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**Research Article****Butterflies (Insecta: Lepidoptera) of Ajinkyatara Fort, Satara, Maharashtra, India****Shinde DL, Kamble PM**

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**Abstract:** Surveys and photographic collection of butterflies in Ajinkyatara fort Satara Maharashtra, India. is carried out from 28<sup>th</sup> August 2011 to 30 January 2012 still 36 species of butterflies belonging to 29 genera responding 4 families viz., Papilionidae, Lycaenidae, Pieridae and Nymphalidae are recorded.**Keywords:** Butterflies, Insecta, Lepidoptera Ajinkyatara fort, Satara

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**INTRODUCTION**

Butterflies fill our environment with colours and have a special place in our hearts. But other than aesthetic values, they also perform some important tasks of ecological significance. The most important function that they perform is that of pollination. Adult butterflies spend most of their time visiting one flower after another to feed on nectar and in the bargain aid in crosspollination of many flowering plants. Another important that they play in the ecosystem is that of being a vital line in the food-chain. They constitute a significant percentage of food for many species especially spiders, birds and reptiles, butterflies also indicators of a healthy environment. Adult butterflies as also their early stages are very sensitive to even subtle undesirable environmental changes thus for warning us on the changing quality of our surrounding.

The Ajinkyatara fort is surrounded by Satara city and lies between 17°68`N and 74°03`E at the 1003.64 m. above mean sea level and it is part of the Western Ghats. It is the 16<sup>th</sup> Century fort and now also holds the television tower for the city of Satara as the fort is in the higher altitude visitors can enjoy a magnificent view of the entire Satara city. Satara enjoy a tropical climate with the moderate temperature ranging from 21° to 35°c. The monsoon operates over the Satara from June to September. The monsoons are like giving force to people and the fauna of Ajinkyatara fort.

There are 25,000 species of butterflies in the world out of which 1,500 species are in India. Ajinkyatara fort and surrounded area we have steel 36 species are reported.

**AN OVER VIEW OF THE RELEVANT LITERATURE**

The review of literature indicates that very little is known on the butterflies of the Ajinkyatara fort except the work of Dr. Milind Bhakare. They are reared near about 80 species of butterflies and examine the life cycle (2010) also they are prepared a butterfly garden in their farm house 2.5 km. away from Satara city.

Rather than Thomas Gay *et al.*[8] worked on common. Butterflies of India. Also Parag Rangnekar given [5], takes efforts on the studying butterflies of great Goa and Western Ghats and Southern India

The present work will enrich the understanding of butterflies of Ajinkyatara fort and surrounding area.

**MATERIALS AND METHODS**

The best time to observe butterflies is early morning when bask it is also best time for photography. This time for butterflies are easily approachable and photographed A standard Sony DSC H 50 still camera having 15x optical zoom is enough to capture some great pictures. Hence we are tracking early morning trail on Ajinkyatara fort for 3 days interval. The collected photographs and survey reports are screened in the computer laboratory for proper identification appropriate literature

**RESULT AND DISCUSSION**

The present work is conducted from 28<sup>th</sup> August 2011 and it will be completed at 30<sup>th</sup> January 2012, till 36 species of butterflies are reported from 28 genera belonging to 4 families

The family wise distribution is given below [5].

**A] Family:-Papilionidae**

Papilionidae are the well-known swallow-tails butterflies. They are among the largest and most beautiful of our insects. Though mostly black or brown,

their beauty enhanced by varied colour markings, with bright red and yellow. Their hind wings often have long tail and hence the name swallows tail butterflies. They are common in the forests, grasslands, plains and hills and are mostly abundant during the rains

Crimson Rose  
Family Papilionidae  
Genus – *Pachliopta*  
Species – *hector*

Characters:

It is found in forest scrubs and grasslands it is similar to Common Rose but distinguished by white bands on fore wing having 90-110 mm. wingspan and bright crimson spots on the hind wings. Maximum number are seen during monsoon and winter it has a slow, fluttering but steady flight and is often observed in areas with large patches of Lantana a rich sources of nectar the butterfly also has a strong migratory habit.

