THE LEPIDOPTERISTS' NEWS

Volume 9 1955 Numbers 4-5

SOME OBSERVATIONS ON THE HABITS OF *STRYMON FALACER* (LYCÆNIDÆ)

by HARRY K. CLENCH

During the summer of 1950 I observed *Strymon falacer* Godart in large numbers in the vicinity of my former home in the village of Willow Run, Michigan (2½ miles NE of Ypsilanti, Washtenaw Co.). This extreme abundance provided an unusual opportunity for the collection of data, not readily obtainable otherwise, concerning certain aspects of the habits of the species. A special (but unhappily not achieved) goal was information concerning possible differences in habits between *S. falacer* and its sibling species, *S. caryævorus* McDunnough. The latter was already known to occur in the same general area (Clench, *Lepid. News* 4: 14; 1950), but it was so very rare in 1950 (only three taken, to over 150 *S. falacer*) that no observations of moment were possible in that direction.

In the following year, 1951, *S. caryævorus* was about as rare as before but *S. falacer* was again very abundant, and further observations were possible, though other duties made them less extensive than in 1950.

THE AREA COVERED

Three fields, once apparently farmed but now largely fallow, served as the locus of the bulk of these observations.

The first field is a gently sloping, rectangular area of rather large size (roughly estimated at 200 by 400 feet), its short lower end delimited by a small, sluggish stream, the two long and the short upper sides all bordered by woodland (see below). The lower quarter of the field is entirely given over to small truck gardens rented to local residents; adjacent to this is a portion that perhaps two or three years previously had been plowed for similar gardens, but not used and left fallow and largely barren: these two portions making up about half the length of the field. The remaining, uppermost, half has been abandoned for about ten years, to judge by the few hawthorns, elms and other saplings that are sparsely scattered over it, and is covered with a dense mixture of grasses and herbaceous annuals: the usual plants of idle fields in the area. The more significant of these may be listed, roughly in order of their abundance:

(1) *Potentilla* sp. (*intermedia* L.?). A moderately tall (about two feet), erect, yellow-flowered cinquefoil, very abundant in abandoned fields, along

roadsides and so on in the whole area. Here mostly restricted to the upper portion of the field where it was generally dispersed.

(2) *Melilotus officinalis* (L.) Lam. A rather tall (3-4 feet), bush-like legume with yellow flowers. Abundantly distributed over the upper portion of the field and along the periphery and traversing paths of the remaining portions.

(3) *Erigeron* sp. (*strigosus* Muhl.?) A rather tall (3-4 feet), white flowered, aster-like composite, strongly localized in rather large stands, chiefly in the upper portion of the field.

(4) *Achillea millefolium* L. A short (1 foot), erect plant with white flowers. General, but low and not at all conspicuous.

(5) *Trifolium* sp. A short (less than 1 foot), white-flowered clover, generally distributed over the upper portion of the field, especially along the edges.

(6) *Trifolium pratense* L. A semi-decumbent clover (less than 1 foot tall), with large reddish inflorescences. Found all over the upper portion of the field, but distinctly more abundant in one corner.

(7) *Daucus carota* L. A rather tall (about 3 feet), white-flowered species, the common Queen Anne's Lace; occurring in all parts of the field but tending to clump in certain areas.

(8) *Melilotus alba* Desr. A rather tall (3-4 feet), bush-like legume, almost identical in appearance to *M. officinalis* (see above), but with white flowers. Generally distributed, principally in the upper portion of the field.

(9) *Chrysanthemum leucanthemum* L. var. *pinnatifidum* Lecoq & Lamotte. A small (1-2 feet), erect, white-flowered plant, the common Ox-Eye Daisy. Rather local, confined to the upper portions of the field.

(10) *Apocynum cannabinum* L. A rather tall (about 3 feet) and bush-like plant, the well-known Dog-Bane or Indian Hemp, with loose inflorescences of white flowers. Strongly localized in two patches, one near the border and one about 80 feet from the woods, in the upper portion of the field.

(11) *Hypericum perforatum* L. Tall (3-4 feet), yellow-flowered. Very local in one or two clumps near the border of the field.

