

ON A COLLECTION OF BUTTERFLIES (LEPIDOPTERA) AT THE DESERT REGIONAL STATION, ZOOLOGICAL SURVEY OF INDIA, JODHPUR

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INTRODUCTION

The pattern of faunal distribution depends mainly on climate, vegetation and physiography of the ecosystem. Each species has a unique distributional pattern, which is the result of its ecological and evolutionary history. North-western part of India covering the two states of Rajasthan and Gujarat, besides the Union Territory of Dadra & Nagar Haveli falling under the jurisdiction of the Desert Regional Station (DRS) presents an interesting field of study on the lepidopteran fauna distributed over certain types of diverse ecosystems varying from the arid region in the east upto the salty marsh land of Runn of Kutchch in the west and over and above the Aravallis. The analysis of literature reveals that our present knowledge on distribution of Lepidoptera is insignificant in this region on the ground of utterly inadequate survey. This can be further concluded that comparatively well-known lepidopteran groups have surprisingly failed to draw the proper attention of the taxonomists. Nevertheless, present study on lepidopteran material deposited in the DRS, ZSI, Jodhpur will certainly enrich our knowledge on the Lepidoptera fauna from different districts of Rajasthan, Gujarat and Dadra & Nagar Haveli.

Earlier Nurse (1899), Macpherson (1927), Mosse (1929), Aldrich (1946), Talbot (1947, 1978), Pruthi and Bhatia (1952), Mathur and Champakavalli (1961), Shull (1963, 1964), Kushwaha *et al.* (1963), Shull and Nadkerny (1967), Gupta and Thakur (1986, 1990) and Varshney and Gupta (1996) have made valuable contribution on the taxonomy of Lepidoptera from Rajasthan and Gujarat. The present paper reports thirty-nine species of butterfly representing twenty-five genera grouped under seven families.

MATERIAL AND METHODS

The material studied in this paper were made available from two sources. Besides the collection made by the scientists of DRS, Jodhpur during the last four decades, specimens collected by the authors during the last two years have also been included in the present study. The details of

identified specimens reported by Gupta and Thakur (1986, 1990) from Rajasthan and Gujarat are also incorporated. Maximum number of specimens were collected by insect net while a few ones were hand-picked or collected by light-trapping method. All the specimens are registered and deposited in the collection of DRS.

SYSTEMATIC ACCOUNT

i. Family : PIERIDAE

1. *Colotis etrida* (Boisduval)

Material examined : INDIA RAJASTHAN : Jodhpur : Akaraj ji ka talab (8 Km. SW), 1 ex., 13.xi.1963, Moti Lal, Reg. No. 1559; Patodi House, 1 ex., 8.xi.1966, N.K. Parida, Reg. No. I 2451; Sangaria (14 Km. SW), 1 ex., 29.x.1963, Moti Lal, Reg. No. 1489; Lombardia talab (23 Km. SW), 2 exs., 23.xi.1963, K.C. Kansal, Reg. No. A/117; Chandelav village tank (40 Km. from Jodhpur), 2 exs., 18.xi.1965, V.C. Agarwal, Reg. No. I 2273.

2. *Colotis danae* (Fabricius)

Material examined : INDIA : RAJASTHAN : Jodhpur : Balsamand Garden, 2 exs., 5.ix.1962, K.C. Kansal, Reg. No. A/116, A/120. GUJARAT : Bharuch : Rajpipla, 1 ex., 31.i.1975, T.G. Vazirani, Reg. No. 3176/3.

3. *Colotis calais amata* (Fabricius)

Material examined : INDIA : RAJASTHAN : Pali : Dujana, 1 ex., 12.viii.2000, S.I. Kazmi, Reg. No. R/377.

4. *Colotis vestalis* (Butler)

Material examined : INDIA : RAJASTHAN : Jodhpur : Paota, 5 exs., 18.viii.1961, Ramreet Singh, Reg. No. 1/824.

5. *Ixias marianne* (Cramer)

Material examined : INDIA : RAJASTHAN : Alwar : Sariska : Pancho ki pole, 3 exs., 11.x.1973, Y.P. Sinha, Reg. No. 1479/3.

6. *Delias eucharis* (Drury)

Material examined : INDIA : GUJARAT : Vadodara : Rajmahal, 2 exs., 10.ix.1976, 1 ex., 10.ix.1976, Y.P. Sinha, Reg. No. 5268/3 & 5271/3. Bharuch : 1 ex., 14.ix.1976, Y.P. Sinha, Reg. No. 5458/3. DADRA & NAGAR HAVELI : Dadra : 1 ex., 7.ix.1976, Y.P. Sinha, Reg. No. 5827/3.

7. *Eurema laeta* (Boisduval)

Material examined : INDIA : RAJASTHAN : Pali : Hemawas, 2 exs., T.G. Vazirani, Reg. No. 3814/3. Jaipur : Kabir Marg, 3 exs., 8.x.1973, Y.P. Sinha, Reg. No. 1402/3. Jodhpur : 11 Km. from town, 1 ex., 10.ix.1964, R.N. Bhargava, Reg. No. 3050; Patodi House, 2 exs., 25.x.1966, 2 exs., 30.x.1966, 1 ex., 14.xii.1966, 1 ex., 19.xii.1966, N.K. Parida, Reg. No. I 2139; I 2410, I 2499 & 2505; Mandore, 1 ex., 15.v.1965, V.C. Agarwal, Reg. No. I 2046; Public Garden, 1 ex., 17.viii.1962, 2 exs., 7.i.1963, Moti Lal, Reg. No. 3/423 & Nil; Balsamanad Garden, 1 ex., 5.ix.1962, R.C. Sharma, Reg. No. 3/218; Sangaria : Kuri village, 2 exs., 29.x.1963, Moti Lal, Reg. No. 1489; 1 ex., 27.x.1963, K.C. Kansal, Reg. No. I 772; Chandelav village tank (40 Km. from Jodhpur), 3 exs., 18.xi.1965, V.C. Agarwal, Reg. No. I 2273. Dungarpur : Surpuro ki nadi (4 Km. NW), 3 exs., 26.iii.1964, R.N. Bhargava, Reg. No. I 1424. Alwar : Sariska : Pancho ki pole, 2 exs., 11.x.1973, Y.P. Sinha, Reg. No. 1479/3; Silisrh, 1 ex., 10.x.1973, Y.P. Sinha, Reg. No. 1437/3. Udaipur : Ahar river, 1 ex., 19.iii.1964, V.C. Agarwal, Reg. No. I 1351. Sirohi : Abu (2 Km. N of Abu Railway Station), 1 ex., 6.3.1964, V.C. Agarwal, Reg. No. I 1216; Abu Bus Station, 1 ex., 7.iii.1964, V.C. Agarwal, Reg. No. I 1234. GUJARAT : Palanpur : Doasa 1 ex., 14.xi.1964, V.C. Agarwal, Reg. No. GI 337. Patan : Anwar tank (10 Km. from Patan), 2 exs., 30.x.1964, R.N. Bhargava, Reg. No. GI 283. Himmatnagar : 3 Km. S of Himmatnagar, 4 exs., 4.xi.1964, 1 ex., 6.xi.1964, R.N. Bhargava, Reg. No. GI 337 & GI 336; 5 Km. S of Himmatnagar, 2 exs., 5.xi.1964, Reg. No. GI 351. Dangs : Ahwa, 1 ex., 5.ii.1975, T.G. Vazirani, Reg. No. 3197/3.