Common Mormon  
Family Papilionidae  
Genus – *Papilio*  
Species – *polytus*

Characters:

The wing span 90-100 mm. in a length found in forest , scrubs and grasslands the butterfly exhibits sexual dimorphism and mimicry. The males is black with a row of white spot along the margin of the fore wings and the centre of the hind wing. The female mimic the Common and Crimson Rose but is distinguished by its black body. The male of this butterfly is much smaller than the female.

Blue Mormon  
Family Papilionidae  
Genus – *Papilio*  
Species – *plymnestor*

Characters:

The wing span 120-150 mm in a length. This is woodland species preferring heavy rain and moist areas. It is a large butterfly with pale blue marking on the hind wing. The underside has red spots at the base of the wings the butterfly has a fast and dodgy flight. Also seen mud-pudding on wet patches along water bodies or on dung and droppings, with wings continuously flapping as it does so.

Tailed Jay  
Family Papilionidae  
Genus – *Graphium*  
Species – *agamemnon*

Characters:

The wing spans measuring about 85-100 mm in length. This swallowtail is a forest dweller but also seen in urban gardens or chards. It is black butterfly

with apple- green coloured marking on the wings. It has straight and speedy flight. The wings are continuously fluttered resembling the movements of Sunbird the best place to search for one is near the most Tree ( *Polyalthialongifolia* ) a favorite host plant.

Lime Butterfly  
Family Papilionidae  
Genus – *Papilio*  
Species – *demoleus*

Characters:

The wing spans measuring about 80-110 mm in length. In length found in scrubs and grass lands. It is colourful butterfly with its wings ornamented by various shades of yellow on the upper-side, while the underside has red, lemon yellow and blue- colour. It is found in almost all habitats and derives its name from the citrus (lime) plants. Its caterpillar is a pest of citrus spp., and can cause economic loss to orchards. It has slower flight compared to other swallowtails, basks regularly and hence easy to photograph.

**B] Family:-Lycaenidae**

The Lycaenidae are generally small butterfly with a predominantly blue colour and also with series of spots blue and delicate tails

Common Cerulean  
Family Lycaenidae  
Genus – *Jamides*  
Species – *celeno*

Characters:

The wing span measuring about 27-36 mm in length. This is an attractive butterfly with shiny blue upper-side and long straight lines on its under-wings. The pattern of these lines help in distinguishing this species from the other Ceruleans. The dry season form exhibits dark bands instead of lines of the wet season form. It is found in well wooded and forested areas but always in openings and clearings with ample availability of sun light.

Red Pierrot  
Family Lycaenidae  
Genus – *Thalycada*  
Species – *nyseus*

Characters:

The wing spans measuring about 30-36 mm in length. Found in forest, scrubs and grasslands, this is one of the brilliantly coloured and striking butterflies. The upper-side of the wing is black with orange spot at the base of the hind wing. The underside has pied pattern with the orange at the base of the hind wing visibly conspicuous. It is a weak flier not flying more than a meter from the ground and settles often but not for too long. Can usually be observed and photographed feeding on flower nectar.

Plain Cupid  
Family Lycaenidae  
Genus – *Chilads*  
Species – *pandav*

Characters:

The wing spans measuring about 25-35 mm in length. Found in forest, scrubs and grasslands. The plains Cupid is a tiny grayish coloured butterfly with spotting and lines on the underside. Only the hind-wings show black spotting and possess small tails at the ends. Prefers open sunny areas and avoids shady places. It is more common during late monsoon and early winter periods.

Indian sunbeam  
Family-Lycaenidae  
Genus – *Curetis*  
Species – *thetis*

Characters:

Upperside dark cupreous red glossy and shining. Forewing base irrorated with dusky scales while underside shining silvery white and hind wings crossed trasversaly by discal .It is occur in peninsular India south of himalyas but not in desert tracts in areas with a scartly rainfall parts

**C] Family:-Pieridae**

The pierids mostly white are medium- sized butterflies with shades of yellow or orange.

