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An Introduction to the "Species Diversity of Animals Inhabiting in Wangtakrai Park" Project

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Abstract

Wangtakrai Park is situated in the foothills outside and to the south of Khao Yai National Park in Nakhon Nayok Province, Thailand. His Royal Highness Prince Chumbhot of Nagor Svarga and his wife, Mom Rajawongse Pantip Paribatra acquired a portion of this private landholding situated between two major streams that flow out of the Khao Yai National Park in 1952 and developed and expanded the property. The park was first opened to the public in 1960 with the vision to create a center for botanical education and ecotourism. Ecologically, Wangtakrai Park is regarded as a transition zone between the highland forest of Khao Yai National Park and the privately-owned lowland floodplains in Nakhon Nayok Province. This unique location supports higher species richness and abundance than in the lowlands affected by ongoing human activity, though is less rich than in the highland forests. The intermediate elevation also creates a blend of plant communities and succession stages that provide a wide variety of food sources and shelter necessary for terrestrial and aquatic animals. Recently, a high volume of visitors has also recently led to environment degradation due to human activity. This highlights the need for visitor education programs to raise awareness of conservation and reduce their environmental impacts. To achieve the first step of creating a database of natural resources that can support educational initiatives, a preliminary survey project titled "Species diversity of animals inhabiting in Wangtakrai Park" was conducted. This project was a collaborative effort involving the Chumbhot-Pantip Foundation, the National Science Museum Thailand and Mahidol University. The four

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papers gained by survey results are published in a special volume of the Thai Specimen Journal and document surveys of terrestrial invertebrates such as ant and mollusk species, bat species, and catalogue the aquatic species together with their biological characteristics. The aquatic surveys were mainly focused on documenting fishes and mollusks.

Keywords: Wangtakrai Park, History, Transition zone, Educating visitors

Introduction

The Chumbhot-Pantip Foundation and the National Science Museum Thailand have signed a Memorandum of understanding (MoU) to enhance and promote public understanding of biodiversity and environmental conservation through science and technology. The MoU outlined the use of resources at Wangtakrai Park for biodiversity development, particularly in the taxonomy of fauna, and for environmental activities aimed at raising awareness. The "Species diversity of animals inhabiting in Wangtakrai Park" preliminary survey project implemented under the MoU purposes to include documenting its historical significance of the park and conduct surveys of the park's fauna. The park's history highlights the impact a citizen can have on biodiversity conservation. The surveys are expected to provide insights on the area's biodiversity richness and its ecological connection with Khao Yai National Park where natural resources are conserved. The findings from this collaboration, achieved through the combined efforts of multiple organizations, will support further advancement in biodiversity conservation in the area.

History of Wangtakrai Park

Wangtakrai, also known as Chumbhot-Pantip Gardens, is located in the foothills outside the boundary of Khao Yai National Park, Nakhon Nayok Province, Thailand. The name "Wangtakrai" refers to a serene valley alongside running streams (Wang*)*, bordered by dense shrubs called "Takrai Hang Nak" or the aquatic rotula (*Rotula aquatica*), which grow prolifically along the banks (Figure 1a–b). In 1952, His Royal Highness Prince Chumbhot of Nagor Svarga and his wife, Mom Rajawongse Pantip Paribatra, purchased a portion of this private landholding, nestled between two major streams which flow out of Khao Yai, Khlong Takhian (also known as Khlong Wangtakrai) and Khlong Maduea. With a profound appreciation for nature, the Prince and Princess transformed and expanded the property into a tranquil retreat. After the Prince's passing, Mom Rajawongse Pantip dedicated over 10 years to planning and designing the gardens. She transformed fields once overrun with reeds and cogon grass into lush green lawns and gardens, creating a space that has served both as a tribute to her late husband and as a showcase of various flowering plants and trees for public enjoyment. In 1960, Mom Rajawongse Pantip opened Wangtakrai to the public with a vision of establishing a center for botanical education and ecotourism. Her goal was to provide visitors the opportunity to learn about and appreciate the beauty of nature. Since its opening, Wangtakrai has continued to delight those who visit its beautiful grounds throughout the year. The park is owned by the Chumbhot-Pantip Foundation (Figure 2).

