Table 2. – Comparative Life Data on Three Pairs of Adult *Trypeta angustigena* Foote Held in Small Cages.

Female No.	1	2	3
Preoviposition period, days	15[a]	6	8
Oviposition period, days	31	14	7
Total eggs laid	227	146	54
Longevity of females, days	50	20	15
Longevity of males, days[b]	23	31	76

[a] Without a male for 8 days; after male present, eggs laid in 7 days.
[b] Males transferred from cages no. 2 and 3 as needed, so that female no. 1 was never without a male.

each with a damp filter paper on the bottom for humidity and a clear plastic lid on which a thin film of honey and yeast hydrolysate mixture was smeared for food. The flies were held at 16 hr light per 24-hr day and at 24°C for 12 hr and 12.75°C for 12 hr. Pairs of leaves were presented every 2 or 3 days for selection as ovipositional sites. The stems were in small vials which were inserted through holes in opposite sides of the cartons so that the leaves were horizontal and adjacent to each other. A leaf from a plant attacked in the garden was included with each change (so as not to stop oviposition) together with a leaf from a plant not attacked out of doors.

A total of 13 species of plants was exposed to gravid females. Six of the leaves were accepted for oviposition and 7 were not (Table 1). The only discrepancy with results previously obtained in the garden was the rejection of *Cacalia suaveolens* under caged conditions in mid-August. However, *Cacalia* was not a preferred host out of doors, where it was slightly attacked in late April and early July.

Larval Inoculation into Leaves. – Larvae, newly hatched from eggs in the leaves used for oviposition, were removed and placed into slits made in the midrib or a larger vein in the leaves of each of 22 plant species. The inoculated leaves were held at the conditions described under Oviposition.

The leaves of 7 plants supported complete larval development (Table 1). If a leaf deteriorated, a fresh leaf was presented and the larvae were able to enter it and continue feeding. Six of these plants were selected for oviposition in the garden, with complete larval development following. *Adenostyles* was not chosen for oviposition, either out of doors or in cages, but was readily accepted by the larvae inoculated into it.

These plants supported larval development into the second instar but the larvae were unable to establish themselves in fresh leaves when the original leaves deteriorated. Two of these 3 were marginal hosts in the garden, while *Senecio vulgaris* was not selected for oviposition either in cages or out of doors.

Larvae could not sustain themselves in leaves of the remaining 12 plants. Of these, *Petasites* and *Senecio mikanioides* were acceptable in the garden. It was observed that *S. mikanioides* leaves are thick and succulent and several larvae drowned either in the slits or after making short mines.

Notes on the Biology

In small cages, the life cycle averaged about 2 months under the conditions previously described. The preoviposition period averaged 7 days (Table 2). The egg stage averaged 6, or 7$\pm$1, days. Each of the three larval instars averaged 6$\pm$2 days while feeding on preferred host plants. The pupal stage required an average of 27$\pm$4 days. There appeared to be 5 generations per year in the laboratory garden. In 1970 the periods of greatest leaf mining activity were March, May and early June, July and early August, September, and late December and January.

Mating was not seen in nature, but it was observed 9 times in cages. The act was prolonged and lasted from 3-¾ to 7-½ hr. Females were observed *in copulo* at ages varying from 4 to 49 days, and the males were 3 to 27 days old when observed mating.

