

Distribution and composition of butterfly species along the latitudinal and habitat gradients of the Western Ghats of India

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ABSTRACT: Distribution of butterfly species along the latitudinal and habitat gradients of the Western Ghats was studied. The Western Ghats was divided into 14 latitude zones and the species diversity in each latitude zone, along with habitats of their occurrence, were studied using the data from literature survey for the entire Western Ghats as well as data from personal observations in the areas between 14°N to 20°N latitudes. Out of 334 species recorded from the Western Ghats, 58 species were found in all latitudinal zones, while 5 species were reported in only one latitudinal zone. Further, southern Western Ghats consisted of more number of species and more number of genera as compared to northern Western Ghats. Latitudinal zones between 10°N to 12°N had most of the Western Ghats endemic species. Habitat wise distribution of species revealed three significant clusters grossly separated by the level of human disturbance. Evergreen forest habitats supported maximum number of species endemic to the Western Ghats.

INTRODUCTION

The Western Ghats (WG) of India, considered as one of the biodiversity hotspots (Myers *et. al.* 2000), is rich in fauna and flora with many endemic species. However, out of 182,500 sq. km of primary forest in the Western Ghats-Sri Lanka, only 6.8% of primary forest cover exists today (Myers *et. al.* 2000) and even the existing forests are declining rapidly (Jha *et. al.* 2000). This rapid loss of forests, and hence biotic diversity, is an irreversible environmental threat (Mittermeier *et. al.* 1998). Study of species distribution patterns in such threatened areas may help in the design and implementation of conservation strategies to avoid any further loss of these biological resources, which is of a major concern (Gunawardene *et. al.* 2007).

Butterflies are suitable for biodiversity studies, as the taxonomy, geographic distribution and status of many species are relatively well known. Further, butterflies are good biological indicators of habitat quality as well as general environmental health (Larsen 1988; Kocher and Williams 2000; Sawchik *et. al.* 2005), as many species are strictly seasonal and prefer only particular set of habitats (Kunte 1997). Butterflies may react to disturbance and change in habitat and act as an ecological indicator (Mac Nally and Fleishman 2004; Fleishman *et. al.* 2004). They may get severely affected by the environmental variations and changes in the forest structure, as they are closely dependent on plants (Pollard 1991; Blair 1999). Thus minor changes in their habitat may lead to either migration or local extinction (Blair 1999; Kunte 2000b; Mennechez, Schtickzelle and Baguette 2003). Because of their dependence on the plants, butterfly diversity may reflect overall plant diversity in the given area (Padhye *et. al.* 2006). Thus, change in land use pattern may lead

to landscape changes that can reflect into change in butterfly diversity and distribution. As a result, butterflies can also be used as umbrella species (the species whose protection serves to protect many co-occurring species) for conservation planning and management (Fleishman *et. al.* 2000; 2001; Betrus *et. al.* 2005).

Another reason why butterflies might be used as model organisms, especially in the WG, is the recent surge in the literature on the diversity, habitat usage and conservation of butterflies (Gaonkar 1996; Kunte 2000b; Kehimkar 2008; Kunte 2008b; Kunte, in press). As a result, ample of information on the butterflies on the WG is available. Nevertheless, our understanding of the fine scale patters of latitudinal distribution of butterflies within the WG is still limited. While Gaonkar (1996) gives state wise distribution of the butterflies of the WG, Kunte (2008b) has provided distribution in four zones of the WG. Studying the distribution of butterflies at the finer scale within the WG will be important to identify local biodiversity hotspots within the WG.

In this paper we have surveyed the latitudinal and habitat wise distribution of butterflies by collecting data from literature since 1886 till date and our sporadic field surveys in the northern WG. We have given a detailed analysis of butterfly diversity along the latitudinal and habitat gradient along the WG. Implications of our study for the conservation are also discussed.

MATERIALS AND METHODS

Study area: The Western Ghats

WG run continuously parallel to the west coast of India between 8°N - 22°N, ending in south of Gujarat State, traversing a length of about 1600 km (Figure 1). Spread over an area of about 175,000 sq. km, this mountain range

contains remaining tropical rain forests on its slopes. There are hills from 1000m ASL to 2000m ASL altitude, between 8°N - 13°N and 18°N - 19°N. The Nilgiris, Palnis and Anamalais are the only stretches of this mountain range with altitude over 2000m ASL. The northern portion of the range is at lower elevations than the southern portion. The WG receives much of its rain from the southwest monsoon, hence June to October are generally wettest season. However, the northern portion of the range is generally drier than the southern portion, as the southern portion also receives north-eastern/return monsoon during November and December. Average annual rainfall on the WG is 2500 mm. The dry periods south of 13° N are 2–5 months while in the north it varies from 5 to 8 months. Mean temperature ranges between 20° to 24° C, frequently shooting beyond 30° C during summer (April–May) and sometimes falling to almost 0° C during winter in the high altitude hilly regions (Dahanukar *et al.* 2004).

Data collection from literature survey

Data on the presence of different butterfly species in the 14 latitudinal zones (Figure 1), their habitat of occurrence and food plant preference was collected from the literature (Appendix 1). Conservation values for the butterflies were adapted from Kunte (2008b), which are defined based on four criteria – (1) Global distribution: varies from highest 10 points for narrow distribution in WG to lowest one point for occurrence in 3 or more zoogeographical regions, (2) Local distribution in the WG: varies from highest 10

points for restricted to only southern region to lowest 2 points for presence in northern and central regions only, (3) Status in the WG: varies from highest 10 points for rare and patchy distribution to lowest 1 point for abundant and wide spread species, (4) Habitat preference: varies from highest 10 points for low and mid elevation evergreen and semi evergreen forests to lowest 1 point for diverse habitat types. The conservation value for a species is the sum of the scores for all 4 above mentioned criteria with maximum score of 40 and minimum score of 5. While the conservation values were taken from Kunte (2008b), for *Chilades putli* (Eastern Grass Jewel), which is not mentioned in Kunte (2008b), conservation value was assigned as 14 based on the same criteria.

Data collection from field survey

Apart from the literature survey, we also conducted some field surveys between 14°N-20°N latitude (Table 1), the region for which very scanty data is available in published literature except for 18° to 19°N (see Figure 1). Field data was collected by conducting random surveys by all out search method, when butterflies are most active, i.e. in the morning 0900h to 1100h and evening 1530h to 1730h. Butterflies were identified in the field with the help of field guides (Gunathilagaraj *et al.* 1998; Kunte 2000). Specimen collection was strictly avoided.

Unpublished data for Sahyadri Tiger Reserve, Amboli, Agumbe, Satara, Bangalore, Mumbai, Phansad, Dajipur and Gaganbawda were available from personal communications

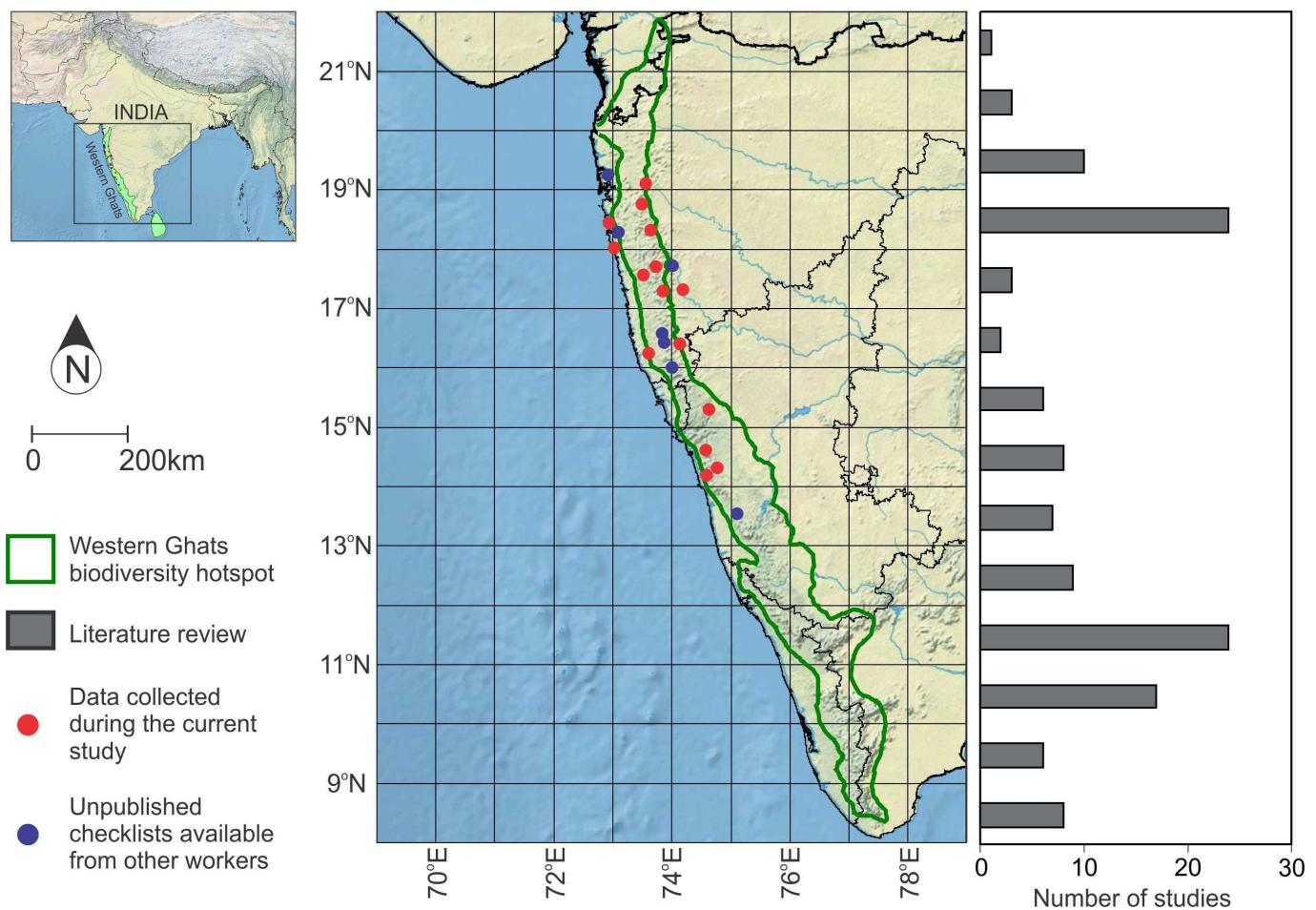


FIGURE 1. Study area and the latitudinal zones. Bar chart of number of studies in the literature survey includes only the checklists and distributional records. Multiple papers based on the same study are considered together as one. Note that a single study may span over more than one latitudinal zone. Additional checklists available from current study and unpublished surveys are shown as filled circles on the map.

with Rohan Bhate, Hemant Ogle, Kishen Das, Milind Bhakre, Harsha Kumar, Zeeshan Mirza, Rajesh Sanap, Naik and Ankur Patwardhan. Butterfly species distribution data compiled by all the above mentioned methods and subsequently used for the analysis is given as Appendix 2.

