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Newsletter of the Invertebrate Conservation & Information Network of South Asia (ICINSA)

Butterflies of Visakhapatnam District, Andhra Pradesh, India

There are over 20,000 species of butterflies recorded in the world of which 1,500 species are reported from India (Kunte et al. 2021). Below is the list of authors and the number of species they have reported from the Eastern Ghats. Gunathilagaraj et al. (1998) – 150 species from Eastern Ghats, Goswami et al. (2018) – 102 species from northern Eastern Ghats, Ramamurty et al. (2013) – 78 species from Visakhapatnam, Andhra Pradesh, Rao et al. (2004) – 89 species from Nagarjunasagar and Srisailem Tiger Reserve, and Raju et al. (2003) – 68 species from Visakhapatnam.

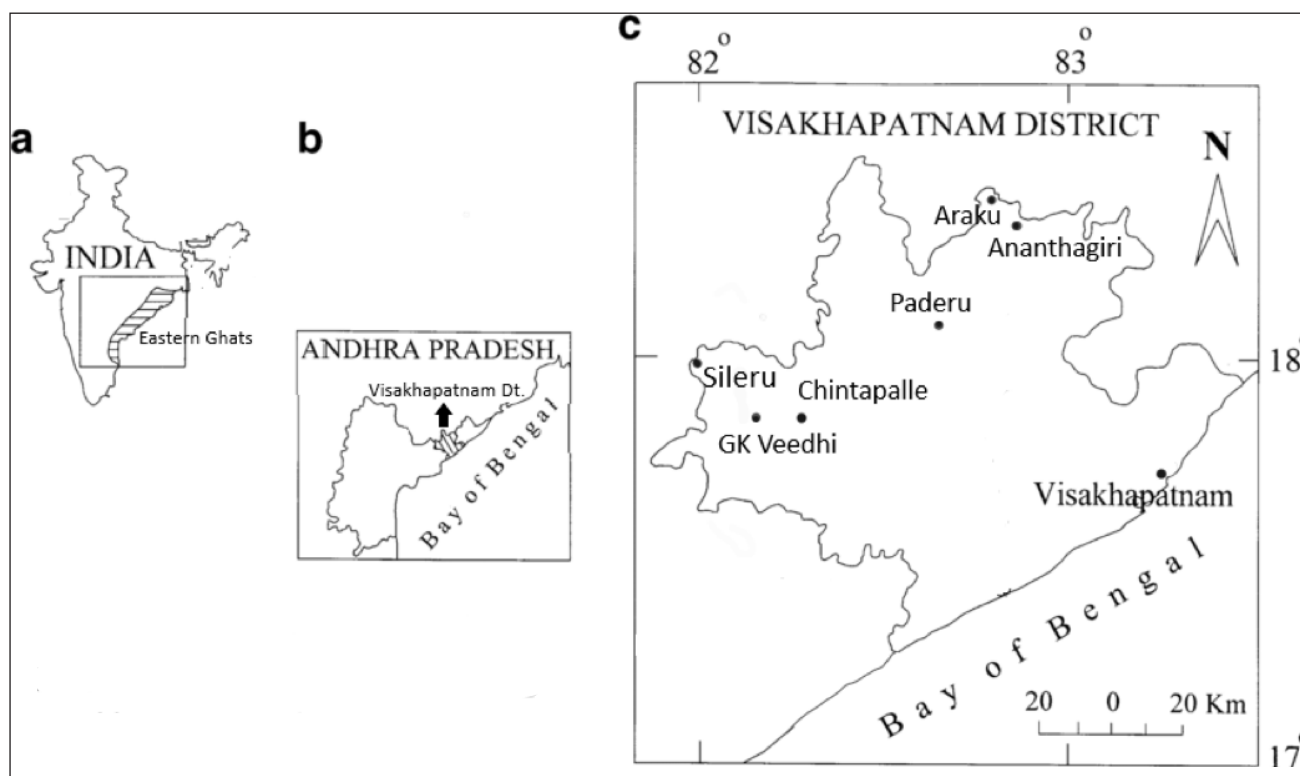
A detailed study of butterflies was carried out from August 2016 to August 2018 in the Eastern Ghats forests of Visakhapatnam District and urban environments of Visakhapatnam City. Visakhapatnam District is one of the nine coastal districts of Indian state of Andhra Pradesh (15.9129° N, 79.7400° E). Visakhapatnam (17.6868° N, 83.2185° E) is the largest city serving as headquarters of the Visakhapatnam District. It has a tropical wet and dry climate. The annual mean temperatures range between 24.7–30.6 °C (76–87 °F), with the maximum in the month of May and the minimum in January. It collects an average of 955 mm of rainfall per year. The Eastern Ghats region

of Visakhapatnam District falls under tropical monsoon climate receiving rainfall from both south-west and north-east retreating monsoons. The rainfall ranges 60–160 cm. The mean temperature in January ranges 20–25 °C. The maximum temperature goes up to 41 °C during summer. The forests include dry evergreen, semi-evergreen forests, dry savannah forests, and tropical dry scrub forests.

