1·20 g/l were the modifications to CNM medium. This medium resulted in luxuriant growth and heavy sporulation as compared to original one.

The saprophytic production of honey-dew secretions in the flasks was observed after 20 days of fungal growth. Initially one to two small colourless droplets were observed which increased in number (4 to 6) with the age, and started floating over thick mycelial mat. Colourless droplets turned pink to dark brown in colour after 25 days (Fig. 1). These secretions

FIG. 1. Showing the droplets of 'honey-dew oozing out from the fungus culture.

were found to contain a large number of conidia which germinated readily in water, producing germ tubes. Honey-dew obtained from the cultures also proved pathogenic and produced disease symptoms on HB-4 (new) variety when inoculated artificially[2]. In view of the above findings it is now apparent that honey-dew production is not only the consequence of parasitism but can also be formed saprophytically without any contact with the host tissues.

Department of Botany, University of Jodhpur, Jodhpur 342 001,
A. KUMAR.
H. C. ARYA.
March 25, 1978.

1. Arya, H. C. and Kumar, A., *Trans. ISDT and UCDS*, 1976, **1**, 177.
2. — and —, In *Biology of Micro-organisms*, Eds. H. K. Saksena, R. K. Grover, and K. S. Bilgrami, 1977 (in press).
3. Mower, R. L. and Hancock, J. G., *Can. J. Bot.*, 1975, **53**, 2826.
4. Murashige, T. and Skoog, F., *Physiol. Plant.*, 1962, **15**, 437.
5. Kumar, A. and Arya, H. C., *Proc. Symp. Plant Dis. Problems*, September 18-20, 1975, Udaipur.
6. Puranik, S. B. and Mathre, D. E., *Phytopathology*, 1971, **61**, 1075.

RESIDUES OF METHYL PARATHION, QUINALPHOS, PHOSALONE AND FENITROTHION IN/ON OKRA

AN attempt was made in this investigation to study the persistence of the newer and largely used plant protection chemicals methyl parathion, quinalphos, phosalone and fenitrothion in okra and to determine a safe waiting period for the consumption of the fruits. The investigation was conducted in okra (v. r. Pusa Sawani) during February–May 1977; the amounts used were: phosalone 0·70 kg ai/ha, quinalphos 0·50 kg ai/ha, methyl parathion 0·50 kg ai/ha and fenitrothion 1·00 kg ai/ha per spray. Each treatment was replicated thrice in a randomised block design. The crop was sprayed four times with a high volume knap-sack sprayer at 1000 litres/ha, commencing from the time of flowering at 15 days interval. There was 1·2 cm rainfall during February 1977 and after that there was clear sunny weather during the spraying and sampling periods. Composite fruit samples were collected at 1 hour and 1, 3, 5, 7 and 10 days after the last spray and analysed for the insecticide residues. Methyl parathion, quinalphos and fenitrothion residues were analysed by the method of Getz and Watts[2] and phosalone residues by the method of Anon[1]. The residues of fenitrothion, methyl parathion and quinalphos in the fruits were extracted with acetone and the extracts passed through a chromatographic column containing a mixture of celite, magnesium oxide and charcoal (1 : 1 : 1) as adsorbants. Phosalone residues in fruits were extracted with carbon tetrachloride and the extracts analysed by solvent partition technique. Half-life values (RL_{50}) of all the insecticides were calculated as per the method (Hoskins[3]). The results are given in Table I.

TABLE I

Residues of methyl parathion, quinalphos, phosalone and fenitrothion in/on okra fruits (ppm)

Days after application	Methyl Parathion	Quinalphos	Phosalone	Fenitrothion
0	10·50	5·50	7·42	3·76
1	6·72	3·85	5·30	2·51
3	4·26	3·20	4·26	1·86
5	1·95	1·50	2·72	0·72
7	0·60	ND	1·30	0·53
RL_{50} (days)	1·78	3·43	3·00	2·35
t_{tol} (days)	6·64	5·00	4·40	5·48
Tolerance level (EPA, USA)	1·00	2·00*	2·00	0·75

* The tolerance level has not yet been fixed by EPA (USA). However, a tolerance level of 2·00 ppm has been suggested by the manufacturer.

The initial deposits of all the insecticides were high and these dissipated to lower levels in subsequent days. Among the insecticides tried, only methyl parathion *recorded the highest initial deposit followed sequentially* by phosalone, quinalphos and fenitrothion but the half-life value was highest for quinalphos followed by phosalone, fenitrothion and methyl parathion in the decreasing order.