(12) *Cirsium* sp. (*arvense* [L.] Scop.?) A small (1-2 feet), slender, lavender-flowered thistle, scattered but sparse, and only in the middle portion of the plowed-but-fallow part of the field, mostly 60 or more feet from the woods.

(13) *Asclepias syriaca* L. A moderately tall (2-3 feet), lavender-flowered milkweed, localized in a few clumps in the plowed-but-fallow portion of the field.

The woodland bordering this field is an oak-hickory association with a strong admixture of *Acer* (maple) and *Ulmus* (elm), and probably is of about 40-50 years' standing. A prevalent shrub stratum often reaches 14-20 feet in height, though its extent has apparently been curtailed by former grazing. These woods are rather dry in summer, but in the spring have much standing water.

The second field is much smaller, roughly the shape of an elongate isosceles triangle, and flat. It is bordered along the short side by an embankment above which is a paved road, on one long side by a stream and on the remaining side by woodland similar to that just described. The field is apparently frequently cut over and in spring has considerable standing water. The significant plants here are: *Erigeron* sp. in a dense stand near the road; *Melilotus alba,* common and evenly distributed; *M. officinalis,* about equally common and evenly distributed; *D. carota,* rather common and evenly scattered though with a marked tendency to clump in places; *A. cannabinum,* in a small patch near the woods at the far apex of the field.

The third field is oval in outline, nearly touching the far apex of the second field (separated from it by perhaps 20 feet of woodland), bordered partly by the same stream which, however, is here hidden from view by a parapet of earth about 10 feet high, and limited elsewhere by woodland of the same sort as already described. The dominant plant by far in this field was *Melilotus officinalis* which grew in great profusion, relieved only by three or four scattered plants of *M. alba.*

The areas of the last two fields combined would not equal that of the upper portion of the first field.

METHODS

The general pattern of collection and observation was as follows: On each trip a route, more or less at random, was followed so as to sample all of the fields, and the major plants in them, as nearly as possible in proportion to their abundance. During the course of this route every possible specimen of *S. falacer* was taken, papered immediately after pinching, given an individual number (in a consecutive series started afresh each trip), and at once was marked on the paper the estimated distance of the capture from the woods, a notation indicating the rather precise location of capture, and what the specimen was on at time of capture—leaf or flower, and of what species. On return to the house the necessary general data were inscribed on each paper (place, date of capture, time and duration of trip, field catalogue number), and all the information on the specimens was copied into the field notebook, adding the sex of each, in the same order as captured originally. In addition to the above information, all notes made on behavior and so forth were entered into the field notes for that day.

Due to the time necessarily consumed by the marking of the information on the papers as the specimens were taken, the number captured in a trip was much below what could have been taken had no notes been made. In optimum conditions of *falacer* abundance, when a specimen could be netted almost as fast as desired, with little or no loss of time in searching, the number taken averaged about 1 specimen every two minutes.

In all, six trips were made in 1950 and eight in 1951. Data from six of these fourteen were not usable in much of the following account, due to the late hour, insufficient sampling, or other bias in collecting.

RESULTS

The following notes, though necessarily somewhat random, and in most places regrettably incomplete, do furnish a basis for further investigation and suggest some curious and interesting things.

1. *General frequency.* In the previous two years (1948, 1949) of my residence in Willow Run, I had always sought *S. falacer* in the above mentioned wooded areas, where it occurred uncommonly (six or eight in an afternoon being a good catch).

The fields here discussed were never visited prior to 1950, or at most only briefly and in unfavorable places. It is, thus, impossible adequately to compare the very high frequencies observed in 1950 and 1951 with those of previous years. The numbers observed in these last two years seemed very comparable one to the other; and on the few occasions that the old woodland haunts were revisited, *falacer* was found to be about as common there as it had been in 1948 and 1949. The only inference possible, though admittedly on very slender evidence, is that the frequencies of the last two years, though striking in comparison with previous experience, were not abnormal and were merely the result of collecting in a different and more favorable situation; and therefore that these numbers represent normal abundance there.