A total of 11 areas were selected from Visakhapatnam District, of which six areas were from Eastern Ghats forests and five areas from urban environments of the city. Bi-monthly visits were undertaken in the Eastern Ghats forests areas - Chintapalli (17.8713° N, 82.3533° E), G K Veedhi (17.8629° N, 82.1965° E), Ananthagiri (18.1969° N, 82.9979° E), Paderu (18.0806° N, 82.6645° E), Aaraku (18.3273° N, 82.8775° E), Sileru (18.0482° N, 82.0339° E) and in Visakhapatnam urban environments - Kambala Konda (17.7664° N, 83.3496° E), Thotlakonda (17.8261° N, 83.4105° E), Indira Gandhi Zoological Garden (17.7692° N, 83.3500° E), Simhachalam Hills (17.7664° N, 83.2506° E), and Biodiversity Park (17.7289° N 83.3367° E).

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Study area map showing Visakhapatnam District.

Observations were made through transects, each of 500 m length with 5 m on either side. One to three transects at every site were covered. Observations were taken in the morning from 0800 to 1200 h when the butterflies were most active. Abundance of butterflies in different habitats were recorded. The encountered butterflies were identified while they were in flight or in resting. Identification of the species was done mostly through photographic evidence. Species which are difficult to identify were caught by hand net and released after examination. Species identification and classification are mainly as per Evans (1932), Gunathilagaraj

(1998), Kunte (2000), Kehimkar (2008), and Kunte et al. (2021).

In the present study, 105 species belonging to six families were recorded (Table 1). The family Nymphalidae (Brush-footed butterflies) was dominated with 36 species, whereas the family Riodinidae (Metalmarks/ Punches and Judies) was lowest with only one species. The family Lycaenidae (Blues) was represented with 23 species, Pieridae (Whites & Yellows) with 22 species, Papilionidae (Swallowtails) with 12 species, and Hesperidae (Skippers) with 11 species. Observed species were grouped into six

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categories: Urban Common (UC) – 40%, Urban Occasional (UO) – 40%, Urban Rare (UR) – 20%, Forest Common (FC) – 13%, Forest Occasional (FO) – 62%, and Forest Rare (FR) – 25%, on the basis of their habitat preference and number of sightings in the field.

Twelve species were recorded as new to Visakhapatnam District—*Troides helena*, *Colotis amata*, *Delias hyparete*, *Eurema brigitta*, *E. laeta*, *Ixias pyrene*, *Lethe europa*, *Vanessa cardui*, *Ypthima baldus*, *Y. ceylonica*, *Virachola isocrates*, and *Freyeria trochylus*.

Seven species are legally protected in India under the Wildlife (Protection) Act, 1972—*Pachliopta hector* under Schedule I, *Euploea mulciber* & *Appias libythea* under Schedule IV, and *Hypolimnys misippus*, *Lampides boeticus*, *Euchrysops cnejus*, & *Tanaecia lepidea* under Schedule II.

Twelve species were exclusively found in the Eastern Ghats forests of Visakhapatnam District but not in urban environments—*Troides helena*, *Delias hyparete*, *Ixias pyrene*, *Ariadne ariadne*, *Symbrenthia lilaea*, *Tanaecia lepidea*, *Ypthima baldus*, *Ypthima ceylonica*, *Ypthima huebneri*, *Caleta decidia*, *Talica nyseus*, and *Sarangesa dasahara*. Two species were found only in urban environments of Visakhapatnam—*Appias libythea* and *Abisara bifasciata suffusa*.

The study shows that both forests and urban areas are rich in butterfly diversity. The major threats affecting the abundance in forest areas are habitat destruction, degradation & fragmentation, monoculture practices like rice and coffee plantations, conversion of forest land into agricultural fields, mining activities, podu or shifting cultivation, hunting, and grazing (Ganesh et al. 2015; Goswami et al. 2018). Invasion of alien species like *Lantana camara*, *Parthenium Parthenium hysterophorus*, African Wattle *Acacia auriculiformis* and *Eupatorium Chromolaena odorata* also pose a threat to native species.

