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The Attraction of the Levant Housefly *Musca vicina* Macq. to natural breeding media.

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INTRODUCTION.

In connection with a field study on rural breeding sites of the Levant housefly, *Musca vicina* Macq., in Israel (ASCHER 1956, 1957) it was deemed of importance to find out the types of manure especially attractive to this fly, and to shed some light on the factors governing its attraction.

It is evident, that smell plays an important rôle in the attractiveness of manures for the housefly. AWATI and SWAMINATH (1920) reasoned that the presence of substances with distinctive odors, such as ammonia, H_2S, phosphorus compounds etc. is necessary, before the fly is even stimulated to approach a breeding medium. ROUBAUD and VEILLON (1922) and RICHARDSON (1925) state that the housefly is attracted to manure for the purpose of oviposition only, the chief attractants being ammonia or ammonium carbonate, and some fatty acids, such as butyric or valerianic acid. KUZINA (1940) concluded from experimental evidence obtained with pig manure and cow manure, that females are conducted to these oviposition sites mainly by smell. KALANDADZE and CHILINGAROVA (1942) found in field experiments that *Musca vicina* in Georgia (USSR) preferred pig manure for oviposition. They also believed in odor as being the principal factor in determining the direction of flight. Thus pig dung, which has the strongest odor, probably attracts ovipositing females from a larger area. The peculiar suitability of pig dung, when compared with other manures for housefly breeding and the preference of houseflies for it has been repeatedly demonstrated in Denmark (THOMSEN 1934, THOMSEN and HAMMER 1936), in Hungary (MAKARA 1935) and in Russia (DERBENEVA-UKHOVA 1937, and others). Even in countries where swine manure is found to smaller extent as e.g. in Israel (ASCHER 1956) or where it is very rare, as e.g. in Egypt (HAFEZ 1939), field observations have indicated that *Musca vicina* is most strongly attracted to it.

EXPERIMENTAL.

Biological Material.

The flies used in this study were of a highly resistant strain of *Musca vicina* Macq. (R-strain, see REUTER and ASCHER 1956). They were fed water and sugar and were three days old, unless indicated otherwise.

Fresh manures were collected in the field (stables, cowsheds, pigsties), in glass containers, which were closed immediately with cloth covers. The manures were tested as to their attractiveness within 2 days after collection.

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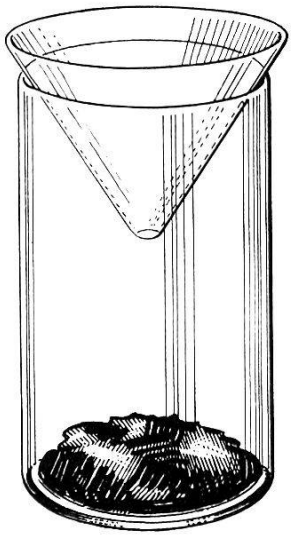

Fig. 1.

Method.

The method used to evaluate attraction, was DETHIER's (1955) recent one: The attractant material is placed into a glass cylinder, into which is inserted a glass funnel with cut-off stem (Fig. 1).

The flies entering through the glass funnel are trapped in the glass cylinder and can thus be anaesthetized and counted at the end of the experiment.

These traps were exposed to flies either on the bottom of a standard Peet-Grady chamber (1.80×1.80×1.80 m.) henceforward designated *P.G.*, or on the bottom of big cages (90 cm. length, 60 cm. width, 47 cm. height, covered with mosquito netting, henceforward designated *Cage*). The *P.G.* chamber was decided upon to somewhat simulate natural conditions. The cylinders used in the *P.G.* chamber were of a height of 20 cm., diam. 10 cm., funnel diameter being 10.4 cm. In the *Cage* a much smaller trap was used (height 9 cm., diam. 6.5 cm., diam. of funnel 7 cm.). The amount of attractant introduced into the big trap was 50 gm., while in the small traps 25 gm. were used.

The arrangement of the experiments was as follows: There were always compared one or several traps with manures against a trap containing sugar and sometimes in addition against an empty trap, which served as controls. Approximately 500 counted males and 500 counted females were used in each experiment. Exposure time was always 2 hours, after which the traps were removed from the exposition chamber and the trapped flies counted. Temperatures ranged from 25-30°C.

