

Identification of Amphibian Species in the Durin Serugun Village Forest, Sibolangit, North Sumatra

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ABSTRACT

Research findings on amphibians from various locations in North Sumatra are still limited compared to other provinces. However, the potential fauna in its forests is greatly needed. The Durin Serugun Village Forest, Sibolangit District, North Sumatra, is a customary and conservation forest. This area borders directly with the Taman Hutan Raya (Tahura) North Sumatra North Sumatra. The Durin Serugun Village Forest is rich in flora and fauna, including data on amphibian species that have never been reported before. The purpose of this study is to obtain data on amphibian species, including endemic ones. This is done as a report and to add data on amphibian species in the Durin Serugun Village Forest Area. The research was conducted in April 2025. Research method with a Visual Counter Survey (VES) combined with exploration to obtain data on amphibian species in two habitats; terrestrial (including arboreal and fossorial) and aquatic. The results of the study obtained 15 species of amphibians from 5 families; Bufonidae (4 species), Megophryidae (1 species), Ranidae (4 species), Dicroglossidae (5 species), and Rhacophoridae (1 species). Three of them are endemic to Sumatra; *Chalcorana parvaccola*, *Sumaterana crassiovis* and *Rhacophorus catamitus*. The report on amphibians in this location is expected to be an important reason for all relevant parties to take decisive and serious steps to protect and preserve the area. The existence of several endemic species is evidence that the amphibian diversity in this region is important to preserve. The results of this study reveal the existence of amphibian species, which improves the quality of data on amphibians in North Sumatra, especially in the Sibolangit District of Durin Serugun Village. The data from this study is also important for broader and more in-depth exploration.

Key words: Amfibi, Sibolangit, Desa Durin Serugun, Endemic, Visual Encounter Survey (VES).

ABSTRAK

Hasil penelitian tentang amfibi dari berbagai lokasi di Sumatera Utara masih sedikit dibandingkan provinsi lainnya. Padahal potensi fauna yang ada pada hutannya sangat diperlukan. Hutan Desa Durin Serugun, Kecamatan Sibolangit, Sumatera Utara, merupakan hutan adat dan konservasi. Kawasan ini berbatasan langsung dengan Tahura (Taman Hutan Raya) Sumatera Utara. Hutan Desa Durin Serugun kaya akan flora dan fauna, termasuk data tentang jenis amfibi yang belum pernah dilaporkan. Tujuan penelitian ini adalah untuk memperoleh data tentang spesies amfibi, termasuk yang endemik. Hal ini dilakukan sebagai laporan dan penambahan data jenis jenis amfibi pada Kawasan Hutan Desa Durin Serugun. Penelitian telah dilakukan pada April 2025. Metode penelitian dengan Visual Ancounter Survey (VES) dipadukan dengan Eksplorasi pada dua tipe habitat untuk memperoleh data jenis-jenis amfibi; terrestrial (termasuk arboreal dan fossorial) dan akuatik. Hasil penelitian ini mengidentifikasi 15 spesies amfibi dari 5 famili; Bufonidae (4 spesies), Megophryidae (1 spesies), Ranidae (4 spesies), Dicroglossidae (5 spesies), dan Rhacophoridae (1 spesies). Tiga diantaranya merupakan endemik Sumatra yaitu; *Chalcorana parvaccola*, *Sumaterana crassiovis* dan *Rhacophorus catamitus*. Laporan tentang amfibi di lokasi ini diharapkan menjadi alasan penting bagi semua pihak terkait untuk mengambil langkah-langkah tegas dan serius dalam melindungi dan melestarikan kawasan tersebut. Terdapatnya beberapa jenis endemik sebagai bukti bahwa kekayaan amfibi di kawasan ini penting dilestarikan. Hasil penelitian ini mengungkapkan keberadaan spesies amfibi sebagai peningkatan kualitas data tentang amfibi di Sumatera Utara terutama Kecamatan Sibolangit Desa Durin Serugun. Data hasil penelitian ini juga menjadi data penting dalam eksplorasi yang lebih luas dan mendalam.

Kata kunci: Amfibi, Sibolangit, Desa Durin Serugun, Endemik, Visual Encounter Survey (VES).

