IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, July 2026
Impact Factor: 8.2

A Comparative Study of Lepidoptera and Odonate Diversity of in and Around Devkhop and Surya Dam, Palghar, Maharashtra, India.

Vilas Sapte[1*], Rahul Jadhav[1], Chris Rodrigues[2]
[1]Research Scholar, Department of Zoology
[1]Professor and Research Guide, Department of Zoology
Vidyavardhini's Annasaheb Vartak College of Arts, Kedarnath Malhotra College of Commerce, E. S. Andrades College of Science, Vasai Road (West), District Palghar, Maharashtra, India.
[2]Department of Zoology, D.G. Ruparel College of Arts, Science and Commerce, Mumbai, (M.S), India.
Corresponding author: Chris Rodrigues (chris.rodrigues120405@gmail.com)

Abstract: *The study assesses the diversity and taxonomic composition of Lepidoptera (Butterfly) and Odonata at two sites (Devkhop and Surya dam) in Maharashtra, India. A total of 36 Lepidopteran (Butterfly) species belonging to 9 families and 11 Odonate species belonging to 5 families were recorded. Among lepidopterans Lepidoptera, Nymphalidae was the dominant family (27.78%), followed by Papilionidae (25%) and Crambidae (16.67%) whereas Libellulidae (54.55%) represented the most species-rich Odonate family. Comparative analysis revealed that Devkhop dam supported significantly higher species richness, with several relatively uncommon species recorded only at the former site. In contrast, Devkhop dam was dominated by widespread generalist species associated with disturbed and human modified habitats. The observed differences in community composition suggest that habitat heterogeneity and lower anthropogenic disturbance contribute substantially to insect diversity. The findings highlight the ecological importance of conserving freshwater habitats and their surrounding vegetation, emphasizing the need for habitat management and long term biodiversity monitoring to safeguard these ecologically important insect communities.*

Keywords: Diversity, Lepidoptera, Odonate, Devkhop dam, Surya dam

1. INTRODUCTION

Lepidopterans (Butterflies) and Odonates which comprise dragonflies and damselflies are among one of the most conspicuous and ecologically significant groups of insects. These both groups play vital roles in the ecosystem functioning and biodiversity maintenance (Corbet 1999; Dennis, 2010). Butterflies serve as important pollinators and herbivores while also acting as prey for numerous vertebrates and invertebrates, thereby playing a significant role in contribution to the food web dynamics (Bonebrake et al., 2010), Odonates are known to be one of the most efficient predators throughout both the aquatic larval life and terrestrial adult sages and are instrumental in regulating population of mosquitoes and other small and related insects thus making them one of the important biological control agents (Corbet, 1999), due to the sensitivity to habitat quality, climatic conditions and environmental disturbances, bott these groups of insects are also widely recognized as being a reliable bioindicator for assessing the ecosystem health and monitoring ecological the changes across diverse landscapes (Samways and Steytier,1996).

The Palghar region lies within the Western Ghats, a renowned biodiversity hotspot in India. Lepidopteran (Butterflies) belonging to the insect group under the phylum Arthropoda are celebrated for their vibrant colors and intricate patterns. Beyond their beauty, certain butterfly species play crucial roles as charismatic or flagship species to promote local conservation. (Gowda et al., 2011).

DOI: 10.48175/IJARSCT-37874

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 3, July 2026 Impact Factor: 8.2

The diversity and distribution of both butterflies and Odonates are strongly influenced by vegetation composition, habitat heterogeneity, water availability, temperature, humidity and anthropogenic activities which include urbanisation and land use change (Clark et al., 2007, Dolny, 2012), Butterflies are known to generally exhibit very close association with the host plants and nectar resources which result in them having high habitat specificity and making them excellent indicators of terrestrial habitat integrity (Dennis, 2010). In a very similar manner Odonates also show dependence on clean freshwater sources for their larval development, thus water quality, hydroperiod and associated vegetation can significantly affect their presence and diversity in a region (Subramanian, 2009), An Increasing risk of habitat fragmentation, pollution , agriculture intensification and climate change have resulted in decline in many insect populations worldwide , among which include butterflies and Odonates, thus there is an urgent need for continuous biodiversity assessment and long term ecological monitoring (Dirzo et al., 2014, Wagner et al., 2021).

India is recognized as one of the world's most diverse countries in terms of species richness and supports an exceptionally rich diversity of insects like butterflies and Odonates (Kunte, 2000, Subramanian, 2009). Maharashtra possesses a mosaic of dense forest, large wetlands, grasslands and agricultural field and also immense urban green spaces which collectively play a vital role in sustaining diverse assemblage of both taxa, however many regions remain poorly documented and studied despite increasing anthropogenic pressures (Tiple et al.,2013) Systematic biodiversity surveys provide valuable baseline information an species richness, abundance, habitat associations and seasonal occurrence, which are essential for conservation planning, habitat management and future ecological monitoring (New, 1997) .

Nearly half the earth was occupied by insects (May, 1992). Depending on the season, the occurrence of butterfly species is also variable (Kunte, 1997). There was less record available on butterfly species diversity in the Palghar region of Maharashtra. The present work helped to prepare a checklist of butterfly species and diversity found at two selected sites. Palghar as a region has been poorly studied in terms of species richness or documentation of such taxa, hence this present study was undertaken to document the diversity and distribution of butterflies and Odonates within Devkhop and Surya dam.

