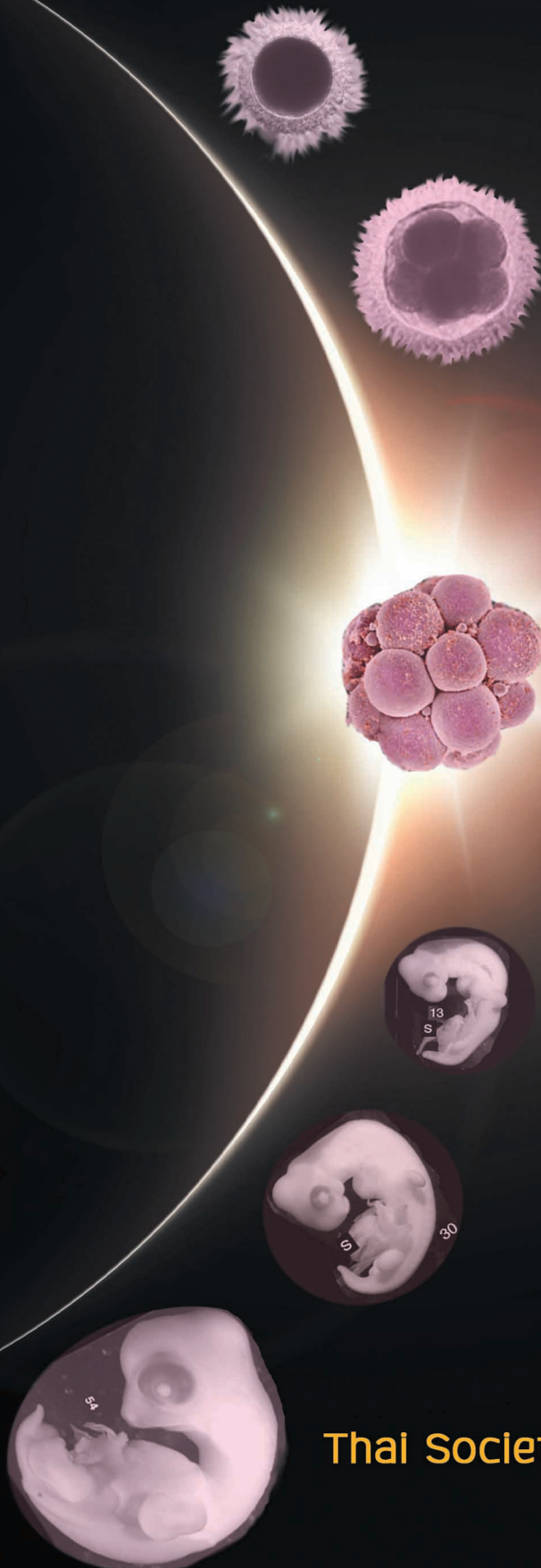




เวชสารสัตวแพทย์



The Thai Journal of Veterinary Medicine



Proceeding of
The 1st Symposium of the
Thai Society for Animal Reproduction

ISSN 0125-6491 VOL.41 SUPPLEMENT 2011

THE THAI JOURNAL OF VETERINARY MEDICINE

Office:

Faculty of Veterinary Science, Chulalongkorn University, Bangkok 10330 Thailand
Tel. 66(2)- 218 9676 Fax. 66(2)- 218 9677

Advisory Committee:

Prof. Dr. Mongkol Techakumphu
Dean

Dr. Yukol Limleamthong
President of the Veterinary Council of Thailand

Assoc. Prof. Dr. Benjamas Patamalai
Associate Dean (Research Affairs)

Assoc. Prof. Dr. Achariya Sailasuta
*President of the Thai Veterinary Medical Association
under the Royal Patronage*

Miss Pringsri Ingkaninun
Assistant Dean (Physical Resource Management Affairs)

Assoc Prof. Dr. Wimon Pothiwong
*President of Chulalongkorn University Veterinary
Alumni Association*

Editorial Board:

Annop Kunavongkrit (Thailand)
Atichat Bramasa (Thailand)
Chollada Buranakarl (Thailand)
Jiroj Sasipreeyajan (Thailand)
Marissak Kalpravidh (Thailand)
Mongkol Techakumphu (Thailand)
Narongsak Chaiyabutr (Thailand)
Peerasak Chanprateep (Thailand)
Pranee Tuntivanich (Thailand)
Roongroje Thanawongnuwech (Thailand)
Somchai Chanpongsang (Thailand)

Andrew Ponter (France)
Andrej Madej (Sweden)
Eileen L. Thacker (USA)
Elisabeth Persson (Sweden)
Han-Soo Joo (USA)
Karen L. Keller (USA)
Oliver Sparagano (UK)
Stanley H. Done (UK)
Stig Einarsson (Sweden)
Takashi Aoki (Japan)
Teresa Y. Morishita (USA)

Anudep Rungsipipat (Thailand, *Editor-in-Chief*)
Kriengyot Sajjarengpong (Thailand)
Nalinee Tuntivanich (Thailand)

Piyarat Chansiripornchai (Thailand)
Sarinee Kalandakanond-Thongsong (Thailand)
Taradol Luangtongkum (Thailand)

Journal Management:

The Chulalongkorn University Veterinary Library and Information Centre
Faculty of Veterinary Science, Bangkok, 10330 Thailand
Tel. 66(2)- 218 9554-7 Fax. 66(2)- 255 8853, 0 2252 0980
Email fvs_info@chula.ac.th, theTJVM@gmail.com
<http://www.vet.chula.ac.th/~tjvm/>

This publication will be indexed and abstracted in Science Citation Index Expanded (SciSearch®), SCOPUS, CABI and Elsevier

Printing:

Tiranasan Co. Ltd.
62 Pun Rd. Silom Bangrak, Bangkok, 10500 Thailand
Tel. 66(2)- 236 4463 Fax. 66(2)- 2366229

Board of Reviewing Editors

Animal Husbandry: Duangsmorn Suwattana, Somchai Chanpongsang

Animal Nutrition: Karen L. Keller, Pongtorn Sungpuag, Suwanna Kijparkorn, Uttra Jamikorn

Aquatic Animal Medicine: Aranya Ponpornpisit, Kanit Chukanhom

Companion Animal Medicine: Krongthong Oraveerakul, Sirilak Disatian

Pharmaceutical Sciences: Kanokrat Siripanichgon, Nijsiri Ruangrunsi, Somboon Tanasupawat, Sunan Pongsamart

Physiology & Biochemistry: Gunnaporn Suriyaphol, Kittipong Tachampa, Kris Angkanaporn, Narongsak Chaiyabutr, Prapruddee Piyaviriyakul, Sumpun Thammacharoen, Weera Supornsilpchai

Livestock Animal Medicine: Kittisak Ajariyakhajorn, Kumpon Kaeoket, Nalin Upragarin, Niwat Chansiripornchai, Pornchalit Asawacheap, Supol Luengyosleuchakul, Wisanu Wanasawaeng, Witaya Suriyastaporn

Medicine: Kanokrat Siripanichgon, Lallida Pariyakanok, Pinnita Tanthuvanit, Pongsak Yuktanandana

Theriogenology: Annop Kunavongkrit, Chanchao Lorthongpanich, Chatchote Thitaram, Stig Einarsson, Padet Tummaruk, Sukanya Manee-in, Suneerat Aiumlamai, Theerawat Tarasanit

Veterinary Anatomy: Paisan Tienthai, Peerapol Sukon, Prasarn Tangkawattana

Veterinary Microbiology: Channarong Rodkhum, Nuvee Prapasarakul, Thongchai Chalermchaikit, Varaporn Vuddhakul

Veterinary Parasitology: Oliver Sparagano, Sonthaya Tiewsisrisup

Veterinary Pathology: Chaleow Salakij, Nopadon Pirarat, Roongroje Thanawongnuwech, Sirikachon Tangkawattana, Somporn Techangamsuwan, Taweesak Songserm, Thanongsak Mamom

Veterinary Pharmacology: Kanchana Imb-silp, Nipattra Debavalya

Veterinary Public Health: Benjamas Patamalai, Rungtip Chuanchuen, Suphachai Nuanualsuwan, Suthep Ruangwises

Veterinary Surgery: Marissak Kalpravidh, Wanna Suriyastaporn.

