USE OF EVERS' MODIFIED BELLIER'S TEST FOR DETERMINING PERCENTAGE OF ADULTERATION OF SESAME OIL WITH GROUNDNUT OIL

SESAME (til or gingelly) oil is used as principal edible oil in Gujarat and Thana District and groundnut oil is a common adulterant of this oil. After the introduction of The Bombay Prevention of Adulteration Act, we had to experience a great difficulty in ascertaining the percentage of adulteration of sesame oil with groundnut oil. Unless the proportion of adulteration with groundnut oil is determined in sesame oil samples, the Court of Law does not accept the validity of the certificate, the reason being that the Text of Certificate as laid down in the Act, requires that the percentage of foreign ingredient in a particular article of food must be stated in the Certificate and hence the certificate stating only the fact that "the oil sample is not genuine" is liable to be rejected by the Court and this has happened in some cases under this Act. This led us to apply Evers' modified Bellier's Test (for ascertaining percentage proportion of groundnut oil adulteration in olive oil) to ascertain proportion of groundnut oil adulteration in sesame oil. This test is very convenient and reliable for routine work if turbidity temperatures are carefully observed. We carried out a series of experiments by taking a number of samples of pure sesame oil and mixing them with pure groundnut oil in definite percentages and determined the turbidity temperatures corresponding to the different percentages of groundnut oil present in sesame oil. The experimental procedure is the same as outlined in Evers' modified Bellier's test (*vide Tech. Handbook of Oils, Fats and Waxes*, Vol. II, p. 140,—Fryer & Weston, 1920). The following are the comparative results of turbidity temperatures recorded by Evers with respect to percentage of groundnut oil present in olive oil and those recorded by us with respect to the percentage of groundnut oil present in sesame oil.

Approximate percentage of Groundnut Oil present corresponding to Temperatures of Turbidity (Evers)

OIL	Turbidity Temp.
Olive	11·8–14·3°C.
+Groundnut 5%	15·9–17°C.
,, ,, 10%	19·8
,, ,, 20%	25·7
,, ,, 30%	29·2
,, ,, 40%	31·5
,, ,, 50%	33·8
,, ,, 60%	35·3
,, ,, 70%	36·6
,, ,, 80%	38·0
,, ,, 90%	39·3
Arachis	40·0–40·8

Percentage of Groundnut Oil present corresponding to Temperatures of Turbidity (our results)

OIL	Turbidity Temp.
Sesame	15·0 — 16·0
+Groundnut 5%	17·5
,, ,, 10%	19·5
,, ,, 20%	22·0
,, ,, 30%	24·5
,, ,, 40%	27·5
,, ,, 50%	30·5
,, ,, 60%	32·5
,, ,, 70%	34·5
,, ,, 80%	35·5
,, ,, 90%	37·0
Arachis	38·0 — 38·5

The chart of the above results if plotted enables the analyst to determine the percentage of adulteration with groundnut oil in sesame oil very accurately. The turbidity temperature of groundnut oil (obtained by ether extraction) is 38°·0-38°·5 C. The above variations in the turbidity temperatures may be due to variations in the composition of different fatty acid glycerides in oils of different climatic regions. The test is useful only when groundnut oil is the only adulterant in sesame oil. As regards other oils further work is under progress.

Public Health Laboratory, C. M. DESAI.
Borough Municipality, A. H. PATEL.
Surat,
December 6, 1944.

INVESTIGATION OF NEW PLANT-LARVICIDES WITH SPECIAL REFERENCE TO *SPILANTHES ACMELLA*

MALARIA-CONTROL in India as elsewhere consists essentially in the elimination of the malaria-carrier anopheline mosquito, which is achieved with comparatively more ease and success by destroying it in its larval stage with the use of larvicides. The only effective mosquito-larvicidal plant, apart from synthetic larvicides, known and used uptil now is *Crysanthemum cinerarifolium*, popularly known as pyrethrum. We undertook to investigate the mosquito-larvicidal properties of some select plants which are popularly known to possess some insecticidal properties.

To start with, water and alcoholic extracts of the different parts of the plants were tried to see their effect on anopheline larvæ. If promising results were obtained, the plant was subjected to a detailed examination. The following plants were investigated:—

(1) Berries of *Duranta plumieri* (N.O. Verbenaceæ).
(2) Leaves and stems of *Ipomœa murioata* (N.O. Convolvulaceæ).
(3) Stems of *Berberis aristata* (N.O. Berberidaceæ).

(4) Stems of *Acorus calamus* (N.O. Araceæ).
(5) Leaves and stems of *Aristolochia bracteata* (N.O. Aristolochiaceæ).
(6) Seeds of *Butea frondosa* (N.O. Papilionaceæ).
(7) Flowers and leaves of *Spilanthus acmella* (N.O. Compositæ).

The first four plants had either no lethal effect or were feeble in action. Durranta is a commonly used hedge-plant and Dr. Manson[1] suggested that the alkaloid in the berries was possibly the toxic factor. We have extracted the alkaloid and found it to be possessing a negligible toxicity.

