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## Herpatofaunal diversity in Chillavaripalli and Ellutla reserve forests of Ananthapuramu district, Andhra Pradesh

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### Abstract

Present study was conducted in Chillavaripalli and Ellutla reserve forest, to understand the diversity of both amphibian and reptiles (Herpatofauna) from the study area. Study area is located in Ananthapuram district of Andhra Pradesh, India. Present study was conducted during October 2015 to September 2016. Appropriate scientific methods such as pitfall trap method and Visual encounter method were adopted to enumerate the herpatofaunal diversity from the study region. In this study, we have recorded a total 10 Amphibian species which were belongs to 4 families and 25 reptile species which were belong to 11 families were recorded from the study region. Among 25 reptilian species *Varanus bangalensis*, *Python molurus* are listed under Schedule-I of Indian Wildlife Protection Act, 1972. Forest fires, killing, hunting, and biotic stress like grazing and browsing are the main threats to the herpatofauna of the study area.

**Keywords:** Herpatofauna, Anantapur, IWPA, *Varanus bangalensis*, *Python molurus*

### Introduction

Herpatofaunal species are the indicator species in an environment and also these species help to understand or assess the health of an ecosystem. Herpatofaunal species occupies important tropical level in pyramid of food and they acts as key stone species in an ecosystem by controlling population of pests, and standing as prey for many predators. Their loss may affect delicate balance of predator ecosystem dynamics, herpatofauna assist in terrestrial-aquatic linkages in transferring nutrients from aquatic to terrestrial ecosystems [1]. Recent population studies on herpatofauna indicates that, there are 6347 amphibian and 8863 reptile species reported worldwide [2-3] among these species 32.5% of all known amphibians and 22% of reptiles are endangered, 122 amphibians and 22 reptile species currently are extinct from the wild [4]. Like many other group of animals the population of herpatofaunal species are under continuous threat due to various factors like habitat loss, fragmentation of habitat and climate change [5-9].

In Andhra Pradesh, several studies was done on herpatofaunal diversity and distribution by various researchers in different parts like Nallamala Hills, Nagarjunasagar, Srisailem Tiger Reserve, Eastern Ghats, Rayalaseema, Seshachalam Biosphere Reserve [10-22]. This Present study on herpatofaunal diversity will provide additional information to the Ananthapuramu district of Rayalaseema region. The main aim of this study is to document the herpatofaunal species and identifying their habitats and status from the study region.

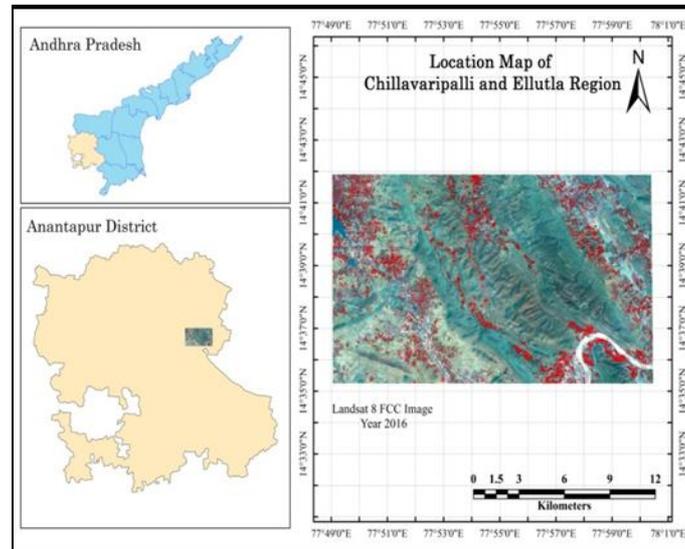
### Study area

Chillavaripalli and Ellutla Reserve Forest is located in Narpala mandal of Anantapur district, Andhra Pradesh, India. It lies between latitude 14°35'10"N to 14°41'50"N and 77°49'00" E to 78°00'00" E at an elevation of 585 M above the sea level (Figure 1). The reserve forest has grasslands and shrubby flora lacking prominent deep-rooted vegetation. The area is amidst unbroken chain of rugged hills. H.G.Champion and Seth (1968) [23] have classified these forests as 6A/C1 Southern Tropical Thorny Forests.