II. MATERIAL AND METHODS

Both sites were visited at regular, predetermined intervals through the study period (2023 to 2026) Rainfall in the region ranges from 650 to 950 mm per year on average. Palghar's varied topography, which includes forested areas, agricultural land, grasslands, and water bodies, provides a unique and diverse environment for butterfly and Odonates species. The area is characterized by a tropical climate with distinct seasons, including the monsoon, Winter and Summer with environmental variables such as time of the day, recent rainfall events, cloud size and temperature of day were taken into consideration during each survey in an attempt to minimize temporal and climatic approach, in which organisms were recorded in situ without any deliberate manipulation of their habitat or behaviour, thereby preserving the ecological context of each sighting. Within this survey, random sampling was employed through the study sites thus reducing observer bias and increasing the representativeness of the data. During each visit, specimens were photographed primarily through digital photography, with each individual or aggregation photographed from multiple angles, when possible, capture of diagnostic characters were also taken. For every photographic record, the location was located with reference to their microhabitat. Insects and other arthropods were not deliberately captured with nets or were handled directly so as to minimize the stress, mortality and potential alteration of behaviour, and to comply with a menial invasive and ethical survey approach.

In the field, photographs of the butterflies were taken with the help of a Oppo mobile phone, Sony and Nikon coolpix camera. Specimens were identified solely on the basis of photographic evidence, supported by detailed field notes on behaviour, posture and habitat association, rather than by collection of specimens. post survey, the images were examined and compared with standard taxonomic keys and online reference databases, focusing on stable morphological characters that are reliably discernible in photographs.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 3, July 2026 Impact Factor: 8.2

2.1 Study area

Site A: Devkhop dam – 19°43'05.5"N 72°48'45.0"E

Site B: Surya Dam – 19°41'51.6"N 72°51'02.6"E.

The Western Ghat includes Maharashtra, and the Palghar region lies between these hotspots. This location is situated 100 km to the north of the district headquarters in state capital, Mumbai. The latitude for the Palghar region is 19°43 and the longitude is 72°48. The climate of the study area is characterized by hot summers, with a maximum temperature of 42°C from May to June and an average of 12°C in January. Palghar receives an average annual rainfall ranging between 2,000 mm and 3,500 mm (118 inches). The vast majority of this precipitation, about 95% to 97%, occurs during the southwest monsoon season from June to September, with July typically being the wettest. Two sampling sites were selected in the study area, which include Devkhop and Surya dam.

A) Devkhop Dam : 19°43'05.5"N 72°48'45.0"E

Devkhop Dam is a large reservoir located near Palghar town. It is approximately 6 km from urban areas and is set against the foothills of the Sahyadri range. The impoundment forms the Devkhop lake along the Palghar-Manor Road, thus creating a semi-lentic freshwater ecosystem surrounded by rich patches of scrub, grasslands and patches of moist deciduous vegetation. This landscape also is known to be reported for its diversity of avifauna, insects and various organisms from other associated ataxia making the dam and its catchment area rich in biodiversity.

B) Surya Dam: 19°41'51.6"N 72°51'02.6"E.

Surya dam, Maswan is one of the major water supply reservoirs constructed on the Surya River in the tribal uplands of the Palghar district, with the source near Dhamani village and intake structures around the Kawadas. The dam is the core component of the Surya regional bulk drinking water supply scheme which is designed to deliver hundreds of millions of litres of water to regions like Vasai-Virar, Mira-Bhayandar, and other 44 associated and nearby villages in Palghar. Its large reservoirs and regulated riverine stretch serve as an excellent diversity hub for various associate fauna which includes birds, fishes and insects and other related taxa.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, July 2026
Impact Factor: 8.2