In urban areas the butterfly habitats are adversely affected due to pollution, industrialization and urbanization. Planting of vast stretches of monotypic and exotic species like *Bougainvillea Bougainvillea spectabilis*, Madagascar Almond *Terminalia mantaly*, and Buttonwood *Conocarpus lancifolius* in majority traffic islands and road dividers pose a threat to the native species. Landscaping is seen everywhere for beautification purposes, which leaves no native herbal plants for the butterflies and larvae to flourish. Making every possible inch of urban space with concrete, not only depletes the water table but also reduces wild patches that attract butterflies.

Ecotourism is to be encouraged by giving enough guidance and support to the

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Table 1. List of Butterflies recorded in the Eastern Ghats forests and urban environments of Visakhapatnam District, Andhra Pradesh.

	Family	Scientific Name	Common Name	Sch. WPA-1972	"Habitat & Relative Abundance"
1	Papilionidae (Swallowtails)	<i>Graphium agamemnon</i> (Linnaeus 1758)	Tailed Jay		UC, FO
2		<i>Graphium doson</i> (C. & R. Felder 1864)	Common Jay		UC, FO
3		<i>Graphium nomius</i> (Esper 1799)	Spot Swordtail		UO, FR
4		<i>Graphium sarpedon</i> (Linnaeus 1758)	Common Blue Bottle		UR, FR
5		<i>Pachliopta aristolochiae</i> (Fabricius 1775)	Common Rose		UC, FC
6		<i>Pachliopta hector</i> (Linnaeus 1758)	Crimson Rose	Sch I	UO, FR
7		<i>Papilio clytia</i> Linnaeus 1758	Common Mime		UR,FR
8		<i>Papilio crino</i> Fabricius 1793	Common Banded Peacock		UR, FO
9		<i>Papilio demoleus</i> Linnaeus 1758	Lime Swallowtail		UC, FO
10		<i>Papilio polymnestor</i> Cramer 1775	Blue Mormon		UO,FO
11		<i>Papilio polytes</i> Linnaeus 1758	Common Mormon		UC, FO
12		<i>Troides helena</i> (Linnaeus 1758)	Common Birdwing		FO
13	Pieridae (Whites & Yellows)	<i>Appias albina</i> (Boisduval 1836)	Common Albatross		UC, FO
14		<i>Appias libythea</i> (Fabricius 1775)	Western Striped Albatross	Sch IV	UR
15		<i>Belenois aurota</i> (Fabricius 1793)	Pioneer		UC, FO
16		<i>Catopsilia pomona</i> (Fabricius 1775)	Lemon or Common Emigrant		UC, FO
17		<i>Catopsilia pyranthe</i> (Linnaeus 1758)	Mottled Emigrant		UC, FO
18		<i>Cepora nerissa</i> (Fabricius 1775)	Common Gull		UC, FO
19		<i>Colotis amata</i> (Fabricius 1775)	Small Salmon Arab		UR, FR
20		<i>Colotis danae</i> (Fabricius 1775)	Crimson-tip		UO, FO
21		<i>Colotis etrida</i> (Boisduval 1836)	Little or Small Orange-tip		UC, FO
22		<i>Colotis aurora</i> (Cramer 1780)	Plain Orange-tip		UR, FO
23		<i>Colotis fausta</i> (Olivier 1804)	Large Salmon Arab		UC,FO
24		<i>Delias eucharis</i> (Drury 1773)	Indian Jezebel		UC, FO
25		<i>Delias hyparete</i> (Linnaeus 1758)	Painted Jezebel		FO
26		<i>Eurema andersonii</i> (Moore 1886)	One -spot Grass Yellow		UO, FO

