

Article

Far north salamander digestive tract 6 of endocrine cells of immune organization chemical research

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Abstract: Application protein-Biotin-Peroxidase complex (ABC) Immune organization Chemical Method of Far North salamander (*Salamandrella Keyserlingii*) Digestive Tract 5-Serotonin (5-HT), Gastrin (Gas), Somatostatin (SS), Pancreatic hyperglycemia (GLU), People pancreatic polypeptide (PP) And P-Material (SP) 6 Of endocrine cells of distribution for the study. In this paper Duncan Multiple compare the of methods of endocrine cells in the digestive tract of distribution density the statistical analysis. Results display, 5-Serotonin cells in digestive tract the parts were distribution, Gastric body (2.80 ± 0.70) And twelve duodenum (2.60 ± 0.75) Distribution density highest pylori minimum (0.85 ± 0.67); Gastrin cells only distribution in small intestine twelve duodenum (1.85 ± 0.75) Density highest; somatostatin cells distribution in esophageal, gastric body, pylorus, twelve duodenum and ileum the parts and pylorus (2.25 ± 0.64) Distribution density highest; pancreatic hyperglycemia of cells I saw in gastric cardia and gastric body people pancreatic polypeptide Cells and P-Material cells in the whole digestive tract were not detection. Various endocrine cells of form diverse was round, oval, cone-shaped and spindle and. Far North salamander digestive tract endocrine cells of this a kind of density distribution and morphology characteristics and other amphibians and Heilongjiang origin far northern salamander compared both common and have difference, the reason may be and species, feeding habits and habitat environment and factors about.

Keywords: far north salamander; digestive tract; endocrine cells; immune organization chemical

1. Material and methods

1.1. Material

Far North salamander of male and female adults that are only 5 months late collected from the forest farm in Lushui Lake and Zhenxilin Lake, Fusong County, Baishan City, Jilin Province ($42^{\circ}35' N 127^{\circ}50' E$). The following referred to as Jilin origin of back to after laboratory on have a little water of glass cylinder in fasting then with ether anesthesia on Digestive Tract paragraphs including esophageal, gastric cardia, gastric body, gastric pylorus, twelve duodenum, empty intestinal, ileum and rectum the based. First 0.7% Physiological saline quick rinse then with improvement Bouin's Liquid fixed 24 h 70% Alcohol save stand.

1.2. Reagent and experimental methods

Main reagent including 6 Rabbit anti-human polyclonal antiserum. Protein-Biotin-Peroxidase complex (Avidin-Biotin-peroxidase complex Vectastain ABC) Immune organization chemical kit for Ameri can ZYMED Public Division products.

Conventional paraffin slice dewaxing to water slice $37^{\circ}C$ H₂O₂-Methanol

solution incubation for 15 min, eliminate endogenous peroxidase activity. Then fill into distilled water dipping for 5 min, 0.01 mol/L PBS (pH 7.4) dipping for 5 min. Drop normal goat serum (3:200) At room temperature (15–25°C) incubation natural 20 min Closed non-specific reaction parts. Add the serum drop an anti-dilution multiple see table1At room temperature overnight. Dip3Times every time 5 min Drop and two anti-incubation (sheep anti-Rabbit IgG Antiserum dilution multiple 1:200) 45 min PBS Dip3 Times 5 min. Drop and protein-Biotin-Peroxidase (ABC) Reagent (dilution multiple 1:1:100) Incubation 40 min. PBS Leaching Times 5 min. Drop and DAB-H₂O₂ color after cold PBS Flushing cold distilled water. Hematoxylin complex dyeing conventional dehydration, transparent, mounting. Control slice ABCK it in normal goat serum instead of an anti-the incubation the rest Steps Phase.

1.3. Data statistical analysis

Leica DC500Microscopic Imaging System of Far North salamander digestive tract the parts of slice, and take photos reference literature [1,2]. Of count methods of Far North salamander digestive tract the parts of slice was randomly take10 A400 Times view count SPSS18.0 statistical analysis software of A hormone cells in different parts of distribution density Duncan Multiple compare the statistical analysis. In this paper data were to average \pm Standard deviation (Mean \pm SD) said, P Less than 0.05Significant difference.

2. Results

Under light microscope, the distribution5-Serotonin (5-HT) Cells, gastrin (Gas) Cells, somatostatin (SS) Cells and glucagon (GLU) The cells are dark brown or dark brown, the cytoplasm is dyed dark brown, and the nucleus is light brown. The background cells, especially the nucleus, are dyed blue. Human pancreatic polypeptide (PP) Cells and P-Matter (SP) Cells were not detected in the whole digestive tract.2.). The control was negative.

