# New records and updated list of the herpetofauna from Luot mountain, Vietnam National University of Forestry, Vietnam

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# Ghi nhận mới và cập nhật danh sách loài bò sát và lưỡng cư tại Núi Luốt, Trường Đại học Lâm nghiệp, Việt Nam

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***ABSTRACT***

*Luot Mountain, managed by the Vietnam National University of Forestry, spans over 110 hectares and is an important experimental forest. The area features a mixed forest ecosystem, combining monoculture plantations and native species, creating favorable conditions for biodiversity development. It is not only home to a variety of plant and animal species but also serves as a valuable environment for education and research, supporting training programs and nature conservation efforts. In this study, reptiles and amphibians at Luot Mountain were surveyed using the transect method, which helped clarify the richness of the ecosystem. Three reptile species were recorded for the first time, including: Emma's dragon (Calotes emma), Brahminy Blind Snake (Indotyphlops braminus), and Yellow-Spotted Keelback (Fowlea flavipunctata). These discoveries increased the total number of species recorded at the site to 29, including 19 reptiles and 10 amphibians. Through this research, a total of 5 threatened species were recorded, including 2 species listed in the IUCN Red List (2024), 5 species in the Vietnam Red Data Book (2007), and 2 species in Government Decree No. 84 (2021). These findings highlight the importance of protecting forest ecosystems to ensure sustainability for future generations, emphasizing the need for continuous conservation efforts and scientific cooperation to preserve these valuable habitats for years to come.*

***Từ khóa:***
*Bảo tồn, Bò sát, ghi nhận mới, lưỡng cư, Núi Luốt.*

***TÓM TẮT***

*Núi Luốt thuộc quản lý của Trường Đại học Lâm nghiệp, trải rộng trên diện tích hơn 110 ha và là một khu rừng thực nghiệm quan trọng. Với hệ sinh thái rừng hỗn hợp, khu vực này kết hợp giữa các loài cây độc canh và các loài cây bản địa, tạo điều kiện cho sự phát triển đa dạng sinh học. Đây không chỉ là nơi cư trú của nhiều loài động thực vật mà còn là môi trường học tập và nghiên cứu giá trị, hỗ trợ các chương trình đào tạo và bảo tồn thiên nhiên. Trong nghiên cứu này, các loài bò sát và lưỡng cư tại núi Luốt được khảo sát bằng phương pháp điều tra theo tuyến, giúp làm rõ sự phong phú của hệ sinh thái. Ba loài bò sát lần đầu được ghi nhận gồm: Nhông emma (Calotes emma), Rắn giun thường (Indotyphlops braminus) và Rắn nước đốm vàng (Fowlea flavipunctata). Những phát hiện này góp phần nâng tổng số loài được phát hiện tại đây là 29 loài (19 loài bò sát và 10 loài lưỡng cư). Qua nghiên cứu này,*

*tổng cộng có 5 loài bị đe dọa đã được ghi nhận, bao gồm 2 loài được liệt kê trong Sách Đỏ IUCN (2024), 5 loài được liệt kê trong Sách Đỏ Việt Nam (2007) và 2 loài được liệt kê trong Nghị định số 84 của Chính phủ (2021). Những phát hiện này nhấn mạnh tầm quan trọng của việc bảo vệ hệ sinh thái rừng để đảm bảo tính bền vững cho các thế hệ mai sau.*

## 1. INTRODUCTION

Luot mountain, managed by the Vietnam National University of Forestry, spans over 110 hectares and serves as an experimental forest characterized by a mixed ecosystem of monoculture plantations and native forest species (Luu Quang Vinh & Pham Van Thien 2018) [1]. This area was established for educational and research purposes, providing a valuable site for studying forest ecology and biodiversity. However, research on amphibians and reptiles in Luot mountain remains limited, primarily consisting of preliminary surveys focused on species composition based on earlier studies. Previous research by Luu Quang Vinh & Pham Van Thien (2018) [1] documented 11 species of reptiles and 9 species of amphibians, including 6 species recorded for the first time in Hanoi City. More recently, Ha et al. (2022) [2] expanded this knowledge by recording an additional 18 species of reptiles and amphibians using funnel traps, of which 6 species were new records for this area. These findings highlight the potential richness of herpetofauna in Luot mountain but also underscore the need for more comprehensive studies to fully understand the diversity and distribution of species in this region. Building on these prior studies, our recent field survey, conducted over three months from March 5 to July 5, 2024, has led to the discovery of three new records of reptiles from Luot mountain. This updated data contributes to the growing understanding of the area's herpetofauna and emphasizes the importance of continued research and conservation efforts to protect this unique ecosystem.