2. *Period of flight.* The earliest date of emergence is not well documented. In 1948 the first record was a perfect pair, male and female, captured on 30 June. In 1949 the first specimen, a perfect male, was taken on 25 June at another locality a few miles distant. In 1950 none was seen on 25 June during collecting in the area, and the next trip there, on 4 July, revealed them in large numbers. In 1951 a trip on the 16th of June showed none, whereas on 23 June they were abundant, though less so than two days later. The first appearance, then, apparently fluctuates from about 20 June to 1 July in the area.

Records of the last appearance are even poorer, but suggest that the normal flight period is roughly 5 weeks' duration, ending in the last few days of July when the flight period begins early, to the first week in August, when the flight period begins late.

3. *The over-all proportion of the sexes.* Combined figures for the two years (except a few biased trips) show 156 males and 55 females, or about 2.8 males per female. This is more conveniently expressed as the fraction of males in a given sample, in this case 0.74. As will be shown below, the sex ratio in the fields varies with the hour of the day, and most of the observations were made during, or very near, the critical time (between 6 and 7 PM), when the proportion of males increased markedly. Furthermore, without knowing more of the separate behavior of the sexes it is impossible to assert that a representative sample of them visit the flowers in the fields. In this connection, however, it may be noted that of the specimens taken in 1948 where sexes are given in my notes, and most of which represent woodland captures, 12 were males, against 4 females (proportion of males, 0.80). In 1950-1951, limited collecting in the woods yielded a total of 14 specimens (proportion of males, 0.56). On the whole, though observation is deplorably insufficient, males would

appear to outnumber the females, and possibly as much as three to one. This is in harmony with field and museum experience with many other *Strymon* and other Thecline genera.

4. *The daily change in field sex-ratio.* Most of the collecting and observation of *S. falacer* was done in the afternoon, often until failing light made collecting—or even seeing—difficult to impossible. As a result there was ample opportunity to observe the interesting changes in the proportion of the sexes which take place towards evening.

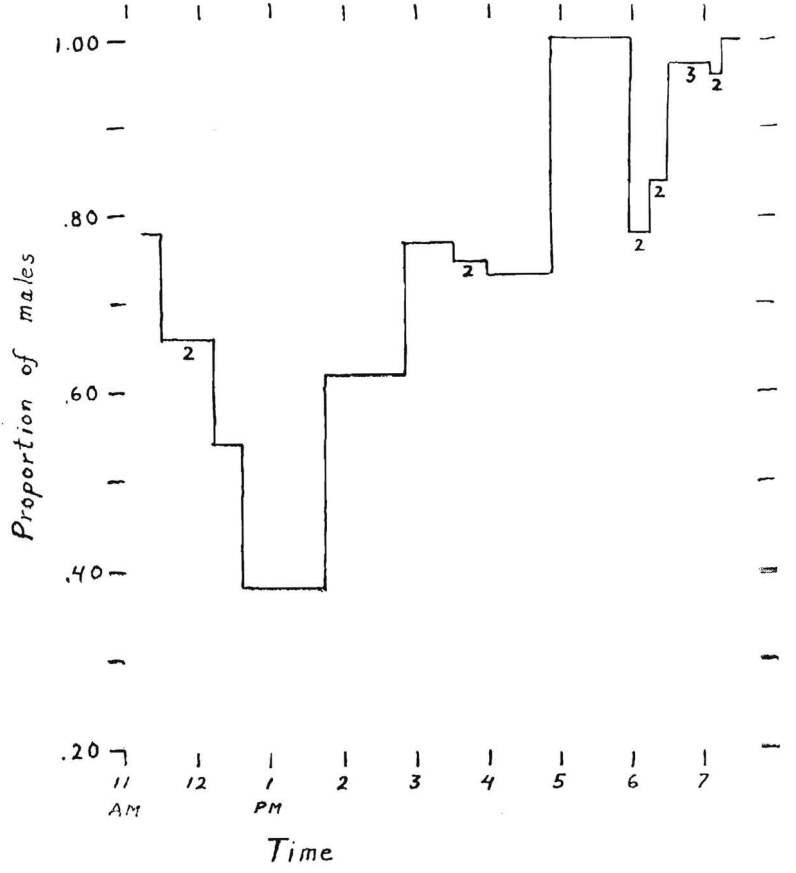

Fig. 1. Daily change in the proportion of the sexes of *S. falacer*. The small numbers under parts of the line indicate the number of observations on which average is based. In all other places only single observations provided the figures.

