

DISTRIBUTION AND BIOLOGY OF A PLEISTOCENE RELICT:  
*OCHLODES YUMA* (HESPERIIDAE)JAMES A. SCOTT<sup>1</sup>, OAKLEY SHIELDS<sup>2</sup>, AND SCOTT L. ELLIS<sup>3</sup>

The purpose of this paper is to summarize our knowledge of the distribution, life history and behavior of *Ochlodes yuma* (Edwards), a little-known western United States skipper.

**Larval foodplant.** *Phragmites communis* Trin., the Common Reed, is a large (ca. 2 m), cosmopolitan, perennial grass forming canelike thickets in wet places, with a wind-dispersed fruit and spreading rhizome (Mason, 1957; Polunin, 1960, p. 98). It occurs in Europe, Asia, Africa, the Americas, and Australia but is absent from many islands (Ridley, 1923). It may be the most widely distributed flowering plant in the world (Polunin, 1960, p. 98; Sculthorpe, 1967, p. 366). In western United States it occurs along watercourses, irrigation canals, freshwater springs, and alkaline or even sulphurous seeps.

C. Don MacNeill, J. M. Burns, and J. F. and T. C. Emmel raised *O. yuma* larvae on *P. communis* leaves in the Central Valley of California (Arnaud, 1960; Emmel & Emmel, 1973). J. Scott observed oviposition on leaves at the base of the plant in San Juan Co., Utah. J. F. Emmel and C. Sekerman found ova and larval shelters with leaf edges fastened together to form a tube at Surprise Canyon, Inyo County, California. J. F. Emmel found many last instar larvae in larval shelters at Mesquite Spring, Inyo Co., Calif. *O. yuma* is extraordinarily restricted to *P. communis*; it is almost always found in or within a few meters of stands of *P. communis*. We know of only one record away from *P. communis*, a male from Home-wood Canyon, Inyo Co., California, 0.5 mile from *P. communis*.

Habitats with *O. yuma* have only one thing in common: the presence *P. communis*. In the Central Valley of California colonies occur along estuaries, sloughs, and canals. Colonies occur along the Colorado and other rivers in the Great Basin. In desert parts of the Great Basin, colonies are to be found at springs, on alkaline salt-encrusted flats with sufficient subsurface water to support *Phragmites*, and in semi-irrigated streamside marshes. One colony (near Mina, Mineral Co., Nevada) was at a sulphurous spring, and another (Surprise Canyon, Inyo Co., California) was at a seep with *Phragmites* on a hillside. Agricultural activity seems to have increased the habitat for *O. yuma* along the Colorado River drainage in Colorado.

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TABLE 1. Distribution records. Dates are given only for those records not included in Fig. 2.

ARIZONA. *Coconino Co.*: Little Colorado River at Cameron, 4100', K. Roever, and Tilden, 1957; 1 mi. W of Tuba City, 4500', K. Roever; Indian Gardens, Grand Canyon, Tilden, 1957; *Pima Co.*: Tucson, Tilden, 1957 (this record may be dubious, as Mr. Kilian Roever has not found it there).

CALIFORNIA. *Calaveras Co.*: Sand Flats, Tilden, 1957; *Contra Costa Co.*: Antioch, F. H. Chermock, J. Scott, and Tilden, 1957; Bethel Island, J. Scott; Jersey Island, N. La Due; *Inyo Co.*: near Aberdeen, 12 mi. N of Independence, 3840', S. L. Ellis and S. A. Johnson; Antelope Spring, J. S. Buckett; Darwin Falls, J. W. Tilden, L. M. Martin, S. S. Nicolay, R. Holland; Hank Lubkin Ranch, Cartago, C. Henne; Homewood Canyon, Argus Range, 3600–4000', J. F. Emmel & O. Shields; Hunter Canyon, Saline Valley, Los Angeles County Museum; 4 mi. NE of Independence just W Owens River, S. L. Ellis & S. A. Johnson; 2 mi. N Lone Pine, J. S. Buckett; Limekiln Spring, 4000', Surprise Canyon, Panamint Range, J. F. Emmel & O. Shields; Lone Pine Ranger Station road, 5 mi. W Lone Pine, 6500', S. L. Ellis & S. A. Johnson; Mesquite Spring Campground, J. F. Emmel; Olancha, Comstock, 1927; 1 mi. N of Shoshone on Hwy. 127, 1630', J. F. Emmel & O. Shields; Deep Springs, Tilden, 1957; Whitney Portal nr. Lone Pine, S. L. Ellis; Haiwee, Tilden, 1957; Owens Lake, Tilden, 1957; Wyman Creek Canyon, White Mts., 6000', J. F. Emmel & O. Shields; *Mono Co.*: Farrington Camp, Tilden, 1957; Mammoth Camp, Tilden, 1957; *Sacramento Co.*: Bannon Island, F. H. Chermock; South Stone Lake, A. M. Shapiro; Beach Lake, A. M. Shapiro; Jackson Slough Road, Brannan Island, J. Scott; Sherman Island, C. D. Ferris, W. Howe, R. Davis; Twitchel Island, N. La Due; Elkhorn Slough, C. D. Ferris; *San Bernardino Co.*: Topock Marsh, 15 mi. SSE Needles, 500', K. Roever; *San Joaquin Co.*: Bishop Tract, J. Scott; Empire Tract, J. Scott; *Solano Co.*: Suisun Slough, A. M. Shapiro; *Stanislaus Co.*: Modesto, Tilden, 1957.