Background of animal diversity and human associates in the area

Situated near the southwestern margin of Khao Yai, Wangtakrai Park serves as a transition zone between the highland forest of the government-administered Khao Yai National Park and the privately-owned lowland, largely agricultural floodplain of Nakhon Nayok Province. The uplands of Khao Yai, to the north of Wangtakrai are covered with three types of evergreen

Figure 1. Two conspicuous plants in Wangtakrai: a–b, "Takrai Hang Nak" or the aquatic rotula, *Rotula aquatica* Lour. (photograph by Bhanumas Chantarasuwan, November 2002); c, "Krai Nam" or the willow-leaved water croton, *Homonoia riparia* Lour. (photograph by Veera Vilasri, March 2024).

forests: dry evergreen, moist evergreen, and hill evergreen forests. These varied forest types create different habitats for a wide array of highland animals (Lynam *et al*., 2006; Krailas *et al*., 2012; Pla-ard *et al*., 2021; Chanachai *et al*., 2022; Rattanawanawong *et al*., 2022; Bangthong *et al*., 2023; Kanka *et al*., 2023). In contrast, the lowland area to the south of Wangtakrai Park, covering the Mueang Nakhon Nayok District, has largely been developed and contains a large urban area along the Nakhon Nayok River and a still relatively rich area or marsh and deepwater rice paddy named "Pak Phli". The Pak Phli area provides a unique habitat for the endangered danionin fish (Family Danionidae), *Trigonostigma somphongsi* and concentrations of migratory birds, such as the greater spotted eagle (*Clanga clanga*) and the black-eared kite (*Milvus migrans lineatus*) (Mallalieu, 2007; DeCandido *et al*., 2013; Petsut *et al*., 2016).

Wangtakrai Park supports lower species richness and abundance than the highland forests, which are under legal protection, but higher species richness and abundance than the

Figure 2. Historical photographs: a, Prince Chumbhotbongse of Nagor Svarga and M.R. Pantip Paribatra; b, An early excursion at Wangtakrai by Prince Chumbhot (third from left) and M.R. Pantip Paribatra (far right); and c–f, An early excursion at Wangtakrai.

Figure 3. Flower bed near the base of Khao Yai National Park (photograph by Veera Vilasri, July 2024).

lowlands where human disturbances are ongoing (Laurance *et al*., 2011; García-López *et al*., 2012; Ahumada *et al*., 2013). The park may benefit from its position at an intermediate elevation creating a blend of plant communities or succession stages that provide a wider variety of food sources and shelter necessary for certain animals (Goodman *et al*., 1999; McCain, 2004; Jambari *et al*., 2019). As a result, Wangtakrai Park is notably rich in biodiversity, hosting several unique species. For example, the willow-leaved water croton (*Homonoia riparia* Lour.), locally known as "Krai Nam" is a dominant plant along the park's streams (Figure 1c). This freshwater plant occurs throughout South and Southeast Asia as well as in southern China. *H. riparia* is valued for its medicinal properties and faces significant threats in China due to habitat alteration (Yi *et al*., 2016) and climate change (Yi *et al*., 2018). Besides its medicinal uses, this plant also acts as a bio-indicator of freshwater habitat integrity due to its sensitivity to land modification. However, its function as a microhabitat for stream and terrestrial animals is still underexplored (Baird, 2007; IUCN, 2013; Kondaji and Kumar, 2022). In addition, the remaining land area composed of at least 2.4 km2 of dry evergreen forests, planted forests, orchards, lawns and flower beds, also provides a variety of horizontal and vertical microhabitats, such as air, canopy, ground surface and underground niches (Figure 3). These microhabitats play crucial roles in maintaining ecological stability in the area and are vital habitats for terrestrial dwellers, including insects, land snails, amphibians, reptiles, birds, and mammals (Zug, 2011; Wanger *et al*., 2014; Tongnunui *et al*, 2016; Basset *et al*., 2019; Atkinson *et al*., 2023) (Figure 4).