Veterinary Virology: Juthathip Kaewcharoen, Kanisak Oraveerakul, Pravina Kitikoon.

The Thai Journal of Veterinary Medicine

Vol. 41 Supplement 2011

Contents

Proceeding of the 1st Symposium of the Thai Society for Animal Reproduction

Review Article

- Ovulation Induction in Sows 19
Padet Tummaruk, Atthaporn Roongsitthichai, Fabio De Rensis
- Influence of Nutritional Management on Folliculogenesis in Ewes 25
Anongnart Somchit-Assavacheep
- Inducing Farrowing in Sows by PGF₂ alpha and Its Analogues 31
Kampon Kaeoket, Panida Chanapiwat
- Somatic Cell Nuclear Transfer in Laboratory Animals; Practical Approach to Livestock Animals 39
Yoko Kato, Yukio Tsunoda
- Steroid Receptors and Their Roles in Pig Uterus 43
Sayamon Srisuwatanasagul
- A New Approach to Repeat Breeding in Cows: Treatments Targeting the Endometrial Growth Factor-cytokine Network 51
Seiji Katagiri
- Control of Follicle Development and Ovulation in Mare: Principal and Clinical Aspects 55
Theerawat Tharasanit
- Clinical Applications of GnRH Agonist Deslorelin in Dogs and Cats 59
Suppawiwat Ponglowhapan
- Control of Oestrus and Ovulation in Dog and Cat: An Update 65
Sudson Sirivaidyapong
- GnRH Pulse Generation and Its Application to the Manipulation of Follicular Development and Ovulation 69
Hiroko Tsukamura, Kei-ichiro Maeda
- Genetic Markers on Reproductive Traits in Pigs 73
Thanathip Suwanasopee, Skorn Koonawootrittriron
- Somatic Cell Cloning for Livestock and Endangered Species 77
Rangsun Parnpai, Kanokwan Srirattana, Sumeth Imsoonthornruksa, Mariena Ketudat-Cairns
- The Application of DNA Fingerprint for Veterinary Medicine 87
Janjira Phavaphutanon
- Updated Reproductive Hormonal Profiles in Female Elephants 91
Saroch Kaewmanee, Gen Watanabe, Yuki Yamamoto, Tatsuya Yamamoto, Miori Kishimoto, Kentaro Nagaoka, Chowalit Nakthong, Marnoch Yindee, Nicharee Income, Imke Lueders, Chatchote Thitaram, Parntep Ratanakorn, Kazuyoshi Taya
- Control of Estrus and Ovulation in Cows 95
Siriwat Suadsong
- Gamete Rescues from Gonads of Wild Animal Post-mortem 99
Kaywalee Chatdarong
- Effect of Nutrition on Reproductive Performance of Postparturient Dairy Cows in the Tropics: A Review 103
Theera Rukkwaamsuk
- Abstract: Oral Presentation**
- A1 Bilateral Intratubal Artificial Insemination with Frozen-thaw Semen in rhFSH-Induced Oestrous Cats 109
Ajjima Chansaenroj, Paweena Thuwanut, Kaywalee Chatdarong, Suppawiwat Ponglowhapan
- A2 The Relationship Between Serum IGF-I and Puberty Attainment in Gilts 111
Atthaporn Roongsitthichai, Junpen Suwimonteerabutr, Seri Koonjaenak, Padet Tummaruk
- A3 Comparison of Frozen-thawed Epididymal Dog Sperm Quality after Cold Stored in Epididymis and in Extender 113
Nadthagarn Gleawketgarn, Chiti Hoonaukit, Nopmanee Taechangam, Kaywalee Chatdarong
- A4 Cat Ovarian Tissue Cryopreservation Using a Passive Cooling Device 115
Nae Tanpradit, Kaywalee Chatdarong
- A5 Extracellular Adenosine 5'-triphosphate (ATP): Effects on Cryopreserved Epididymal Cat Sperm 117
Paweena Thuwanut, Kaywalee Chatdarong