COLORADO. *Delta Co.*: Austin, 5000', S. L. Ellis; Columbine Ranch Rd., 3 mi. SW Hotchkiss, 5750', S. L. Ellis; Federal Fish Hatchery, SE of Lazear, N. Fk. Gunnison River, 5300', S. L. Ellis; Leroux Creek, #4 Ditch takeout, 5700', S. L. Ellis; *Mesa Co.*: 1 mi. NE jct. I-70 & Hwy. 65, J. Scott; 5 mi. S Debeque, between Debeque & Cameo, Colorado River, J. Scott; Unaweep Canyon nr. Gateway, 6300', S. L. Ellis, J. Scott; *Moffat Co.*: Echo Park, Dinosaur National Mon., 5300', J. F. Emmel, O. Shields, S. L. Ellis; *Montrose Co.*: Hwy. 90, 10 road mi. NE Naturita, S. L. Ellis & O. Shields; W. Paradox Creek, nr. Paradox, 5400', S. L. Ellis, S. A. Johnson; *Rio Blanco Co.*: White River, cotypes of *scudderii*.

NEVADA. *Clark Co.*: Cold Creek, Spring Mts., 6200', A. Austin; Corn Creek, J. F. Leser; Corn Creek Station, Desert Big Game Refuge Hdq., 3000', K. Roever, O. Shields, P. Herlan; Moapa, 1600', K. Roever; Logandale, P. Herlan, J. F. Leser; Overton, P. Herlan; Rogers Spring, 8 & 12 mi. S of Overton, P. Herlan; Stewart Springs, ca. 1 mi. W of Overton arm of Lake Mead, P. Herlan; Tule Springs, ca. 10 mi. N of Las Vegas city limits, A. Austin, K. Roever; Whitney Mesa, J. F. Leser; *Elko Co.*: 2.1 mi. S of Bear Creek Summit (August), P. Herlan; *Esmeralda Co.*: Lida Summit, P. Herlan; *Lander Co.*: Humboldt River NE of Battle Mtn. (August 5), J. Scott; *Lincoln Co.*: 2 mi. N of Caliente, J. F. Emmel & O. Shields; *Mineral Co.*: at the mouth of Cottonwood Canyon, 5.5 mi. SW of Hawthorne, P. Herlan; 4 mi. S of Mina, K. Roever; Whiskey Flats on the Pole Line Rd. 15 mi. S of Hawthorne, P. Herlan; *Nye Co.*: Beatty, J. Scott; 5 mi. N of Beatty, 3500', K. Roever; 5.8 mi. NE of Currant, J. Scott.

UTAH. *Emery Co.*: San Rafael River, jct. I-70, J. Scott; *Garfield Co.*: Calf Creek, 12 mi. S of Boulder, K. Roever; 1 mi. W Henrieville, K. Roever; *Grand Co.*: 12.5 mi. NE jct. Hwy. 128 & Castleton road, Hwy. 128, 3800', S. L. Ellis, O. Shields; *Kane Co.*: N of Glendale, J. F. Emmel & O. Shields; 2 mi. S of Kanab, 4800', K. Roever;

TABLE 1. (Continued)

*San Juan Co.*: NE jct. Hwy. 160 & Hatch Wash, J. Scott; *Utah Co.*: Green River at Split Mtn., C. J. & B. V. Durden; nr. Jensen P. O., O. A. Paterson (figured by Holland, 1931, plate 53), in Carnegie Museum; Merkle Park, R. E. Stanford; *Washington Co.*: ca. 1 road mi. E of Park Headquarters on Hwy. 15, Zion Nat. Park, along Clear Creek, 4500', J. F. Emmel & O. Shields.