INTRODUCTION

Amphibians represent one of the major groups of vertebrate fauna worldwide, exhibiting the unique ability to inhabit both aquatic and terrestrial environments (Dharma & Meityani, 2019; Faivovich *et al.*, 2006). As poikilothermic organisms, they rely on ambient environmental conditions for thermoregulation (Rofiq *et al.*, 2021). The class Amphibia is divided into three orders: Anura, Gymnophiona, and Caudata, each distinguished by specific morphological and ecological traits (Ginting *et al.*, 2020; Iskandar, 1998) (Kusrini, 2013). Amphibians occur on nearly all continental landmasses, except in extreme environments such as the coldest regions, arid deserts, and remote oceanic (Faivovich *et al.*, 2006). Their habitats range from terrestrial and arboreal zones to fully aquatic and fossorial niches (Kusrini, 2013). A hallmark of amphibian biology is their glandular, smooth skin, which facilitates cutaneous respiration and moisture retention (Addaha *et al.*, 2015). Within ecosystems, they function both as predators of invertebrates and as sensitive bioindicators of environmental health (Arifin, 2024a; Kurniati, 2005, 2012; Rusli, 2019).

The order Anura, which includes frogs and toads, is the most species-rich group of amphibians in Indonesia, with over 500 species recorded from Sumatra to Papua (Kamsi *et al.*, 2017). Of these, 135 species are found on Sumatra alone (Arifin, 2024b). In contrast, the order Gymnophiona (caecilians) is less well known and remains the subject of ongoing research. In Sumatra, only the genus *Ichthyophis* Fitzinger has been documented, comprising six species: *Ichthyophis elongatus* Taylor, *Ichthyophis billitonensis* Taylor, *Ichthyophis glutinosus* L., *Ichthyophis nigroflavus* Taylor, *Ichthyophis paucisulcus* Taylor and *Ichthyophis sumatranus* Taylor (Arifin, 2024b; GBIF, 2025; Harapan *et al.*, 2020; Kusumah *et al.*, 2023). No members of the order Caudata (salamanders) have been recorded in Indonesia to date (Ginting *et al.*, 2020; Putra & Siregar, 2014).

Sumatra Island is renowned for its high biodiversity, including a rich assemblage of amphibian species. The first herpetological surveys on the island were conducted by Van Kampen in 1923 (Aulan *et al.*, 2024). However, according to (Harvey *et al.*, 2002), studies of Sumatran herpetofauna have lagged behind those on other landmasses. Nevertheless, documentation of frogs and toads on this third-largest Indonesian island has steadily increased,

now encompassing several hundred species and continuing to grow (Arifin, Cahyadi, *et al.*, 2018; Arifin, 2024a; Aulan *et al.*, 2024; Kamsi, 2003; Kamsi *et al.*, 2017; Putra & Siregar, 2014). Several studies have focused specifically on the amphibian fauna of North Sumatra. Aulan *et al.* (2024) surveyed the Batang Toru Forest area and recorded 26 amphibian species across six families. Siregar (2010) reported 27 species from the CA/TWA Sibolangit region, also representing six families. More recently, Ginting *et al.* (2020) and Rosifa *et al.* (2024) documented 13 species from six families in the village of Bukum, Sibolangit.

While amphibian diversity in the Sibolangit subdistrict has been well-documented by (Siregar, 2010), (Ginting *et al.*, 2020) and (Rosifa *et al.*, 2024), no studies have addressed the primary forest of Durin Serugun Village. This primary forest, characterized by a dense canopy and a direct boundary with the Bukit Barisan Nature Reserve (Tahura), contains numerous tributary streams and water-filled depressions that serve as ideal amphibian habitats. This research needs to be done as data and references about biodiversity in Sibolangit Sub-district, Durin Serugun Village which has never been reported. The natural wealth within should be an important reason for the Durin Serugun Village Forest as a buffer for the Bukit Barisan Tahura to be preserved from conversion, deforestation and other damage. The presence of amphibians in an ecosystem is an indicator of the health of the natural ecosystem of their habitat. The Natural Forest in Sibolangit Sub-district is the headwaters of important rivers that flow into Medan City, namely the Deli River and Belawan River (Handayani *et al.*, 2024) and is a source of water for the surrounding Medan City community.

