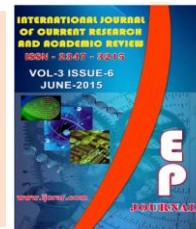




*International Journal of Current Research
and Academic Review*

ISSN: 2347-3215 Volume 3 Number 6 (June-2015) pp. 246-258

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**Diversity of Butterfly in Contai and its adjoining areas Purba Medinipur,
West Bengal, India**

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KEYWORDS

Diversity of
Butterfly,
Lepidoptera,
Contai,
West Bengal,
India

A B S T R A C T

Butterflies are certainly the most popular insects along with bees and ants. Their popularity is largely due to their appearance, especially their glorious colours. Butterflies and moths belong to the insect order Lepidoptera. They can distinguish from all other insects by having their delicate wings covered with scales. Butterflies are one of the most important assemblages of insects that act as biodiversity indicators as well as nature's gardeners. Due to habitat destruction and unscientific management of natural resources, diversity of Butterflies gradually decreased and their survival rate under the threat. A total 46 species were observed, out of which 10 species belonging to FAMILY PIERIDAE, 6 species were belonging to FAMILY PAPILIONIDAE, 16 species were belonging to FAMILY NYMPHALIDAE AND 12 SPECIES BELONGING TO Family LYCAENIDAE and 2 species belonging to Family HESPERIDAE during March 2014-April 2015 in the Contai and its adjoining area area.

Introduction

Butterflies are generally regarded as one of the best taxonomically studied group of insects. In world more than 28,000 species of butterflies, with about 80 percent found in tropical regions. The order Lepidoptera, which constitutes of the majority of visually appealing insects such as the butterflies and moths have 125,000 to 150,000 described species (Gullan and Cranston, 2009).

Butterflies being one of the most studied groups of insects have been systematically documented since the 18th century (Heppner, 1998). Butterflies are beautiful, flying insects with large scaly wings. Like all insects, they have six jointed legs, 3 body parts, a pair of antennae, compound eyes, and an exoskeleton. The three body parts are the head, thorax and abdomen (the tail

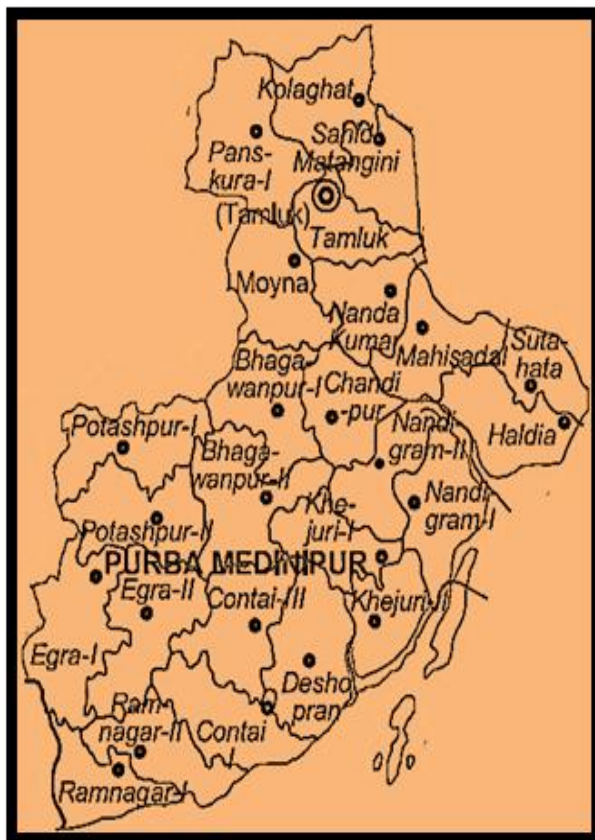
end). The butterfly's body is covered by tiny sensory hairs. The four wings and the six legs of the butterfly are attached to the thorax. The thorax contains the muscles that make the legs and wings move. Butterflies are found all over the world and in all types of environments: hot and cold, dry and moist, at sea level and high in the mountains. Most butterfly species, however, are found in tropical areas, especially tropical rainforests. Many butterflies migrate in order to avoid adverse environmental conditions (like cold weather). Butterfly migration is not well understood. In Purba Medinipur District specially to Contai and its adjoining areas, the butterfly diversity is first time reported in this paper. In this

present paper morphological features, local name, common name, scientific name, time of occurrence, are described and also mentioned the cause of decline.