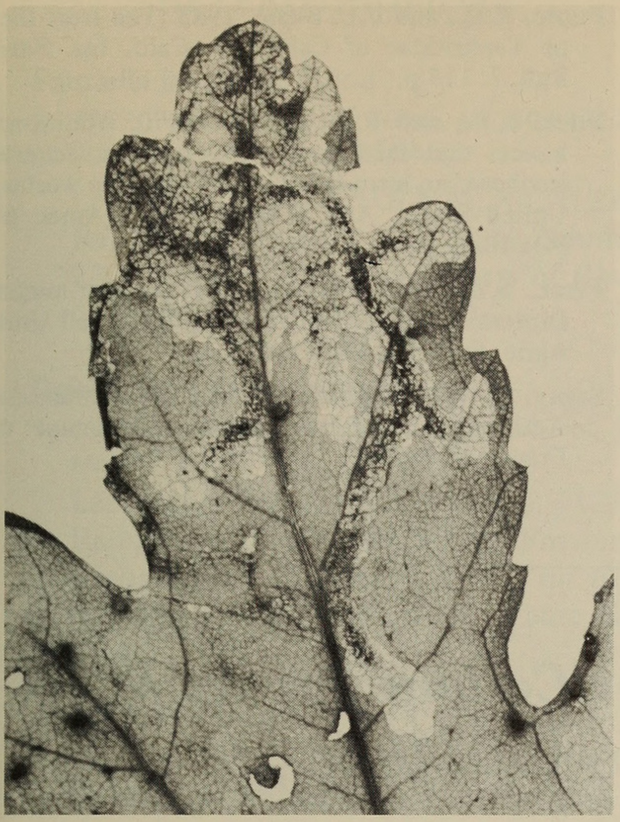

Fig. 1.—Upper surface of a mined leaf of *Chrysanthemum morifolium* Ram., showing size of completed mine. After hatching, the larva mined 36 mm on the lower surface before the mine became visible on the upper surface. Enlarged 2X.

Fig. 2.—Enlarged portion of a mined leaf of *Arnica chamissonis* ssp. *foliosa* var. *jepsoniana* Maguire, showing the herringbone pattern of feeding.

The eggs are inserted under the epidermis and almost all are laid on the lower surface of a horizontal leaf. In small cages, 100% of the eggs produced by females no. 1 and 3 were laid on the lower surface (Table 2). Female no. 2 laid 10 of 23 eggs on the upper surface during the first 8 days of egg laying; all of the remaining eggs were laid on the lower surface.

The larvae are leaf miners (Fig. 1). Their method of feeding was described by Frost (1924), based on the feeding of the larvae of *Agromyza* (=*Nemorimyza*) *posticata* (Meigen). The resulting markings caused by the mouthhooks have long been called the herringbone pattern (Fig. 2). Third-instar larvae make rather large mines, and frequently they completely hollow out small leaves such as those of *Senecio serra*. However, the 2 larger instars have the ability to exit from a leaf, crawl to another, bore into it, and continue mining. The larvae leave their mines to pupate in the soil.

The adults are seldom seen. During 1970 only 4 individual flies were observed in the laboratory garden, 3 on lower leaves and 1 on an upper leaf. In addition, the leaf mines are generally inconspicuous in spite of their size because they are usually present on the lower foliage. For example, during one survey for mined leaves, the location of each mine on its plant was measured. No mines were found more than 20 cm above the ground on plants 40 to 45 cm in height. On January 9, 1971, 2 *Chrysanthemum* plants 90 cm tall were examined for mined leaves. These were generally on the lower one-half of the plants and 14 of 16 mines were found on the lower two-thirds of the plants. Two mines were in the topmost leaves. Generally, the leaves selected for oviposition are not those that are young and vigorously growing but that are mature even to the point of starting to yellow. The factors which determine the age of leaf or even the plant species chosen by the females for oviposition have yet to be determined.

It is suggested that this insect, not described until 1960 and known from only 57 specimens in northern and central California in 1963 (Foote and Blanc 1963, map 98), has remained relatively unknown because of the secretive habits of the adults. It is now known to attack 5 native, 1 weedy, 1 crop, and 2 ornamental plants in California.

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Lectotype Designations for Certain Species of Thysanoptera Described by J.D. Hood

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ABSTRACT

Lectotypes are designated for 17 species of Thysanoptera described by J.D. Hood in the California Academy of Sciences collection. The families Heterothripidae, Thripidae, and Phlaeothripidae are represented.

The purpose of this paper is to designate lectotypes for 17 species of Thysanoptera described by J.D. Hood that are represented in the California Academy of Sciences collection by specimens of the type-series. Arnaud and Lee are preparing for publication a list of Thysanoptera types contained in the Academy collection and wish to clarify the status of these specimens. Hodd omitted holotype designations from some of his papers, and in others he stated only in the introductions–not in the descriptions–that the types or holotypes were in his collection. However, for each species he described, he labelled a specimen as "holotype." In order to preserve the status that Hood intended his specimens and species to have, we are selecting as lectotypes those "holotypes," which agree with the original descriptions. Lectotypes designated in this paper and most paralectotypes of their species are in the U.S. National Museum of Natural History, Washington, D.C., and each species is represented in the California Academy of Sciences collection by one or more paralectotypes.