MATERIAL AND METHOD

Research was conducted in April 2025 in the primary forest of Durin Serugun Village, Sibolangit District, Deli Serdang Regency, North Sumatra. The Durin Serugun Village Forest lies within the Sibolangit District, Deli Serdang Regency, North Sumatra. It shares boundaries with Bandar Baru Village, Ujung Deleng Village, and the Bukit Barisan Nature Reserve (Tahura). The site is located approximately 48 km from Medan City. It is designated both as a conservation forest and as a customary forest. High annual rainfall and relative humidity, together with an intact forest canopy, maintain stable microclimatic conditions of moisture and temperature. Several tributaries

originate within this forest, forming the headwaters of the Deli and Belawan Rivers, which supply freshwater to Medan City and Deli Serdang Regency. These well-preserved hydrological and microclimatic conditions provide optimal habitats

for amphibians, which require proximity to aquatic environments. Today, the Durin Serugun Village Forest supports diverse flora and fauna, including both aquatic and terrestrial amphibian species (Figure 1).



Figure 1. Map and amphibian survey habitats in the Durin Serugun Village Forest, Sibolangit. A & B. Survey location maps; C. Terrestrial habitat; D. Aquatic habitat.

Materials

The tools and materials used are as follows: compass, GPS, measuring tape, tally sheet, headlamp/flashlight, batteries, tape, camera, net, plastic bags, caliper, scales, writing instruments, label paper, hanging labels, thermohygrometer, tissue, sample bottles, knife, scissors, syringe, needle, cotton, alcohol 70%, alcohol 96%, formalin 4%, and the identification guidebook and journal by (Aulan et al., 2024; Ginting et al., 2020; Iskandar, 1998; Kamsi, 2003; Kurniati, 2005; Putra & Siregar, 2014; Rosifa et al., 2024; Rusli, 2019; Siregar, 2010).

Procedure

The methods used were the Visual Encounter Survey (VES) method and the exploration method with purposive route setting in two habitats (aquatic and terrestrial) that were suspected to have the potential for amphibians to be found. The observation route was 600 meters long for each habitat type (aquatic and terrestrial). Observations were conducted at night from 19.00 to 24.00 WIB.

Each sample found was then collected, recorded, and documented. The samples were then identified at the Alifa Agricultural Research Center Laboratory using identification guidebooks and journals: (Aulan et al., 2024; Ginting et al., 2020; Iskandar, 1998; Kamsi, 2003; Kurniati, 2005; Putra & Siregar, 2014; Rosifa et al., 2024; Rusli, 2019; Siregar, 2010).

RESULTS AND DISCUSSION

Results

The Durin Serugun Village Customary Forest is a customary forest that borders directly with the Bukit Barisan Nature Reserve (Tahura). The dense forest canopy cover, accompanied by numerous small rivers, provides a suitable habitat for various flora and fauna, especially amphibians. The condition of forests that are still preserved by exploitation and land conversion activities. However, even preserved forests like these can potentially suffer damage if there are insufficient reasons to implement strong and strict biodiversity protection and conservation efforts to protect the

balance of the ecosystems formed within them. The condition of forests that are still preserved by exploitation and land conversion activities. However, even preserved forests like these can potentially suffer damage if there are insufficient reasons to implement strong and strict biodiversity protection and conservation efforts to protect the balance of the ecosystems formed within them.

Located at an altitude of 700–1,100 m above sea level, this primary forest was surveyed at an altitude of 950–1,010 m. During sampling, the ambient air temperature ranged from 21–24 °C with a relative humidity of around 99%. This

indicates that the forest is still in good condition. The dense forest acts as a natural umbrella, shading the ground from direct sunlight and blocking the wind. This reduces water evaporation from the soil and increases the relative humidity in the forest. Air humidity is greatly influenced by air temperature; when the air temperature increases, the air humidity decreases (Karyati et al., 2016), which is consistent with the temperature conditions at the study site. Our study identified 15 amphibian species, representing five families, in terrestrial, aquatic, and arboreal habitats (Table 1).