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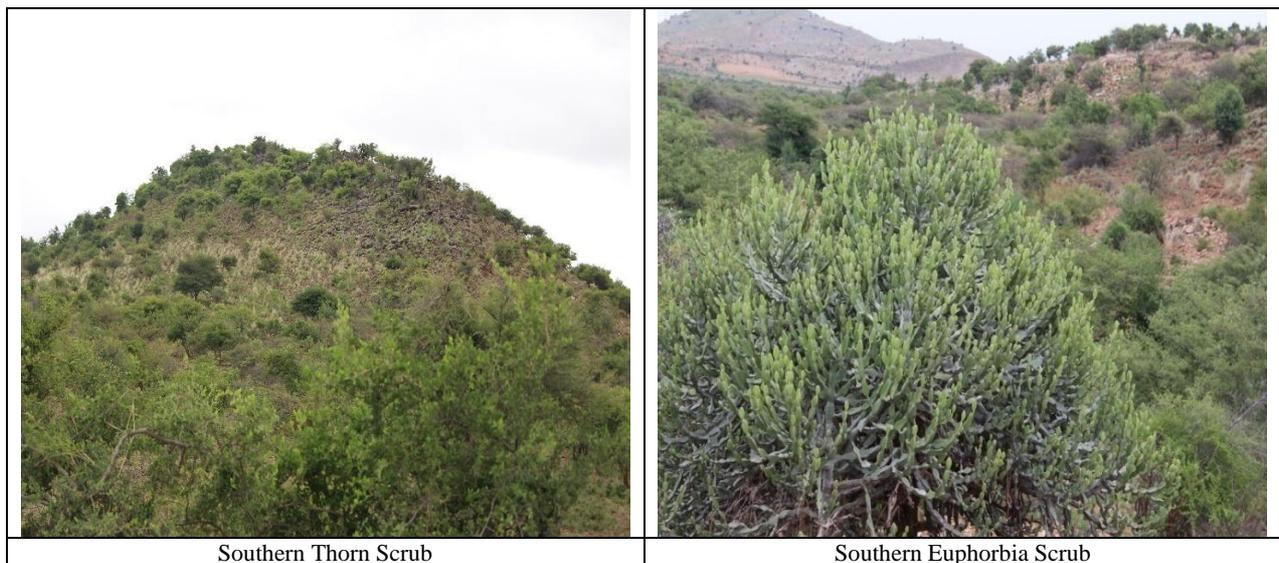


**Fig 1:** Location map of Chillavaripalli and Ellutla Reserve forests.

### Vegetation of the study area

The top canopy of study area comprises *Albizzia amara*, *Chloroxylon sweitenia*, *Feronia limonia*, *Canthium didynium*, *Wrightia tinctoria* etc, Middle canopy comprises of *Cassia fistula*, *Bauhinia rasimosa*, *Acacia Arabica*, *Acacia sundra*, *Dichrosta chiscinerea*, *Dolichendron flacata*, *Cassia carandusetc.*, Shrubs comprises of *Randia dumetorum*, *Gymnosporia montana*, *Gmelina asiatica*, *Zizyphus*

*numularia*, *Ixora arborea*, *Cadaba fruiticosa*, *Cassia auriculata.*, *Euphorbia antiquorum*, *Acacia ferruginea.*, *Acacia planifrons.*, *Acacia torta.*, *Acacia horrida.*, *Ziziphus glabrata.*, *Scutia myrtina.*, *Rhus mysurensis.*, *Canthium coromandelianum.*, *Capparis sp.* *Senna alexandrina.*, Grasses that represent are *Sympopogan collaratus*, *Heteropogan contortus*, *Panicum repens*, *Cynodon dactylone* etc [24].



**Fig 2:** Vegetation of the study area

### Methodology

Survey was carried out between 22<sup>nd</sup> October 2015 to September 16<sup>th</sup> 2016. Samplings were carried out three times a week during the rainy season and once a week during the end of season, for a total of 90 days. Adopted standard methods such as pitfall trap method and visual encounter survey (VES) method were used for enumerating or assessing herpatofaunal diversity in various habitats of study region study region [25-26]. Animals were located by lifting stones, under rocks, fallen leaves, trees and peeling barks of trees during the early hours, afternoon and evening in the day time and before midnight during night time. During this study, photographs were taken for further identification of the species. Identification of