Figure 4. Blue-winged pitta, *Pitta moluccensis*, on the bank of the Khlong Takhian (Khlong Wangtakrai) Stream (photograph by Dome Pratumthong, July 2023).

Given its beautiful natural ecology and rich biodiversity combined with its proximity to Bangkok, Wangtakrai Park has become a popular tourist attraction, especially during weekend and long holidays. However, the high volume of visitors inevitably impacts the environment due to anthropological activities. While effective management is essential to preserving the environment, educating visitors is also necessary to raise awareness of conservation and reduce their environmental impacts. To enhance educational efforts, information on local biodiversity is required to create content based on solid scientific knowledge. Consequently, conducting biodiversity surveys in the area is a promising approach to gather this essential knowledge.

Contents of the present volume

This special volume of the *Thai Specimen Journal* presents the findings from the project team's surveys on the species diversity of animals in Wangtakrai Park conducted from November 2022 to July 2024. The project was a collaborative effort involving the Chumbhot-Pantip Foundation, the National Science Museum Thailand and Mahidol University. The preliminary surveys aimed to document ant species, record bat species and assess their diversity and catalog species and biological characteristics of aquatic animals, focusing on fishes and mollusks, and including species lists of these taxa inside the park. As the results gained from these surveys, four papers are published in the volume as following list.

Changlom (2025) studies the diversity of terrestrial and aquatic mollusks and gives the species list including 14 species in 12 genera and eight families. In case of terrestrial mollusks, they are categorized into two groups, litter and tree snails, based on their habitat observed.

Jaithrong *et al*. (2025) provide the checklist of ants (Family Formicidae) that reveal 90

species belonging to 40 genera and eight subfamilies. Among them, one is recognized as the first record of Thailand and twelve are alien species.

Chungthanawong *et al*. (2025) investigate the diversity of freshwater fishes and represent 22 species in 14 families and six orders. They provide a detail view of community composition inhabiting in primary and modified habitats, occurrence of a non-native species indicating impact of increasing in human activity and insight of regional biogeography of fish fauna.

Pratumthong *et al*. (2025) focus on the diversity of bat (Order Chiroptera) based on night observations. They record 16 species in 11 genera and 5 families. Two of them are regarded as common species in both stream and garden habitats. In addition, the variation of bat diversity in the area is mainly influenced by two factors, habitat type and seasonal change.

Although the faunal inventory is still incomplete, these contributions so far have greatly improved our understanding of the animal diversity in Wangtakrai Park, so as to enhance the quality of educational materials.

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References

Ahumada, J.A, J. Hurtado and D. Lizcano. 2013. Monitoring the status and trends of tropical forest terrestrial vertebrate communities from camera trap data: a tool for conservation. *PLoS ONE* 8(9): 1–10. e73707. doi:10.1371/journal.pone.0073707

Atkinson, C.L., G.W. Hopper, D.A. Kreeger, J.W. Lopez, A.N. Maine, B.J. Sansom, A. Schwalb and C.C. Vaughn. 2023. Gains and gaps in knowledge surrounding freshwater mollusk ecosystem services. *Freshwater Mollusk Biology and Conservation* 26: 20–31.

Baird, I.G. 2007. Fishes and forests: the importance of seasonally flooded riverine habitat for Mekong river fish feeding. *Natural History Bulletin of Siam Society* 55(1): 121–148.

Bangthong, P., R. Sukmasuang, N. Khoewsree, M. Plaard, P. Paansri, B. Kaewdee, R. Chairat, P. Duengkae and K. Siripattaranugul. 2023. Species diversity, temporal pattern and habitat use of carnivorous mammals in the Khao Yai National Park, Thailand. *Journal of Wildlife and Biodiversity* 7 (supplement issue): 128–151.

