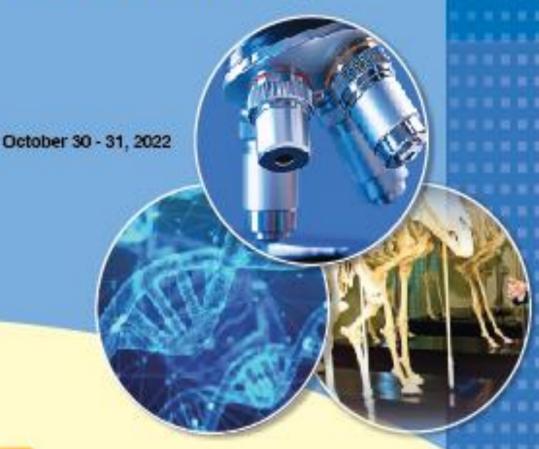


PROCEEDINGS

8th Congress of Asian Association of Veterinary Anatomists (Asian AVA)-2022

Theme: New Horizon in Anatomy



Venue:

Chattogram Veterinary and Animal Sciences University (CVASU) Chattogram, Bangladesh

Organized by:

Department of Anatomy and Histology, CVASU and Asian Association of Veterinary Anatomists (Asian AVA)









Proceedings

8th Congress of Asian Association of Veterinary Anatomists (Asian AVA)-2022



Theme: New Horizon in Anatomy

October 30 - 31, 2022

Venue:

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Supported by





Proceeding of

The 8th Congress of Asian AVA-2022

Chattogram Veterinary and Animal Sciences University

October 30 - 31, 2022

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Prof. Dr. Goutam Buddha Das Vice-Chancellor Chattogram Veterinary and Animal Sciences University Khulshi, Chattogram, Bangladesh



MESSAGE

I am very pleased to know that Department of Anatomy and Histology, Chattogram Veterinary and Animal Sciences University (CVASU), Chattogram, Bangladesh is going to organize the 8th International Conference of Asian Association of Veterinary Anatomists (Asian AVA) during the period of 30-31 October, 2022. I congratulate the organizers for choosing a timely theme of "New Horizon in Anatomy". I believe that it is the best way to develop scientific culture and attitudes among veterinary anatomists to contribute in the field of biology.

I am also really amazed to know that for the first time this international conference is going to held in Bangladesh since the inception of Asian AVA congress. The professionals from biology, basic science, clinical medicine and surgery will be directly benefitted from the presentations given by invited keynote speakers including other researchers and scientists from home and abroad. It will be a unique opportunity to share knowledge, ideas and experiences and to create opportunity for future networking.

I wish a grand success of this event.

Thank you



Prof. Dr. Mohammad Alamgir Hossain
Dean
Faculty of Veterinary Medicine
Chattogram Veterinary and Animal Sciences University
Chattogram, Bangladesh



MESSAGE

Dear colleagues,

On behalf of the Faculty of Veterinary Medicine, I welcome all the attendees of the 8th Congress of Asian Association of Veterinary Anatomists (Asian AVA)-2022 due to be held during October, 30-31 in our CVASU campus at Chattogram, Bangladesh. I hope the attendees from home and abroad will enjoy the different talks, poster sessions and other symposia that is planned to take place during these two days. I am sure that participants will be happy to meet new colleagues, reconnect with members and hear the interesting work that they and their graduate students are working on regarding teaching, research, and anatomic techniques. The backdrop of the beautiful and historic city of Chattogram will add to the pleasure of the meeting and provide lasting memories beyond the science.

Chittagong Veterinary and Animal Sciences University (CVASU) is the lone full-fledged specialized veterinary university in Bangladesh till to date. Although an apparently new institute in this specific field, we believe it is now recognized at both national and international level for its commitment to veterinary and life sciences research, education and outreach. Research is an integral part of any University and at CVASU we are fortunate to have a number of research leaders who has reputation at national and international levels. The natural harmony of the basic scientific and clinical research are in place at CVASU and will give future researchers (vets who will be involved with research in future) insights into potential therapies, for both animal and human illnesses.

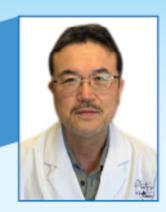
I strongly believe that the forthcoming conference will allow the attendees to develop networking among different higher education institutes from different countries and together we can highlight the emerging role of veterinarians at global problem solving along with reducing animal sufferings.

I add my best wishes for a successful and fruitful conference and my thanks to all organizers.

Thank you



Prof. Dr. Yasuhiro KON Laboratory of Veterinary Anatomy Faculty of Veterinary Medicine Hokkaido University, Japan



CONGRATULATORY ADDRESS

The 1st Annual Meeting of the Asian Society of Veterinary Anatomy was held in Tsukuba (Japan) on March 21, 2006, with 49 general abstracts and 2 symposiums planned. Thereafter, it was decided to continue the meeting every two years. The 2nd meeting was held in Bangkok (Thailand), the 3rd in Chungbuk (Korea), the 4th in Phuket (Thailand), the 5th in Bali (Indonesia), the 6th in Kuching (Malaysia), and the 7th in Jeju Island (Korea). In truth, we had planned to hold the 8th meeting in Bangladesh in 2021, but as you know, we had to postpone it to this year due to the global outbreak of coronavirus infection. Unfortunately, the coronavirus pandemic has not ended this year and is still spreading around the world. We were looking forward to seeing you in Bangladesh, but due to the different rules for coronavirus control in each country and the different prevalence of infection in each country, we have decided to hold the conference online in order to continue to provide a safe and secure conference. In the past two years, online systems in each country have advanced dramatically, and you may now enjoy a trip around the world without having to leave your home.

I will now declare the 8th Asian Congress of Veterinary Anatomy open. I would like to thank Prof. Md. Zahirul Islam Khan, the Congress Director, and Prof. Md. Lutfur Rahman, the Secretary General, who have made a lot of preparations without any reluctance.

Yasuhiro KON

President of Asian Association of Veterinary Anatomists



Prof. Dr. Md. Zahirul Islam Khan
Department of Anatomy and Histology
Bangladesh Agricultural University
Mymensingh, Bangladesh



MESSAGE

It is my privilege and pleasure to welcome all of you on this auspicious occasion of 8th Congress of Asian Association of Veterinary Anatomist (AAVA) which will be held on 30-31 October 2022 in Chattogram Veterinary and Animal Sciences University, Khulshi, Chattogram, a beautiful city of Bangladesh.

Since the inception of Asian AVA congress in March 21, 2006 which was held in Tsukuba, Japan, we have been organizing this scientific conference once every 2-year in the Asian countries focusing veterinary anatomical education and research. However we could not arrange 8th AAVA last year due to COVID-19 pandemic. This time the theme of the present conference is "New Horizon in Anatomy". In past we used conventional tools and methodologies for the teaching and anatomical research. At present, the progressive incorporation of modern study technologies into anatomical research has made it possible to broaden the field of exploration and diagnosis of diseases at the cellular, subcellular and macromolecular levels. I hope, in future the scope of anatomical education and research will be elaborated with the addition of new themes and technologies.

This congress will be held both online and offline, and hopefully a number of national and international anatomical scientists will participate to present their interesting research work in plenary and general scientific session.

Finally, I welcome you all again to attend the conference virtually and physically to make it fruitful and grand success.

Prof. Dr. Md. Zahirul Islam Khan

President

The 8th Congress of Asian AVA-2022



Prof. Dr. Mohammad Lutfur Rahman
Department of Anatomy and Histology
Chattogram Veterinary and Animal Sciences University
Chattogram, Bangladesh



FOREWARD

Since the inception of Asian AVA congress in March 21, 2006 which was held in Tsukuba, Japan, we have been organizing this scientific congress once every 2-year in the different Asian countries focusing on veterinary anatomical education and research. As a consequence, the last 7th congress was successfully held in September 26-27, 2019 at Jeju, South Korea. For the 8th Asian AVA congress, Chattogram Veterinary and Animal Sciences University (CVASU), Bangladesh is very pleased to become a host and announce the date during 30-31 October, 2022. Like before in this year the conference will highlight all the research update in relation to the concept of veterinary anatomical science with exciting 2022 conference theme 'New Horizon in Anatomy'.

The 2-day long program will include invited keynote presentations and research results from scholars, academicians and researcher from home and abroad. The conference proceeding contains the keynote abstracts on the conference theme, invited articles by the faculty, national and international colleagues. A total of 3 plenary lectures, 35 selected invited oral presentations and 21 scientific posters will be presented in this two-day long event. The presentation covered various aspect of anatomical sciences research such as Basic veterinary anatomy, morphological science, clinical anatomy, anatomy of immune system, developmental and reproductive anatomy, neuroanatomy and molecular biology. I am extremely delighted with the overwhelming response and co-operation of the poster presenters.

I am very grateful to Asian AVA, specially the president and other representative members of different countries of Asian AVA for their continuous support in the 8th Asian AVA congress-2022. The main goal of such a conference is to develop a tradition of scientific generational together among national and international veterinarians, veterinary faculty, scientists and researchers in the field of anatomical science,

national and international capacity building in anatomical education and research. Moreover, the conference will assist to identify the opportunities to share the information and resources and to discuss the significance of cross professional collaboration in Bangladesh and other countries. It's a great pleasure that hon'able Vice -Chancellor of CVASU and foreign guest from Japan, Philippines and Thailand will be attending the conference to share the views along with other participants on the conference theme and other aspects of the conference topics. Their presence would encourage future anatomists to embrace more enthusiastically their important role for animal health and the livestock industry and beyond.

I very grateful to different conference committees for completing their respective tasks successfully and professionally. Of-course, I am indeed grateful toAsian Association of Veterinary Anatomists (Asian AVA), Japanese Association of Veterinary Anatomists (Japanese AVA), University Grants Commission of Bangladesh (UGC) and CVASU top management led by Hon'able Vice-Chancellor for his kind approval and support to organize the conference.

I would like to thankACI Advanced Chemical Industries Ltd., Renata Animal Health, SQUARE Pharmaceuticals Ltd., Bengal Overseas Ltd., INVENT Technologies Ltd., MAKS Trading Ltd., Transcom Distribution Company Ltd. for their kind contribution to the conference. I also like to thank the electronic and mass media for covering the program activities.

I hope you will enjoy and actively participate in different activities of the conference. We wish you all a pleasant stay during the conference at CVASU.

Thank you

Prof. Dr. Mohammad Lutfur Rahman Organizing Secretary 8th Congress of Asian AVA-2022

Comtemts

Contents

A Tale of Asian Associati	on of Veterinary Anatomists	1-2
Programme Schedule		3-7
List of Plenary Lectures		8
List of Oral Presentation		8-10
List of Poster Presentatio	ns	11-12
Abstracts of Plenary Lect	ure	11-16
Abstracts of Oral present	ation	17-49
Abstracts of Poster prese	ntation	50-71
Organizing committee of	the 8th Congress of Asian AVA	72-75
Asian AVA Executive Bo	ard	76
Acknowledgements		77

A Tale of Asian Association of Veterinary Anatomists



Prof. Dr. Mohammad Lutfur Rahman Secretary General, 8th Congress of Asian AVA-2022

Correspondence: E-mail:lutfur@cvasu.ac.bd

Biology is a natural science which deals with the scientific studies of life. Anatomy is one of the important branches of biology which is considered as the most relevant basic discipline for medical science. Morphology, cell biology, molecular biology and embryology are the core dimension of anatomy. For representing and promoting all aspects of veterinary anatomy, the International Association of Veterinary Anatomists was founded in September 1957 in Freiburg, Germany. At the 5th General Assembly in Vienna in 1961, the name was changed to World Association of Veterinary Anatomists or WAVA.

The Asian Association of Veterinary Anatomists or Asian AVA was formed in 2006. The objectives are- To promote through international co-operation Asian Congresses on Veterinary Anatomy, Histology and Cytology for the purpose of reviewing scientific, technical and educational problems in Veterinary Anatomical, Histological, Cytological and Molecular Sciences, and to develop other relevant activities in the interest of Veterinary Anatomy, Histology, Cytology and Molecular-biology.

The 1st conference of Asian AVA was held in Tsukuba International Conference Hall, Tsukuba, Ibaraki, Japan at March 21, 2006. The conference chair was Kazuyuki TANIGUCHI from Iwate University and the Secretary General was Noboru MANABE from University of Tokyo.

Subsequently, the host country of the 2nd conference was in Thailand. It was held on September 12 to 13 in 2007 at the Maruay Hotel in the capital of Bangkok. The conference was Chaired by Teerasak PRAPONG and Secretary General was Worawut RERKAMNUAYCHOKE from Kasetsart University.

The 3rd one was held in Hall of NOVA APERIO Culture, Cheongju, Korea from November 4 to 6, 2009. The Chair and Secretary General were Hong-Hyun YANG and Sang-Yoon NAM, respectively from Chungbuk National University.

Again, Thailand was the host country for the 4th conference of Asian AVA. Phuket Graceland Resort & Spa Patong Beach of Phuket was the place for that congress. The date was October 24 to 26, 2012. The congress Chair was Worawut RERKAMNUAYCHOKE and Secretary General was Patamaporn UMNAHANANT from Kasetsart University.



The Bali of Indonesia was selected for the 5th Conference. The name of the Hotel was Discovery Kartika Plaza Hotel and the date was February 12 to 13, 2015. The conference Chair was KetutMudite ADNYANE and Secretary General was Savitri NOVELINA from Bogor Agricultural University.

The 6th conference was held in Riverside Majestic Hotel, Kuching, Malaysia during October 15 to16, 2017. Prof. Masamichi KUROHMARU from University of Tokyo and Prof. Junpei KIMURA from Seoul National University were President and Secretary General, respectively.

Again, Korea was the host country for the 7th conference. The Ocean Suites Jeju Hotel in Jeju of Korea was selected for that conference. The date was September 26 to 27, 2019. The Chair was Prof. Dr. Seong-Joon YI from Kyungpook National University and Secretary General was Prof. Dr. Sang-Yoon NAM from Chungbuk National University.

Now we are celebrating our 8th conference in CVASU, Chattogram, Bangladesh. The two day-long conference during October 30 to 31, 2022. The Chair of organizing committee is Prof. Md. Zahirul Islam KHAN from Bangladesh Agricultural University and Secretary General of organizing committee is Prof. Mohammad Lutfur Rahman from Chattogram Veterinary and Animal Sciences University.

All of you are most welcome in CVASU. We wish a pleasant and enjoyable stay at this beautiful campus of Chattogram Veterinary and Animal Sciences University, Chattogram, Bangladesh over the next two days and a successful program.

Thank you All.



