

satisfactory, for example, cyanide or boiling water. With regard to ethyl acetate and other organic solvents, one must consider the possibility of solubilizing effects on certain plastics used in the apparatus. Properly processed larvae tend in general to retain their color well, with the exception, in my limited experience, of some greens and a few reds.

Concerning the equipment, first there are the desiccators. I now use exclusively the Nalgene vacuum chamber with neoprene gasket. It is made of transparent polycarbonate and may be ordered with gasket and plastic top. It stands about 25 cm high, and the recommended freezer holds two with ease. A further blessing is that they need not (in fact *must* not) be greased. If one is careful to keep the contact surfaces free of dust, dirt and ice crystals, these desiccators will hold the vacuum very well. A further advantage is that the plastic will not break and splinter to the dangerous proportion of a glass vessel in case of an implosion.

As for pumps, valves and manometers as well as all the fittings, I have recently been in touch with a company whose catalogue offers such equipment of commendable quality at good prices. For example, I have been told by two refrigeration experts that the pump I now use is rated at a vacuum of 0.1 micron, but will not pull down in practice to better than 25 microns/Hg, which is still adequate for the purpose. To understand the need for a high vacuum efficiency in the process, one must realize that 1 micron equals approximately 1/25,400 in. Hg, and remember that any pressure above 1-200 microns in the system renders the vacuum operation meaningless.

Some companies also supply high vacuum line valves, copper tubing, "O" type disconnect fittings, and for the permanent joints, a method of soldering requiring only the heat from a small propane torch. Such a method of fixing the permanent joints, of course, eliminates the task of flaring, a job extremely difficult to accomplish successfully where there are numerous joints in close proximity to one another.

Practical suggestions as to specific companies have been published recently in the *News*.

My warm thanks to Dr. Hermann A. Flaschka, who has taken time to edit and correct the original manuscript with humor as well as detail, and to Dr. Theodore D. Sargent, who has performed further needed surgery.

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THE DISTRIBUTION AND LARVAL FOODPLANT RELATIONSHIPS OF *SATURNIA WALTERORUM* (SATURNIIDAE)

Saturnia walterorum Hogue & Johnson is perhaps the rarest saturniid in the United States, occurring locally in southern California. There are relatively few field data available for this moth. Fewer than 30 specimens have been collected and most specimens in collections have been reared from eggs secured from captured females. Sala & Hogue (1958, *Lepid. News* 12: 17-25) described the life history of *S. walterorum* reared under laboratory conditions. It is the purpose of this paper to present new information on flight period, distribution, and larval host records. A future publication will examine the taxonomic relationship between *S. walterorum* and *S. mendocino* Behrens.

Saturnia walterorum is known only from 4 coastal counties in southern California: San Luis Obispo, Los Angeles, Orange, and San Diego. One specimen in the Los Angeles County Museum of Natural History is labeled "Cajon Valley." This label may refer either to El Cajon Valley in San Diego County or Cajon Pass in San Bernardino County. Suitable habitats seem to exist in at least 4 additional

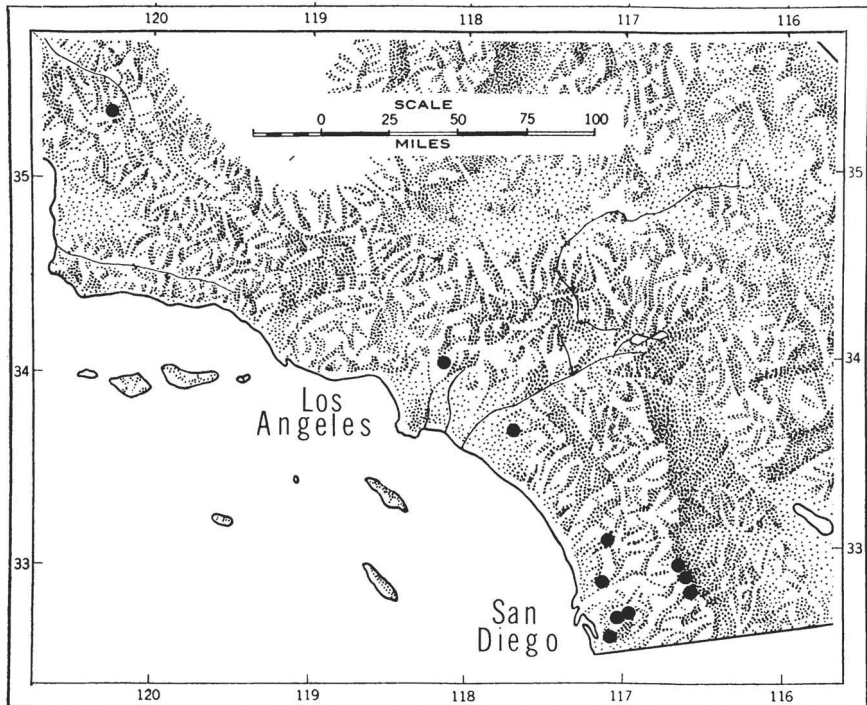


Fig. 1. Known distribution of *Saturnia walterorum* in southern California.

counties in southern California and portions of Baja California, but no available records indicate that it has been sighted or collected other than in the previously mentioned counties. The moth has been collected at elevations varying from 100 to 5500 ft. on both the coastal and high desert slopes of the mountains in southern California (Fig. 1). The flight period at lower elevations begins in late February and extends into mid-April, while at higher elevations specimens have been collected between April and mid-May. Individuals are on the wing only on warm sunny days from 0930 to 1530 hrs.