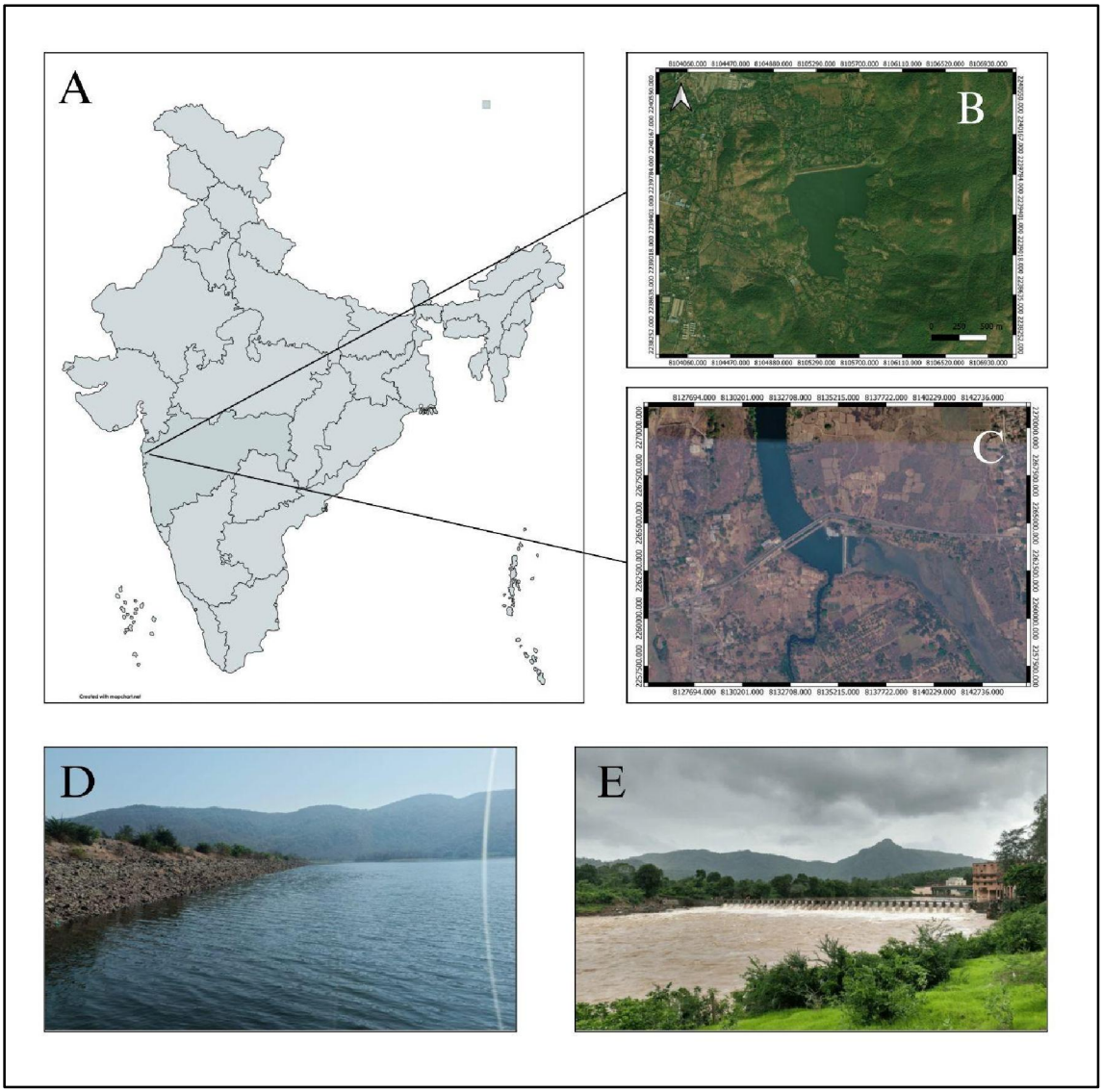

Fig 1 – Location of Study area: Map of India, Maharashtra, Palghar district (A), Google map of Devkhop dam (B), Surya dam (C), Selected study area Devkhop site (D), Surya site (E)

SPECIES OF BUTTERFLY AND ITS IDENTIFICATION

Identification of butterfly species involves recognizing different species based on distinct morphological characteristics, behaviour, habitat preferences, and sometimes even by their interaction with host plants. The process of identifying butterflies can be done using a combination of field observations and reference materials such as identification guides, photographs, or online databases and relevant available literature and photographs described by Sunil et al., (2016) and Kumar et al., (2016). Butterflies are also identified by using different websites (i, ii, iii) as mentioned in the reference section and (Dr. Raju Kasambe, 2016).

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, July 2026
Impact Factor: 8.2

III. RESULTS

A total of 47 species were recorded throughout the survey of which 36 species were of Lepidopterans and 11 species of Odonates.

Diversity of Lepidopteran Families:

The family-wise distribution of Lepidopteran species recorded during the present investigation is illustrated in Figure 1. A total of 36 species belonging to nine families were documented from the study area. Considerable variation was observed in species richness among different families. The family Nymphalidae was the most dominant, contributing 10 species (27.78%) of the total recorded Lepidopteran fauna. Members of this family were widely distributed throughout the study area, indicating their high adaptability to different habitat conditions and the availability of suitable larval host plants. The second most dominant family was Papilionidae, represented by 9 species (25.00%). The high representation of this family suggests the presence of diverse flowering plants and suitable breeding habitats. Species of Papilionidae are generally considered important ecological indicators because of their dependence on specific host plants. The family Crambidae occupied the third position with 6 species (16.67%), indicating moderate diversity within the study area. Crambid moths are commonly associated with grasslands, agricultural fields, and wetland vegetation, reflecting the heterogeneous habitat structure of the study area. The family Pieridae was represented by 4 species (11.11%), while Lycaenidae contributed 3 species (8.33%). These families were moderately represented and are commonly associated with flowering vegetation and shrub ecosystems. The remaining four families - Hesperiidae, Erebidae, Hyblaeidae, and Noctuidae—were represented by only one species each (2.78%), indicating comparatively lower diversity. Their limited representation may be attributed to habitat specificity, seasonal occurrence, or lower sampling frequency.

Diversity of Odonatan Families:

The family-wise composition of Odonata recorded from the study area is presented in Figure 2. A total of 11 species belonging to five families were observed. Among all recorded families, Libellulidae was the most dominant, accounting for 6 species (54.55%). More than half of the total odonate diversity belonged to this family, indicating its ecological success in the freshwater habitats of the study area. Members of Libellulidae are known to tolerate a wide range of environmental conditions and are commonly associated with ponds, lakes, reservoirs, and wetlands. The family Coenagrionidae was represented by 2 species (18.18%), making it the second most dominant family. Species of this family generally prefer slow-moving or stagnant freshwater habitats with abundant aquatic vegetation. The remaining families - Platycnemididae, Calopterygidae, and Gomphidae - were each represented by one species (9.09%). Their comparatively lower representation indicates either habitat specialization or limited suitable breeding sites within the study area.

Sr. no	Family	Common name	Scientific name	Devkhop Dam	Surya Dam
1	Nymphalidae	Commandar	*Moduza procris*	+	
2		Dark band bush brown	*Mycalesis mineus*	+	
3		Spotted rustic	*Phalanta phalantha*	+	+
4		Lemon pansy	*Junonia lemonias*	+	+
5		Peacock pansy	*Junonia almana*	+	+
6		Grey pansy	*Junonia atlites*	+	
7		Blue pansy	*Junonia orithya*	+	+
8		Common sailor	*Neptis hylas*	+	
9		Danaid eggfly	*Hypolimnas misippus*	+	
10		Common four	*Ypthima huebneri*	+	