Data analysis

We prepared dendograms based on Bray-Curtis distances for clustering to analyze the latitudinal and habitat wise distribution of the butterflies using PAST (Hammer *et al.* 2001). Bootstrap values were estimated for 1000 replicates. We used chi-square test of independence to find out whether the family wise distribution of species was dependent on latitudinal zones, habitat types and host plant preference. Correspondence Analysis was performed as a convenient method to visualize contingency table created by considering number of butterfly species of each family in different latitudinal zones, habitats and associated with host plant families with PAST (Hammer *et al.* 2001). Box plot were prepared in SigmaPlot® 10.

TABLE 1. Locality details of additional field surveys done in the current study.

LOCALITY	COORDINATES	
	LATITUDE	LONGITUDE
Bhimashankar	19°07' N	73°54' E
Kamshet - Lonavla	18°46'01" N	73°33'09" E
Phansad	18°25'12" N	72°56'00" E
Velha	18°17'47" N	73°38'15"
Harihareshwar	17°59'51" N	73°01'14" E
Vasota	17°40'19" N	73°43'18" E
Chiplun	17°31'48" N	73°31'12" E
Chandoli	17°13' N	73°50' E
Bhambarwadi	17°17'11" N	74°10'53" E
Nadhavde	16°22'38" N	74°7'38" E
Belane	16°13'23" N	73°35'57" E
Amboli	15°57'53" N	74°00'13" E
Dandeli	15°15'38" N	74°36'56" E
Yana-Sirsi	14°35'22" N	74°33'59" E
Kattlekan	14°17'12" N	74°45'40" E
Bachchudi	14°05'59" N	74°35'59" E

TABLE 2. Latitudinal distribution of species according to their families.

Latitudinal extent (°N)	Total Species (S = 334)	Western Ghats Endemics (WGE = 33)	FAMILY WISE NUMBER OF SPECIES (ENDEMICS)					
			Papilionidae S = 19 (WGE = 5)	Pieridae S = 34 (WGE = 3)	Nymphalidae S = 97 (WGE = 12)	Lycaenidae S = 101 (WGE = 3)	Hesperiidae S = 82 (WGE = 10)	Riodinidae S = 1 (WGE = 0)
8 – 9	178	20	18 (05)	15 (02)	73 (09)	36 (02)	35 (02)	01 (00)
9 – 10	173	18	14 (04)	15 (02)	68 (08)	39 (02)	36 (02)	01 (00)
10 – 11	314	31	19 (05)	32 (03)	93 (11)	95 (03)	74 (09)	01 (00)
11 – 12	319	30	19 (05)	31 (03)	91 (09)	99 (03)	78 (10)	01 (00)
12 – 13	288	25	19 (05)	29 (01)	85 (10)	89 (02)	65 (07)	01 (00)
13 – 14	163	13	19 (05)	22 (01)	64 (05)	25 (01)	32 (01)	01 (00)
14 – 15	265	16	18 (05)	28 (01)	81 (04)	79 (02)	58 (04)	01 (00)
15 – 16	263	15	18 (05)	27 (01)	76 (03)	82 (02)	59 (04)	01 (00)
16 – 17	112	02	09 (00)	14 (00)	44 (02)	29 (00)	15 (00)	01 (00)
17 – 18	189	10	16 (05)	25 (01)	63 (04)	53 (00)	31 (00)	01 (00)
18 – 19	186	07	12 (02)	24 (01)	59 (02)	58 (01)	32 (01)	01 (00)
19 – 20	166	03	12 (01)	25 (00)	51 (02)	46 (00)	31 (00)	01 (00)
20 – 21	162	03	10 (00)	25 (00)	50 (02)	48 (01)	28 (00)	01 (00)
21 – 22	159	02	10 (00)	25 (00)	48 (01)	49 (01)	26 (00)	01 (00)

This zone contains the Palni and Anamalai hill ranges. Latitudinal distribution of butterfly species of different families suggests that latitudinal zones between 10°N - 14°N harbour all species of Papilionidae known from WG. Maximum number of species belonging to Pieridae were found in 10°N - 11°N latitudes (32 species) followed by 11°N - 12°N latitudes (31 species) and both had all three WG endemic species of this family. Maximum number of species of Nymphalidae were present between 10°N - 11°N (93 species) latitudes followed by 11°N - 12°N latitudes (91 species), however maximum WG endemic species of this family (11 species) were present between 10°N - 11°N latitudes followed by 12°N - 13°N latitudes (10 species). In Lycaenidae, maximum species were present in 11°N - 12°N latitudes (99 species) followed by 10°N - 11°N (95 species) and both had all three WG endemics from this family. Maximum number of species (78) as well as maximum number of WG endemic species (10) of Hesperiidae were present in 11°N - 12°N latitudes (Table 2).

Dendrogram depicting the similarity in species composition between latitudes (Figure 2a) showed two clusters one for the southern WG between 8°N - 16°N and another for the northern WG between 17°N - 22°N. The southern cluster is further roughly divided in three zones 8°N - 10°N, 10°N - 13°N and 14°N - 16°N. Latitudinal zone 13°N - 14°N, however showed low similarity from rest of the southern WG cluster. Northern WG cluster had only one well defined zone between 20°N - 22°N, while other zones had very less similarity.

Family wise distribution of the species was significantly dependent on the latitudinal zones ($\chi^2 = 70.048$, $df = 52$, $P = 0.048$) when we considered *Plum Judy* from family Riodinidae together with family Lycaenidae (based on previous classification). This was necessary since Riodinidae had only one species distributed in the WG. Correspondence analysis (Figure 2b) of latitudinal distribution of butterfly families suggested that, as compared to the other families, Pieridae was more predominant in northern WG (16°N - 22°N), Hesperiidae was predominant in southern WG (10°N - 16°N). Nymphalidae and Papillionidae were both predominant in 8°N - 10°N and 13°N - 14°N latitudes, while families Lycaenidae and Riodinidae were omnipresent.

Patterns of distribution of butterfly species agree with other taxa such as micromolluscs (Aravind et al. 2008), amphibians (Daniels 1992), fish (Dahanukar et al. 2004) and bats (Korad et al. 2007) studied in a similar manner where in the latitudinal species distribution along the WG is discussed. These studies also showed higher species diversity as well as endemism in the southern WG (south of 14°N) as compared to those in the northern WG. Gaonkar (1996) has compiled the data on butterfly species distribution along the WG however, the analysis is restricted to the wider latitude ranges at the state level (i.e. occurrence in six political states viz. Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra and Gujarat).

In the latitudinal distribution of the butterflies, we noticed that the latitudinal range between 10°N - 16°N harboured 325 species, which is 97.3% of the total number of species in the entire WG. Higher floristic and habitat diversity south of 16°N latitudes in WG (Ramesh and Pascal 1997; Ramesh 2001; Gimaret-Carpentier et

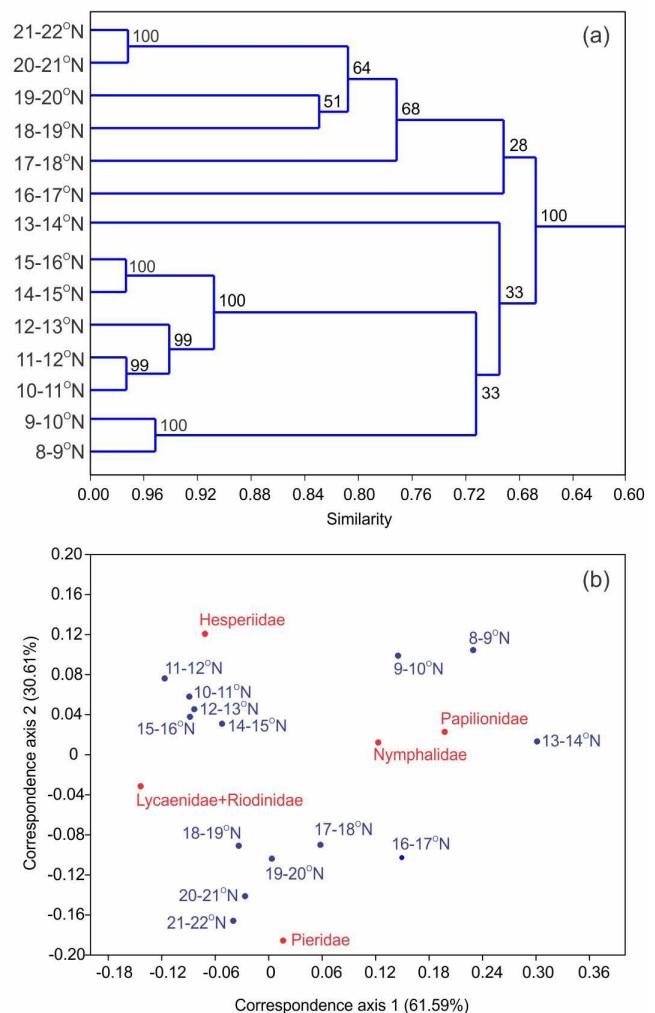


FIGURE 2. Latitudinal distribution of butterflies (a) dendrogram depicting the clustering of different latitudinal zones based on shared species and (b) correspondence analysis of latitudinal distribution of families.

al. 2003; Davidar et al. 2005) could be important factors leading to the higher diversity of butterflies in this area. In the north of 16°N latitude the floristic component and the forest types are relatively less diverse (Ramesh and Pascal 1997). This could be one of the reasons for lower butterfly species diversity in the northern WG. Low number of species in the northern parts of the WG is less likely to be due to variations in number of studies and this can be revealed by the comparison of two representative latitudinal zones, 11°N-12°N and 18°N-19°N. Both these latitudinal zones have equal number of studies and still the southern region (11°N -12°N) has 96% of the total WG butterfly species, while the northern region (18°N-19°N) has only 56% of the total WG butterfly species (Figure 1, Table 2).

Exceptionally higher number of butterfly species in 11°N - 12°N latitudinal zone (319 species, 95.5% of the total number of species in the entire WG) could be a product of higher habitat diversity and hence the host plant species diversity in this latitudinal zone, which includes Nilgiri mountains. Larsen (1988) suggested that Nilgiris simultaneously house both montane as well as temperate elements creating a diversity of habitats supporting a rich diversity of butterfly species. This fact is also revealed by survey of Nilgiri area by Florence (1927), Larsen (1987a; 1987b; 1987c), Radhakrishnan and Lakshminarayanan

(2001), Wynter-Blyth (1944a, 1944b, 1945, 1947) and Yates (1935).

Habitat wise distribution of the butterflies

Distribution of species in different habitats (Table 3, Appendix 2) suggested that the maximum number of species were present in evergreen forests (78%) followed by deciduous (58%) and riparian (37%) habitats. Maximum number of WG endemic species were found in evergreen forests (29 species) followed by grasslands (9 species) and riparian and deciduous with four species each. A total of 143 species were present only in one of the habitats out of which 19 species were WG endemics. Out of these 19 endemic species, 16 were present only in the evergreen forests while three were restricted to grasslands. Most species of Papilionidae and all of its endemics occurred in evergreen forests. Members of Pieridae occurred in both evergreen forests and deciduous patches, while the endemic species of this family occurred in evergreen forests and grasslands. Members of Nymphalidae, Lycaenidae and Hesperiidae occurred in evergreen forests and deciduous habitat. Results of our analysis are consistent with the earlier reports by Kunte *et al.* (1999) and Kunte (2008b). (For the detailed analysis of habitat preference by WG butterfly species see Kunte, 2008b).

