

## Diversity and habitat utilization of reptiles at Taksin Maharat National Park, Tak Province

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### Abstract

The study aims to provide the diversity of reptiles and their utilization of habitats in Taksin Maharat National Park, Tak province. The data were recorded from October 2022 to April 2023, through a visual encounter survey method. Six routes cover the main habitat types: 1) evergreen hill forest, 2) mixed deciduous forest, 3) deciduous dipterocarp forest, and 4) teak plantation. A total of 90 individuals from ten families, 15 genera, and 20 reptile species were found in this study. As a result of an increase in the number of reptile species in this area from 45 to 55. The most common species across all habitat types is *Sphenomorphus maculatus*. The highest diversity index ( $H'$ ) is present at Evergreen Hill Forest as 2.40 and the teak plantation had the lowest diversity index as 1.28. In conclusion, the heterogeneity of habitats and the level of disturbance by humans are the main factors that affect the diversity of reptiles in the study area.

### Keywords

heterogeneity of habitats, reptiles, species diversity, visual encounter survey method

## Introduction

Thailand is located in the Indo-Burma and Sunderland biodiversity hotspots, which are the places that serve as the home of fauna and flora, including some of the endemic species (Plant, 2014). The geography of the western region is characterized by intricate landscapes and mountain ranges, extending along the Myanmar border. The long mountainous continues south from northern Thailand to western Thailand, called the Thanon Thong Chai range, following the Tenasserim range southward. This region is the largest remaining intact forest in Thailand and has long been recognized as a significant zoogeographic transition from the Indo-Malayan Subregion to the Indochinese and Indo-Himalayan Subregions (Pauwel, 2009).

Currently, a total of 517 species of the reptiles of Thailand have been recorded (Uetz *et al.*, 2022). At least 167 reptile species have been discovered in western Thailand (Amaradit, n.d.; Tanya, 2015; David, 2021; Chomdej, 2020; Pauwels, 2020; Poyarkov, 2023). In addition,

about 31 endemic species of reptiles are known from the westernmost part (Poyarkov, 2023).

Taksin Maharat National Park (TMNP) is located on the Thanon Thongchai range, which is the natural border between Thailand and Myanmar. This area comprises highly diverse vegetation types, including evergreen hill forest, mixed deciduous forest, deciduous dipterocarp forest, grassland bamboo forest, and teak plantation. Only 12 species of amphibians, 45 species of reptiles, 114 species of birds, and 54 species of mammals have been confirmed (Amaradit (n.d.)). TMNP is an intact watershed forest with highly diverse ecosystems. However, the faunal diversity of TMNP remains fairly known and incomplete. This study provides an updated checklist of reptiles in this area with their habitat utilization. It is argued that our result will enhance future area management with appropriate conservation strategies.