2.1. Distribution density of endocrine cells

5-The distribution density of serotonin was the highest in stomach and duodenum, followed by jejunum and rectum, and the lowest in pyloric (F_{7,72} = 18.039, p-Less than 0.05Gastrin (Gas) Cells were distributed only in the small intestine, and the highest density was found in duodenum, followed by jejunum. The distribution density of intestine was the lowest (F_{7,72} = 19.549, PLess than 0.05); Somatostatin (SS) Cells are distributed in the esophagus, stomach body, stomach pylorus, duodenum and ileum. Highest, lowest ileal density (F_{7,72} = 20.781, P < 0.05); Glucagon (GLU) Cells are only distributed in the gastric cardia and gastric body, and the distribution density of the gastric body is higher than that of the gastric cardia.

(F_{7,72} = 5, PLess than 0.05)

2.2. Distribution and morphology of endocrine cells in digestive tract

5-Serotonin (5-HT) Cells are distributed in the digestive tract from the esophagus to the rectum, and their morphology and distribution are different in different parts of the digestive tract. Middle esophagus 5-Serotonin cells between epithelial cells, round or oval (pictured).

I:1.) 5-Serotonin cells are located in Epithelial Cells

Triangular In the stomach 5-Serotonin cells are located between epithelial cells, which are pointed out as pyramidal processes.

To the inherent membrane and gastric cavity; Pylorus 5-The serotonin cells lie between the acinar epithelium and are oval

Same data superscript lowercase letter same of said differences don't significantly ($P > 0.05$) Lowercase letter don't same of said difference significant ($P < 0.05$). Data. same column. same superscripts lowercase letter refers.

non-significant difference ($P > 0.05$), superscripts lowercase letter shows significant difference ($P < 0.05$).

Round (Chart I:5); Twelve duodenum in 5-Serotonin Cells Located in epithelial cells between was cone-shaped (Chart I:6); Jejunum, ileum and rectum in 5-Serotonin cells is located in epithelial cells between was cone-shaped processes to intestinal cavity (Chart I:7~9).

Gastrin (Gas) Cells only in the small intestine was detection to twelve duodenums in gastrin cells located in epithelial cells between was cone-shaped processes to intestinal cavity (Chart I:10); Jejunum in gastrin cells located in epithelial base was oval (Chart I:11); Ileum in gastrin cells located in epithelial cells between was round (Chart I:12).

Somatostatin (SS) Cells in addition to cardia, jejunum and rectal the rest digestive tract paragraphs were distribution esophageal in Somatostatin cells distribution in epithelial base was oval (Chart I:13); Gastric body in Somatostatin cells distribution in epithelial cells between was triangle (Chart I:14); Pylorus in Somatostatin cells distribution in lamina propria was cone-shaped processes to pylorus cavity (Chart I:15); Twelve duodenum in Somatostatin cells distribution in the base of the was oval (Chart I:16); Ileum in Somatostatin cells distribution in epithelial between was cone-shaped processes to intestinal cavity (Chart I:17).

Pancreatic hyperglycemia (GLU) Cells only in gastric cardia and gastric body in was observe the. Cardiac in pancreatic hyperglycemia of cells is located in base Bottom was triangle (Chart I:18); Gastric body in pancreatic High Blood Sugar of cells is located in acinar between was round (Chart I:19).

3. Discussion

3.1. Digestive Tract endocrine cells of morphology characteristics

Endocrine Cells of form diverse umbrella up have two style-a class for open-cell the cells more was spindle, cone-shaped, long or irregular-shaped, have is long of cytoplasmic processes into the gastrointestinal cavity or inherent membrane main exercise exocrine of function; the other a class is closed-cell the cells more was round or oval, and digestion cavity no direct contact main implementation Endocrine

of function [3]. This paper far north salamander digestive tract in endocrine cells both open-of also have a closed-of exercise of function both exocrine also have endocrine this paper and no see paracrine of cells form.

3.2. And other amphibious animal digestive tract endocrine cells distribution density of compare

Amphibious animal in 5-Serotonin (5-HT) Cells widely distribution in from esophageal to rectal of digestive tract in but distribution characteristics difference is big. Plaquet pachytriton labiatum 5-Serotonin cells distribution density in pylorus highest secondly is twelve duodenum rectal of minimum [4]; *Cynops orientalis* the is in twelve Duodenum of highest secondly is jejunum rectal of and pylorus minimum [5]; Flowers back toad pylorus above Digestive Tract 5-Serotonin cells was significantly higher than that of intestinal paragraphs [6]; And, China Forest Frog (*R. chensinensis*) Cardiac and gastric body 5-Serotonin cells highest secondly is pylorus and ileum twelve duodenum, jejunum and rectal of minimum [7]; Black orbital toad (*B. melanostictus*) Ileum of highest secondly is jejunum twelve Duodenum of minimum [8]; Ze land frog the is rectal of highest twelve duodenum followed by cardiac and gastric body minimum [9]. This paper Jilin production far north salamander digestive tract in 5-Serotonin cells of distribution range even though the and the amphibious animal same that is in the whole digestive tract in have distribution but distribution characteristics different its gastric body and twelve refers 4 of Zhao lily such as: Far North salamander Digestive Tract Of endocrine cells of immune organization Chemical Research In 593. In intestinal 5-Serotonin cells density highest jejunum and rectal followed by pylorus minimum. This (5-Serotonin cells in amphibians digestive tract in distribution characteristics with species specific to at present is stopped and no found distribution mode completely same of Two Species. Gastrin (Gas) Cells in amphibious animal digestive tract also have distribution but distribution range and density peak also different such as spine.

