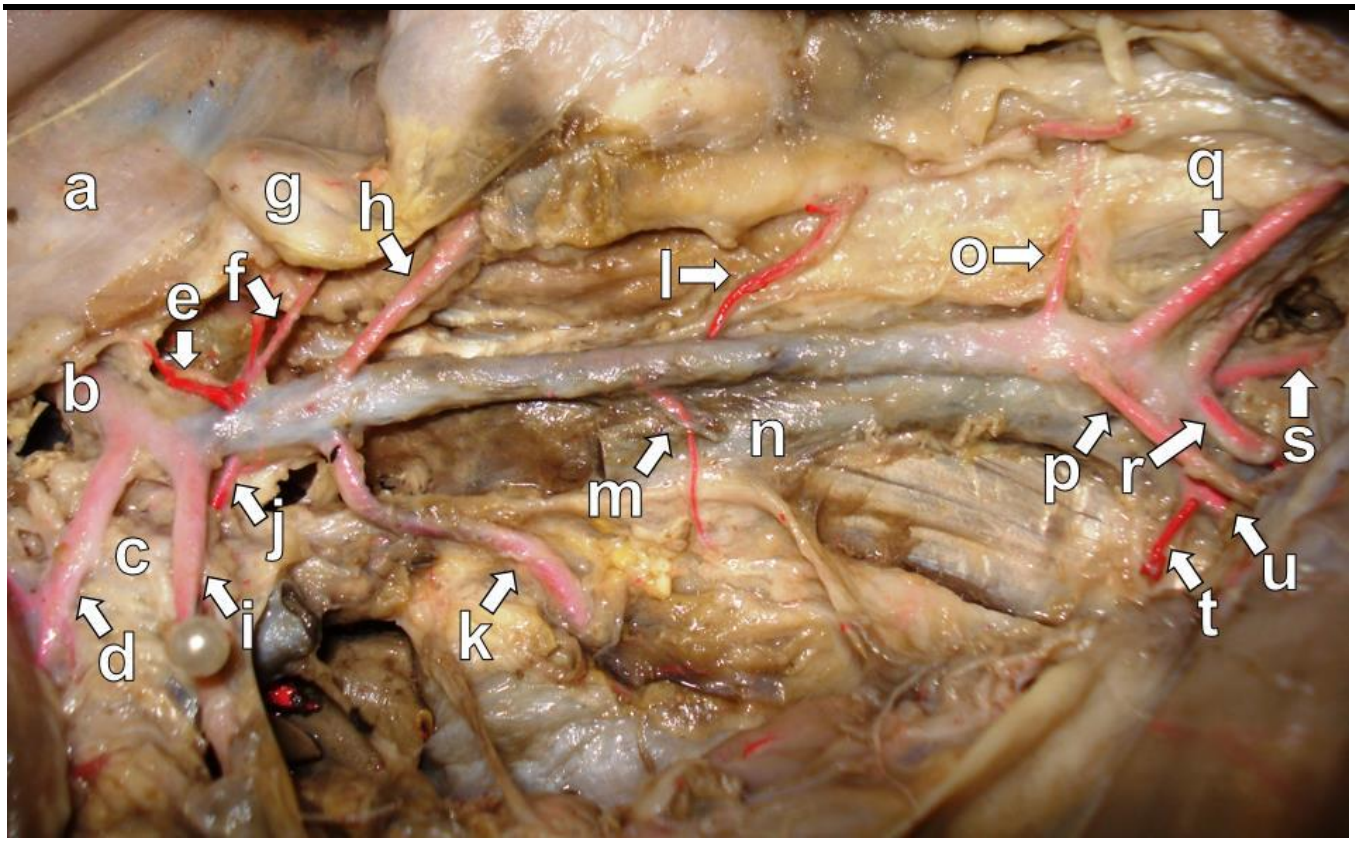


*Fig.2: Ventral vision of dorsal wall in the abdominal cavity of Coati (Nasua nasua) (Second picture). a) left diaphragmatic pillar; b) abdominal aorta a.; c) right diaphragmatic pillar; d) celiac trunk; e) left phrenic a.; f) left suprarenal a.a.; g ) suprarenal gland; h) left renal a.; i) left ovarian a.; j) right phrenic a.; k) right renal a.; l) left ovarian a.; m) right ovarian a.; n) caudal cava vein; o) left circumflex iliac a.; p) caudal mesenteric a.; q) left external iliac; r) right internal iliac; s) median sacral a.; t) right circumflex iliac a.; u) right external iliac.*