

faunal work, the publication of these data concerning *C. rubi* specimens from Fiji has seemed advisable.

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ECOLOGICAL OBSERVATIONS ON *APODEMIA PHYCODOIDES* BARNES & BENJAMIN (RIODINIDAE)

In their paper on the rediscovery of *Apodemia phyciodoides* Barnes & Benjamin, Holland and Forbes (1981, *J. Lepid. Soc.* 35:226-232) indicated that the ecological associations of *phyciodoides* were imperfectly known and required further study. In late July 1984, I was joined by three other members of the Arizona Entomological Society on a trip to southeastern Sonora, Mexico. This trip was part of an on-going study of the Lepidoptera of Sonora by several members of the Arizona group. Observations made during this trip on *phyciodoides* may further clarify its habitat preferences and relationships with other riodinids.

Our group consisted of Jim Brock, John Palting, Steve Prchal and myself. The eight day collecting trip was spent along Highway 16, southeast of Hermosillo, terminating at Yecora, near the Chihuahua state line. The collecting area covered was primarily in the Sierra Madre Occidental and its outer foothills and was about 125 airmiles south of the area collected by Holland and Forbes. Four biotic communities (or life zones) were sampled, from San Jose de Pimas to Yecora. Using terminology from Brown (ed., 1982, *Desert plants* 4:1-342, *Biotic communities of the American southwest—United States and Mexico*), these communities were: Sinaloan Thornscrub, Sinaloan Deciduous Forest, Madrean Evergreen Woodland, and Petran Montane Conifer Forest. *A. phyciodoides* was found to be relatively common along the dirt road between Santa Rosa and Yecora, from four to 10 miles east of Santa Rosa. All of these sites fall in the Madrean evergreen woodland community, a *Quercus-Juniperus-Pinus* habitat. The lowest collecting site, four miles east of Santa Rosa, is near the transition into the Sinaloan deciduous forest, which is indicated by a *Ficus-Ceiba-Celtis* habitat. The upper collecting site, 10 miles east of Santa Rosa, is near the plateau region of the Petran montane conifer forest, dominated by *Pinus* species. The *Quercus* dominated habitat in which *phyciodoides* was found consisted of a rugged canyon-ridge (barranca) geography. Despite fairly extensive collecting, *phyciodoides* was not observed in either of the two adjoining biotic communities. Other "indicator" butterfly species that were most prevalent in the Madrean evergreen woodland were: *Thessalia theona* ssp. (Menetries), *Thessalia cyneas* (Godman & Salvin), an unknown *Piruna* species, and *Cyllopsis pyracmon nabokovi* L. Miller. The presence of *phyciodoides* and *cyneas* together, both of which previously were found in the Chiricahua Mountains of Arizona and both of which have not been found there recently, is intriguing.

On 29 July 1984, while travelling up toward Yecora, both sexes of *phyciodoides* were observed in mid-afternoon at wet places along the dirt road. On 30 July, Brock and I hiked about four miles down the road in late morning, starting from the upper collecting site. The entire length of the hike was in the *Quercus* woodland habitat. Males of *phyciodoides* were observed patrolling along, and landing in, the dirt road. Both sexes were also observed at moisture and nectar. A total of about 25 specimens were collected in the two days. Extensive collecting in the Sinaloan deciduous forest (one to three miles east of Santa Rosa) on 29 July yielded no specimens of *phyciodoides*. The conifer forest

plateau above the *Quercus* zone was also sampled without any observations of *phyciodoides*. The results of this sampling would indicate that the species is associated with the *Quercus* dominated Madrean evergreen woodland biotic community. According to Brown (1982, *ibid.*), this community also dominates much of the region collected by Holland and Forbes, as well as the Chiricahua Mts. of Cochise Co., Arizona—the type locality for *phyciodoides*.

Holland and Forbes also expressed interest in the relationship between *phyciodoides* and other riordinids, especially *Apodemia palmeri* (Edwards) and *A. hepburni* (Godman & Salvin). While our limited observations cannot answer the questions in this subject, they may provide a better understanding of the Riordinidae associations by biotic community. In addition, a potential pattern becomes apparent in the associations between *phyciodoides*, *palmeri*, and *hepburni*.

No riordinid species were observed in the sampling of the Petran montane conifer forest. Within the Madrean evergreen woodland, we found *phyciodoides*, *Apodemia hypoglauca* (Godman & Salvin), *Emesis ares* (Edwards), *Baeotis zonata* (Felder), *Lasaia maria* Clench, and *Calephelis arizonensis* McAlpine. Only *phyciodoides* and *arizonensis* were common in this area, the other species were represented by less than half a dozen specimens each. In the Sinaloan deciduous forest, and lower into its transition with the Sinaloan thornscrub (16 miles east of Tecoripa to three miles east of Santa Rosa), six species were recorded: *hepburni*, *hypoglauca*, *arizonensis*, *maria*, *Emesis poeas*, and *zonata*. In this zone, only *maria* and *hepburni* were common. *A. hypoglauca* was not observed here on the late July 1984 trip but was taken on 26 August 1984 by Doug Mullins within the same zone (near Tepoca, highway 16). A stop along the river at San Jose de Pimas in the lower Sinaloan thornscrub (transitioning to Sonoran desert-scrub) resulted in three different species: *palmeri*, *Apodemia mormo mejicanus* (Behr), and *Calephelis nemesis* (Edwards). *A. palmeri* was common while the other species were present in lower numbers.

In summation, these observations do not answer the problems presented by Holland and Forbes, but they do provide further clarification of the biotic associations of *phyciodoides* and its relationship with *palmeri* and *hepburni*. In southeastern Sonora, *phyciodoides* appears to be closely associated with the *Quercus* dominated Madrean evergreen woodland, a habitat which dominates middle and upper mountain regions into southeastern Arizona. Categorizing riordinid species by biotic community in this region gives the perception that the three *Apodemia* species mentioned above are each associated with different habitats, and perhaps "replace" each other as the biotic communities are transversed.

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POPULATION OUTBREAK OF PANDORA MOTHS (*COLORADIA PANDORA* BLAKE) IN THE MAMMOTH LAKES AREA, CALIFORNIA

Pandora moths (*Coloradia pandora* Blake), which are fairly widespread over the northern pine forests of the west, periodically exhibit an unusual increase in population as described by Brown (1984, *J. Lepid. Soc.* 38(1):65) and Ferguson (1971, *Moths of America north of Mexico*, Fasc. 20.2a, E. W. Classey Ltd., London). During a field trip in 1982, shortly after the described outbreak of adults on the Kiabab Plateau of Arizona, such an outbreak was witnessed in the Mammoth Lakes area (el. 7000 ft.) of California. On the