Table 1. Amphibian species recorded in the Durin Serugun Village Forest, Sibolangit, across three habitat types.

Amphibian species	Family
Terrestrial	
<i>Ingerophrynus divergens</i> (Peters, 1871)	Bufonidae
<i>Pelobatrachus nasutus</i> (Schlegel, 1858)	Megophryidae
<i>Phrynomantis juxtasper</i> (Inger, 1964)	Bufonidae
Aquatic	
<i>Chalcorana parvaccola</i> (Inger, Stuart & Iskandar, 2009)	Ranidae
<i>Leptophryne borbonica</i> (Tschudi, 1838)	Bufonidae
<i>Limnonectes blythii</i> (Boulenger, 1920)	Dicroglossidae
<i>Limnonectes kuhlii</i> (Tschudi, 1938)	Dicroglossidae
<i>Limnonectes laticeps</i> (Boulenger, 1828)	Dicroglossidae
<i>Limnonectes macrodon</i> (Dumeril & Bibron, 1841)	Dicroglossidae
<i>Limnonectes paramacrodon</i> (Inger, 1966)	Dicroglossidae
<i>Odorrana hosii</i> (Boulenger, 1891)	Ranidae
<i>Phrynomantis asper</i> (Gravenhorst, 1829)	Bufonidae
<i>Pulchrana sundabarat</i> (Chan, Abraham, Grimer & Brown, 2020)	Ranidae
<i>Sumaterana crassiovis</i> (Boulenger, 1920)	Ranidae
Arboreal	
<i>Rhacophorus catamitus</i> (Harvey, Pemberton & Smith, 2002)	Rhacophoridae

In contrast, our survey in the Durin Serugun Village Forest, Sibolangit, North Sumatra, recorded 15 species across five families, distributed among terrestrial, aquatic, and arboreal habitats. The results are summarized below:

Identification and Morphology of Amfibi

Terrestrial species

Ingerophrynus divergens (Peters, 1871)

Commonly known as the small-spined toad, this species ranges from 28 to 55 mm in snout–vent length. The head size is wider than its length and bears paired supraorbital–parietal crests. Dorsal skin is granular and predominantly gray. A cranial ridge extends from the eye to the posterior margin of the parotoid gland. The tympanum is distinct. Specimens were encountered on the forest floor among leaf litter. The species is distributed across Sumatra, Borneo, and Java, and has also

been reported from Peninsular Malaysia and Thailand in tropical rainforest at elevations of 400 m a.s.l. (Kurniawan et al., 2022).

Pelobatrachus nasutus (Schlegel, 1858)

This large-bodied frog (70–130 mm SVL) is robust with a short, stout build. Dorsal skin is smooth except for dorsolateral folds and scattered tubercles on the posterior dorsum. Dorsal colouration is usually reddish-brown or brown, while the venter exhibits broad black mottling, providing effective camouflage among dry leaf litter. The head is large, and the eyes are overlaid by conical dermal projections that continue anteriorly to the snout tip. Specimens were found on the forest floor, in flooded zones, and in leaf litter. The species occurs from Peninsular Malaysia and Singapore to Sumatra, Java, and Borneo in tropical rainforest habitats (Munir et al., 2018).

Phrynoidis juxtasper (Inger, 1964)

The giant river toad exhibits a large body size (males 90–215 mm SVL) and entirely tuberculate dorsal skin. Colouration is generally dark gray, brown, or black, occasionally with faint darker spots on the posterior dorsum. Lateral surfaces of males often display reddish hues. Parotoid glands are elongated, extending from the orbit posteriorly and are typically two to four times longer than wide. All digits terminate in broad tips except the fourth toe. Specimens were observed on the forest floor near streams. The species is known from Sumatra and Borneo (Kamsi et al., 2017).