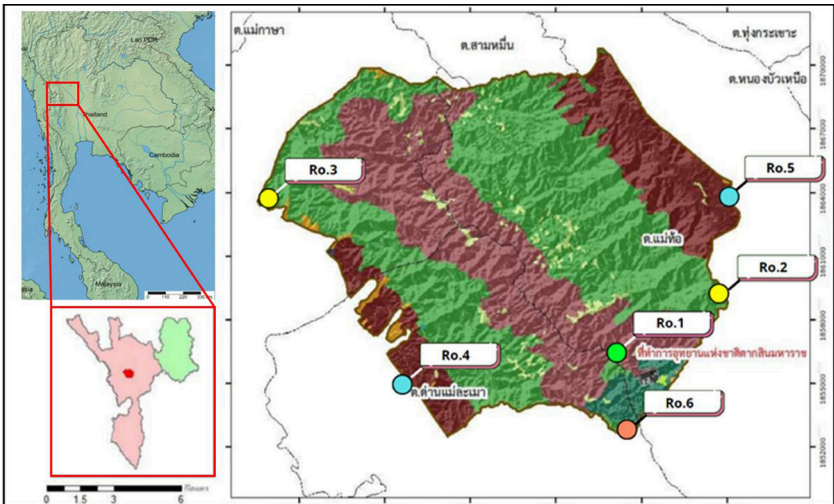
**Materials and Methods**

**Study area**

TMNP is located in Mae Sot District, Tak Province, approximately 26 kilometers west of Tak town, covering an area of 149 square kilometers. Most of the area is composed of intricate landscapes. This place was divided into the western and eastern parts by the Thanon Thongchai Range, which runs through the park. The highest peak is approximately 1,068 meters above sea level (MASL) and the slope of the area is about 5–15 percent, with only a few plains at the edges. Streamlines in this area originate from the central mountain range. The important tributary basins, Huai Mae Tho and Huai Mae Lamao, flow from the west to the Mae Ping River Basin.

The annual rainfall is 42.7 mm. The weather is cool throughout the year. The mean temperature throughout the year is 22.5 °C, with the highest temperature at about 26.0 °C in May and the lowest at about 18.0 °C in January (Amaradit, n.d.).

The six sampling stations were designated (Figure 1), covering four main vegetation types: 1) evergreen hill forest (Ro.1), 2) mixed deciduous forest (Ro.2) and (Ro.3), 3) deciduous dipterocarp forest (Ro.4) and (Ro.5), and 4) teak plantation (Ro.6). The characteristics of each vegetation types are provided by (Amaradit, n.d.) as following (Figure 2).



**Figure 1.** The main vegetation type of Taksin Maharat National Park. The circle indicates the sampling station (modified from Amaradit, n.d.).



**Figure 2.** The four vegetation types of TMNP. A) Evergreen hill forest; B) mixed deciduous forest; C) Deciduous dipterocarp forest; D) teak plantation.

**1) Evergreen hill forest:** Highly plant distributed. An altitude of 1,000 meters or more above sea level. The mean temperature throughout the year is 20 °C. The majority of plant species are evergreen plants. At the top, the tree canopy layer is dense, whereas the understory layer is more widely dispersed. The forest floor is not densely covered. The main types of trees found are six species: *Microcos paniculata*, *Mallotus paniculata*, *Elaeocarpus floribundus*, *Phyllanthus emblica*, *Protium serratum*, and *Archidendron* sp.

**2) Mixed deciduous forest:** The majority of plant species are deciduous plants. At the top, the tree canopy layer is not dense, and the forest floor is not densely covered. Comprising a variety of tree species, the main types of trees include these eight species: *Tectona grandis*, *Lagerstroemia floribunda*, *Pterocarpus macrocarpus*, *Azelia xylocarpa*, *Sindora siamensis*, *Chukrasia tabularis*, *Xylia xylocarpa*, and *Dalbergia oliveri*.

**3) Deciduous dipterocarp forest:** This area is characterized by a sparse forest. The forest floor is often covered with leaf litter. The main types of trees found are these four species: *Shorea obtusa*, *Shorea siamensis*, *Dipterocarpus obtusifolius*, and *Dipterocarpus tuberculatus*.

**4) Teak plantation:** This area was originally a mixed deciduous forest but, it was modified for plant teaks. Most of the area is currently deserted and neglected, leading to a resurgence of indigenous plant species.

### Sampling methodology

This study was conducted from October 2022 to April 2023. The observation was carried out for four days per month during daytime (9 A.M.–3 P.M.) and nighttime (6 P.M.–12 A.M.). The specimens were collected by using the Visual encounter survey followed by Nneji (2019), covering possible reptile habitats. Data were recorded, involving reptile species, the number observed, and photos of the location.

We euthanized specimens using MS-222 (Tricaine methanesulfonate) and subsequently fixed specimens with 70% ethanol. The voucher specimens were deposited at ZMKU (Zoological Museum of Kasetsart University).

### Species identification

The specimens were identified to species level following previous literature such as Das (2010); Chan-ard *et al.* (2015), Cox (2018), and Uetz *et al.* (2022). The global conservation status of each species follows the International Union for Conservation of Nature Red List (IUCN, 2017). The conservation status of Thailand follows the Office of Natural Resources and Environmental Policy, and Planning (ONEP, 2023) and Wildlife Conservation and Protection Act, B.E. 2019 (WCPA, B.E. 2019).