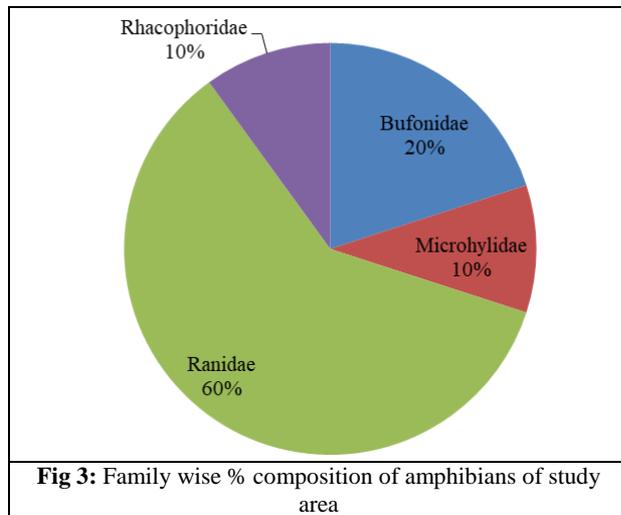
species has done by using various standard field guides [27-28]. Density of identified species were calculated on the average percentage of sightings which is represented as abundant (70 to 100%), common (50 to 70%), frequent (20 to 50%) and rare (0 to 20%) [22].

### Results

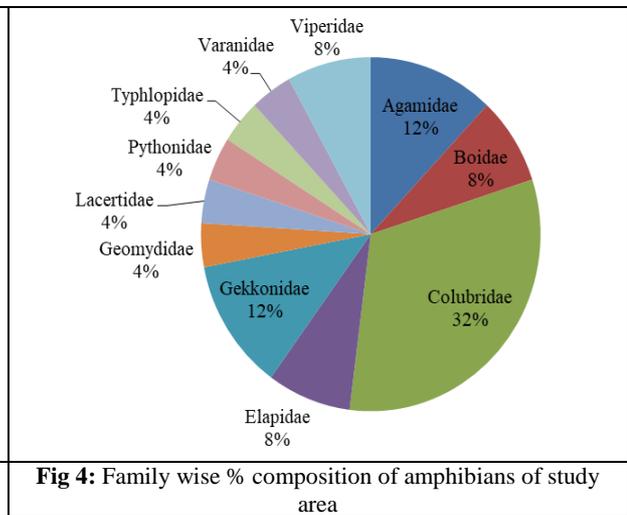
A total 35 herpatofaunal species (Amphibians and Reptiles) which were belong to 15 families were documented from the study region. The detailed checklist of recorded amphibian and reptiles has given in table1. Among these 35 herpatofaunal species, 10 amphibian species and 25 reptilian species were recorded. 10 amphibian species belong to four

families namely Bufonidae (2species), Microhylidae (1species), Ranidae (6species), Rhacophoridae (1species) were recorded from the study region. Family Ranidae was found to be the most dominant amphibian family in the study region (Figure 3). 25 reptilian species belongs to 11 families namely Agamidae (3species), Boidae (2species), Colubridae

(8species), Elapidae (2species), Gekkonidae (3species), Geomydidae (1species), Lacertidae (1species), Pythonidae (1species), Typhlopidae (1species), Varanidae (1species), Viperidae (2 species).Among all reptilian families Colubridae is most dominant family in the study region (Figure 4).



**Fig 3:** Family wise % composition of amphibians of study area



**Fig 4:** Family wise % composition of reptiles of study area

**Table 1:** Checklist of herpetofaunal species of the study area.

S. No.	Common name	Scientific Name	Family	Habitat and distribution	IUCN Status	Density
<b>Amphibians</b>						
1	Common toad	<i>Duttaphrynus melanostictus</i>	Bufonidae	Bush lands, meadows, arid areas, The species spawns and larval development takes place in still waters.	LR-lc	A
2	Ferguson's Toad	<i>Duttaphrynus scaber</i>	Bufonidae	Dry scrubland, grassland and rural farmland areas. Larvae are aquatic and occur in stagnant waters.	LR-lc	A
3	Indian narrow-mouthed frog	<i>Microhyla rubra</i>	Microhylidae	Dry forest, shrub land and grassland, agricultural land and often close to human habitation. Larvae are aquatic and occur in stagnant waters	LR-lc	A
4	Indian bull frog	<i>Hoplobatrachus tigerinus</i>	Ranidae	Inhabiting mostly freshwater wetlands, It is absent or uncommon in forested areas and coastal regions (Fugler, 1983). Breeding takes place during the monsoon season, when adults congregate at ephemeral rainwater pools.	LR-lc	A
5	Skittering frog	<i>Euphlyctis cyanophlyctis</i> (Schneider, 1799)	Ranidae	Wet lands The species breeds, and the larvae develop, in suitable water bodies.	LR-lc	A
6	Cricket frog	<i>Fejervarya caperata</i> (Kuramoto, Joshy, Kurabayashi & (Sumida, 2007)	Ranidae	grassy or shrubby vegetation, species breeds in rainwater ponds, flooded fields, lowland swamps, tree holes, and roadside ditches	LR-lc	F
7	Indian Pond Frog	<i>Euphlyctis hexadactylus</i> (Lesson, 1834)	Ranidae	It is a largely aquatic species, found in most types of water bodies, and in various habitats, where it is associated with aquatic vegetation.	LR-lc	A
8	Indian Burrowing Frog	<i>Sphaerotheca rolandae</i>	Ranidae	It is a largely sub-fossorial species found in loose soil within dry forest, scrubland and agricultural areas.	LR-lc	R
9	Jerdon's bull frog	<i>Hoplobatrachus crassus</i>	Ranidae	It is a terrestrial species of seasonally flooded dry grasslands, open plains and arid areas. Breeding, and presumably larval development, takes place in many different types of water bodies.	LR-lc	A
10	Common Indian tree frog	<i>Polypedates maculatus</i>	Rhacophoridae	Dry and moist forests, grasslands, and agricultural areas and close to human habitations.	LR-lc	R
<b>Reptiles</b>						
1	Peninsular rock agama	<i>Psammophilus dorsalis</i>	Agamidae	Found in a variety of habitats, including dry and moist forests, and shrub lands.	LR-lc	A
2	Forest lizard	<i>Calotes spp.</i>	Agamidae	Arboreal, very rarely comes to the ground; this species is known to be diurnal. Feed on insects and other small animals, although a few also feed on plant matter as adults.	LR-lc	C
3	Peninsular rock agama	<i>Psammophilus dorsalis</i>	Agamidae			