RESULTS.

A. Experiments with swine manure.

1. Attractance as related to sex of flies.

At first, the relative attractance of swine manure, which had shown very strong attraction for *Musca vicina* in our field observations (ASCHER 1956) was tested with flies of both sexes, 3 days old, fed only water and sugar. In each experiment 500 ♂ and 500 ♀ were employed. Results are summarized in Table 1 *(P.G.)* and Table 1a *(Cage)*.

TABLE 1.

The rate of attraction of 3-day-old flies in P.G. to swine manure
(2 hours exposure, each experiment done with appr. 500 ♂ and 500 ♀, fed water and sugar only).

Exp. No.	% of Flies trapped					
	Sugar		Empty vessel		Swine manure	
	♂	♀	♂	♀	♂	♀
1	0	0	not put		1.0	26
2	1.3	3.8	0.6	2.6	0.5	23
3	0.1	1.2	1.0	4.0	0.4	12
4	0	1.2	0.2	2.5	0.2	17
5	5.2	3.0	2.0	1.4	5.4	17
6	0	3.9	0.4	3.0	0.3	38
7	1.0	4.0	not put		1.0	26
8	1.5	4.0	0.8	3.0	0.6	23
9	0	0.3	not put		1.0	38
10	0	1.0	0.2	2.0	0.2	17
11	3.0	5.0	2.0	1.0	5.0	17
Mean	1.1	2.5	0.9	2.4	1.4	23.1

TABLE 1a.

The rate of attraction of 3-day-old flies in Cage to swine manure
(2 hours exposure, each experiment done with approximately 500 ♂ and 500 ♀, fed water and sugar only).

Exp. No.	% of Flies captured			
	Sugar		Swine manure	
	♂	♀	♂	♀
1	6.0	5.0	10	85
2	5.5	5.0	3.0	89

It is quite evident from these experiments that swine manure is strongly attractive only towards *females* of the house-fly; the fact that these females were 3 days old and were fed previously only sugar and water, i.e. had not developed fully their ovaries and therefore contained no eggs, indicates that the concept of attraction to manures for purposes of oviposition only, as postulated by various authors, must be rejected.

Captures of flies in sugar traps and empty traps were very low.

It can be seen that rate of capture in *P.G.* is much smaller than in *Cage*. This is most probably due to:

a) the much greater free space available to flies in *P.G.*,

b) the (upper) light and the glass windows on the side of *P.G.* attract quite a number of flies, which do not descend to the bottom of the chamber, where the traps are located.

2. Attractance as related to age of flies.

The following experiments were undertaken to find out the connection between age of flies and rate of attraction, in *P.G.* (Table 2) and *Cage* (Table 2a). In the *P.G.* trials, also some experiments as regards the state of feeding were incorporated.

TABLE 2.

The connection between age of flies and rate of attractance of females to swine manure (*P.G.*—2 hours exposure).

Exp. No.	Age of flies. Days	State of feeding	% of Flies trapped					
			Sugar		Empty vessel		Swine manure	
			♂	♀	♂	♀	♂	♀
1	1	fed	0.6	1.5	0.8	0.4	2.8	20
2	1	fed	2.0	1.5	0.6	1.6	1.9	32
3	1	fed	0	0	1.0	1.0	0.3	10
4	1	fed	0.1	0.8	0	0	0.1	12
5	1	fed	0.8	1.2	0.2	0.8	2.0	20
		Mean	0.7	1.0	0.5	0.8	1.4	18.8
6	1	unfed	0	0.2	0.2	0.4	3.0	23
7	1	unfed	0	0	0.2	0.4	7.0	40
8	3	fed	1.0	1.5	0.7	0.3	3.0	25
9	6	fed	0.1	2.0	0.2	0.1	0.2	14
10	9	fed	2.5	5.0	0.2	0	2.5	32

Since there were no clear differences in the *P.G.* experiments between the different ages, these experiments were repeated with well established age groups in *Cage* experiments (Table 2a).

From Table 2a, it is evident that while very young flies (0-½ day old) are not yet attracted, 1-day-old females are attracted quite strongly to swine manure. Soon later, attraction rises to the maximum values.

TABLE 2a.