### Statistical analysis

The diversity of the study area was analyzed by the Shannon–Wiener diversity index. In addition, the relative abundance of each species has been provided (Krebs, 1999; Spellerberg, 2003). The Bray–Curtis similarity index was employed to evaluate the similarity of reptiles across the habitat types.

### Shannon–Wiener diversity index ( $H'$ )

$$H' = - \sum_{i=1}^s (P_i) \times \ln(P_i)$$

$H'$  = Shannon-Wiener diversity index.

$p_i$  = The proportion ( $n/N$ ) of individuals of one particular species found ( $n$ ) divided by the total number of individuals found ( $N$ ).

$\Sigma$  = The sum of the calculation, and  $s$  is the number of species.

### Relative abundance (RA)

$$RA (\%) = \frac{TS}{TP} \times 100$$

RA = Relative Abundance (%)

TS = Total Number of Species

TP = Total Sum of All Populations

### Area Relative abundance (ARA)

$$ARA (\%) = \frac{TSF}{TP} \times 100$$

ARA = Area Relative Abundance (%)

TSF = Total Number of Species in Forest type

TP = Total Sum of All Populations

### Similarity among habitat types

Similarities among vegetation types were evaluated using the Bray–Curtis similarity index (Bray and Curtis, 1957). This analysis was applied using PAST 4.03 software.





**Figure 3.** Some reptile species that found in this study. A) *Gekko gekko*; B) *Calotes versicolor*; C) *Sphenomorphus maculatus*; C) *Tropidophorus berdmorei*; E) *Hebius cf. deschauenseei*; F) = *Lycodon capucinus*; G) *Trimeresurus popeiorum*; H) *Hypsiscopus plumbea*; and I) *Malayopython reticulatus*.

**Table 1.** Reptiles recorded in previous studies and this study at Taksin Maharat National Park, Tak.

No.	Family & Scientific Name	IUCN	ONEP	WCPA	Remark
<b>Family: Trionychidae</b>					
1	<i>Amyda cartilaginea</i> (Boddaert, 1770)	VU	LC	/	
<b>Family: Platysternidae</b>					
2	<i>Platysternon megacephalum</i> Gray, 1831	CR	EN	/	
<b>Family: Testudinidae</b>					
3	<i>Indotestudo elongate</i> (Blyth, 1854)	CR	NT	/	
<b>Family: Geoemydidae</b>					
4	<i>Cyclemys dentata</i> (Gray, 1831)	NT	NT	/	First record in TMNP
5	<i>Heosemys spinosa</i> (Gray, 1831)	EN	NT	/	
<b>Family: Gekkonidae</b>					
6	<i>Cyrtodactylus peguensis</i> (Boulenger, 1893)	LC	LC	/	
7	<i>Gekko gecko</i> (Linnaeus, 1758)	LC	LC	-	
8	<i>Hemidactylus frenatus</i> Duméril & Bibron, 1836	LC	LC	-	
9	<i>Hemidactylus platyurus</i> (Schneider, 1797)	LC	LC	-	First record in TMNP
10	<i>Hemidactylus garnotii</i> Duméril & Bibron, 1836	LC	LC	-	First record in TMNP
<b>Family: Agamidae</b>					
11	<i>Acanthosaura crucigera</i> Boulenger, 1885	LC	LC	/	
12	<i>Calotes emma</i> Gray, 1845	LC	LC	/	
13	<i>Calotes mystaceus</i> Duméril & Bibron, 1837	LC	LC	/	

