

Name: Kornorn Srikulnath

Position: - Vice Head of Department of Genetics (Research section)

- Assistant Professor (Kasetsart University)
- Researcher (Reptile Cytogenetics, Nagoya University, Japan)
- Associate Editor: Thai Journal of Genetics
- Associate Editor: Natural Science and Agriculture



Office number: MG 4516

Lab number: MG4611 (Laboratory of Animal Cytogenetics & Comparative Genomics)

Education: 2012 Postdoctoral fellow (Reptile Cytogenetics), Nagoya University, Japan

2010 Ph.D. (Genetics), Kasetsart University, Thailand

2005 B.Sc. (Biology), 1st honor, Kasetsart University

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Research interest:

The aim of my study is to clarify genome and chromosome structures as well as their evolutionary processes in vertebrates by cytogenetic and molecular biology techniques. I plan to carry out the following research topics:-

1. Karyological characterization in vertebrates

To reveal the karyological characterization in vertebrates, the karyotyping, chromosome banding and FISH mapping are performed. The karyological characterization data would inform us the phylogenetic hierarchy of genome evolution in vertebrates and efficiently sustain the favorable selection in animal breeding program.

2. Karyotypic and genomic evolution in vertebrates

To elucidate the process of karyotypic evolution in vertebrates, the chromosome homologies between different species in fish, amphibians, reptiles, birds and mammals are deduced using comparative chromosome mapping.

### 3. Organization of repetitive element in vertebrate genome

Repetitive DNA sequences is a good chromosome marker for investigating the process of karyotypic evolution and sex chromosome identification, and for comparing the genomics structure of vertebrate species. This can be also a source for homologous recombination to initiate various categories of chromosomal rearrangements. Here, the characterization and comparison of organized repetitive element among different species should be conducted to find the common and specific repeats in the evolutionary line.

### 4. Mitochondrial genome analysis & DNA barcoding

To clarify the step of evolution in vertebrates, complete mitochondrial genome analysis is used. The structure and organization are compared among different species within the same class. The complete mitochondrial sequence data sets are also scrutinized through cladistic analysis to demonstrate the genetic relationships among them. Furthermore, the sequence of mitochondrial genome is capable to develop molecular barcoding for identifying species.

Courses:

- Introduction to Cytogenetics
- Cytogenetics
- Principle of Genetics
- Laboratory in Genetics
- Intensive Genetics
- Research Technique in Genetics

Publications:

1. **Srikulnath, K.**, K. Matsubara, Y. Uno, C. Nishida, M. Olsson and Y. Matsuda. 2014.

Identification of the linkage group of the Z sex chromosomes of the sand lizard

(*Lacerta agilis*, Lacertidae) and elucidation of karyotype evolution in lacertid lizards.