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	Family	Scientific Name	Common Name	Sch. WPA-1972	"Habitat & Relative Abundance"
27	Pieridae (Whites & Yellows)	<i>Eurema blanda</i> (Boisduval 1836)	Three-spot Grass Yellow		UO, FO
28		<i>Eurema brigitta</i> (Stoll 1780)	Small Grass Yellow*		UR, FO
29		<i>Eurema hecabe</i> (Linnaeus 1758)	Common Grass Yellow		UC, FC
30		<i>Eurema laeta</i> (Boisduval 1836)	Spotless Grass Yellow*		UR, FO
31		<i>Ixias pyrene</i> (Linnaeus 1764)	Yellow Orange-tip*		FO
32		<i>Leptosia nina</i> (Fabricius 1793)	Psyche		UC, FC
33		<i>Pareronia hippia</i> (Fabricius 1787)	Indian Wanderer		UO, FO
34		<i>Pieris canidia</i> (Linnaeus 1768)	Asian Cabbage White		UO, FO
35	Nymphalidae (Brush-footed)	<i>Acraea terpsicore</i> (Linnaeus 1758)	Tawny Coster		UC, FO
36		<i>Ariadne ariadne</i> (Linnaeus 1763)	Angled Castor		FO
37		<i>Ariadne merione</i> (Cramer 1777)	Common Castor		UC, FC
38		<i>Byblia ilithyia</i> (Drury 1773)	Joker		UO, FR
39		<i>Danaus chrysippus</i> (Linnaeus 1758)	Plain Tiger		UC, FO
40		<i>Danaus genutia</i> (Cramer 1779)	Striped Tiger		UC, FO
41		<i>Elymnias hypermnestra</i> (Linnaeus 1763)	Common Palmfly		UC, FR
42		<i>Euploea core</i> (Cramer 1780)	Common Crow		UC, FO
43		<i>Euploea mulciber</i> (Cramer 1777)	Striped Blue Crow	Sch IV	UR, FC
44		<i>Euploea sylvestris</i> (Fabricius 1793)	Double-Branded Crow		UO, FR
45		<i>Euthalia aconthea</i> (Cramer 1777)	Common Baron		UO, FR
46		<i>Hypolimnas bolina</i> (Linnaeus 1758)	Great Eggfly		UC, FO
47		<i>Hypolimnas misippus</i> (Linnaeus 1764)	Danaid Eggfly	Sch II	UC, FO
48		<i>Junonia almana</i> (Linnaeus 1758)	Peacock Pansy		UO, FO
49		<i>Junonia atlites</i> (Linnaeus 1763)	Grey Pansy		UR, FR
50		<i>Junonia hierta</i> (Fabricius 1798)	Yellow Pansy		UC, FO
51		<i>Junonia iphita</i> (Cramer 1779)	Chocolate Pansy		UC, FC
52		<i>Junonia lemonias</i> (Linnaeus 1758)	Lemon Pansy		UC, FC
53		<i>Junonia orithya</i> (Linnaeus 1758)	Blue Pansy		UO, FR
54		<i>Lethe europa</i> (Fabricius 1775)	Bamboo Treebrown*		UR, FR
55		<i>Melanitis leda</i> (Linnaeus 1758)	Common Evening Brown		UC, FC
56		<i>Melanitis phedima</i> (Cramer 1780)	Dark Evening Brown		UR, FO
57		<i>Moduza procris</i> (Cramer 1777)]	Commander		UO, FR

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	Family	Scientific Name	Common Name	Sch. WPA-1972	"Habitat & Relative Abundance"
58	Nymphalidae (Brush-footed)	<i>Mycalesis perseus</i> (Fabricius 1775)	Common Bushbrown		UC, FC
59		<i>Mycalesis subdita</i> (Moore 1890)	Tamil Bushbrown		UO, FO
60		<i>Neptis hylas</i> (Linnaeus 1758)	Common Sailer		UC, FC
61		<i>Phalanta phalantha</i> (Drury 1773)	Common Leopard		UC, FO
62		<i>Charaxes bharata</i> C. & R. Felder 1867	Indian Nawab		UR, FR
63		<i>Symbrenthia lilaea</i> (Hewitson 1864)	Common Jester		FO
64		<i>Symphaedra nais</i> (Forster 1771)	Baronet		UO, FR
65		<i>Tanaecia lepidea</i> (Butler 1868)	Grey Count	Sch II	FR
66		<i>Tirumala limniace</i> (Cramer [1775])	Blue Tiger		UC, FC
67		<i>Vanessa cardui</i> (Linnaeus 1758)	Painted Lady		UO, FR
68		<i>Ypthima baldus</i> (Fabricius 1775)	Common Five-ring		FO
69		<i>Ypthima ceylonica</i> Hewitson 1865	White Four-ring		FR
70		<i>Ypthima huebneri</i> Kirby 1871	Common Four-ring		FC
71	Riodinidae (Metalmarks)	<i>Abisara bifasciata suffusa</i> Moore 1882	Suffused Double-banded Judy		UR
72	Lycaenidae (Blues)	<i>Acytolepis puspa</i> (Horsfield 1828)	Common Hedge Blue		UO, FO
73		<i>Caleta decidia</i> (Hewitson 1876)	Angled Pierrot		FO
74		<i>Castalius rosimon</i> (Fabricius 1775)	Common Pierrot		UC, FO
75		<i>Catochrysops strabo</i> (Fabricius 1793)	Forget-me-not		UO, FR
76		<i>Chilades laius</i> (Stoll 1780)	Lime Blue		UO, FO
77		<i>Chilades pandava</i> (Horsfield 1829)	Plains Cupid		UO, FO
78		<i>Curetis acuta</i> Moore 1877	Acute Sunbeam		UO, FR
79		<i>Euchrysops cnejus</i> (Fabricius 1798)	Gram Blue	Sch II	UO, FR
80		<i>Freyeria trochylus</i> (Freyer 1845)	Orange-spotted Grass Jewel		UO, FO
81		<i>Jamides bochus</i> (Stoll 1782)	Dark Cerulean		UO, FR
82		<i>Jamides celeno</i> (Cramer 1775)	Common Cerulean		UC, FC
83		<i>Lampides boeticus</i> (Linnaeus 1767)	Pea Blue	Sch II	UO, FO
84		<i>Leptotes plinius</i> (Fabricius 1793)	Zebra Blue		UO, FO
85		<i>Prosotas nora</i> (C.Felder 1860)	Common Lineblue		UC, FO
86		<i>Pseudozizeeria maha</i> (Kollar 1844)	Pale Grass Blue		UC, FO