**Distribution.** Tilden (1957) presented some records. We now know that *O. yuma* occurs in central California, Nevada, Utah, western Colorado, and northern Arizona (Table 1 & Fig. 1).

We have found no geographic variation, and treat *Ochloides scudderi* Skinner as a synonym of *O. yuma*. There is some individual variation in the width of the dorsal forewing dark border, and in size. Types and type

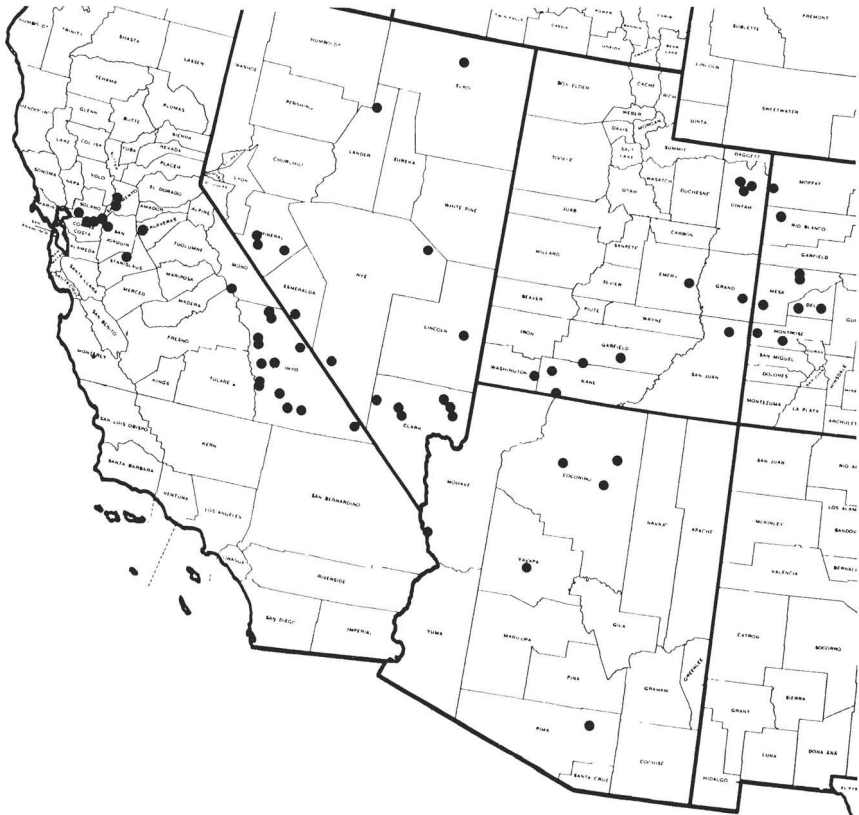


Fig. 1. Distribution records of *O. yuma* in western U.S.

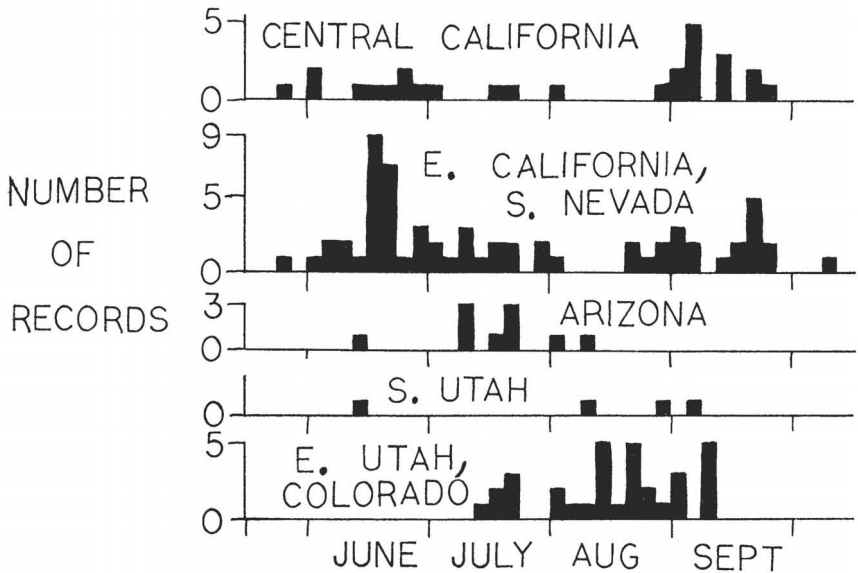


Fig. 2. Histograms of daily collection records (ignoring numbers seen or collected), grouped into four-day intervals, from late May-early October.

localities of *yuma* (Inyo Co., Calif.) and *scudderii* (Rio Blanco Co., Colorado) were treated by Tilden (1961) and Brown (1957).