Materials and Methods

Study site

Contai/ Kanthi is a small town, situated near the coastal area of Purba Medinipur district. The distance from Kolkata to Kanthi is 150km. The latitude and longitude of study site is 21050'N and 87048' E. In this town the authors selected three study sites namely Monoharchak , Baksipur and Campus of P.K.College, Contai.



Collection of Data

The study was started during the period from March-2014 to April 2015. The study





sites were monitored in every month in study period with minimum 1-3 hrs per day.






Actually three study sites were monitored per day from morning 8 a.m to till 10 am. and further 2 p.m to 4p.m. We selected several habitats such as road sides, different fruit gardens(mango, banana, guava),public places, long line bank of canal where host plants of some butterflies were present. Collection of butterflies mainly done by hand picking and photographic documentation. The collections were done in four seasons namely summer, monsoon, post-monsoon and in winter.

As the butterflies are very delicate in nature and therefore its handling is also done very






carefully after collection. Some collected specimens were preserved in the college museum by using naphthalene for the protection against insect pest and fungal attack. The butterflies were identified by using various filed guides and other available literature (Sathyamurthy, 1994; Kunte, 2000; Antram, 2002). Species classification and scientific names are given as per Varshney (1994, 1997). The observed butterflies or time of occurrence in three study sites were categorized in five categorizes on the basis of their abundance such as VC (very common), C (common), NR (not rare), R (rare) and VR (very rare).

The list of observed Butterflies are listed bellow
FAMILY: PIERIDAE







1	COMMON NAME	Mottled Emigrant	
	Local name	Chitpaira	
	Scientific Name	<i>Catopsilia pyranthe</i> (Linnaeus)	
	Characters	The upper side is dull white and the underside is finely striated with light brown or dark grey.	
	Status	Very Common	
	Occurance	S, M, PM, W	
2	COMMON NAME	Common Grass Yellow	
	Local name	Holud	
	Scientific Name	<i>Eurema hecabe</i> (Linnaeus)	
	Characters	Bright yellow with black borders on the upperside of its wings.	
	Status	Very Common	
	Occurance	S, M, PM	
3	COMMON NAME	Common Wanderer/ Indian Wanderer	
	Local name	Tallar	
	Scientific Name	<i>Pareronia hippia</i>	
	Characters	Sky-blue (sky blue) or bluish white with black markings.	
	Status	Not Rare	
	Occurance	S, M, PM	
4	COMMON NAME	Common Gull	
	Local name	Kuchila	
	Scientific Name	<i>Cepora nerissa</i> (Fabricius)	
	Characters	Upper part white with black border from apex and Under surface is pale yellow to bright yellow with darkened veins.	