**Chromosoma** 123: 563-575. DOI 10.1007/s00412-014-0467-8.

2. Thapana, W., P. Sujiwattanarat, **K. Srikulnath**, H. Hirai and A. Koga. 2014. Reduction in the structural instability of cloned eukaryotic tandem-repeat DNA by low-temperature culturing of host bacteria. **Genet. Res.** 96: e13.
3. Baicharoen, S., T. Miyabe-Nishiwaki, V. Arsaithamkul, Y. Hirai, K. Duangsa-ard, B. Siriaroonrat, H. Domae, **K. Srikulnath**, A. Koga and H Hirai. 2014. Locational diversity of alpha satellite DNA and intergeneric hybridization aspects in the *Nomascus* and *Hylobates* Genera of small apes. **Plos One** 9: e109151.
4. Chailertrit, V., A. Swatdipong, S. Peyachoknagul, J. Salaenoi and **K. Srikulnath**. 2013. Isolation and characterization of ten novel microsatellite markers from Siamese fighting fish (*Betta splendens*, Osphronemidae, Anabantoidei) and their transferability to related species, *B. smaragdina* and *B. imbellis*. **Genet. Mol. Res.** 13: 7157-7162.
5. Peyachoknagul, S., C. Nettuwakul, P. Phuekvilai, S. Wannapinpong and **K. Srikulnath**. 2014. Development of microsatellite markers of vandaceous orchids for species and variety identification. **Genet. Mol. Res.** 13: 5441-5445.
6. Peyachoknagul, S., C. Mongkolsiriwatana, S. Wannapinpong, P Srifah Huehne and **K. Srikulnath**. 2014. Identification of Native Dendrobium species in Thailand by PCR-RFLP of the rDNA-ITS and Chloroplast DNA. **Sci. Asia** 40: 113-120.
7. **Srikulnath, K.**, Y. Uno, C. Nishida and Y. Matsuda. 2013. Karyotype evolution in monitor lizards: cross-species chromosome mapping of cDNA reveals highly conserved synteny and gene order in the Toxicofera clade. **Chromosome Res.** 21(8): 805-819.
8. Chaiprasertsri, N., Y. Uno, S. Peyachoknagul, O. Prakhongcheep, S. Baicharoen, S. Charernsuk, C. Nishida, Y. Matsuda, A. Koga and **K. Srikulnath**. 2013. Highly species-specific centromeric repetitive DNA sequences in lizards: molecular cytogenetic characterization of a novel family of satellite DNA sequences isolated from the water monitor lizard (*Varanus salvator macromaculatus*, Platynota). **J. Hered.** 104(6): 798-806.

9. Wannapinpong, S., **K. Srikulnath**, A. Thongpan, K. Choowongkomon and S. Peyachoknagul. 2013. Molecular cloning and characterization of the *CHS* gene family in turmeric (*Curcuma longa* Linn.). **J. Plant Biochem. Biotechnol.** DOI 10.1007/s13562-013-0232-8
10. Islam, F.B., S. Ishishita, Y. Uno, M.B.R. Mollah, **K. Srikulnath** and Y. Matsuda. 2013. Male hybrid sterility in the mule duck is associated with meiotic arrest in primary spermatocytes. **J. Poultry Sci.** 50: 311–320.
11. **Srikulnath, K.** 2013. The dynamics of chromosome evolution in reptiles. **Thai J. Genet.** S(1): 77-79.
12. Thongtam Na Ayudhaya, P., C. Indananda, S. Peyachoknagul and **K. Srikulnath**. 2013. Mitochondrial genome structure of saddleback anemonefish (*Amphiprion polymnus*). **Thai J. Genet.** S(1): 343-346.
13. Prakhongcheep, O., A. Swatdipong, C. Indananda, S. Peyachoknagul and **K. Srikulnath**. 2013. Mitochondrial genome analysis of Siamese fighting fish *Betta splendens*. **Thai J. Genet.** S(1): 119-121.
14. Prakhongcheep, O., N. Chairasertsri, S. Terada, Y. Hirai, **K. Srikulnath**, H. Hirai and A. Koga. 2013. Heterochromatin blocks constituting the entire short arms of acrocentric chromosomes of Azara's Owl Monkey: formation processes inferred from chromosomal locations. **DNA Res.** doi:10.1093/dnares/dst023.
15. Prakhongcheep, O., Y. Hirai, T. Hara, **K. Srikulnath**, H. Hirai and A. Koga. 2013. Two types of alpha satellite DNA in distinct chromosomal locations in Azara's Owl Monkey. **DNA Res.** doi:10.1093/dnares/dst004
16. **Srikulnath, K.**, A. Thongpan, S. Suputtitada and S. Apisitwanich. 2011. New haplotype of the complete mitochondrial genome of *Crocodylus siamensis* and its species-specific DNA markers: Distinguishing *C. siamensis* from *C. porosus* in Thailand. **Mol. Bio. Rep.** 39: 4709-4717
17. **Srikulnath, K.**, Y. Uno, K. Matsubara, A. Thongpan, S. Suputtitada, S. Apisitwanich, C. Nishida and Y. Matsuda. 2011. Chromosomal localization of 18S-28S and 5S rRNA genes and (TTAGGG)*n* sequences of butterfly lizards (*Leiolepis belliana belliana* and *Leiolepis boehmei*, Agamidae, Squamata). **Genet. Mol. Biol.** 34(4): 582-586.