Aquatic

Chalcorana parvaccola (Inger, Stuart & Iskandar, 2009)

This small to medium-sized frog (males 30–65 mm SVL) has dorsal skin covered in very fine granular tubercles, giving a sandpaper-like texture. Its colouration ranges from dirty greenish-gray to yellowish-brown. The throat usually bears irregular longitudinal stripes that often break into spots. The tympanum is dark brown. Limbs are long and slender, with full webbing extending to the tips of all toes except the fourth. Specimens were encountered in still water along river margins, among rocks and rock ledges. *C. parvaccola* is part of the cryptic species of *Rana chalconota* Boulenger, synonymous with *Chalcorana chalconota* (Efendi et al., 2023). The *C. chalconota* species has a larger body size (SVL) compared to the continental form and the *C. parvaccola* species (Inger et al., 2009). This species is endemic to Sumatra (IUCN Red List, 2025; Kennedy et al., 2024; Kurniati & Mujiono, 2020).

Leptophryne borbonica (Tschudi, 1838)

This slender, small toad (males 20–45 mm SVL) exhibits a granular skin texture resembling coarse sand over most of its body, becoming more pronounced laterally. Dorsal colouration is grayish-brown. Ventral surfaces, throat, and limbs exhibit reddish patches on the anterior and posterior thighs, while the dorsum of the thighs matches the overall body colour. Parotoid glands are indistinct. Some specimens display a black segmented pattern posterior to the orbit and an hourglass-shaped marking on the dorsum. Toe webbing does not reach the subarticular tubercles of the third and fifth toes. Specimens were found on rocks and fallen logs within river channels. This

species occurs in Thailand, Peninsular Malaysia, Sumatra, Java, and Borneo (Iskandar, 1998).

Limnonectes blythii (Boulenger, 1920)

A large frog (85–250 mm SVL) with smooth skin. Dorsal colouration varies from reddish-brown to brown, often with a dark brown stripe extending from the nostril to the eye. The snout is sharply pointed. Hind limbs are long, powerful, and fully webbed to the toe joints. A conspicuous dark interorbital bar and a “W”-shaped marking on the shoulder are frequently present. Specimens were observed in flowing streams and, occasionally, on the forest floor. This species is known from Peninsular Malaysia and Sumatra (Kamsi et al., 2017).

Limnonectes kuhlii (Tschudi, 1938)

This medium-sized frog (males 44–74 mm SVL) has wrinkled skin densely covered with star-shaped tubercles. Dorsal colouration ranges from muddy brown to marbled black. The tympanum is indistinct. The head is broad with well-developed temporal muscles. Hind toes are fully webbed to the tips. Limbs are short and muscular. A clear supratympanic fold is present. The species inhabits riverine environments throughout Southeast Asia, including Sumatra and Java (Iskandar, 1998).

Limnonectes laticeps (Boulenger, 1828)

This small to medium-sized frog (28–40 mm SVL) resembles *L. kuhlii* but can be distinguished by incomplete toe webbing on the hind limbs. Dorsal skin is slightly rough and wrinkled. Dorsal colouration is dark brown to reddish, with irregular dark spots and a brown or black interorbital stripe. A broken transverse stripe is often present on the limbs. The ventral surface of the head frequently bears brown speckles, while the belly is white to gray. This species is rarely encountered along stream banks and is known from Sumatra and Borneo (Kamsi et al., 2017).

Limnonectes macrodon (Dumeril & Bibron, 1841)

A large frog measuring 100–150 mm in snout–vent length, with smooth skin interspersed by small dorsal tubercles. Fine tubercles are also present on the eyelids. Toes are fully webbed to the tips. Dorsal colouration ranges from reddish-brown to dark brown. Specimens were found on rocks and fallen logs along stream channels. This species inhabits clear, rocky streams in Java and Sumatra (Iskandar, 1998)(Kurniawan et al., 2022).

Limnonectes paramacrodon (Inger, 1966)

A medium-sized frog with a maximum length of approximately 70 mm. A distinctive black facial stripe crossing the eye gives rise to its common name, the masked frog. A triangular black patch often covers the tympanum. A pale, narrow dorsal stripe extends between the eyes across the posterior head. Dorsal skin is rough and brown, while the groin and posterior thighs frequently exhibit yellow pigmentation. This species occurs from Thailand and Peninsular Malaysia to Singapore, Sumatra, and Borneo (Das et al., 2015; Kamsi et al., 2017).