Common Emigrant-  
Family Pieridae  
Genus – *Catopsilia*  
Species – *pomona*

Characters:

It is measuring about 55-80mm in lenth. Found it forest, scrubs and grassland. This butterfly is encountered in various shades of white and yellow, hence the synonys Lemon Emigrant. The tip of the forewings on the upperside in both the sexes have black markingwhile the underside is completely unmarked. It is a very active butterfly and has an erratic yet a very strong flight.

Common Wanderer –  
Family – Pieridae  
Genus – *Pareronia*  
Species – *valeria*

Characters:

Measuring about 65-80mm. in length found in scrub and grassland. Has got the name because of its wandering flight. The male is light blue in colour with black wing margins and veins. The female mimics the Blue Tigher and is bulish- white with broader margins and veins

Mottled Emigrant –  
Family Pieridae  
Genus – *Catopsilia*  
Species – *pyranthe*

Characters:

Measuring about 50-70mm. in length found in forest scrub and grassland this butterfly can be mistaken with the Common Emigrant expect for the radish-brown striatiions on the wings. Often replces the Common Emigrant  
In drier and hot areas.

Chocolate Albatross -  
Family Pieridae  
Genus – *Appias*  
Species – *lyncida*

Characters:

Chocolate Albatross has a wing span of 55-70mm. The male white above with Chocolate – brown or black margins and bright lemon yellow below with chocolate colour margins. It is forest butterfly .

Common Grass Yellow  
Family -Pieridae  
Genus –*Eurema*  
Species – *hecabe*

Characters:

Measuring about 40-50mm. in length area One of the commonest butterfly of open areas andgrassland it has black borders on the bright yellow upperside of the wing it flies close to the ground visiting flowers to flower. It exhhibits a peculiar habit on resting on the underside of leaves during hot part of day.

**D) Family:-Nymphalidae**

The nymphalids are large, brilliantlycoloured tawny and black marked spotted or striped butterflyies with tails on the hind wings They are lovers of sunshine and are also powerful fliers, They visit flowers through some settle on damp ground dung toddy or rotting fruits. All nymphalids love to bask in the sun on the tree and bushes .

Danid Eggfly –  
Family –Nymphalidae  
Genus –*Hypolimnus*  
Species –*misippus*

Characters:

Measuring about 70-80mm. in length found in forest scrubs grassland. Sexes completely differ in appearance. The male black on the upper side with their white patches – two on the four wing and one large spot on hide wing. The female on the other hand is perfect mimic of the Plain Tiger.

Great Egg fly -

Family –Nymphalidae

Genus –Hypolimnus

Species –*bolina*

Characters:

Measuring about 70-80mm. in length found in forest scrubs grassland. The sexes in this butterfly differ in appearance. The male is very similar to the Danaid Egg fly male but the white spots are suffused with purplish – blue margins. It also has series of white spots at the margin of the hind wings which are absent in the Danaid Eggfly. The female of this spp. Mimics the common Indian Crow and can be differentiated by its large side glistening colours.

Lemon Pansy

Family –Nymphalidae

Genus –Junonia

Species –*lemonias*

Characters:

Measuring about 45-60mm. in length wingspan found in scrubs and grassland it derives its name from the lemon coloured margins on the upper side. The upper side also eye spots. Butterfly exhibits all characters of the Pansy group include Territorial behavior

Common Baron

Family – Nymphalidae

Genus – Euthalia

Species – *aconthea*

Characters:

Measuring about 55-80mm. in length found in forest scrubs and grassland sexes differ in appearance. The female of this species is much larger in size than the male. The male dark brown with a row of small white spot on the forewings. While female is paler having a greenish sheen and has a band on it forewing both the sex have marginal row of black spot on the hind wings.