**Table 1.** Reptiles recorded in previous studies and this study at Taksin Maharat National Park, Tak. (Continue)

No.	Family & Scientific Name	IUCN	ONEP	WCPA	Remark
14	<i>Calotes versicolor</i> (Daudin, 1802)	LC	LC	/	First record in TMNP
15	<i>Draco blanfordii</i> Boulenger, 1885	LC	LC	/	
16	<i>Leiolepis reevesii</i> (Gray, 1831)	LC	LC	-	
<b>Family: Scincidae</b>					
17	<i>Dasia olivacea</i> Gray, 1839	LC	LC	-	
<b>Family: Scincidae</b>					
18	<i>Eutropis macularia</i> (Blyth, 1853)	LC	LC	-	First record in TMNP
19	<i>Sphenomorphus maculatus</i> (Blyth, 1853)	LC	LC	-	First record in TMNP
20	<i>Tropidophorus berdmorei</i> (Blyth, 1853)	LC	LC	-	First record in TMNP
<b>Family: Varanidae</b>					
21	<i>Varanus nebulosus</i> (Gray, 1831)	NT	LC	/	
<b>Family: Typhlopidae</b>					
22	<i>Argyrophis diardii</i> (Schlegel, 1839)	LC	LC	-	First record in TMNP
23	<i>Indotyphlops braminus</i> (Daudin, 1803)	LC	LC	-	
<b>Family: Pythonidae</b>					
24	<i>Malayopython reticulatus</i> (Schneider, 1801)	LC	LC	/	
<b>Family: Colubridae</b>					
25	<i>Ahaetulla nasuta</i> (Lacépède, 1789)	LC	LC	-	
26	<i>Ahaetulla prasine</i> (Boie, 1827)	LC	LC	-	

**Table 1.** Reptiles recorded in previous studies and this study at Taksin Maharat National Park, Tak. (Continue)

No.	Family & Scientific Name	IUCN	ONEP	WCPA	Remark
27	<i>Amphiesma stolatum</i> (Linnaeus, 1758)	LC	LC	-	
28	<i>Boiga cyanea</i> (Duméril, Bibron & Duméril, 1854)	LC	LC	-	
29	<i>Boiga multomaculata</i> (Boie, 1827)	LC	LC	-	
30	<i>Boiga siamensis</i> Nutaphand, 1971	LC	LC	-	
31	<i>Calamaria pavementata</i> Duméril, Bibron & Duméril, 1854	LC	LC	-	
32	<i>Chrysopelea ornate</i> (Shaw, 1802)	LC	LC	-	
33	<i>Coelognathus radiatus</i> (Boie, 1827)	LC	LC	/	
34	<i>Hebius cf. deschauenseei</i> (Taylor, 1934)	LC	LC	-	First record in TMNP
35	<i>Fowlea flavipunctata</i> (Hallowell, 1860)	LC	LC	-	First record in TMNP
36	<i>Fowlea piscator</i> (Schneider, 1799)	LC	LC	-	
37	<i>Lycodon capucinus</i> Boie, 1827	LC	LC	-	
<b>Family: Colubridae</b>					
38	<i>Lycodon davisonii</i> (Blanford, 1878)	LC	LC	-	First record in TMNP
39	<i>Lycodon fasciatus</i> (Anderson, 1879)	LC	LC	-	
40	<i>Oligodon cinereus</i> (Günther, 1864)	LC	NT	-	
41	<i>Ptyas korros</i> (Schlegel, 1837)	NT	LC	/	
42	<i>Ptyas mucosa</i> (Linnaeus, 1758)	LC	LC	/	
43	<i>Rhabdophis subminiatus</i> (Schlegel, 1837)	LC	LC	-	
44	<i>Sibynophis collaris</i> (Gray, 1853)	LC	LC	-	
45	<i>Sibynophis triangularis</i> Taylor & Elbel, 1958	NT	LC	-	



**Table 1.** Reptiles recorded in previous studies and this study at Taksin Maharat National Park, Tak. (Continue)

No.	Family & Scientific Name	IUCN	ONEP	WCPA	Remark
<b>Family: Pareidae</b>					
46	<i>Pareas carinatus</i> Wagler, 1830	LC	LC	-	
<b>Family: Elapidae</b>					
47	<i>Bungarus candidus</i> (Linnaeus, 1758)	LC	LC	-	
48	<i>Bungarus fasciatus</i> (Schneider, 1801)	LC	LC	-	
49	<i>Naja siamensis</i> Laurenti, 1768	VU	LC	-	
50	<i>Ophiophagus hannah</i> (Cantor, 1836)	VU	LC	/	
<b>Family: Pseudaspidae</b>					
51	<i>Psammodynastes pulverulentus</i> (Boie, 1827)	LC	LC	-	First record in TMNP
<b>Family: Homalopsidae</b>					
52	<i>Hypsiglossus plumbeus</i> (Boie, 1827)	LC	LC	-	
<b>Family: Xenopeltidae</b>					
53	<i>Xenopeltis unicolor</i> Reinwardt, 1827	LC	LC	/	
<b>Family: Viperidae</b>					
54	<i>Calloselasma rhodostoma</i> (Kuhl, 1824)	LC	LC	-	
55	<i>Trimeresurus popeiorum</i> Smith, 1937	LC	LC	-	