Program Schedule

Day 1: October 30, 2022 (Sunday)

Inaugural Session

08.30 - 9.00 AM:	Registration (CVASU auditorium, 4th floor)
09.00 - 9.05 AM:	Guests take their seat
09.05 - 9.10 AM:	Recitation from the Holy Quran
09.10 - 9.15 AM:	A documentary on Asian AVA
09.15 - 9.20 AM:	Welcome Speech by Dr. Mohammad Lutfur Rahman, Organizing
	Secretary, 8th Asian AVA congress and Professor, CVASU, Bangladesh
	Welcome Speech by Dr. Mohammad Lutfur Rahman, Organizing

Speech by Special Guests

09.20 - 9.25 AM:	Dr. Yasuhiro KON, President, Asian AVA and Professor, Hokkaido University, Japan
09.25 - 09.30 AM:	Prof. Dr. Mohammad Alamgir Hossain, Dean, FVM, CVASU, Bangladesh

Speech by Chief Guest				
09.30 - 09.35 AM:	${\bf Prof.\ Dr.\ Goutam\ Buddha\ Das},\ {\bf Hon'ble\ Vice-Chancellor},\ {\bf CVASU},\ {\bf Bangladesh}$			
09.35 - 09.40 AM :	09.35 - 09.40 AM : Speech by Chairman, Dr. Md. Zahirul Islam Khan, President,			
	Organizing Committee, 8th Asian AVA Congress, and Professor of BAU, Bangladesh			
09.40 - 10.00 AM:	Group Photo and Tea Break			
10.00 AM:	Plenary Session and Technical Session			



Plenary Lecture/Keynote paper		
Time	Chair	Co-chair
10.00 -11.30 AM	Prof. Dr. Yasuhiro KON, Lab. of Veterinary Anatomy, Faculty of Veterinary Medicine, Hokkaido University, Japan	Prof. Dr. Md. Nazrul Islam, Dept. of Anatomy and Histology, Sylhet Agricultural University, Bangladesh
Time	Topics	Speaker
10.00 -10.30 AM	New Horizon in Anatomy	Prof. Dr. Koh Shinoda Yamaguchi University, Japan
10.30 -11.00 AM	Immune System of Chicken	Prof. Dr. Md. Zahirul Islam Khan Bangladesh Agricultural University, Bangladesh
11.00 -11.30 AM	Prosaposin in the Olfactory and the Auditory System	Prof. Dr. Shouichiro Saito Gifu University, Gifu, Japan
11.30 -11.45 AM	Tea Break	

	Technical Session 1: Morphological Science				
Time	Chair	Co-chair			
11.45 AM 12.45 PM	Prof. Dr. Junpei Kimura College of Veterinary Medicine, Seoul National University, South Korea	Prof. Dr. Md. Rayhan Faruque Dept. of Medicine and Surgery, Chattogram Veterinary and Animal sciences University, Bangladesh			
Time	Topics	Speaker			
11.45 -11.55 AM	Effects of chronic exposure of 4G cell phone radiation in mice	Prof. Dr. Mohammad Rafiqul Islam Bangladesh Agricultural University, Bangladesh			
11.55 AM 12.05 PM	Phytochemical and oral toxicity studies of piper betle ethanolic leaf extract in Mindanao, Philippines	Dr. Anecito G.Juan Central Mindanao University Philippines			
12.05 -12.15 PM	Anatomy of some organs of a juvenile male Ganges River dolphin (<i>Platanista</i> gangetica spp. gangetica)	Dr. Subrata Kumar Shil Chattogram Veterinary and Animal Sciences University, Bangladesh			
12.15 -12.25 PM	The common guitarfish Rhinobatosrhinobatos: A descriptive anatomical study and proposed dissection techniques	Dr. Bayram Suzer Bursa Uludag University, Turkey			
12.25 - 12.35 PM	Revelation of appendicular skeleton in cock-fighting male and female aseel (gallusgallusdomesticus)-a comparative morphometric analytical approach	Dr. Hemayet Hossain Sylhet Agricultural University, Bangladesh			
12.35 - 12.45 PM	Macroanatomical investigations of axial skeleton of bengal monitor lizard (Varanus bengalensis)	Prof. Md. Saiful Islam Siddiqui Sylhet Agricultural University, Bangladesh			
12.45 -2.00 PM	Lunch (Histology La	Lunch (Histology Lab) and Prayer			
02.00-2.30 PM	Core time for poster presentation				
	Technical Session 2: Anatomy of Immune System				
Time	Chair	Co-chair			
02.30 - 3.20 PM	Prof. Dr. Md. Zahirul Islam Khan Dept. of Anatomy and Histology, Bangladesh Agricultural University, Bangladesh	Prof. Dr. Mohammad Lutfur Rahman Dept. of Anatomy and Histology, Chattogram Veterinary and Animal sciences University,			
		Bangladesh			



Time	Topics	Speaker
02.30 - 02.40	Elucidation of vasculature-associated tertiary	Dr. Md. Abdul Masum
PM	lymphoid tissue in caprine kidney	Sher-e-Bangla Agricultural University, Bangladesh
02.40 - 02.50 PM	Pathological role of hedgehog signaling in maintenance of the murine oviductal ciliated epithelium	Marina Hosotani Rakuno Gakuen University, Japan
02.50 - 03.00 PM	Altered morphologies of tear-secreting tissues and cornea in a mouse model of autoimmune disease	Masaya Hiraishi Hokkaido University, Japan
03.00 - 03.10 PM	Genital organ associated lymphoid tissue characteristics in cow, goat, and pig vaginal vestibule	Tsolmon Chuluunbaatar Hokkaido University, Japan
03.10 - 3.20 PM	Characteristics of lymphoid tissue found in large intestine of chicken	Md. Zahir Uddin Rubel Hokkaido University, Japan
03.20 - 03.40 PM Tea Break		-

	Technical Session 3: Developmental and Reproductive Biology	
Time	Chair	Co-chair
	Dr. Ceferino P Maala	Prof. Dr. Mohammad
03.40 - 04.50	Professor Emeritus	Rafiqul Islam
PM	Dept. of Basic Veterinary Sciences	Dept. of Anatomy and
	College of Veterinary Medicine	Histology, Bangladesh
	University of the Philippines Los Banos	Agricultural University,
	College, Laguna, Philippine	Bangladesh
Time	Topics	Speaker
03.40 - 03.50	Effects of imidacloprid-contaminated feed	Mohammad Rabiul Karim
PM	exposure on testicular tissues of adult male	Bangladesh Agricultural
	rabbits (Oryctolagus cuniculus)	University, Bangladesh
03.50 - 04.00	Embryological study of glucagon-like peptide	Md. Al Amin
PM	(GLP)-1 and other-immunoreactive cells in the	Shinshu University, Japan
	small intestine of White Cornish chicken	
04.00 - 04.10	Teratogenic Effect of TCDD (2,3,7,8-	Herlina Pratiwi
PM	tetrachlorodibenzo-p-dioxin) in the	UniversitasBrawijaya
	Development of Isa Brown Embryos	Indonesia
04.10 - 04.20	DBP diminishes testicular steroidogenesis via	Dr. Mohammad Shah Alam
PM	the blocking of the HPT axis: a relation with	Bangabandhu Sheikh
	spermatogenic cell apoptosis in Japanese quails	MujiburRahman Agricultural
		University,Bangladesh
04.20 - 04.30	Morphological features of the mouse	Sawa Onouchi
PM	duodenocolic fold in embryonic days 18.5 and	Gifu University, Japan.
	adult	
04.30 - 04.40	EphB4 and ephrin-B1: potential markers of	Dr. Md. Royhan Gofur
PM	Leydig cells	University of Rajshahi,
		Bangladesh
04.40 - 04.50	Morphological study of testis at different	Dr. AKM Ahsan Kabir
PM	postnatal ages and different stages of the	Bangladesh Agricultural
	seminiferous cycle of Black Bengal goat	University, Bangladesh
05.15 - 06.00	Barrel March	
PM	Roard Meeting	
08.00 - 09.00	Gala Dinner (in PRTC)	
PM	Gala Dillier (III RTC)	



Day 2: October 31, 2022 (Monday)

Technical Session 4: Molecular Biology		
Time	Chair	Co-chair
09.00 - 09.50 AM	Prof. Dr. Koh Shinoda Dean, Faculty of Medicine and Health Science & Dept. of Neuroscience, Yamaguchi University, Japan	Prof. Dr.Yoshinao HOSAKA Department of Functional Anatomy,Faculty of Agriculture, Kyushu University, Japan
Time	Topics	Speaker
09.00 - 09.10 AM	In situ hybridization analysis for the expression of olfactory receptors in the olfactory organ of sea turtle	Nobuaki Nakamuta Iwate University, Japan
09.10-09.20 AM	Characterization of Mab2111-null labioscrotal fold mesenchyme in the preputial/clitoral glands in a mouse model for cerebellar, ocular, craniofacial, and genital (COFG) syndrome	Watcharapon Promsut The University of Tokyo, Japan
09.20 - 09.30 AM	Androgen modulates emotional memory and intrinsic plasticity by acting on the androgen receptor in the adolescent male rat brain	Dr. Md. Nabiul Islam Yamaguchi University, Japan.
09.30 - 09.40 AM	ATeam technology for detecting early signs of viral cytopathic effect	Karla Cristine C. Doysabas Central Mindanao University, Philippines
09.40 - 09.50 AM	Expression and localization of ephrin-B1 and EphB4 in adrenal gland of adult mouse	Prof. Dr. Jahagir Alam Osaka Metropolitan University, Japan.
09.50-10.05 AM	Tea Break	

Technical Session 5: Clinical Anatomy				
Time	Chair	Co-chair		
10.05 - 10.45 AM	Prof. Dr. Shah Md. Abdur Rauf Dept. of Veterinary and Animal Sciences, University of Rajshahi Bangladesh	Prof. Dr. Muhammad Nazrul Islam Dept. of Anatomy and Histology, Sylhet Agricultural University, Bangladesh		
Time	Topics		Speaker	
10.05 - 10.15 AM	Anaesthetics and Surgical Evalu Splenectomy in Calves	ation of	Prof. Dr. Bhajan Chandra Das Chattogram Veterinary and Animal sciences University, Bangladesh	
10.15 - 10.25 AM	Bengal sea shell- based calcium car	The development of bone paste from Bay of Bengal sea shell- based calcium carbonate for bone fracture healing in vivo study using goat		
10.25 - 10.35 AM		Segmental Mandibulectomy of Acanthomatous Ameloblastoma in a dog		
10.35 - 10.45 AM	goats with application of bone past	Evaluation of long bone fracture healing in goats with application of bone paste (Cockle shells based calcium carbonate)		
10.45 -11.05 AM	Tea Break			



Technical Session 6: Basic Veterinary Anatomy				
Time	Chair		Co-chair	
11.05 -11.55 AM	Prof. Dr. Kh. Nurul Islam Dept. of Anatomy and Histology, Chattogram Veterinary and Animal sciences University, Bangladesh	Dept. of Chalermph	Dr. Kannika Wongpanit Dept. of Agriculture and Resources, ChalermphrakiatSakonNakhon Province Campus, Kasetsart University, Thailand	
Time	Topics		Speaker	
11.05 -11.15 AM	Alcohol-based fixative could be a safer option to reduce the hazardous effects of formalin		Dr. Latifa Akter Bangladesh Agricultural University, Bangladesh	
11.15 -11.25 AM	Activity of Technical Workshop for Animal Gross Anatomy in the Japanese Association of Veterinary Anatomists		Osamu Ichii,Hokkaido University, Japan	
11.25 -11.35 AM	The status of Veterinary Anatomy Museum in the Philippines with Special Reference to the Jose A. Sol is Museum of Veterinary Anatomy		Prof. Dr. Ceferino P Maala University of the Philippines, Philippines	
11.35 -11.45 AM	Initiatives in Veterinary Anatomy Museums for an Efficient Museum Education During and After Lockdown: Adaptation to a New World Order		Okan Ekim Ankara University, Turkey	
11.45 -11.55 AM	Digital stereology: new horizon in veterinary anatomy research		Javad Sadeghinezhad University of Tehran, Iran	
11-55 AM 12.15 PM	Tea break			

Closing Session		
12.15 - 12.35 PM	Oral and Poster Presentation Award	
12.35 - 12.40 PM	Remarks and Declaration of the next Congress	President of Asian AVA
12.40 - 12.45 PM	Speech of Chair	Organizing Secretary of the 8th Congress
12.45 - 12.50 PM	Vote of Thanks	President of the 8 th Congress
01.00 - 02.00 PM	Lunch (in PRTC) and Prayer	
02.15 PM	Tour	



Day 1: October 30, 2022, Sunday

List of Plenary Lectures

- PL-1 : Prof. Dr. Koh Shinoda, Yamaguchi University, Japan New Horizon in Anatomy
- PL-2: Prof. Dr.Md. Zahirul Islam Khan, Bangladesh Agricultural University, Bangladesh Immune System of Chicken
- PL-3: Dr. Shouichiro Saito, Gifu University, Gifu, Japan, Prosaposin in the Olfactory and the Auditory System

List of Oral Presentations

Technical Session 1: Morphological Science

- OP-1: Prof. Dr. Mohammad Rafiqul Islam, Bangladesh Agricultural University, Bangladesh Effects of chronic exposure of 4G cell phone radiation in mice
- OP-2: Dr. Anecito G. Juan, Central Mindanao University, Philippines Phytochemical and oral toxicity studies of piper betleethanolic leaf extract in Mindanao, Philippines
- OP-3: Dr. Subrata Kumar Shil, Chattogram Veterinary and Animal Sciences University, Bangladesh Anatomy of some organs of a juvenile male Ganges River dolphin (Platanistagangetica spp. gangetica)
- OP-4: Bayram Suzer, Bursa Uludag University, Turkey
 The common guitarfish Rhinobatosrhinobatos: A descriptive anatomical study and proposed dissection techniques
- OP-5: Dr. Hemayet Hossain, Sylhet Agricultural University, Bangladesh

 Revelation of appendicular skeleton in cock-fighting male and female aseel (gallus gallus domesticus) -a comparative morphometric analytical approach
- OP-6: Md. Saiful Islam Siddiqui, Sylhet Agricultural University, Bangladesh Macroanatomical investigations of axial skeleton of bengal monitor lizard (Varanus bengalensis)

Technical Session 2: Anatomy of Immune System

- OP-1: Dr. Md. Abdul Masum, Sher-e-Bangla Agricultural University, Bangladesh Elucidation of vasculature-associated tertiary lymphoid tissue in caprine kidney
- OP-2: Marina Hosotani, RakunoGakuen University, Japan Pathological role of hedgehog signaling in maintenance of the murine oviductal ciliated epithelium
- OP-3: Masaya Hiraishi, Hokkaido University, Japan Altered morphologies of tear-secreting tissues and cornea in a mouse model of autoimmune disease
- OP-4: Tsolmon Chuluunbaatar, Hokkaido University, Japan,
 Genital organ associated lymphoid tissue characteristics in cow, goat, and pig vaginal vestibule
- OP-5: Md. Zahir Uddin Rubel, Hokkaido University, Japan Characteristics of lymphoid tissue found in large intestine of chicken



Technical Session 3: Developmental and Reproductive Biology

- OP-1: Mohammad Rabiul Karim, Bangladesh Agricultural University, Bangladesh, Effects of imidacloprid-contaminated feed exposure on testicular tissues of adult male rabbits (Oryctologus cuniculus)
- OP-2: Md. Al Amin, Shinshu University, Japan Embryological study of glucagon-like peptide (GLP)-1 and other-immunoreactive cells in the small intestine of White Cornish chicken
- OP-3: Herlina Pratiwi, Universitas Brawijaya, Indonesia
 Teratogenic Effect of TCDD (2,3,7,8-tetrachlorodibenzo-p-dioxin) in the Development of Isa
 Brown Embryos
- OP-4: Dr. Mohammad Shah Alam, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Banglades DBP diminishes testicular steroidogenesis via the blocking of the HPT axis: a relation with spermatogenic cell apoptosis in Japanese quails
- OP-5: Sawa Onouchi, Gifu University, Japan Morphological features of the mouse duodenocolic fold in embryonic days 18.5 and adult
- OP-6: Dr. Md. Royhan Gofur, University of Rajshahi, Bangladesh EphB4 and ephrin-B1: potential markers of Leydig cells
- OP-7: AKM Ahsan Kabir, Bangladesh Agricultural University, Bangladesh Morphological study of testis at different postnatal ages and different stages of the seminiferous cycle of Black Bengal goat

Day 2: October 31, 2022, Monday

Technical Session 4: Molecular Biology

- OP-1: Nobuaki Nakamuta, Iwate University, Japan
 In situ hybridization analysis for the expression of olfactory receptors in the olfactory organ of sea turtle
- OP-2: Watcharapon Promsut, The University of Tokyo, Japan, Characterization of Mab2111-null labioscrotal fold mesenchyme in the preputial/clitoral glands in a mouse model for cerebellar, ocular, craniofacial, and genital (COFG) syndrome
- OP-3: Dr. Md. Nabiul Islam, Yamaguchi University, Japan. Androgen modulates emotional memory and intrinsic plasticity by acting on the androgen receptor in the adolescent male rat brain
- OP-4: Karla Cristine C. Doysabas, Central Mindanao University, Philippines, A Team technology for detecting early signs of viral cytopathic effect
- OP-5: Prof. Dr. Jahagir Alam, Osaka Metropolitan University, Japan Expression and localization of ephrin-B1 and EphB4 in adrenal gland of adult mouse