Odorrana hosii (Boulenger, 1891)

A medium to large frog (45–100 mm SVL) with smooth skin and variable colouration, typically olive-green, brown, or greenish-brown. Flanks are often darker to blackish, extending from the snout through the eye to the groin. A weak but distinct dorsolateral fold is present. Odor-producing glands in the skin emit a foul scent when handled. The body is slender with long hind limbs. Both front and hind toes bear well-defined disc pads and circum-marginal grooves. Toe webbing reaches the discs. Specimens were located on stones, tree trunks, cliff faces, and branches adjacent to streams. The species occurs in Thailand, Peninsular Malaysia, Sumatra, Java, and Borneo (Iskandar, 1998).

Phrynoidis asper (Gravenhorst, 1829)

Known as the river toad, this large species (males 70–120 mm SVL) has rough, tuberculate skin covered in spiny warts. Dorsal colouration is dull brown, grayish, or blackish. The venter usually has black speckling, and males often exhibit a dark or reddish throat. A supraorbital groove connects to the parotid gland via the supratympanic groove. Specimens were observed along riverbanks. This toad is distributed across Sumatra, Java, Borneo, and Peninsular Malaysia (Kamsi et al., 2017; Siregar, 2010).

Pulchrana sundabarat (Chan, Abraham, Grimer & Brown, 2020)

A small to medium-sized frog (males 38–65 mm SVL) with very fine dorsal tubercles. Dorsal colouration ranges from dark brown to black, transitioning to gray or white ventrally. The ventral gray may darken by day. The head is long and broad with a rounded snout. The distance between

the eye and the nostril is slightly acute. Both front and hind toes bear small but distinct discs. The first toe exceeds the second in length. Toe webbing is rudimentary at the base, with the fourth and fifth toes slightly elongated. This species inhabits lowland to hilly forest streams up to 850 m a.s.l. in southern Thailand, Peninsular Malaysia, and Sumatra. In Durin Serugun Village Forest, it was recorded above 1,000 m a.s.l. (Chan et al., 2020).

Sumatrana crassiovis (Boulenger, 1920)

A frog ranging from 30 to 85 mm SVL, with dorsal colouration varying from light to dark green and overlaid by black and brown mottling that resembles batik patterns. The vent is pale white. The skin is smooth with fine granules. Eyes are large with prominent eyelids, golden to brown in colour, and vertically elliptical pupils. The tympanum is distinct and smaller than the eye, with a short supratympanic fold behind the orbit. Toe and finger discs are expanded into diamond-shaped pads. Hind toes are fully webbed. The genus *Sumatrana* is a new genus described by (Arifin, Smart, et al., 2018), previously known as *Chalorana kampeni* and *Chalcorana crassiovis*. This is based on the characteristic of the tadpole stage abdomen, which has a kind of adhesive device as an adaptation to fast-flowing rivers called gastromyzophorous, a type that is very rarely found. This species is only found in clear, rocky river streams in Sumatra. This frog is also known as the Bandar Baru Frog or Kerinci Frog, which is an endemic species in Sumatra and this species is classified as Least Concern (Arifin et al., 2022; Arifin, Smart, et al., 2018; IUCN, 2018; Kurniati & Mujiono, 2020; Wulandari et al.).

Arboreal

Rhacophorus catamitus (Harvey, Pemberton & Smith, 2002)

This tree-dwelling frog measures 30–50 mm in snout–vent length and was observed along stream margins. The snout is blunt, and the first and second fingers of the forelimbs lack webbing. Both fore- and hind-feet bear slight dermal folds at their tips. The dorsal skin and head exhibit fine granulation. Dorsal colouration is brown with transverse dark bands, and white spots are typically present on the thighs and beneath the eyes. Occurs in the Barisan Mountains at an altitude of 1,068–1,680 m. Although in this study it was found at an altitude of between 700 and 1,100 m. This species is endemic to Sumatra (Harvey dkk., 2002; IUCN Red List., 2008 ; O'Connell dkk., 2020; Streicher dkk., 2012, 2014).