The connection between age of flies and rate of attractance of females to swine manure (Flies fed water and sugar) (*Cage*—2 hours exposure).

Exp. No.	Age of flies. Days	% Flies trapped			
		Sugar		Swine manure	
		♂	♀	♂	♀
1	0–½	0	0	0	2.8
2	1	2.7	1.5	0.8	25
3	1–2	0.6	0.6	0.5	61
4	2	2.7	1.5	8.1	60
5	2–3	2.0	0	18	88
6	3	1.8	7.0	11	70
7	4	0	0	18	76
8	5	0	0	1	76

3. Attractance and its relation to copulation.

Since from the previous experiments it was evident that full ovarian development is not essential for attraction of females to swine manure, it was of interest to find out whether copulation plays any part in determining rate of attractance. Pupae were therefore placed in test tubes (one pupa per test tube), and all the females hatched were assembled in a cage, and fed water and sugar. These virgins were used three days later in *Cage*. Within 2 hours, 0% of the ♀ flies used were trapped on sugar and 79% on swine manure. This demonstrates clearly that copulation played no rôle in the attraction experiments with swine manure.

4. Influence of state of feeding of the flies on rate of attraction.

In attraction studies, the state of feeding of the insects is undoubtedly of great importance. While in all the previous experiments flies were only fed water and sugar, in this series of experiments the flies were copiously fed with milk (30% milk powder suspension in water) on their third day of life. The milk was then withdrawn, the flies placed again on a diet of water and sugar for 24 hours and 48 hours respectively and tested as to their response. Flies were found to be rather sluggish for the first 24 hours after feeding with milk and accordingly the response of the females towards swine manure was lowered considerably. When 48 hours have elapsed after the feeding with milk the response rose again (Table 3). Most probably this is due to digestion of

the milk accompanied by renewed activity, and not due to an oviposition-type of stimulus due to development of eggs.

TABLE 3.

Effect of state of feeding with milk on attractance of flies to swine manure in Cage.

Exp. No.	Age of flies. Days	Hours after feeding with milk	% Flies trapped			
			Sugar		Swine manure	
			♂	♀	♂	♀
1	4	24	0.5	1.0	1.0	18
2	4	24	0.5	0	1.0	18
3	5	48	5.0	12	1.0	34
4	5	48	5.0	0	12	37

In analogous experiments in *P.G.*, 24 hours after feeding with milk, the following rates of capture were found: Sugar and empty vessel captured no flies at all; swine manure captured 3% of the females and 1% of the males.

5. *Attractance as influenced by exposure time.*

The exposure time used by us was 2 hours and at least in *Cage*-experiments, the majority of 3 days old females, fed water and sugar only, were captured within this time (see e.g. Tables 1a, 2a). It was therefore of interest to find out whether this rate of capture was already reached before the two hours had elapsed. Traps were therefore set up in 6 cages for different exposure times. Table 4 sums up these results.

TABLE 4.

Rate of capture at different exposure times in Cages (Flies 3 days old, fed water and sugar).

Cage No.	Length of exposure, minutes	% Flies captured			
		Sugar		Swine manure	
		♂	♀	♂	♀
1	15	3.0	0	2.0	31
2	30	2.0	0	4.0	65
3	45	1.5	0	2.5	48
4	60	4.0	0	1.5	83
5	90	3.0	2.0	0.7	65
6	120	1.0	2.0	8.5	91

In one of the cages, 65% of the females had thus been captured in the swine manure trap already within 30 minutes. However,

considering the fluctuating results, 2 hours appeared to be an adequate time of exposure in order to ensure the capture of 80% or more of the females on swine manure. This was also illustrated in the next experiment (Table 5), which was devised in order to find out whether the capture rate of flies in swine manure traps during the longer exposure periods is not enhanced by the *"fly-factor"* [2] though of course it was not expected that in the presence of such a powerful attractant as swine manure the "fly-factor" would play any rôle. Into a *Cage,* with 500 ♀ and 500 ♂, fed water and sugar only, a sugar and a swine manure trap were introduced for 15 minutes, then taken out and replaced by a new pair of traps, which were again replaced after 15 minutes, etc.

The results of this experiment (Table 5) evidently do not differ significantly from those of the previous one (Table 4).

TABLE 5.