Technical Session 5: Clinical Anatomy

- OP-1: Prof. Dr. Bhajan Chandra Das, Chattogram Veterinary and Animal sciences University, Bangladesh Anaesthetics and Surgical Evaluation of Splenectomy in Calves
- OP-2: Prof. Dr. Kh. Nurul Islam, Chattogram Veterinary and Animal sciences University, Bangladesh The development of bone paste from Bay of Bengal sea shell- based calcium carbonate for bone fracture healing in vivo study using goat model.
- OP-3: Prof. Dr. Md. Rayhan Faruque, Chattogram Veterinary and Animal sciences University, Bangladesh Segmental Mandibulectomy of Acanthomatous Ameloblastoma in a dog
- OP-4: Dr. Suraj Kumar Yadav, Chattogram Veterinary and Animal sciences University, Bangladesh Evaluation of long bone fracture healing in goats with application of bone paste (Cockle shells based calcium carbonate)

Technical Session 6: Basic Veterinary Anatomy

- OP-1: Dr. Latifa Akter, Bangladesh Agricultural University, Bangladesh Alcohol-based fixative could be a safer option to reduce the hazardous effects of formalin
- OP-2: Osamu Ichii, Japan Activity of Technical Workshop for Animal Gross Anatomy in the Japanese Association of Veterinary Anatomists
- OP-3: Prof. Dr. Ceferino P Maala, University of the Philippines, Philippines
 The status of Veterinary Anatomy Museuminthe Philippines with Special Reference to the Jose
 A. Solis Museum of Veterinary Anatomy
- OP-4: Okan Ekim, Ankara University, Turkey Initiatives in Veterinary Anatomy Museums for an Efficient Museum Education During and After Lockdown: Adaptation to a New World Order
- OP-5: Javad Sadeghinezhad, University of Tehran, Iran
 Digital stereology: new horizon in veterinary anatomy research

List of Poster Presentation



- Poster- 01: Professor Dr. Nasrin Sultana, Bangladesh Agricultural University, Bangladesh

 Modulation of growth performance, gut health, serum biochemistry, and meat quality traits
 in broilers by clove (Syzygiumaromaticum) and tulsi (Ocimum sanctum) supplementation
- Poster- 02: Dr. Sujan Kumar Sarkar, Sher-e-Bangla Agricultural University, Bangladesh

 Copper supplementation ameliorates fatty liver disease of laying quail birds
- Poster- 03: Dr. Md. Mahmudul Amin, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh Effect of conventional and non-smoke mosquito coils in a closed environment
- Poster- 04: Professor Dr. Mohammad Rabiul Karim, Bangladesh Agricultural University, Bangladesh Role of antioxidants against imid acloprid (IMI)-induced hepatotoxicity
- Poster- 05: Dr. Md. Arman Sharif, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh Plastination of internal organs of goat by a creative method for teaching and research
- Poster-06: Dr. Ankon Das, Chattogram Veterinary and Animal Sciences University, Bangladesh Relationship between spaying and mammary gland tumor in dogs
- Poster- 07: Dr. Avi Das, Chattogram Veterinary and Animal Sciences University, Bangladesh

 Clinical investigation and management of megacolon followed by lordosis in cats
- Poster- 08: Professor Dr. Bhajan Chandra Das, Chattagram Veterinary and Animal

 Surgical correction of third eyelid gland prolapse (cherry eye) in a dog- first case report in Bangladesh
- Poster- 09: Dr. Debashish Sarker, Chattogram Veterinary and Animal Sciences University, Bangladesh Endoscopic examination for confirmatory diagnosis of mucosal changes and foreign bodies of the upper digestive tract in small animals
- Poster-10: Dr. Ummay Khaer Fatema Chy, Chattogram Veterinary and Animal Sciences University, Bangladesh Investigation and management of anatomical changes of the different organs from canine transmissible venereal tumor in dog
- Poster-11: Dr. Farnaz Kader Nova, Chattogram Veterinary and Animal Sciences University, Bangladesh Clinical anatomy of regional anesthetic sites in the head region of the male adult Zebu cattle (Bos indicus)
- Poster-12: Thomby Paul, Chattogram Veterinary and Animal Sciences University, Bangladesh

 Ultrasonographic Visualization and Measurement of Anatomical Changes of Udder and
 Teats during Mastitis in Ruminants
- Poster-13: Dr. Subrata Kumar Shil, Chattagram Veterinary and Animal Sciences University, Bangladesh Necropsy of a juvenile male Ganges River dolphin (Platanistagangetica spp. gangetica) in Bangladesh.
- Poster-14: Dr. Zannatul Maowa, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh Effects of silver nanoparticle on mice testis: testicular damage and spermatogenesis suppression



- Poster- 15: Dr. Md. Sheikh Sadi, University of Rajshahi, Bangladesh

 Testicular morphometrics at the onset of puberty of indigenous sheep
- Poster- 16: Dr. AkieYanai, Yamaguchi University Graduate School of Medicine, Japan.
 Immunohistochemical phenotypes of STB/HAP1 in the enteroendocrine cells and enteric neurons
- Poster-17: Professor Dr. MohiUddin, Chattogram Veterinary and Animal Sciences University, Bangladesh Distribution of retinal ganglion cells and spatial resolving power of eye in the native chicken of Bangladesh
- Poster- 18: Dr. Abu Hassan, Hajee Mohammad Danesh Science and Technology University (HSTU), Dinajpur. Dietary exposure to lead (Pb) related with biochemical and histomorphological changes in testes and kidney of rabbit
- Poster-19: Prof. Md Saidur Rahman, Patuakhali Science and Technology University, Bangladesh

 Acute intra-striatal hemorrhage induces cortical neuronal death and neuro-functional

 deficit in mice
- Poster- 20 : Dr. Md. Royhan Gofur, University of Rajshahi, Rajshahi-6205, Bangladesh

 Effects of probiotic as an antibiotic substitute on gut morphology in broiler chickens
- Poster 21: Dr. Kannika Wongpanit, Kasetsart University, Thailand

 Relationship corpura lutea weight and luteal tissue progesterone concentration of rats
 during estrus cycle and pregnancy

Abstracts of Plenary Lecture



New Horizon in Anatomy

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Anatomy forms an original stream of the life sciences. And animals and human are intimately linked in "one health and one biological network," and a collapse tends to expand to their diverged diseases. Anatomical education and research in veterinary and medical fields are closely associated with the base of physiology, pathology, and surgery. We have understood the structure of objects in gross anatomy by dissecting the structure into parts and then reconstructing them to reveal the relationship between the whole and its parts. We have also deepened our understanding of the surface to inside by 3D reconstruction from 2D histological analysis based on tissue sections. The development of electron microscopy has revealed the cellular ultrastructure, clarifying that their disruption leads to diseases from cell-tissue-organ to the body in a hierarchical manner. Furthermore, the development of histochemistry, immunohistochemistry, and in situ hybridization has identified the histocytochemical localization and relation of molecules. And now, correlated light and electron microscopy (CLEM) and time-lapse imaging techniques using fluorescent proteins have begun to raise as the science of not only "shape in space" but also "shape in time and space," including its temporal changes. Morphological dynamics with purpose in the flow of time is indeed inextricably linked to function, elevating anatomy to essential substrates of molecular biology, physiology, and veterinary/human medicine.

In this lecture, I will highlight the role of anatomy in elucidating structure, function, and pathogenesis, focusing on our own discoveries of the necklace olfactory glomerulus, estrogen synthesizing neurons, and stigmoid body (neuro-cytoplasmic inclusion). In addition, we would also like to discuss how we have improved the environment of anatomical laboratories with formaldehyde-fixed animals and cadavers that anatomists must be involved in. Because the earth is round, wherever we live, we must always be aware that we are at the top of the world and looking down the tangential edge of the earth. We are constantly facing the rising-sun on the horizon and keeping perspectives of cutting-edge science on the "New Horizon of Anatomy."

Key word: Horizon, Morphology and Electron Microscopy





Immune System of Chicken

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The lymphoid tissues of chicken have an independent phylogenetic origin, their function being to react to foreign antigens by producing antibodies, thereby providing adaptive immunity. The mechanism of adaptive immunity in birds have two components: central or primary and peripheral or secondary. The central lymphoid tissues include bursa of Fabricius with germinal centers responsible for the production of B lymphocytes and plasma cells in various tissues and maintaining humoral immunity. The other is the thymus which is responsible for the provision of thymus processed T lymphocytes to the whole body. It provides a unique microenvironment in which the T-cell precursor undergo development, differentiation and clonal expansion and causing cell-mediated immunity. The peripheral lymphoid tissues depend on the central organs for their origin, development and function. In birds the peripheral lymphoid tissues include the spleen and all the mucosa-associated lymphoid tissues (MALT), respiratory tract (BALT), alimentary tract (GALT), with Peyer's patches, isolated follicles and cecal tonsil; urinary tract (UTALT), genital tract (GTALT), head-associated lymphatič tissues (HALT) which consist of Harderian gland, lacrimal gland, eyelid conjunctivas and nasal cavity mucosa. Recent advances of avian immunology have made available monoclonal antibodies that recognize T-lymphocyte subpopulations, B lymphocytes and Immunoglobulins (lgs)-containing plasma cells. Using these antibodies, the present study revealed that the T lymphocytes, B lymphocytes, macrophages, lgs-containing plasma cells in the primary and secondary lymphatic gland; and in mucosa-associated lymphphatic tissues have significant age-related development. They are responsive to diseases; drugs, vaccines, vitamins, minerals and sex-hormone therapy. The frequencies of immunocompetent cells are more in the native chickens than the broilers, again their frequencies varied among the different strains of broiler.

Key word: Immune System, lymphoid, Tissues, BALT, MALT, GALT, Mucosa



Prosaposin in the olfactory and the auditory system

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Prosaposin (PSAP) is a glycoprotein conserved widely in vertebrates, and can exert the trophic effect to the cell via intra- and extracellular pathways. Inside the cell, PSAP is transported into the lysosome and digested into 4 kinds of saposins. Each saposin is essential for the normal lysosome function, therefore, the lack of PSAP causes the severe lysosomal storage disease. PSAP is also known to be secreted into the various kinds of the body fluids, and this extracellular PSAP can exert the neurotrophic effect. The extracellular PSAP can activate the specific G protein-coupled receptor, or be captured by endocytosis, be transported into the endosome and facilitate the autophagosome activity, and finally the neurotrophic effect will be elicited by PSAP. We have examined the expression pattern of PSAP in the olfactory and the auditory system. In the rat olfactory and vomeronasal epithelium, receptor neurons showed the intense PSAP immunoreactivity. In the rat main and accessory olfactory bulb, PSAP expression was observed in principal neurons by immunohistochemistry and in situ hybridization, but its expression pattern was different each other. The periglomerular cell in the accessory olfactory bulb showed PSAP expression more intense than that in the main olfactory bulb, but showed immunoreactivity in developmentally later period comparing to that in the main olfactory bulb. In the auditory system, the mouse inner hair cell and the spiral ganglion were expressed PSAP, however, no PSAP expression was observed in the chick hair cell although the chick spiral ganglion showed high PSAP expression. We revealed that the unique expression pattern of PSAP in each sense organ, it may relate to its activity and some of which may be acquired in mammals in the vertebrate evolution.

Key words: Audition, Neurotrophic factor, Olfaction

Abstracts of oral Presentation



Technical Session 1 : Morphological Science

Effects of chronic exposure of 4G cell phone radiation in mice

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The aim of this study was to investigate the effects of 4G mobile phone radiation in mice. A twenty-one 4-week aged male mice were divided into three groups; group A (control), group B (exposed 40 minutes daily for 60 days), group C (exposed 60 minutes daily for 60 days). Exposure of radiation was given from 4G connected mobile phones in an interactive call with the 2100 MHz frequency. The control group did not receive any radiation. After exposure, the behavioural study was performed in every week by using elevated plus maze tool. The hematological, biochemical and histological studies were performed after radiation exposure. The behavioural study showed that the frequency of time spent and entries into the open arms of plus maze was decreased while time spent in closed arms was increased significantly in exposed groups. The mean body weight of the exposed group was decreased significantly. The TLC and Hb% were increased significantly in 40- and 60-minutes exposed groups while the values of TEC was decreased significantly in 60 minutes exposed group. The ALT, AST, and Serum creatinine values were increased significantly in 40 and 60 minutes of exposed groups. Marked lymphocytic infiltration was found surrounding the bile duct and hepatic artery in the liver and lymphocytic infiltration with severe vascular congestion was found in the kidney of 60 minutes exposed group of mice. Irregular shapes seminiferous tubules, and fewer spermatogenic cells with larger lumen were found in some of the seminiferous tubules of exposed mice. The pyramidal neurons in the CA1 and CA3 area of hippocampus showed variable degrees of degeneration in 60 minutes exposed groups. The findings of this study indicated that excessive use of mobile phone radiation leads to damage the structural integrity of the hippocampal neurons which may lead to anxiety like behaviors as well as the deleterious effects on hematobiochemical parameters, impairment of liver, kidney, and testis in mice.

Key words: Cell phone, Radiation, Behavior, Hippocampus, Mice



Phytochemical and oral toxicity studies of piper betleethanolic leaf extract in Mindanao, Philippines

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In the present study, Piper betleethanolic leaf extract was analyzed for phytochemical composition and evaluated for oral toxicity in mice. A single fixed dose of 2000 and 5000 mg/kg P. betleethanolic leaf extract was used in acute oral toxicity, while a daily dose of 500 and 1000 mg/kg extract for 28 days was used in sub-acute oral toxicity. Physical parameters, behavior, body weight, and mortality were monitored daily for two weeks and four weeks for acute and sub-acute toxicity, respectively. Hematologic and serum (ALT, BUN, and creatinine) parameters were measured. The mice were sacrificed and necropsied at the end of the study. The phytochemical analysis showed P. betlecontains phenols, tannins, saponins, anthraquinones, terpenoids, and steroids, while alkaloids and flavonoids were not detected. Total phenolic content was at 250.15±32.1 mg gallic acid equivalent (GAE/L). A single-dose of P. betleleaf extract was non-lethal with transient lethargy and lack of grooming activity. Sub-acute multiple doses caused persistent alopecia, lethargy, poor growth (p<0.05), and mortalities. These findings revealed the relative safety of a single dose of P. betleleaf extract; however, caution should be taken if used repeatedly.

Key words: Piper betle, ethanolic, phytochemicals, oral toxicity, Mindanao, Philippines



Anatomy of some organs of a juvenile male Ganges River dolphin (Platanistagangetica spp. gangetica)

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Ganges River dolphin(Platanistagangetica spp. gangetica) are warm-blooded air-breathing mammals, endemic to the Indian subcontinent. Nevertheless, a scant number of basic histomorphological research has been conducted on this endangered species. Therefore, the aim of this study was to describe the morphological features of different organs of P. gangetica. In spite of being an aquatic animal, they showed similarities with terrestrial mammals such as the pair of lungs and an apical bronchus in respiratory system which are quite common in ruminants and pigs. Unlike terrestrial animal, the tracheobronchial tree was stiffer due to circularly arranged anastomosing plates of the hyaline cartilaginous ring in the trachea and cartilaginous plates in the bronchiole. The digestive system displayed a three-chambered stomach consisting of both mechanical and glandular stomach similar to the artiodactyls. Furthermore, the intestine showed smaller caecum similar to the monogastric mammal. The urogenital system displayed lobulated kidneys, a urinary bladder, a fibroelastic penis with sigmoid flexure, and a long urethral process which are quite similar to some of the terrestrial ruminants. All those modifications unlike terrestrial mammals are thought to be necessary for their adaptation. Thus, this research will broadly help our veterinarians and conservationist to take further steps toward disease diagnosis, and monitoring of marine health for saving this endangered species.