Angled Castor

Family – Nymphalidae

Genus –*Ariadne*

Species – *ariadne*

Characters:

Measuring about 85-60mm in length of wingspan. Found in grasslands it is radish brown butterfly with wavy slender loosely arranged blackish lines on its wing. The forewing apex has a conspicuous white spot and the wing margin is wavy. The butterfly always keeps close to ground and does not fly beyond 1.5 m

Common Indian Crow –

Family – Nymphalidae

Genus –*Euploea*

Species – *croce*

Characters:

Measuring about 85-95mm in length of wingspan. It has common butterfly Satara found in all kinds of habitats. It is a brown coloured butterfly with two series of white spots along the wing margins. Few white spots are also visible on the forewing. Looking like the Great Eggfly females.

Blue Tiger

Family – Nymphalidae

Genus –*Ariadne*

Species – *ariadne*

Characters:

Measuring about 90-100mm in length of wingspan the tiger belongs to a group called 'Milkweed butterflies'. The adult butterfly is unpalatable to many predators. The blue tiger is blackish brown with blue coloured variable markings found in diverse habitats. It can be confused with the Glassy Tiger, the Common Wanderer female but can be distinguished by its blue margins.

Blue Pansy

Family – Nymphalidae

Genus –*Junonia*

Species – *orithya*

Characters:

Measuring about 40-60mm in length the shiny blue colour on the upper side of the hind wings of this butterfly catches the eye. The forewings are black with a white band separating the brownish apex from the rest. It has two eye spots on each forewing and hind wing. It is a butterfly of grassland and open areas.

Common Bush Brown

Family – Nymphalidae

Genus –*Mycalesis*

Species – *perseus*

Characters:

Measuring about 38-50mm in length found in all kinds of habitats, as the name suggests this butterfly prefers the undergrowth. It exhibits seasonal variations with the winter form having a white line running across both the wings and a series of conspicuous eye spots between the white line and the wing margin. The white line and eye spots are absent or negligible in the dry season.

Painted Lady

Family – Nymphalidae

Genus –*Cynthia*

Species – *cardui*

Characters:

Measuring about 55-70mm in length found in grassland and open areas. It is an attractive butterfly with light tawny coloured wings having a black margin. It is

more abundant in the monsoon and post monsoon season and almost absent during the dry season

Common Sailer  
Family – Nymphalidae  
Genus – *Neptis*  
Species – *hylas*

Characters:

Measuring about 50-60mm in length found in all kind of habitats the upper side is black with three whitew bends running almost parallel. This bends composed of spots with the middle one appearing almost unbroken. The top most band have a triangular diagnostic marking which help in differentiating this species from other sailers

Common Sergeant -  
Family – Nymphalidae  
Genus – *Athyma*  
Species – *perius*

Characters –

Measuring about 60-70mm in length found in forest. Very similar to the sailers and can be confused for one at first sight. Can be distinguished from the sailers by its larger size more powerful flight and wavy hind wing margins. The marking on the wing too differ, with Sergeanthaving a series of three spot in common sailer .

Common Leopard –  
Family – Nymphalidae  
Genus – *Phalanta*  
Species – *phalantha*

Characters –

Measuring about 50-60mm in length of wingspan. A bright coloured tawny butterfly with black marking the inverted U- shaped marking on the lower edge of the hind wings are diagnostic .Both sexes are look similar. The butterfly has swift flight jerky movement; it is found in all the kinds of habitats but prefers forest tracts

Peacock Pansy  
Family – Nymphalidae  
Genus – *Junonia*  
Species – *amana*

Characters –

Measuring about 60-65mm in length of wingspan. The upper side is tawny red coloured with eye spot on both the wings the spots on the hind wing are large and prominent resembling the eye spot on peacock feather and hence the name . It is found all habitats

Grey Pansy  
Family – Nymphalidae  
Genus – *Junonia*  
Species – *atilis*

Characters –

Measuring about 55-65mm in length of wingspan found in all kinds of habitat an unmistakable grey butterfly with row of eye spot on the both wing. The eye spot orange coloured centers it is a very bold butterfly and seen around the water bodies .