Rate of capture, when traps are exchanged during the experiment (Cage) (Flies 3 days old, fed water and sugar).

Set of traps	Duration of exposure, minutes	Duration of stay of traps in cage, minutes	% Flies captured in each set of traps				Total % captured			
			Sugar		Swine manure		Sugar		Swine manure	
			♂	♀	♂	♀	♂	♀	♂	♀
a	15	15	1	0	2	21	1	0	2	21
b	30	15	0	0	4	26	1	0	6	47
c	45	15	0	0.2	4	8	1	0.2	10	55
d	60	15	0	0	4	17	1	0.2	14	72
e	90	30	0	0	5	12	1	0.2	19	84
f	120	30	0	0	3	3	1	0.2	22	87

B. Experiments with other manures and their comparison with swine manure.

These experiments were carried out mainly in *P.G.*

6. Attraction to cow manure.

Experiments with traps of cow manure and comparison between the attraction of cow manure and swine manure are summarized in Tables 6 and 7.

The results demonstrate that cow manure does not show preferential attraction for females as clearly as swine-manure. This is also seen in Table 7, which in addition shows swine manure to be more attractant than cow manure.

[2] An attractive substance secreted and deposited on feeding sites by *Musca* and *Phormia* during feeding (BARNHART & CHADWICK 1953; DETHIER 1955).

TABLE 6.

The rate of attraction of houseflies to cow manure in P.G.
(Flies fed water and sugar).

Exp. No.	Age of flies, Days	% Flies trapped					
		Sugar		Empty vessel		Cow manure	
		♂	♀	♂	♀	♂	♀
1	1	0	0.7	0.5	0.7	0	0.8
2	3	0	0	3.0	2.0	11	10
3	5	0	2.0	0.7	0.7	9	17
4	5	0	2.0	0.7	0.5	3	13
5	6	0.2	1.0	4.0	0	3	14

TABLE 7.

Comparison between cow manure and swine manure in P.G.
(Flies fed water and sugar).

Exp. No.	Age of flies, days	% Flies captured							
		Sugar		Empty vessel		Swine manure		Cow manure	
		♂	♀	♂	♀	♂	♀	♂	♀
1	1	1.0	1.2	0.2	0.2	0	2.2	1.0	1.0
2	3	0	0.1	0	0	7	21	9	11

7. *Attraction to different kinds of manures.*

In these experiments four kinds of manure were compared in *P.G.*, while a sugar trap and an empty trap served as controls. The traps were placed in Latin square design. Results were rather fluctuating; some of them are recorded in Table 8.

TABLE 8.

Comparison between different types of manures in P.G.
(Each experiment appr. 500 ♂ + 500 ♀, 3 days old, fed water and sugar only).

Exp. No.:	% Flies captured					
	1		2		3	
Trap	♂	♀	♂	♀	♂	♀
Swine manure . .	3.5	21	0.8	20	0.4	17
Cow manure . .	1.0	19	0.3	1.5	0.8	2.0
Horse manure . .	0.8	1.0	2.1	2.0	2.0	3.0
Sheep manure . .	5.0	5.0	6.0	16	4.5	3.0
Sugar	1.0	3.5	1.4	1.5	0.6	0.8
Empty vessel . .	0.8	1.5	1.0	2.5	1.0	1.0

In all experiments swine manure showed the highest capture rate.

C. Experiments with other attractive substances.

8. Attraction to a 5% yeast suspension in water.

According to WOLFINSOHN (1953) a 5% baker's yeast suspension in water, aged for 1 week in a closed container, is rather attractive to houseflies. We used this preparation, which acquires a very pungent odor within a week to 10 days, in traps, in *P.G.* (Table 9) and *Cage* (Table 9a).

TABLE 9.

Attraction of an aged 5% yeast suspension in P.G.
(Flies fed water and sugar).

Exp. No.	Age of flies, days	% Flies captured					
		Sugar		Empty vessel		Yeast susp.	
		♂	♀	♂	♀	♂	♀
1	1	0	0	0	0	0	0
2	3	0	0	0	0	0	40
3	3	0	4.0	0	6.0	0	40

Attraction to the aged yeast suspension is thus nil in 1-day-old females, but rises to 40% in 3-day-old females. In *Cage* experiments, the results are even more striking (Table 9a).