Keywords: Ganges River dolphin, Lung, Morphology, Penis, Stomach



The common guitarfish Rhinobatosrhinobatos: A descriptive anatomical study and proposed dissection techniques

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The common guitarfish (Rhinobatosrhinobatos) is an endangered species and is included in the red list of the International Union for Conservation of Nature as "critically endangered, cr." Although guitarfish are displayed and protected in public aquaria, only limited information is available on the external and internal anatomy of this species and dissection methods applicable to it. In this study, common guitarfish kept in a public aquarium were dissected with an appropriate method, and the internal and external organs of the fish were identified. A semicircular incision to observe the abdominal cavity, a triangular incision to reveal the pericardial cavity, and a circular incision to observe the brain tissue were conducted. The present study suggests that guitarfish can be dissected with three main incisions to observe the internal organs, heart, and brain. The general examination of the external organs showed that the animal had the typical anatomical structure of guitarfish. The internal organs, including the stomach, intestines, spleen, liver, gall bladder, epigonal organ, testicles, brain, cerebellum, optic lobes, and heart of the guitarfish, were also observed.

Keywords: Anatomy, Dissection techniques, Endangered species, Guitarfish, Rhinobatidae.



Revelation of appendicular skeleton in cock-fighting male and female aseel (gallusgallusdomesticus)-a comparative morphometric analytical approach

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To reveal skeletal morphometric analysis, an understanding of some morphological features and phenotypic variance is crucial. Nevertheless, Aseel's skeletal morphometry has not yet undergone a comprehensive investigation. The morphometry of the appendicular skeleton (AS) and its comparison between male and female Aseel were examined and revealed in this study. After preparing and measuring AS, length and width, correlation and differences were examined in males (n = 12) and females (n = 10). A two-tailed independent sample t-test was conducted and compared the results that was summarized as the length (mean±SD, cm) of Femur, Tibiotarsus, Fibula, Tarsometatarsus, Humerus, Radius, Ulna and scapula of male and female were $(11.62\pm0.92, 9.22\pm0.49), (18.68\pm0.68, 13.65\pm0.67), (13.62\pm0.67, 10.75\pm0.51),$ $(12.7\pm0.81, 8.96\pm0.57), (10.87\pm1.05, 7.68\pm1.03), (9.66\pm0.86, 7.53\pm0.76),$ (10.93±0.96, 8.23±0.85), (10±1.06, 8.34±0.53) respectively at 95% CI, p<0.001 for all. The common language (CL) effect size was calculated and that indicated the chance for a randomly selected pair of individuals the length of a male is higher than the length of a female is 97% on an average. The correlation analysis showed that the relationship between length and width was positively correlated. This study aids in the modern research of Aseel's propensity for cockfighting and acts as a manual for scientific investigations on domestic birds.

Keywords: Skeleton, Morphometric and Aseel



Macroanatomical investigations of axial skeleton of bengal monitor lizard (Varanus bengalensis)

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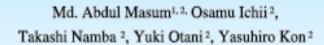
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The aim of this study is to elucidate the osteological outline on the bones belongs to axial skeleton of Bengal monitor lizard (Varanusbengalensis) thereby making more contribution in filling the gap of knowledge and skills framework in the field of Zoo, Lab. and Wild animal medicine, Archaeology and Anthropology. The skeletons were dug out from the grounds which were buried 03 month ago with precaution and protection to avoid small bone missing. These bones were washed out, sun dried and then, the gross morphological study was carried out. Various osteological features of the bones of axial skeleton were observed, studied and recorded. The study revealed that, parietal bone is extensive and mainly takes part in the formation of roof of the cranial cavity like canidae as well as subfamily caprinae, the orbital rim is totally incomplete and separated by an opening. The two halves of mandible is fused incompletely by mandibular symphysis with deep masseteric fossa and well developed canine teeth as like as canidae, though, this belong to Varanidae reptile. The vertebral column is composed of seventeenpresacral, one sacral, and eight post sacral vertebrae. The rib cage is composed of eight pairs of rounded ribs and sternum. This study provides a baseline data for further ventro-legal, archaeological and clinical cases.

Key words: Bengal Monitor Lizard, Axial skeleton, Bone, Skeletal anatomy

Technical Session 2 : Anatomy of Immune System

Elucidation of vasculature-associated tertiary lymphoid tissue in caprine kidney



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Recently, we have reported a unique tertiary lymphoid tissue namely vasculature-associated lymphoid tissue (VALT) in autoimmune model mouse kidney which directly contributed to renal lesion (RL) development via providing effector cells. However, there is no report regarding the development of VALT and its possible contribution to RL development in kidney of goat. One-year old doe (Saneen breed, Capra aegarushircus) were used for this experiment. Excised kidneys were examined using routine histopathological staining, immunohistochemistry, and scanning electron microscopy to reveal RLs and detect different cells. Kidney samples from examined goats were grouped into healthy kidney (HK) which showed normal structure and inflamed kidney (IK) that showed glomerular lesions characterized by glomerular hypertrophy, hypercellularity, and adherence of podocyte to parietal cells. VALTs were only found near to the arcuate and interlobular artery of IK rather than HK, VALT was composed of T-cells, B-cells, and macrophages and vascularized with numerous high endothelial venules. Juxtaposition of infiltrating lymphocytes and macrophages indicating antigen presentation to lymphocytes in VALT. Moreover, presence of Ki67+ proliferating cells and CD138+ plasma cells in VALT indicating its activation state. Therefore, we conclude that VALT develops in goat IK and participate in renal lesions development via providing effector cells.

Key words: Elucidation, vasculature, Caprine, kidney





Pathological role of hedgehog signaling in maintenance of the murine oviductal ciliated epithelium

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We have reported autoimmune disease-prone MRL/MpJ-Faslpr/lpr (MRL/lpr) mice showing abnormal morphofunction of the ciliated epithelium of the infundibulum. In this study, we examined the relationship between Hedgehog (Hh) signaling, which is known to maintain homeostasis in the adult epithelium, and pathology of the infundibulum. In addition to the histological localization and gene expression of Hh signaling pathway-related components: patch (Ptch), smoothened (Smo), and Gli, we examined those of Pax8, a marker for progenitor cells in the oviductal epithelium, and Foxil, a marker for ciliogenesis in the infundibulum of healthy mice (C57BL/6N and MRL/MpJ) and MRL/lpr at 3 and 6 months of age. First, in MRL/lpr at 6 months of age, Pax8 was downregulated and Foxil was upregulated with aging, suggesting that homeostasis of the infundibulum epithelium of aged MRL/lpr mice was disturbed. Second, in all strain mice, the motile cilia of ciliated epithelial cells in the infundibulum harbored Ptch1, Smo, and Gli2. In contrast, these Hh signaling-related components were significantly downregulated in the infundibulum of MRL/lpr mice at 6 months of age. The expression levels of Pax8 and Foxil were significantly positively correlated with those of Ptch1, Smo, and Gli2. Altogether, it is suggested that Hh signaling involves in homeostasis of the ciliated epithelium in the murine infundibulum and that in MRL/lpr mice, which show exacerbated severe systemic autoimmune abnormalities, molecular alterations in Hh signaling-related components interact with local inflammation in the infundibulum, leading to disturbances in epithelial homeostasis.

Key words: Key words: Autoimmune abnormality, Ciliated epithelium, Hedgehog signaling, Homeostasis, Oviduct



Altered morphologies of tear-secreting tissues and cornea in a mouse model of autoimmune disease

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Cornea is covered by the tear film composed of lipid, water, and mucin layers from the outside. Autoimmune disease (AD) can lead imbalance of these layers composition resulting in dry eye (DE). Although AD-associated DE is reported in human as well as dogs, its pathology remains unclear. Here, we investigated the relation between autoimmunity and morpho-function of tear-secreting glands and cornea using male AD-prone BXSB/MpJ-Yaa mice (Yaa) and its control strain, BXSB/MpJ (BXSB) at the age of 8, 20, and 28 weeks. The indices of AD in Yaa, the concentration of serum autoantibody and the ratio of spleen weight-to-body weight (S/B), increased from 8 and 20 weeks old, respectively. The tear volume was higher in Yaa than in BXSB at 8 weeks but decreased with aging and the increase of AD indices. For the histological evaluation of lipid layer-formation glands, Yaa showed smaller acinar cells in meibomian gland and Harderian aland compared with BXSB at 28 weeks, and the acinar cell size of the latter gland decreased with aging and the increase of S/B in Yaa. For that of water layer, extraorbital and intraorbital lacrimal glands showed cell infiltrations in Yaa at 20 and 28 weeks, and the acinar cell size of the latter gland decreased with aging and increase of S/B in Yaa. For that of mucin layer, the conjunctiva goblet cells tended to decrease from 8 to 20 weeks in both strains but increased at 28 weeks in Yaa. The thickness of cornea anterior epithelium decreased with aging, and ultrastructural analysis revealed the partial lack of microvilli on comea surface in Yaa. This study indicated that the unstable tear film due to the progression of AD in Yaa associated with the cornea injury providing important insights to reveal the pathology of AD-associated DE in human and veterinary medicine.

Key words: Tear film, autoimmune disease, cornea



Genital organ associated lymphoid tissue characteristics in cow, goat, and pigvaginal vestibule

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The gut-associated and bronchial-associated lymphoid tissues are well recognized as part of the mucosal-associated lymphoid tissues in mammals and initiate a serial immune reaction to certain antigens encountered across all mucosal surfaces. The female reproductive tract has a unique immune function compared with the mucosa in other organs and serves both innate and adaptive immune systems; however, the genital organ-associated lymphoid tissue (GOALT) has received limited attention. This study investigated the gross anatomical and histological features of GOALTs found in the vaginal vestibules (Ws) of cows, goats, and pigs. The Ws of healthy cows, goats, and pigs (n ≥ 6, over 1 year, non-pregnant; cow: Holstein breed; goat, Saanen breed; pig, mixed breeds) were examined by using the whole-mount specimens stained with hematoxylin and the histological sections stained with hematoxylin and eosin, periodic acid Schiff, picrosirius red, immunohistochemistry, or immunofluorescence. The ultrastructure of the mucosal surface of Ws was analyzed using scanning electron microscopy. In whole-mount specimens of cows, goats, and pigs, various sized and dark-blue hematoxylin-positive spots were diffusely distributed, indicating lymphoid tissues (LTs), surrounded the vulva/vaginal vestibular mucosa in the form of a ring. We named their structures "Genital Lymphoid Ring (GLR)". Then, LTs histologically identified as a lymphatic nodule or diffuse lymphoid tissue. Generally, in all examined animals, both types of LTs consisted of B-cells, T-cells, macrophages, dendritic cells, or plasma cells. Ws were covered by non-keratinized and stratified squamous epithelium, which was disrupted in some areas covering LTs, and immune cells directly contacted with intraluminal space through this area lacking epithelium. In summary, all examined cows, goats, and pigs showed GLR in their W which was morphologically not significantly different, suggesting GOALTs are general structures for local immunological barriers and partially homologous with mucosa-associated lymphoid tissue found in the pharyngeal lymphoid ring.

Key words: Genital organ associated lymphoid tissue, Mucosal immunology



Characteristics of lymphoid tissue found in large intestine of chicken

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Gut-associated lymphoid tissues (GALTs) are crucial structures for mucosal immunity in animals. From our previous study, we found anorectal mucosa-associated lymphoid tissue (AMALT) with various morphology in mice, and its development was affected by systemic immune condition and sexes(Rubel et al, the 2nd Japanese Veterinary Anatomy Academia 2022). In the anorectal canal (0-1.5 cm cranial from anus), lymphoid tissues (LTs) were observed, and they consist of T-cells, B-cells, macrophages, lining M-cells, and vascularized high endothelial venules. In particular, AMALTs in the autoimmune disease-prone mouse tended to be developed compared with health mice. In similar to mammals, avian species also develops GALTs which function as a crucial immunological structure. In large intestines of chicken, the presence of diffuselymphoid tissues (DLTs) was reported in the rectum (Casteleyn et al. 2010); however, its detailed information is still scarce. The present study investigated the GALTs found in chicken large intestines and analyzed their morphological characteristics. Briefly, both sexes of Rhode Island Red (RIR) chickens (n = 4) were used for histological analysis at one year. The terminal part of rectum (2 cm cranial from cloaca) was collected, and their structures were observed by using histological section stained by hematoxylin and eosin.In chicken rectum, LTs were mainly found in lamina propria and submucosa with various morphology. Several LTs showed clear border with epithelium, and that of the others were unclear due to the cell migrations to epithelium. Characteristically, male tended to show more developed LTs compared with females, but there was no difference in quantitative values indicating the number or appearance of these LTs. Therefore, further studies are needed to clarify the quantitative information and cell compositions of GALTs in the chicken large intestines by adding the sample numbers.

Key words: Anorectal mucosal associated lymphoid Tissue, Morphometric analysis, Chicken, Sex



Technical Session 3: Development and Reproductive Biology

Effects of imidacloprid-contaminated feed exposure on testicular tissues of adult male rabbits (Oryctolagus cuniculus)

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Toxicity of pesticides for non-target organisms is of worldwide concern. This study was conducted to evaluate the effect of repeated exposure to insecticide, imidacloprid (IMI)-contaminated feed on testicular tissue, spermatogenic cell population, Leydia cell number and sperm morphology in adult male rabbits (n=24). The treatment groups received IMI (Bildor® 100 mg/L water spray on green grass)-contaminated green grass without wash (n=8, designated as washed feed rabbit) and after wash (n=8, designated as not washed feed rabbit) every alternative day once daily up to 15 days. Rest of the rabbits as control, received normal pesticide free standard feed. During the exposure time, there was no evident toxic symptom found on regular monitoring of IMI exposed rabbits. Histopathologically, thickness of tunica albuginea of testes was reduced significantly with loosely arranged connective tissues in both IMI exposed rabbits compared to the control rabbits. Within the testes, bizarre shaped seminiferous tubules, increased lumen diameter and disorganized as well as detachment of spermatogenic cells from the basement membrane were seen in IMI exposed rabbits. The spermatogenic cell population decreased significantly (P<0.05) in both IMI exposed rabbits compared to the control rabbits. Leydig cell numbers decreased significantly (P<0.05) in IMI exposed rabbits. High percentage of morphologically abnormal spermatozoa was seen in IMI exposed rabbits. The degree of the histopathological changes was more prominent in testes of IMI exposed not washed feed rabbit compared to washed feed rabbits. The results showed that insecticide-IMI has toxicological effects on testicular tissues, mainly spermatogenic and Leydig cell population of adult rabbits which may cause infertility.

Key words: Imidacloprid, Histopathology, Spermatogenic cells, Leydig cells, Testes, Rabbit.



Embryological study of glucagon-like peptide (GLP)-1 and other- immunoreactive cells in the small intestine of White Cornish chicken

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Glucagon-like peptide (GLP)-1, neurotensin (NT), Somatostatin (SST), and Cholecystokinin (CCK) are major intestinal hormones and play important roles in function of the chicken small intestine. This study aims to clarify the distribution and morphology of GLP-1- and NT, SST and CCK -immunoreactive (IR) cells in the chicken small intestine at pre hatch. Duodenum jejunum, ileum and colorectum were collected from embryos at incubation days 17, 19, 20 and 21 day old as tissue samples. Tissue samples fixed in Bouin's fluid were embedded in paraffin wax and cut at 5 µm thickness in the ordinary manner. Streptavidin-biotin method labeled with HRP was used for the detection of GLP-1, NT, SST, CCK. GLP-1-IR cells were observed in the epithelium of jejunum and ileum from all samples. NT-IR cells were also observed throughout the small intestine from all samples. SST-IR were observed from Duodenum to Ileum except colrectum and numerous density was found in the Duodenum than jejunum and Ileum. The CCK -IR also observed from Duodenum to Ileum not in colorectum which similar to SST-IR. During assessment these IR cells, It was found that most of the Cells were round shaped with no long cytoplamic process. These cells were widely distributed in the tip, middle, lower of villi and crypt at prehatch. This distribution and density of cells varied according to intestinal site and incubation days. These results indicate that endocrine cells in the chicken small intestine markedly change their distribution in the epithelium at prehatch.