Dendrogram depicting the similarity in species composition between habitats (Figure 3a) showed two distinct clusters comprising of - (1) evergreen, deciduous and riparian habitats and (2) grassland, scrubs, hill slopes, degraded, agricultural and urban habitats. First cluster mentioned above was separated from the second cluster with greater dissimilarity depicting sharing of less number of species among these habitats.

Habitat wise distribution of the butterflies suggests that the undisturbed natural habitats such as evergreen forests, deciduous forests and riparian patches show maximum richness of total as well as endemic species, which is consistent with Kunte *et al.* (1999), Kunte (2008b) and Kunte (in press). The cluster analysis emphasises this fact by separating these habitats into a distinctly separated clades. The habitats such as scrubs and grasslands show lower richness as compared with the undisturbed habitats as they are marginally disturbed due to cattle grazing and other minor anthropogenic activities. The disturbed habitats such as hill slopes, agricultural lands and urban

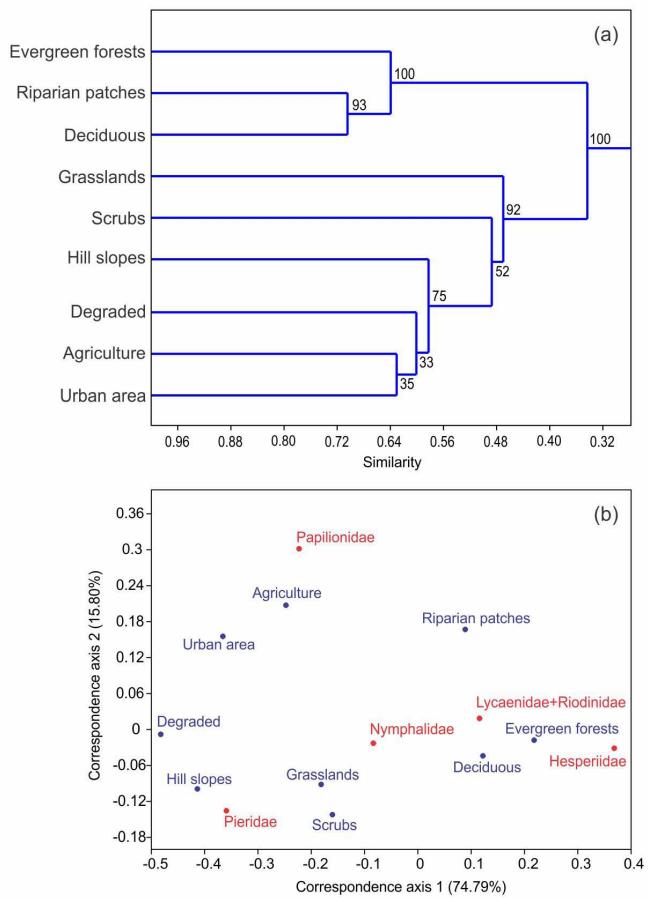


FIGURE 3. Habitat wise distribution of butterflies (a) dendrogram depicting the clustering of different habitats based on shared species and (b) correspondence analysis of habitat wise distribution of families.

habitats on the other hand show very less richness with no endemic species perhaps due to the change in the land use pattern and subsequent changes in the original landscape. Kunte (2008b) has also mentioned the marked absence of endemic species in dry open habitats such as deciduous forests, scrubs and savannas, which are a result of recent anthropogenic alterations.

Family wise distribution of the species was significantly dependent on the habitat types ($\chi^2 = 61.79, df = 32, P = 0.0006$). Correspondence analysis (Figure 3b) of habitat wise distribution of butterfly families reveals the following facts – (1) Hesperiidae, Lycaenidae and Riodinidae were predominant in evergreen, deciduous and riparian habitats as compared to other butterfly families. (2) Pieridae was

TABLE 3. Habitat wise distribution of species according to their families.

Habitat	Total Species (S = 334)	Western Ghats Endemics (WGE = 33)	FAMILY WISE NUMBER OF SPECIES (ENDEMICS)						
			Papilionidae S = 19 (WGE = 5)	Pieridae S = 34 (WGE = 3)	Nymphalidae S = 97 (WGE = 12)	Lycaenidae S = 101 (WGE = 3)	Hesperiidae S = 82 (WGE = 10)	Riodinidae S = 1 (WGE = 0)	
Evergreen forests	262	29	17 (05)	23 (02)	84 (10)	74 (03)	63 (09)	01 (00)	
Grasslands	080	09	07 (01)	16 (02)	28 (05)	17 (00)	12 (01)	00 (00)	
Deciduous	194	04	12 (02)	23 (00)	59 (02)	61 (00)	38 (00)	01 (00)	
Degraded	034	01	04 (00)	07 (00)	16 (01)	06 (00)	01 (00)	00 (00)	
Scrubs	084	01	05 (01)	16 (00)	30 (00)	23 (00)	10 (00)	00 (00)	
Riparian patches	124	04	14 (02)	09 (00)	41 (02)	38 (00)	21 (00)	01 (00)	
Agriculture	041	02	07 (01)	07 (01)	13 (00)	09 (00)	05 (00)	00 (00)	
Urban area	051	02	08 (01)	10 (01)	17 (00)	13 (00)	03 (00)	00 (00)	
Hill slopes	045	01	04 (00)	10 (01)	19 (00)	10 (00)	02 (00)	00 (00)	

predominant in scrub, grassland, hill slope and degraded habitats as compared to other butterfly families. (3) Papilionidae was predominant in urban and agricultural habitats as compared to other butterfly families, and (4) Nymphalidae was present in all habitats.

The correspondence analysis of Butterfly family distribution with respect to the host plant families revealed significant host plant preference by different butterfly families ($\chi^2 = 932.72$, $df = 380$, $P < 0.0001$). Both Papilionidae and Pieridae showed preference for specific host plant families as compared to Lycaenidae, Hesperiidae, Riodinidae and Nymphalidae, who preferred more diverse set of host plant families (Figure 4).

It has been suggested that the human interference leads to the ecotone effects, increases the microhabitats and vegetation associated with disturbance, leading to higher diversity of butterflies (Devy and Davidar 2001; Padhye et al. 2006). However, our current analysis suggests that the effect is more on a local scale. While in a global scenario for the entire WG, the disturbed habitats such as scrubs, grasslands, hill slopes, agricultural lands and urban habitats do not support high diversity as compared to the evergreen forests, deciduous forests and riparian patches.

Conservation Implications

Latitude wise conservation values of the butterflies (Figure 5a) suggest that the average conservation values of butterflies in southern WG (8°N to 16°N) are more than the average conservation values for northern WG (16°N to 20°N). While, the habitat wise conservation values of the butterflies (Figure 5b) shows that the average conservation value of butterflies found in the evergreen forests was more than any other habitat, followed by riparian patches, deciduous forests, grasslands and scrubs. Degraded habitats such as agricultural lands, urban areas and hill slopes harboured butterflies with relatively lower conservation values.

Kunte (2008b) has discussed the threat and conservation issues of butterfly species in the WG. In our study we have further analysed the species distribution data to go to the finer dimensions and identify the areas of WG for prioritizing the conservation efforts. Our analysis suggests that latitudinal range 10°N - 12°N has maximum average conservation value and it harbours maximum number of species as well as maximum number of endemic species. Thus this latitudinal range should be given more intensive conservation efforts on the top

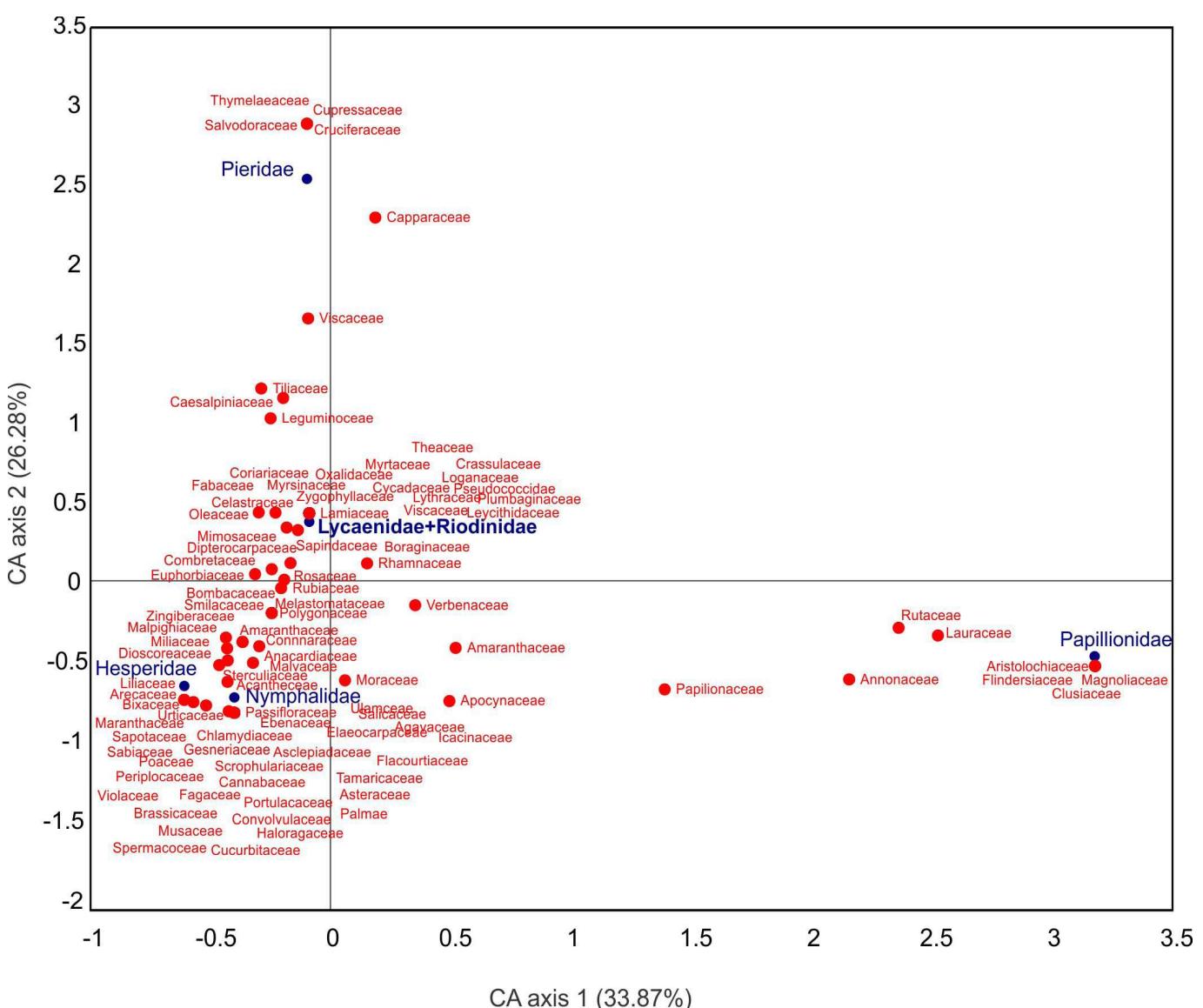


FIGURE 4. Correspondence analysis of host plant family preference for different butterfly families.

