BUTTERFLIES ATTRACTED TO LIGHT IN GUJARAT STATE, INDIA

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During the southwest monsoon (mid-June through October, 1963) the writer has collected over four thousand insects at lights. The great majority of these insects (Heterocera) were collected at a 400-watt mercury-vapor lamp located in the Gujarat State Transport bus compound at Ahwa, headquarters of the Dangs District. The fluorescent lights placed on the walls of the transport office building also provide excellent collecting places. Likewise the petromax lights (pressure lamps) used in the mission bungalow attract many insects.

Ahwa is located on a plateau (alt. 1700 ft.) and is surrounded by teak and bamboo jungle. The average annual rainfall is eighty inches. In this pan-tropical area there are many species of moths, butterflies and other insects attracted to light. This paper, however, will deal only with the butterflies attracted to light during the monson season and with a few scattered records throughout the year.

There are no electric lights in the town of Ahwa. Only on the dark nights (nights without moonlight) are the kerosene street lamps lighted. Even then very few insects are to be found at these lesser lights, for the powerful mercury-vapor light provides a greater attraction. This lamp is mounted near the top of a twenty-five foot steel pole, so that the whole bus compound and even nearby areas are lighted by its powerful rays.

In 1963 the writer has taken seventeen species of Rhopalocera at light in India, as follows:

SATYRIDAE

1. *Mycalesis perseus* (Fabricius). Oct. 19, 1963, Ahwa, the dry season form was taken at 10:00 p.m. at the fluorescent light in the transport office building (see No. 11, in photo).

2. *Mycalesis mineus* (Linnaeus). Sept. 30, 1963, Ahwa, 10:30 p.m. at the mercury-vapor lamp in the bus compound (see No. 7, in photo); another was taken on Aug. 20, 1963, Ahwa, 9:45 p.m. at the fluorescent light in the transport building (see No. 8, underside, in photo); both of these are wet season forms. The dry season form was taken on Oct. 19, 1963, Ahwa, at 9:45 p.m. below the flourescent light (See no. 9, underside in photo; the ocelli are reduced to white specks).

3. *Ypthima baldus* Fabricius. Sept. 29, 1963, Ahwa, 10:15 p.m. at the mercury-vapor lamp, the only record of this species at light (see no. 10, underside, in photo).

4. *Melanitis leda* (Drury). First record of the wet season form

"determinata" at the mercury light was at 9:45 p.m. on July 26, 1963, I have many subsequent records of this form throughout the 1963 monsoon season. The dry season form "ismene" was first taken on Oct. 24, 1963, 9:30 p.m. at the mercury-vapor lamp (See No. 2 in photo), another on Nov. 6, 1963 at 9:30 p.m. at the same light, and again on Nov. 12, 1963 two were collected by the petromax lamp in the mission bungalow, Ahwa, at 6:30 p.m. and at 9:15 p.m. Both forms frequently appear at the mercury-vapor lamp and at the fluorescent lights; however, the wet season form seems to be more common at light, occasionally appearing in great numbers, twenty or thirty at one time.

5. *Lethe rohria nilgiriensis* Guérin. Oct. 30, 1963, Ahwa, one ♂ was taken at 8:15 p.m. at the fluorescent light in the transport building (see No. 19 in photo).

NYMPHALIDAE

6. *Euthalia garuda* (Moore). Oct. 19, 1963, Ahwa, 10:15 p.m., one ♀ was taken at the fluorescent light in the transport building (see No. 1 in photo); on Nov. 9, 1963 a ♂ was caught at a petromax light at 7:15 p.m. in the mission bungalow.

7. *Precis hierta hierta* (Fabricius). Feb. 17, 1963, 9:00 p.m., one ♀ was taken at a petromax lamp in the mission bungalow, the only record of this species at light (see No. 16 in photo).

8. *Vanessa cardui* (Linnaeus). Sept. 25, 1963, Ahwa, 9:30 p.m. at fluorescent light in the transport building, the only record at light (see No. 18 in photo).

9. *Ergolis merione merione* (Cramer). Oct. 18, 1963, Ahwa, 9:15 p.m. at fluorescent light in transport building, the only record at light (see No. 14 in photo).