4	Red sand boa	<i>Eryx johnii</i>	Boidae	Found in dry, semi-desert scrub plains and rocky dry foothills. It prefers loose sand, or sandy soil	LR-nt	F
5	Checkered keel back	<i>Xenochropis piscator</i>	Boidae	Widespread species also the most widespread fresh water snake. This is also the most common snake in and around human habitat	LR-lc	C
6	Indian rat snake	<i>Ptyas mucosa</i>	Colubridae	Remain hidden in dark and silent places like rat holes, termite mounds, wood caves, including rainforest, scrub lands, semi-desert, dry, moist and mixed forests	LR-nt	C
7	Indian garden lizard	<i>Calotes versicolor</i>	Colubridae	An oviparous, arboreal, insectivorous lizard found in India and across Asia. The lizard is very successful due to its ability to thrive in urban and other highly human-influenced environments, and thus occupies a very widespread geographic range.	LR-lc	C
8	Green vine snake	<i>Ahaetulla nastua</i>	Colubridae	Choose dense bushes and plantation to stay at a place without showing any movement. Hides in dense green vegetation of low height. Found both in hills and plains. Lives in variety of forests including mixed, dry and moist deciduous forests. Not found in deserts.	LR-lc	C
9	Common sand boa	<i>Gongylophis conicus</i>	Colubridae	Common Sand Boa genus of Burrowing Boas species of Indian subcontinent. Found commonly in agricultural lands and seen frequently during disturbing any kind of land having sandy soil.	LR-nt	C
10	Common cat snake	<i>Boiga trigonata</i>	Colubridae	Most widely distributed Boiga species of Indian subcontinent. This species can be found in almost all kind of forests and wide range of elevations.	LR-lc	C
11	Brook's gecko	<i>Hemidactylus brooki</i>	Colubridae	Thrives in warm, humid areas where it can crawl around on rotting wood in search of the insects it eats. The animal is very adaptable and may prey on insects and spiders, displacing other reptiles	LR-lc	C
12	Bronze back tree snake	<i>Dendrelaphis tristis</i>	Colubridae	This oviparous (egg laying animal snake. harmless snake prefers the tree tops to life on the ground.	LR-lc	A
13	Bark gecko	<i>Hemidactylus leschenaultia</i>	Colubridae	Most common in anthropogenic habitats.	LR-lc	C
14	Spectacled cobra	<i>Naja naja</i>	Elapidae	habitats but generally prefer open forest edges, fields, and the areas around villages,	LR-nt	C
15	Common Krait	<i>Bungarus caeruleus</i>	Elapidae	Its range comprises a wide variety of habitats. It is found in fields and low scrub jungle, as well as inhabited areas.	LR-nt	C
16	Termite hill gecko	<i>Hemidactylus triedrus</i>	Gekkonidae	Nocturnal and terrestrial; inhabits open forests and scrub land. It shelters during the day in rock cracks and rodent burrows.	LR-lc	A
17	Reticulated ground gecko	<i>Hemidactylus reticulatus</i>	Gekkonidae	Most specimens of this terrestrial, nocturnal gecko have been found in dry deciduous forests in leaf-litter, under rocks, in termite mounds, in open scrub, and in rocky outcrops.	LR-lc	C
18	Bhrahminy skink	<i>Eutropis carinata</i>	Gekkonidae	This is the only snake which is not known for male individuals, the whole population consists only female.	LR-nt	A
19	Indian pond terrapin	<i>Melanocheilus trijuga</i>	Geomydidae	typically forages on aquatic vegetation along the edges of water bodies This is omnivorous turtle	LR-lc	R
20	Snake eyed lizard	<i>Ophisops spp.</i>	Lacertidae	This is a diurnal species found on well-vegetated, Rocky Mountains, on hardy soils near small streams or semi-perennial wadis, found climbing through vegetation and over rocks.	LR-nt	R
21	Indian rock python	<i>Python molurus</i>	Pythonidae	Mostly found in forested areas, including forests and, but is also found in grasslands, marshes, streams and rivers.	LR-lc	R
22	Common worm snake	<i>Typhlops braminus</i>	Typhlopidae	They are completely fossorial, habits and appearance similar to earthworms.	VU	C
23	Monitor lizard	<i>Varanus bengalensis</i>	Varanidae	Variety of habitats, from desert areas to floodplains, scrubland to forests, at moderate elevations It can also inhabit agricultural areas	LR-nt	C
24	Saw scaled viper	<i>Echis carinatus</i>	Viperidae	Found on a range of different substrates, including sand, rock, and soft soil and in scrublands. Often found hiding under loose rocks.	LR-nt	F
25	Russel's viper	<i>Daboia russelli</i>	Viperidae	Mostly found in open, grassy or bushy areas, but may also be found in scrub jungles, on forested plantations and farmland. It is most common in plain.	LR-nt	C