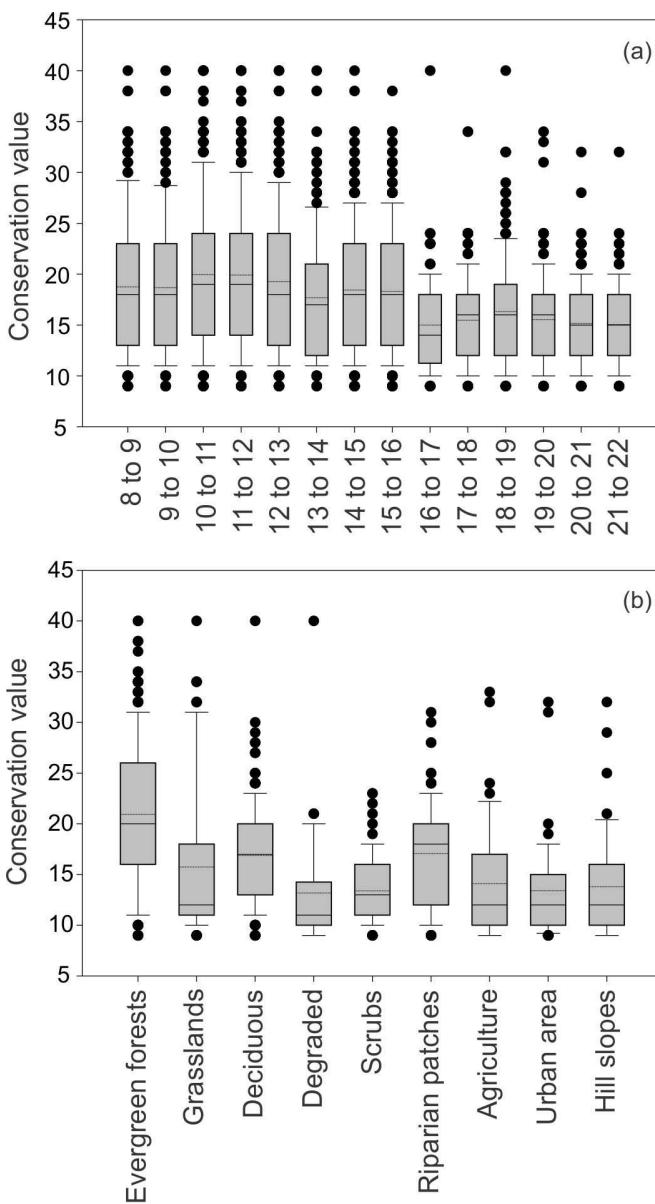


FIGURE 5. Latitude wise (a) and habitat wise (b) distribution of conservation values for butterflies. Dashed line inside the box is mean and solid line is the median. Filled circles are outliers.

most priority. Habitat wise distribution of the butterfly species suggests that evergreen forests, deciduous forests and riparian patches should be on the topmost priority for the conservation efforts followed by the scrubs and grasslands. Conservation of these priority habitats in the priority latitude zones will not only ensure conservation of butterflies, but also other surrogate taxa. As butterflies are useful indicator of habitat quality and can also act as umbrella species for conservation planning and management (Fleishman *et al.* 2000; 2001; Betrus *et al.* 2005); our analysis along with the conservation values assigned by Kunte (2008b) may help in assigning the Umbrella species as well as surrogate or indicator species status to different butterfly species or species groups. Further efforts on these lines, using the criteria described by various workers (Blair 1999; Fleishman *et al.* 2000; Nally and Fleishman 2004; Betrus *et al.* 2005; Fleishman *et al.* 2005), are essential for the biodiversity conservation in Western Ghats. Monitoring the status of such focal species in high priority areas that are mentioned above

is a shortcut for developing conservation strategies as conservation of these species ensures conservation of large no of species even across the taxa and hence helps conservation of overall biodiversity of the area under management (Blair 1999; Fleishman *et al.* 2000; Sawchik *et al.* 2005).

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APPENDIX 1. References used of the compilation of data on distribution, habitat occupancy and food plant preference.

REFERENCE	DATA TYPE		
	DISTRIBUTION	HABITAT	FOOD PLANT
Abdulali 1973	+	-	-
Abdulali 1980	+	-	-
Abdulali 1982	+	-	-
Aitken 1886	+	-	-
Aitken and Comber 1904a	+	-	-
Aitken and Comber 1904b	+	-	-
Amala et al. 2011	+	-	+
Ambrose and Raj 2005	+	+	+
Andheria 2001	+	-	-
Anon 1960	+	-	-
Arun and Azeez 2003	+	-	-
Arun 2003	+	-	-
Babjan and Archana 1998	+	-	-
Balakrishnan et al. 2006	-	-	+
Bean 1968	+	+	+
Bean 1988	+	+	+
Best 1953	+	-	-
Best 1955	+	-	-
Best 1956	+	-	-
Best 1978	+	-	-
Betham 1894	+	-	-
Bhalodia et al. 2002	+	-	-
Bhopale and Athavale 2009	+	+	-
Binoy and Mahew 2004	+	-	-
Chakrabarti and Gurung 2005	+	-	-
Chaturvedi and Haribal 1992	-	-	+
Chaturvedi and Satheesan 1979a	-	-	+
Chaturvedi and Satheesan 1979b	+	-	-
Chaturvedi et al. 2005	+	+	-
Davidson et al. 1897a	+	+	+
Davidson et al. 1897b	+	+	+
Davidson et al. 1897c	+	+	+
Davidson et al. 1898d	+	+	+
Devy and Davidar 2001	+	+	-
Dolia et al. 2008	+	-	-
Eswaran and Pramod 2005	+	-	-
Evans 1910	+	-	-
Evans 1932	+	-	-
Evans 1949	+	-	-
Fergusson 1891	+	+	-
Florence 1927	+	-	-
Gaonkar 1996	+	-	-
Ghorpade and Kunte 2010	+	-	-
Ghosh and Chaudhury 1986	+	-	-
Ghosh et al. 1990	+	-	-
Gunathilagaraj et al. 1997a	+	-	-
Gunathilagaraj et al. 1997b	+	-	-
Gunathilagaraj et al. 1998	+	+	+
Hannington 1916	+	-	-
Kalesh and Prakash 2007	-	-	+
Kehimkar 2008	+	+	+
Kishendas 2007	-	-	+
Komarpant and Borkar 2004	+	+	-
Krishnakumar et al. 2008	+	+	-
Kunte 1997	+	-	-
Kunte 2000a	+	+	-
Kunte 2000b	+	+	+

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APPENDIX 1. CONTINUED.

REFERENCE	DATA TYPE		
	DISTRIBUTION	HABITAT	FOOD PLANT
Kunte 2005	-	+	+
Kunte 2006	-	-	+
Kunte 2008a	+	+	+
Kunte 2008b	-	+	-
Kunte <i>et al.</i> 2008	+	-	-
Larsen 1987a	+	+	+
Larsen 1987b	+	+	+
Larsen 1987c	+	+	+
Larsen 1988	+	+	+
Lovalekar <i>et al.</i> 2011	+	+	-
Mathew and Binoy 2002	+	-	+
Mathew and Rahamathulla 1993	+	+	-
Mathew <i>et al.</i> 2003	+	-	-
Mohan <i>et al.</i> 2003	+	-	+
Mohandas 2004	+	-	-
Nair 2001	+	-	-
Nair 2002a	+	-	-
Nair 2002b	+	-	-
Nair 2004	+	-	-
Nair 2005a	-	-	+
Nair 2005b	-	-	+
Nalini 1996	+	-	-
Nayak <i>et al.</i> 2004	+	+	-
Nimbalkar <i>et al.</i> 2011	+	+	+
Padhye <i>et al.</i> 2006	+	-	-
Palot 1998	+	-	-
Palot and Abdurahman 2003	+	-	-
Palot <i>et al.</i> 2005	-	-	+
Palot and Radhakrishnan 2001	-	-	+
Palot and Radhakrishnan 2006	-	-	+
Palot and Radhakrishnan 2008	+	+	-
Pramod Kumar <i>et al.</i> 2007	+	-	-
Radhakrishnan and Lakshminarayanan 2001	+	+	-
Radhakrishnan and Palot 2006	+	+	-
Radhakrishnan and Palot 2007	+	+	-
Radhakrishnan and Sharma 2002	+	+	-
Radhakrishnan 2000	+	+	-
Rae 1939	+	-	-
Rajagopalan 2005a	+	-	-
Rajagopalan 2005b	-	-	+
Rane and Ranade 2004	+	+	-
Rangnekar and Dharwadkar 2009	+	+	+
Raut and Pendharkar 2010	+	-	-
Reuben 1960	+	+	+
Rufus and Sabarinathan 2007	+	-	-
Sarkar <i>et al.</i> 2011	+	-	-
Senthilmurugan 2005	+	+	+
Shahabuddin 1997	+	+	+
Sharma and Borkar 2008	+	-	-
Sharma and Chaturvedi 2006	+	-	-
Sharma 2005	+	-	-
Sharma 2009	+	-	-
Shull 1963	+	-	-
Soniya and Palot 2002	+	-	-
Sreekumar and Balakrishnan 2001	+	-	-
Srivastava 1998	+	-	-
Sudheendrakumar <i>et al.</i> 2000	+	+	-
Susanth 2005a	+	+	+
Susanth 2005b	-	-	+
Ugarte and Rodricks 1960	+	-	-
Venkatesha 2004	-	-	+
Watson 1890	+	-	-
Wirth 2004	+	-	-
Wynter-Blyth 1944a	+	+	-
Wynter-Blyth 1944b	+	+	-
Wynter-Blyth 1945	+	+	-
Wynter-Blyth 1947a	+	-	-
Wynter-Blyth 1947b	+	-	-
Xavier 2006	+	-	+
Yates 1933	+	-	-
Yates 1935	+	-	-
Yates 1944	+	+	-

