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# Calamaria mizoramensis — A New Reed Snake Species from Mizoram and What It Reveals About Northeast India's Biodiversity

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**SUBJECTS COVERED****ENVIRONMENT****SCIENCE & TECH****CURATED & WRITTEN BY****Bharat Choudhary**

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## WHY IN NEWS

Scientists at Mizoram University discovered *Calamaria mizoramensis* — a new species of reed snake from the humid forests of Mizoram — bringing the global *Calamaria* genus total to 70 species and Mizoram's herpetofauna count to 169. Published in *Zootaxa*, this discovery underscores Northeast India's status as a global biodiversity hotspot with significant undiscovered fauna.

## THE REED SNAKE: BIOLOGY AND CLASSIFICATION

**Calamaria** (reed snakes) are small, slender, burrowing snakes in the family **Colubridae** — one of the world's largest snake families. They are among the most species-rich genera of Southeast and South Asian snakes, yet also among the least studied because of their cryptic, fossorial lifestyle.

### Key characteristics of the genus *Calamaria*:

**Size:** Typically 15–35 cm long (among the smallest snakes in their range)

**Appearance:** Cylindrical, uniform-coloured bodies; small, blunt heads with minimal distinction from the neck — adaptations for burrowing

**Diet:** Earthworms, small insect larvae, other invertebrates — not a predator of vertebrates

**Behaviour:** Nocturnal and semi-fossorial (partially subterranean); rarely seen on the surface except at night or after rain

**Distribution:** Southeast Asia, South Asia, China — primarily in humid tropical and subtropical forests

### The new species — *Calamaria mizoramensis*:

**Colour:** Dark brown to blackish with faint dorsolateral stripes; yellow or cream-coloured underside

**Elevation:** Found at **670–1,295 metres** in humid, forested hill terrain

**Behaviour:** Nocturnal; semi-fossorial; found in leaf litter and under logs

**Non-venomous:** Like most *Calamaria* species; poses no danger to humans

## NORTHEAST INDIA AS A BIODIVERSITY HOTSPOT

This discovery is not an accident of luck — it reflects Northeast India’s biological significance.

### Why the Northeast is a global biodiversity epicentre:

**Biogeographic crossroads:** Northeast India sits at the junction of the **Himalayan, Indo-Burma, and Indo-Malayan biogeographic regions** — three of the world’s 36 biodiversity hotspots intersect here. Species evolved separately in each region meet here, creating extraordinary endemism.

**Forest cover:** Mizoram has **~86% forest cover** — the second-highest of any state in India (after Lakshadweep for UTs). Dense, intact forest provides habitat for species lost elsewhere.

**Altitudinal diversity:** From lowland tropical forests at 150m to high-altitude montane forests at 2,000m+ creates microhabitat diversity that supports thousands of species variants.

**Low research intensity:** Despite biodiversity richness, Northeast India has historically received less taxonomic research investment than the Western Ghats. Fewer scientists studying means more species remain undescribed — which paradoxically means more discoveries per research effort.

**Mizoram’s herpetofauna (reptiles + amphibians):** Before *C. mizoramensis*: 168 species After this discovery: **169 species** — among the highest in any Indian state

## WHAT “PUBLISHING IN ZOOTAXA” MEANS

**Zootaxa** is the world’s largest peer-reviewed journal for zoological taxonomy, published by Magnolia Press (New Zealand). Publishing a new species in Zootaxa follows a defined process:

**Field collection:** Specimen collected by researchers; preserved and catalogued

**Morphological comparison:** Detailed measurements (scale counts, body proportions, colouration pattern) compared with all known species in the genus

**Molecular analysis (if applicable):** DNA barcoding or mitochondrial sequencing to confirm genetic distinctiveness

**Peer review:** Submitted to Zootaxa; reviewed by expert taxonomists

**Publication + registration:** Once published, species name registered in **ZooBank** (official ICZN registry of animal names)

Under the **International Code of Zoological Nomenclature (ICZN)**, a new species formally exists only when:

A type specimen is designated (holotype)

It is described in a peer-reviewed publication

*Calamaria mizoramensis* now has official taxonomic standing — it is a recognised species in science.

## INDIA'S SPECIES DISCOVERY LANDSCAPE

India has been reporting 400–500 new species annually in recent years — one of the highest rates in the world:

Taxonomic Group	India's Global Rank	Notable Northeast Species
Reptiles	~6th globally	Multiple Calotes, Cyrtodactylus, Calamaria spp
Amphibians	~8th	Nyctibatrachus (Kerala), multiple Mizoram frogs
Flowering plants	~6th	Arunachal's orchid diversity (900+ species)
Freshwater fish	~8th	Schistura loaches, Psilorhynchus spp

### Why new species continue to be found in India:

Underfunded taxonomy research being revived under DST/DBT schemes

Molecular tools (DNA barcoding) revealing cryptic species that look identical morphologically but are genetically distinct

Field surveys in previously inaccessible areas (border zones, high-altitude terrain)

Collaborations between Indian and international taxonomists

## CONSERVATION SIGNIFICANCE

New species discoveries raise immediate conservation questions:

**Is *Calamaria mizoramensis* endangered?** We don't know yet. The species has just been described; IUCN assessment requires population surveys, range mapping, and threat assessment — a process that takes years after initial discovery. Many newly described species are immediately placed in "Data Deficient" category.