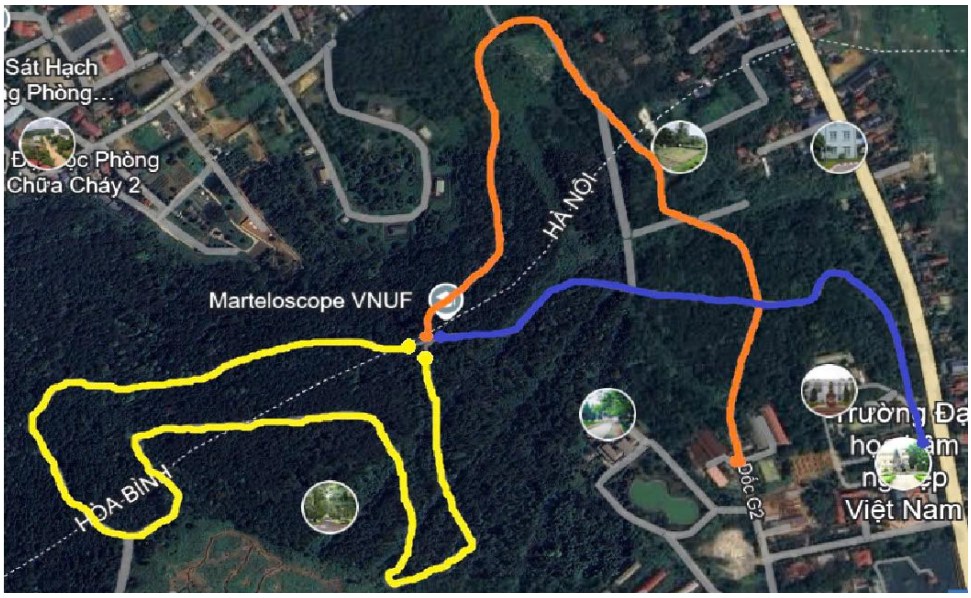
## 2. RESEARCH METHODS

Field surveys were conducted at Luot Mountain by Vinh Q. Luu, Vinh Q. Vuong, Mai N. T. Vu, Tuong S. Dinh, Trung T. Nguyen (hereafter Vinh Q. Luu et al.) from 5/3/2024 to 5/7/2024. The study area consists of two consecutive hills running in the Northeast-Southwest direction. One peak is 133 m a.s.l., the other is 76 m a.s.l. Specimens were collected by hand or using a snake hook. Specimens were euthanized in a closed vessel with a piece of cotton wool containing ethyl acetate (Luu Quang Vinh & Pham Van Thien 2018) [1], fixed in 80% ethanol for four to six hours, then later transferred to 70% ethanol for permanent storage. The specimens are subsequently deposited in the collection of the Vietnam National University of Forestry (VNUF), Hanoi, Vietnam. Taxonomic identification mainly followed Smith (1943) [3], Taylor (1962) [4], Taylor (1963) [5], Nguyen Van Sang (2007) [6], Nguyen et al. (2009) [7], Nguyen et al. (2016) [8].

Le et al. (2018) [9] Abbreviations used for morphometry are as follows: SVL (snout-vent length): from tip of snout to anterior margin of cloaca; TaL (Tail length): from posterior margin of cloaca to tip of tail. Bilateral scale counts were given as left/right.