From noon until about 3 PM the proportion of males in the fields is apparently about 0.6 or so. At about the latter time the proportion begins to rise and by 4 PM it is more nearly 0.75. It remains there until 6:30 or so, when rather suddenly it rises to very nearly 1.0. Shortly after 7 PM the field was nearly dark and all *falacer* had departed.

This change in sex-ratio is apparently accomplished by the gradual withdrawal of females into the woods. It is most probable that actually both sexes begin to return to the woodland, females at first in the majority, then as their absolute number is reduced, males predominating until shortly after 7 PM when the fields are empty. The slim numerical data in support of these contentions are given in fig. 1. They are, however, buttressed by considerable observation in the field, not reducible to figures.

An interesting correlative to this was observed several times as dusk approached. Specimens were seen spontaneously to abandon flowers and fly, not overly rapidly but quite directly and purposefully, towards and into the nearest woods.

5. *General activity.* At all times during the daylight hours very little spontaneous flying in the fields was observed. Individuals remained at single inflorescences for long periods of time, and seldom flying far unless disturbed.

An activity that has been recorded for this and allied species is the so-called "battle." Two, or sometimes more, individuals (usually or always males?) fly in a circle about two feet in diameter, one chasing the other very rapidly the while slowly rising into the air to a height of twenty or so feet, where they "break" and the participants descend and go their separate ways. No such activity was ever noted in the fields, though on one occasion in a woods clearing two males (as proved by subsequent capture) were seen so engaged. Neither was there any courtship activity, nor any mated pairs. It is possible that *falacer* may mate late in its flight period, in the evening, and only near its foodplant (and hence in the woods); and possibly that mated pairs will be found partially concealed on leaves of low shrubs. This possibility is suggested by analogy with the habits of *S. acadica.*

TABLE I

Numbers of *S. falacer* captured at different distances from the woods edge

Distance (feet)	0-4	5	10	15	20	25	30	40	50	60	70	75	80	90	100
No. males	12	13	40	11	29	3	9	3	9	2	1	1	1	0	1
No. females	1	2	4	4	10	2	3	1	3	2	0	1	1	0	0

6. *The relation of* falacer *frequency to distance from woods.* It was soon apparent that *falacer* frequency was definitely correlated with distance from the woods. Before detailing this relationship, a brief description of the distribution of frequencies in the woodland itself would not be amiss.

Throughout the wooded lands adjacent to the fields the occurrence of *falacer* may be called minimal—rare, unpredictable, random incidences only. In scattered favorable situations—a generous play of sunlight shining through breaks in the upper leaf canopy onto the leaves of shrubs below—*falacer* will

be met occasionally in slightly increased numbers, though still far from commonly. The most I have seen at one time under such circumstances is three or four.

Where these woodlands yield abruptly to the fields under discussion, however, the situation suddenly changes. At the woods edge itself *falacer* is more abundant than anywhere within the woods. As the edge is left (*i.e.*, towards the center of the field), the frequency rapidly rises to a peak about 15-20 feet out. Thereafter it almost as abruptly drops, the rapidity of the drop lessening markedly about 30 feet out. At roughly 40 feet the frequency is close to that at the woods edge; at 70-80 feet it is about that of favorable woodland glades; at 100 feet it approximates that of general woodland distribution. This frequency distribution is shown in graphic form in fig. 2a, based on part of the data in Table I. Here recorded captures of both sexes combined are spotted.