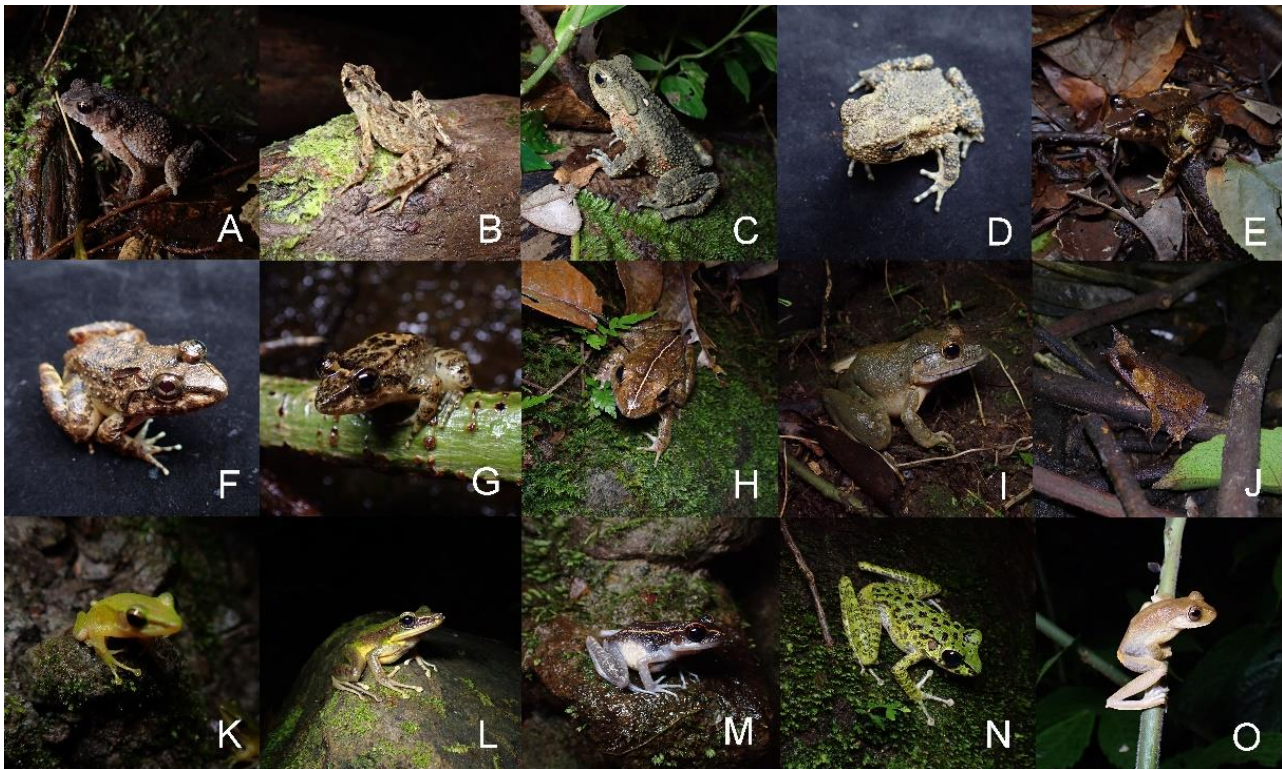


Figure 2. Amphibian species recorded in the Durin Serugun Village Forest, Sibolangit, North Sumatra: A. *Ingerophrynus divergens*; B. *Leptophryne borbonica*; C. *Phrynoidis asper*; D. *Phrynoidis juxtasper*; E. *Lumnonectes blythii*; F. *Limnonectes kuhlii*; G. *Limnonectes laticeps*; H. *Limnonectes paramacrodon*; I. *Limnonectes macrodon*; J. *Pelobathracus nasutus*; K. *Chalcorana parvaccola*; L. *Odorrana hosii*; M. *Pulchrana sundabarat*; N. *Sumaterana crassiovis*; O. *Rhacophorus catamitus*.