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, July 2026
Impact Factor: 8.2

		ring			
11	Pieridae	Common emigrant	*Catopsilia pomona*	+	+
12		Common grass yellow	*Eurema hecabe*	+	+
13		Common jezebel	*Delias eucharis*	+	
14		Great orange tip	*Hebomoia glaucippe*	+	
15	Lycaenidae	Common pierrot	*Castalius rosimon*	+	
16		Dark grass blue	*Zizeeria karsandra*	+	+
17		Red pierrot	*Talicada nyseus*	+	+
18	Papilionidae	Spot swordtail	*Graphium nomius*	+	
19		Common jay	*Graphium doson*	+	
20		Common mime	*Papilio clytia*	+	
21		Common mormon	*Papilio polytes*	+	
22		Common rose	*Pachliopta aristolochiae*	+	
23		Common crow	*Euploea core*	+	+
24		Plain tiger	*Danaus chrysippus*	+	+
25		Common tiger	*Danaus genutia*	+	+
26		Glassy tiger	*Parantica aglea*	+	
27	Hesperiidae	Dark banded swift	*Pelopidas agna*	+	+
28	Erebidae	Tropical tiger moth	*Asota caricae*		+
29	Hyblaeidae	Teak defoliator	*Hyblaea puera*	+	+
30	Crambidae	Beet webworm moth	*Spoladea recurvalis*	+	+
31		Bean leafroller	*Omiodes diemenalis*	+	
32		Rice leafroller	*Cnaphalocrocis medinalis*	+	+
34		Banded pearl moth	*Sameodes cancellalis*	+	
35		Rice yellow stem borer	*Scirpophaga incertulas*		+
36	Noctuidae	Cotton bollworm	*Helicoverpa armigera*	+	+

Table 1. Checklist of Lepidopteran (Butterfly) species observed in Two sites.

Sr. no	Family	Common name	Scientific name	Devkhop dam	Surya dam
1	Platycnemididae	Black winged bamboo tail	*Disparoneura quadrimaculata*	+	
2	Coenagrionidae	Blue sprite	*Pseudagrion microcephalum*	+	+
3		Pygmy dartlet	*Agriocnemis pygmaea*	+	+
4	Calopterygidae	Mountain emerald	*Vestalis submontana*	+	
5	Libellulidae	Ditch jewel	*Brachythemis contaminata*	+	+

DOI: 10.48175/IJARSCT-37874

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, July 2026
Impact Factor: 8.2

6		Granite ghost	*Bradinopyga geminata*	+	+
7		Ruddy marsh skimmer	*Crocothemis servilia*	+	+
8		Slender skimmer	*Orthetrum sabina*	+	+
9		Black stream glider	*Trithemis festiva*	+	
10		Long legged marsh glider	*Trithemis pallidinervis*	+	
11	Gomphidae	Common clubtail	*Ictinogomphus rapax*	+	