Basset, Y., R. Ctyvtecka, C. Dahl, S.E. Miller, D.L.J. Quicke, S.T. Segar, H. Barrios, R.A. Beaver, J.W. Brown, S. Bunyavejchewin, S. Gripenberg, M. Knížek, P. Kongnoo, O.T. Lewis, N. Pongpattananurak, P. Pramual, W. Sakchoowong and M. Schutze. 2019. Insect assemblages attacking seeds and

fruits in a rainforest in Thailand. *Entomological Science* 2019: 1–15. doi: 10.1111/ens.12346.

Chanachai, Y., A. Nathalang, P. Duengkae and R. Sukmasua. 2022. Species diversity, abundance, and movement of small mammals in the dry evergreen forest at Khao Yai National Park, Thailand. *Biodiversitas* 23(11): 5892–5901.

Changlom, B. 2024. A Checklist of mollusks in Wangtakrai Park, Nakhon Nayok Province, central Thailand. *Thai Specimens* 4: 11–18.

Chungthanawong, C., J. Khudamrongsawat, C. Vidthayanon, D. Pratumthong, A. Klaipet and V. Vilasri. 2025. Diversity of freshwater fishes from Wangtakrai Park in Nakhon Nayok Province, central Thailand, with notes on species composition and regional biogeography. *Thai Specimens* 4: 59–74.

DeCandido, R., T. Subedi, M. Siponen, K. Sutasha, A. Pierce, C. Nualsri and P.D. Round. 2013. Flight identification of *Milvus migrans lineatus* 'Black-eared' Kite and *Milvus migrans govinda* 'Pariah' Kite in Nepal and Thailand. *BirdingASIA* 20: 32–36.

García-López, A., E. Micó and E. Galante. 2012. From lowlands to highlands: searching for elevational patterns of species richness and distribution of scarab beetles in Costa Rica. *Diversity and Distributions* 18: 543–553.

Goodman, S.M., M.D. Carleton and M. Pidgeon. 1999. Rodents of the Reserve Naturelle Integrale d'Andohahela, Madagascar. *Fieldiana Zoology* 94: 217–249.

IUCN, 2013. *Ecological survey of the Mekong River between Louangphabang and Vientiane cities, Lao PDR, 2011–2012*. Vientiane, Lao PDR: IUCN, 241 pp.

Jambari, A., S. Sasidhran , H.R.A. Halim, K.A. Mohamed, A. Ashton-Butt, A.M. Lechner and B. Azhar. 2019. Quantifying species richness and composition of elusive rainforest mammals in Taman Negara National Park, Peninsular Malaysia. *Global Ecology and Conservation* 18: 1–10.

Jaithrong, W., T. Jeenthong, K. Yodprasit, S. Soo-Jung and W. Tasen. 2024. A Checklist of known Ant Species (Hymenoptera: Formicidae) in Wangtakrai Park and surrounding Areas, central Thailand. *Specimens* 4: 19–58.

Kanka, P., R. Sukmasuang, P. Duengkae and K. Siripattaranukul. 2023. Abundance and physical factors affecting the appearance of selected terrestrial birds in Khao Yai National Park using camera trapping. *Biodiversitas* 24(1): 222–232.

Kondaji, P. and S. Kumar. 2022. *Homonoia riparia* Lour (Euphorbiaceae): an important ecological indicator of perennial streams. *Journal of Biodiversity and Conservation* 6(1): 464–465.

Krailas, D., S. Chotesaengsri, W. Dechruksa, S. Namchote, C. Chuanprasit, N. Veeravechsukij, D. Boonmekam and T. Koonchornboon. 2012. Species diversity of aquatic mollusks and their cercarial infections; Khao Yai National Park, Thailand. *Journal Tropical Medicine and Parasitology* 35(2): 37–47.