APPENDIX 2. List of butterflies with the latitudinal and habitat wise distribution.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **													HABITAT PREFERENCE **									
PAPILIONIDAE																								
<i>Graphium agamemnon</i>	Tailed Jay	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	-	-	RP	-	UA	-	
<i>G. antiphates</i>	Five-Bar Swordtail	a	b	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>G. doson</i>	Common Jay	a	b	c	d	e	f	g	h	-	j	-	l	-	-	EF	-	DS	-	-	RP	-	-	-
<i>G. nomius</i>	Spot Swordtail	a	b	c	d	e	f	g	h	-	j	k	l	m	n	EF	-	DS	-	-	RP	-	-	HS
<i>G. sarpedon</i>	Common Bluebottle	a	-	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	-	-	-	RP	AG	UA	-
<i>Pachliopta aristolochiae</i>	Common Rose	a	b	c	d	e	f	g	h	i	j	k	l	m	n	-	GL	DS	DE	SC	RP	AG	UA	HS
<i>P. hector</i>	Crimson Rose	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	RP	AG	-	-
<i>P. pandiyana</i> ***	Malabar Rose	a	b	c	d	e	f	g	h	-	j	k	-	-	-	EF	GL	-	-	-	-	-	-	-
<i>Papilio buddha</i> ***	Malabar Banded Peacock	a	-	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	-	-	-	RP	-	UA	-
<i>P. clytia</i>	Common Mime	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	-	RP	-	-	-
<i>P. crino</i>	Common Banded Peacock	-	-	c	d	e	f	-	-	-	-	-	-	-	-	-	-	DS	-	SC	-	-	-	-
<i>P. demoleus</i>	Lime	a	-	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	-	RP	AG	UA	HS
<i>P. dravidarum</i> ***	Malabar Raven	a	b	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	-	-	-	-	-	-	-
<i>P. helenus</i>	Red Helen	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	-	RP	AG	-	-
<i>P. liomedon</i> ***	Malabar Banded Swallowtail	a	b	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	DS	-	-	-	-	-	-
<i>P. paris</i>	Paris Peacock	a	-	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	-	DE	-	RP	-	UA	-
<i>P. polymnestor</i>	Blue Mormon	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	-	RP	-	UA	-
<i>P. polytes</i>	Common Mormon	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	HS
<i>Troides minos</i> ***	Southern Birdwing	a	b	c	d	e	f	g	h	-	j	k	l	-	-	EF	-	DS	-	SC	RP	AG	-	-
PIERIDAE																								
<i>Appias albina</i>	Common Albatross	-	-	c	d	e	f	g	h	-	j	k	l	m	n	EF	-	DS	-	-	RP	-	UA	-
<i>A. indra</i>	Plain Puffin	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	-	-	-	-	-	-	-
<i>A. lalage</i>	Spot Puffin	a	b	c	-	-	-	-	-	-	-	-	-	-	-	EF	GL	DS	-	-	-	-	-	-
<i>A. libythea</i>	Striped Albatross	a	b	c	d	e	-	g	h	-	-	k	l	m	n	-	-	DS	-	SC	-	-	-	-
<i>A. lyncida</i>	Chocolate Albatross	-	-	c	d	e	-	g	h	i	j	k	l	m	n	EF	-	DS	DE	-	RP	-	-	-
<i>A. wardii</i> ***	Lesser Albatross	a	b	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	-	-	-	-	-	-	-
<i>Belenois aurota</i>	Pioneer Or Caper White	a	b	c	d	e	f	g	h	i	j	k	l	m	n	-	-	DS	-	SC	-	-	-	-
<i>Catopsilia pomona</i>	Common Emigrant	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	HS
<i>C. pyranthe</i>	Mottled Emigrant	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	-	HS
<i>Cepora nadina</i>	Lesser Gull	a	-	c	d	e	f	g	h	-	-	l	-	-	-	EF	-	-	-	-	-	-	-	HS
<i>C. nerissa</i>	Common Gull	-	-	c	d	e	f	g	h	i	j	k	l	m	n	-	-	DS	DE	SC	-	-	UA	-
<i>Colias nilagiriensis</i> ***	Nilgiri Clouded Yellow	a	b	c	d	-	-	-	-	-	-	-	-	-	-	EF	GL	-	-	-	AG	UA	HS	-
<i>Colotis amata</i>	Small Salmon Arab	-	-	c	d	e	-	g	h	-	j	k	l	m	n	-	GL	DS	-	SC	-	-	-	HS
<i>C. danae</i>	Crimson Tip	-	-	c	d	e	f	g	h	-	j	k	l	m	n	-	GL	-	-	-	-	-	-	-
<i>C. etrida</i>	Small Orange Tip	-	-	c	d	e	f	g	h	-	j	k	l	m	n	EF	GL	DS	-	-	-	-	-	-
<i>C. eucharis</i>	Plain Orange Tip	-	-	c	d	e	-	g	h	-	j	k	l	m	n	-	GL	-	-	SC	-	-	-	-
<i>C. fausta</i>	Large Salmon Arab	-	-	c	d	e	-	g	h	-	-	l	m	n	-	-	DS	-	-	-	-	-	-	-
<i>C. phisidia</i>	Blue-Spotted Arab	-	-	-	-	-	-	-	-	-	-	-	m	n	-	-	DS	-	-	-	-	-	-	-
<i>C. vestalis</i>	White Arab	-	-	-	-	-	-	-	-	-	-	-	m	n	-	-	DS	-	-	-	-	-	-	-
<i>Delias eucharis</i>	Common Jezebel	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	HS

APPENDIX 2. CONTINUED.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **												HABITAT PREFERENCE **							
<i>Eurema andersonii</i>	One-Spot Grass Yellow	-	-	c	d	e	f	-	-	j	-	-	-	-	EF	GL	-	-	-	-	
<i>E. blanda</i>	Three-Spot Grass Yellow	-	-	c	d	e	f	g	h	-	j	k	l	m	n	EF	GL	DS	DE	SC	RP
<i>E. brigitta</i>	Small Grass Yellow	-	-	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	SC	-
<i>E. hecate</i>	Common Grass Yellow	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP
<i>E. laeta</i>	Spotless Grass Yellow	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-
<i>E. nilgiriensis ***</i>	Nilgiri Grass Yellow	-	-	c	d	-	-	-	-	-	k	-	-	-	-	GL	-	-	-	-	-
<i>Hebomoia glaucippe</i>	Great Orange Tip	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	-	RP
<i>Ixias marianne</i>	White Orange Tip	-	-	c	d	e	-	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-
<i>I. pyrene</i>	Yellow Orange Tip	-	-	c	d	e	f	g	h	-	j	k	l	m	n	EF	-	DS	-	SC	RP
<i>Leptosia nina</i>	Psyche	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-
<i>Pareronia ceylonica</i>	Dark Wanderer	-	-	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	-	-	-	-
<i>P. valeria</i>	Common Wanderer	-	-	c	d	e	f	g	h	i	j	k	l	m	n	-	-	DS	-	SC	-
<i>Pieris canidia</i>	Indian Cabbage White	-	b	c	d	e	-	g	-	-	j	k	l	-	-	EF	GL	-	-	-	AG
<i>Prioneris sita</i>	Painted Sawtooth	-	-	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	-	-	-	-
NYMPHALIDAE																					
<i>Acraea violae</i>	Tawny Coster	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-
<i>Amathusia phidippus</i>	The Palmking	-	b	c	-	-	-	-	-	-	-	l	-	-	-	-	-	-	-	AG	-
<i>Argynnis hyperbius</i>	Indian Fritillary	-	-	c	d	-	-	g	-	-	-	-	m	n	-	EF	GL	DS	-	-	RP
<i>Ariadne ariadne</i>	Angled Castor	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP
<i>A. merione</i>	Common Castor	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP
<i>Athyra nefte</i>	Color Sergeant	-	-	c	d	e	-	g	h	-	-	k	-	-	-	EF	-	-	-	-	-
<i>A. perius</i>	Common Sergeant	a	b	c	d	e	f	g	h	i	j	k	l	-	-	EF	GL	DS	-	SC	-
<i>A. ranga</i>	Blackvein Sergeant	a	-	c	d	e	f	-	h	i	-	-	-	-	-	EF	-	-	-	-	-
<i>A. selenophora</i>	Staff Sergeant	a	b	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	-	-	-	-
<i>Byblia ilithyia</i>	Joker	-	-	c	d	e	f	g	h	-	j	k	l	m	n	-	-	DS	DE	SC	-
<i>Cethosia nietneri</i>	Tamil Lacewing	a	b	c	d	e	f	g	h	-	j	k	-	-	-	EF	-	DS	-	-	-
<i>Charaxes bernardus</i>	Tawny Rajah	a	b	c	d	e	f	g	h	-	j	k	l	m	n	EF	-	DS	-	-	-
<i>C. solon</i>	Black Rajah	a	b	c	d	e	-	g	h	i	j	k	l	m	n	-	-	DS	-	-	-
<i>Cirrochroa thais</i>	Tamil Yeoman	a	b	c	d	e	f	g	h	-	j	-	m	n	EF	-	DS	-	-	RP	-
<i>Cupha erymanthis</i>	Rustic	a	b	c	d	e	f	g	h	i	j	k	-	-	-	EF	-	DS	DE	-	RP
<i>Cyrestis thyodamas</i>	Common Map	a	b	c	d	e	f	g	h	i	j	k	-	m	n	EF	-	-	-	-	-
<i>Danaus chrysippus</i>	Plain Tiger	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP
<i>D. genutia</i>	Striped Or Common Tiger	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP
<i>Discophora lepida</i>	Southern Duffer	a	b	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-
<i>Doleschallia bisaltide</i>	Autumnleaf	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-
<i>Dophla evelina</i>	Redspot Duke	a	b	c	d	e	f	g	h	-	j	-	m	n	EF	-	-	-	-	-	-
<i>Elymnias hypermnestra</i>	Common Palmfly	a	-	c	d	e	f	g	h	i	j	k	l	-	-	EF	-	DS	-	SC	-
<i>Euploea core</i>	Common Indian Crow	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP
<i>E. klugii</i>	Brown King Crow	a	b	c	d	e	-	g	h	-	j	k	l	m	n	EF	-	DS	-	-	RP
<i>E. sylvester</i>	Double-Branded Crow	-	-	c	d	e	f	g	h	-	j	k	l	-	-	EF	-	DS	-	SC	-
<i>Euripus consimilis</i>	Painted Courtesan	a	b	c	d	-	-	g	h	-	-	-	-	-	-	EF	-	DS	-	-	-