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	Family	Scientific Name	Common Name	Sch. WPA-1972	“Habitat & Relative Abundance”
87	Lycaenidae (Blues)	Rapala iarbus (Fabricius 1787)	Common Red Flash		UR, FR
88		Rathinda amor (Fabricius 1775)	Monkey Puzzle		UC, FO
89		Spalgis epius (Westwood 1851)	Apefly		UO, FR
90		Spindasis vulcanus (Fabricius 1775)	Common Silverline		UC, FC
91		Talicauda nyseus (Guerin-Meneville 1843)	Red Pierrot		FO
92		Virachola isocrates (Fabricius 1793)	Common Guava Blue*		UR, FR
93		Zizula hylax (Fabricius 1775)	Tiny Grass Blue		UR, FO
94		Zizina otis (Fabricius 1787)	Lesser Grass Blue		UO, FO
95		Hesperiidae (Skippers)	Badamia exclamationis (Fabricius 1775)	Brown Awl	
96	Borbo bevani (Moore 1878)		Lesser Rice Swift / Bevan’s Swift		UR, FO
97	Borbo cinnara (Wallace 1866)		Rice Swift		UO, FO
98	Hasora chromus (Cramer 1780)		Common Banded Awl		UO, FO
99	Matapa aria (Moore 1866)		Common Branded Redeye		UO, FR
100	Pelopidas mathias (Fabricius 1798)		Small Branded Swift		UO, FO
101	Sarangesa dasahara (Moore 1866)		Common Small Flat		FO
102	Spialia galba (Fabricius 1793)		Asian Grizzled Skipper		UO, FO
103	Suastus gremius (Fabricius 1798)		Oriental Palm Bob		UO, FO
104	Telicota bambusae (Moore 1878)		Dark Palm-Dart		UO, FO
105	Udaspes folus (Cramer 1775)		Grass Demon		UO, FO
UC-Urban Common; UO-Urban Occasional; UR-Urban Rare; FC-Forest Common; FO-Forest Occasional; FR-Forest Rare. * New record to Visakhapatnam District. Sch. WPA-1972=Schedule species under Indian Wildlife (Protection) Act 1972.					

local tribal community. Specific 'Butterfly Watch' tours may be arranged to attract tourists and the revenue must be spent for tribal only in those forest areas. 'Butterfly Farming' is to be encouraged not only to conserve threatened species but also provide alternative means of livelihood to forest

dwellers (Kunte et al. 2000; Kehimkar 2008). In urban areas, developing natural butterfly parks and gardens in all school, college, university premises and in all public spaces is an essential step towards conservation of butterflies. On road dividers and traffic islands, by planting suitable nectar and larval

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food plants and by keeping small damp areas with salt and rotten fruits, the local butterfly fauna can be supported. Small patches of wild plants are to be allowed to grow on road sides and vacant spaces which supports many local butterfly species. Creating public awareness by involving students, local people, forest dwellers, and tribals is essential in the conservation of butterflies.

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