**Note:**

I. IUCN = International Union for Conservation of Nature and Natural Resources Red List of Threatened Species (2017)

(LC = Least concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered)

II. ONEP = The conservation status of Thailand follows the Office of Natural Resources and Environmental Policy, and Planning (2015)

(LC = Least concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered)

III. WCPA B.E. 2019 = Wildlife Conservation and Protection Act, B.E. 2019

(/ = present, - = absent)



**Figure 4.** *Hebius cf. deschauenseei*: A) Full body, B) Side head view, C) Ventral body view.

### Results and Discussion

A total of 10 families, 15 genera, and 20 reptile species from TMNP were recorded in this study (Fig. 3). Our result increased the number of reptile species in this area from the most recent checklist published by Amaradit (n.d.) from 45 to 55 species (Table 1). A total of 12 reptile species represent a new record for TMNP as follows: Tortoise; *Cyclemys dentate* (Gray, 1831) Lizard; *Hemidactylus platyurus* (Schneider, 1797), *Hemidactylus garnotii* (Duméril and Bibron, 1836), *Calotes versicolor* (Daudin, 1802), *Eutropis macularia* (Blyth, 1853), *Sphenomorphus maculatus* (Blyth, 1853), *Tropidophorus berdmorei* (Blyth, 1853) Snake; *Argyrophis diardii* (Schlegel, 1839), *Hebius deschauenseei* (Taylor, 1934), *Fowlea flavipunctata* (Hallowell, 1860), *Lycodon davisonii* (Blanford, 1878) and *Psammodynastes pulverulentus* (Boie, 1827). Most of them are widespread and were found in adjacent areas, but not present in the previous record.

During the survey conducted in the TMNP, some reptile species were not found which were present in previous surveys. These reptile species are *Amyda cartilaginea* (Boddaert, 1770), *Cyrtodactylus peguensis* (Boulenger, 1893), *Acanthosaura Lepidogaster* (Cuvier, 1829), and *Coelognathus radiatus* (Boie, 1827). It is possible that the survey's limited time and seasonality could have affected the abundance of reptiles. The survey was conducted during the dry season, and in tropical regions, reptiles are active throughout the year. However, the activity patterns of some species are affected by seasonal changes in rainfall,

**Table 2.** Observational Records and diversity analyses of reptile species encountered in each habitat type during the reptile survey of Taksin Maharat National Park, Tak (RA = relative abundance)

Family & Species	RA	Number in each habitat type					
		Total Record	Ever-green hill forest	Mixed deciduous forest	Deciduous dipterocarp forest	Teak plantation	
<b>Family: Agamidae</b>			<b>3</b>	<b>9</b>	<b>0</b>	<b>2</b>	
1	<i>Calotes emma</i>	5.55	5	0	5	0	0
2	<i>Calotes mystaceus</i>	1.11	1	0	1	0	0
3	<i>Calotes versicolor</i>	8.89	8	3	3	0	2
<b>Family: Gekkonidae</b>			<b>11</b>	<b>6</b>	<b>6</b>	<b>5</b>	
4	<i>Gekko gecko</i>	6.67	6	3	1	1	1
5	<i>Hemidactylus frenatus</i>	15.55	14	4	4	3	3
6	<i>Hemidactylus platyurus</i>	7.78	7	3	1	2	1
7	<i>Hemidactylus garnotii</i>	1.11	1	1	0	0	0
<b>Family: Scincidae</b>			<b>3</b>	<b>1</b>	<b>2</b>	<b>0</b>	
8	<i>Eutropis macularia</i>	12.22	11	5	0	6	0
9	<i>Sphenomorphus maculatus</i>	23.33	21	5	12	4	0
10	<i>Tropidophorus berdmorei</i>	4.45	4	4	0	0	0
<b>Family: Typhlopidae</b>			<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	
11	<i>Argyrophis diardii</i>	1.11	1	1	0	0	0

