

OVERWINTERING OF MONARCH BUTTERFLIES AS A BREEDING COLONY IN SOUTHWESTERN ARIZONA

RICHARD S. FUNK
3025 Del Mar Ave., Yuma, Ariz.

According to Urquhart (1960), monarch butterflies, *Danaus plexippus* (Linnaeus), are known to overwinter in the United States "either as free-flying, non-roosting individuals . . . or as roosting colonies." These individuals apparently do not breed, nor are eggs deposited by previously mated females; rather, they are awaiting the return of warm spring weather to trigger their northward migration, during which the females may begin oviposition.

It was with some interest, therefore, that I found 48 larvae and six pupae of *D. plexippus* on 26 December 1965 at Yuma, Yuma Co., Arizona. Three fresh adults were also caught at this time. The locality was revisited at various intervals, and counts were made of each developmental stage present except ova. These counts were: 4 January 1966, 34 larvae, 11 pupae, 0 adults; 16 January 1966, 14 larvae, 31 pupae, and 9 fresh adults; 22 January 1966, 23 larvae, 28 pupae, and 6 fresh adults; 18 February 1966, 21 larvae, 32 pupae, and 7 fresh adults; 27 February 1966, 8 larvae, 30 pupae, and 11 fresh adults; and 6 March 1966, 0 larvae, 27 pupae, and 7 fresh adults. Adults when caught were marked with India ink to determine whether they would remain in the area, but none were recaptured on later dates.

During this same time period (26 December–6 March), adults could be seen flying about the Yuma area on warm days, but I was unable to determine whether any of these were also propagating. Females in the observation area were seen to oviposit on the foodplants on 16 January and 18 and 27 February. Copulation was not observed. A number of larvae were reared in captivity, none of which were parasitized. A dozen larvae and two pairs of adults (emerged 29 and 30 December, 9 and 14 January) from this colony are in my collection, as is a somewhat worn female caught 30 December at Yuma.

Temperature conditions at Yuma would seem to be favorable to the development of monarchs during the winter months. Urquhart (1960) states that some individuals from an overwintering colony become active at temperatures above 60° F., and that above 70° F. the entire colony becomes active. Table I shows the temperatures for Yuma during the period December 1965–March 1966, inclusive (source: U. S.

TABLE I. DAILY TEMPERATURE DATA FOR YUMA, ARIZONA, FOR DECEMBER 1965-MARCH 1966, IN DEGREES FARENHEIT, RANGE (AVERAGE).

	Maxima	Minima	Averages
December	49-79 (64.0)	35-58 (44.8)	47-65 (54.4)
January	54-73 (63.7)	32-53 (40.6)	45-60 (52.2)
February	55-78 (68.0)	33-54 (42.0)	47-63 (55.0)
March	61-98 (80.8)	35-57 (49.9)	48-77 (65.4)

Dept. of Commerce, Environmental Science Services Administration records.) Freezing temperatures (32° F.) were recorded only on 23 and 24 January.

The foodplant being utilized by the monarchs at Yuma during the observation period has been identified as *Asclepias tuberosa* L. by the Herbarium of the University of Arizona, Tucson. This plant is not native to the Yuma Desert; Kearney and Peebles (1960) give the range of *A. tuberosa* in Arizona as "Apache County to Coconino County, south to Cochise, Santa Cruz, and Pima counties, 4,000 to 8,000 feet, mostly in . . . pine forests . . ." Yuma is at an elevation of less than 150 feet above sea level. The *A. tuberosa* plants were growing in a garden. It would be interesting to learn whether monarchs can or do utilize species of *Asclepias* native to the Yuma region as foodplants during the winter. Kearney and Peebles record *A. albicans* Wats., *A. subulata* Decne. [foodplant of *Danaus gilippus strigosus* (Bates)], and *A. erosa* Torr. from Yuma County, but I cannot say whether *Danaus plexippus* could feed on any of them during the winter.

ACKNOWLEDGMENTS

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LITERATURE CITED

- KEARNEY, THOMAS H. and ROBERT H. PEEBLES, 1960. Arizona Flora, 2nd. ed. Univ. California Press, Berkeley and Los Angeles, 1085 pp.
URQUHART, F. A., 1960. The Monarch Butterfly. Univ. Toronto Press, 361 pp.

ANNOUNCEMENT OF 1968 ANNUAL MEETING

The Nineteenth Annual Meeting of the Lepidopterists' Society will be held June 15-18 in Washington, D. C., at the Museum of Natural History. The program will include registration and open house on June 15, a field trip on June 16, and presentation of papers, with a concluding banquet, June 17-18. A discussion of polymorphism will highlight the program, and invitational addresses will be presented by H. B. D. Kettlewell and H. E. Hinton, of England.