Plain Tiger  
Family – Nymphalidae  
Genus – *Danaus*  
Species – *chrysippus*

Characters –

Measuring about 70-80mm in length wingspan look similar to the female of Danaid Eggfly of which it is a model It is Tawny coloured butterfly with a broad black area at the apex of the forewing which encircles a white band. The hind wing has 3-4 small black spot it is found throughout the year in all kind habitats.

Common Four Ring  
Family – Nymphalidae  
Genus – *Ypthima*  
Species – *huebneri*

Characters –

Measuring about 35-40mm in length of wing span found in all kind of habitat when basking with open wing, a prominent spot on forewing with two inner “pupil ” and two smaller spot on the hind wing are conspicuous . On the underside the hind wing exhibits four spots, three at end and one at the apical region. The butterfly can be seen basking with its wings half open

Common Five Rings  
Family – Nymphalidae  
Genus – *Ypthima*  
Species – *balus*

Characters –

Measuring about 30-50mm in length of wing span similar to the common five ring in appearance but has certain differences the eye spot on the forewing is larger in size while the underside of the hind wing has three pair of spot of which the middle pair larger in the dry season from these spot are reduced this butterfly prefer forest area but keeps to open patches these habitat too .

Common Tree Brown  
Family – Nymphalidae  
Genus – *Lethe*  
Species – *rohria*

Characters –

Measuring about 60-70mm in length of wingspan. This is butterfly of well wooded areas A crepuscular butterfly like Common Evening Brown . It is active during early morning and late evening . The underside of the butterfly exhibits a series of spot both

on the forewing and hind wing On the hind wing the apical spot is conspicuous and much larger The spot on the forewing form a “ boomerang” shape with their placement.

Tawny Caster  
Family – Nymphalidae  
Genus –*Acraea*  
Species – *violae*

Characters –  
Measuring about 30-35mm in length of wingspan as the name suggests it is bright tawny coloured butterfly with the wing having black border and spot. The black border on the hind wing has a serious white spots it is butterfly of diverse habitat founding dense forests.

Common Evening Brown  
Family – Nymphalidae  
Genus –*Melanitis*  
Species – *leda*

Characters –  
Measuring about 65-85mm in length of wingspan found in forest tracts and grasslands a crepuscular butterfly seen flying during down and dusk It is brown colour butterfly its wing having eye spot and a white pupil like marking surrounded orange patches it has different colour and different forms in different seasons namely the dryseason forms and the wet seasons forms usually attracted to electrical lamps and light in the night

Chocolate Pansy  
Family – Nymphalidae  
Genus –*Precisip*  
Species – *iphita*

Characters –  
Measuring about 55-80mm in lengthof wingspan the upper side is brown with hind wing having a row of mall dark brown eye spot found in wooded areas and forest it has a typical pansy flight and fly’s close to the ground The dry season forms of this butter fly s with its wing closed is a perfect mimic of a dry leaf.