8. *Eurema hecabe hecabe* (Linnaeus)

Material examined : INDIA : RAJASTHAN : Ganganagar : Central State Farm, Suratgarh, 1 ex., 6.ix.2000, S.I. Kazmi, Reg. No. R/45.

9. *Eurema hecabe simulata* (Linnaeus)

Material examined : INDIA : RAJASTHAN : Alwar : Sariska : Pancho ki pole, 3 exs., 11.x.1973, Y. P. Sinha, Reg. No. 1479/3. Jodhpur : Patodi House, 1 ex., 25.x.1966, 1 ex., 26.x.1966, N.K. Parida, Reg. No. I 2439 & 2440; 1ex., 12.ii.1964, V.C. Agarwal, Reg. No. 1952; Public Garden, 1 ex., 14.viii.1962, 1 ex., 17.viii.1962, Moti Lal, Reg. No. 3/421 & 3/423; Lombardia talab (23 Km. SW of Jodhpur), 2 exs., 23.xi.1963, K.C. Kansal, Reg. No. 1625; Agolai, 1 ex., 26.viii.1964, V.C. Agarwal, Reg. No. I 1690. Sirohi : 2 Km. from Abu Railway Station, 1 ex., 6.iii.1964, V.C. Agarwal, Reg. No. I 1216. Dungarpur : Surpuro ki nadi, 1 ex., 26.iii.1964, R.N. Bhargava, Reg. No. I 1424. GUJARAT : Palanpur : Mansarover tank, 3 exs., 11.x.1964, V.C. Agarwal, Reg. No. GI 19; 4 Km. from Palanpur near nallah, 1 ex., 12.x.1964, V.C. Agarwal, Reg. No. GI 44. Bharuch : 1ex., 16.ix.1976, Y.P. Sinha, Reg. No. 5458/3. Patan : Anwar tank (10 Km. from Patan), 2 exs., 30.x.1964, R.N. Bhargava, Reg. No. GI 283. Bhuj : Jakhawara tank (3 Km. from Bhuj), 1 ex., 15.x.1964, V.C. Agarwal, Reg. No. GI 94. DADRA & NAGAR HAVELI : Silvasa : 1 Km. SE, 1 ex., 28.iii.1964, R.N. Bhargava, Reg. No. I 1435.

10. *Cepora nerissa* (Fabricius)

Material examined : INDIA : RAJASTHAN : Alwar : Sariska : Pancho ki pole, 1 ex., 11.x.1973, Y.P. Sinha, Reg. No. 1479/3. GUJARAT : Dangs : Ahwa, 1 ex., 15.ii.1975, T.G. Vazirani, Reg. No. 3177/3. Bharuch : Rajpipla, 1 ex., T.G. Vazirani, Reg. No. 3176/3.

11. *Anaphaeis aurota aurota* (Fabricius)

Material examined : INDIA : RAJASTHAN : Jodhpur : Lardi, 1 ex., 26.ix.2000, M. Faisal, Reg. No. R/46; Manaklao, 2 exs., 24.iii.2001, S.I. Kazmi, Reg. No. R/107, R/108; Lombardia talab (23 Km. SW), 4 exs., 23.xi.1963, K.C. Kansal, Reg. No. 1625; Patodi House, 1 ex., 14.xii.1966, 1 ex., 16.xii.1966, 1 ex., 30.ix.1966, Coll. N.K. Parida, Reg. No. I 2499, I 2502 & I 2408; Salawas village, 1 ex., dt. Nil, Moti Lal, Reg. No. Nil; Kishangarh, 1 ex., dt. Nil, A. Charan, Reg. No. A/676. Alwar : Bundi, 1 ex., 10.x.1973, Y.P. Sinha, Reg. No. 1437/3. Udaipur : Ahar River (2 km. NW of Railway Station), 1 ex., 19.iii.1964, V.C. Agarwal, Reg. No. I 1351. Dungarpur : Surpuro ki nadi, 4 exs., 26.iii.1964, R.N. Bhargava, Reg. No. I 1424.

12. *Catopsilia crocale crocale* (Cramer)

Material examined : INDIA : RAJASTHAN : Jodhpur 1 ex, 10. iv.1964, R.N. Bhargava, Reg. No. 3050; Patodi House, 5 exs., 17.viii.1963, R.S. Pillai, Reg. No. 3/1116; 3 ex., 19.ix.1966, 6 exs., 21.ix.1966, 3 exs., 24.ix.1966, 1 ex., 26.ix.1966, 4 exs., 27.ix.1966, 1 ex., 30.ix.1966, 1 ex., 3.x.1966, 1 ex., 4.x.1966, 1 ex., 17.x.1966, 1 ex., 24.x. 1966, 1 ex., 25.x.1966, 1 ex., 16.xii.1966, N.K. Parida, Reg. No. I 2385, I 2392, I 2400, I 2404, I 2407, I 2406, I 2408, I 2410, I 2411, I 2430, I 2439 & I 2502, 1 ex., 31.x.1964, V.C. Agarwal, Reg. No. I 1708; Paota line, 1 ex., 17.viii.1963, R.S. Pillai, Reg. No. 3/1116; Paota, 1 ex., 28.vii.1961, 1 ex., 29.vii.1961, Ramreet Singh, Reg. No. I/820 & I/781, 1 ex., 31.viii.1963, R.S. Pillai, Reg. No. 2131; Mandor Garden, 1 ex., 9.ix.1964, V.C. Agarwal, Reg. No. 1749; 1 ex., 8.xi.1963, Moti Lal, 1 ex., 9.ix.1964, 1 ex., 31.x.1964, Reg. No. 1925, I 1749 & I 1708; Manaklao, 1 ex., 24.iii.2001, S.I. Kazmi, Reg. No. R/47; Salawas (SW of Jodhpur), 3 exs., 21.xii.1962, Moti Lal, Reg. No. 3/401, Beriganga (14 Km. from Jodhpur), 3 exs., 21.ix.1963, Moti Lal, Reg. No. 1353; Public Garden, 1 ex., 14.viii.1962, 1 ex., 17.viii.1962, 1 ex., 20.vii.1963, Moti Lal, Reg. No. 3/421; Luni River, (40 Km. SW of Jodhpur), 9.vii.1963, K.C. Kansal, Reg. No. 3/981. Udaipur : Ahar River (2 km. NW of Railway Station), 1 ex., 19.iii.1964, V.C. Agarwal, Reg. No. I 1351. GUJARAT : 3 exs., dt. Nil, Y.P. Sinha, Reg. No. Nil. Palanpur : Dantiwara, 1 ex., 13.x.1964, V.C. Agarwal, Reg. No. Nil; Mansarovar tank (2 Km. of Palanpur), 1 ex., 11.x.1964, V.C. Agarwal, Reg. No. GI 19. Bharuch : 1 ex., 16.ix.1976, Y.P. Sinha, Reg. No. 5458/3. Bhuj : Kukarma tank (11 Km. E of Bhuj), 1 ex., 25.x.1964, V.C. Agarwal, Reg. No. GI 240. DADRA & NAGAR HAVELI : Dadra : Dadra, 2 exs., 7.x.1976, Y.P. Sinha, Reg. No. Nil.

13. *Catopsilia pyranthe* (Linnaeus)

Material examined : INDIA : RAJASTHAN : Pali : Hemawas, 1 ex., 12.xi.1975, T.G. Vazirani, Reg. No. 3814/3. GUJARAT : Patan : Anwar talab (10 Km. SW of Patan), 1 ex., 30.x.1964, R.N. Bhargava, Reg. No. GI 283. Palanpur : Narsarover tank, 1 ex., 11.x.1964, V.C. Agarwal, Reg. No. GI 19; 5 Km. from Doasa, 1 ex., 15.x.1964, V.C. Agarwal, Reg. No. GI 94. Himmatnagar : 3 Km. from town, 1 ex., 10.xi.1964, R.N. Bhargava, Reg. No. GI 19.