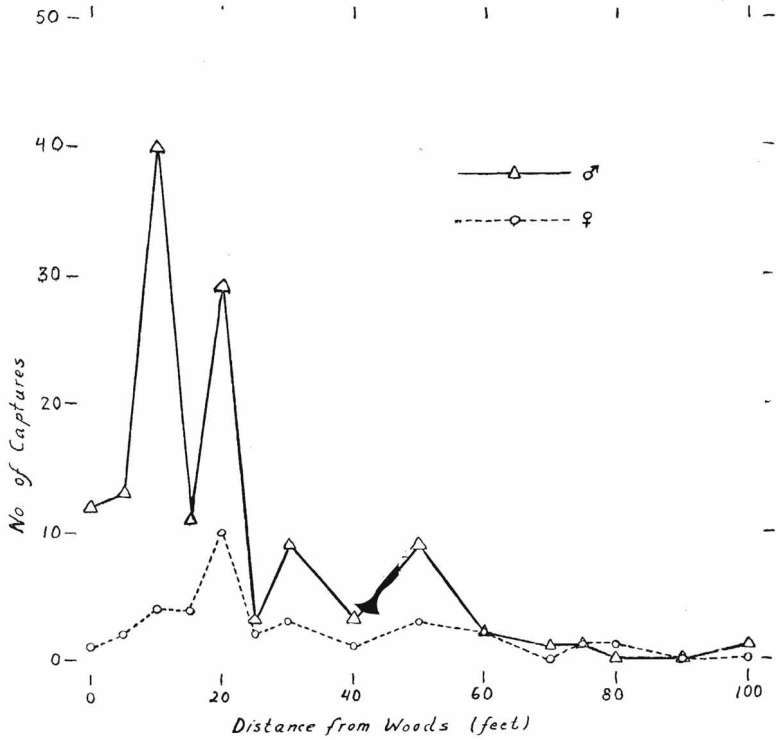

Fig. 2a. Combined male and female captures of *S. falacer* at different distances from the woods.

The above-described distribution of frequencies occurs in spite of uniform illumination by the sun of the whole field and even within the edge of the woods a certain distance. Shading of parts of the fields by the descent of the evening sun produced little or no noticeable effect, though as elsewhere ob-

served there is at about this time a general exodus from the fields back to the woods. In short, distribution of field frequencies does not seem to be related to sunlight distribution, though the opposite is true within the woods, as already implied. In the woods, it might further be added, the individuals are not found on flowers, as in the fields, but rather on the upper surfaces of leaves.

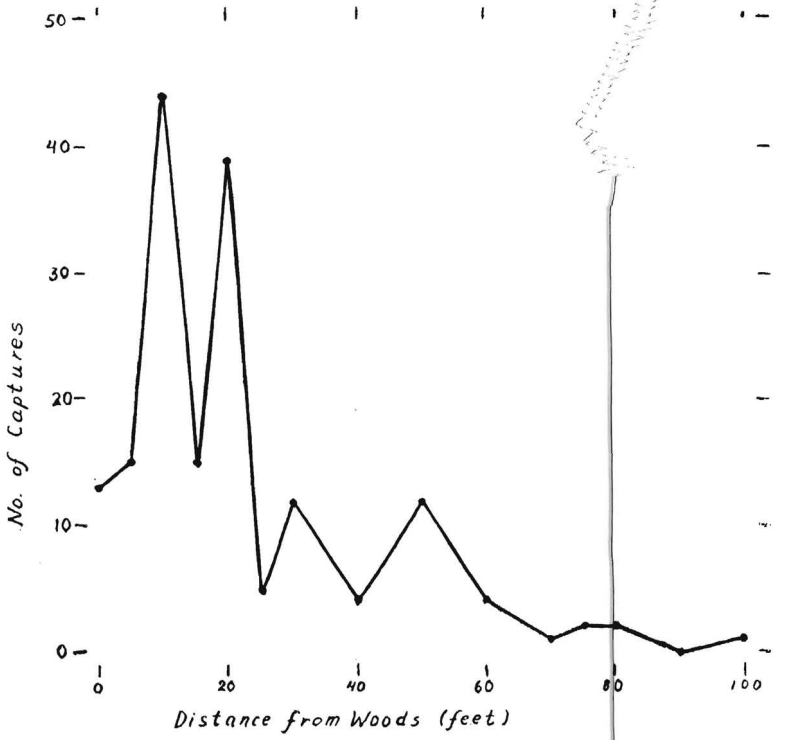

Fig. 2b. Captures of males and females of *S. falacer* at different distances from the woods.