18. Unajak, S., P. Meesawat, K. Anyamaneeratch, D. Anuwareepong, **K. Srikulnath** and K. Choowongkomon. 2011. Identification of species (meat and blood samples) using nested-PCR analysis of mitochondrial DNA. **Afr. J. Biotechnology** 10(29): 5670-5676.
19. **Srikulnath K.** 2010. FISH as a chromosome identification strategy to delineate karyotypic evolution in vertebrates. **Thai J. Genet.** 3(2): 120-136.
20. **Srikulnath K.**, K. Matsubara, Y. Uno, A. Thongpan, S. Suputtitada, C. Nishida, Y. Matsuda and S. Apisitwanich. 2010. Genetic Relationship of three butterfly lizard species (*Leiolepis reveesii rubritaeniata*, *Leiolepis belliana belliana*, *Leiolepis boehmei*, Agamidae Squamata) inferred from nuclear gene sequence analysis. **Kasetsart J. (Nat. Sci.)** 44: 424-435.
21. **Srikulnath K.**, C. Nishida, K. Matsubara, Y. Uno, A. Thongpan, S. Suputtitada, S. Apisitwanich and Y. Matsuda. 2009. Karyotypic evolution in squamate reptiles: comparative gene mapping revealed highly conserved linkage homology between the butterfly lizard (*Leiolepis reveesii rubritaeniata*, Agamidae, Lacertilia) and the Japanese four-strip rat snake (*Elaphe quadrivirgata*, Colubridae, Serpentes). **Chromosome Res.** 17: 975-986.
22. **Srikulnath K.**, K. Matsubara, Y. Uno, A. Thongpan, S. Suputtitada, S. Apisitwanich, Y. Matsuda and C. Nishida. 2009. Karyological characterization of the butterfly lizard (*Leiolepis reveesii rubritaeniata*, Agamidae, Squamata) by molecular cytogenetic approach. **Cytogenet. Genome Res.** 125: 213-223.

#### Proceedings in Conference

1. Chaiprasertsri, N., A. Supikamolseini, S. Kamolnorrath, K. Kunya, S. peyachoknagul and **K. Srikulnath**. 2013. Molecular barcoding of varanid lizard in Thailand. **In the 39th Congress on Science and Technology of Thailand (STT39)**. Bangkok, Thailand.
2. **Srikulnath, K.** 2012. Snake genomics. In the conference "Snake Science" and Snake Venoms in Thailand". Bangkok, Thailand.
3. Bonjongsat, N., P. Thongtam Na Ayudhaya, N. Ngaoburanawit, C. Indananda, S. peyachoknagul and **K.Srikulnath**. 2012. Sequence divergence of some anemonefishes

in Thailand to verify species from each other. **In the 50<sup>th</sup> Kasetsart University Annual Conference.** Bangkok, Thailand.

