

only half of the floor of the rearing carton with the diet, leaving the other half clear for cocoon formation. In other cases, e.g., *Spodoptera latifascia* and *Estigmene acrea*, the mature larvae burrowed into the diet media for pupation. In time, the diet hardened and trapped the insect. For rearing such species, a special rearing carton must be prepared for mature caterpillars, half plated with diet and the other half containing soil for burrowing and pupating.

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"MUD PUDDLE CLUBS" IN PURE *COLIAS EURYTHEME* (PIERIDAE) IN NORTH CENTRAL CALIFORNIA

Clark (1932, Butterflies of the District of Columbia, pp. 154-155) and Clark & Clark (1951, Butterflies of Virginia, pp. 109-110) chronicled the invasion and establishment of the Orange Sulphur, *Colias eurytheme* Bdv., in the northeastern United States almost 50 years ago. They first suggested that "mud puddle" behavior originated in that species through introgressive hybridization with *C. philodice* Latr. Puddling by summer males of *C. eurytheme* was not observed for about ten years after that species invaded the Washington, D.C. area. Puddling is still much less common in *C. eurytheme* than in *C. philodice* in the northeast.

One of the few areas in North America where genetically pure *C. eurytheme* populations still exist is the Central Valley of California. The nearest *C. philodice* are east of the Sierran divide, north of Mount Shasta, or in the irrigated alfalfa-growing areas of southeastern California and Arizona (Emmel & Emmel 1973, Butterflies of Southern California, pp. 18-19). Even so, yellow individuals do turn up rarely in these populations. They were first noted by Hovanitz (1944, Genetics 29: 1-30) and do not seem to have increased in frequency in some 35 years, and their origin remains unexplained.

Although *C. eurytheme* often achieves extremely high densities in the Central Valley, I have been unable to find records of mud puddle aggregations and had never observed them myself until 26 May 1978. On that date 81 males were counted in four aggregations in a drying drainage ditch in Rancho Cordova, Sacramento Co., elevation about 10 m. The aggregations were found between 1455 and 1538 h along 2 km of ditch; all were in direct sunshine. They consisted of: (i) 10 *C. eurytheme*, 1 *Pieris rapae* L., 3 *Everes comyntas* Godart; (ii) 23 *C. eurytheme*, 1 *E. comyntas*; (iii) 38 *C. eurytheme*; (iv) 10 *C. eurytheme*, 1 *P. rapae*. All individuals were fresh males. Where more than one species was involved, each formed a compact group separate from the others. At another location about 3 km away a single male *P. rapae* was seen on a puddle about 1100. Mid-afternoon weather conditions were scattered to broken cirrus cloud; air temperature 24-27°C, relative humidity 30%; wind SW, ca. 15 km/h.

Nearby annual grassland, occupied by vast stands of a weedy annual *Vicia* (Leguminosae), was the scene of large-scale emergence of *C. eurytheme*. Virtually all of several hundred animals seen were fresh males. Many soft-winged individuals could be found, especially in the morning. A copulating pair, the female teneral, was found 150 m from the ditch at 1525.

Nectar sources were superabundant (blooming *Vicia*, *Brassica*, and *Centaurea*) and showed no sign of saturation despite the great numbers of butterflies flying. The sample of male *eurytheme* I collected from the puddles contained only large, deep orange, typical "summer" phenotypes. The water content of the vegetation was still high but beginning to decrease markedly, and the weather had been cooler than normal for a week. I have no hypothesis to account for the prevalence of puddling at this site on this date, but it does imply that the capacity to form such aggregations does exist in pure *C. eurytheme*.

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LEPIDOPTERA FROM BOLUSES OF NESTLING CATTLE EGRETS IN EASTERN MISSOURI

The relatively recent immigration and rapid range expansion of the Cattle Egret (*Bubulcus ibis* (L.)) in North America (Crosby 1972, *Bird-banding* 43: 205-212) has elicited several studies on the feeding behavior and diet of this bird in the United States (e.g., Hanebrink & Denton 1969, *Arkansas Acad. Sci. Proc.* 23: 74-79; Fogarty & Hetrick 1973, *Auk* 90: 268-380; Jenni 1973, *Auk* 90: 821-826). The studies that have been published to date in the U.S.A. mainly provide only the family names of the arthropod prey species, and their only consensus relative to arthropods is that they are a major item in the diet of nestling Cattle Egrets. It seems logical to anticipate that more precise determinations of the arthropod species could help ornithologists designate certain of the prey species as indicators of portions of the adult Cattle Egret's foraging habitat and thereby more accurately interpret the bird's overall ecology and behavior.

As part of a preliminary study of the diet of nestling Cattle Egrets, Dr. Jean W. Graber, Illinois Natural History Survey, collected regurgitated boluses from a heronry containing ca. 300 active Cattle Egret nests on Billings Island in the Mississippi River, Scott Co., Missouri, on 30 June and 6 July 1975. Approximately 20 boluses were collected on each sampling date. They were preserved in 70 percent ethyl alcohol and subsequently examined by me for lepidopterous prey.

The two sets of boluses contained 45 caterpillars and 2 moths representing 9 species and 4 families (Table 1). The caterpillars in the boluses were in remarkably good condition thereby facilitating identification of most species. All except two of the caterpillars, *Leucania* sp. and the single pyralid, are known to be common in field crops in the midwestern part of the U.S.A. In fact, the species complex suggests that the caterpillars were captured by adult Cattle Egrets in a legume-grass habitat such as an alfalfa (*Medicago sativa* L.) or soybean (*Glycine max* (L.) Merr.) field. The geometrid moth, *Haematopsis grataria* Fabricius, frequently may be encountered in short, mixed herbaceous habitats, e.g., weedy pastures and crop borders (pers. obs.).

Plathypena scabra (Fabricius) primarily feeds on legumes (Pedigo, et al. 1973, *J. Econ. Ent.* 66: 665-673) as do the only two species of *Colias* that occur in eastern Missouri (see Klots 1960, *A Field Guide to the Butterflies of North America East of the Great Plains*. Houghton Mifflin Co., Boston. 349 + xvi p.). The low numbers of *Pseudaletia unipuncta* (Haworth) and *Leucania* sp., which are both grass-feeding caterpillars (Godfrey 1972, *U.S.D.A. Tech. Bull.* 1450, 265 pp.) suggests a limited amount of grass cover in the areas foraged by the adult Cattle Egrets on the dates sampled.