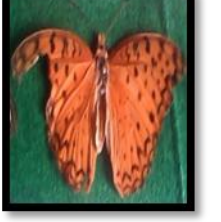


	Status	Abundant	
	Occurance	M,PM,W	
5	COMMON NAME	Common Emigrant	
	Local name	Pairachali	
	Scientific Name	<i>Catopsilia pomona</i> (Fabricius)	
	Characters	Male pale yellow to greenish yellow with black markings	
	Status	C	
	Occurance	S, M, PM, W	
6	COMMON NAME	Psyche	
	Local name	Furus	
	Scientific Name	<i>Leptosia nina</i> (Fabricius)	
	Characters	White with black apex and a median sized black spot at the fore wing.	
	Status	VC	
	Occurance	S, PM, W	
7	COMMON NAME	Pioneer or Cape White	
	Local name	Chikari	
	Scientific Name	<i>Anapheis aurota</i> (Fabricius)	
	Characters	White and yellow with black markings and a distinct "hockey-stick" mark at the front margin of the fore wings.	
	Status	VC	
	Occurance	S,PM,M	
8	COMMON NAME	Common Jezebel	
	Local name	Hartani	
	Scientific Name	<i>Delias eucharis</i> (Drury)	
	Characters	White and yellow with black stripes and orange-red marginal spots which are edged white, and black border on both sides.	
	Status	VC	
	Occurance	S,PM,W	
9	COMMON NAME	Striped albatross	
	Local name	Dhulkapas	
	Scientific Name	<i>Appias olferna</i>	
	Characters	Dusky white to yellowish with black or brown stripes. Two forms are found (i) libythea & (ii) Olferna	
	Status	C	
	Occurance	Pm,w	
10	COMMON NAME	Small Salmon Arab	
	Local name		
	Scientific Name	<i>Colotis amata</i>	
	Characters	Hind wing with a band on costal margin extended to just within the upper margin of the cell, covered with dense black specialized scales. Fore wings, salmon pink, costa black, covered with pinkish scales, apex and termen broadly black with transverse series of pink spots	
	Status	C	
	Occurance	S,PM	




FAMILY: PAPILONIDAE

1	COMMON NAME	Common Mime	
	Local name	Khagra	
	Scientific Name	<i>Papilio Clytia</i> (Linnaeus)	
	Characters	This tail-less Swallowtail has two forms: Clytia and Dissimilis, in both the sexes. The Clytia is dark brown with two series of white spots at the edges of its wings.	
	Status	C	
	Occurance	S,W	
2	COMMON NAME	Common Rose	
	Local name	Aalte	
	Scientific Name	Pachliopta aristolochiae	
	Characters	Large, glossy, black butterfly with two broad white bands on the fore wings. The tailed hind wings have bright crimson spots	
	Status	Rare	
	Occurance	PM,W	
3	COMMON NAME	Common Mormon	
	Local name	Kalim	
	Scientific Name	<i>Papilio polytes</i> (Linnaeus)	
	Characters	Dark blackish-brown with a row of white spots along the central region of the hind wing.	
	Status	VC	
	Occurance	S,M,PM,W	
4	COMMON NAME	Common Banded Peacock	
	Local Name	Moural	
	Scientific Name	Papilio crino	
	Characters	A gorgeous green and blackish-brown swallowtail.	
	Status	R	
	Occurance	PM,W	
5	COMMON NAME	Tailed Jay	
	Local name	Chaitak	
	Scientific Name	Graphium agamemnon	
	Characters	Black with apple-green spots and streaks on wings.	
	Status	C	
	Occurance	S,W	
6	COMMON NAME	Lime butterfly	
	Local name	Ruru	
	Scientific Name	<i>Papilio demoleus</i> Linnaeus	
	Characters	Black and yellow butterfly with a slight tooth on hind wings.	
	Status	VC	
	Occurance	S,M,PM,W	