Pesticide Residue Laboratory,
Tamil Nadu Agricultural University,
Coimbatore-3,
March 27, 1978.

K. RAJUKKANNU.
K. SAIVARAJ.
P. VASUDEVAN.
M. BALASUBRAMANIAN.

1. Anonymous, " Phosalone determination centre de Rechercher Nilchlas Crillet (Rhone-Poulence) " (Private communication), 1973.
2. Getz, E. and Watts, R. " Application of 4 (*p*.nitrobenzyl) pyridine as a rapid quantitative reagent for organophosphate insecticides," *J. Assoc. Offic. anal. Chem.*, 1964, 47, 1094.
3. Hoskins, W. M., " Methods for expressing the persistence of insecticidal residues on plants, " *Final Reports*, Regional Project W-45, USDA, 1961.

AFLATOXIN B_1 FORMATION BY *ASPERGILLUS FLAVUS* ON THE GRAINS OF SOME COMMON MAIZE CULTIVARS

Aspergillus flavus Link ex Fries was isolated from several maize samples collected from Banswara District of Rajasthan during 1975 (Siradhana *et al.*[3]). This fungus produced aflatoxin B_1 on maize grains. Krishnamchari *et al.*[2] attributed deaths in Banswara and Dungurpur Districts of Rajasthan due to aflatoxicosis during 1974. It was thought desirable to know if aflatoxin B_1 formation varies on different maize cultivars under the same set of environmental conditions.

Fifty gram seeds of Ganga-5, VL-54, Vijay, Ganga Safed-2, Shakti and Moti Makka were sterilized in 100 ml Erlenmeyer conical flasks at 15 lb pressure for 20 min. Each flask was inoculated separately with 1·5 ml of spore suspension of *A. flavus* having 4×10^4 spores per ml. The flasks were incubated at $30 \pm 1°$ C for 20 days. The seeds so incubated were ground and sieved through 20 mesh. A sample of 25 g of the ground material was weighed and aflatoxin B_1 was extracted as described by de Iongh *et al.*[1]. Quantity of aflatoxin B_1 was calculated in each g of material as described by Omprakash and Siradhana[4].

Maximum aflatoxin B_1 formation was observed on Ganga Safed-2 followed by Vijay, Maharana, VL-54 and Ganga-5. On opaque (Shakti composite) aflatoxin B_1 formation was minimum (Table I).

TABLE I

Formation of aflatoxin B_1 by Aspergillus flavus *on different cultivars of maize incubated at* $30 \pm 1°$ *C for* 20 *days*

Cultivars	Aflatoxin B_1 in mg/g of grains
Ganga-5	17·17
VL-54	25·07
Vijay	35·72
Ganga Safed-2	48·08
Maharana	27·82
Opaque	15·45

Humidity plays an important role in the establishment of infection on grains in fields. It was observed that there was always more *Aspergillus* infection when the cobs were inoculated during *kharif* rather than during *rabi* and/or *zaid*.

In the areas where high rainfall and high humidity prevails after harvest, cultivars which support maximum formation of aflatoxin B_1 should not be recommended for cultivation. Maize materials which do not support formation of aflatoxin B_1 beyond safe limits should be utilized for breeding purposes. Enough work has not been done on this line.

Authors are grateful to Dr. H. N. Mehrotra*, Dean, Rajasthan College of Agriculture, Udaipur, for the facilities.

Department of Plant Pathology,
Rajasthan College of Agriculture, Udaipur,
April 1, 1978.

OMPRAKASH.
BABU SINGH SIRADHANA.

* Present address: Adviser, Bidhan Chandra Krishi Vishwa Vidyalaya, Kalyani (West Bengal).

1. de Iongh, H., VLes, R. O. and Vegel, P. de, *Mycotoxins in Food Stuffs*. MIT Press, Cambridge, Massachusetts, 1965, p. 235.
2. Krishnamchari, K. A. V. R., Bhat, R. V., Nagarajan, V. and Tilak, T. B. G., *Indian J. Med. Res.*, 1975, 63, 1036.
3. Siradhana, B. S., Dange, S. R. S., Rathore, R. S., and Singh, S. D., *Curr. Sci.*, 1978, 47, 59.
4. Omprakash and Siradhana, B. S., *Ibid.*, 1978, 47, 695.