Aristolochia bracteata and *Butea frondosa* showed a fairly good action. The preliminary trials with alcoholic and water extracts of *Butea frondosa* having proved rather encouraging the petrol extract was tried and was found to be effective in a concentration of 1 per cent. in water.

Spilanthes acmella.—The fresh flowering tops of this plant were extracted with ether. The ether extract was yellowish in colour and produced a highly tingling sensation on the tongue. The extract is insoluble in water but is easily soluble in boiling alcohol, cold benzene or solvent naphtha. The larvicidal property of the extract was studied quantitatively as follows: 100 mgs. of the extract was dissolved in 5 c.c. of alcohol with 100 mgs. of pure castile soap and this solution was poured into one litre of water with shaking. The suspension of the extract thus formed, was stable enough for the work. This suspension was diluted with the required quantities of water to give the different concentrations used in the experiments. Controls, containing equivalent quantities of alcohol and soap in the same concentrations used, were also kept. These controls did not show any effect on the larvæ over 24 hours of observation. These suspensions and controls were kept in beakers and 10 anopheline larvæ were kept in each. All the larvæ used in the experiment were fresh, obtained from the same habitat and were of the third or the fourth stage. The larvæ in suspensions of the material, first showed a stage of irritation with brisk movements, later on lost their activity and were unable to reach the surface. The time was noted when all the larvæ lost their capacity to reach the surface and is indicated in the following table under the heading as "The time required for the loss of capacity to float". The time taken by all the larvæ for complete death is also noted and is given in the table. These experiments were repeated several times with closely similar results. It is evident from these experiments that the extract of *Spilanthes acmella* is lethal to anopheline larvæ even in a dilution of 1 in 100,000.

TABLE I

Concentration	Time required for the loss of capacity to float	Time required for death
1 part in 10,000 of water	5 minutes	40 minutes
1 ,, ,, 25,000 ,,	15 ,,	120 ,,
1 ,, ,, 50,000 ,,	25 ,,	180 ,,
1 ,, ,, 100,000 ,,	35 ,,	15 hrs.

Chemical investigation of this plant is in progress and spilanthol[2] has been isolated and identified in the ether extract. Spilanthol was isolated earlier by Japanese workers from *Spilanthes oleracea* or American para-cress. The ether extract on treatment with 60 per cent. alcohol precipitates a large amount of waxes and sterols which have no action on larvæ and also have no tingling taste. The alcohol-soluble material has a tingling taste and about two-thirds of it is spilanthol, which appears to be the main active constituent.

A patent regarding the use of this extract as larvicide has been applied for.

We take this opportunity to express our heartfelt thanks for the supply of flowers to Prof. L. S. S. Kumar, Economic Botanist to the Government of Bombay, without whose help and co-operation it would have been impossible to carry out this work.

Further work is in progress.

G. S. PENDSE,
N. L. PHALNIKAR
B. V. BHIDE.

Maharaja Pratapsinh Chemical Lab.,
Sir Parashurambhau College, Poona,
and
Indian Drugs Res. Assn., Poona.

December 6, 1944.

1. Manson, *J. Malaria Inst.* (Delhi), 1939, **2**, No. 1, 85. 2. Gerber, F., *Arch. Pharm.*, 1903, **241**, 270. Y. Asahina and M. Asano, *J. Pharm Soc.* (Japan), 1920, 503. —, *Ibid*, 1922, 85. M. Asano and T. Kanematsu, *Ber.*, 1932, **65 (B)**, 1602.

ACTIVITY OF SULPHANILYL BENZAMIDE AGAINST TYPE I PNEUMOCOCCAL INFECTION IN MICE

(A Preliminary Note)

IN a previous paper (Bose and Ghosh, 1944) it has been noted that after oral administration in mice, sulphanilyl-benzamide gave rise to a fairly high blood concentration with low percentage of conjugation, and maintained a more steadier level than sulphanilamide. Further work on its urinary excretion (Bose and Ghosh, 1944) in human volunteers, has also shown it to be rapidly eliminated through the system. Brownlee and Tonkin (1943) have already observed its bacteriostatic effects *in vitro* against the intestinal pathogens. Considering its high systemic absorption and rapid urinary excretion, it was considered to be of interest to study its effect against certain cocceal infections of the body. The present paper deals with the result of treatment by sulphanilyl-benzamide against Type I pneumococcal infection in mice.

EXPERIMENTAL

The technique employed in assessing the therapeutic activity of the drug was essentially the same as described by Bose *et al.* (1941) in a similar paper on sulphamethylthiazole. The drug was fed to mice in a 5 per cent. aqueous solution of pH ca 8·2. The animals used weighed 20 to 22 gms. The activity of the drug was compared simultaneously with that of 2-(*p*-amino-benzene sulphonamido)-pyridine, which was taken as a standard. Two