**Table 1. Coordinates of Luot mountain survey transects**

| Transect | Location | Coordinates |
|---|---|---|
| Transect 1 | T7 Building – 2nd Crossroads | 20°91'22"N/105°57’67"E-<br>20°91'28"N/105.57’58"E |
| Transect 2 | G2 Building – Nursery | 20°54'42"N/105°34'30"E-<br>20°54'53"N/105°34'29"E |
| Transect 3 | 2nd Crossroads – Peak 133 - 2nd Crossroads | 20°91'278N/105°57'58E -<br>20°91'176N/105°56'79"E |




*(Source: Vinh Q. Vuong)*

**Figure 1. Diagram of survey transects at Luot mountain**
*(transect 1: blue, transect 2: orange, transect 3: yellow)*

## 3. RESULTS AND DISCUSSION

### 3.1. Family Agamidae Cuvier, 1827

***Calotes emma* Gray, J. E. 1845**

**Oriental Garden Lizard/Nhông emma**

**Specimen examined** (n=1). One adult male (NL.24.10) collected on 5th June 2024 (20°91.362'N/105°57.473'E, at 98 m a.s.l.) on the tree along the road in the transect 2 near botanical garden by Vinh Q. Luu et al.

**Morphological characters:** The specimen from Luot mountain agreed with the description of Nguyen et al. (2016) [8]: SVL 94.76 mm, TaL 245.36 mm; the snout broader than it is long; 9/9 supralabials; 10/10 infralabials; 18/18 scale rows between the eyes; 8/8 scale rows between the nostrils; 19 ventral scales; 41 dorsal scales, with the dorsal scales being keeled; 60 scales encircling the body; the limbs pentadactyl, with 22 subdigital lamellae under the fourth finger and 29 subdigital lamellae under the fourth toe, keeled.

**Coloration in life:** Head brown; body, tail, and limbs grayish brown with six distinct dark longitudinal stripes along the body.

**Ecological notes:** The specimen was collected at noon on a tree about 1 m from the ground near the road. Surrounding habitat was monoculture plantations of native forest species.

**Distribution:** In Vietnam, this species is found from Cao Bang to Ba Ria-Vung Tau (Nguyen et al. 2009).

*(Photo: Vinh Q. Luu)*

**Figure 2. Nhông emma (*Calotes emma*)**

**3.2. Family Typhlopidae Merrem, 1820**

***Indotyphlops braminus* (Daudin, 1803) Common Blind Snake/Rắn giun thường**

**Specimen examined** (n=1). One adult female (NL.24.11) collected on 3rd July 2024 (20°91.197'N/105°56.906'E, at 76 m a.s.l.) on the trail behind T7 building in the transect 1 by Vinh Q. Luu et al.

**Morphological characters:** The specimen from Luot mountain agreed with the description of Smith (1943) [3] and Nguyen Van Sang (2007) [6]: SVL 228.55 mm; TaL 110.51 mm; A rounded snout, slightly raised in the middle; snout scales narrow, with the visible portion on top being 1/3 the width of the head; pre-nasal scales small and approximately equal in size underneath. The nostril is located between two divided nasal scales; 3 supralabials; 9 smooth scale rows surrounding the body; 10/10 ventral scale rows; 11/11 dorsal scale rows on tail; 261 dorsal scale rows along the spine; small eyes as a dark spot under a large ocular scale; tail short, with a length equal to or slightly greater than its width.

**Coloration in life:** Dorsal surface of body dark bluish-black with a metallic sheen; ventral side lighter than the dorsal side.

**Ecological notes:** The specimen was collected in the late afternoon on the forest floor mixed with leaf litter in the planted native tree area behind T7 building

**Distribution:** In Vietnam, this species was a widespread species. This species is found from Lang Son to Ho Chi Minh City (Nguyen et al. 2009) [7].

*(Photo: Vinh Q. Luu)*

**Figure 3. Rắn giun thường (*Indotyphlops braminus*)**

**3.3. Family Colubridae Oppel, 1811**

***Fowlea flavipunctata* (Hallowell, 1861) Yellow-spotted Keelback/Rắn nước đốm vàng**

**Specimen examined** (n=1). One adult female (NL.24.24) collected on 5th July 2024

(20°91.278'N/105°57.058'E, at 76 m a.s.l.) in the transect 3 of Luot mountain by Vinh Q. Luu et al.