Table 2 - Tabular representation of Odonate diversity in Two sites

Table.2 Photo plate

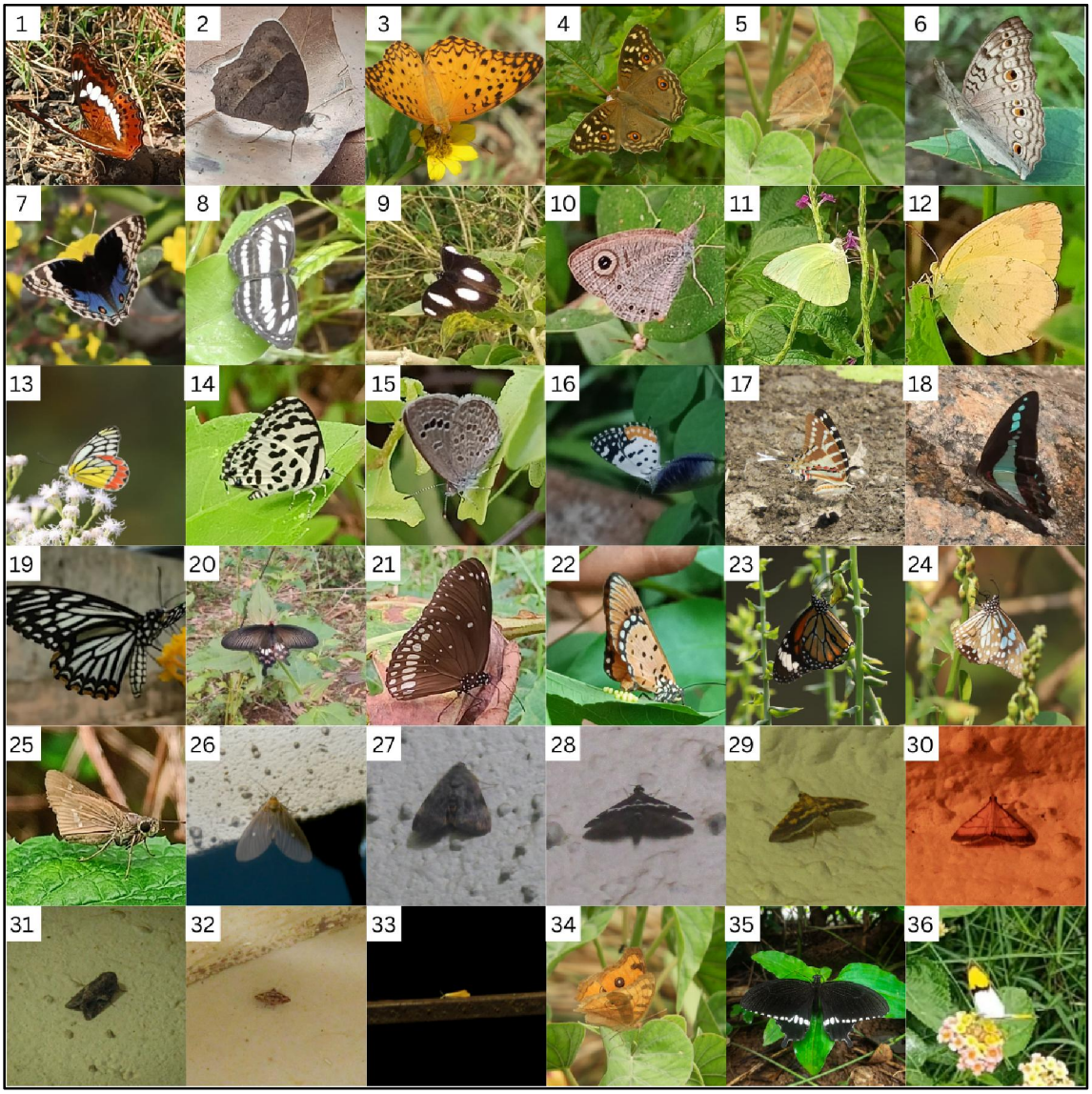

Fig. 1 - Photographic representation of Lepidopteran (Butterfly) diversity reported during survey -(1) M.procris, (2) M.mineus (3) P.phalantha, (4) J.lemonias, (5) J.almana,(6) J.atlites, (7) J.orithya, (8) N.hylas, (9)H.misippus, (10)

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, July 2026
Impact Factor: 8.2

Y.huebneri, (11)C.pomona, (12) E.hecabe, (13) D.eucharis, (14) C.rosimon, (15) Z.karsandra, (16)T.nyseus, (17) G.nomius, (18) G.doson, (19) P.clytia, (20) P.aristolochiae, (21) E.core, (22) D.chrysippus, (23) D.genutia, (24) P.algea, (25) P.agna, (26) A.caricae, (27) H.puera, (28) S.recurvalis, (29)O.diemenalis, (30) C.medinalis, (31) H.armigera, (32) S.cancellalis, (33) S.incertulas, (34) J.atlites, (35) P.polytes, (36) H.glaucippe

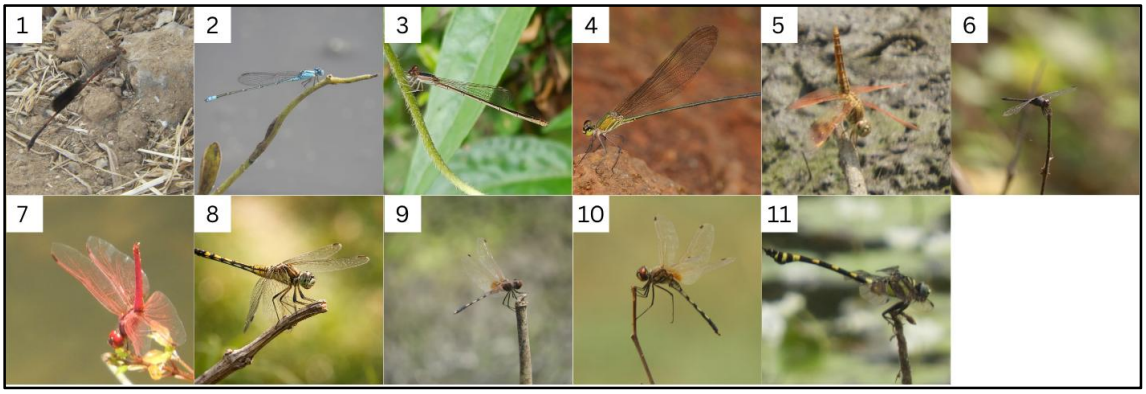

Fig. 2 - Photographic representation of Odonates diversity reported during survey - (1) D. quadrimaculata, (2) P.microcephalum (3) A.pygmaea, (4) V.submontana, (5) B.contaminata, (6) B.geminata, (7) C.servilia, (8) O.sabina, (9) T.festiva, (10) T.pallidinervis, (11) I.rapax

The taxonomic composition of the recorded lepidopteran fauna revealed considerable variation among families. Among the order the family Nymphalidae emerged as the dominant family contribution to a total of 10 species and representing the highest species richness. The second most species rich family was Papilionidae which represented a total of 9 species. Family Crambidae represented a total of 6 species while family Pieridae reported a total of 4 species. The family Lycaenidae represented 3 species while the lowest of dominance were reported by families Hesperiidae, Erebidae, Hyblaeidae and Noctuidae which represent only single species for each family. In terms of Odonates there was a similar pattern of dominance. The family Libellulidae was the most species rich family contributing a total of 6 species and accounting for the majority of the dragonflies recorded during the survey . The family Coenagarionidae reported only 2 species while families Platycnemididae, Calopterygidae and Gomphidae represented the lowest of the dominance with each family reporting only single species.

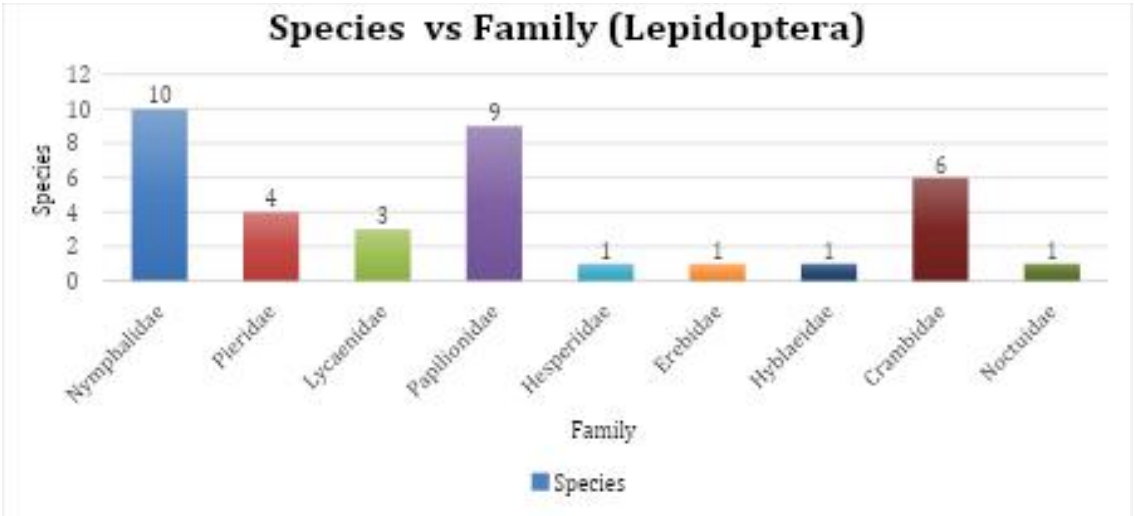

Fig. (1)