A6	Reproductive Performances of Cross Breed Dairy Cows of Small Holder Farmers in Northern of Thailand	119
	<i>Swichai Rojanasthien, Terdsak Yano</i>	
A7	Efficiency of CIDR-B Application on Follicular Response, Ovulation Time and Synchronization Rate in Thai Swamp Buffaloes	121
	<i>Thuchadaporn Chaikhun, Fabio De Rensis, Mongkol Techakumphu, Siriwat Suadsong</i>	
A8	Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) Strains Isolated from Sows and Boars in Thailand during 2005-2010	122
	<i>Pannin Surapat, Sutharus Sriariyagul, Oraphan Seemakram, Em-on Olanratmanee, Rachod Tantilertcharoen, Roongroje Thanawongnuwech, Padet Tummaruk</i>	
Abstract: Poster Presentation		
B01	Quantifying Number of Follicles within the Pig Ovary by Proliferating Cell Nuclear Antigen (PCNA) Immunostaining Method	125
	<i>Duangkamol Phoophitpong, Supradit Wangnaitam, Sayamon Srisuwatanasagul, Padet Tummaruk</i>	
B02	Semen Quality in Fishing Cats (<i>Prionailurus viverrinus</i>) with Unilateral Cryptorchidism or Presumptive Testicular Hypoplasia: A Preliminary Result	127
	<i>Anuchai Pinyopummin, Anurut Aunsusin, Kornchai Kornkaewrat, Piyawan Suthanmapinunt, Khongsak Thiangtum, Kaitkanoke Sirinarumitr</i>	
B03	Association between Backfat Depth and Serum IGF-I in Gilts	129
	<i>Atthaporn Roongsithichai, Junpen Suwimonteerabutr, Seri Koonjaenak, Padet Tummaruk</i>	
B04	Detection of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) Antigen in Ovarian Tissue of Gilts Culled due to Reproductive Disturbances	131
	<i>Em-on Olanratmanee, Supradit Wangnaitam, Roongroje Thanawongnuwech, Padet Tummaruk</i>	
B05	Cryoprotective Effect of Trehalose Supplementation on Domestic Cat Spermatozoa Quality	133
	<i>Jintana Susereedamrong, Panisara Kunkitti, Saksiri Sirisathien, Sukanya Manee-in</i>	
B06	Generation of Neuronal Progenitor Cells (NPC) and Neurons Derived from Mouse Embryonic Stem (ES) and Induced Pluripotent (iPS) cells <i>in vitro</i>	135
	<i>Nuttha Klincumhom, Sasitorn Rungarunlert, Melinda K. Pirty, Olga Ujhelly, Suchitra Maungthaisong, Kaywalee Chatdarong, Mongkol Techakumphu, Andras Dinnyés</i>	
B07	Vasectomy and Laparoscopic Ovariectomy in Thai-Saenen Goats	137
	<i>Peerasak Suttiyotin, Chowalit Nakthong, Bunlue Kornmatitsuk, Somkiat Huaijantug</i>	
B08	Comparison of Glycosaminoglycans (GAGs) in the Cervices of Bitches during Estrous Cycle	139
	<i>Pichanun Linharattanaruksa, Andrew Pitsillides, Muhammad Khalid, Sayamon Srisuwatanasagul, Kaywalee Chatdarong</i>	
B09	Distribution of the Immune Cells in the Oviduct of Gilts Culled due to Repeat Breeder and Anoestrus	141
	<i>Sakaoporn Prachantasena, Supassama Chaiyawong, Tharnath Nanthirudjanar, Paisan Tienthai, Padet Tummaruk</i>	
B10	Progesterone Receptors in the Uterine Epithelium of Gilts after IUI and DIUI	142
	<i>Sayamon Srisuwatanasagul, Padet Tummaruk, Annop Kunavongkrit, Sukanya Manee-in, Kongkiat Srisuwatanasagul, Jongkol Sangviroon</i>	
B11	<i>In vitro</i> Embryo Development after Intracytoplasmic Sperm Injection (ICSI) with Sperm Derived from Frozen-thawed Cat Testicular Tissue	144
	<i>Sirirak Buarpong, Theerawat Tharasanit, Mongkol Techakumphu</i>	
B12	Effects of Low-density Lipoprotein on the Quality of Canine Epididymal Spermatozoa Following Freezing and Thawing	146
	<i>Nawarus Prapaiwan, Supanan Punjachaipornpol, Dolnarat Yamtang, Theerawat Tharasanit, Kampon Kaeoket, Sukanya Manee-in</i>	
B 13	Validating sex ratio in boar semen using quantitative PCR	148
	<i>Chanyuth Tretipskul, Sirin Theerawatanasirikul, Padet tummaruk, Mongkol Techakumphu</i>	
B14	Duration of Parturition is Associated with the Incidence of Postparturient Disorders in Sows	150
	<i>Padet Tummaruk, Kridtasak Sang-Gasanee</i>	
B15	The Efficacy of Flunixin meglumine in Sows with Postpartum Dysgalactia Syndrome	152
	<i>Padet Tummaruk, Kridtasak Sang-Gasanee</i>	
B16	Sperm Distribution in the Reproductive Tracts of Sows after Intra-uterine Insemination with Cryopreserved Boar Semen Supplementing with Seminal Plasma	155
	<i>Panida Chanapiwat, Kampon Kaeoket, Padet Tummaruk</i>	
B17	Cryopreservation of Bull Semen by Using Egg Yolk Based Extender Compared with Soya Bean Extract Based Extender	157
	<i>Kobkaew Bumroongthai, Paweeranut Banmairuoy, Sirinun Pisamai, Jinda Singlor, Padet Tummaruk</i>	
B18	Effects of Prostaglandin F _{2α} on Serum Testosterone and Sperm Output in Holstein Friesian Bulls in Tropical Climates	159
	<i>Jedsada Titiroongruang, Prachaya Hirunpattarawong, Poompat Sophonpattana, Jinda Singlor, Padet Tummaruk</i>	