TABLE 9a.

Attraction of an aged 5% yeast suspension in Cage
(Flies fed water and sugar).

Exp. No.	Age of flies, days	% Flies captured					
		Sugar		Empty vessel		Yeast susp.	
		♂	♀	♂	♀	♂	♀
1	1	0	0	0	0	0	0
2	3	12	4.0	not done		1.0	95
3	3	1.5	4.0	not done		1.0	84
4	5	0	0	0	0	5.0	94
5	5	0	1.0	not done		5.0	99

9. Attraction to a 20% ammonium carbonate solution in water.

C. H. RICHARDSON (1916), and C. H. RICHARDSON and E. H. RICHARDSON (1922) demonstrated the strong attractiveness of solu-

tions of ammonium carbonate and its volatilized products of decomposition for gravid females of the housefly.

In Russia attempts have been made to control flies by increasing the attractiveness of manure for oviposition through addition of ammonium carbonate (VANSKAYA 1941).

In our experiments a 20% solution of ammonium carbonate in water proved to be a most powerful attractant indeed, even in *P.G.* However, it differed from all the natural attractants previously investigated, in as far as *it attracted males and females to equal extent* among flies 3 days old, fed water and sugar only.

TABLE 10.

Attraction of a 20% ammonium carbonate solution in P.G.
(Flies 3 days old, fed water and sugar).

Exp. No.	% Flies captured					
	Sugar		Empty vessel		20% Am. carb. sol.	
	♂	♀	♂	♀	♂	♀
1	1.5	0.9	0	0	88	77
2	2.0	1.5	0	1.0	83	80

10. Attraction to various compounds.

Indole, which is highly attractive to blowflies (see numerous literature references in DETHIER 1947, p. 111), was not attractive to houseflies in *P.G.*- and *Cage*-experiments, when it was offered either in the pure form or in a saturated solution in water. Neither was any attractance demonstrated by skatole and trimethylamine (see DETHIER 1947). Apparently the importance of these compounds as attractants is limited to necrophagous and coprophagous insects.

Three "Fly Attractants" (ANON. 1955), which are said to simulate 1) odor components of fruits and flowers attractive to flies, 2) fermenting and decaying food products, 3) the odor of a horse stable [3] respectively, proved to be unattractive either in pure form or as 2% in sugar.

DISCUSSION.

a) *Discussion of method.*

DETHIER's (1955) cylinder-funnel method proved to be very efficient to evaluate attraction of houseflies, but it should be remembered that this simple kind of trap was devised by DETHIER

[3] Produced by POLAK's Frutal Works, Inc., Middletown, N.Y., U.S.A.; obtained through courtesy of Mr. N. GRATZ.

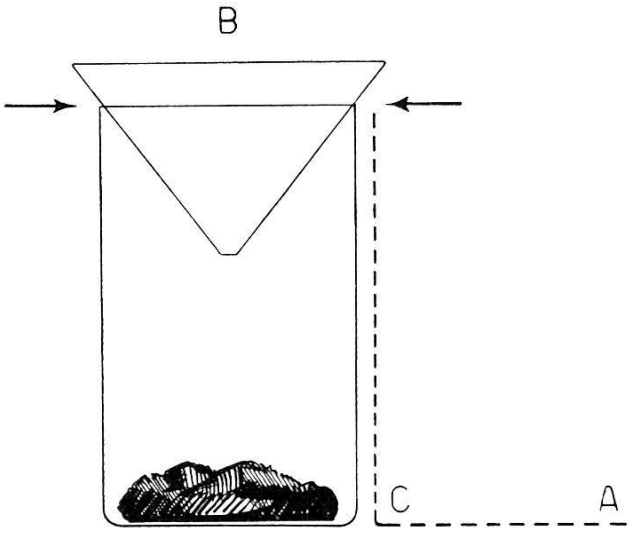

Fig. 2a.