14. *Catopsilia florella* (Fabricius)

Material examined : INDIA : RAJASTHAN : Jodhpur : Patodi House, 1 ex., 21.ix.1966, N.K. Parida, Reg. No. I 2392.

15. *Catopsilia pomona* (Fabricius)

Material examined : INDIA RAJASTHAN : Jodhpur Public Garden, 1 ex., 14.viii.1962, 1 ex., 20.ix.1963, Moti Lal, Reg. No. 3/421 & 1349.

ii. Family : NYMPHALIDAE

16. *Hypolimnas bolina* (Linnaeus)

Material examined : INDIA : GUJARAT : Dangs : Ahwa : 3 exs., 28.ix.1976, Y.P. Sinha, Reg. No. 5704/3. DADRA & NAGAR HAVELI : Dadra, 1 ex., 7.x.1976, Y.P. Sinha, Reg. No. 5832.

17. *Hypolimnas misippus* (Linnaeus)

Material examined : INDIA : RAJASTHAN : Jodhpur : Public Garden, 1 ex., 20.i.1963, Moti Lal, Reg. No. A/133; Mandore Garden, 1 ex., 8.xi.1963, 1 ex., dt. Nil, V.C. Agarwal, Reg. No. A/134 & A/282.

18. *Acraea violae* (Fabricius)

Material examined : INDIA : GUJARAT : Panchmahal : Godhra, 1 ex., 25.i.1975, T.G. Vazirani, Reg. No.3174/3. RAJASTHAN : Banswara : Phod (4 Km. from Banswara), 1 ex., 25.3.1964, R.N. Bhargava, Reg. No. I 1407.

19. *Cynthia cardui* (Linnaeus)

Material examined : INDIA : RAJASTHAN : Jodhpur : Phallodi, 1 ex., 25.iii.2001, G.S. Arora, Reg. No. R/106. DADRA & NAGAR HAVELI : Dadra : 1 ex., 7.ix.1976, Y.P. Sinha, Reg. No. 5827/3.

20. *Neptis hylas astola* Moore

Material examined : INDIA : GUJARAT : Dangs : Ahwa, 1 ex., 8.ii.1975, T.G. Vazirani, Reg. No. 3184/3, Saputara, 2 exs., 11.ii.1975, T.G. Vazirani, Reg. No. 3184/3.

21. *Atella phalantha* (Drury)

Material examined : INDIA : GUJARAT : Dangs Ahwa, 1 ex., 8.ii.1975, T.G. Vazirani, Reg. No. 3183/3. RAJASTHAN : Jodhpur : Mandore Garden, 1 ex., 22.vii.1966, P.D. Gupta, Reg. No. I 2367.

22. *Symphaedra nais* (Forster)

Material examined : INDIA GUJARAT : Dangs : Ahwa, 1 ex., 8.ii.1975, T.G. Vazirani, Reg. No. 3183/3.

23. *Precis almana* (Linnaeus)

Material examined : INDIA : GUJARAT : Palanpur : Umardasi Power Station, 1 ex., 10.x.1964, V.C. Agarwal, Reg. No. GI 3. DADRA & NAGAR HAVELI : Dadra : 6 exs., 7.ix.1976, Y.P. Sinha, Reg. No. 5827/3; 1 ex., 7.x.1976, Y.P. Sinha, Reg. No. 5834/3.

24. *Precis lemonias* (Linnaeus)

Material examined : INDIA : RAJASTHAN : Jodhpur : Patodi House, 1 ex., 12.ii.1964, V.C. Agarwal, Reg. No. A/191, 1 ex., 30.ix.1966, 4 exs., 3.x.1966, 1 ex., 26.x.1966, N.K. Parida, Reg. No. I 2408, I 2410 & I 2440; Public Garden, 5 exs., 16.viii.1962, 2 exs., 17.viii.1962, 1 ex., 20.ix.1963, Moti Lal, Reg. No. A/186, A/188 & A/189. GUJARAT : Dangs : Ahwa, 2 exs., 5.ii.1975, T.G. Vazirani, Reg. No. 3177/3; Malegaon, 1 ex., 11.ii.1975, T.G. Vazirani., Reg. No. 3176/3. DADRA & NAGAR HAVELI : Dadra : 1 ex., 9.ix.1976, Y.P. Sinha, Reg. No. 5827/3.

25. *Precis orithyia* (Linnaeus)

Material examined : INDIA : GUJARAT : Dangs : Ahwa, 1 ex., 8.ii.1975, T.G. Vazirani, Reg. No. 3185/3. Palanpur : Dantiwara (1 Km. West), 1 ex., 13.x.1964, V.C. Agarwal, Reg. No. 3379. RAJASTHAN : Jodhpur : Patodi House, 1 ex., 31.viii.1964, V.C. Agarwal, Reg. No. I 178, 3 exs., 17.viii.1963, R.S. Pillai, Reg. No. A/92, 6816; Public Garden, 1 ex., 20.ix.1963, 1 ex., 17.viii.1962, Moti Lal, Reg. No. A/193 & 3/423; Sangaria, Kuri village (14 Km. SW of Jodhpur), 1 ex., 29.x.1965, Moti Lal, Reg. No. A/194.

26. *Precis hierta* (Fabricius)

Material examined : INDIA : RAJASTHAN : Jodhpur : Public Garden, 2 exs., 20.ix.1963, Moti Lal, Reg. No. A/182, A/195; Patodi House, 1 ex., 3.viii.1963, R.S. Pillai, Reg. No. A/122,

1 ex., 12.ii.1964, V.C. Agarwal, Reg. No., 1952, 1 ex., 30.ix.1966, N.K. Parida, Reg. No., I 2408; Mandore Garden, 1 ex., 9.ix.1964, V.C. Agarwal, Reg. No. I 1749; Balsamand Garden, 1 ex., 5.ix.1962, R.C. Sharma, Reg. No. A/120; Sangaria : Kuri village (14 km. SW of Jodhpur), 1 ex., 29.x.1963, Moti Lal, Reg. No. A/184; Beriganga, 1 ex., 21.ix. 1963, Moti Lal, Reg. No. A/131.

iii. Family : PAPILIONIDAE

27. *Pachliopta aristolochiae* (Fabricius)

Material examined : INDIA : GUJARAT : 3 exs., dt. Nil, V.P. Sinha, Reg. No. Nil. Himmatnagar : (3 Km N), 1 ex., 6.xi.1964, R.N. Bhargava, Reg. No. GI 3660. RAJASTHAN : Jodhpur : Patodi House, 1 ex., 3.x.1966, N. K. Parida, Reg. No. I 2410; Sardarsamand, 1 ex., 26.xi.1963, Moti Lal, Reg. No. 1610; Bhopalgarh, 1 ex., 19.ix.2000, S.I. Kazmi, Reg. No. R/1.

28. *Papilio polytes romulus* Cramer

Material examined : INDIA : RAJASTHAN : Pali : 1 ex., 12.xi.1975, T G. Vazirani, Reg. No. 3814/3. Jodhpur : Patodi House, 1 ex., 27.ix.1966, N.K. Parida, Reg. No. I 2407; 1 ex., 30.ix.1966, N.K. Parida, Reg. No. I 2408. Jhunjhunu : Police Line, 1 ex., 6.xi. 1962, DRS/ZSI Survey Party, Reg. No. 5835/3. GUJARAT : Bharuch : Rajpipla, 1 ex., 31.i.1975, T.G. Vazirani, Reg. No. 3176/3.