B19	Effect of Amino-Lite® 34X Supplementation in Postpartum Sows on the Occurrence of Postparturient Disorders and Backfat Loss <i>Padet Tummaruk, Praiswan Sripour</i>	161
B20	A Preliminary Study on Captive Lion (<i>Panthera lion</i>) Semen in Thailand <i>Kaitkanoke Sirinarumitr, Junjira Phavaphutanon, Nathavut Kanatiyanont, Anurut Aunsusin, Piyawan Suthanmapinunt, Kornchai Kornkaewrat, Kawin Nunkhang, Suthida Laopium, Chunsumon Limmanont, Anuchai Pinyopummin</i>	164
B21	Effect of Finasteride and Deslorelin on Clinical Benign Prostatic Hypertrophy in Dog and Disease Recurrence After Treatment Cessation <i>Chunsumon Limmanont, Janjira Phavaphutanon, Kaitkanoke Sirinarumitr</i>	166
B22	The Different of Bacterial Species in Vagina and Uterus of Healthy Dogs <i>Sroisuda Chotimanukul, Sudson Sirivaidyapong</i>	168
B23	Assessment of Male Fertility in Endangered Banteng, Gaurs and White Rhinoceros: A Case Report <i>Ampika Thongphakdee, Wanlaya Tipkantha, Jintana Susreedamrong, Rungtip Inthasri, Daraka Thongthainan, Umaporn Maikaw, Jedsada Thawnern, Wisid Arsaitummakul, Sumate Kamolnorrath, Boripat Siriaroonrat</i>	170
B24	Effect of Collection Extender (Dicol®) on Cold-stored Boar Sperm Viability and Bacterial Contamination <i>Junpen Suwimonteerabutr, Paweena Thuwanut, Jinda Singlor, Kaywalee Chatdarong, Padet Tummaruk</i>	173
B25	Delay of Puberty and Reproductive Performance in Male Dogs Following the Implantation of 4.7 and 9.4 mg GnRH-Agonist Deslorelin at Early Prepubertal Age <i>Sudson Sirivaidyapong, Nicole Sirisopit Mehl</i>	175
B26	Treatment of Vincristine Resistant Canine Transmissible Venereal Tumor by Combination of L-Asparaginase and Vincristine Sulfate <i>Pansawut Sudjaidee, Patrakrit Theewasutrakul, Sirichai Techarungchaikul, Suppawiwat Ponglowhapan, Kaywalee Chatdarong</i>	177
B27	Effect of GnRH-agonist Deslorelin Subcutaneously Implantation on Fertility in Mixed Breed Female Rabbits at The Age of 2.5 Months and 5 Months <i>Thunyaporn Phungvivatnikul, Varisara Tisyangkul, Sirawit Pagdepanichkit, Sudson Sirivaidyapong</i>	179
B28	Hermaphroditism With Bilateral Ovotestes in A Dog : A Case Report <i>Suppawiwat Ponglowhapan, Nadthagarn Glaewketgarn, Chainarong Lohachit</i>	180
B29	Successful Medical Treatment Of Pyometra In A Brood Bitch: A Case Report <i>Suppawiwat Ponglowhapan</i>	183