LYCAENIDAE

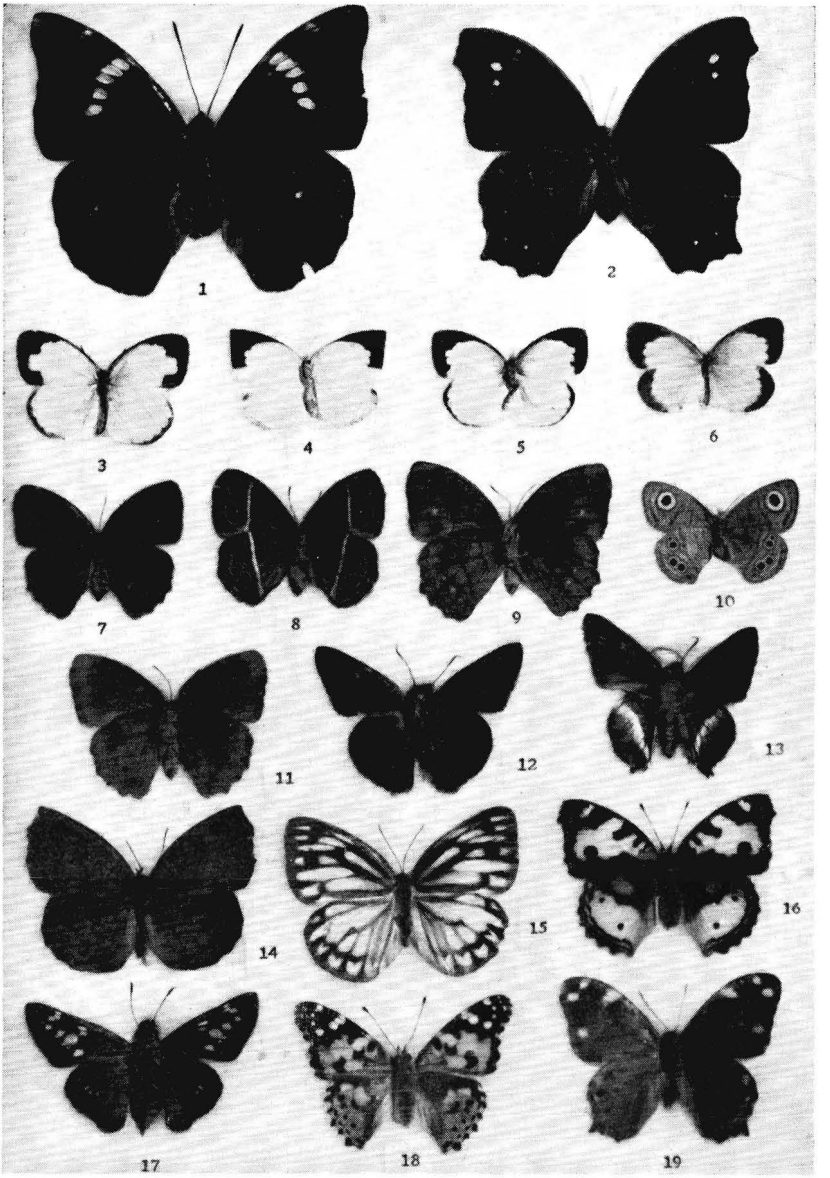
10. *Zizeeria lysimon* Hübner. Nov. 11, 1963, Ahwa, a ♂ was captured at 8:30 p.m. at the fluorescent light in the transport building, the only record at light.

PIERIDAE

11 *Huphina nerissa* (Fabricius). Sept. 28, 1963, Ahwa, 8:30 p.m., a ♀ was taken at the fluorescent light in the transport building, the only record at light (see No. 15 in photo).

12. *Eurema brigitta* (Cramer). Sept. 16, 1963,Ahwa, 10:15 p.m., one was taken at the mercury-vapor lamp (see No. 6 in photo); another was captured on Oct. 25, 1963 at 9:30 p.m. at the fluorescent light in the bus transport building.

13. *Eurema hecobe* (Linnaeus). July 11, 1963, Ahwa, 10:15 p.m., one was taken at the mercury-vapor lamp (see No. 3 in photo); this species has been taken many times at the mercury lamp and at the



BUTTERFLIES ATTRACTED TO LIGHT IN INDIA: 1. *Euthalia garuda* ♀. 2. *Melanitis leda* d. s. f. *"ismene"*. 3. *Eurema hecabe*. 4. *E. laeta* d. s. f. 5. *E. laeta* w. s. f. "venata". 6. *E. brigitta*. 7. *Mycalesis mineus* w. s. f., upperside. 8. *M. mineus* w. s. f., underside. 9. *M. mineus* d. s. f., underside. 10. *Ypthima baldus*, underside. 11. *Mycalesis perseus* d. s. f., underside. 12. *Hasora chromus*, ♂ upperside. 13. *H. chromus*, ♂ underside. 14. *Ergolis merione merione*. 15. *Huphina nerissa* ♀. 16. *Precis hierta hierta* ♀. 17. *Pelopidas conjuncta*. 18. *Vanessa cardui*. 19. *Lethe rohria nilgiriensis* ♂.

fluorescent lights during the monsoon months.

