

Zeitschrift: Mitteilungen der Schweizerischen Entomologischen Gesellschaft =
Bulletin de la Société Entomologique Suisse = Journal of the Swiss
Entomological Society

Herausgeber: Schweizerische Entomologische Gesellschaft

Band: 52 (1979)

Heft: 1

Artikel: An improved sampling method for phlebotomine sandflies developed in
Saudi Arabia

Autor: Büttiker, W.

DOI: <https://doi.org/10.5169/seals-401914>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 25.12.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

An improved sampling method for phlebotomine sandflies developed in Saudi Arabia

W. BÜTTIKER

CIBA-GEIGY Ltd., Agricultural Division, CH-4002 Basle

A new field sampling method for sandflies is described, and results are compared with those obtained with a previous method. The new trap consists of a piece of hard plastic sheeting with tracing paper glued to both sides, lit by a torch on one side to attract phlebotomines by night.

Several useful field methods for sampling phlebotomines have been developed and are reported to give good results (e.g. LEWIS, 1967; PERFIL'EV, 1968; RIOUX & GOLVAN, 1969; ZIELKE, 1970; ABONNENC, 1972).

All of them have been used in Saudi Arabia during the period of 1975-1977. The standard method adhered to in Saudi Arabia was the castor oil coated tracing paper stapled onto strong quality cardboard and placed at numerous sites in different urban and rural biotopes. These habitats ranged from gardens, garden walls, garbage places and squares of large towns to similar locations and courtyards in villages and settlements in oases. A special study has been carried out in various desert biotopes in the Western, Central and Eastern Regions of the country and the detailed results regarding the species spectrum, distribution, biology and ecology are summarized by LEWIS & BÜTTIKER (in prep.).

Early during the general sandfly survey in the country, trials with several materials for supporting the translucent tracing paper were carried out. As in the conventional method using cardboard as a surface on which the tracing paper was stapled the torches were used at night in order to attract the sandflies from the close vicinity. A prototype consisted of a wooden frame on which the castor oil coated parchment paper was pinned. In collaboration with Mr. E. MAWICK, Hofuf, the first field trials with plastic sheeting were carried out and yielded good results.

METHOD

Commonly available materials have been used in designing the new method. The supporting hard plastic sheets of 4 mm thickness were cut to a size of 23.0x31.5 cm allowing additional space around the tracing paper of the standard size A4 (21.0x29.5 cm) (fig. 1). The thickness of the tracing paper is specified by the manufacturers as 90-95 g/m², but sometimes this was not available and a thinner paper was used.

The torches are commonly available three-cell brands. They were placed as a rule in the interior of caves, rock crevices and the like, but in several instances the source of light was positioned in the open.

In the caves the cardboard and plastic sheets were squeezed into a suitable position in the opening of the cave or (if the hole of the cave was too wide) kept upright by means of stones. Note also the box used for transporting sheets (fig. 1).

Table 1: Comparison of sandflies trapped by the methods investigated.

Date	Location	New Method					Castor oil cards + torch			Castor oil cards only		
		No. of traps	Number of Sandflies			Sandflies per trap	No. of cards	No. of Sandflies	Sandflies per card	No. of cards	No. of Sandflies	Sandflies per card
			Inside	Outside	Total							
17/18.3.77.	Wadi Mutai-wiyadh	2	20	9	29	14.5	-	-	-	14	37	2.6
7/8.4.77.	Wadi Amariyah	2	8	3	11	6.5	-	-	-	20	7	0.3
12/13.4.77.	Wadi Mizbil	2	80	44	124	62.0	-	-	-	17	53	3.1
14/15.4.77.	Wadi Salbukh	2	49	15	64	32.0	-	-	-	10	16	1.6
19/20.4.77.	Hofuf/Desert	3	27	11	38	12.6	-	-	-	9	23	2.6
19/20.4.77.	Wadi Khumra	1	102	41	143	143.0	1	30	30.0	16	147	9.2
12/13.5.77.	Ain Hieth	1	31	15	46	46.0	-	-	-	3	4	1.3
4/5.8.77.	Wadi Khumra	1	69	39	108	108.0	-	-	-	4	9	2.2
18/19.8.77.	Wadi Hureimala	2	42	30	72	36.0	1	30	30.0	6	117	19.5
8/9.9.77.	Wadi Salbukh	2	28	21	49	24.5	1	14	14.0	10	30	3.0
27/28.9.77.	Wadi Khumra	2	125	91	216	108.0	-	-	-	10	171	17.1
Totals:		20	581	319	900	45.0	3	74	24.7	119	614	5.2