DISCUSSION

Based on previous herpetological surveys in Sibolangit District, Deli Serdang, North Sumatra, (Siregar, 2010) reported at least 27 amphibian species from the Sibolangit Wildlife Reserve/ Conservation Area and adjacent villages. This represents the highest species count among studies to date, likely owing to its broader spatial coverage and more extensive field exploration documented 13 species in Bukum Village, Sibolangit (Ginting et al., 2020) and (Rosifa et al., 2024). Research in Durin Serugun Village has never been conducted before, while several research reports from different locations but still within the Sibolangit District, such as TWA/CA Sibolangit and Sembahe Village and its surroundings by (Siregar, 2010), reported 23 species of amphibians found. The results of this study are classified as having the highest number of species compared to other locations, with 7 species found in this study (*I. divergens*, *P. juxtasper*, *L. borbonica*, *L. blythii*, *L. kuhlii*, *O. hosii*, *P. asper*). Another study in Bukum Village by Ginting et al. (2020) found 6 families consisting of 9 species, with 3 of the same species (*Phrynoidis juxtasper*, *L. borbonica*, *L. blythii*),

while Rosifa et al. (2024) in Bukum Village found 4 families consisting of 13 species, with 5 of the same species (*Phrynoidis juxtasper*, *L. borbonica*, *L. blythii*, *L. kuhlii*, *L. macrodon*, and *O. hosii*) as in this study. Based on this comparison, there is an increase of up to 50% in new species identified in this study compared to previous research data (Siregar, 2010; Ginting et al., 2020; Rosifa et al., 2024). The percentage of species based on habitat shows that amphibians are more commonly found in aquatic habitats (73%) than in terrestrial habitats (20%), the data proves that the Durin Selugur Village Forest, which is dominated by small rivers and pools of water, is the habitat of many amphibians that were found. This study further adds to the information on amphibian species in North Sumatra.

The results show that there are three types of Sumatran endemics. Endemic species are native species that are only found in certain areas and not found in other areas, which are the result of the natural evolutionary process of biota to become unique to a particular geographical area (Inger & Voris 2001). According to (Iskandar & Erdelen, 2006), Indonesian herpetofauna is generally not well known, and the distribution of a species is

very little known. Considering the rapid rate of logging and forest conversion, efforts to protect biological components (in this case amphibians and reptiles) are urgently needed. Almost all protection statuses, both nationally and according to IUCN or CITES categories, are not widely known or understood.

Three endemic species in Sumatra: *C. parvaccola*, *S. crassiovis*, and *R. catamitus* are classified as Least Concern (LC) or low risk because their populations are considered stable, abundant, or not experiencing significant decline. However, amphibians are a vulnerable species that are easily disturbed by destructive activities. In addition, Arifin et al. (2022) have clearly demonstrated that frog diversity in Sumatra is still far from complete, and it is estimated that new species will continue to be discovered in the future. The number of species reported in Sumatra continues to increase, reinforcing the urgency to preserve forest areas due to the diversity that needs to be conserved. This includes proper management and the involvement of local communities.

CONCLUSION

A total of 15 amphibian collection records were obtained from the Durin Serugun Village Forest, Sibolangit, North Sumatra. These specimens represent 10 genera across five families and span three terrestrial, eleven aquatic, and one arboreal species. The five families are Bufonidae (4 species), Megophryidae (1 species), Ranidae (4 species), Dicroglossidae (5 species), and Rhacophoridae (1 species). Three species are endemic to Sumatra: *C. parvaccola*, *S. crassiovis*, and *R. catamitus*. The forest area of Durin Serugun Village is a customary forest and borders directly on the Bukit Barisan National Park, which acts as a buffer zone and needs to be preserved. The flora and fauna play their respective roles in the ecosystem, food chain and ecological functions. In addition, fauna such as amphibians serve as unique biodiversity assets and as bioindicators of ecosystem and environmental health. The existence of amphibians is inseparable from the preservation of their habitat from environmental damage such as deforestation and other forms of destruction. Reports on amphibians in this location are expected to be an important reason for all relevant parties to take firm and serious steps to protect and preserve the area. The existence of several endemic species is proof that the rich fauna, such as amphibians, found in the Durin Serugun Village Forest, Sibolangit, North Sumatra, needs to be protected for its sustainability. The results of this study reveal the existence of amphibian species as

an improvement in the quality of data on amphibians in North Sumatra, especially in the Durin Serugun Village, Sibolangit District. The data from this study is also important for broader and more in-depth exploration.

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