DOI: 10.48175/IJARSCT-37874

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, July 2026
Impact Factor: 8.2

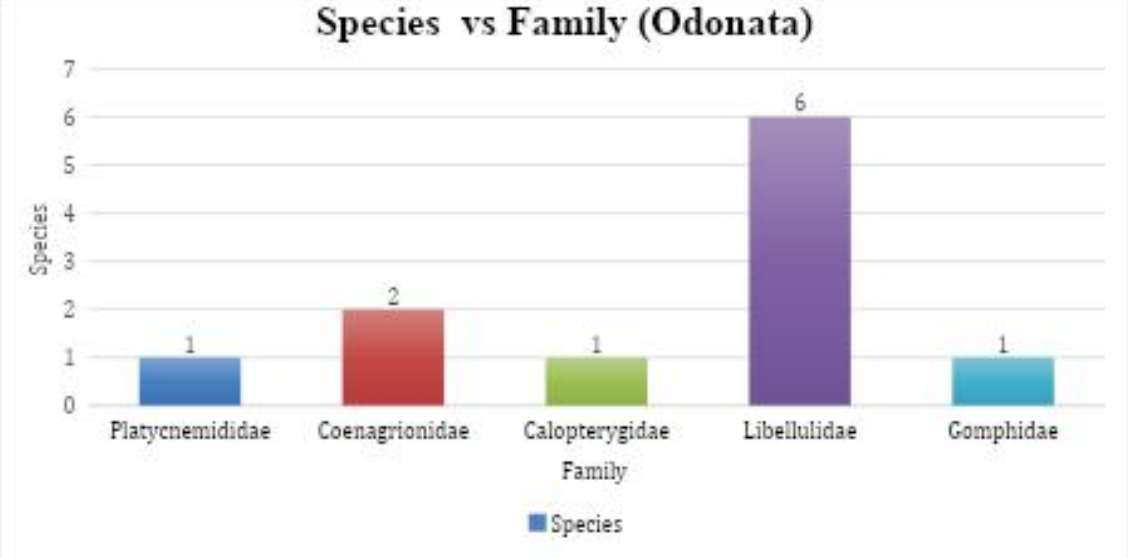

Fig. (2)

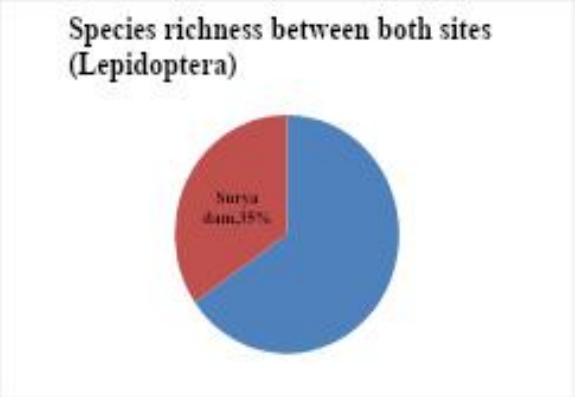

Fig. (3)

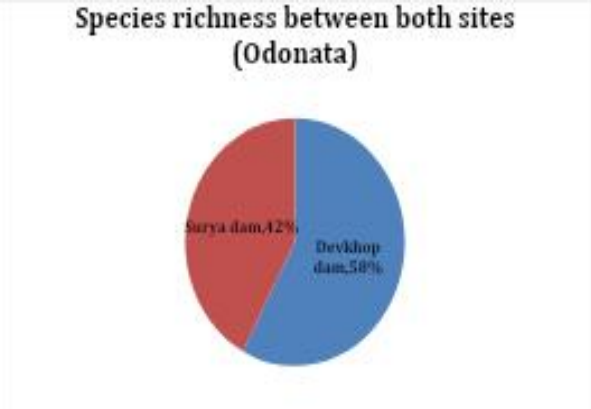

Fig. (4)

Fig 1, 2, 3 & 4 - Statistical analysis of Lepidopteran and Odonate diversity (Species vs Family and Devkhop vs Surya dam)

A comparison between 2 sites demonstrated a marked difference in Lepidopteran species richness and community composition . Devkhop dam site exhibited a substantially greater diversity with a total of 34 recorded species encompassing generalist species and also relatively uncommon taxa . In contrast, the study site of Surya dam supported a comparatively lower diversity with 18 recorded species. The lepidopteran community at this site was predominantly composed of more common and widely distributed species which are associated with more urban landscapes, open habitats and agricultural fields. In a similar manner, the comparison of Odonate diversity between both sampling sites further highlighted a similar ecological difference between the study areas . Devkhop dam reported the highest Odonate diversity with a total of 11 recorded species , including both common species and also relatively uncommon taxa . In a converse manner , Surya dam recorded a richness of only 6 species of which majority were common generalist species.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 3, July 2026
Impact Factor: 8.2

IV. DISCUSSION

The dominance of the family Nymphalidae in the present study is an indicator of a good ecosystem , butterflies from this family are generally regarded as one of the most ecologically successful butterfly family owing to their board habitat tolerance, polyphagous larval feeding habits, high dispersal ability and adaptation to wide range of climatic conditions (Kunte, 2000; Kehimkar, 2016), also the larva of these butterflies utilize a diverse array of host plants while adults tend to exploit nectar, tree sap, rotting fruits and mineral rich substrates which allow them to occupy multiple ecological niches throughout the (Kunte, 2000; Bonebrake et al., 2010). Consequently the predominance of ten nymphalid species recorded during the present survey reflects the availability of heterogeneous vegetation and suitable microhabitats capable of supporting pieces with varying ecological needs (Bonebrake et al., 2010; Kehimkar, 2016)