FAMILY: NYMPHALIDAE







1	COMMON NAME	Common Crow	
	Local name	kaowa	
	Scientific Name	<i>Euploea core</i> (Cramer)	
	Characters	A brown butterfly with a complete row of marginal and sub-marginal white spots.	
	Status	VC	
	Occurance	S,PM,W	
2	COMMON NAME	Brown King Crow/King Crow	
	Local name	_____	
	Scientific Name	<i>Euploea klugii</i>	
	Characters	Both male and female are very variable in markings and in the outline of the termen and dorsum of the forewing. Forewing dark-brown glossed with brilliant blue, generally a spot at apex of cell, a small costal spot, two short streaks beyond apex of cell. Hindwing brown, glossed with blue in the middle, sub-terminal series of spots incomplete or absent.	
	Status	NR	
Occurance	S, M,PM		
3	Status	Grey Pansy	
	Occurance	Chandnari	
	Scientific Name	<i>Precis atlites</i> (Linnaeus); <i>Junonia atlites</i> (Linnaeus)	
	Characters	Creamish-grey with brown lines and a row of black spots near the wing margin.	
	Status	C	
Occurance	S,M,PM,W		
4	COMMON NAME	Peacock Pansy	
	Local name	Nayan	
	Scientific Name	<i>Junonia almana</i> (Linnaeus)	
	Characters	Coppery yellow with peacock colour at the centre with yellow and black rings around it.	
	Status	NR	
Occurance	PM,W		
5	COMMON NAME	Chocolate Pansy	
	Local name	Kairi	
	Scientific Name	<i>Precis iphita</i> (Cramer)	
	Characters	Brown with darker bands.	
	Status	C	
Occurance	PM,W		
6	COMMON NAME	Plain Tiger	
	Local name	Tamot	
	Scientific Name	<i>Danaus chrysippus</i> (Linnaeus)	
	Characters	This is a tawny with black apex, body is black, spotted with white. The hindwing has three small black spots approximately at the centre.	
	Status	VC	



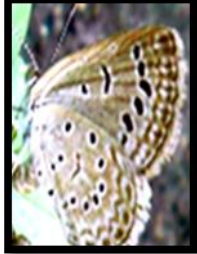
	Occurance	S,PM,W	
7	COMMON NAME	Striped Tiger or Common Tiger	
	Local name	Bagballa	
	Scientific Name	<i>Danaus genutia</i> (Cramer)	
	Characters	Orange with black stripes.	
	Status	VC	
	Occurance	S,M,PM,W	
8	COMMON NAME	Blue Tiger	
	Local name	Himalkuchi	
	Scientific Name	<i>Tirumala limniace</i> (Butler)	
	Characters	Dark brown to black with blue markings.	
	Status	C	
	Occurance	S,PM,W	
9	COMMON NAME	Lemon Pansy	
	Local name	Usum	
	Scientific Name	<i>Junonia lemonias</i> (Linnaeus)	
	Characters	Dark brown with eye-like markings with orange rings.	
	Status	NR	
	Occurance	W	
10	COMMON NAME	Chestnut Streaked Sailer	
	Local name	Batasi	
	Scientific Name	<i>Neptis jumbah</i> (Moore)	
	Characters	Dark brown, with white horizontal lines.	
	Status	VC	
	Occurance	S,M,PM,W	
11	COMMON NAME	Common Leopard	
	Local name	Chita	
	Scientific Name	<i>Phalanta phalantha</i> (Drury)	
	Characters	Yellow with black band spot.	
	Status	C	
	Occurance	PM,W	
12	COMMON NAME	Angled Castor	
	Local name	Kanmorche	
	Scientific Name	<i>Ariadne ariadne</i> (Linnaeus)	
	Characters	Reddish brown with regular slender single lines	
	Status	C	
	Occurance	All months	
13	COMMON NAME	Great Eggfly	
	Local name	Jamui	
	Scientific Name	<i>Hypolimnas bolina</i> (Linnaeus)	
	Characters	The iridescent, bluish white, egg shaped markings on the upperwing surface make the male of this species a handsome insect.	

	Status	C	
	Occurance	M,PM,W	
14	COMMON NAME	Tawny Coster	
	Local name	Harinchara	
	Scientific Name	<i>Acraea violae</i> (Fabricius)	
	Characters	Tawny-orange, with black cell streaks and darkened veins.	
	Status	VC	
	Occurrence	S,M,PM	
15	COMMON NAME	Common Baron	
	Local name	Bhusunda	
	Scientific Name	<i>Euthalia aconthea</i> (Cramer)	
	Characters	The male is dark brown with a row of very small white spots on the forewings. The female is pale brown with a prominent white band on the forewings. In female Upperside tawny, veins black.	
	Status	VR	
	Occurrence	S,PM	
16	COMMON NAME	Common Palm fly	
	Local name		
	Scientific Name	<i>Elymnias hypermnestra</i>	
	Characters	Males exhibit black colored upperside forewings with small blue patches and reddish brown color on upperside hindwings.	
	Status	NR	
	Occurrence	S,M	