APPENDIX 2. CONTINUED.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **													HABITAT PREFERENCE **									
<i>Euthalia aconthea</i>	Common Baron	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	-	RP	-	UA	-
<i>E. lubentina</i>	Gaudy Baron	a	b	c	d	e	-	g	h	i	j	k	l	m	n	-	-	DS	-	-	-	-	-	-
<i>E. nais</i>	Baronet Or Red Baron	-	-	c	d	e	f	g	h	-	j	k	l	m	n	-	-	DS	-	-	-	-	-	-
<i>E. telchinia</i>	Blue Baron	-	-	c	d	-	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>Hypolimnas bolina</i>	Great Eggfly	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	SC	RP	-	UA	-
<i>H. misippus</i>	Danaid Eggfly	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-	-	UA	-
<i>Idea malabarica ***</i>	Malabar Tree Nymph	a	b	c	d	e	f	g	h	-	j	-	-	m	-	EF	-	-	-	-	RP	-	-	-
<i>Junonia almana</i>	Peacock Pansy	a	b	c	d	e	f	g	h	i	j	k	l	m	n	-	-	-	-	-	RP	-	-	-
<i>J. atlites</i>	Grey Pansy	a	b	c	d	e	f	g	h	i	j	k	l	m	n	-	-	-	-	-	RP	-	-	-
<i>J. hierta</i>	Yellow Pansy	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	-	-	-	RP	-	-	HS
<i>J. iphita</i>	Chocolate Pansy	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	-	RP	AG	UA	HS
<i>J. lemonias</i>	Lemon Pansy	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	HS
<i>J. orithya</i>	Blue Pansy	a	b	c	d	e	f	g	h	i	j	k	l	m	n	-	GL	-	-	-	-	-	-	-
<i>Kallima horsfieldi ***</i>	South Indian Blue Oakleaf	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	-	RP	-	-	-
<i>K. inachus</i>	Orange Oakleaf	-	-	-	-	-	-	-	-	-	-	-	m	n	EF	-	DS	-	-	RP	-	-	-	
<i>Kaniska canace</i>	Blue Admiral	a	b	c	d	e	f	g	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-
<i>Lethe drypetis</i>	Tamil Treebrown	a	b	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	DS	-	-	RP	-	-	-
<i>L. europa</i>	Bamboo Treebrown	a	b	c	d	e	-	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-	-	-	-
<i>L. rohria</i>	Common Treebrown	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	SC	-	-	-	-
<i>Libythea lepita</i>	Common Beak	-	-	c	d	e	-	-	-	-	j	k	-	m	n	EF	-	DS	-	SC	RP	-	-	-
<i>L. myrrha</i>	Club Beak	a	b	c	d	e	-	g	h	-	-	k	-	-	-	EF	-	DS	-	-	RP	-	-	-
<i>Melanitis leda</i>	Common Evening Brown	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	HS
<i>M. phedima</i>	Dark Evening Brown	a	-	c	d	e	f	g	h	i	j	k	-	-	-	EF	-	DS	DE	-	-	-	-	-
<i>M. zitenius</i>	Great Evening Brown	-	-	c	d	e	-	g	h	-	j	-	-	-	-	EF	-	-	-	-	RP	-	-	-
<i>Moduza procris</i>	Commander	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	-	RP	AG	UA	-
<i>Mycalesis adolphei ***</i>	Redeye Bushbrown	-	-	-	d	e	-	-	-	-	-	-	l	-	-	EF	GL	-	-	-	-	-	-	-
<i>M. anaxias</i>	Whitebar Bushbrown	a	b	c	d	e	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-
<i>M. davisoni ***</i>	Palni Bushbrown	a	b	c	d	e	f	g	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-
<i>M. igilia ***</i>	Small Longbrand Bushbrown	-	-	c	d	e	-	-	i	-	-	-	-	-	-	EF	-	DS	DE	-	-	-	-	-
<i>M. mineus</i>	Dark Branded Bushbrown	a	b	c	d	e	f	g	h	-	j	k	l	m	n	EF	GL	DS	-	SC	-	-	-	HS
<i>M. oculus ***</i>	Red-Disc Bushbrown	a	b	c	-	-	-	-	-	j	-	-	-	-	-	EF	GL	-	-	-	-	-	-	-
<i>M. orcha ***</i>	Palebrand Bushbrown	-	-	c	d	e	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-
<i>M. patnia</i>	Gladeye Bushbrown	a	b	c	d	e	f	g	h	-	-	-	l	-	-	EF	-	DS	DE	-	RP	-	-	-
<i>M. perseus</i>	Common Bushbrown	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-	-	-	-
<i>M. subdita</i>	Tamil Bushbrown	-	-	c	d	e	f	g	-	-	-	-	-	-	-	EF	-	DS	-	-	RP	-	-	-
<i>M. visala</i>	Longbrand Bushbrown	-	-	c	d	e	-	-	-	-	-	k	l	m	n	EF	-	-	-	-	-	-	-	-
<i>Neptis clinia</i>	Southern Sullid Sailer	a	b	c	d	e	-	g	h	-	-	k	-	-	-	EF	-	DS	-	-	RP	-	-	-
<i>N. columella</i>	Shortbanded Sailer	-	-	c	d	e	-	-	-	j	k	l	m	n	EF	-	DS	-	-	RP	-	-	-	
<i>N. hylas</i>	Common Sailer	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	HS
<i>N. jumbah</i>	Chestnut-Streaked Sailer	a	b	c	d	e	-	g	h	i	j	k	l	m	n	EF	-	DS	-	-	RP	-	-	-
<i>N. nata</i>	Clear Sailer	a	b	c	d	e	f	g	-	-	-	-	-	-	-	GL	DS	-	-	-	-	-	-	HS

APPENDIX 2. CONTINUED.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **												HABITAT PREFERENCE **								
<i>N. soma</i>	Sullied Sailer	a	-	-	d	e	-	-	-	j	k	-	-	-	EF	-	-	-	-	-		
<i>N. viraja</i>	Yellowjack Sailer	a	b	c	d	e	-	g	h	-	-	-	-	-	EF	-	-	-	-	-		
<i>Orsotriaena medus</i>	Nigger	a	b	c	d	e	f	g	h	i	j	-	l	m	-	EF	-	DS	-	RP	-	
<i>Pantoporia hordonia</i>	Common Lascar	a	b	c	d	e	f	g	h	i	j	k	l	-	-	EF	-	-	-	-	-	
<i>P. sandaka</i>	Extra Lascar	-	-	c	-	-	-	g	h	-	-	-	-	-	EF	-	-	-	-	-		
<i>Parantica aglea</i>	Glassy Tiger	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	RP	-	
<i>P. nilgiriensis</i> ***	Nilgiri Tiger	a	-	c	d	e	-	-	-	j	k	-	-	-	EF	GL	-	-	-	-		
<i>Parantirrhoea marshallii</i> ***	Travancore Evening Brown	a	b	c	-	e	-	-	-	-	-	-	-	-	EF	-	-	-	-	-		
<i>Parthenos sylvia</i>	Clipper	a	b	c	d	e	f	g	h	-	-	-	-	-	EF	-	DS	-	RP	-		
<i>Phalanta alcippe</i>	Small Leopard	-	-	c	d	e	f	g	h	-	j	-	-	-	EF	-	-	-	-	-		
<i>P. phalantha</i>	Common Leopard	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	DE	SC	RP	
<i>Polyura agraria</i>	Anomalous Nawab	-	-	c	d	-	-	g	h	-	j	-	-	-	EF	-	DS	-	SC	-		
<i>P. athamas</i>	Common Nawab	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-	
<i>P. schreiber</i>	Blue Nawab	a	b	c	d	e	f	g	h	-	-	k	-	-	-	EF	-	-	-	-	-	
<i>Rohana parisatis</i>	Black Prince	-	-	c	d	-	f	g	h	-	j	k	-	-	-	EF	-	-	-	-	-	
<i>Tanaecia lepidea</i>	Grey Count	a	b	c	d	-	f	g	h	i	j	-	l	-	-	EF	-	DS	-	SC	RP	
<i>Tirumala limniace</i>	Blue Tiger	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	
<i>T. septentrionis</i>	Dark Blue Tiger	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	RP	
<i>Vanessa cardui</i>	Painted Lady	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	
<i>V. indica</i>	Indian Red Admiral	a	-	c	d	e	f	g	-	-	j	-	-	m	n	-	GL	-	-	-	-	-
<i>Vindula erota</i>	Cruiser	a	b	c	d	e	f	g	h	-	j	-	l	-	-	EF	-	-	-	-	-	
<i>Ypthima asterope</i>	Common Threering	-	-	c	d	e	f	g	h	i	j	k	l	m	n	-	-	DS	-	SC	-	
<i>Y. avanta</i>	Jewel Fourring	-	-	-	d	-	-	g	h	-	-	k	-	-	-	EF	-	-	-	-	-	
<i>Y. baldus</i>	Common Fivering	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	SC	RP	
<i>Y. ceylonica</i>	White Or Ceylon Fourring	a	b	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	DS	-	SC	-	
<i>Y. chenui</i> ***	Nilgiri Fourring	a	b	c	d	e	f	-	-	-	-	-	-	-	-	GL	-	-	-	-	-	
<i>Y. huebneri</i>	Common Fourring	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	RP	-	
<i>Y. philomela</i>	Baby Fivering	-	-	c	d	e	f	g	h	-	-	k	-	-	-	EF	-	-	-	-	-	
<i>Y. ypthimoides</i> ***	Palni Fourring	a	b	c	-	-	-	-	-	-	-	-	-	-	-	GL	-	-	-	-	-	
<i>Zipaetus saitis</i> ***	Tamil Catseye	a	b	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	
LYCAENIDAE																						
<i>Acytolepis lilacea</i>	Hampson's Hedge Blue	-	-	c	d	e	f	-	-	-	-	-	-	-	-	EF	-	-	-	-	-	
<i>A. puspa</i>	Common Hedge Blue	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	RP	-	
<i>Amblypodia anita</i>	Leaf Blue	-	b	c	d	e	-	g	h	i	j	k	l	-	-	EF	-	DS	-	RP	-	
<i>Ancema blanka</i>	Silver Royal	-	-	-	d	e	-	g	h	-	-	-	-	-	-	EF	-	DS	-	RP	-	
<i>Anthene emolus</i>	Ciliate Blue	-	-	c	d	e	-	g	h	-	j	-	-	-	-	EF	-	DS	-	RP	-	
<i>A. lycaenina</i>	Pointed Ciliate Blue	-	-	c	d	e	-	g	h	-	j	k	-	m	n	EF	-	DS	-	RP	AG	
<i>Apharitis acamus</i>	Tawny Silverline	-	-	-	-	-	-	-	-	-	-	-	-	n	-	GL	-	-	SC	-	-	
<i>A. lilacinus</i>	Lilac Silverline	-	-	-	d	e	-	-	-	-	-	-	-	-	-	GL	-	-	-	-	-	
<i>Arhopala abseus</i>	Aberrant Oakblue	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	
<i>A. alea</i> ***	Kanara Oakblue	a	b	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	