### Mizoram's wildlife threats:

**Jhum (slash-and-burn) cultivation:** Traditional shifting agriculture; creates forest fragmentation at lower elevations

**Development pressure:** Road construction, hydropower projects (Tuivai Project)

**Climate change:** Changes precipitation patterns, affecting moisture-dependent species in montane forests

**Illegal wildlife trade:** Northeast India is a corridor for wildlife trafficking to Southeast Asian markets

**Conservation implication:** The discovery of *C. mizoramensis* adds to the scientific case for maintaining Mizoram's high forest cover. A species found only in a specific elevation band in a single state has an extremely restricted range — any habitat degradation in that zone could threaten the entire species.

## UPSC RELEVANCE

**Prelims:** *Calamaria mizoramensis* (non-venomous reed snake; Mizoram University; Zootaxa journal; 70 global *Calamaria* spp; 169 Mizoram herpetofauna; semi-fossorial; nocturnal; elevation 670-1,295m); Indo-Burma biodiversity hotspot; ICZN (International Code of Zoological Nomenclature); ZooBank; holotype; Colubridae (snake family); Mizoram forest cover (~86%; 2nd highest in India); Biodiversity hotspot definition (Norman Myers 1988: >1,500 endemic plant species + <30% original habitat).

**Mains GS-3:** Northeast India as biodiversity hotspot — ecological significance and conservation challenges | Taxonomy research in India — gaps, funding, and institutional capacity | Species discovery rate vs habitat loss — is India winning or losing the race? | Jhum cultivation and forest conservation — balancing tribal livelihood with biodiversity.

## ★ FACTS CORNER — KNOWLEDGE PEDIA

### CALAMARIA MIZORAMENSIS:

Common name: Mizoram Reed Snake  
 Family: Colubridae; Genus: Calamaria  
 Non-venomous; nocturnal; semi-fossorial  
 Habitat: Humid forested hills, 670–1,295m elevation; Mizoram  
 Discovered by: Mizoram University researchers  
 Published in: Zootaxa (world's largest zoological taxonomy journal)  
 Global Calamaria count after discovery: 70 species  
 Mizoram herpetofauna count: 169 species (reptiles + amphibians)

### BIODIVERSITY HOTSPOTS (INDIA'S):

Western Ghats + Sri Lanka: ~8,000 plant species; 77% endemic plants; 6 states + SL  
 Eastern Himalayas (includes Northeast India): ~9,000 plant species  
 Indo-Burma (includes Mizoram, Manipur, Nagaland, parts of Assam, Tripura, Meghalaya): ~13,500 plant species; rich in freshwater biodiversity  
 Sundaland: Nicobar Islands (part of)

### NORTHEAST INDIA BIODIVERSITY DATA:

States: Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim  
 Mizoram forest cover: ~86% (among highest in India)  
 Arunachal Pradesh: highest orchid diversity in India (900+ species)  
 Manipur: Loktak Lake (India's largest freshwater lake in northeast); Keibul Lamjao NP (world's only floating NP)

### COLUBRIDAE FAMILY:

Largest snake family: ~1,800+ species globally  
 Mostly non-venomous; some rear-fanged mildly venomous  
 Indian colubrids: Rat snakes, Wolf snakes, Reed snakes, Green snakes, Keelbacks  
 Distinguished from: Elapidae (cobras, kraits — front-fanged, highly venomous) and Viperidae (vipers — solenoglyphous fangs)

### TAXONOMIC PROCESS:

ICZN: International Code of Zoological Nomenclature; governs animal species naming  
 ZooBank: Official ICZN registry; species must be registered here for validity  
 Holotype: Primary reference specimen designating a species  
 Cryptic species: Morphologically similar but genetically distinct species

### INDIA'S SPECIES DISCOVERY RATE:

~400-500 new species per year (various taxonomic groups)  
 Reptile new species: ~20-30 per year  
 Major institutions: WII (Wildlife Institute of India), ZSI (Zoological Survey of India), regional universities

### OTHER RELEVANT FACTS:

ZSI (Zoological Survey of India): Kolkata; established 1916; responsible for faunal surveys; Animal Discovery India programme

BSI (Botanical Survey of India): Kolkata; established 1890; plant taxonomy

Wildlife Protection Act 1972: Schedule I/II/III/IV for protection of different species; Colubridae snakes are protected under Schedule II

Jhum cultivation: Also called swidden agriculture; traditional in hill communities of Northeast; Forest Rights Act 2006 protects community rights over jhum lands

Sources: Mizoram University, Zootaxa, ZSI, IUCN Red List

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