Key words: Chicken, Glucagon-like peptide-1, Neurotensin (NT), Somatostatin (SST), Cholecystokinin (CCK) and Pre-hatch



Teratogenic Effect of TCDD (2,3,7,8-tetrachlorodibenzo-p-dioxin) in the Development of Isa Brown Embryos

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2,3,7,8-tetrachlorodibenzo-p-dioxin or TCDD is a chemical compound resulting from the burning effect that is very dangerous for humans, plants, or animals which can cause skin damage immunotoxic, hepatotoxic, carcinogenic, teratogenic, diseases on reproduction, disturbing on growth processes, neurobehavioral, and specific endocrine effects. In addition, this compound can also disturb embryo development and increase embryo mortality. This study aims to determine the teratogenic TCDD administration on head diameter, head circle, body length, and body-wide of Isa brown embryos. In this study, there were three treatment groups: a standard group without the addition of TCDD in corn oil, a placebo group with the addition of 5 μ L corn oil, and a treatment group with the addition of TCDD of 5 ng/egg dissolved in 5 μ L corn oil. The treatments were given for seven days. The statistical analysis showed that the teratogenic effect of TCDD had a significant impact on the development of thorax circles but did not impact head diameter, head circle, body-wide and body length.

Key words: 2,3,7,8-tetrachlorodibenzo-p-dioxin, anatomy of chicken embryo, seven-day chicken embryo, TCDD, Teratogenic effect.



DBP diminishes testicular steroidogenesis via the blocking of the HPT axis: a relation with spermatogenic cell apoptosis in Japanese quails

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Although di(n-butyl) phthalate (DBP) induces spermatogenic cell apoptosis, its mechanism is not yet clear in quails. The prepubertal quails were given a single dose of 500 mg/kg DBP by gavage and killed at 3, 6, and 24 h after treatment. Results showed a significant reduction of intratesticular testosterone (ITT) level and testicular steroidogenic enzymes mRNA expression, while a significant increase in spermatogenic cell apoptosis in DBP-treated quails, compared to the control. The maximal apoptosis was detected at 6 h after treatment and the maximal reduction of testosterone level was at 3 h. To address whether DBP suppressed testicular steroidogenesis by affecting the hypothalamic-pituitary-testicular (HPT) axis, we analyzed the pituitary LH\$\beta\$ mRNA expression and serum LH level. The pituitary LH\$\beta\$ gene expression and serum LH level were significantly decreased in the treated groups. Therefore, the present observations essentially suggest the possibility that DBP might have blocked LH secretion from the hypothalamus and/or pituitary, and then the LH stimulation of Leydig cells was decreased, thereby reducing the ITT level. DBP-induced diminution of the ITT level might cause alteration of the physical structure of Sertoli cells, which in turn, might induce the spermatogenic cell apoptosis.

Keywords: Di(n-butyl) phthalate (DBP), Japanese quails, Testicular steroidogenesis, Spermatogenic cell apoptosis, Hypothalamic-pituitary-testicular (HPT) axis.



Morphological features of the mouse duodenocolic fold in embryonic days 18.5 and adult.

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We focused on morphological features of the mouse duodenocolic fold at embryonic days 18.5 and adult phase. The duodenocolic fold, a sheet of the mesentery, was located between the whole-ascending duodenum and the descending colon. At the cranial area near the duodenojejunal flexure, the duodenocolic fold connected to both the mesocolon and the mesojejunal part of the root of the mesentery. At the middle and caudal area of the abdominal cavity, the duodenocolic fold connected to the mesocolon. Interestingly, the duodenocolic fold contained a smooth muscle bundle along the ascending duodenum. The smooth muscle bundle continued from the outer muscular layer of the middle to caudal part of the ascending duodenum. The 3-dimentional imaging of the duodenocolic fold revealed that the smooth muscle bundle extended toward the root of the mesentery. A part of the duodenocolic fold connecting to the mesojejunal part of the root of the mesentery seemed to be homologous to the superior duodenal fold in human, known as the duodenojejunal fold; in contrast, the most of the duodenocolic fold seemed to be homologous to the inferior duodenal fold in human, known as the duadenamesocolic fold. The smooth muscle bundle in the mouse duadenacolic fold had common in point of the location and uncommon in point of the nerve supply to the suspensory muscle of the duodenum in human, known as the ligament of Treitz. Although this study had insufficient evidences mentioning that the mouse duodenocolic fold was homologous to the mesentery around the duodenum in human, this study could give a cue for comparative anatomy between animals and humans.

Key words: embryonic days 18.5, duodenocolic fold, smooth muscle bundle, three-dimensional imaging



EphB4 and ephrin-B1: potential markers of Leydig cells

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All cells express characteristic markers (proteins, lipids, glycosylation, etc.) that can be used to help distinguish unique cell types. Cell markers can be expressed both extracellularly on the cells surface and/or as an intracellular molecule. Erythropoietin-producing hepatocellular (Eph) receptor tyrosine kinases and their ephrin ligands are membrane proteins that serve as a cell-cell communication/signaling system with widespread roles in cell physiology and disease. EphB4 and ephrin-B1 express in steroidogenic cells in the ovary, and thus we speculate their co-expression in male gonadal steroidogenic cells (Leydig cells). We examined the expression of EphB4 and ephrin-B1 in the Leydig cells of mouse varying in postnatal ages from one day to eight weeks (the day of birth was regarded as day 0). RT-PCR analysis revealed that EphB4 and ephrin-B1 molecules expressed both in developing and adult testis (from birth to eight weeks), though the relative expression levels of these molecules gradually decreased with age in early postnatal periods (until four weeks), and then was stable until eight weeks. Double immunofluorescence staining revealed that CYP17A1-positive cells (CYP17A1 is mostly used as a marker of Leydig cells) substantially expressed EphB4 and ephrin-B1 throughout the study period from one day to eight weeks of postnatal age. Moreover, EphB4 immunoreactivity in CYP17A1-positive Leydig cells was almost similar throughout the study period, whereas ephrin-B1 immunoreactivity in CYP17A1-positive Leydia cells was weak at early postnatal ages (from one day to two weeks) and became very strong by four weeks of age. These findings suggest that: (1) EphB4 and ephrin-B1 are expressed both in fetal and adult Leydig cells, and (2) fetal and adult Leydig cells express ephrin-B1 at low and high levels, respectively. Hence, EphB4 and ephrin-B1 are the potential markers of both fetal and adult Leydig cells confirmed by RT-PCR analysis and immunostaining, and are the candidate molecules for regulating testosterone production.

Key words: Marker, CYP17A1, Leydig cell, postnatal, steroidogenic cell



Morphological study of testis at different postnatal ages and different stages of the seminiferous cycle of Black Bengal goat

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The present study was aimed to know the histological morphology of testis of Black Bengal goat at different postnatal ages. Twelve male Black Bengal kids were divided into four groups according to age. These groups were 3.5, 5, 7 and 9 months, respectively. Goats were castrated to collect the testis sample. The testis weight and volume increased with the age of goats. Whereas, testis width and length increased significantly up to 5 months of age. The diameter of seminiferous tubules (ST), ST epithelium height and ST lumen diameter increased at 7.0 months of age. In addition, the testis fragments were embedded in paraffin, sectioned in a microtome and stained with hematoxylin and eosin for histological evaluation. There were 8 stages in the seminiferous epithelium cycle and their frequencies were also different. Our study showed that stage I in Black Bengal goats is the longest, having a frequency of 34% followed by stages V–VII (27%). So, we characterized eight stages of the seminiferous cycle in Black Bengal goat testis with details information. The results show that Black Bengal buck comes in sexual maturity at about 7 months of age but testicular development continues upto 9 months of age.

Key words: Black Bengal goat, Seminiferous epithelium cycle, Seminiferous tubules, Sexual maturity, Testis



Technical Session 4: Molecular Biology

In situ hybridization analysis for the expression of olfactory receptors in the olfactory organ of sea turtle

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Generally, the olfactory organ of turtle consists of the upper chamber epithelium (UCE) and the lower chamber epithelium (LCE). The UCE and LCE are distinguished by the presence or absence of associated glands and thought to detect air-borne odorants and water-borne odorants, respectively. However, how the olfactory organ of sea turtles, which spend most of the life under water, adapts to the aquatic environment is largely unknown. Meanwhile, the odorant receptors (ORs) are generally classified as class I ORs and class II ORs, known to detect water-soluble adorants and volatile adorants, respectively. In the present study, we investigated the expression of olfactory receptor genes in the olfactory organ of green sea turtle Chelonia mydas by in situ hybridization. Majority of olfactory receptor neurons in the olfactory organ of sea turtle expressed the genes encoding alpha subunit of olfactory neuron specific G-protein and cyclic nucleotide gated channel alpha 2 that mediate signal transduction of ORs, whereas relatively small population of olfactory receptor neurons expressed the gene encoding transient receptor potential channel C2 involved in the signal transduction of vomeronasal receptors. The cells expressing class I ORs were mainly situated in the LCE, suggesting that the olfactory organ of sea turtle detects water-borne odorants by the LCE. Meanwhile, the class II ORs were expressed in both UCE and LCE, suggesting that airborne adorants were detected by the entire olfactory organ. This may indicate a characteristic of the olfactory organ of turtles that have been adapted to aquatic environment.

Key words: Adaptation, Odorant receptors, Olfaction, Vomeronasal receptors



Characterization of Mab2111-null labioscrotal fold mesenchyme in the preputial/ clitoral glands in a mouse model for cerebellar, ocular, craniofacial, and genital (COFG) syndrome

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The labioscrotal fold agenesis with cerebellar, ocular, and craniofacial disorders (COFG syndrome) is a human genetic disease caused by MAB21L1 mutations. The Mab21l1-null mice, a human COFG model, displayed severe hypoplasia of rodent-specific preputial (CGs) and clitoral glands (PGs) that are derived from the labioscrotal fold at the perinatal stage. However, the roles of MAB21L1 in such genital features are still unknown. Here, we showed the presence of PG/CG-specific MAB21L1-positive mesenchyme around hair follicle structure at perinatal stages, which was essential for the normal development of PGs and CGs. In wild-type mice, MAB21L1 was highly expressed in the nucleus of α-smooth muscle actin-positive mesenchymal cells at PO. The MAB21L1 positive mesenchymal cells mainly occupied the interstitial spaces between gland epithelia and the capillary network at P7. These MAB21L1-positive mesenchymal cells were detected as a major interstitial population at 3-week-old and undetectable by 8-week-old. Lack of MAB21L1 in Mab2111-null mice caused reduced primordia and mesenchyme of PGs and CGs at P7 and atrophied PGs and CGs by 3-week-old. Histopathological analysis of Mab2111-null PGs and CGs showed a reduced number of mesenchymal cells with a drastic reduction of interstitial spaces between gland epithelia and capillary at P7. The vascular density around the glands was significantly reduced by PO. In the adult stage, Mab2111-null PGs showed small acini and narrow intercalated duct, whereas CGs underwent regression of acini. Moreover, we have developed a new organ culture system of E18.5 PG/CG primordia including surrounding mesenchyme. Interestingly, the Mab2111-null organ culture induced the survival of mesenchymal cells of PGs/CGs, but the gland epithelial cells reduced the proliferative activity. These findings suggest that the reduced number of the MAB21L1-positive mesenchymal cells might be rescued by the culture system. Taken together, MAB21L1 is essential for maintaining mesenchymal cell population, which is influenced by in vivo microenvironmental conditions.

Keywords: MAB21L1, Labioscrotal fold mesenchyme, External genitalia, Mouse



Androgen modulates emotional memory and intrinsic plasticity by acting on the androgen receptor in the adolescent male rat brain

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Adolescence is the critical postnatal stage for the action of androgen in multiple brain regions. Androgens can regulate the learning and memory functions in the brain. It is known that the inhibitory avoidance test can evaluate emotional memory and is believed to be mainly dependent on the amygdala and hippocampus. However, the effects of androgen on inhibitory avoidance memory and its relation with intrinsic plasticity have never been examined in adolescent male rats. In the present study, the effects of androgen on inhibitory avoidance memory, androgen receptor (AR)-immunoreactivity in the amygdala and hippocampus, and the dynamics of intrinsic plasticity of CA1 hippocampal pyramidal neurons were studied using behavioral analysis, Western blotting, immunohistochemistry, and current-clamp electrophysiology in sham-operated, orchiectomized + testosterone or orchiectomized + dihydrotestosterone-administered male adolescent rats. Orchiectomized rats showed significantly reduced time spent in the illuminated box after 30 min (test 1) or 24 h (test 2) of electrical foot-shock (training), reduced AR-immunoreactivity, resting membrane potential, action potential afterhyperpolarization amplitude, and membrane resistance. In contrast, it significantly increased action potential threshold and membrane capacitance compared to those in sham-operated rats. These effects were successfully reversed by treatment with either aromatizable androgen "testosterone" or non-aromatizable androgen "dihydrotestosterone." Furthermore, we injected AR-antagonist "flutamide" in intact rats to determine the pathway of androgenic effects. Administration of the AR-antagonist flutamide in intact rats showed similar changes to those in orchiectomized rats, suggesting that androgens affect the intrinsic plasticity to modulate emotional memory, possibly by directly acting on the AR. Our current study potentially clarifies the role of androgen in enhancing the basal excitability of the neurons, which may influence selective neuronal excitation or activation to modulate certain hippocampal functions.

Keywords: Sex hormone, Immunohistochemistry, Electrophysiology, Behavior, Memory



ATeam technology for detecting early signs of viral cytopathic effect

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Adenosine 5'-triphosphate (ATP), the major energy currency of the cell, is involved in many cellular processes, including the viral life cycle, and can be used as an indicator of early signs of cytopathic effect (CPE). In this study, we demonstrated that CPE can be analyzed using an FRET-based ATP probe named ATP indicator basedon Epsilon subunitfor Analytical Measurements (ATeam). There sultsrevealed that asearlyas3hr, the virus infected cells showed a significantly different Venus/cyan fluorescent protein (CFP) ratio compared to the mock-infected cells. The ATeam technology is therefore useful to determine the early signs of ATP-based CPE as early as 3 hr without morphology-based CPE by light microscopy, and enables high throughput determination of the presence of microorganisms in neglected samples stored in laboratories.

Keywords: ATeam probe, BHK-ATeam cells, Cytopathic effect, Försterresonance energy transfer, Venus/cyan fluorescent protein ratio



Expression and localization of ephrin-B1 and EphB4 in adrenal gland of adult mouse

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Eph receptors and ephrin ligands are membrane-bound cell-cell communication molecules. Their expression and function in the adrenal gland are virtually unknown. We previously found that ephrin-B1 and EphB4 are co-expressed in sex-steroid producing cells of adult mouse testis and cycling mouse ovary. Based on previous findings, we hypothesized that "ephrin-B1 and EphB4 are co-expressed not only in sex-steroid producing cells of gonads but also in corticosteroid-producing cells in adrenal gland of adult mouse". Therefore, we have examined co-expression and localization of ephrin-B1 and EphB4 in mouse adrenal gland, especially focused on their co-expression in corticosteroid-producing cells in the adrenal gland. By RT-PCR, ephrin-B1 and EphB4 mRNA were detected in male and female mouse adrenal gland. By immunofluorescence microscopy, we found that ephrin-B1 and EphB4 immunoreactivity were co-expressed with variable intensity in corticosteroid-producing cells in zonaglomerulosa (zG) and zonafasciculata (zF) of male and female mouse. Interestingly, we also found that ephrin-B1 and EphB4 immunoreactivity was co-expressed in progesterone catabolizing transient x-zone (xZ) in adrenal cortex of adult female mouse. Moreover, we found that ephrin-B1 immunoreactivity was strong in zG and bottom region of zF, and weak/faint in the middle region of zF of the cortex in the male while strong in the zG, weak/faint in the middle and bottom region of zF as well as in xZ in the female. By contrast, EphB4 immunoreactivity was weak in the zG, and weak/faint in zF of both the male and female. In addition to EphB4 immunoreactivity was weak in xZ of the virgin female. These results at least suggested that ephrin-B1 and EphB4 co-expression are common not only in sex-steroid producing cells of gonads but also in corticosteroid-producing cells of adrenal gland of adult mouse. Therefore, ephrin-B1 and EphB4 are likely good maker molecules for corticosteroid-producing cells in the adrenal gland of adult mouse.