\*LR-nt = Lower Risk near Threatened; LR-lc = Lower Risk least Concern; VU = Vulnerable; A- Abundant; C- Common; F- Frequent; R – Rare.

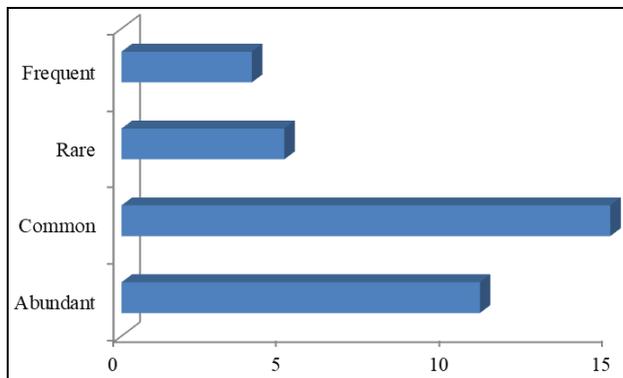
Density of herpatofauna results reveals that among 35 herpatofaunal species 11 species abundantly, 15 species commonly, 5 species rarely and 4 species frequently found

from study area (Figure 5). The detailed family wise density of amphibians and reptiles is given in table 2.

**Table 2:** Family wise density distribution of Herpatofaunal species.

Family	No of species	% of species	Abundant	Common	Rare	Frequent
Amphibians						
Bufoinae	2	20	2			
Microhylidae	1	10	1			
Ranidae	6	60	4		1	1
Rhacophoridae	1	10			1	
Reptiles						
Agamidae	3	12	1	1		1
Boidae	2	8		1		1
Colubridae	8	32	1	7		
Elapidae	2	8		2		
Gekkonidae	3	12	2	1		
Geomydidae	1	4			1	
Lacertidae	1	4			1	
Pythonidae	1	4			1	
Typhlopidae	1	4		1		
Varanidae	1	4		1		
Viperidae	2	8		1		1

\* Density of identified species were calculated on the average percentage of sightings which is represented as abundant (70 to 100%), common (50 to 70%), frequent (20 to 50%) and rare (0 to 20%)

**Fig 5:** Density of herpatofaunal species.

### Discussion

Based on results this study concludes that, this study area is herpatofauna shows good distribution, composition abundance. During data collection related to herpatofaunal diversity from the study region we noticed forest fires, killing, hunting and biotic stress (grazing and browsing) are the ear marked threats in the in the study region. These reasons may affect the population of herpatofauna in present study area. In this study region pressure on biotic components are high it may be due to overpopulation and other climatic conditions. Keeping this in view there is a need of conservation of each and every biota from ecosystems. For this we have to have baseline studies in local level is necessary. This kind of studies (baseline studies) will support for further studies like impact assessment, role of herpatofauna in dry lands, relation with other group of animals etc <sup>[29]</sup> and it will helpful for making conservation strategies and management of herpatofaunal diversity from the study region.

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