29. *Papilio demoleus* Linnaeus

Material examined : INDIA : RAJASTHAN : Jodhpur : Patodi House, 1 ex., 29.xii.1962, Ramreet Singh, Reg. No. A/412; 1 ex., 19.x.1966, N.K. Parida, Reg. No. I 2435; 1 ex., 4.x.1966, N.K. Parida, Reg. No. I 2411; Mandore Garden, 1 ex., 8.xi.1963, Moti Lal, Reg. No. I 525; Paota, 28.viii.1961, Ramreet Singh, Reg. No. A/109, Public Garden, 1 ex., 14.viii.1962, Moti Lal, Reg. No. A/109; 1 ex., No details, Reg. No. A/398. Pali : Dujana, 1 ex., 12.viii.2000, M. Faisal, Reg. No. R/376. GUJARAT : Dangs : Ahwa, 1 ex., 5.ii.1975,. T.G. Vazirani, Reg. No. 3177/3.

30. *Pathysa nomius* (Esper)

Material examined : INDIA : RAJASTHAN : Jodhpur : Mandore Garden, 3 exs., 22.vii.1966, P.D. Gupta, Reg. No. I 2367.

iv. Family : DANAIDAE

31. *Danais chrysippus chrysippus* (Linnaeus)

Material examined : INDIA : RAJASTHAN : Jodhpur : 1 ex., 10.ix.1964, R.N. Bhargava, Reg. No. A/271; Sardarsamand, 1 ex., 26.iv.1963, 4 exs., 26.ix.1963, 12 exs., 26.xi.1963, 7 exs., 4.xii.1962, Moti Lal, Reg. No. A/387, A/115, A/127 & A/108; Filter House, 7 exs., 4.v.1963, Moti

Lal, Reg. No. A/108; Mandore Garden, 2 exs., 8.xi.1963, 1 ex., 11.ix.1963, 4 exs., 3.xii.1963, Moti Lal, Reg. No. A/126, A/131 & A/125, 1ex., 15.iv.1964, V.C. Agarwal, Reg.No., A/258, 2 exs., 24.iii.2001, S.I. Kazmi, Reg. No. R/104, R/105; Public Garden, 2 exs., 14.viii.1962, 1 ex., 16.viii.1962, 1 ex., 17.viii.1962, 3 exs., 20.ix.1963, Moti Lal, Reg. No. A/108 & A/128; Luni River (3 Km. SW of Jodhpur), 2 exs., 12.xi.1962, 2 exs., 12.xii.1962, Moti Lal, Reg. No. A/108; Paota, 1 ex., 8.i.1963, K.C. Kansal, Reg. No. A/108, 1ex., 31.viii.1963, R.S. Pilli, Reg. No. A/132, 1 ex., 29.viii.1964, B. Ram, Reg. No. A/257; 1 ex., 8.iv.1965, R.N. Bhargava, Reg. No. A/284; Patodi House, 1 ex., 24.iv.1964, 2 exs., 25.iv.1964, V.C. Agarwal, Reg. No. A/283, A/264 & A/265, 1 ex., 26.i.1966, 2 exs., 24.ix.1966, 1 ex., 30.ix.1966, 1 ex., 17.x.1966, 1 ex., 19.x.1966, N.K. Parida, Reg. No. A/270, A/266, A/269, A/265, A/285 & A/268; Beriganga, 4 exs., 21.ix.1963, Moti Lal, Reg. No. A/124; Lomia River (25 Km. SW of Jodhpur), 3 exs., 23.xi.1963, K.C. Kansal, Reg. No. A/129; Kuri village (20 Km. from Jodhpur), 7 exs., 25.iv.1964, V.C. Agarwal, Reg. No. I 1495 A/259, A/260, A/261, A/262, A/277 & A/280; Sangaria, Kuri village, 2 exs., 29.x.1963, Moti Lal, Reg. No. A/130; Ummaidnagar, 1 ex., 24.iii.1963, B. Ram, Reg. No. A/108; Agolai, 1 ex., 14.i.1964, V.C. Agarwal, Reg. No. A/275; 1 ex., 18.ix.1964, R.N. Bhargava, Reg. No. A/279. Pali : Hemawas, 1 ex., 12.xi.1975, T.G. Vazirani, Reg. No. 3814/3. Jhunjhunu : Police Lines, 1 ex., 6.xi.1962, around Rest House, 3 exs., 6.xi.1960, 5 exs., 6.xi.1962, DRS/ZSI Survey Party, Reg. No. A/108. Barmer : Naraina tank, Sarcha ki Dhani, 1 ex., 16.xii.1965, P.D. Gupta, Reg. No. A/263. Bhilwara : 1 km. SE, 3 exs., 28.iii.1964, R.N. Bhargava, Reg. No. A/276, A/278 & A/281. Dungarpur Surpuro ki nadi, 1 ex., 26.iii.1964, R.N. Bhargava, Reg. No. A/267. Ganganagar : Central State Farm, Suratgarh, 1 ex., 6.ix.2000, S.I. Kazmi, Reg. No. R/44. GUJARAT : Palanpur : 4 km. West, 2 exs., 12.x.1964 V.C. Agarwal, Reg. No. A/287 & A/288; Dantiwara, 2 exs., 13.x.1964, R.N. Bhargava, Reg. No. A/289 & A/291. Himmatnagar : 3 Km. N, 11 exs., 6.xi.1964, R.N. Bhargava, Reg. No. GI 366, A/290, A/388, A/389, A/374, A/375, A/376, A/370, A/371 & A/373. Patan : 10 Km. from town, 3 exs., 3.x.1964, R.N. Bhargava, Reg. No. A/372 A/368 & A/369. Bhuj : Near Khari River, 1 ex., 22.x.1964, V.C. Agarwal, Reg. No. A/390; Kukarma Tank, 1 ex., 25.x.1964, V.C. Agarwal, Reg. No. A/286; Amisar Tank, 1 ex., 19.x.1964, V.C. Agarwal, Reg. No. A/393. Bharuch : Rajpipla, 1 ex., 31.i.1975, T.G. Vazirani, Reg. No. 3176/3.

32. *Danais genutia* (Cramer)

Material examined : INDIA : RAJASTHAN : Jodhpur : Balsamand Garden, 1 ex., 5.ix.1962, K.C. Kansal, Reg. No. A/110.

33. *Tirumala limniaca leopardus* Butler

Material examined : INDIA : RAJASTHAN : Jodhpur : Patodi House, 1 ex., 17.viii.1963, R.S. Pillai, Reg. No. A/178. Sirohi : Abu bus stand (4 Km. East) S.E. Aravali range, 1 ex., 7.iii.1964, V.C. Agarwal, Reg. No. I 1234. GUJARAT : 1 ex., Y.P. Sinha, details not available.