APPENDIX 2. CONTINUED.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **												HABITAT PREFERENCE **											
<i>A. amantes</i>	Large Oakblue	a	b	c	d	e	-	g	h	-	-	k	l	m	n	EF	-	DS	-	-	RP	AG	-	-	
<i>A. atrax</i>	Indian Oak Blue/Dark Broken-Band Oak blue	-	b	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>A. bazaloides</i>	Tamil Oakblue	-	-	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>A. pseudocentaurus</i>	Western Centaur Oakblue	a	b	c	d	e	-	g	h	-	-	k	l	-	-	-	-	DS	-	-	-	-	-	-	-
<i>Azanus jesous</i>	African Babul Blue	-	-	c	d	e	-	g	h	-	j	k	-	m	n	-	GL	-	-	-	-	-	-	-	
<i>A. ubaldus</i>	Bright Babul Blue	-	-	c	d	e	-	g	h	-	j	k	l	m	n	-	GL	-	-	-	-	-	-	-	
<i>A. uranus</i>	Dull Babul Blue	-	-	c	d	e	-	g	h	-	j	k	-	m	n	-	GL	-	-	-	-	-	-	-	
<i>Bindahara phocides</i>	Plane	-	-	c	d	e	-	g	h	-	j	-	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>Caleta caleta</i>	Angled Pierrot	-	-	c	d	e	-	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	-	-	-	-	
<i>Castalius rosimon</i>	Common Pierrot	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	SC	-	-	UA	-	
<i>Catapaecilma major</i>	Common Tinsel	a	b	c	d	e	-	g	h	-	j	k	-	-	-	-	DS	-	-	-	-	-	-	-	
<i>Catochrysops panormus</i>	Silver Forget-Me-Not	-	-	c	d	e	-	-	-	-	-	-	-	-	-	EF	-	DS	-	-	RP	-	-	-	
<i>C. strabo</i>	Forget-Me-Not	a	b	c	d	e	-	g	h	-	j	k	l	m	n	-	-	DS	-	SC	-	-	-	-	-
<i>Celastrina lavendularis</i>	Plain Hedge Blue	-	-	c	d	-	-	-	i	-	-	l	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>Celatoxia albidisca</i> ***	Whitedisc Hedge Blue	a	b	c	d	e	-	-	-	-	-	k	-	m	n	EF	-	-	-	-	-	-	-	-	
<i>Cheritra freja</i>	Common Imperial	-	-	c	d	e	f	g	h	-	-	l	-	-	-	EF	-	-	-	-	RP	-	-	HS	
<i>Chilades laius</i>	Lime Blue	a	b	c	d	e	-	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	RP	-	UA	HS	
<i>C. pandava</i>	Plains Cupid	a	b	c	d	e	-	g	h	i	j	k	l	m	n	-	-	DS	-	-	-	-	-	-	-
<i>C. parrhasius</i>	Small Cupid	-	-	c	d	e	-	g	h	-	j	k	-	m	n	-	GL	-	-	-	-	-	-	-	-
<i>C. putli</i>	Eastern Grass Jewel	a	b	c	d	e	f	g	h	i	j	k	l	m	n	-	GL	-	-	-	-	-	-	-	-
<i>C. trochylus</i>	Western Grass Jewel	-	-	c	d	e	f	g	h	i	j	k	l	m	n	-	GL	-	-	-	-	-	-	-	-
<i>Chliaria othona</i>	Orchid Tit	-	-	c	d	e	-	g	h	i	j	-	l	-	-	EF	-	-	-	-	-	-	-	-	
<i>Creon cleobis</i>	Broadtail Royal	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	DS	-	-	RP	-	-	-	-
<i>Curetis dentata</i>	Dentate/Bright/Toothed Sunbeam	-	-	c	d	-	f	-	-	-	-	-	m	n	-	-	DS	-	-	-	-	-	-	-	-
<i>C. siva</i> ***	Shiva Sunbeam	-	-	c	d	-	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>C. thetis</i>	Indian Sunbeam	-	-	c	d	e	f	g	h	i	j	k	l	m	n	-	-	DS	-	-	-	-	-	-	-
<i>Deudorix epitarbas</i>	Cornelian	a	b	c	d	e	-	g	h	-	j	k	-	m	n	EF	-	DS	-	-	RP	-	-	-	-
<i>D. isocrates</i>	Common Guava Blue	a	b	c	d	e	-	g	h	i	j	k	l	m	n	-	-	DS	-	-	-	-	-	-	-
<i>D. perse</i>	Large Guava Blue	a	b	c	d	e	f	g	h	-	j	k	l	m	n	-	-	DS	-	-	-	-	-	-	-
<i>Discolampa ethion</i>	Banded Blue Pierrot	a	b	c	d	e	-	g	h	-	j	k	-	m	n	EF	-	DS	-	-	RP	-	-	-	-
<i>Euchrysops cnejus</i>	Gram Blue	a	b	c	d	e	-	g	h	i	j	k	l	m	n	EF	GL	-	DE	SC	RP	AG	UA	HS	-
<i>Everes lacturnus</i>	Indian Cupid	-	-	c	d	e	f	g	h	i	j	-	-	n	EF	-	DS	-	-	RP	-	-	-	-	
<i>Horaga onyx</i>	Common Onyx	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>H. viola</i>	Violet/Brown Onyx	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>Hypolycaena nilgirica</i>	Nilgiri Tit	-	-	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>Ionolyce helicon</i>	Pointed Line Blue	-	-	c	d	e	-	-	-	-	-	k	-	-	-	EF	-	-	-	-	-	-	-	-	
<i>Iraota timoleon</i>	Silverstreak Blue	a	b	c	d	e	-	g	h	-	-	k	l	m	n	EF	-	-	-	-	-	-	-	-	
<i>Jamides alecto</i>	Metallic Cerulean	-	-	c	d	e	-	-	i	j	k	-	-	-	-	EF	-	DS	-	-	RP	-	-	HS	-
<i>J. bochus</i>	Dark Cerulean	a	b	c	d	e	f	g	h	i	-	k	l	m	n	-	-	DS	-	-	-	-	UA	-	-
<i>J. celeno</i>	Common Cerulean	a	b	c	d	e	-	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	-	
<i>Lampides boeticus</i>	Pea Blue	a	b	c	d	e	-	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	HS	

APPENDIX 2. CONTINUED.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **													HABITAT PREFERENCE **									
<i>Leptotes plinius</i>	Zebra Blue	-	-	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC	RP	-	UA	-
<i>Logania distanti</i>	Dark Mottle	-	-	-	d	e	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>Loxura atymnus</i>	Yamfly	-	b	c	d	e	f	g	h	i	j	k	l	-	-	EF	-	DS	-	-	RP	-	-	
<i>Megisba malaya</i>	Malayan	-	-	c	d	e	-	g	h	-	j	-	-	-	-	EF	-	DS	-	-	RP	-	-	
<i>Nacaduba berenice</i>	Rounded 6-Line Blue	-	-	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	DS	-	-	RP	-	-	
<i>N. beroe</i>	Opaque 6-Line Blue	-	-	c	d	e	-	g	h	-	j	k	l	-	-	EF	-	DS	-	-	RP	-	-	
<i>N. caluria</i>	Dark Ceylon 6-Line Blue	-	-	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>N. hermus</i>	Pale 4-Line Blue	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>N. kurava</i>	Transparent 6-Line Blue	-	-	c	d	e	-	g	h	i	j	-	l	-	-	EF	-	DS	-	-	RP	-	-	
<i>N. pactolus</i>	Large 4-Line Blue	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>Neopithecops zalmora</i>	Quaker	a	b	c	d	e	f	g	h	i	j	-	-	m	n	EF	-	-	-	-	-	-	-	
<i>Petrelaea dana</i>	Dingy Line Blue	a	b	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	DS	-	-	RP	-	-	
<i>Pratapa deva</i>	White Royal	-	-	c	d	e	-	g	h	-	j	k	l	-	-	EF	-	DS	-	-	RP	-	-	
<i>Prosotas dubiosa</i>	Tailless Line Blue	-	-	c	d	e	-	g	h	-	j	k	l	m	n	EF	-	DS	-	SC	-	-	-	
<i>P. nora</i>	Common Line Blue	-	-	c	d	e	f	-	h	-	j	k	l	m	n	EF	-	DS	-	SC	-	-	-	
<i>P. noreia</i>	White-Tipped Line Blue	-	-	c	d	e	-	g	h	-	-	l	-	-	-	EF	-	-	-	-	-	-	-	
<i>Pseudozizeeria maha</i>	Pale Grass Blue	-	-	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	RP	AG	UA	HS
<i>Rachana jalindra</i>	Banded Royal	-	-	c	d	e	-	h	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>Rapala iarbus</i>	Indian Red Flash	a	b	c	d	e	-	g	h	-	j	k	l	m	n	-	-	DS	-	-	-	-	-	
<i>R. lankana</i>	Malabar Flash	a	b	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>R. manea</i>	Slate Flash	a	b	c	d	e	f	g	h	-	j	k	l	m	n	EF	-	DS	-	SC	RP	-	-	
<i>R. varuna</i>	Indigo Flash	-	-	c	d	e	-	g	h	-	j	k	l	-	-	EF	-	DS	-	-	RP	-	-	
<i>Rathinda amor</i>	Monkey Puzzle	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	-	-	-	-	-	-	
<i>Spalgis epius</i>	Apefly	a	b	c	d	e	-	g	h	-	j	k	l	m	n	EF	-	DS	-	-	RP	-	-	
<i>Spindasis abnormis</i>	Abnormal Silverline	-	-	c	d	e	-	-	-	-	j	k	-	-	-	-	-	DS	-	-	-	-	-	
<i>S. elima</i>	Scarce Shot Silverline	-	-	c	d	e	-	g	h	-	-	k	-	m	n	-	-	DS	-	-	-	-	-	
<i>S. ictis</i>	Shot Silverline	-	-	c	d	e	-	g	h	-	j	k	l	m	n	-	-	DS	-	-	RP	-	-	
<i>S. lohita</i>	Longbanded Silverline	a	b	c	d	e	-	g	h	-	-	k	-	m	n	-	-	DS	-	-	-	-	-	
<i>S. schistacea</i>	Plumbeous Silverline	-	-	c	d	e	-	g	h	-	j	k	-	-	-	-	-	DS	-	-	-	-	-	
<i>S. vulcanus</i>	Common Silverline	a	b	c	d	e	f	g	h	-	j	k	l	m	n	EF	GL	DS	-	SC	RP	-	UA	
<i>Surendra querectorum</i>	Common Acacia Blue	a	b	c	d	e	-	g	h	-	-	k	-	m	n	-	-	DS	-	-	-	-	-	
<i>Tajuria cippus</i>	Peacock Royal	-	-	c	d	e	-	g	h	-	j	k	-	m	n	EF	-	DS	-	SC	-	AG	-	
<i>T. jehana</i>	Plains Blue Royal	a	b	c	d	e	-	g	h	-	-	k	l	-	-	EF	-	DS	-	-	RP	-	-	
<i>T. maculata</i>	Spotted Royal	a	b	c	d	e	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	-	-	-	
<i>T. melastigma</i>	Branded Royal	-	-	c	d	-	-	g	h	-	-	-	-	-	-	EF	-	DS	-	-	RP	-	-	
<i>Talicada nyseus</i>	Red Pierrot	a	b	c	d	e	f	g	h	i	j	k	l	-	-	EF	-	DS	-	SC	-	-	UA	HS
<i>Tarucus ananda</i>	Dark Pierrot	-	-	c	d	e	f	g	h	-	-	-	-	-	-	EF	-	DS	-	-	RP	-	-	
<i>T. balkanica</i>	Balkan Pierrot	-	-	-	-	-	-	-	-	-	-	-	m	n	-	-	-	SC	-	-	-	-	-	
<i>T. callinara</i>	Spotted Pierrot	-	-	c	d	-	-	g	h	-	-	-	-	-	-	EF	-	DS	-	SC	-	-	-	
<i>T. indica</i>	Pointed Pierrot	-	-	-	d	-	-	-	-	-	-	-	m	-	-	-	DS	-	SC	-	-	-	-	
<i>T. nara</i>	Rounded/Rusty/Striped Pierrot	-	-	c	d	e	-	h	i	j	k	l	m	n	EF	-	DS	-	SC	-	-	-		