Keywords: Ephrin-B1, EphB4, Corticosteroid-producing cell, Adrenal gland.



Technical Session 5 : Clinical Anatomy

Anaesthetics and Surgical Evaluation of Splenectomy in Calves

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The spleen is the largest and secondary lymphoid organ with vital importance in defense, especially to filter, retain, and deal with the blood borne pathogens in domestic mammals. Splenectomy is a powerful therapeutic procedure in a wide variety of medical disorders in humans and small animals, but in calves, splenectomy has been mostly of an experimental nature rather than surgical affections. Either therapeutic or research purposes, successful splenectomy is very important. Therefore, objective of the study was to analyze the anathetics and surgical efficacy of splenectomy in calves. The study was performed in 3 calves at Shahedul Alam Quadary Teaching Veterinary Hospital (SAQTVH), Chattogram Veterinary and Animal Sciences University (CVASU) and Bangladesh Livestock Research Institute (BLRI), Savar, Dhaka. Under Xylazine and Ketamine-based general anesthesia, local field block, and/or paravertebral anesthesia with lidocaine hydrochloride, splenectomy was carried out parallel and posterior to the last rib. Post-operatively, antibiotics, pain killers, antihistaminics, and topical ointments were given and all calves went to uneventful recovery with specific aftercare at 14th postoperative day. Case no. 1 was euthanized at 15th post-operative day and case no. 2 and 3 were still survived (195days) without suffering any complications. The present study suggests that the splenectomy can be successfully performed by just caudal and parallel to the last rib approach under xylazine and ketamine combination with local infiltration and distal paravertebral anaesthesia. Adequate postoperative care is also an integral part for successful recovery of the patients.

Keywords: Splenectomy, anesthesia, calves.



The development of bone paste from Bay of Bengal sea shell- based calcium carbonate for bone fracture healing in vivo study using goat model.

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The Bay Of Bengal Sea Shells have collected from Patenga shell market ensuring hygienic and safety environment. The shells have been scrubbed, cleaned and washed. The cleaned shells dried in oven for few hours. The shells have been made small pieces using mechanical hammer. The small pieces of shells have been grinded as powders using blender. The powders sieved using the seiver and collected. The powders have been mixed with chitosan solution for the development of bone paste. The bone paste has been implanted in the bone hole of 6 mm diameter in the upper extremity of tibia of aged two goats. The bone hole of one goat has kept without the bone paste as control. The implantation period was 5 weeks. After five weeks, the bone holes have been observed grossly and radiographically. The bone paste implanted bone hole has healed within 5 weeks whereas the bone hole without the paste remained as hole. It can be concluded that the bone paste from the Bay of Bengal Sea shells-based calcium carbonate will be used as bone fracture healing.

Key words: Bay of Bengal sea shells, calcium carbonate, bone paste, bone fracture, goat.



Segmental Mandibulectomy of Acanthomatous Ameloblastoma in a dog

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A 30.9 kg, 09 years old, spayed female, yellow Labrador retriever cross dog was admitted to the Foster Hospital for Small Animals, North Grafton, Massachusetts, USA with the clinical history of salivation, inappetence, halitosis and asymmetric lower jaw for several days. Oral cavity inspection revealed a 2.5 cm semi – firm to hard and multinodular mass at the base of left mandibular lower 4th premolar tooth. The mass was biopsied. The histopathology revealed sheets of no keratinizing adontogenic epithelium with peripheral palisading epithelium and abundant central acanthocytes with prominent intercellular bridges. It was a locally invasive benign tumor arising from the ameloblasts, which were cells involved in tooth formation. CT-Scan image showed that the tumor did not metastasize. It was diagnosed as acanthomatousameloblastoma. As the tumor invaded the local bone, it was removed by performing left segmental mandibulectomy under gaseous anaesthesia with left mandibular nerve block. Following surgery, the dog was given fentanyl, an opoid analgesic at 3µg/kg/hour intravenously. Lactated Ringers Solution was given intravenously at the maintenance rate with an E- collar. At the initiation of the surgery, cefalozin was given intravenously and that was continued every 08 hours after surgery. The dog was discharged with oral carprofen, an NSAID, and a fentanyl patch to prevent pain.

Key words: Acanthomatousameloblastoma, segmental mandibulectomy



Evaluation of long bone fracture healing in goats with application of bone paste (Cockle shells based calcium carbonate)

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Long bone fracture is one of the most common orthopedic conditions encountered in goats. Nowadays, various fracture healing materials have been developed in recent years, with bone paste being among one of them. Calcium carbonate from seashell has good osteoconductivity which facilitates the bone growth on its surface and can be used as a bone-filling material. The research work was conducted at ShahedulAlamQuadary Teaching Veterinary Hospital (SAQTVH), Chattogram Veterinary and Animal Sciences University since July, 2021 to July, 2022 to analyze the bone healing characteristics by applying bone paste in goat femur fractures. The study was performed on ten goats which were same age, sex, breed and approximate same body weight, free from infectious and neurological disease. All ten goats were divided into two groups (Bone paste and control group). Diaphyseal femur fracture was created by applying standard surgical protocol in bone paste group and produced a 8mm gap which was fill-up by bone paste. All fracture cases were stabilized by intramedullary pinning. Research parameters were radiographic, ultrasonographic, CBC, serum and histopathology evaluation. Radiographic, ultrasonographic, CBC, serum parameters were analyzed at different intervals. Radiographic examination revealed sufficient callus to have formed on day 60 in bone paste group, which indicates better healing characteristics compare to control groups. Ultrasound examination also shown better fracture union in bone paste group. Histopathology gross findings revealed bone seen more callus tissue formation around the fracture site and higher strength compared to control groups. Microscopic examination confirmed the formation of osteoblasts from the periosteum, endochondral ossification, and the formation of osteocytes leading to the control group, where there was a higher amount of fibrous tissue and less bone tissue. There were no significant changes in TEC,WBC, HB in both groups but in serum biochemical analyze revealed significant increase in calcium, protein and zinc level in treated animals. The present study concluded that the cockle shells based calcium Carbonate plays important role for long bone fracture healing in goats.

Key words: cockle shells, calcium carbonate, bone paste, bone healing, goat.



Technical Session 6 : Basic Veterinary Anatomy

Alcohol-based fixative could be a safer option to reduce the hazardous effects of formalin

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Formalin is a widely used fixative but there is potential public health risks. Continuous exposure to formalin may result various health related issues leading to cancer and death. Besides, alcoholic fixation is advantageous over formalin fixation because of faster fixation, optimal preservation and safer workplace environment. A new alcohol-based fixative, EMA (ethanol, methanol and acetic acid = 3:1:1) could be a safer option in this regard. EMA was found to be a better preserver tissue morphology and nucleic acids than formalin. To compare the health hazards of formalin and EMA, a total thirty adult male mice were randomly distributed into three groups- exposure groups (formalin and EMA) and control group. The mice were subjected to natural inhalation exposure of the fixatives followed by behavioral depression test (forced swimming test), histopathology and serum biochemical tests. Our results showed that the hazardous effects of formalin were remarkably higher than that of EMA. Formalin exposed mice showed severe depression (P < 0.001) in the forced swimming test compared to the EMA and control groups. Histopathologically, diffuse lymphocytic infiltrations around the lung alveoli and bronchioles and severe accumulation of reactive cells in the cerebral cortex were detected in the formalin exposed group, whereas little or no inflammation with fibrinous exudates was reported in the bronchioles and cerebral tissues of the EMA and control groups. The serum biochemical analysis of the inflammatory mediators (Interleukin-6 and C-reactive protein) revealed that both significantly (P < 0.001) increased in the formalin exposed group compared to the EMA and control groups. These results confer that EMA could be a safer alternative to reduce the health hazards of formalin in the workplace environment.

Keywords: Tissue morphology, Nucleic acids, Depression test, Histopathology, Inflammation



Activity of Technical Workshop for Animal Gross Anatomy in the Japanese Association of Veterinary Anatomists

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Technical Workshop for Animal Gross Anatomy was established in 2013 as one of the committees affiliated with the Japanese Association of Veterinary Anatomists (JAVA). This workshop mainly educates members of JAVA and contributes to society through the development of more effective dissection protocols and their education methods. The workshop is held once a year at a veterinary-related institution in Japan, with approximately 15-20 participants (e.g., BC or PhD students, young and experienced researchers/educators). The workshop collects knowledge on systemic and clinical anatomy of bovines, equines, porcines, canines, and chickens, which are the basic animals used for veterinary education in Japan. Further, in 2019, we published "Guide for the Gross Anatomy" of Animals" in Japanese, based on the knowledge obtained from each workshop, and this guide has been used as a textbook for workshops. Furthermore, JAVA started a certification program for animal gross anatomy techniques and its instruction in 2020. The certification can be obtained by attending a specified number of workshops and obtaining a specified number of credits. According to the number of credits, JAVA-Qualified Technician or JAVA-Qualified Technical Instructor is awarded. This system is important for the refinement of our gross animal anatomy techniques, development of JAVA, and training of the next generation of researchers and educators. Currently, we aim to make "Guide for the Gross Anatomy of Animals" available in English for non-Japanese speakers. Therefore, we would also like to contribute to the development of veterinary medicine and other related fields in Asian countries through more effective education methods by using this English version.

Key words: Gross anatomy, workshop, guide, Asia, JAVA



The status of Veterinary Anatomy Museuminthe Philippines with Special Reference to the Jose A. Solis Museum of Veterinary Anatomy

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Museum areputupfor the purpose of collection, preser vation, protection, display and interpretation of objectsoriter-n sart is ticcuituralorscientificfor thee ducation and entertainment of the public. The Jose A.Solis Museum of Veterinary Anatomy (JASMVA) occupiesa 200sq.m.space inside the Department of Basic Veterinary Sciences (DBVSc) (Formerly the Department of Veterinary Anatomy). It was formerly called the Anatomy Collection Center that housed the anatomy specimens from the College of Veterinary Medicine transferred from University of the Philippines Diliman to University of the Philippines LosBañosin 1984. The Anatomy Collection Center was renovated in 2009 and renamed Jose A. Solis Museum of Veterinary Anatomy after Dr. Jose A. Solis a renowned Filipino Professor of Veterinary Anatomy. In 2019, with the help of alumni, the museum underwent face lift in order to attract more visitors to the facility. It has now become one of the must see places for visitor of the University of the Philippines Los Baños. Presently, the Jose A. Solis Museum of Veterinary Anatomy has 11 glass cabinets housing rare spec imens such as fetal anomalies and mal formations. This is the firs to fits kindin the Philippines. There are also mounte dskeletons of wildand domestic animals inclu ding that of the Philippines Eagle (Pi the cophagajefferyi) morecommonlyknow nas the Monkey Eating Eagle. Numerous skulls of wildlifeand domestic animals are also on display. Among the skull son display was that of the PhilippineTamaraw (Bubalusmindorensis). The Philippine Eagleandthe Philippines Tamaraw are considered critically endangered wild life species. Many skins of various animals are also among the top attractions in the Museum. Just like other Museums, the Jose A. Solis Museum of Veterinary Anatomy is faced with problems, for most of which is space. The Museum needs a bigger space to accommodate large number of specimens coming from supporters of the Museum, Lastly, there is a need for an additional space to be use that Audio Visual Room (AVR) where visitors after viewing the specimens can watch interesting and advicational Videos on Veterinary Medicine.

Key words: veterinary anatomy museum, Jose A. Solis Museum,



Initiatives in Veterinary Anatomy Museums for an Efficient Museum Education During and After Lockdown: Adaptation to a New World Order

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While the World Health Organization announced a global pandemic and recommended a total lockdown for countries, nobody could predict that this would continue more than a year. Public services and cultural sectors including the museums are among the most affected by the current coronavirus regulations. UNESCO stated that nearly 90% of the museums around the world had to close their doors, while almost 13% are under serious threat of never opening. Museum education is one of the most special ways of teaching by stimulation of various perceptions including not only visual, auditory and tactile senses, but also cognitive skills. This unique education should certainly be applied for the visitors but now has to be maintained by the help of various distance learning techniques. Not only for the veterinary students, but also for the public visitors, especially for the children, the improved digital technology and up-to-date learning tools and materials can easily be integrated to the anatomy museums. The entire museum inventory can be transferred to digital world and demonstrated with the help of technological tools or devices and this will eventually improve the learning capacity. Therefore, it is vital for all anatomy museums to constitute a digital version to improve the existing museum with up-to-date educational methods and technology in terms of making anatomy education much more efficient. The prescient museums, concerned about being in 13% and acquainted with digital technologies, immediately prepared their strategy plan for the pandemic period. And we believe that Ankara Veterinary Anatomy Museum was one of them. In this presentation; the strategies and the advancement for the digital transformation of our museum including 3D Museum and 360 degree angle tours will be conveyed in detail. Besides, the cost and the efficiency of digital transformation for an advanced museum education supported by current technologies will also be discussed. And finally, success and motivation levels of the trainees and students and their professional and personal achievement levels will be evaluated.

Key words: Anatomy, education, digital technology museum, COVID



Digital stereology: new horizon in veterinary anatomy research

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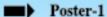
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Much of the research in veterinary anatomy is based on the morphometry of cells, structures and organs in different species. However, microscopic morphometry studies are facing two main challenges of reducing the size and dimension of the structures. Design-based stereological techniques allow to efficiently acquire accurate and precise quantitative estimates of three-dimensional morphometric features of whole organs from measurements made on two-dimensional sections, by making use of statistical sampling and stochastic geometry principles. Stereology is a reliable method to reveal certain features of development, repair, natural aging, and normal anatomy of the different organs. In stereology, coefficient of error is predictable, and in fact this is one of the main advantages of this method over model or assumption-based methods that depend on the size, shape and number of particles and their data are far from reality. This review presents simple and practical methods for performing global stereology, including volume, length, surface and number \calculations, as well as local stereology, including the mean cell and nuclear volume estimation. With the development of digital stereology, the use of stereology in morphometry becomes easier and it is hoped that it will be used as a common method in veterinary anatomy studies.