14. *Eurema laeta* Boisduval. Aug. 1, 1963, Ahwa, 9:45 p.m., one wet season form "venata" was taken at the mercury-vapor light (see No. 5 in photo), on Oct. 24, 1963, 10:15 p.m., the dry season form "laeta" was taken at the fluorescent light in the transport building (see No. 4 in photo).

15. *Catopsilia crocale* (Cramer). Oct. 27, 1963, Ahwa, 9:10 p.m., a badly faded ♀ was captured at the fluorescent light in the transport building.

HESPERIIDAE

16. *Hasora chromus* (Cramer). Aug. 16, 1963, Ahwa, 8:00 p.m., a ♂ was taken at the mercury-vapor lamp in the bus compound (see No. 12, in photo); another was captured on Sept. 16, 1963 at 6:55 p.m. while flying around a petromax light in the mission bungalow (see No. 13, in photo).

17. *Pelopidas conjuncta* Hewitson. Sept. 20, 1963, Ahwa, 9:30 p.m., one was taken at the fluorescent light in the transport building, the only record at light (see No. 17 in photo).

OBSERVATIONS AND SUMMARY

The literature on the butterflies of India records only a few species as crepuscular or as nocturnal. Like Donahue (1962), the present writer has found *Melanitis leda* to be the most common single species at light. The wet season form "determinata" has been taken on sixty nights at light and the dry season form "ismene" many times. Some of the satyrids are somewhat crepuscular, especially *Mycalesis mineus* and *M. perseus*, the former having been taken at light more than a dozen times and the latter on several occasions. Several species of the genus *Eurema* (Pieridae) fly at dusk. *Eurema hecabe* probably should be listed as a crepuscular species. The writer has twenty records of *hecabe* at the mercury-vapor lamp and at the fluorescent lights. Likewise *Eurema laeta* and *E. brigitta* are somewhat crepuscular and occasionally found at light. Of the Hesperiidae, *Hasora chromus* was frequently observed at the mercury-vapor lamp during the 1961 southwest monsoon season Shull, 1963). In 1963, however, it has been taken at light on two occasions only. Large numbers of the skippers are crepuscular in their habits, so it may not be surprising to find a few skippers attracted to light; however, *Matapa aria* (Moore) (Hesperiidae) flies at dusk feeding on *Lantana* nectar just outside the writer's office door, but it has never been attracted to the petromax light burning only twenty-five feet away. Likewise *Abisara echerius* (Stoll) (Erycinidae) frequently flies at dusk, even flying around on the veranda just outside the office, but it too shows no attraction to the light. Thus it would be wise to avoid the conclusion

that crepuscular species are more likely to be attracted to light than are the day-flying species. Further, the writer has collected four nymphalids, five pierids and one lycaenid at light – all of these normally considered to be diurnal in their habits; however, as pointed out earlier, a few species of *Eurema* (Pieridae) show crepuscular tendencies. The evidence thus far shows more diurnal species being attracted to light than the so-called crepuscular species.

The writer has never taken *Papilio demoleus, Precis orithya, Danaus chrysippus, Gangara thyrsis* and *Talicada nyseus* at light – species reported at light in India by other writers – but these records also support the theory that more diurnal species are attracted to light than are the crepuscular species. But, as Mr. Donahue has so well stated in this *Journal of the Lepidopterists' Society*, "Further observations and experimentation will undoubtedly aid in the interpretation of this interesting phenomenon" (Vol. 16: p. 135).

Since only certain species of moths are attracted to light and many others seem to have no attraction to light, it does not seem unreasonable to conclude that a few species of butterflies also may be attracted to light. The occurrence of so many species at light – and occasionally by the score – can scarcely always be due to some accidental disturbance of the butterflies when at rest.

In conclusion, it should be noted that at least twenty-two species of butterflies, representing seven of the major families, have been collected at light in India. The writer has collected seventeen species of butterflies at light in India representing five major families.

References

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CORRECTIONS

On p.227 and 228 respectively, of vol. 13, no. 4, of the *Journal, Precis lavinia coenia* should be ascribed to Hübner and *Kricogonia lyside* to Godart. I am indebted to Mr. Cyril F. dos Passos for calling my attention to these errors. On p. 73 vol. 15, no. 1, of the *Journal*, the last sentence, second paragraph should read "overwinter in the larval stage".

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