Assessment of Male Fertility in Endangered Banteng, Gaurs and White Rhinoceros: A Case Report

A. Thongphakdee^{1*}, W. Tipkantha¹, J. Susreedamrong¹, R. Inthasri¹, D. Thongthainan², U. Maikaw², J. Thawnern², W. Arsaitummakul¹, S. Kamolnorrath¹, B. Siriaroonrat¹

¹Bureau of Conservation, Research & Education, Zoological Park Organization under the Royal Patronage of H.M. the King ²Khao Kheow Open Zoo, Zoological Park Organization under the Royal Patronage of H.M. the King *Corresponding author: ampialaska@hotmail.com

Keywords: banteng, gaur, semen quality, sperm morphology, white rhinoceros

Introduction

Wild population of endangered megaherbivores such as gaur (*Bos gaurus*), banteng (*Bos javanicus*) and white rhinoceros (*Ceratotherium simum simum*) has been declining due to natural habitat loss and overhunting. There are good members of captive population in zoos which can be a valuable resource for research and conservation programs such as gamete banking and reproductive biology research. However, some of these endangered animals fail to propagate offsprings due to unknown causes even complete copulation was observed. Clinical examination of reproductive organs and assessment of semen quality and sperm morphology would certainly be necessary for diagnose male fertility and further sperm preservation. Moreover, recent advances in the development of assisted reproductive technologies show feasibility to overcome reproductive problems and sustain genetic diversity (2). The objective of the study was to assess semen quality and sperm morphology in captive banteng, gaurs and white rhinoceros.

Materials and Methods

Mature banteng (n=1, estimated body weight 500 kg), gaurs (n=2, estimated body weight 400-500 kg) and white rhinoceros (n=1, estimated body weight 2000 kg) in Khao Kheow Open Zoo (KKOZ) were anesthetized for physical examination and semen collection (Fig 1).

Banteng and gaurs (gaur 1 and 2) were anesthetized using two different formulas

of anesthetic drugs. A combination of thaifentanil (A3080), medetomidine HCl, and ketamine HCl was used in banteng and gaur 2. Gaur 1 was anesthetized by a combination of carfentanil, xylazine HCl and ketamine HCl. Rectal probe (7 cm in diameter) with three longitudinal electrodes was inserted and placed on the base of accessory sex glands. Three series of stimulation was conducted by using an electro-stimulator (P.T. Electronics, Boring, OR) starting at 2 V (1-2 stimulations) and gradually increased 0.5 V of each stimuli up to 10 V (18-36 stimulations per series).

A male white rhinoceros was anesthetized by using a combination of medetomidine hydrochloride, butophanol tartrate and ketamine hydrochloride. Ketamine HCl and/or Guaifenesine was given IV to maintained throughout the procedure. A modified rectal probe (11.5 cm in diameter) was used. Stimulation was performed for three series. Each series was started at 2 V (2-5 stimulations) and gradually increased to 8 V (2-5 stimulations).