Keywords: Digital stereology, Veterinary anatomy, Morphometry

Abstracts of Poster presentation





Modulation of growth performance, gut health, serum biochemistry, and meat quality traits in broilers by clove (Syzygiumaromaticum) and tulsi (Ocimum sanctum) supplementation

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In an epoch of the growing risk of antibiotic resistance, there is a dire need to establish an effective novel feeding practice for broiler nutrition as an alternative to antibiotics. Hence, the aim of the current study was to evaluate the impact of clove powder and tulsi extract on the growth performance, gut morphologic and morphometric indices, and cecal microbial status of broiler, as an alternative to antibiotic growth promoters (AGPs). Sixty day-old chicks of Cobb-500 strain were randomly divided into four groups, each having 15 replicates. Chicks of the control group (TO) were fed commercial broiler feed with no additional supplementation. The treatment groups were offered commercial broiler feed and received clove powder and tulsi extract with drinking water at the rate of 0.5% + 2%, 1% + 3%, and 1.5% + 4% in the T1, T2, and T3 groups, respectively. Results showed a nonlinear relationship with the dosage of clove and tulsi. All the growth parameters substantially (P < 0.05) improved in T2 while T1 and T3 showed no significant improvement compared to T0. Giblet and offal weights showed no noticeable differences except intestine and heart where intestine weight markedly (P < 0.05) decreased in T3 and heart weight significantly (P < 0.05) increased in T1 and T2. Clove and tulsi supplementation substantially improved the villus height and villus surface area of the small intestine in T2 while the large intestine remained mostly unaffected by the treatment. Cecal microbial status significantly improved in all the treatment groups having increased (P < 0.05) Lactobacillus spp. count and decreased (P < 0.05) E. coli count compared to T0. Levels of cholesterol, triglyceride, low-density lipoprotein, and glucose were significantly (P < 0.05) reduced in the treated groups. Contrariwise, high-density lipoprotein, total-protein, albumin, globulin, and albumin-globulin ratio significantly (P < 0.05) increased. Carcass weight was increased substantially in the T2 group. Meat color was also improved in the treated groups though the breast meat showed slightly increased yellowness in T1 and T2. The pHu and water holding capacity of meat were found significantly (P < 0.05) higher in T3. An increase in the cross-sectional area of myofibers was also observed that was significant (P < 0.05) only in the T2 group. Based on the aforementioned findings, it can be concluded that the combination of clove and tulsi can improve growth performance, gut health and meat quality of broilers which is largely dose-dependent and might be supplied as a potential alternative to AGPs.

Key words: Broiler; clove; tulsi; growth performance; gut health; serum biochemistry.



Copper supplementation ameliorates fatty liver disease of laying quail birds

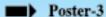
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Copper (Cu) is a crucial trace mineral, necessary for all living organisms to function properly. Both shortage and excess of Cu causes physiological abnormalities. Serum Cu protects against non-alcoholic fatty liver disease (NAFLD) in human. Importantly, fatty liver disease in laying hen and quail birds is a significant obstacle. Therefore, this study was designed to evaluate the potential beneficial and harmful effects of Cu on high energy diet induced fatty liver disease (HEDIFL) in laying Japanese quail (Coturnix japonica). Four groups (n = 15) of total 60 quails of 24 weeks age were fed high energy diet. Control group had no Cu supplementation in the form of copper sulfate while T1, T2 and T3 were treated with 500, 1000, 1500 mg of copper sulfate per kg feed. Average body weight was taken and birds were sacrificed to collect blood and liver sample. Alanine aminotransferase (ALT) and aspartate aminotransferase (AST) were evaluated and histopathological evaluations of liver samples were performed. Average body weight of T1 and T2 was around 230 g while control and T3 had 210 g and 190 g, respectively. The liver weight was highest in control (about 9.00 g) but others decreased with the increase of dose of treatment. Both ALT and AST were found to be high in control where T1, T2, T3 were lower compare to control. Routine histological staining of liver showed excessive fat globules in control group but normal in T1. Quails in T2 and T3 showed recurrence of fatty liver where later one was more significant. Administration of Cu in low dose prevents fatty liver disease in laying quail but higher dose worsen the condition.

Key words: Laying quail, fatty liver disease, Cu, high energy diet.





Effect of conventional and non-smoke mosquito coils in a closed environment

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Although the same pyrethroid insecticide is impregnated in both smoke and non-smoke coils, the non-smoke one emits fewer PICs (products of incomplete combustion) due to its different base materials. However, in an insufficiently ventilated room simulating human's closed bedrooms, the impact of smoke and non-smoke mosquito coils on the respiratory and male reproductive systems has not received much attention. Thus, in this experiment, eighteen male rats (age: 10-12 weeks) were split into three groups of six, where the control group was exposed to normal environmental air while the non-smoke and smoke coil groups were inhaled D-transallethrin and meperfluthrin based coil smoke for 8 hours per night, respectively. After 4 weeks of exposure, sperm parameters, as well as testicular and pulmonary histological abnormalities, were accessed. The findings indicated that both mosquito coils considerably deteriorated sperm quality along with testicular and pulmonary architecture, with little distinction between them. Furthermore, the degenerated seminiferous tubules and distorted respiratory bronchioles lead us to conclude that non-smoke coils are as deleterious as conventional smoke emitting one in a confined enclosure.

Key words: Conventional smoke coils, non-smoke mosquito coils, respiratory system, male reproductive system, closed environment.



Role of antioxidants against imidacloprid (IMI)-induced hepatotoxicity

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Pesticide residues in food and food products are an important public health problem. The imidacloprid (IMI) is the most well-known and commonly used broad-spectrum, systemic, neonicotinoids insecticide being used extensively for crops, vegetables, fruits and flea control programs. The present study was designed to develop mitigation option against IMI-induced hepatotoxicity by supplementing antioxidants (Vit E-Se, Vit C) in IMI-exposed adult male rabbits. Twenty five adult male rabbits were divided equally into 5 groups namely: Group-1 (control), Group-2 (IMI-exposed), Group-3 (IMI + Vit E-Se), Group-4 (IMI + Vit C), and Group-5 (IMI + Vit E-Se + Vit C). Rabbits of Group-1 received normal green grass and Group-2 received IMI (Imidacloprid, Bildor® 0.5 ml (100 mg)/L water) contaminated green grass every alternative day once daily up to 15 days. Group-3, 4, 5 received IMI-contaminated green grass, simultaneously Vit E-Se (Vit E @ 75 mg/L drinking water and Se @ 0.25 mg/L drinking water) and Vit C (100 mg/L drinking water) were given in aqueous form in respective groups on every alternative days once daily up to 15 days. Blood serum analysis showed that the hepatic enzymes AST and ALT level were significantly higher in IMI-exposed rabbits compared to the control and antioxidants treated groups. Histopathology of liver revealed coagulation necrosis with granulomatous inflammation and congestion in portal areas with dilated and congested central veins. Interestingly, no histopathological changes were seen in liver of antioxidants supplemented rabbits indicating that antioxidant property of Vit E-Se, Vit C have protective role against IMI-induced hepatotoxicity in rabbits. Immunohistochemistry of liver section showed that Iba 1-positive macrophage was significantly changed in IMI-exposed rabbits compared to the control and antioxidants treated groups. The results suggest that residue of field use IMI is responsible for hepatotoxicity which can be mitigated using different antioxidants.

Key words: Imidacloprid, antioxidant, liver, hepatotoxicity, rabbit.

Plastination of internal organs of goat by a creative method for teaching and research

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Plastination is a well-known preservation technique to generate non-toxic anatomical specimens, which can be used for overlong educational purposes. Due to its advantages in anatomy teaching and research, this procedure is becoming more and more common. In this technique water and fat are replaced from specimen by forced impregnation, then produces hard, arid, unscented and natural looking specimens by substituting the water and fat with an intermediate solvent. Currently, a variety of plastination techniques are employed but that are need specialized laboratory facilities and expensive chemicals. So, In the present study paraffin wax were used as intermediate solvent to simplify the plastination technique. For the preparation of the specimens, various recently gathered internal organs (heart, liver, spleen, trachea, lung, testis, brain etc.) of goat were used. These organs were removed and dissected to reveal various gross anatomical aspects. The samples were prepared by being fixed in 10% formalin, frozen until solid, dehydrated and dried in a freeze drier, soaked with melted paraffin, cured and then kept at room temperature for use as a teaching tool in the future. The prepared wax-impregnated specimens were sterile, dry, adorless, robust, non-toxic, and handled with just bare hand. They also didn't need any particular storage precautions. This technique will improve the appearance, clarity of surface anatomy, and description of other sections. It will also improve undergraduate and postgraduate teaching demonstrations and the collection of the anatomical museum. The current study demonstrated that plastinated cadaver models can be used by anatomists more easily than formalin-fixed or embalmed cadavers.

Key words: Preservation, Plastination, Paraffin, Goat, Internal organs



Relationship between spaying and mammary gland tumor in dogs

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Mammary gland tumors (MGTs) in dog is one of the most common type of neoplasm and a major cause of death of female dogs worldwide. Spaying of female dog is considered as a key preventive measure to decrease the risk of occurrence of mammary tumors in dogs. However the prevalence of mammary gland tumors and the association between neutering and reduction of the risk is not clearly known in Bangladesh. Therefore, the study was designed to investigate the relationship between spaying and mammary gland tumor considering the different age and breeds in dog. In this study, 10 adult female dogs were clinically diagnosed with MGTs, presented to the ShahedulAlamQuadary Teaching Veterinary Hospital (SAQTVH), Chattogram Veterinary and Animal Science University (CVASU) from June 2021 June 2022. The result showed that, all cases (n=10/10) admitted in hospital diagnosed as MGTs which were intact female. According to the Fine Needle Aspiration Cytology (FNAC), 70% (n=7/10) cases were diagnosed as malignant (adenocarcinoma) and 30% (n=3/10) were benign (adenoma) form. On radiographic examination and FNAC, 30% (n=3/10) cases metastasis were seen in lungs and lymph node respectively, 60% (n=6/10) cases were at the age range of 6-8 years and 40% (n=4/10) were of 9-11 years. Breed variation reveals that 30% (n=3/10) cases were of local breed, 30% (n=3/10) were German Shepherd, 20% (n=2/10) were Dachshund and 20% (n=2/10) were Spitz. In 60% (n=6/10) cases, mastectomy was done and remaining 40% (n=4/10) were given chemotherapy. The findings reveals that, mammary tumors were common in intact female dogs that would be an alarming massage for the dog owners.

Key words: Spaying, mammary gland tumor, dog



Clinical investigation and management of megacolon followed by lordosis in cats

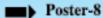
Avi Das¹, Thomby Paul¹, Debashish Sarker¹, Ankon Das¹, Ummay Khaer Fatema Chy¹ and Bibek Chandra Sutradhar²

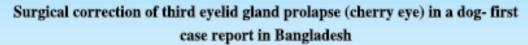
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Megacolon is a persistent, irreversible increase in colon diameter and the most advanced stage of chronic constipation, diagnosed based on a combination of history, abdominal palpation and radiography. The common causes of megacoion in cat are improper nerve functioning, pelvic canal narrowing after trauma, neoplasia, feline dysautonomia, hairballs obstruction, and naturally occurring strictures in the colon. Lordosis in cats usually develops concurrent with megacolon due to excessive curvature of a certain number of vertebrae in the back region. The study aimed to retrospectively investigate the relationship between management of megacolon and lordosis in cats. Total 216 cats were presented for radiography to ShahedulAlamQuadary Teaching Veterinary Hospital (SAQTVH), Chattogram Veterinary and Animal Sciences University (CVASU), between May 2022 and August 2022, where 12 cats met the inclusion criteria. All abdominal radiographs were reviewed, and all subsequent data were recorded, including the radiographic information relating megacolon and the presence of lordosis. Megacolon was observed in 5.6% (n=12/216) of total cats which was very common in early aged animals. Moreover, megacolon was also at risk of lordosis observed in 66.7% (n=8/12) of megacolon affected cat with narrow pelvic canal after trauma. In this study, three cases (25%) were corrected surgically by colotomy and other (75%) cases were managed medically with dietary changes. This study revealed the evidence of the untreated megacolon consequences in lordosis with posterior paralysis in cats.

Key words: Cat, megacolon, lordosis





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Dogs with Nictitans Gland Prolapse (NGP), also known as third eyelid gland prolapse or Cherry eye disease, have a serious and common eye surgical affection in dogs. Although numerous surgical procedures have been documented but the most efficient method has not been determined. The objective of the present case study describes the surgical outcome of Cherry eye in a dog. In the study a castrated male Labrador Retriever dog of 2.5 years old, weighing 26 kg with a history of swollen mass and conjunctivitis at medial canthus of the right eye for 3 months was presented to the ShahedulAlamQuadary Teaching Veterinary Hospita (SAQTVH)I, Chattogram veterinary and Animal Sciences University (CVASU), Chattagram. Clinical examination revealed swollen mass, redden conjunctiva, rapid blinking of eyelid, epiphora in right eye. According to based on relevant clinical history and examination, the present case was diagnosed as third eyelid gland prolapse (Cherry eye) and the authors were decided for surgical correction by Morgan's Pocket technique. After proper medication of surgery, dog was fully recovered within 2 weeks and there was no recurrence history upto 3 months of post-surgery. The authors suggest that the Morgan's Pocket technique can be easily applied for the Cherry eye correction in dogs.

Key words: Cherry eye, Morgan's Pocket technique, third eyelid, Labrador Retriever dog.





Endoscopic examination for confirmatory diagnosis of mucosal changes and foreign bodies of the upper digestive tract in small animals

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Flexible endoscopy is a minimally invasive technique that forms part of the investigation of gastrointestinal (GI) disease, allowing visualization and biopsy of the GI tract. Practicing of flexible gastroscopy in small animals is still new in Bangladesh. In veterinary practice, visualization of esophagus, stomach, and duodenum by gastroscopy opens a novel window in diagnostic imaging. Diagnostic indications include the evaluation of structural abnormalities, inflammatory conditions, intraluminal masses, traumatic injuries, and foreign bodies. In mega cities of Bangladesh, radiography and ultrasonography are commonly used as diagnostic imaging in veterinary practice. The lack of visualized examination of the upper GI system, various disease of the GI system remains undiagnosed. This study aimed to describe the technique of gastroscopy for confirmatory diagnosis of mucosal changes and therapeutic approaches of the foreign bodies of the upper digestive tract in small animals. This study was conducted on seven dogs and seven catswith three different anesthetic protocols. The study was designed depending on the conditions of animals. In gastroscopy, 64.29% of animals have normal gastric mucosal color and vascularization, 13.33% have gastric ulcers, 13.33% have gastritis, 26.67% of animals have foreign structures, and 23.53% have aberrant contents in the stomach. Therapeutically, 11.54% of the foreign bodies were managed by flexible endoscopy. The mean durations of endoscopic procedures were 5.98 minutes in dogs and 4.42 minutes in cats. No major complications were encountered within and after the endoscopic procedure. For better understanding, flexible endoscopy might be practiced in small animals for confirmatory diagnosis and therapeutic management of various conditions of the upper digestive tract in Bangladesh.

Key words: Endoscopy, Upper gastrointestinal tract, Dogs, Cats

Poster-10



Investigation and management of anatomical changes of the different organs from canine transmissible venereal tumor in dog

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Canine Transmissible Venereal Tumor (CTVT) is a naturally occurring transmissible cancer that is usually transmitted during coitus and results in the appearance of tumors most often associated with the external genitalia of male and female dogs. In Bangladesh, there were few study recorded on anatomical changes and their management of CTVT in dog. The present study was investigated CTVT on 28 dogs, in the last 6 months at ShahedulAlamQuadary Teaching Veterinary Hospital (SAQTVH), Chattogram. On physical examination, grossly the CTVT was cauliflower-like, pedunculated, nodular, papillary or multilobular in appearance. The Fine Needle Aspiration Cytology (FNAC) was showed the confirmatory diagnosis of CTVT. Demographic measurements of the affected animals were recorded. Most of them were local breed (93%) whether both spitz and labrador were Females were highly affected (64.3%) considering to the males (35.7%); however, both groups of animals were intact. According to the age, CTVT was found 85% in young and 15% in older animals. The distribution of tumours were 53.5% in vaging, 3.5% in vulvar lip, 25% in penis, 4% on scrotum, 7% on thigh and 3.5% on the upper conjunctiva and 3.5% on skin. Maximum tumorous growth were found as ulcerative (96%) and metastatic form (10.7%) treated either therapeutic (89%) or surgical approaches (11%). The results of the both treatment strategies were found anatomically normal and functionally effective in dog.