The second highest representation of papillionidae indicates the study sites support a relatively diverse assemblage of larval host plants belonging to the families such as Rutaceae, Annonaceae, Lauraceae, and Aristolochiaceae with are associated with the development of these butterflies (Kehimkar, 2016; Kunte, 2000). Members of Papillionidae are generally considered habitat sensitive and often respond to presence of well-preserved vegetation , making them valuable ecological indicators of habitat quality (Bonebrake et al., 2010). The moderate representation of Crambidae, Pieridae and Lycaenidae suggest the presence of mosaic of grasses, herbs, shrubs and flowering plants and also host specific vegetation capable of supporting butterflies and diverse ecological preferences (Scoble, 1995; Kehimkar, 2016). The low representation by family Hesperiidae, Erebidae, Hyblaeidae and Noctuidae may be attributed to their specialized habitat requirements, cryptic behaviour, nocturnal activity , seasonal emergence or lower detectability (Scoble, 1995; Triplehorn & Johnson, 2005)

The Odonate assemblage exhibited a comparable pattern with Libellulidae emerging as the dominant family, these Lebellulids constitute the majority of dragonfly species due to their ecological adaptability and wide geographical distribution (Subramanian, 2005; Dijkstra et al., 2013). These dragonflies are also capable of exploiting a wide range of freshwater habitats, slow flowing streams , ponds, lakes, marshes , thus enabling them to thrive under varying environmental conditions (Subramanian, 2005). To add further, their relatively short generational times , efficient flight capabilities and tolerance to moderate habitat disturbances further contribute to their ecological success and widespread occurrence (Corbet, 1999; Dijkstra et al., 2013)

The comparatively low richness of families like Coeagrionidae, Platycnemididae, Calopterygidae and Gomphidae probably reflects differences in habitat specialization and ecological requirements among odonate families . Coenagrionids are generally associated with well vegetated lentic habitats and are often more sensitive to changes in aquatic vegetation (Subramanian, 2005; Corbet, 1999). Species belonging to Calopterygidae and Gomphidae frequently depend on clean , flowing streams with specific substrate characteristics , while many gomphids possess burrowing larvae that require sandy or gravel riverbeds for their development (Corbet,1999; Dijkstra et al.,2013). In a similar manner, members of Platycnemididae often exhibit localised distributions and narrow habitat preferences , making their presence less frequent (Subramanian, 2005).

The difference in lepidopteran species richness between Devkhop dam and Surya dam is likely attributed to variation in habitat heterogeneity, vegetation complexity and the availability of larval hosts plants and adult nectar resources (The Ecology of Butterflies in Britain; Dennis, 2010). Habitat heterogeneity is widely recognized as on the strongest determinants of butterfly diversity because structurally complex habitats provide a greater variety of ecological niches , microclimatic conditions and food resources necessary for the persistence of specialist as well as generalist species (Tews et al., 2004). The considerably higher richness observed at Devkhop dam including the occurrence of uncommon species suggest the presence of more stable and less disturbed ecosystem which can sustain such species (Kremen, 1992)

A lower richness recorded at Surya dam and the predominance of widespread generalist butterflies are characteristic of landscapes which have a higher anthropogenic disturbance, habitat simplification or agricultural influence which results in replacement of specialist species with common or generalist species (Blair, 1999) . Similar shifts in butterfly community composition of common generalist species have been documented across fragmented and human modified

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 3, July 2026 Impact Factor: 8.2

landscapes, thus emphasizing the sensitivity of lepidopterans to environmental alteration (Bonebrake et al., 2010). Consequently the observed differences between the two reservoirs indicate that Devkhop dam presently functions as more favourable habitat for maintaining regional lepidopteran biodiversity, whereas the comparatively common assemblage at Surya dam may reflect reduced habitat quality and ecological integrity

V. CONCLUSION

The present study demonstrated that Devkhop dam supported substantially greater biodiversity of both Lepidopteran and Odonata than that of Surya dam, thus highlighting the importance of habitat quality in shaping insect communities. The dominance of family Nymphalidae and Papillionidae among lepidopterans, together with predominance of Libellulidae among the Odonates, reflected the adaptability and ecological success of these families' access range of freshwater and terrestrial habitats. However the higher species richness recorded at Devkhop dam, including the occurrence of relatively uncommon species indicates the presence of more heterogeneous vegetation, better habitat connectivity and comparatively lower levels of anthropogenic disturbances. In contrast the lower diversity observed at Surya dam where community were dominated primarily by widespread generalist species, thus suggesting at the habitat simplification and environmental disturbances may reduce the availability of suitable microhabitats for the sustenance of specialised taxa.

The findings of this study also emphasize the ecological consequences of humans induced habitat alteration on freshwater and surrounding terrestrial ecosystems. Increasing anthropogenic activities like agricultural expansion, vegetation clearing, infrastructure development, gazing, pollution and other modifications can result in reduction of the diversity of native plant species, alter breeding and breeding habitats and also fragrant the ecological corridors that are essential for these taxa. Such disturbances often favour resilient generalist species while leading to the gradual decline of habitat specialists, ultimately resulting in biotic homogenization and reduced ecosystem resilience. Therefore, conserving natural vegetation around dam catchments, minimising habitat degradation, restoring degraded riparian zones and implementing long term biodiversity monitoring programs are essential to maintain the rich insect diversity. Hence, there is a good scope for documentation and systematic classification of Lepidopteran and odonates species for detailed future study.