A curious point in this distribution, not discerned in the impressions formed in the field, but showing up well in the tabulated and graphed data, is the somewhat different distribution of the two sexes. Since females presumably are more bound to woodlands, where their ovipositing activity must perforce occur (and since it has often been shown that when the habitats of the two sexes of a butterfly are different, that of the female is generally nearer the vicinity of the larval food), it is surprising to note that males seem to reach their peak closer to the woods than do females, and are more sharply restricted. Female frequency reaches a peak about 10 feet farther out, and they occur in greater relative abundance farther still than do males. The data for these generalizations are given in Table I, and are graphed in fig. 2b.

7. *Flower preferences.* It has already been implied that the dominant, if not exclusive, activity of the *S. falacer* seen in the fields was feeding at flowers.

In this activity some interesting preferences were noticed. Nearly all the specimens captured during the two seasons of study were taken on flowers in these fields, and for each was noted the species of flower on which it was taken. The combined results are given in Table III, which lists the plants involved roughly in order of their abundance, the principal flower color and height groups of each; and the total number, as well as the number of each sex, of *falacer* captured on each, and so on.

As can be seen from this table, the plants are divisible into three groups according to color (WHITE; VIOLET—including reddish to bluish; and YELLOW), and three groups according to size (SHORT—under one foot in height; MEDIUM—between one and two feet high; and TALL—exceeding two feet in height), making a total of nine combinations. The captures of *falacer* tabulated according to these combinations (Table II) show two very marked preferences: (a) for white flowers; and (b) for tall plants. The latter, in fact, accounts for over 90% of all captures on flowers. As would be expected, the combination of these two—tall, white-flowered plants—shows by far the largest figure of any of the nine combinations: over two-thirds of all flower captures.

TABLE II

Number of individuals, both male and female, of *S. falacer* taken on flowers of different colors and heights

Flower Color	Flower heights			
	Short (under 1 ft.)	Medium (1-2 feet)	Tall (over 2 ft.)	Totals
White	4	6	142	152
Violet	1	2	35	38
Yellow		0	21	21
Totals	5	8	198	211

The least popular classes of flowers appear to be the yellow-flowered plants, and the short ones. The particular combination of these two, however, was not specifically observed.

The preference for tall plants is quite in keeping with the observed woodland habits of the species, for there it was never seen perched on leaves lower than about two feet from the ground, and was most frequently seen between four and ten feet.

That these apparent trends are significant there seems little question. Specific preferences for certain flower species, however, also enter into the picture. Compare, for example, the captures on *Daucus carota* and *Melilotus alba,* two plants of about equal availability in point of numbers and situation, both with white flowers and of very comparable height. In spite of this, over 11 times as many *falacer* were taken from flowers of *M. alba* as from *D. carota.* Much more interesting, however, is the great difference between *M. alba* and

TABLE III

Flower preferences of *Strymon falacer*. See text for amplification.

	flower color	height class	*falacer* captures					chi square	P range	proportion of males	suggested favorization	class of flower preference
			actual			expected						
			total	males	females	males	females					
column no.	1	2	3	4	5	6	7	8	9	10	11	12
Potentilla (intermedia?)	Y	M	0	0	0	....	....	....	.....	....		d
Melilotus officinalis	Y	T	21	12	9	15.6	5.4	3.23	.05 - .10	.57	F	b
Erigeron (strigosus?)	W	T	25	18	7	18.6	6.4	0.08	.70 - .80	.72		b
Achillea millefolium	W	S	4	2	2	3.0	1.0	1.33	.20 - .30	.50	F	c
Trifolium sp.	W	S	0	0	0	....	....	....	.....	....		d
Trifolium pratense	V	S	1	1	0	0.7	0.3	0.43	.50 - .70	1.00		c
Daucus carota	W	T	8	3	5	5.9	2.1	1.42	.20 - .30	.38	F	b
Melilotus alba	W	T	90	74	16	66.9	23.1	2.94	.05 - .10	.82	M	a
Chrys. leucanthemum	W	M	6	6	0	4.5	1.5	2.00	.10 - .20	1.00	M	b
Apocynum cannabinum	W	T	19	10	9	14.1	4.9	4.62	.02 - .05	.53	F	a
Hypericum perforatum	Y	T	0	0	0	....	....	....	.....	....		d
Cirsium (arvense?)	V	M	2	2	0	1.5	0.5	0.67	.30 - .50	1.00		b
Asclepias syriaca	V	T	35	28	7	26.0	9.0	0.60	.30 - .50	.80		a
Totals			211	156	55					.74		

Explanation of symbols.