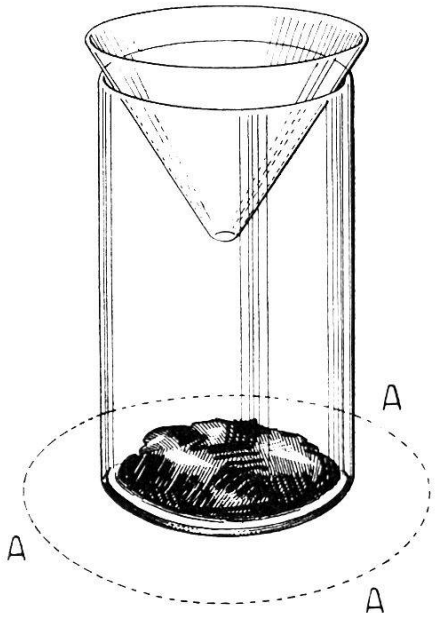

Fig. 2b.

to investigate BARNHART's and CHADWICK's (1953) "fly factor", which is a rather weak attraction factor in comparison with e.g. manures.

Everybody working with this method with stronger attractants will notice that relatively few flies are attracted initially to the opening of the funnel; flies rather start to accumulate at points A (see Fig. 2a and b) on the ground of the exposition chamber. They then seem to follow the smell along the path A-C, then find their way up the walls of the cylinder until they reach the funnel and drop into it. Attraction does not seem to be exerted at B (above the funnel), but the (apparently heavy) vapors of the attractant emanations seem to leave the trap at the *contact area between cylinder and funnel* (arrows in Fig. 2a) and not through the funnel. The vapors then seem to drop on the ground around the trap, and if a control trap (empty trap or sugar-trap) is placed within the vapor sphere A-C, it starts to get strongly attractive itself. The low catches in control and sugar vessels, however, found in this work, cannot be ascribed to this phenomenon, since the distances between the traps in *P.G.* and *Cage* are too big. It is much more likely that these catches are due to the well known exploring tendency of the housefly.

On placing a trap with a *very strong* attractant, such as swine manure or an aged 5% yeast suspension inside the exposition chamber, one sees almost instantaneously clusters of flies sitting on the contact area between cylinder and funnel, trying in vain to gain access. When we sealed the contact circumference between funnel and cylinder with cellulose tape, the trap, though containing e.g. swine manure, became *completely inattractive!*

In order to make visible the path of heavy vapors leaving the trap, the following crude model experiment was put up: Some solid carbon dioxide was placed inside the DETHIER trap. There was no visible exit of vapors from the opening of the funnel (only some whirls being observed below the opening of the funnel). Instead, vapors streamed out at the contact area between funnel and cylinder.

b) Discussion of Results.

It can be perceived from the results that under the test conditions most frequently applied by us, i.e. flies 3 days old, and fed water and sugar only, two of the strongest attractants encountered, namely swine manure and 5% aged yeast suspension, attract practically only females. On the other hand, ammonium carbonate attracted males and females to equal extent. No experiments were done with gravid females with an ammonium carbonate trap and thus our results cannot be compared with those of RICHARDSON on ammonium carbonate.

Of manures, the highest rate of capture was obtained with swine manure. Though it has been stated by various authors that swine manure and other manures are visited by female houseflies for purposes of oviposition, we have found nowhere the statement that *only* females are attracted to manure. Moreover, even 1 day old females are already attracted to some extent to swine manure, and this obviously cannot be for purposes of oviposition. Neither are the ovaries of 3-day-old (or older) females, fed water and sugar only, sufficiently developed (though one should always take into consideration in mass breedings artefactual supply of proteins due to feeding on dead flies—see ASCHER and LEVINSON 1956). It has thus to be assumed that the attraction of the female housefly to manure is an inherent property, even before eggs are produced. Neither caused lack of fertilization any reduction in attraction to swine manure.

Somewhat similar observations have been recorded with blowflies (*Lucilia sericata*): only female flies are attracted to sheep wool, the highest degree of attraction being obtained with fertilized females, fed daily on meat, i.e. with eggs. However, even in the absence of fertilization and meat, attraction was still considerable (CRAGG and RAMAGE 1945, CRAGG and COLE 1956).

In many fruitflies it has been found that decomposing proteinaceous baits attract predominantly females (DETHIER 1947, p. 119).