**PLATE NO. I: A] Family:-Papilionidae**



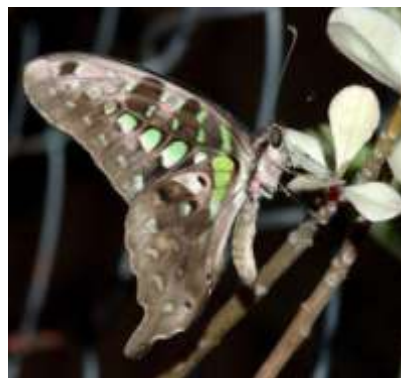
**1)Crimson Rose**



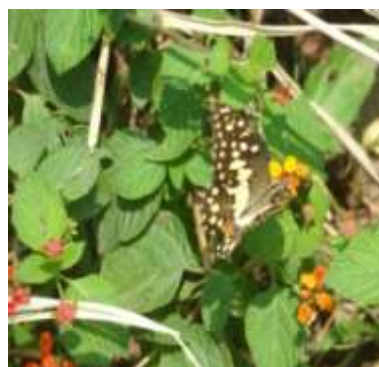
**2) Common Mormon**



**3) Blue Mormon (Courtesy: Amolkumar Lokande)**



**4 ) Tailed Jay**



**5 ) Lime Butterfly**

**PLATE NO. II: B] Family:-Lycaenidae**



**1) Common Cerulean**



**2) Red Pierrot**



**3) Plain Cupid**



**4) Indian Sunbeam**

**PLATE NO.III C) Family Pieridae**



**1)Common Emigrant,**



**2)Common Wanderer,**



**3) Mottled Emigrant,**



4)Chocolate Albatross,



2) Great Eggfly,



5) Common Grass Yellow



3)Lemon Pansy,

**PLATE NO.IV Family – Nymphalidae**



1)DanidEggfly,



4) Common Baron,





5)Angled Castor,



8)Blue Pansy,

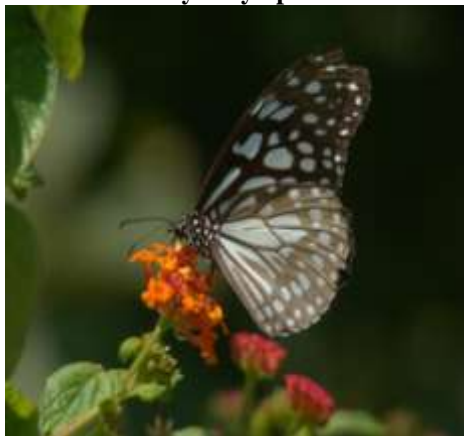


6)Common Indian Crow



9) Common Bush Brown,

**PLATE NO.V Family – Nymphalidae**



7)Blue Tiger ,



10)Painted Lady,



11) Common Sailer,



12) Common Leopard



16) Common Four Ring,

PLATE NO.VI: Family – Nymphalidae



13) Peacock Pansy,



17) Common Five Rings,



14) Grey Pansy,

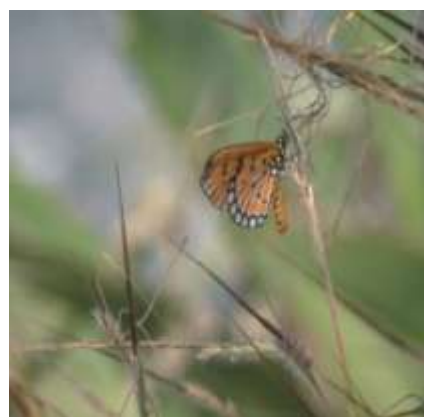


18) Common Tree Brown

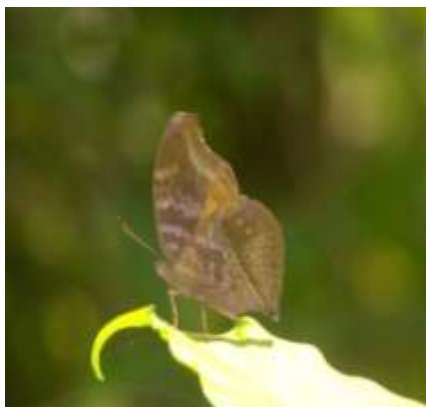
PLATE NO.VII: Family – Nymphalidae



15) Plain Tiger,



19) Tawny Caster,



20) Common Evening Brown,



21) Chocolate Pansy.