Column 1. Y, yellow; W, white; V, reddish to bluish violet.

2. S, short (under 1 foot); M, medium (1-2 feet); T, tall (over 2 feet).

6 & 7. Expected numbers based on proportion of totals in columns 4, 5.

11. F, suggestive of being favored by females; M, by males.

12. a, preferred flower species; b, tolerated; c, casual; d, avoided.

its congener, *M. officinalis.* These two species are almost indistinguishable in growth form, size, leaf, floral structure, differing strikingly only in color. Furthermore, *M. officinalis* was the commoner of the two by several times. Yet over four times as many *falacer* were captured on flowers of *M. alba* as were taken on those of *M. officinalis.* The actual disparity in preference of *falacer* for these two is probably even greater than these figures would show. In the third field the dominant plant was *M. officinalis,* which virtually covered the restricted area of the field with a dense yellow tangle. Only a few scattered, isolated bushes of *M. alba* were present. Yet on each of the several visits to the field, anywhere from four to over a hundred (!) *S. falacer* were seen on *alba,* with only a very rare capture or glimpse of one on *M. officinalis.* Whether the deciding factor in the very obvious preference for *M. alba* over *M. officinalis* is the color difference, or some more subtle distinction such as nectar composition or quantity, cannot at this writing be stated. That it might, at least in part, be the latter is suggested by the interesting behavior of a female *S. falacer* observed on 8 July 1950. She was seen to alight, rather abruptly, on an inflorescence of *M. officinalis.* After several probes of the flowers with her proboscis, she withdrew and flew a few inches to a nearly juxtaposed inflorescence of *M. alba,* where she began feeding.

In the matter of specific preferences, a quantitative approach to the subject is exceedingly difficult owing to the manifest impracticability of providing the necessary accurate measures of flower abundance. Furthermore, since there is a variable preference for different distances from the woods, this, too, would have to enter into any such analysis. By default, then, a non-quantitative system was adopted of merely listing the flower species in estimated order of abundance.

Four classes of preference of *S. falacer* for the different flower species may be discerned, and appear to be fairly discrete: (a) preferred; (b) tolerated; (c) casual; (d) avoided.

In the first group, the "preferred," may be listed *Asclepias syriaca,* probably the most favored of all. Considering the uncommonness of this plant in the fields compared to the others, 35 captures on it is a large number. At every visit one could count on finding at least one, and usually more, on every plant within reasonable distance from the woods. Second in this group is undoubtedly the already discussed *Melilotus alba,* from which were taken almost as many specimens as were captured on all the others combined. The relatively great abundance of this plant, however, makes the figure not quite so significant as the smaller number on the far less frequent *A. syriaca.* Third, and last, in this group is *Apocynum cannabinum.* Again, the recorded number of captures (19) is less than for someof the species listed below, but this flower was very infrequent.

In the second group, the "tolerated," we find a number of species on which captures were too frequent for them to be only "casual," yet far below the frequency shown for those dubbed "preferred." First among these is *Erigeron* sp., with a number of captures sufficiently large that it possibly ranks close to the borderline between "tolerated" and "preferred." Second is *Daucus carota* with eight recorded captures. *Chrysanthemum leucanthemum* is close behind if at

all, with six captures, correlated with a lesser frequency of the plant. *Melilotus officinalis* is probably next, and although it has many more captures (21), it was also one of the most abundant of all the plants in the fields. Very difficult to place in correct sequence is *Cirsium (arvennse?).* It was very infrequent, and furthermore was almost exclusively found at rather great distances (40 feet and more) from the woods, so the two captures thereon are difficult to interpret.