Our results with a trap containing an aged 5% yeast suspension in water also showed practically only attraction of females, the capture rate reaching nearly 100% in *Cage* experiments. In con-

nection with this it is of interest to recalculate recovery rates in WOLFINSOHN's (1953) dispersal study. WOLFINSOHN liberated 50,000 marked houseflies, of which 6,898 flies (i.e. appr. 14%) were recovered from traps baited with an aged 5% yeast suspension. Since WOLFINSOHN used mixed populations (WOLFINSOHN, personal communication) and assuming that 50% of his flies were females, his true recovery rate, which should be based on females only, would be much better, i.e. about 28%.

Results were rather fluctuating, when different manures were compared in *P.G.* One has, however, to consider that a rather complex mixture of odors is created in the exposition chamber in these experiments. Nevertheless swine manure proved to be the best attractant also here.

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Résumé.

Des essais d'attraction ont été faits avec une souche de laboratoire de *Musca vicina* Macq. à l'aide d'un verre cylindrique muni d'un entonnoir servant de trappe (système DETHIER), dans une chambre Peet-Grady et une cage spacieuse.

* seen in WEST, L. S. (1951).
** seen in DETHIER, V. G. (1947).

Parmi les mouches nourries exclusivement au sucre et à l'eau, seules les femelles ont été attirées par du fumier de porc. Le premier jour après l'éclosion des jeunes mouches, l'attraction était encore faible, mais elle s'est rapidement intensifiée par la suite. Des femelles non fécondées ont réagi de la même manière positive.

Les mouches nourries au lait se sont montrées moins attirées par le fumier pendant les premières 24 heures, mais déjà après 48 heures, leur capacité de réaction était rétablie.

Quelques expériences ont été faites pour mesurer le temps nécessaire à capturer la majorité des mouches dans les cages à essai. Ces expériences ont également montré qu'en présence de substances fortement attractives tel que le fumier de porc, le « facteur mouche » de BARNHART et CHADWICK ne joue aucun rôle.

Des essais avec du fumier de vache, ou, comparativement avec du fumier de vache et de porc, ou encore des essais comparatifs entre des fumiers de divers animaux (porc, vache, cheval, mouton) dans la chambre de Peet-Grady ont confirmé que le fumier de porc est l'attracteur le plus puissant.

Une suspension aqueuse de 5 % de levure qu'on a laissé reposer s'est révélée être très attractive, mais seulement pour les mouches femelles.

On a enfin trouvé qu'une solution de carbonate d'ammonium dans de l'eau est également attractive pour mâles et femelles.

Zusammenfassung.

Es wurden an einem Laboratoriumstamm von *Musca vicina* Macq. mit Hilfe der DETHIERschen Glaszylinder-Trichterfalle-Methode in einer Peet-Grady-Kammer und einem geräumigen Käfig Attraktionsversuche durchgeführt.

Von mit Zucker und Wasser gefütterten Fliegen wurden praktisch nur die Weibchen durch Schweinemist angezogen. Die Anziehung am ersten Lebenstag war schwach, wurde jedoch bald danach stärker. Das Ausfallen der Befruchtung bei Weibchen beeinträchtigt die Anziehung durch Schweinemist nicht.

Wurden die Fliegen mit Milch gefüttert, so reagierten sie viel schwächer auf den Attraktanten während der ersten 24 Stunden nach der Fütterung, aber schon nach 48 Stunden stieg die Attraktionsbereitschaft.

Einige Experimente wurden ausgeführt, um die Expositionszeit zu ermitteln, welche nötig ist, um den Großteil der Fliegen in Versuchskäfigen zu fangen. In diesen Versuchen konnte auch gezeigt werden, daß BARNHARTS und CHADWICKS «Fliegen-Faktor» bei Versuchen mit starken Attraktoren, wie z. B. Schweinemist, keine Rolle spielt.

Versuche mit Kuhmist, Vergleiche zwischen Kuh- und Schweinemist und schließlich Vergleiche zwischen Mist verschiedener Tiere (Schwein, Kuh, Pferd, Schaf) in der Peet-Grady-Kammer zeigten, daß Schweinemist den stärksten Attraktor bildet.

Eine gealterte 5% Hefesuspension in Wasser erwies sich als sehr stark attrahierend, aber wieder nur für Weibchen.

Schließlich wurde gefunden, daß eine 20% Ammoniumkarbonatlösung in Wasser für Männchen und Weibchen gleich attraktiv war.