34. *Euploea core core* (Cramer)

Material examined : INDIA : RAJASTHAN : Jodhpur : Mandore Garden, 5 exs., 8.xi.1963, Moti Lal, Reg. No. A/179, 1ex., 22.vii.1966, P.D. Gupta, Reg. No. I 2367. Pali : Dujana, 1 ex., 12.viii.2000, S.I. Kazmi, Reg. No. R/110. GUJARAT Dangs : Ahwa, 6 exs., 28.ix.1976, Y.P. Sinha, Reg. No. 5704/3; 2 exs., Y.P. Sinha, no details. DADRA & NAGAR HAVELI : Dadra : 2 exs., 7.ix.1976, Y.P. Sinha, Reg. No. 5827/3. Silvasa : 3 exs., 7.x.1976, Y.P. Sinha, Reg. No. 5827/3 & 5835/3.

v. Family : HESPERIIDAE

35. *Peliopidas mathias* Fabricius

Material examined : INDIA : RAJASTHAN : Barmer : Chotan, 1 ex., 14.viii.2000, S.I. Kazmi, Reg. No. R/375.

36. *Telicota augias* (Linnaeus)

Material examined : INDIA : GUJARAT : Dangs : Ahwa, 2 exs., 5.ii.1975, T.G. Vazirani, Reg. No. 3177/3.

vi. Family : SATYRIDAE

37. *Melanitis leda* (Drury)

Material examined : INDIA : RAJASTHAN : Pali : Dujana, 1 ex., 12.viii.2000, M. Faisal, Reg. No. R/109.

vii. Family : LYCAENIDAE

38. *Euchrysops cnejus* (Fabricius)

Material examined : INDIA : RAJASTHAN : Jodhpur : Patodi House, 8 exs., 20.ix.1966, 2 exs, 21.ix.1966, 6 exs., 23.ix.1966, 1 ex., 26.ix.1966, 1 ex., 30.ix.1966, 2 exs., 4.x.1966, 1 ex., 13.x.1966, 1 ex., 17.x.1966, 1 ex., 26.xi.1966, 3 exs., 14.xii.1966, N.K. Parida, Reg. No. I 2389, I 2392, I 240, I 2404, I 2408, I 2411, I 2410, I 2430, I 2480 & I 2499; Kakani village, 1 ex., 29.x.1963, K.C. Kansal, Reg. No. I 772; Muclia village, 1 ex., 8.xi.1966, R.N. Bhargava, Reg. No. I 2427; Sangaria : Kuri village (4 Km SW of Jodhpur), 1 ex., 29.x.1963, Moti Lal, Reg. No. 1489. Pali : Dujana, 1 ex., 12.viii.2000, M. Faisal, Reg. No. R/32.

39. *Tarucus extricatus* Butler

Material examined : INDIA : RAJASTHAN : Jodhpur : Bhopalgarh, 1 ex., 19.ix.2000, S.I. Kazmi, Reg. No. R/5.

DISCUSSION

In the DRS collection it has been found that thirty-nine lepidopteran species are distributed under twenty-five genera and seven families (Fig. 1). The family Pieridae is represented by highest number (15) of species, followed by Nymphalidae (11 spp.). However, both the families have same generic strength (7). In other words, both the families occupy twenty-eight percent of the total generic strength and the least one (4%) are occupied by Satyridae (Fig. 2). The families Danaidae and Papilionidae share the same generic strength (12%), followed by Hesperidae and Lycaenidae occupying eight percent each.

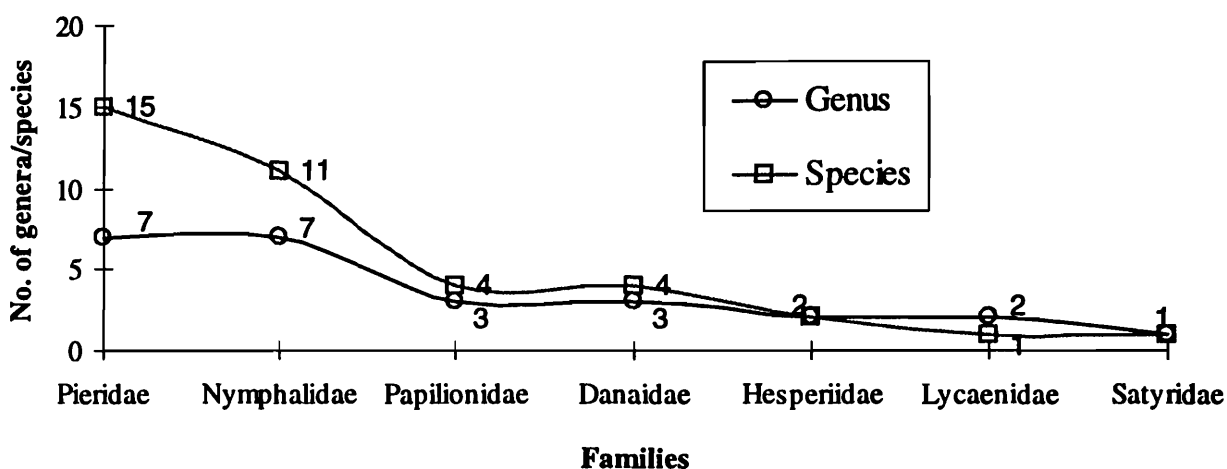


Fig. 1. : Number of genera/species distributed under each family.

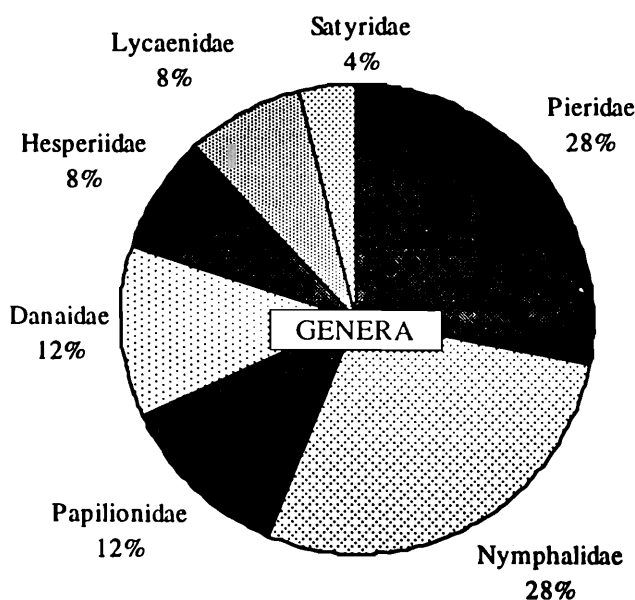


Fig. 2. : Percentage of genera under each family in DRS collection.

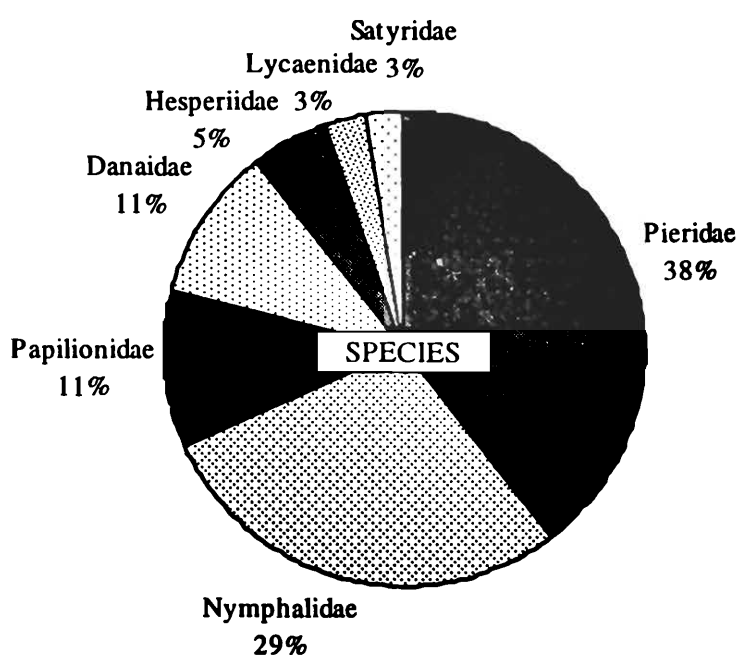


Fig. 3. : Percentage of species under each family in DRS collection.