APPENDIX 2. CONTINUED.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **												HABITAT PREFERENCE **							
<i>Thaduka multicaudata</i>	Manytailed Oakblue	-	-	c	d	e	-	g	h	-	-	k	-	-	-	EF	-	-	-	-	
<i>Udara akasa</i>	White Hedge Blue	-	-	c	d	e	f	-	-	-	-	-	-	-	-	EF	-	-	-	-	
<i>U. singalensis</i>	Singalese/Large Hedge Blue	a	b	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	
<i>Zeltus amasa</i>	Fluffy Tit	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	
<i>Zesius chrysomallus</i>	Redspot	a	b	c	d	e	-	g	h	-	-	k	l	m	n	-	-	DS	-	-	
<i>Zinaspa todara</i>	Silverstreaked Acacia Blue	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	DS	-	-	
<i>Zizeeria karsandra</i>	Dark Grass Blue	-	-	c	d	e	-	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	
<i>Zizina otis</i>	Lesser Grass Blue	a	b	c	d	e	-	g	h	i	j	k	l	m	n	EF	GL	DS	DE	SC	
<i>Z. hylax</i>	Tiny Grass Blue	-	-	c	d	e	-	g	h	i	j	k	l	m	n	EF	GL	DS	-	SC	
RIODINIDAE																					
<i>Abisara echerius</i>	Plum Judy	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	-	
HESPERIIDAE																					
<i>Aeromachus dubius***</i>	Dingy Scrub-Hopper	-	-	c	d	-	-	-	-	-	-	-	-	-	-	GL	-	-	-	-	
<i>A. pygmaeus</i>	Pygmy Grass/Scrub-Hopper	a	b	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	DS	-	-	
<i>Ampittia dioscorides</i>	Bush Hopper	-	-	c	d	e	f	g	h	-	j	-	-	-	-	-	-	-	RP	-	
<i>Arnetta mercara ***</i>	Coorg Forest Hopper	-	-	c	d	e	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	
<i>A. vindhiana</i>	Vindhyan Bob	-	-	c	d	e	-	g	h	-	j	k	l	m	n	-	-	DS	-	-	
<i>Badamia exclamationis</i>	Brown Awl	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	GL	DS	-	-	
<i>Baoris farri</i>	Paintbrush Swift	a	b	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	-	-	-	
<i>Baracus vittatus</i>	Hampson's Hedge-Hopper	a	b	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	DS	-	-	
<i>Bibasis gomata</i>	Pale Green Awlet	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	
<i>B. sena</i>	Orange-Tail Awl	-	-	c	d	e	-	g	h	i	-	-	l	-	-	EF	-	DS	-	-	
<i>Borbo cinnara</i>	Rice Swift	a	b	c	d	e	f	g	h	i	j	k	l	-	-	EF	GL	DS	-	SC	
<i>Burara jaina</i>	Orange-Striped Awl	-	-	c	d	e	-	g	h	-	j	-	-	-	-	EF	-	DS	-	RP	
<i>Caltoris canaraica ***</i>	Kanara Swift	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	
<i>C. kumara</i>	Blank Swift	-	-	c	d	e	-	g	h	i	-	k	l	m	n	EF	-	DS	-	RP	
<i>C. philippina</i>	Philippine Swift	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	
<i>Caprona agama</i>	Spotted Angle	-	-	c	d	-	-	-	-	-	-	-	-	-	-	DS	-	SC	-	-	
<i>C. alida</i>	Spotted Angle	-	-	c	d	-	-	-	-	-	-	-	-	-	-	DS	-	SC	-	-	
<i>C. ransonnetti</i>	Golden Angle	a	b	c	d	e	-	g	h	-	j	k	l	m	-	EF	-	DS	-	-	
<i>Celaenorhinus ambareesa</i>	Malabar Spotted Flat	-	b	c	d	e	f	g	h	i	j	k	l	m	n	-	-	DS	-	-	
<i>C. leucocera</i>	Common Spotted Flat	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	RP	
<i>C. ruficornis</i>	Tamil Spotted Flat	-	-	c	d	e	-	g	h	-	j	-	-	-	-	EF	-	DS	-	RP	
<i>Choaspes benjamini</i>	Indian Awking	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	
<i>Coladenia indrani</i>	Tricolour Flat	a	b	c	d	e	f	g	-	i	j	k	l	m	n	-	-	DS	-	-	
<i>Cupitha purreea</i>	Wax Dart	a	b	c	d	-	-	-	-	-	-	k	-	-	-	EF	-	DS	-	RP	
<i>Erionota thrax</i>	Palm Redeye	-	-	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-	-	
<i>Gangara thyrsis</i>	Giant Redeye	a	b	c	d	e	f	g	h	-	-	k	l	-	-	EF	-	DS	-	RP	
<i>Gegenes nostrodamus</i>	Dingy Swift	-	-	-	-	-	-	-	-	-	-	-	m	n	-	-	-	SC	-	-	
<i>Gerosis bhagava</i>	Common Yellowbreasted Flat	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-	
<i>Gomalia elma</i>	African Mallow/Marbled Skipper	-	-	c	d	e	-	g	h	-	-	k	-	m	-	-	DS	-	SC	-	-

APPENDIX 2. CONTINUED.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **												HABITAT PREFERENCE **					
<i>Halpe homolea</i>	Indian / Ceylon Ace	-	-	c	d	e	-	g	h	-	-	-	-	EF	-	-	-	-	
<i>H. porus</i>	Moore's Ace	a	b	c	d	e	-	g	h	-	-	-	-	EF	-	-	-	-	
<i>Hasora badra</i>	Common Awl	a	b	c	d	e	-	g	h	-	-	-	l	-	-	EF	-	DS	-
<i>H. chromus</i>	Common Banded Awl	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-
<i>H. taminatus</i>	White Banded Awl	-	-	c	d	e	f	-	h	-	j	-	-	-	-	EF	-	DS	-
<i>H. vitta</i>	Plain Banded Awl	-	-	c	d	-	-	g	h	-	j	-	-	-	-	DS	-	-	-
<i>Hyarotis adrastus</i>	Tree Flitter	a	b	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-
<i>H. microsticta</i>	Brush Flitter	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-
<i>Iambrix salsala</i>	Chestnut Bob	a	b	c	d	e	f	g	h	-	j	k	-	m	n	EF	-	DS	-
<i>Matapa aria</i>	Common Redeye	a	b	c	d	e	f	g	h	-	j	k	l	m	n	-	-	DS	-
<i>Notocrypta curvifascia</i>	Restricted Demon	a	b	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	DS	-
<i>N. paralyos</i>	Common Banded Demon	-	-	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	-	-
<i>Odontoptilum angulata</i>	Chestnut/Banded Angle	-	-	c	d	e	f	g	h	-	j	k	-	-	-	EF	-	DS	-
<i>Oriens concinna</i> ***	Tamil Dartlet	-	-	c	d	e	-	-	-	-	-	-	-	-	-	EF	-	-	-
<i>O. goloides</i>	Indian/Common Dartlet	a	b	c	d	e	-	-	-	j	-	-	-	-	-	EF	-	DS	-
<i>Parnara bada</i>	Common Straight Swift	a	b	c	d	e	f	g	h	-	-	k	l	-	-	GL	-	-	-
<i>P. ganga</i>	Continental Swift	-	-	-	-	-	-	-	-	-	-	-	m	n	-	GL	-	DE	SC
<i>Pelopidas agna</i>	Dark Branded Swift	-	-	c	d	e	-	g	h	-	-	k	l	-	-	EF	-	-	-
<i>P. assamensis</i>	Great Swift	-	-	-	-	-	-	-	-	-	-	-	m	n	EF	GL	-	-	-
<i>P. conjuncta</i>	Conjoined Swift Great Swift	a	b	c	d	e	f	g	h	-	-	k	l	m	n	EF	-	-	-
<i>P. mathias</i>	Dark Small Branded Swift	-	-	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-
<i>P. subochracea</i>	Large Branded Swift	-	-	c	d	e	-	g	h	-	-	k	-	-	-	EF	-	-	-
<i>P. thrax</i>	Pale Small Branded Swift	-	-	-	-	-	-	-	-	-	-	-	-	n	-	GL	-	-	-
<i>Polytremis lubricans</i>	Contiguous Swift	-	-	c	d	e	-	-	-	-	-	-	-	-	-	EF	-	DS	-
<i>Potanthus confucius</i>	Confucian/Chinese Dart	-	-	-	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-
<i>P. pallida</i>	Pallied Dart	-	-	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-
<i>P. palnia</i>	Palni Dart	-	-	-	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-
<i>P. pava</i>	Pava Dart	-	-	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-
<i>P. pseudomaesa</i>	Psuedomaesa/Common Dart	a	b	c	d	e	-	g	h	-	-	l	m	n	EF	-	-	-	-
<i>Pseudoborbo bevani</i>	Bevan's Swift	-	-	c	d	e	f	g	h	-	j	k	l	m	n	-	GL	-	-
<i>Psolos fuligo</i>	Coon	a	b	c	d	e	f	-	h	-	-	l	-	-	-	EF	-	-	-
<i>Psuedocoladenia dan</i>	Fulvous Pied Flat	a	b	c	d	e	f	g	h	-	-	k	l	m	n	EF	-	DS	-
<i>Quedara basiflava</i> ***	Yellow-Base Tree Flitter	a	b	c	d	e	f	-	-	-	-	-	-	-	-	EF	-	-	-
<i>Salanoemia sala</i>	Maculate Lancer	-	-	-	d	e	-	-	-	-	-	-	-	-	-	EF	-	-	-
<i>Sarangesa dasahara</i>	Common Small Flat	a	b	c	d	e	f	g	h	-	j	k	l	m	n	EF	GL	DS	-
<i>S. purendra</i>	Spotted Small Flat	-	-	c	d	e	f	g	h	-	-	k	l	m	n	-	-	DS	-
<i>Sovia hyrtacus</i> ***	Bicolour Ace	a	b	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-
<i>Spialia galba</i>	Indian Grizzled / Indian Skipper	a	b	c	d	e	f	g	h	i	-	k	l	m	n	-	GL	-	-
<i>Suastus gremius</i>	Indian Palm Bob	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-
<i>S. minutus</i>	Small Palm Bob	-	-	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-
<i>Tagiades gana</i>	Immaculate/Large/Suffused Snow Flat	a	b	c	d	e	f	g	h	-	j	-	-	-	-	EF	-	-	-

APPENDIX 2. CONTINUED.

FAMILY/Species *	COMMON NAME	LATITUDINAL ZONES **												HABITAT PREFERENCE **						
<i>T. japerus</i>	Common/Ceylon Snow Flat	a	b	c	d	e	-	g	h	-	-	-	-	-	EF	-	-	-	-	
<i>T. litigiosa</i>	Water Snow Flat	a	b	c	d	e	f	g	h	i	j	k	-	-	-	EF	-	DS	-	-
<i>Tapena twaithesi</i>	Angled Flat / Black Angle	-	-	c	d	e	-	g	h	-	-	-	l	m	n	EF	-	DS	-	-
<i>Taractrocera ceramas</i>	Tamil Grass Dart	-	-	c	d	e	f	g	h	-	j	k	l	m	n	-	GL	-	-	AG
<i>T. maevius</i>	Common Grass Dart	a	b	c	d	e	-	g	h	i	-	-	l	-	-	GL	-	-	-	-
<i>Telicota ancilla</i>	Dark Palm Dart	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	SC
<i>T. colon</i>	Pale Palm Dart	a	b	c	d	e	-	g	h	-	j	k	l	m	-	EF	-	DS	-	SC
<i>Thoressa astigmata***</i>	Unbranded Ace	-	-	c	d	e	-	g	h	-	-	-	-	-	-	EF	-	-	-	-
<i>T. evershedi ***</i>	Evershed's Ace	-	-	c	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-	-
<i>T. honorei ***</i>	Madras Ace	-	-	c	d	e	-	g	h	-	-	k	-	-	-	EF	-	-	-	-
<i>T. sitala ***</i>	Sitala Ace	-	-	-	d	-	-	-	-	-	-	-	-	-	-	EF	-	-	-	-
<i>Udaspes folus</i>	Grass Demon	a	b	c	d	e	f	g	h	i	j	k	l	m	n	EF	-	DS	-	RP

* Taxonomic status as per Kunte (2008b) and Ghorpade & Kunte (2010).

** Key: a = 8-9°N, b = 9-10°N, c = 10-11°N, d = 11-12°N, e = 12-13°N, f = 13-14°N, g = 14-15°N, h = 15-16°N, i = 16-17°N, j = 17-18°N, k = 18-19°N, l = 19-20°N, m = 20-21°N, n = 21-22°N, EF = evergreen forest, GL = grassland, DS = deciduous, DE = degraded, SC = scrubs, RP = riparian patches, AG = agricultural lands, UA = urban areas, HS = hill slopes.

*** Western Ghats endemic species.