Chest Frog (*PAA spinosa*) [10] And bufo gargarizans (*B. gargarizans*) [11] Distribution in In addition to Esophageal outside of part of the digestive tract and pylorus distribution density highest *Rana plancyi* [12]. Of pylorus, twelve duodenum and ileum in distribution density peak also in pylorus.

China Forest Frog [7] And flowers. Frog (*Odorrana Schmackeri*) [13] found only in twelve duodenum and jejunum of have distribution density peak respectively in the duodenum and jejunum. This paper in the far north, where the salamander digestive tract in gastrin cells in addition to distribution in twelve duodenum and jejunum outside in ileum also have distribution this and the animal of research results are different. This (amphibious animal digestive tract gastrin cells of distribution characteristics have.

Between difference at the same time also reflect its own distribution characteristics. Somatostatin (SS) Cells in *Bufo gargarizans* [11]. The whole digestive tract in have distribution its density distribution peak is located in pylorus; *PAA spinosa* [10]. Somatostatin cells distribution in addition to Esophageal outside of digestive tract in dense Of peak in pylorus; tiger frog (*R. rugulosa*) [14] And flowers. Frog [13].

Somatostatin cells distribution in addition to Esophageal and rectal outside of digestive tract in and distribution density peak also is located in pylorus; this paper in Far North salamander somatostatin cells density distribution peak and the animal same that in gastric pylorus, but distribution range (including esophageal, gastric body, pylorus, twelve duodenum and ileum). But and the animal different (somatostatin cells of distribution may has certain of species specific).

Pancreatic hyperglycemia (GLU) Cells in different amphibious animal Digestive Tract of distribution range also different. Such as *Bufo gargarizans* [11]. In cardiac, gastric body, pylorus and duodenum have distribution; Japan Liwa (Xu, et al., 2004) only in gastric body of have a small amount of the distribution in flowers. Frog [13] and *PAA spinosa* [10]. Digestive Tract in were no pancreatic hyperglycemia of cells of distribution. This paper in the far north, where the salamander digestive tract pancreatic high

Blood glucose of cells of distribution and the animals are not same only in gastric body of and Gastric Cardia have distribution. People pancreatic polypeptide (PP) Cells in amphibious animal digestive tract in distribution relative is less spine chest than frogman pancreatic polypeptide cells in stomach, small intestine and rectum in distribution density peak in the duodenum [10]. This paper in Far North salamander digestive tract in but not detection human pancreatic polypeptide fine cell this and Tree Frog (*Hyla arborea japonica*) [15]. And *Rana plancyi* [12]. Digestive Tract in no people pancreatic polypeptide cells distribution of results is consistent. In far north, Salamander digestive tract in same also no detection P-Material (SP) Cells this and flowers. Frog [13], *PAA spinosa* [10] and China Forest Frog [7] of study results is consistent.

3.3. Two origin far north salamander digestive tract endocrine cells of similarities

Jilin origin far north salamander digestive tract endocrine cells and Heilongjiang origin (of [16]) of compared both similarities and have different. similarities is (1) 5-Serotonin (5-HT) Cells in its the whole digestive tract in have distribution; (2) In Digestive Tract in Somatostatin (SS) Cells and pancreatic hyperglycemia (GLU) Cells of distribution range and density peak were consistent people pancreatic polypeptide (PP) Cells were no distribution; (3) Digestive Tract in have distribution of endocrine cells of the form is not difference. Different. Is (1) Heilongjiang origin far northern salamander 5-Serotonin cells in esophageal and pylorus density highest in twelve duodenum minimum (of spring [17]) Jilin origin these cells in gastric body and twelve Duodenum of highest pylorus minimum; (2) Gastrin (Gas) Cells, Heilongjiang origin far north salamander only distribution in twelve duodenum and jejunum in (of [18]) And Jilin origin far northern salamander in addition to distribution in twelve duodenum and jejunum outside also in ileum of have distribution; (3) Heilongjiang origin far northern salamander only in gastric body of detection P-Material (SP) Cells (of [19]) And Jilin origin far north salamander but no detection P-Material cells.

Two far north salamander life of natural environment differentiates in Hailin city, Heilongjiang Province. Its average temperature around the year is 4.2 °C, and

average rainfall is 536.3 mm, as well as average altitude of 400~500 m, while Baishan City, Jilin Province has an average temperature of 4.6 °C around the year, and the average rainfall is 883.4mm, average altitude of 800~1 200 m. Two far north salamander digestive tract endocrine cells similarities of reason may and species specific about and different may and two of habitat difference about.

Conflict of interest: The author declares no conflict of interest.

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