**Morphological characters:** The specimen from Luot mountain agreed with the description of Nguyen Van Sang (2007) [6]: SVL 203.64 mm, TaL 75 mm; head distinctly separated from the neck; 9/9 supralabials, with the largest scales entering the orbit on both left and right sides; 10/10 infralabials, in contact with the first chin shield; 2/2 anterior and 2/2 posterior temporals; 1/1 preoculars; 3/3 postoculars; 19 dorsal scale rows keeled except for the two outermost rows which are smooth; 126 ventrals; 40 subcaudals, anal scale divided.

**Coloration in life:** Dorsal surface of body grayish-brown with black crossbands on the dorsum and sides, enhanced by black-edged dorsal scales for camouflage; head darker, with a double black streak from the posterior subocular scale to the notch between the 5th supralabial, and another streak from the upper posterior subocular crossing the anterior temporals and the 8th supralabial; ventral surface dirty white with black-edged anterior margins on the ventral scales.

**Ecological notes:** The dead specimen was found on the road at 9:05 am, indicating that the species is active on the ground and may be vulnerable to road traffic.

**Distribution:** In Vietnam, this species was a widespread species (Nguyen et al. 2009) [7].

*(Photo: Vinh Q. Vuong)*

**Figure 4. Rắn nước đốm vàng (*Fowlea flavipunctata*)**

**Tab 2. An updated list of amphibians and reptiles recorded from Luot mountain**

| No | Scientific name | Data source | RBVN (2007) | Decree 84 (2021) | IUCN (2024) |
|---|---|---|---|---|---|
| | **REPTILIA Laurenti, 1768** | | | | |
| | **SQUAMATA Oppel, 1811** | | | | |
| | **Sauria Macartney, 1803** | | | | |
| **I** | **Agamidae Gray, 1827** | | | | |
| 1 | *Calotes emma* (Daudin, 1802)* | 3 | | | |
| **II** | **Gekkonidae Gray, 1825** | | | | |
| 2 | *Hemidactylus frenatus* Dumérin & Bibron, 1836 | 1,2 | | | |
| **III** | **Lacertidae Gray, 1825** | | | | |
| 3 | *Takydromus sexlineatus* (Daudin, 1802) | 1 | | | |
| **IV** | **Scincidae Oppel, 1811** | | | | |
| 4 | *Eutropis longicaudatus* (Hallowell, 1856) | 1,2 | | | |
| 5 | *Lygosoma siamense* Siler, Heitz, Davis, Freitas, Aowphol, Termprayoon & Grismer, 2018** | 2,3 | | | |
| **V** | **Typhlopidae Merrem, 1820** | | | | |
| 6 | *Indotyphlops braminus* (Daudin, 1803)* | 3 | | | |
| **VI** | **Xenopeltidae Bonaparte, 1845** | | | | |
| 7 | *Xenopeltis unicolor* Reinwardt, in Boie, 1827 | 1,2 | | | |
| **VII** | **Colubridae Oppel, 1811** | | | | |
| 8 | *Coelognathus radiatus* (Boie, 1827) | 2 | VU | | |
| 9 | *Dendrelaphis pictus* (Gmelin, 1789) | 1 | | | |
| 10 | *Ptyas korros* (Schlegel, 1837) | 1,2 | EN | | NT |
| 11 | *Ptyas mucosa* (Linnaeus, 1758) | 2 | EN | IIB | |
| **VIII** | **Natricidae Bonaparte, 1838** | | | | |
| 12 | *Fowlea flavipunctata* (Hallowell, 1860)* | 3 | | | |
| 13 | *Rhabdophis helleri* (Schmidt, 1925) ** | 1 | | | |
| **IX** | **Pareatidae Romer, 1956** | | | | |
| 14 | *Pareas margaritophorus* (Jan, 1866) | 1,2 | | | |
| **X** | **Homalopsidae Günther, 1864** | | | | |
| 15 | *Hypsiscopus plumbea* (Boie, 1827) | 1 | | | |
| **XI** | **Elapidae Boie, 1827** | | | | |
| 16 | *Bungarus fasciatus* (Schneider, 1801) | 2 | EN | | |
| 17 | *Bungarus multicinctus* (Blyth, 1861) | 2 | | | |
| 18 | *Naja atra* Cantor, 1842 | 1 | EN | IIB | VU |
| **XII** | **Viperidae Oppel, 1811** | | | | |
| 19 | *Trimeresurus albolabris* (Gray, 1842) | 1 | | | |