**Table 2.** Observational Records and diversity analyses of reptile species encountered in each habitat type during the reptile survey of Taksin Maharat National Park, Tak (RA = relative abundance) (Continue)

Family & Species	RA	Number in each habitat type				
		Total Record	Ever-green hill forest	Mixed deciduous forest	Deciduous dipterocarp forest	Teak plantation
<b>Family: Colubridae</b>			<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>
12 <i>Fowlea flavipunctatus</i>	1.11	1	0	0	1	0
13 <i>Hebius cf. deschauenseei</i>	1.11	1	1	0	0	0
14 <i>Lycodon capucinus</i>	1.11	1	0	1	0	0
15 <i>Lycodon davisonii</i>	1.11	1	0	1	0	0
<b>Family: Pseudaspididae</b>			<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>
16 <i>Psammodynastes pulverulentus</i>	2.23	2	1	0	1	0
<b>Family: Pythonidae</b>			<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
17 <i>Malayopython reticulatus</i>	1.11	1	0	1	0	0
<b>Family: Homalopsidae</b>			<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>
18 <i>Hypsiglossus plumbea</i>	1.11	1	0	0	1	0
<b>Family: Viperidae</b>			<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
19 <i>Trimeresurus popeiorum</i>	1.11	1	1	0	0	0
<b>Family: Geoemydidae</b>			<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
20 <i>Cyclemys dentata</i>	2.23	2	2	0	0	0
Number of individuals observed		90	34	30	19	7

**Table 2.** Observational Records and diversity analyses of reptile species encountered in each habitat type during the reptile survey of Taksin Maharat National Park, Tak (RA = relative abundance) (Continue)

Family & Species	Number in each habitat type					
	RA	Total Record	Ever-green hill forest	Mixed deciduous forest	Deciduous dipterocarp forest	Teak plantation
Total number of species		20	13	10	8	4
Area Relative Abundance (ARA)		100.00	37.78	33.34	21.11	7.77
Shannon-Wiener diversity index (H')			2.40	1.84	1.84	1.28

air temperature, and humidity. Many reptile species hide or reduce activity in the dry season in response to thermoregulatory needs and the availability of prey (McDiarmid *et al.*, 2012). Due to these reasons, several species of reptiles were difficult to encounter and hence, were not found in this study. A long-term study of TMNP is required to explore the habitat and behavior of these reptile species.

*Hebius deschauenseei* (Taylor, 1934) is distributed in north and northwestern Thailand. This species also occurs in the Phu Hin Rong Kla National Park in northeastern Thailand, Vietnam and southern China (Das, 2010; Thai National Parks, 2024; Uetz, 2023). A remarkable characteristic of this species is venter pale with a pattern of three parallel rows of dark spots. However, our specimen has only two rows of dark spots on the ventral part. Herein, we recorded specimens as *Hebius cf. deschauenseei* (Figure 4).

Regarding the conservation status, most of the reptiles found in this study have been categorized by IUCN (2017) and ONEP (2023) as LC, which are the specific species that are still abundant in the wild. Except for *Cyclemys dentate*, which is the first record in this study. This turtle was categorized as a Near Threatened species in the IUCN red list, ONEP, and recorded as a protected wild animal in the Wildlife Conservation and Protection Act, B.E. 2019. Because its population is gradually decreasing due to hunting for medicinal materials, food, and pets (Priambodo, 2023).

Comparison of reptile diversity across vegetation types, high values of Shannon Weiner (H') and Area relative abundance (ARA) showed a significantly high diversity of reptiles in evergreen hill forest (H' = 2.40; ARA = 37.78%), followed by Mixed deciduous forest (H' = 1.84; ARA = 33.34%), deciduous dipterocarp forest (H' = 1.84; ARA = 21.11%) and the Teak plantation had the lowest reptile diversity (H' = 7.77, ARA = 7.77%) (Table 2).