**CHECKLIST OF BUTTERFLIES**

Sr.No	Name of the Butterfly	Family
1	Crimson Rose( <i>Pachliopta hector</i> )	Papilionidae
2	Common Mormon( <i>Papiliopolytus</i> )	Papilionidae
3	Blue Mormon ( <i>Papiliopolymnestar</i> )	Papilionidae
4	Tailed Jay ( <i>Graphiumagamemnon</i> )	Papilionidae
5	Line Butterfly ( <i>Papiliodemoleus</i> )	Papilionidae
6	Common Cerulean ( <i>Jamidesceleno</i> )	Lycaenidae
7	Red Pierrot ( <i>Talicananyseus</i> )	Lycaenidae
8	Plain Cupid ( <i>Hiladspandava</i> )	Lycaenidae
9	Indian Sunbeam ( <i>Curetisthetis</i> )	Lycaenidae
10	Common Emigrant ( <i>Catopsiliapomona</i> )	Pieridae
11	Common Wonderer ( <i>Pareroniavaleria</i> )	Pieridae
12	Mottled Emigrant ( <i>Catopsiliapyraenthe</i> )	Pieridae
13	Chocolate Albatross ( <i>Appiaslyncida</i> )	Pieridae
14	Common Grass Yellow ( <i>Euremaheccabe</i> )	Pieridae
15	DanaidEggfly ( <i>Hypolimnismusisippus</i> )	Nymphalidae
16	Great Eggfly ( <i>Hypolimnusbolina</i> )	Nymphalidae
17	Lemon Pansy ( <i>Junonialemonids</i> )	Nymphalidae
18	Common Baron ( <i>Eutheliaaconthea</i> )	Nymphalidae
19	Angled Castor ( <i>Ariadneariadane</i> )	Nymphalidae
20	Common Indian Crow ( <i>Euploea croe</i> )	Nymphalidae
21	Blue Tiger ( <i>Tirumalaliniace</i> )	Nymphalidae
22	Blue Pansy ( <i>Junonia orithya</i> )	Nymphalidae
23	Common Bush Brown( <i>Mycalesisperseus</i> )	Nymphalidae
24	Painted Lady ( <i>Cynthia carduii</i> )	Nymphalidae
25	Common Sailer ( <i>Neptishylas</i> )	Nymphalidae
26	CommonSergeant ( <i>Athymaperius</i> )	Nymphalidae
27	Peacock Pansy ( <i>Junoniaalmana</i> )	Nymphalidae
28	Gray Pansy ( <i>Junoniaatlitus</i> )	Nymphalidae
29	Plain Tiger ( <i>Danus chrysippus</i> )	Nymphalidae
30	Common Four Ring ( <i>Ypthmahuebnen</i> )	Nymphalidae
31	Common Five Ring ( <i>Ypthmabaladus</i> )	Nymphalidae
32	Common Leopard ( <i>Phalantaphalantha</i> )	Nymphalidae
33	Common Tree Brown ( <i>Lethe rohria</i> )	Nymphalidae
34	Tawny Coster ( <i>Acraeaviolae</i> )	Nymphalidae
35	Common Evening Brown( <i>Melanitisleda</i> )	Nymphalidae
36	Chocolate Pansy ( <i>Precisipiphita</i> )	Nymphalidae

Sr. No	Families	Genera	Species	Total
1	Papilionidae	03	05	05
2	Lycaenidae	04	04	04
3	Pieridae	04	05	05
4	Nymphalidae	18	22	22
	Total	29	36	36

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#### REFERENCES

1. Gunatilagaraj K; Some South Indian Butterflies, Nilgiri Wildlife and Environment Society. 1998
2. Krushnamegh Kunte; Buttrefly of Penisular India, Indian Academy of Science. 2000.
3. Mani MS; Insect, National Book Trust, India. 1992.
4. Meena Harbal; Buttreflies of Sikkim, Nature Conservation Foundation. 1992.
5. Parag Rangnekar; A Photographic guide to Butterfly of Goa and other ranges of the Western Ghats and Southern India. 2007.
6. Patrik Hook; A Concise Guide To Insects, Parragon Books. Ltd., 2008.
7. The Beautiful World Of Butterflies, CEE Publication. 2004.
8. Thomas Gay, Isaac Kehimkar, Punetha JC; Common Butterflies of India.WWF/ Oxford University Press. 1992.