The larval hostplant of *S. walterorum* has been in question for some time. Field observations indicate that larvae, pupae, and oviposition have occurred only on plants of the families Anacardaceae and Ericaceae. It is interesting to note that plants of the family Ericaceae serve as the host for *S. mendocino*, a species which occurs to the north of, and is thought to be allopatric to, *S. walterorum*.

Two species of Anacardaceae are known to serve as natural larval hosts; these are *Rhus laurina* Nuttall and *R. integrifolia* Bentham & Hooker. Both species of *Rhus* inhabit dry chaparral slopes below 3000 ft. On two occasions females were observed ovipositing on *R. integrifolia* by the author, and empty cocoons have been found in association with this shrub (Sala & Hogue, op. cit.). Larvae have also been collected on *R. laurina* in San Diego by R. Hatch (pers. comm.).

At higher elevations it appears that members of the family Ericaceae serve as larval hosts. One larva has been collected on an unidentified species of *Arctostaphylos* in the San Gabriel Mountains (Sala & Hogue, op. cit.). Adults have been observed in association with various species of *Arctostaphylos* in the Santa

Monica, and San Gabriel Mountains by C. Henne (pers. comm.) and in the Laguna Mountains by R. Breedlove (pers. comm.).

The larvae of *S. walterorum* exhibit two distinct color phases; one green, and the other reddish-orange. The bark of *Arctostaphylos* and areas of new growth on both species of *Rhus* are characteristically red in color. Therefore, each color phase of the larvae may blend into different portions of its environment. This adaption may make them less conspicuous to natural enemies while on the hostplant. Larvae of both color phases emerged from the ova of one female in a ratio of 1:1.

The cocoon, which is brown and coarsely constructed, appears similar to the dried inflorescences of *Rhus*. This similarity may be advantageous, for reared larvae usually pupate at the terminal ends of branches among dried flowers or at the base of the plant, thus concealing the pupation site.

I would like to thank the following individuals for allowing me to examine their records and specimens: Christopher Henne of Pearblossom; Fred Thorne of El Cajon; Dave and Jean Roldness of San Diego; James Tilden of San Jose; Eric Walters of Anaheim; and Charles Hogue and Julian Donahue of the Los Angeles County Museum of Natural History.

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AN UNUSUALLY LONG PUPAL STAGE OF *BATTUS POLYDAMAS POLYDAMAS* L. (PAPILIONIDAE)

For a number of years my sons and I have been breeding butterflies found in El Salvador. Among them we have reared from egg to adult, several times, groups of *Battus polydamas polydamas* L. The full process has taken an average of 40 days, pupation alone from ten to eighteen days. According to Young (1971, Ann. Entomol. Soc. Amer. 60: 595-599), in Costa Rica the total development for this species averages 41.32 days, ranging from 36 to 46 days, with pupation ranging from 14 to 16 days.

On 14 June 1972 we saw a female lay seven eggs, which were collected and put in a transparent plastic bag. On the 20th, the eggs hatched. The larvae were fed with fresh leaves of the foodplant, *Aristolochia anguicida* L., until pupation, which occurred between 8 and 10 July. Only five larvae had survived out of the seven. On 17 July, the first adult, a male, emerged, that is 9 days after pupation, which is a little shorter than usual. The next adult, another male, emerged on 19 July, 11 days after pupation, being this time closer to average.

With the remaining three individuals, pupation time was completely unexpected. The third adult, a male again, emerged on 27 October; the fourth, another male, on 7 December; and the fifth, a female, on 25 January 1973! The pupal stage in these three cases was 110, 150 and 199 days respectively. All of these adults were absolutely normal and healthy.

We emphasize the fact that this species is gregarious during the early stages, and that the seven larvae were kept in the same bag, and therefore under the same conditions of food, light and temperature. When pupation occurred, the pupae were placed in the same pupation box, and again they were exposed to the same environmental conditions until the first two adults emerged. At that time one of the pupae was given to Mr. Steve R. Steinhäuser, who lives in the neighboring town of Santa Tecla, some 13 km. from San Salvador, at a slightly higher altitude. This pupa was the one that lasted 199 days. The other two were in the same box at all times.