FAMILY: LYCAENIDAE

1	COMMON NAME	Quaker	
	Local name	Kardi	
	Scientific Name	<i>Neopithecops zalmora</i> (Fruhstorfer)	
	Characters	Upperside dark brown, with variable white patch on the disc, a prominent black spot on underside of hind wings.	
	Status	C	
	Occurance	M,PM,W	
2	COMMON NAME	Gram Blue	
	Local name	Joural	
	Scientific Name	<i>Euchrysops cnejus</i> (Fabricius)	
	Characters	The Gram Blue is a tailed, light grey butterfly marked with thin lines and spots.	
	Status	C	
	Occurrence	S,M,PM	
3	COMMON NAME	Pale Grass Blue	
	Local name	Dhupi	
	Scientific Name	<i>Pseudozizeeria maha</i> (Kollar)	
	Characters	Upperside dark blue, underside usually brown, occasionally brown, spots are rounded and dark.	

	Status	VC	
	Occurrence	S,M,PM,W	
4	COMMON NAME	Plains cupid	
	Local name		
	Scientific Name	<i>Chilades pandava</i> (Horsfield)	
	Characters	The upperside of male is lavender-blue with dark borders.	
	Status	C	
	Occurrence	PM, W	
5	COMMON NAME	Forget-me-not	
	Local name	Rit-tam	
	Scientific Name	<i>Catochrysops strabo</i> (Fabricius)	
	Characters	Pale blue. Under hindwing has two small black costal spots.	
	Status	NR	
	Occurrence	S,PM	
6	COMMON NAME	Lime Blue	
	Local name	Tura	
	Scientific Name	<i>Chilades laius</i>	
	Characters	Light grey, tailless blue.	
	Status	C	
	Occurrence	S,M,PM	
7	COMMON NAME	Common Cerulean	
	Local name	Surul	
	Scientific Name	<i>Jamides celeno</i> (Cramer)	
	Characters	Grey or brown with white lines or brown bands.	
	Status	VR	
	Occurrence	PM,W	
8	COMMON NAME	Long-banded silverline	
	Local name	-----	
	Scientific Name	<i>Spindasis lohita</i> (Horsfield)	
	Characters	Creamy yellow to cinnamon red, silvery lines edged prominently with black to red.	
	Status	NR	
	Occurrence	S,M	
9	COMMON NAME	Rounded/Striped Pierrot	
	Local name	Tilkusi	
	Scientific Name	<i>Tarucus nara</i> (Kol.)	
	Characters	White with black spots and border; upper side violet blue with narrow black border.	
	Status	VR	

	Occurrence	S,PM	
10	COMMON NAME	Common Pierrot	
	Local name	Tilaia	
	Scientific Name	<i>Castalius rosimon</i> (Fabricius)	
	Characters	Black spots and streaks on white wings	
	Status	VC	
	Occurrence	S,M,PM	
11	COMMON NAME	Ciliate Blue	
	Local name	Ayandanri	
	Scientific Name	<i>Anthene emolus</i>	
	Characters	Upperside dark blue, Underside pale brown with many white bands.	
	Status	C	
	Occurrence	S,M.	
12	COMMON NAME	Tiny grass blue	
	Local name		
	Scientific Name	<i>Zizula hylax</i> (Fabricius)	
	Characters		
	Status	VC	
	Occurrence	S, M, PM, W	