| No | Scientific name | Data source | RBVN (2007) | Decree 84 (2021) | IUCN (2024) |
|---|---|---|---|---|---|
| | **AMPHIBIA Linnaeus, 1785** | | | | |
| | **ANURA Fischer Von Waldheim, 1813** | | | | |
| **XII** | **Bufonidae Gray, 1825** | | | | |
| 20 | *Duttaphrynus melanostictus* (Schneider, 1799) | 1,2,3 | | | |
| **XIII** | **Microhylidae Günther, 1858** | | | | |
| 21 | *Kaloula pulchra* Gray, 1831 | 1,2,3 | | | |
| 22 | *Microhyla butleri* Boulenger, 1900 | 1,2,3 | | | |
| 23 | *Microhyla heymonsi* Vogt, 1911 | 1,2,3 | | | |
| 24 | *Microhyla pulchra* (Hallowell, 1861) | 1,2 | | | |
| **XIV** | **Hylidae Rafinesque, 1815** | | | | |
| 25 | *Hyla simplex* Boettger, 1901 | 1,3 | | | |
| **XV** | **Dicroglossidae Anderson, 1871** | | | | |
| 26 | *Fejervarya limnocharis* (Gravenhorst, 1829) | 1,2,3 | | | |
| 27 | *Hoplobatrachus rugulosus* (Wiegmann, 1834) | 1 | | | |
| **XVI** | **Ranidae Rafinesque, 1814** | | | | |
| 28 | *Sylvirana guentheri* (Boulenger, 1882) | 2 | | | |
| **XVII** | **Rhacophoridae Hoffman, 1932** | | | | |
| 29 | *Polypedates mutus* (Smith, 1940) | 1,2,3 | | | |

*Data sources: 1: Luu Quang Vinh & Pham Van Thien (2018*)[1]*, 2: Ha et al. (2020*) [2]*, 3: This study. Decree 84 (2021) = Decree No.84/2021/ND-CP dated September 22, 2021 of the Government amending and supplementing a number of articles of the Government's Decree No. 06/2019/ND-CP of January 22, 2019, on the management of endangered, precious and rare forest plants and animals and implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Group IIB: including species of forest fauna that, although currently not threatened with extinction but may become so without strict control of exploitation and use for commercial purpose and species specified in CITES Appendix II naturally inhabiting Vietnam* [13]*; RBVN (2007) = Vietnam Red Data Book* [12]*. Part I. Animals. Descriptions of nationally endangered species of wild animals. EN = Endangered, VU = Vulnerable; IUCN (2024) = The IUCN Red List of Threatened Species ver.2024-1 VU =Vulnerable, LR/nt = Lower Risk/Near Threatened* [11]*, * new record, ** taxonomic reassignments acccording to Siler et al. (2018)* [14] and *David & Vogel (2021)* [10].

In this study, we recorded 5 threatened snake species, including 2 species listed in the IUCN Red List of Threatened Species (2024) [11]: *Naja atra* listed at the VU level (Vulnerable) and *Ptyas korros* listed at the NT level (Near Threatened); 5 snake species listed in the Vietnam Red Book (2007) [12]: *Coelognathus radiatus*; *P. korros*; *P. mucosa*; *Bungarus fasciatus*; *N. atra*; and 2 snake species listed in Decree No. 84/2021/ND-CP of the Government of Vietnam on the management of endangered wild plants and animals [13]: *N. atra* and *P. mucosa* are listed at level IIB (restricted exploitation and commercial use).

## 4. CONCLUSION

The results of the survey discovered 3 more reptile species recorded for the first time in Luot mountain, including *Calotes emma*, *Indotyphlops braminus*, *Fowlea flavipunctata*. Contributing to increasing the total number of species discovered here to 29 species (19 reptiles, 10 amphibians). Among these, 2 species are listed in the IUCN Red List (2024) [11], 5 species in the Vietnam Red Data Book (2007) Vietnam Red Data Book (2007) [12], and 2 species in Decree No. 84 [13] of the Government (2021).

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