Only two species of plants make up the third group, the "casuals," *Achillea millefolium* and *Trifolium pratense.* Undoubtedly further collecting could increase the number of casual species slightly by adding one or more of the less abundant species of plants. It will be noted that both these species are in the "low" size group.

Of the fourth group, the "avoided," by far the most striking is the *Potentilla.* This exceedingly abundant plant was repeatedly surveyed for *falacer* without ever a specimen having been sighted on it. There seems little doubt that *falacer* actually does avoid this species. The same statement may be applied to the small *Trifolium* sp., though as I paid less attention to it in the field the assertion is open to more doubt. It possibly may be found to lie in the "casual" group. Though white-flowered, it is exceedingly low and possibly for this reason as much as for any other it is bypassed. *Hypericum perforatum,* though not very common, was tall and prominent and was repeatedly searched for *falacer.* As with the *Potentilla,* however, no trace was ever seen of the butterfly on it. It should be emphasized here that a complete census of the plants in flower in the fields during the flight period of *falacer* was not made. As a consequence there are undoubtedly a good many species that could have been added to the list, all of which, since no *falacer* was taken on any of them, would have been assigned here. These additional species for the most part would be small or very uncommon: definitely not part of the dominant field vegetation.

One of the more interesting aspects of *falacer* flower preference is the difference between the sexes in their preference for certain species. There is no indubitable instance of a plant species exclusively visited by either sex[1] but there are several indications of a stronger preference by one sex or the other for certain species.

Samples, unfortunately, are too small for the results to be statistically convincing, though they are suggestive. The essential data are given in Table III: flower species visited; total number of *falacer* on each; number of each sex on each; the expected numbers of each sex (based on the sex ratio of the totals for the whole table); the value of chi square for the comparison of actual and expected numbers of the sexes; the resulting probability ranges (*i.e.*, probability that a deviation as great or greater than that observed would be due to chance alone).

The customary fiducial limits for such probability values are usually $P = .05$ or less, or $P = .01$ or less; and as can readily be seen only one of the values in

[1] Three plant species have recorded for them only male captures: *Trifolium pratense, Chrysanthemum,* and *Cirsium.* The numbers taken on all of these, however, are so small that no certainty whatever may be attached to them as indicating exclusive male visitation.

the table is less than .05. In interpreting the results, therefore, the following decisions are made with regard to the probabilities:

over 0.30	not indicative of difference,
0.30-0.20	slightly suggestive of difference,
0.20-0.10	suggestive of difference,
0.10-0.05	strongly suggestive of difference,
less than 0.05	probably significant difference.

On this basis, then, six of the ten flower species on which *S. falacer* has been taken show some degree of suggestivity of selection by one or the other sex, and these may therefore be divided into two groups:

(a) Favored by males

Melilotus alba strongly suggestive
Chrysanthemum leucanthemum suggestive

(b) Favored by females

Apocynum cannabinum probably significant
Melilotus officinalis strongly suggestive
Achillea millefolium slightly suggestive
Daucus carota slightly suggestive

It is interesting to note that the two *Melilotus* species are contrasting.

APPENDIX

In 1953 I was able to collect *S. falacer* in Pennsylvania under very comparable circumstances to those in Michigan, described above: a mixed deciduous woodland, bordered by an old field, well provided with *Melilotus officinalis* and *alba, Asclepias syriaca,* and others of the same species seen in the Michigan fields. The locality was near Ohio Pyle, Fayette County. The only *S. falacer* seen were in the woods itself, in open glades and sunlit patches, on leaves from four to ten or so feet from the ground: very comparable in situation and frequency to the woodland occurrence in Michigan. Nowhere in the field, however, was a single *S. falacer* seen.

The question is entirely open; is the cause of the abundance of *S. falacer* in the Michigan fields: (a) a genetic peculiarity of the Michigan population; (b) a freak situation of the locality; (c) a non-localized phenomenon which may occur anywhere, depending only on a particular concurrence of several events; or (d) something else?

Section of Entomology, Carnegie Museum, Pittsburgh 13, Penna., U. S. A.