FAMILY: HESPERIIDAE

1	COMMON NAME	Grass Demon	
	Local name		
	Scientific Name	<i>Udaspes folus</i>	
	Characters	It is black with a large white spot on the upperside of the hind wing and several smaller whites spots on the forewing. The underside of its wings is mostly white with brown edges and spots.	
	Status	NR	
	Occurrence	M,PM	
2	COMMON NAME	Rice Swift	
	Local name	Johur	
	Scientific Name	<i>Borbo cinnara</i> (Wallace)	
	Characters	Dark brown wings, white spots on the underside of the hind wings.	
	Status	C	
	Occurrence	W,PM	

VC- Very Common , C-Common, NR–Not Rare, R–Rare, VR-Very Rare

S-Summer, M-Monsoon PM-Post Monsoon, W-Winter

Distribution of different families of butterflies in three study sites

SI No	Common Name	Family	SA-1	SA-2	SA-3
1	Mottled Emigrant	PIERIDAE	+++	+++++	+
2	Common Grass Yellow	PIERIDAE	+++	+++++	+++
3	Common Wanderer/ Indian Wanderer	PIERIDAE	+++	+++++	+
4	Common Gull	PIERIDAE	+++	+++++	+
5	Common Emigrant	PIERIDAE	++	+++++	+
6	Psyche	PIERIDAE	+++	+++++	+
7	Pioneer or Cape White	PIERIDAE	+++	+++++	+
8	Common Jezebel	PIERIDAE	+++	++++	+
9	Striped albatross	PIERIDAE	+++	++++	+
10	Small Salmon Arab	PIERIDAE	-	+++++	-
11	Common Mime	PAPILIONIDAE	+++	+++++	+
12	Common Rose	PAPILIONIDAE	+++	+++++	+
13	Common Mormon	PAPILIONIDAE	+++	+++++	+
14	Common Banded Peacock	PAPILIONIDAE	-	+	-
15	Tailed Jay	PAPILIONIDAE	+++	+++++	+++
16	Lime butterfly	PAPILIONIDAE	+++	+++++	+++
17	Common Crow	NYMPHALIDAE	+++	+++++	+
18	Brown King Crow/King Crow	NYMPHALIDAE	+++	+++	+
19	Grey Pansy	NYMPHALIDAE	+++	+++++	+
20	Peacock Pansy	NYMPHALIDAE	+++	+++++	+
21	Chocolate Pansy	NYMPHALIDAE	+++	+++++	+
22	Plain Tiger	NYMPHALIDAE	+++	+++++	+++
23	Striped Tiger or Common Tiger	NYMPHALIDAE	+++	+++++	+
24	Blue Tiger	NYMPHALIDAE	+++	+++++	+
25	Lemon Pansy	NYMPHALIDAE	+++	+++++	+++
26	Chestnut Streaked Sailer	NYMPHALIDAE	+++	+++++	-
27	Common Leopard	NYMPHALIDAE	+	+++	-
28	Angled Castor	NYMPHALIDAE	+	++++	+
29	Great Eggfly	NYMPHALIDAE	+++	++++	-
30	Tawny Coster	NYMPHALIDAE	+	+	+
31	Common Baron	NYMPHALIDAE	+++	+++++	+
32	Common Palm fly	NYMPHALIDAE	+++	+++	-
33	Quaker	LYCAENIDAE	+++	+++++	+++
34	Gram Blue	LYCAENIDAE	+++	+++++	+
35	Pale Grass Blue	LYCAENIDAE	+++	+++++	+
36	Plains cupid	LYCAENIDAE	+++	+++++	+
37	Forget-me-not	LYCAENIDAE	+++	+++++	+
38	Lime Blue	LYCAENIDAE	+++	+++++	+
39	Common Cerulean	LYCAENIDAE	+++	+++++	+
40	Long banded Silverline	LYCAENIDAE	+++	+++++	+
41	Rounded/Striped Pierrot	LYCAENIDAE	+++	+++	+
42	Common Pierrot	LYCAENIDAE	+++	+++++	+
43	Ciliate Blue	LYCAENIDAE	++++	+++	-
44	Tiny grass blue	LYCAENIDAE	++++	++++	+++
45	Grass Demon	HESPERIDAE	+	++++	+
46	Rice Swift	HESPERIDAE	+++	+++++	-