4. **Srikulnath, K.** 2011. Sex determination and sex chromosome in vertebrates. **In 5<sup>th</sup> Wildlife and Zoo seminar.** Bangkok, Thailand.
5. **Srikulnath, K.,** A. Swatdipong, Y. Uno, K. Matsubara, S. Peyachoknagul and Y. Matsuda. 2011. Compartmentalization of retroelement (Rex1, Rex3 and Rex6) in Siamese fighting fish (*Betta splendens*, Anabantoidei, Perciformes) genome. **In 17<sup>th</sup> National Genetic Conference. P 227-230.** Chiangmai, Thailand.
5. Supikamolseini, A., S. Suntrarachun, L. Chanhome, M. Sumontha, S. Peyachoknagul and **K. Srikulnath.** DNA barcoding of some venomous snakes in Thailand. **In 17<sup>th</sup> National Genetic Conference. P 107-110.** Chiangmai, Thailand.
6. Charoenta, T., A. Swatdipong, V. Chailertrit, C. Indananda, P. Wonnapijij, **K. Srikulnath** and S. Peyachoknagul. Distinguish of three bubble nesting brooder fighting fishes by multiplex PCR. **In 17<sup>th</sup> National Genetic Conference. P 231-234.** Chiangmai, Thailand.
7. **Srikulnath, K.,** C. Nishida, K. Matsubara, Y. Uno, A. Thongpan, S. Suputtitada, Y. Matsuda and S. Apisitwanich. 2009. Comparative FISH chromosome mapping and nucleotide sequence analysis of 3 species butterfly lizards (*Leiolepis reveesii rubritaeniata*, *Leiolepis belliana belliana*, *Leiolepis boehmei*, Agamidae, Lacertilia) in Thailand, p. 76. **In 35th Congress on Science and Technology of Thailand (STT35).** Chonburi, Thailand.
8. **Srikulnath, K.,** A. Thongpan and S. Apisitwanich. 2007. Karyotypes of Siamese crocodile (*Crocodylus siamensis*) and saltwater crocodile (*Crocodylus porosus*) using Het- and G-banding. **In 15<sup>th</sup> National Genetic Conference. p. 40-44.** Songkhla, Thailand.

Abstract in Conference (International Conference)

1. **Srikulnath, K.,** K. Matsubara, Y. Uno, C. Nishida and Y. Matsuda. 2013. The dynamics of chromosome evolution in reptiles. **20th International Chromosome Conference.** Bologna, Italy.

2. Chaiprasertsri, N., Y. Uno, S. Peyachoknagul, O. Prakhongcheep, M. Shibusawa, S. Baicharoen, S. Charernsuk, C. Nishida, Y. Matsuda, A. Koga and **K. Srikulnath**. 2012. Molecular structure of repetitive element in the water monitor lizard (*Varanus salvator macromaculatus*, Platyntota, Squamata). **In 2012 Malasia-Thailand Graduate Forum in Life Science, Fodd Science, and Agriculture**. Bangkok, Thailand.
3. **Srikulnath, K.**, A. Swatdipong, Y. Uno, K. Matsubara, S. Peyachoknagul and Y. Matsuda. 2010. Localization of repetitive elements in Siamese fighting fish (*Betta splendens*, Anabantoidei, Perciformes) genome. **In the abstract of 4th Asian Chromosome Colloquium**. Beijing, China.
4. **Srikulnath, K.**, Y. Uno, K. Matsubara, A. Thongpan, S. Suputtitada, C. Nishida, Y. Matsuda and S. Apisitwanich. 2010. The complete mitochondrial genome of the three butterfly lizards (*Leiolepis reveesii rubritaeniata*, *Leiolepis belliana belliana*, *Leiolepis boehmei*, Agamidae, Squamata) and their genetic relationship in iguanian lizards, p. 163. **In The abstract of ISBDS2010 International Symposium on Biodiversity Sciences “Genome, Evolution and Environment”**. Nagoya, Japan.
5. **Srikulnath, K.**, C. Nishida, K. Matsubara, Y. Uno, A. Thongpan, S. Suputtitada, S. Apisitwanich and Y. Matsuda. 2009. Chromosomal characterization of butterfly lizard, *Leiolepis reveesii rubritaeniata*). p. 46. **In Chromosome science abstract The 3rd Asian Chromosome colloquium**. Osaka, Japan.

Abstract in Conference (Local Conference)

1. Sriwatananukulkit, O., S. Peyachoknagul and **K. Srikulnath**. Chromosomal karyotyping of striped catfish inferred from molecular cytogenetic approach. **In the 39th Congress on Science and Technology of Thailand (STT39)**. Bangkok, Thailand.
2. Supikamolnseni, A., S. Suntrarachun, L. Chanhom, M. Sumontha, S. Peyachoknagul and **K. Srikulnath**. DNA marker for identification of some venomous snakes in Thailand. **In the 39th Congress on Science and Technology of Thailand (STT39)**. Bangkok, Thailand.