Total number of Sandflies: 1,588

RESULTS

The field results obtained from the experiments with the prototype and the final version using hard plastic sheeting as a support for the castor oil-coated tracing paper are included in this present note (table 1). In some cases a comparison between the old standard method with and without using a torch, and the new method was carried out. As seen from the index calculated from the number of sandflies per card or trap, it is evident that the new method is most efficient, particularly pertaining to the number of sandflies collected per unit.

COMMENTS

A total of 1,588 sandflies have been collected during the field experiments comparing the traditional and the new sampling methods. As can be seen from table 1, the new method ranks first in sampling sandflies, next to it comes the cardboard on which oil-coated tracing paper is stapled with a torch for attracting flies. The least effective is the old method without torch. The rate of efficacy is given in the average number of sandflies sampled from all the field trials carried out, viz:



Fig. 1: View of sampling site in a natural desert biotope. Note the torch behind the plastic plate producing diffuse light on oil-coated surfaces and attracting sandflies from the neighbourhood. The coolbox is equipped for transporting plastic plates.

Method 1:	Castor oil paper on cards, without torch.	5.2 sandflies/sheet
Method 2:	Castor oil paper on cards, with torch.	24.7 sandflies/sheet
Method 3:	Hard plastic sheets plus papers and torch.	45.0 sandflies/trap

It has to be pointed out that the new method has actually two sheets of tracing paper whereas the others are provided with a single sheet only. However, it could be assumed that particularly with Method 2 the sandflies would move to the torch and coated paper surface as easily as to the plastic sheet provided with two tracing papers.

It is believed that the improved effect of the new method is mainly due to the transparency of the plastic sheet in combination with the opaque type of tracing paper allowing the light to spread in a much wider angle and to be effective over longer distances.

It is also of interest to note that usually a much larger proportion of the Phlebotomines caught with Method 3 are collected on the side towards the torch. As a rule the torch was based within the cave pointing its light outside. The pair of figures, «inside» and «outside», given in table 1 illustrate these conditions.

Another significant advantage of the new method is the strong support for the oil papers in rough weather, such as wind and rain. It was also noticed that the sticky sheets produced satisfactory results during nights with fog. Finally it has to be mentioned that the tracing papers of the new method can be used many times by wiping off the castor oil with cotton or tissue paper after having transferred the sandflies from the paper onto the slides.

ACKNOWLEDGEMENTS

The collaboration of Mr. E. MAWICK, POLENSKY-ZÖLLNER, Hofuf, in suggesting the use and providing the first set of plastic sheeting is gratefully acknowledged. The best thanks are due to Messrs. A. PHILLIPS and S. BARKHAM, Riyadh, for their assistance in the field and in the laboratory.

LITERATURE

- ABONNENC, E. 1972. *Les Phlebotomines de la Région Ethiopienne (Dipt., Psychodidae)*. Memoires ORSTOM No. 55. Paris.
- LEWIS, D.J. 1967. *The Phlebotomine Sandflies of West Pakistan (Dipt., Psychodidae)*. Bull. Br. Mus. Nat. Hist. (Ent.) 19 (1): 1-57.
- RIOUX, J.A. & GOLVAN, Y. 1969. *Epidémiologie des leishmanioses dans le Sud de la France*. Monographie de l'I.N.S.E.R.M., No. 37. Paris, 221 pp.
- PERFILEV, P. 1968. *Phlebotomidae (Sandflies)*. Fauna of U.S.S.R. Moscow. English translation.
- LEWIS, D.J. & BÜTTIKER, W. (in prep.) *Phlebotomine sandflies of the Kingdom of Saudi Arabia*. Fauna of Saudi Arabia. 2.
- ZIELKE, E. 1970. *A method of catching Phlebotomines (Dipt. Psychodidae)*. J. Ent. Soc. Sth. Afr. 33: 355.