Laurance, W.F., J.L.C. Camargo, R.C.C. Luizão, S.G. Laurance, S.L. Pimm, E.M. Bruna, P.C. Stouffer, G.B. Williamson, J. Benítez-Malvido, H.L. Vasconcelos, K.S.V. Houtan, C.E. Zartman, S.A. Boyle, R.K. Didham, A. Andrade and T.E. Lovejoy. 2011. The fate of Amazonian forest fragments: a 32-year investigation. *Biological Conservation* 144: 56–67.

Lynam, A.J., P.D. Round and W.Y. Brockelman. 2006. *Status of birds and large mammals in Thailand's Dong Phayayen - Khao Yai forest complex.* Biodiversity Research and Training (BRT) Program and Wildlife Conservation Society, Bangkok. 245 pp.

Mallalieu, M. 2007. Great spotted eagles *Aquila clanga* in central Thailand. *Forktail*, 23: 167–170.

McCain, C.M. 2004. The mid-domain effect applied to elevational gradients: species richness of small

mammals in Costa Rica. *Journal of Biogeography* 31: 19–31.

Petsut, N., J. Petsut and S. Kulabtong. 2016. Biodiversity of fishes in deep water rice field at Nakornnayok Province. *Ramkhamhaeng Research Journal of Sciences and Technology* 19(1): 14–27 (In Thai with English abstract).

Pla-ard, M., N. Khioesree, B. Keawdee, W. Hungheng, P. Chattrakuldee, P. Pengthong, J. Thongbanthum, P. Paansri, K. Charaspet, T. Panganta, Y. Chanachai, P. Duengkae, D. Marod, S. Uthairasmee, T. Kaewkrachang, N. Bhumpakphan, Y. Trisurat, W. Suksavate, S. Sungkaew, N. Pongpattananurak, P. Racharak, D. Wiwatwittaya, W. Tasen and R. Sukmasuang. 2021. Monitoring the diversity, abundance, activity period and habitat use of wildlife species around the wildlife corridor that connects the natural world heritage site in Thailand. *Biodiversitas* 22(11): 4983–4996.

Pratumthong, D., C. Ngamchaluay and A. Klaipet. 2025. Checklist of bats in Wangtrakrai Park, Nakhon Nayok Province, Central Thailand. *Specimens* 4: 75–82.

Rattanawanawong, N., N. Bhumpakphan, U. Kutintara and R. Sukmasua. 2022. Wildlife-vehicle collisions in Khao Yai National Park, Thailand: impact on native species for some conservation management. *Biodiversitas* 23(6): 3050–3061.

Tongnunui, S., F.W.H. Beamish and C. Kongchaiya. 2016. Fish species, relative abundances and environmental associations in small rivers of the Mae Klong River basin in Thailand. *Agriculture and Natural Resources* 50(2016): 408–415.

Wanger, T.C., K. Darras, S. Bumrungsri, T. Tschmtke and A.-M. Klein. 2014. Bat pest control contributes to food security in Thailand. *Biological Conservation* 171: 220–223.

Yi, Y., X. Cheng, Z. Yang, and S. Zhang. 2016. Maxent modeling for predicting the potential distribution of endangered medicinal plant (*H. riparia* Lour) in Yunnan, China. *Ecological Engineering* 92: 260–269.

Yi, Y., Y. Zhou, Y. Cai, W. Yang, Z. Li, and X. Zhao. 2018. The influence of climate change on an endangered riparian plant species: The root of riparian *Homonoia*. *Ecological Indicators*, 92: 40–50.

Zug, G.R. 2011. Tropical Asian dry forest amphibians and reptiles: a regional comparison of ecological communities. Pp. 275–303. In W.J. McShea, S.J. Davies, N. Bhumpakphan (eds). *The ecology and conservation of seasonally dry forest in Asia*. Washington, DC: Smithsonian Institution Scholarly Press.


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