3. Suntronpong, A., S. Peyachoknagul and **K. Srikulnath**. 2013. Cytogenetic characterization of Barramundi (*Lates calcarifer*) using chromosome banding methods. **In the 18th National Genetics Conference in Thailand**. Bangkok, Thailand.
4. Twilprawat, P., A. Suntronpong, S. Peyachoknagul and **K. Srikulnath**. 2013. Karyological characterization of swamp eel (*Monopterus albus*) inferred from molecular cytogenetic approach. **In the 18th National Genetics Conference in Thailand**. Bangkok, Thailand.
5. Prakhongcheep, O., S. Lappharat, S. Baicharoen, B. Siriaroonrat, S. Kamolnorrnanath, R. Bunjongrat and **K. Srikulnath**. 2011. Karyological characterization of Eld's deer and muntjacs in captive of Thailand. **In 5<sup>th</sup> Wildlife and Zoo seminar**. Bangkok, Thailand.
6. **Srikulnath, K.**, A. Swatdipong, C. Indananda and S. Peyachoknagul. 2010. Complete mitochondrial genome structure of wild Siamese fighting fish (*Betta splendens*, Anabantoidei, Perciformes) genome. **In The abstract of 36th Congress on Science and Technology of Thailand (STT36)**. Bangkok, Thailand.

Grants:

- 2013 NRCT fund (National Research Council of Thailand)  
Project: Karyotype of varanid lizards inferred from molecular cytogenetic approach
- 2013 NRCT fund (National Research Council of Thailand)  
Project: Mitochondrial genome of varanid lizards for evaluation of the phylogenetic relationship
- 2013 Thailand Research Fund (TRF)  
Project: Thai garlic type classification using electronic nose system
- 2013 KURDI fund (Kasetsart University Research and Development Institute)  
Project: Evolution of Fragrance Gene in Aromatic Coconut (*Cocos nucifera* Linn.)



- 2012 KURDI fund (Kasetsart University Research and Development Institute)  
Project: Karyological characterization of white sea bass (*Lates calcarifer*) by molecular cytogenetic approach
- 2012 KURDI fund (Kasetsart University Research and Development Institute)  
Project: DNA barcoding and DNA marker of venomous snake in Thailand
- 2012 Postdoctoral fellowship Nagoya University (Japan)  
Project: Molecular cytogenetics and comparative mapping of amphibians and reptiles
- 2012 International collaboration work between Thailand (Kasetsart University) and Japan (Nagoya University)  
Project: A study on genetics and molecular mechanism of hybrid sterility and hybrid dysgenesis in duck

Awards:

- 2014 Visiting staff under Lotus Unlimited Project, EU-Asian Mobility (Avian Comparative Genomics), University of Kent, UK
- 2014 KU Research Star 2013 (Biological Science)

Current students:

Ph.D. student

1. Pradipunt Thongthaem Na Ayudhya
2. Sudarat Baichoren
3. Ornjira Prakhongcheep
4. Watcharaporn Thapana

### Master student

1. Arrjaree Supikamolseni
2. Nampetch Chaiprasertsri
3. Nararat Laopichienpong
4. Parinya Wongtienchai
5. Aorarat Suntronpong
6. Sorravis Lapbenjakul
7. Worapong Singchat

### Bachelor student

1. Tarada Tripetchr
2. Ponsuda Moonin
3. Utadcha Lerdpisitpaisan

### Previous students:

1. Visarut Chailertrit
2. Nuvadee Bonjongsat
3. Napat Ngaoburanawit
4. Orada Sriwatananukulkit
5. Gunprapa Deein
6. Panupon Twilprawat