Figure 3 concludes that Pieridae and Nymphalidae are represented by thirty-eight and twenty-nine percent of the total species strength respectively. The family Danaidae and Papilionidae

represents eleven percent each (*i.e.*, 4 species) of the total fauna. The position occupying the least number (1) of species is shared jointly by families Satyridae and Lycaenidae. Figs. 4–6 provide the district wise information on taxa collected from different districts of the study area. It is evident that out of the thirty-two districts of Rajasthan, only twelve districts are represented in our collection while the districts like Ajmer, Baran, Bharatpur, Bikaner, Bundi, Chittorgarh, Churu, Dholpur, Dausa, Hanumangarh, Jaisalmer, Jalore, Jhalawar, Karauli, Kota, Nagaur, Rajsamand, Sawai Madhopur, Sikar and Tonk are yet to be surveyed (Fig. 4). The district Jodhpur alone recorded the highest number of genera (16) and species (25). Though the district Pali has the same familial strength (5) as that of Jodhpur but the number of the genera (8) and the species (9) is lesser. Except these two districts, all other districts remain poorly surveyed.

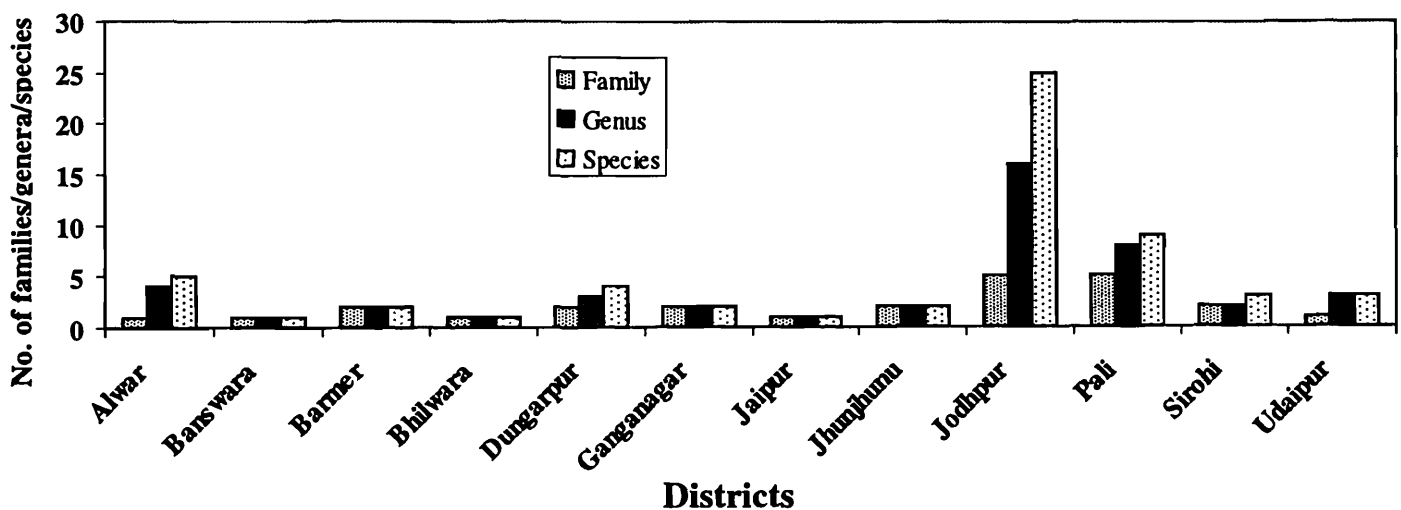


Fig. 4 : Number of families/genera/species recorded in different districts of Rajasthan.

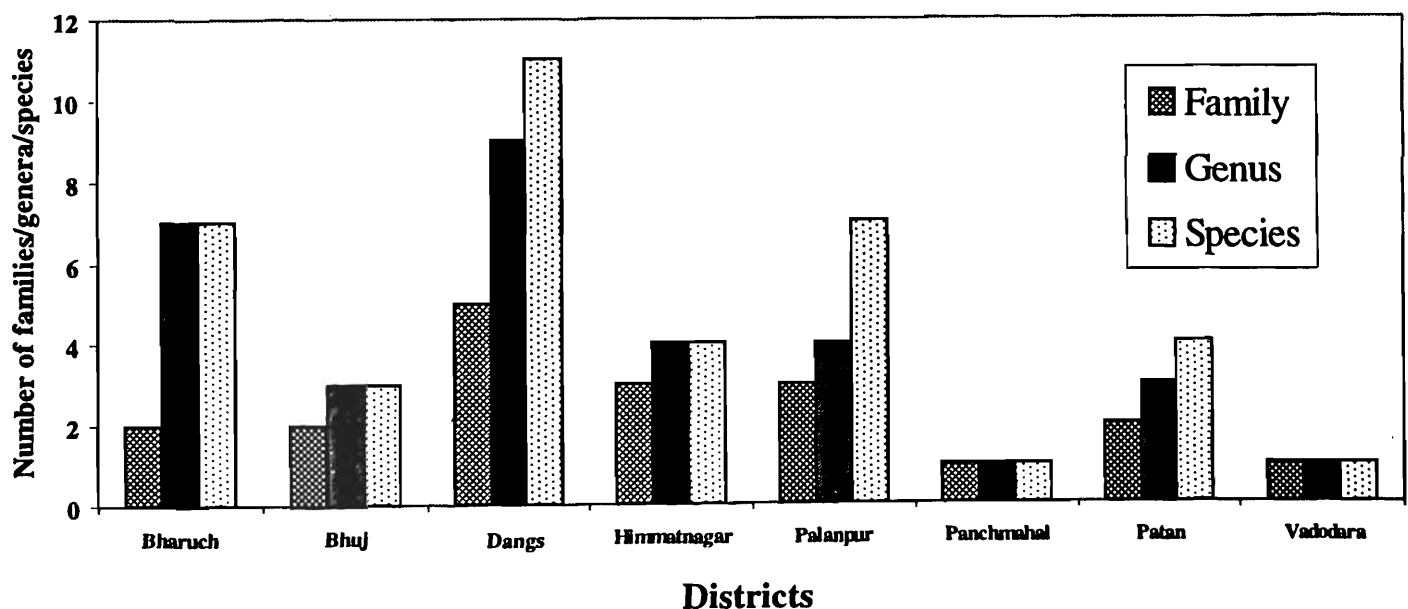


Fig. 5. : Number of families/genera/species recorded in different districts of Gujarat.

The information presented in fig. 5 points to the fact that the lepidopteran fauna of only eight districts of Gujarat are explored by the scientists of this station while there is a dearth of collection

from other seventeen districts. In our collection, Dangs district is well represented by eleven species. In Palanpur, seven species are distributed under four genera and three families while in Bharuch the same number of species are spread over seven genera and two families.

In the Union Territory of Dadra and Nagar Haveli only eight species belonging to seven genera under three families are known from Dadra and Silvassa (Fig. 6).