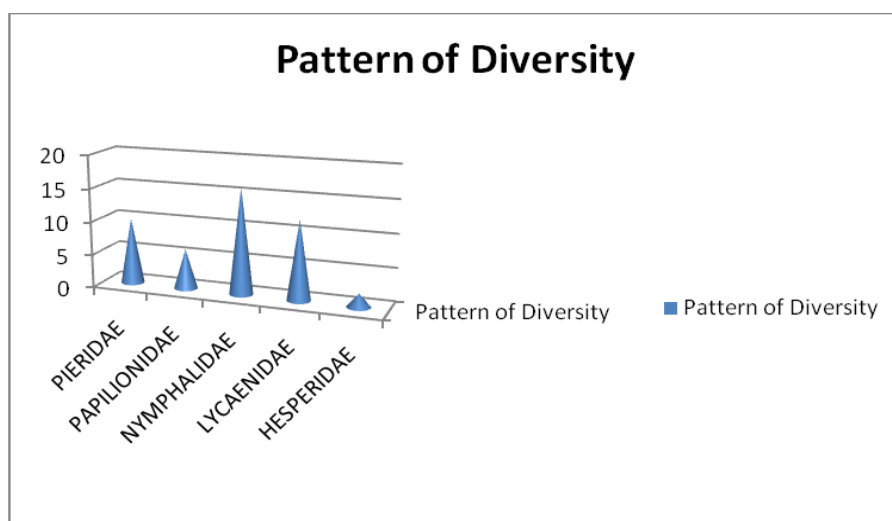
SA-1= Monoharchak, SA-2= Baksisipur SA-3= Contai college campus
 +++=Moderately appeared ++++= Highly appeared += Less appeared - = Not appeared

Result and Discussion

Butterflies are one of the marvelous creation of nature. It also acts as an indicators of ecological changes in their surroundings. During study as well as sampling total forty six species of butterflies are recorded from three study sites and these belongs to the five families namely Pieridae, Papilionidae, Nymphalidae, Lycaenidae and Hesperidae. The diversity and abundance of species is highly correlated with the availability of food plants in the surroundings (Kunte 2000). Among the Family Peridae the observed butterflies have strong migratory habit and Common Wander is protected under schedule II of Indian Wild Life(Protection) Act,1972. The Mottled Emigrant, Common Grass Yellow and Common Emigrant were recorded as most abundant species from three study sites). . The family Papilionidae is the smallest butterfly family and popularly called Swallow tails. The most abundant species recorded from the study sites was Lime butterfly. Among the Family Nymphalidae Common Crow, Plain Tiger, Common Tiger

and Lemon Pansy were the more diverse butterflies. Occurrence of maximum number of species in the family Nymphalidae could be the result of high availability of food plants in the study area. Lycaenidae are also the largest families of butterflies along with Nymphalidae but most of them were very small. The Gram Blue and Lime Blue were more abundant. The less abundant family recorded were Hesperidae. Clark *et al.*, 2007, reported that increased human activities were associated with decreased butterfly species and claimed that the rich, rare and specialized species were the most affected. Therefore Conservation is hence necessary to keep these rare species from being pushed to extinction. The Wild Life (Protection) Act 1972 has enough provisions for conservation of butterflies. Under this Act, around 120 species and sub-species of butterflies and moths are in Schedule-I and nearly 292 species and sub-species are in Schedule-II. Not also legislation , but proper effective steps in maintaining the wild life habitat through continuous process of awareness generation among the local community, young generation is required.

Graphic Representation of Butterfly Diversity



Conclusion

Present study shows the occurrence of high number of butterfly species in Contai and its adjoining areas. . It was observed that, the occurrence and distribution of butterflies were closely associated with the availability of its larval and adult host plants. It is also said that the gradual destruction of natural habitat induce to decline the butterflies species in very recent.

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