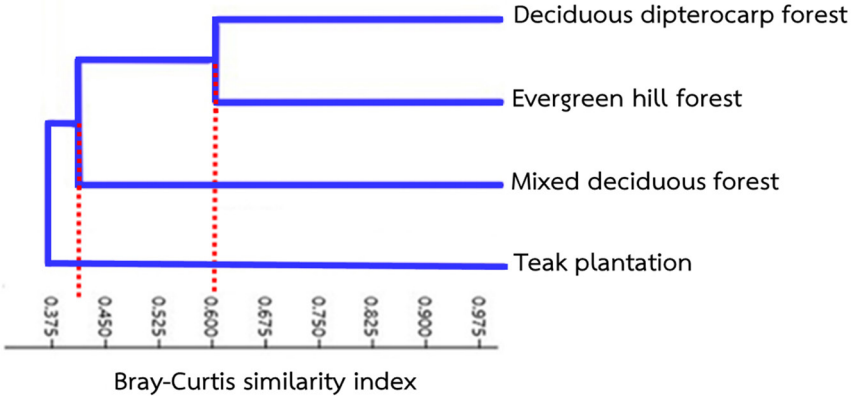
Environmental heterogeneity is the primary factor influencing the diversity and varying distribution of reptiles across ecosystems (Dodd, 2016). Most reptiles need a suitable habitat for reproduction, feeding, and survival. As a result of our diversity analyses, forest habitats were more preferred habitats by reptiles than teak plantations. In addition, there are a lot of human activities and locations that have been modified for camping. There were only four reptiles in this area, *Calotes versicolor*, *Gekko gecko*, *Hemidactylus frenatus*, and *Hemidactylus platyurus*, which had adapted to live in buildings and urban environments.



The dominant species is *Sphenomorphus maculatus*, which encountered a total of 21 individuals observed. This skink was mostly found nearby streamlines with a high percentage of leaf litter, even in lowland or mountain areas. This microhabitat is present in all vegetation types, which affected the outcome of the highest encounter, especially in mixed deciduous forests.

According to cluster analysis, deciduous dipterocarp forests were the most similar to evergreen hill forests at 60 % (Figure 5). They formed a separate cluster due to the same composition of five reptile species. Then, mixed deciduous forests formed another cluster, with only one species (*Eutropis macularia*) not found in the above clade. These three vegetation types were defined as intact forests. Ground cover is important for reptiles, with positive correlations for many species (McDiarmid *et al.*, 2012). Those three forest types consist mostly of leaf litter and shrubs, which might have affected the outcome of similar species composition.

In contrast, only 40% of the species composition of the teak plantation is similar to that of the forest habitat. This locality is an open forest ecosystem with a high level of disturbance. Thus, this place showed the lowest diversity of reptiles and had distinct reptile species adapted to live in modified habitats.



**Figure 5.** Cluster diagram of Bray-Curtis similarity index of reptiles at different vegetation types for TMNP.

**Summary**

Six localities and four different habitat types were included in most of the reptile records in this study. A total of 10 reptile species were encountered which increases the total number of reptiles in Taksin Maharat National Park from 45 to 55 species. One newly recorded species, *Cyclemys dentate*, was evaluated as a global conservation concerns species. Thus, the occurrence and population of reptile species should be confirmed. The majority of reptiles found in the TMNP are Sauria which are well-suited to survive in a variety of environments. The habitat preference is the major factor responsible for the distribution and diversity of reptile species. The evergreen hill forests show the highest reptile diversity, particularly with low human disturbance, as the forest remains undisturbed. The teak plantation that was modified for human activity exhibited the lowest reptile diversity.

According to the preliminary survey, the number of reptiles at TMNP is probably higher than demonstrated. For further study, pitfall traps are recommended to sample the fossorial species for example ground skink, typhlopids and small snakes. Furthermore, observing more localities, especially in the northern area, is recommended.

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