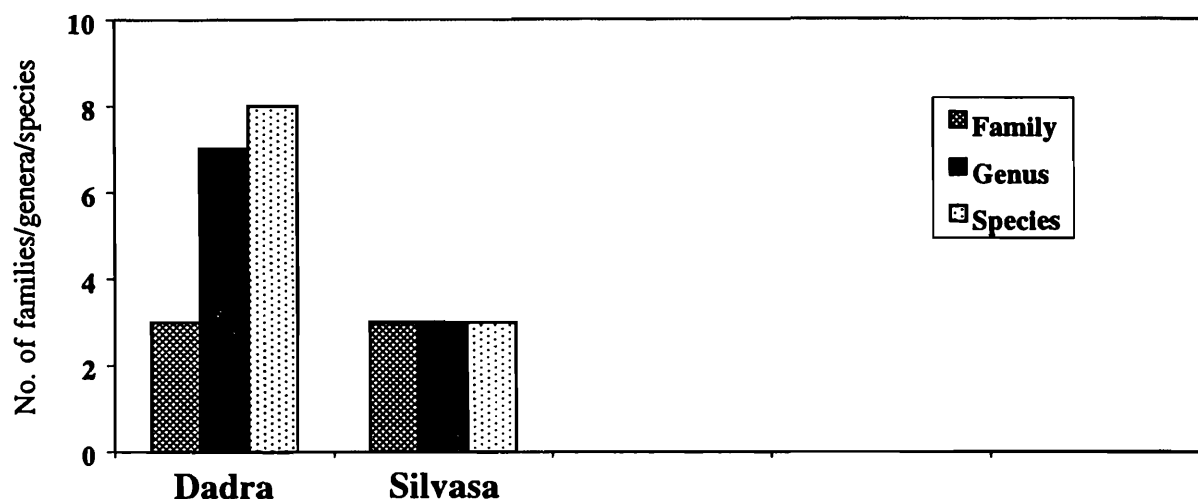


Fig. 6. : Number of families/genera/species recorded in different districts of Dadra and Nagar Haveli.

In our collection, three genera, viz., *Colotis*, *Catopsilia* and *Precis* are represented by four species each (Table 1). The genus *Eurema* holds the second highest position in having three species. There are three genera viz., *Papilio*, *Hypolimnas* and *Danais* which are represented by two species each, while the remaining eighteen genera (*Ixias*, *Delias*, *Cepora*, *Anaphaeis*, *Acraea*, *Cynthia*, *Neptis*, *Atella*, *Symphaedra*, *Pachliopta*, *Pathysa*, *Tirumala*, *Euploea*, *Peliopidas*, *Telicota*, *Melanitis*, *Euchrysops* and *Tarucus*) are represented by a single species each. It has been noted that the genus *Eurema* is most widely distributed genus occurring in fifteen districts, followed by *Danais* (12 districts), *Catopsilia* (10 districts) and *Precis* and *Euploea* (5 districts each).

Collection data shows that thirty-three species of Lepidoptera were found to be associated with seventy-five plant species (Table 2). Out of these, *Catopsilia pyranthe* and *C. florella* were collected from maximum number of plant hosts (8 species).

Two sub-species (*hecabe*, *simulata*) of *Eurema hecabe* were collected from seven plants. Eleven species apparently did not show any host-specificity (Table 2).

Varshney and Gupta (1996) correctly pointed out that no comprehensive studies on the lepidopteran fauna of Rajasthan, Gujarat and Dadra & Nagar Haveli have so far been made that really have any idea of the possible number of taxa inhabiting the area to give a comprehensive zoogeographic treatment. Hence, in absence of any adequate/ sufficient data on the lepidopteran fauna from the neighbouring states it is too early to establish the existence of dominant group of taxa. Although, the present study provides a complete list of the lepidopteran fauna in our collection but definitely it is the need of the moment to chalk out the strategies to collect more information

Table 1. : Occurrence of Lepidoptera taxa from Rajasthan, Gujarat and Dadra & Nagar Haveli represented in DRS collection.

TAXA					STATES & UNION TERRITORY																						
					RAJASTHAN											GUJARAT						DADRA & N. HAVELI					
Family	Genus	Species	Sub-species	Author	Jodhpur	Pali	Alwar	Jaipur	Dungarpur	Udaipur	Sirohi	Barmer	Bhilwara	Ganganagar	Banswara	Jhunjhunu	Bharuch	Himmatnagar	Bhuj	Vadodara	Patan	Palanpur	Dangs	Panchmahal	Dadar	Silvassa	
Pieridae	<i>Colotis</i>	<i>etridae</i>		(Boisduval)	+																						
	<i>Colotis</i>	<i>danae</i>		(Fabricius)	+												+										
	<i>Colotis</i>	<i>calais</i>	<i>amata</i>	(Fabricius)		+																					
	<i>Colotis</i>	<i>vestalis</i>		(Butler)	+																						
	<i>Ixias</i>	<i>marianne</i>		(Cramer)			+																				
	<i>Delias</i>	<i>eucharis</i>		(Drury)														+			+				+		
	<i>Eurema</i>	<i>laeta</i>		(Boisduval)	+	+	+	+	+	+	+								+			+	+	+			
	<i>Eurema</i>	<i>hecabe</i>	<i>hecabe</i>	(Linnaeus)											+							+	+				
	<i>Eurema</i>	<i>hecabe</i>	<i>simulata</i>	(Linnaeus)	+		+		+		+							+		+		+	+			+	
	<i>Cepora</i>	<i>nerissa</i>		(Fabricius)			+																	+			
	<i>Anaphaeis</i>	<i>aurota</i>	<i>aurota</i>	(Fabricius)	+		+		+	+								+									
	<i>Catopsilia</i>	<i>crocale</i>	<i>crocale</i>	(Cramer)	+						+							+		+						+	+
	<i>Catopsilia</i>	<i>pyranthe</i>		(Linnaeus)		+													+			+	+				
	<i>Catopsilia</i>	<i>flbrella</i>		(Fabricius)	+																						
<i>Catopsilia</i>	<i>pomona</i>		(Fabricius)	+																							
Nymphalidae	<i>Hypolimnas</i>	<i>bolina</i>		(Linnaeus)																			+		+	+	
	<i>Hypolimnas</i>	<i>misippus</i>		(Linnaeus)	+																						
	<i>Acraea</i>	<i>violae</i>		(Fabricius)											+										+		
	<i>Cynthia</i>	<i>cardui</i>		(Linnaeus)	+																					+	
	<i>Neptis</i>	<i>hylas</i>	<i>astola</i>	Moore																				+			

Table 1. : Cont'd.

TAXA					STATES & UNION TERRITORY																					
					RAJASTHAN											GUJARAT						DADRA & N. HAVELI				
Family	Genus	Species	Sub-species	Author	Jodhpur	Pali	Alwar	Jaipur	Dungarpur	Udaipur	Sirohi	Barmer	Bhilwara	Ganganagar	Banswara	Jhunjhunu	Bharuch	Himmatnagar	Bhuj	Vadodara	Patan	Palanpur	Dangs	Panchmahal	Dadar	Silvasa
	<i>Atella</i>	<i>phalantha</i>		(Drury)	+																		+			
	<i>Symphaedra</i>	<i>nais</i>		(Forster)																			+			
	<i>Precis</i>	<i>almana</i>		(Linnaeus)																		+			+	
	<i>Precis</i>	<i>lemonias</i>		(Linnaeus)	+																		+		+	
	<i>Precis</i>	<i>orithya</i>		(Linnaeus)	+																	+	+			
	<i>Precis</i>	<i>hierta</i>		(Fabricius)	+																					
Papilionidae	<i>Pachliopta</i>	<i>aristolochiae</i>		(Fabricius)	+													+								
	<i>Papilio</i>	<i>polytes</i>	<i>romulus</i>	Cramer	+	+										+	+									
	<i>Papilio</i>	<i>demoleus</i>		Linnaeus	+	+																	+			
	<i>Pathysa</i>	<i>nomius</i>		(Esper)	+																					
Danaidae	<i>Danais</i>	<i>chrysippus</i>	<i>chrysippus</i>	(Linnaeus)	+	+			+			+	+	+		+	+	+	+		+	+				
	<i>Danais</i>	<i>genutia</i>		(Cramer)	+																					
	<i>Tirumala</i>	<i>limniaca</i>	<i>leopardus</i>	Butler	+						+															
	<i>Euploea</i>	<i>core</i>	<i>core</i>	(Cramer)	+	+																	+		+	+
Hesperiidae	<i>Peliopidas</i>	<i>mathias</i>		Fabricius								+											+			
	<i>Telicota</i>	<i>augias</i>		(Linnaeus)																						
Satyridae	<i>Melanitis</i>	<i>leda</i>		(Drury)		+																				
Lycaenidae	<i>Euchrysops</i>	<i>cnejus</i>		(Fabricius)	+	+																				
	<i>Tarucus</i>	<i>extricatus</i>		Butler	+																					