Libellulidae represented the dominant family by a substantial margin, accounting for 6 species. Coenagrionidae was represented by 2 species. The families Platycnemididae, Calopterygidae, and Gomphidae showed minimal species diversity, with each family represented by 1 species.

The findings contribute valuable insights for biodiversity conservation strategies in the region and advocate for sustainable management practices that protect both butterflies, odonates and their vital host plants.

VI. ACKNOWLEDGMENT

The authors express deep gratitude to thank the Research Guide Dr. Rahul Jadhav who provided guidance, ssupport and assistance throughout the research work for this publication And to the Principal of Vidyavardhini's, Annasaheb Vartak College of Arts, Kedarnath Malhotra College of Commerce, E. S. Andrades College of Science, Vasai Road (West) - 401 202, Dist.: Palghar, M.S., India for providing research laboratory.

REFERENCES

1. Blair, R. B. (1999). Birds and butterflies along an urban gradient: surrogate taxa for assessing biodiversity? Ecological Applications, 9(1), 164–170.
2. Bonebrake, T. C., Ponisio, L. C., Boggs, C. L., & Ehrlich, P. R. (2010). More than just indicators: A review of tropical butterfly ecology and conservation. Biological Conservation, 143(8), 1831–1841.
3. Clark, T. E., Samways, M. J., & McGeoch, M. A. (2007). The effects of grassland management on butterfly diversity. Biodiversity and Conservation, 16, 121–137.
4. Corbet, P. S. (1999). Dragonflies: Behaviour and Ecology of Odonata. Harley Books.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 3, July 2026 Impact Factor: 8.2

5. Dennis, R. L. H. (2010). A Resource-Based Habitat View for Conservation. Wiley-Blackwell.
6. Dijkstra, K.-D. B., Monaghan, M. T., & Pauls, S. U. (2013). Freshwater biodiversity and aquatic insect ecology. Hydrobiologia, 712, 1–17.
7. Dirzo, R., Young, H. S., Galetti, M., Ceballos, G., Isaac, N. J. B., & Collen, B. (2014). Defaunation in the Anthropocene. Science, 345(6195), 401–406.
8. Dolný, A., Bárta, D., Lhota, S., Rusdianto, & Drozd, P. (2012). Dragonflies indicate tropical rainforest condition. Ecological Indicators, 18, 560–567.
9. Gowda, R., Kumara, V., Promod, A. and Hosetti, B. (2011). Butterfly diversity, Seasonality and status in Lakkavalli Range of Bhadra Wildlife Sanctuary, Karnataka. World Journal of Science and Technology, 1(11): 67-72.
10. Kehimkar, I. (2016). Butterflies of India. Bombay Natural History Society & Oxford University Press.
11. Kremen, C. (1992). Assessing the indicator properties of species assemblages for natural areas monitoring. Ecological Applications, 2(2), 203–217.
12. Kumar, P., Devi R, Mattu, V.K., (2016).Diversity and abundance of Butterfly fauna (Insecta: Lepidoptera) of Subalpine area of Chanshal Valley of District Shimla (Himachal Pradesh), Journal of Entomology and Zoology Studies; 4(4): 243-247.
13. Kunte, K. (2000). Butterflies of Peninsular India. Universities Press (Hyderabad) and Indian Academy of Sciences (Bengaluru), pp. 270.
14. May, P.G. (1992). Flower selection and the dynamics of lipid reserves in two nectarivorous butterflies. Ecology, 73: 2181-2191.
15. New, T. R. (1997). Butterfly Conservation. Oxford University Press.
16. Samways, M. J., & Steytler, N. S. (1996). Dragonfly (Odonata) distribution patterns in relation to biotope variables. Biological Conservation, 78(3), 279–288.
17. Scoble, M. J. (1995). The Lepidoptera: Form, Function and Diversity (2nd ed.). Oxford University Press.
18. Subramanian, K. A. (2005). Dragonflies and Damselflies of Peninsular India – A Field Guide. E-book of the Project Lifescape.
19. Subramanian, K. A. (2009). Dragonflies of India: A Field Guide. Vigyan Prasar.
20. Sunil H. B., Pawar P. A., and Bendre N. N. (2025). Butterfly Diversity in Mahadare Conservation Reserve, Satara (MS), Western Ghats: A Synoptic Checklist, UTTAR PRADESH JOURNAL OF ZOOLOGY 46(12):64-85. DOI:10.56557/upjoz/2025/v46i125045.
21. Tews, J., Brose, U., Grimm, V., et al. (2004). Animal species diversity driven by habitat heterogeneity/diversity: the importance of keystone structures. Journal of Biogeography, 31(1), 79–92.
22. Tiple, A. D., Khurad, A. M., & Dennis, R. L. H. (2013). Butterfly diversity in relation to habitat and disturbance in central India. Journal of Insect Science, 13, 1–9.
23. Triplehorn, C. A., & Johnson, N. F. (2005). Borror and DeLong's Introduction to the Study of Insects (7th ed.). Thomson Brooks/Cole.
24. Wagner, D. L., Grames, E. M., Forister, M. L., Berenbaum, M. R., & Stopak, D. (2021). Insect decline in the Anthropocene: Death by a thousand cuts. Proceedings of the National Academy of Sciences, 118(2), e2023989118.
25. Dr. Raju Kasambe. (2018). Butterflies of western ghats.
i. Butterflies of India- https://www.ifoundbutterflies.org/
ii. Butterflies' identification guide - https://owlcation.com/stem/butterfly-identification
iii. Butterfly conservation - https://butterflyconservation.org/butterflies/identify-a-butterfly?page=1
iv. **डॉ. राजू कसंबे २०१६. महाराष्ट्रातील फुलपाखरे**