Ejaculated semen was divided for sperm evaluation and cryopreservation. Sperm viability was assessed by eosin-nigrosin staining. William's staining was used for assessing head morphological abnormality. Fresh semen was fixed in formal saline for assessing tail morphological abnormality.

Results and Discussion

Semen characteristic and sperm morphology of banteng, gaurs and white rhinoceros were shown in table 1. Semen quality and sperm morphology of all animals except gaur 2 were normal. Semen

of gaur 2 was diagnosed low sperm motility and low sperm concentration. Sperm morphology of banteng and gaur was similar, but different in white rhinoceros, which had smaller head (Fig 2). Major abnormalities of sperm morphology were coiled and bent tails. All semen samples except that from gaur 2 could be cryopreserved.



Fig 1. Electroejaculation in banteng (A), gaur (B) and white rhinoceros (C). Penis characteristic of white rhinoceros (D).

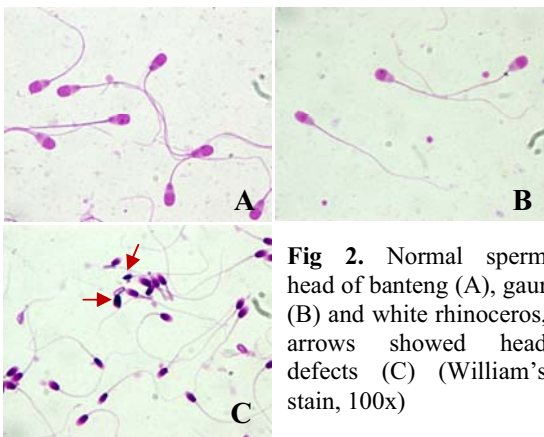


Fig 2. Normal sperm head of banteng (A), gaur (B) and white rhinoceros, arrows showed head defects (C) (William's stain, 100x)

The present study shows the first time of anesthesia and semen collection in white rhinoceros in Thailand. Ejaculated semen of banteng, gaurs and white rhinoceros was successfully collected after general anesthesia. Semen quality of all animals except gaur 2 was in range of normal data in previous reports (4, 5). This information is valuable for fertility assessment in

captive male banteng, gaurs and white rhinoceros, which can benefit breeding management. Furthermore, ejaculated semen of the animals in the study was successfully preserved successfully and kept in the wildlife semen bank. Frozen semen would be useful for aiding low genetic diversity which found bottle necked situation of banteng and gaur populations in some areas (1, 3). Suitable semen extender, freezing protocol and post-thawed success i.e. motility, viability and physiological function of the sperm will be reported in the future study.

In conclusion, anesthesia and semen collection protocols in the study could be used safely for physical examination and male fertility assessment in banteng, gaurs and white rhinoceros. Semen of these endangered species could be cryopreserved for future research and applied in reproductive technologies such as artificial insemination and *in vitro* fertilization.

Acknowledgements

We are grateful for Dr. Mitchell Bush and Dr. Scott Citino for their professional advice on anesthesia. We would like to thanks veterinarians, curators and keepers for their generous attempt on animal care. We also thank the Director General of KKOZ, Mr. Suriya Sangpong for his kind support.

References

1. Bradshaw et al., 2007. Mol Ecol. 16(14): 2998-3008.
2. Hermes et al., 2009. Theriogenology. 71(3): 393-399.
3. Nguyen et al., 2007. BMC Genet. 68: 77.
4. Reid et al., 2009. Theriogenology. 71(2): 275-291.
5. Sukwongs et al., 1998. Proc 36th Kasetart Univ Ann Conf: Abs: 147.

Table 1. Characteristics of ejaculated semen of captive banteng, gaurs and white rhinoceros

Species Parameters	Banteng	Gaur 1	Gaur 2	Rhino- ceros
Semen volume (ml)	24.6	5.7	7.1	19.3
Semen pH	7.5	7	8.5	8.5
Sperm concentration (x10 ⁶ spermatozoa/ml)	365	2,020	35	765
Sperm motility (%)	80	90	50	80
Alive sperm (%)	78.5	85.5	83	86.5
Normal head morphology (%)	99	98	95.5	94.5
Normal tail morphology (%)	73.5	84.5	65.5	78.0