Key words: Canine Transmissible Venereal Tumor, Chemotherapy, Dog

Poster-11



Clinical anatomy of regional anesthetic sites in the head region of the male adult Zebu cattle (Bos indicus)

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The basic knowledge of the applied anatomy of the head region is important in clinical practices since regional anesthesia is the only choice for ruminants. Thus, using three head region samples we aimed to reveal the proper anesthesia sites of clinically important nerves of adult male Zebu cattle through a surface approach. Our study revealed that either the mean distance of 4.26 ± 0.46 cm from the lateral canthus of the eye or the mean distance of 4.66 ± 0.57 cm from the base of the horn along the temporal line was the suitable site for the cornual nerve blocking. Similarly, the supraorbital nerve emerged mean of 3.63 ± 0.32 cm dorsomedial to the mid-orbital rim and the infraorbital nerve emerged mean distance of 4.46 ± 0.15 cm rostral and dorsomedial to the facial tuber. Finally, the mental nerve blocking site was measured at a distance of a mean of 3.63 ± 0.15 cm caudoventral to the canine tooth and a mean of 3.9 ± 0.36 cm ventral to the lip commissure. These data may be helpful for the field veterinarians to desensitize the regions related to various surgical conditions such as dehoming, disbudding, sinus trephining, and wound management in lip and cheek in Zebu (indigenous) cattle.

Key words: Regional anesthesia, surface anatomy, zebu cattle

Poster-12



Ultrasonographic Visualization and Measurement of Anatomical Changes of Udder and Teats during Mastitis in Ruminants

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Ultrasonography is a non-invasive and rapid diagnostic method for visualizing morphological appearance as well as detecting pathological changes in mammary gland. The study was designed to evaluate the anatomical changes of udder and teats through ultrasonography during mastitis in ruminants. The study was conducted on 40 lactating crossbred goats of Jamnapari and 6 lactating crossbred cows of Holstein Friesian which were examined ultrasonographically using a multi-frequency (5-10 MHz) linear transducer. A direct microscopic somatic cell count was performed on milk samples collecting from each quarter and categorized into normal, subclinical and clinical mastitis. On ultrasonographical examination, the echotexture of mammary parenchyma in normal gland was hypoechoic and homogenous. However, the echotexture of mammary parenchyma affected with clinical mastitis was non-homogenous, and appeared as hyperechagenic and hypoechagenic in both the goats and cows. Hypoechaic flakes were frequently observed in gland cistern and teat cistern affected with clinical mastitis. The contents of lactiferous ducts were hypoechoic as well as the ducts were hardly visible in infected mammary parenchyma of both species. The lining of the teat wall was irregular and muscle layers separation were observed within the teat wall affected with clinical mastitis. The length and thickness of the teats were significantly different (P<0.05) in healthy glands compared in both the subclinical and clinical mastitis. The length and width of the supramammarylypmhnodes were also significantly different (P<0.05) in healthy glands compared with both the subclinical and clinical mastitis. The use of ultrasonography for evaluating the structures of udder and teats in ruminants holds promise in the future in Bangladesh.

Key words: Anatomical changes, Udder and teats, Ultrasonography, Ruminants



Necropsy of a juvenile male Ganges River dolphin (*Platanistagangetica spp. gangetica*) in Bangladesh.

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A juvenile male Ganges River Dolphin (Platanistagangetica spp. gangetica) was brought for post-mortem examination in the Chittagong Veterinary and Animal Sciences University veterinary hospital. The great concern is the population reduction of this endemic dolphin species in Bangladesh throughout the last couple of decades. Therefore, this necropsy aimed to reveal the factor for the death of the dolphin. The study revealed some scratches on the skin of several regions of the skin such as the head, neck, and lateral thorax along with congestion of the lung and liver both macro and microscopically. Furthermore, the stomach was empty and the intestine was filled with gas along with a cyst. Based on the history and the necropsy findings, we came to the conclusion that the dolphin died of suffocation due to underwater entrapment in the fishing net. These findings may be helpful for veterinarians and conservationists to make strategies to save this endangered species.

Key words: Ganges River dolphin, necropsy, congestion, scratch



Effects of silver nanoparticle on mice testis: testicular damage and spermatogenesis suppression

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The enormous use of nanoparticles including silver nanoparticles (AgNPs) as therapeutic, diagnostic, vaccine agents, and personal care products, increases human health hazards because they can easily pass through the blood-brain barrier, and blood testes barrier. The acute, sub-acute and chronic effects of AgNPs on testicular tissues were investigated in six-week-old mice. Daily exposure to AgNPs for 7 days and 15 days resulted in decreased tubular size, degeneration of spermatogenic cells, larger tubular lumen, a thinner layer of seminiferous tubules, and finally significantly reduced the number of testicular spermatids/sperm heads. Moreover, epididymal sperm concentration and motility were significantly decreased as well as increased abnormal sperm in the treated groups compared to the control. An acute (single dose) exposure of AgNPs caused progressive detachment and sloughing of spermatogenic cells into the lumen of the seminiferous tubules at 6 hour (h), and this effect was found to increase at 12 and 24 h after treatment. Desguarnation of spermatogenic cells from seminiferous tubules basement membrane was often found at 24 h in acute group compared to controls. In the TUNEL analysis, a significantly increased number of spermatogenic cell apoptosis was found in the acute treatment group compared to the control. Maximal apoptosis was found at 12 h of treatment. Taken together, this finding let us to conclude that AgNPs treatment to mice disrupts seminiferous tubules, including progressive detachment and sloughing of spermatogenic cells into the lumen of seminiferous tubules and the sloughed cells undergo apoptosis due to loss of support from Sertoli cells.

Key words: Silver nanoparticle, seminiferous tubule degeneration, spermatogenic cell apoptosis, sperm.





Testicular morphometrics at the onset of puberty of indigenous sheep

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Testicular morphometric measurements are useful indicators in selection of ram used for breeding purpose. Biometrics and histomorphometrics of testis of indigenous sheep, varying in age from day 0 to 7 months, were measured at birth or day 0, 1-week, 2-week, 1-, 2.5-, 5-, and 7-months of postnatal age. The biometrics (testicular length, breadth and weight) and histomorphometrics (thickness of tunica albuginea, and diameter of seminiferous tubules) of indigenous sheep testis varied significantly (p<0.05) among age groups from 2.5 months of postnatal age and onward, suggests that around after 2.5 months of age, lambs were in a stage of rapid sexual development as determined by a significant increase in testicular morphometrics. Centrally placed gonocytes migrated centrifugally towards the basement membrane with the progression of age, and converted to spermatogonia and placed among the Sertoli cells at the periphery of the sex cords by the 2.5 months of age. Lumenization of seminiferous tubules, and stratification of seminiferous epithelium, i.e., initiation of spermatogenesis in indigenous sheep were occurred at 5th month of age. All types of cell of spermatogenic lineage were found by 7 months of age. Onset of puberty, i.e., establishment of spermatogenesis, was observed to be established at 7 months of postnatal age in the indigenous sheep as evidenced by presence of spermatozoa adhering to the ad luminal border of the Sertoli cells as well as in the lumen of seminiferous tubules. The testicular morphometrics at the onset of puberty of indigenous sheep were: testicular length7.17 ± 0.21 cm, breadth 4.59 ± 0.17 cm, weight 50.23 ± 0.79 gm, thickness of tunica albuginea 312.38 ± 13.58µm, and diameter of seminiferous tubules 176.22 \pm 8.21 μ m. Overall, this study was the first in determination of the testicular morphometrics at the onset of puberty of indigenous sheep of Bangladesh.

Keywords: Morphometrics, lumenization, spermatogenesis, puberty, postnatal ontogenesis, indigenous sheep



Immunohistoc hemical phenotypes of STB/HAP1 in the enteroen docrine cells and enteric neurons.

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Huntingtin-associated protein 1 (HAP1) is a neural huntingtin interactor and being considered as a core molecule of stigmoid body (STB). STB/HAP1 is predominantly expressed in the brain and spinal cord. In addition, STB/HAP1 is also expressed in the peripheral organs including the endocrine system. The enteric nervous system (ENS) can act as a potential portal for pathogenesis of neurodegenerative disorders. However, ENS is also a neurodegenerative target in these disorders. To date, the expression of STB/HAP1 and its neurochemical characterization have never been examined in the enteroendocrine cells and enteric neurons. In the present study, the expression of HAP1 in pyloric stomach, its relationships with different chemical markers for enteroendocrine cells (EECs), and the markers of motor neurons, sensory neurons, and interneurons in the myenteric plexus of ENS were clarified using light, fluorescence, and electron microscopy. HAP1-immunoreactive (ir) cells were abundantly expressed in the glandular mucosa but were very few in the surface epithelium. Double-labelled immunofluorescence staining for HAP1 and markers for EECs showed that almost all the G-cells expressed HAP1. In contrast, HAP1 was completely lacking in D-cells, EC-cells or ECL-cells. In myenteric plexus, a large number of calretinin, calbindin, NOS, VIP, ChAT, SP, somatostatin, and TH-ir neurons showed HAP1-immunoreactivity. In contrast, most of the CGRP-ir neurons were devoid of HAP1-immunoreactivity, suggesting that HAP1 is highly expressed in excitatory motor neurons, inhibitory motor neurons, and interneurons but almost absent in sensory neurons in myenteric plexus. Our current study is the first to clarify that HAP1 is selectively expressed in G-cells in pyloric stomach, which probably reflects HAP1's involvement in regulation of the secretion of gastrin. Our current results also suggest that due to lack of putative STB/HAP1 protectivity, the sensory neurons might be more vulnerable to neurodegeneration than STB/HAP1-expressing motoneurons/interneurons in the myenteric

Key words: Huntingtin-associated protein 1, Immunohistochemistry, Gastrin, Enteric nervous system, Stigmoid body

■ Poster-17



Distribution of retinal ganglion cells and spatial resolving power of eye in the native chicken of Bangladesh

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The distribution of retinal ganglion cells (RGCs) was observed in the retinal wholemount of native chicken (Gallus gallus domestricus) of Bangladesh by using light microscopy. We considered five different anatomic regions (central, nasal, temporal, dorsal, and ventral) of Nissl stained wholemount, and the RGCs were counted, plotted, and measured accordingly. The average area of the retina was 431.75 mm2 while the total number of ganglion cells was 2124431 on average. Only the central area of the retina was the peak density (10400 cells/mm2) area, signifying the acute visual area, whilst the maximum spatial resolving power was 11 cycles/degree. The overall concentration of RGCs gradually declined towards the periphery but the size of cells generally decreased towards centrally. The size of ganglion cell was not uniform (12 to 180 µm2), specifically the central retina, just above the optic disc was packed with tiny-sized cells. The number, topographic distribution, and size of RGCs in native chicken signified their domesticated or terrestrial characters, uneven visual acuteness, and possibly only the central retina was the area for fine vision as the function of RGCs.

Key words: area centralis, native chicken, peak density, retinal ganglion cell, spatial resolving power





Dietary exposure to lead (Pb) related with biochemical and histomorphological changes in testes and kidney of rabbit

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The experiment was conducted to observe the toxic effect of different doses of dietary lead (Pb) on biochemical, gross and histopathological changes in the testes and kidneys of male rabbits. A total number of 36 rabbits (4.5 months of age) were assigned in three dietary treatments with three replicates. Control group T0 received only a basal diet and the other groups T1 and T2 received a basal diet supplemented with Pb at a dose level of 20 and 40 mg/kg bw respectively. By the end of the experiment (4 months), animals were slaughtered and blood and tissue samples were collected for biochemical and histopathological tests. Oral administration of lead caused decreased weight and congestion of the kidney attributed to the glomerular shrinkage and reactive cell infiltration microscopically. Significant decrease in weight, degeneration of germ cells, and vacuolation of the seminiferous tubules were recorded in testes. Serum testosterone level was decreased in lead-treated groups which might be due to the cellular degeneration of Leydig cells. In conclusion, lead acetate had a serious dose-dependent biochemical and histomorphological effect in the male rabbit.

Key words: Lead, biochemical parameter, serum testosterone, histomorphological

■■ Poster-19



Acute intra-striatal hemorrhage induces cortical neuronal death and neuro-functional deficit in mice

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Stroke with intracerebral hemorrhage (ICH) is harmful. Cortical neuronal damage and neurobehavioral deficits that manifest in animal models of ICH in the striatum have not been thoroughly studied elaborately. Because of this, the current investigation assessed the cortical neuronal loss and neurobehavioral dysfunction related to left hemispheric striatal ICH in mice. ICH induced in mice by striatal infusion of autologous whole blood. Mice were examined for brain tissue destruction and neuro-functional impairments at various times following ICH induction. Mice used as sham controls were used as a benchmark. We observed that the cortical neuronal architectural deviation, neurodegeneration and behavioral impairments were all impacted by striatal ICH. Additionally, all groups were most sensitive to the 30-point neurologic impairment scoring system for detecting sensitivity and locomotor abnormalities on days 1, 3, and 7 following ICH. Future preclinical investigations into the effects of ICH will benefit from these findings.

Key words: Intra-striatal hemorrhage, Neuronal death, Functional deficits, Mice





Effects of probiotic as an antibiotic substitute on gut morphology in broiler chickens

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The abuse of antibiotics may cause antibiotic-resistant microbes and antibiotic residue in animal and poultry products. Probiotics have been used for several decades due to their beneficial effects on immunity and the growth of livestock and poultry. Therefore, the effects of probiotic as an antibiotic substitute on growth performance and the gut morphology of broiler chickens were studied. A total of 72 mixed-sex day-old chicks (45.04 \pm 0.92 g) of broiler (Cobb 500) were randomly divided into two groups, with three replicates in each group, and twelve broilers per replicate. The experiment was conducted for 32 days. The dietary treatments contained an antibiotic group (T1, basal diet + 1g/L water chlortetracycline (Eska-CTC®); twice daily used in growing period (d14-28)), and a probiotic group (T2, basal diet + probiotic (1g/3L water ad libitum daily (Avigut®)). The results showed T1 broilers had improved feed conversion ratio (FCR, 1.47 \pm 0.057) and average body weight gain (1.95 \pm 0.052 kg) than T2 broilers, 1.56 \pm 0.049 and 1.82 \pm 0.067 kg, respectively, at day 32. The measured gut growth of T2 broilers in terms of length of small intestine, large intestine (colorectum) and cecum was close to T1 broilers, though T1 broilers had increased (p < 0.05) large intestinal length. Histologically, T2 broilers villus height (duodenum) was close to that of T1 broilers, but T1 broilers had comparatively increased (p < 0.05) villus height of cecum, and crypt depth in duodenum and cecum. In conclusion, dietary supplementation of probiotic could improve the growth performance as well as gut morphology of broiler chickens. The results indicated that probiotics could be used as antibiotics substitutes in the diet of broiler chickens to produce health hazards free safe meat for human consumption.

Key words: Probiotic, antibiotic substitute, broiler, growth performance, gut morphology



Relationship corpura lutea weight and luteal tissue progesterone concentration of rats during estrus cycle and pregnancy

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The main function of the corpuralutea (CL) is production of progesterone. CL plays crucial role for regulation of estrus cycle and for accomplishment a pregnancy. The aim of this study is tocompare relationship between tissue progesterone concentration and CL weight in rat. The CLs were categorized depend on 2 generation of estrus cycle (estrus, metestrus, proestrus and diestrus) current ovulation as first generation (G1), and old CL or second generation (G2). During pregnancy, CLs were examined at 1.0, 7.5, 9.0, 12.0, 13.5, 18.0 and 21.0 days post coitus (dpc). The weight of CLs were significant difference between the weights of both generation (p < 0.01). The CL weight during pregnancy on 1 dpcwas statistically significant with the other dpc (p <0.01). The weight CL have positively correlated with luteal tissue progesterone concentration during estrus cycle (r = 0.4860). There was correlation in the opposing direction between the weights and tissue progesterone during pregnancy (r = -0.3649). Collectively, these reports suggest that rat CL could use their weight to classify generation of CL during estrus cycle and present a useful model for studying mechanisms of CLs.

Key words: corpuralutea, progesterone, estrus, pregnancy



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