on their distribution. The in-depth knowledge of the faunal richness, host-specificity, zoogeographical affinities and distribution of these Lepidoptera would certainly enrich our knowledge.

Table 2. : Lepidoptera fauna collected from different host plants.

Name of the species	Host plants
<i>Colotis etridae</i> (Boisduval)	<i>Cadaba indica</i>
<i>C. danae</i> (Fabricius)	<i>Cadaba indica</i> , <i>C. divaricata</i> , <i>Maerua arenaria</i> , <i>Capparis sepiaria</i> .
<i>C. calais amata</i> (Fabricius)	<i>Salvadora persica</i> , <i>S. oleoides</i> , <i>Azima tetracantha</i>
<i>C. vestalis</i> (Butler)	<i>Salvadora persica</i>
<i>Ixias mariane</i> (Cramer)	<i>Capparis sepiaria</i> , <i>C. divaricata</i> , <i>C. aphylla</i> , <i>C. grandis</i> .
<i>Delias eucharis</i> (Drury)	<i>Loranthus elasticus</i> , <i>L. scurrula</i> , <i>L. longiflorus</i> , <i>Xeromphis uliginosa</i>
<i>Eurema laeta</i> (Boisduval)	Host data not available
<i>E. hecabe hecabe</i> (Linnaeus)	<i>Cassia tora</i> , <i>C. fistula</i> , <i>Albizia</i> sp. <i>Wagatea spicata</i> , <i>Sesbania aculeata</i> , <i>Butea monosperma</i> , <i>Schleichera oleosa</i>
<i>E. hecabe simulata</i> (Linnaeus)	-Do-
<i>Cepora nerissa</i> (Fabricius)	<i>Capparis aphylla</i> , <i>C. heyneana</i>
<i>Catopsilia crocale crocale</i> (Cramer)	<i>Cassia fistula</i> , <i>C. tora</i> , <i>Butea monosperma</i> , <i>Brassica oleracea</i>
<i>C. pomona</i> (Fabricius)	-Do-
<i>C. pyranthe</i> (Linnaeus)	<i>Cassia tora</i> , <i>C. auriculata</i> , <i>Litsea chinensis</i> , <i>L. monopetala</i> , <i>L. glutinosa</i> , <i>Mallotus philippensis</i> , <i>Phoebe lanceolata</i> , <i>Triadica sebifera</i>
<i>C. florella</i> (Fabricius)	-Do-
<i>Hypolimnas bolina</i> (Linnaeus)	<i>Fleurya interrupta</i> , <i>Elatostemma cuneatum</i> , <i>Portulaca oleracea</i>
<i>Hypolimnas misippus</i> (Linnaeus)	<i>Portulaca oleracea</i> , <i>Abutilon</i> sp., <i>Hibiscus</i> sp.
<i>Acraea violae</i> (Fabricius)	Host data not available
<i>Cynthia cardui</i> (Linnaeus)	<i>Zornia diphylla</i> , <i>Blumea</i> sp.
<i>Neptis hylas astola</i> Moore	Moore <i>Cylista</i> sp., <i>Mucuna</i> sp., <i>Flemingia</i> sp., <i>Canavalia ensiformis</i>
<i>Atella phalantha</i> (Drury)	<i>Flacourtia ramontchi</i> , <i>E. montana</i> , <i>Smilax</i> sp., <i>Salix</i> sp.
<i>Symphaedra nais</i> (Forster)	<i>Sorea robusta</i> , <i>Diospyros melanoxylon</i> .

Table 2. : *Cont'd.*

Name of the species	Host plants
<i>Precis almana</i> (Linnaeus)	<i>Asteracantha longifolia</i> , <i>Hygrophila</i> sp., <i>Barleria</i> sp.
<i>P. lemonias</i> (Linnaeus)	<i>Asteracantha longifolia</i> , <i>Nelsonia campestris</i>
<i>P. orithyia</i> (Linnaeus)	<i>Justicia procumbens</i> , <i>J. micrantha</i> , <i>Ipomaea batatas</i>
<i>P. hierta</i> (Fabricius)	<i>Asteracantha longifolia</i> , <i>Barleria</i> sp.
<i>Pachliopta aristolochiae</i> (Fabricius)	<i>Aristolochia indica</i> , <i>Ziziphus mauritiana</i>
<i>Papilio polytes romulus</i> Cramer	<i>Citrus medica</i> , <i>Glycosmis pentaphylla</i> , <i>Zanthoxylum rhetsa</i>
<i>P. demoleus</i> Linnaeus	<i>Citrus</i> sp., <i>Glycosmis pentaphylla</i> , <i>Zanthoxylum rhetsa</i>
<i>Pathysa nomius</i> (Esper)	<i>Polyalthia longifolia</i> , <i>Saccopetalum tomentosum</i>
<i>Danais genutia</i> (Cramer)	<i>Calotropis</i> sp.
<i>D. chrysippus chrysippus</i> (Linnaeus)	<i>Calotropis procera</i> , <i>C. gigantea</i> , <i>Holarrhena antidysenterica</i>
<i>Tirumala limniaca leopardus</i> Butler	<i>Calotropis</i> sp., <i>Dregea volibilis</i>
<i>Euploea core core</i> (Cramer)	<i>Ficus bengalensis</i> , <i>F. indica</i> , <i>F. glomerata</i> , <i>F. religiosa</i> , <i>Nerium odorum</i> , <i>Cryptolepis elegans</i>
<i>Peliopidas mathias</i> Fabricius	Host data not available
<i>Telicota augias</i> (Linnaeus)	Host data not available
<i>Melanitis leda</i> (Drury)	Host data not available
<i>Euchrysops cnejus</i> (Fabricius)	<i>Butea monosperma</i> , <i>Acacia ougenia dalbergioides</i> , <i>Cylista scariosa</i> .
<i>Tarucus extricatus</i> Butler	<i>Zizyphus</i> sp.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. Qaiser H. Baqri, Additional Director, Desert Regional Station, Zoological Survey of India, Jodhpur, for providing necessary facilities to carry out this work. The authors are grateful to the Ministry of Environment and Forests, Govt. of India, New Delhi, for providing financial assistance of the research project entitled "Studies on Faunal Diversity in the Thar Desert of Rajasthan" Thanks are also due to Sri Vijay K. Bangariya and Sri Sanjay K. Das for their useful help in statistical analysis.

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