Colonies usually are very isolated from each other. Like *Speyeria nokomis nokomis* (Edwards), another western United States butterfly found at isolated springs, the current colonies seem to be relicts of a formerly widespread Pleistocene distribution. All of the records we have are within the drainage basin of the Colorado River during the Pleistocene, except the records from the Central Valley of California, where it may have been introduced from the Great Basin during this century. It has only recently been discovered to occur in the Central Valley (Tilden, 1957).

Colonies are often very small; in several cases the area of plants was only about  $30 \times 10$  m, and at Mesquite Spring, Inyo Co., California, the isolated *Phragmites* patch was only  $1 \times 5$  m in size. Most of the colonies in the Great Basin are many miles from other *Phragmites* patches. The persistence of these isolated colonies is amazing; it has been thousands of years since wetter Pleistocene conditions may have permitted more extensive populations to exist.

**Time of emergence.** There are two broods in California and southern Nevada (Fig. 2). In the eastern part of the range there is only one brood

(Fig. 2); in Colorado peak numbers along the Colorado River are several weeks later than at sites farther from the river. Records are too few from southern Utah and Arizona to determine the number of broods. Males slightly precede females in emergence by a few days as in most butterflies.

**Behavior.** *O. yuma* is a perching species (Scott, 1974), defined as a mate-locating strategy in which males rest at characteristic sites and investigate passing objects in search of females that fly to these sites to mate. *O. yuma* males rest usually on *P. communis* leaves 1–2 m above ground, in a low spot among the *P. communis* or, when the plants grow on a river bank, on leaves or sometimes boulders on the bank side of the plants. Males sometimes patrol among the plants. Males investigate passing objects, usually other males, then usually rest in the vicinity of their previous resting site. Males show perching behavior at all times of day. We found a copulating pair in Moffat Co., Colorado, at 1340 (24-hr. standard time).

Adults have been observed feeding on flowers of yellow *Chrysothamnus nauseosus* (Pursh) Britton, *Grindelia* sp., and *Helianthus* sp., reddish purple *Polygonum pennsylvanicum*, *Cirsium* sp., and *Asclepias* sp., rose-purple *Arctium minus* Schk., and bluish *Aster* sp.

**Parasites.** A tachinid larval parasite from Contra Costa Co., California was identified as *Spathidexia dunningi* (Coquillett) (Arnaud, 1960).

#### ACKNOWLEDGMENTS

We thank A. T. Austin, F. H. Chermock (now deceased), C. J. Durden, C. D. Ferris, J. F. Emmel, C. Henne, P. J. Herlan, N. La Due, S. S. Nicolay, K. Roever, and R. Stanford for distribution records.

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#### BIZARRE CAPTURE OF A BUTTERFLY BY AN AMBUSH BUG

Pyle (1973, J. Lepid. Soc. 27: 305-307) reported the communal feeding of ambush bugs (Hemiptera: Phymatidae: *Phymata* sp.) upon a single adult silver bordered fritillary, *Boloria selene* Denis & Schiffermüller (Nymphalidae). He stated that due to the small size of the ambush bugs relative to the butterfly that the "means of actual capture. . . baffled me." Personal observation of a similar situation has revealed a possible mode of capture.

On 11 November 1968 at the Brackenridge Field Laboratory of the University of Texas at Austin (within Austin), I observed the capture of a dogface butterfly, *Colias (Zerene) cesonia* Stoll (Pieridae), by an ambush bug, *Phymata fasciata* (Gray), on an inflorescence of cowpen daisy, *Verbesina encelioides* Cav. (Gray) (Compositae). *C. cesonia* is common in this area at this season and frequently visits inflorescences of *V. encelioides* for nectar. One particular butterfly was observed to visit several inflorescences in rapid sequence (very little time is spent at a single inflorescence). Upon approaching one inflorescence, the butterfly quickly dipped down to the plant but did not rise immediately to fly to another. Instead, a rapid beating of the wings ensued with the body of the butterfly remaining stationary. Shortly, the butterfly ceased movement but later began beating its wings again.

Investigation of the inflorescence revealed that the butterfly was being held by its proboscis which was caught fast in one of the foretibia of the bug. This impasse (butterfly unable to escape, bug unable to consume a meal) continued for at least fifteen minutes, after which time observations ceased. Possibly the bug could have maneuvered its beak into position to pierce the body of the butterfly. Great strength and elasticity of the proboscis as illustrated by *C. cesonia* would indicate that the proboscis probably would not break (permitting freedom but in a mutilated condition). Body length of the bug was about 10 mm while that of *C. cesonia* averages about 23 mm.

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