TABLE II

Activities of PPO, PRO and IAA oxidase, average of three replicates

Sl. No.	Tissues	PPO	PRO	IAA-oxidase— IAA destroyed μg/ 100 mg f.w.
		Δ absor./min/100 mg f.w.		
1.	Young healthy	166·6±1	160·0±1	143·0±2
2.	Young gall	175·5±2	183·0±1	76·0±1
3.	Old healthy	150·0±1	167·0±1	110·0±3
4.	Old gall	185·0±2	185·0±2	83·0±2

phenolic inhibitors or protectors leads to hyperauxinity in the tissues and results in gall formation. Similar results have also been reported from our laboratory in *Zizyphus* gall tissues[2,3] *Sesamum phyllody*[7] and in other plant tumors[6,9,10].

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IN VITRO PRODUCTION OF HONEY-DEW IN *CLAVICEPS FUSIFORMIS* LOV.

EAR-HEADS of pearl millet (*Pennisetum typhoides* S & H) produce enormous pink to brown coloured exudation of 'honey-dew', oozing out between the glumes when attacked by ergot disease, caused by *Claviceps fusiformis* Lov[1]. The honey-dew of *Claviceps* spp. is a unique substrate for various insects and ants and helps in spreading the disease from infected earheads to healthy and disease-free florets[2]. Mower and Hancock[3] while studying the mechanism of honey-dew formation by *Claviceps* spp. observed that biochemical and biophysical relationships of sugar movement in ergot-infected plants lead to the formation of honey-dew. The host's sucrose is converted to fungal honey-dew through 'sucrose sink' with increased translocation in the direction of the parasite.

During the studies on the ergot fungus in cultures, the *in vitro* production of honey-dew was observed. Pure cultures of the fungus were raised in 100 ml 'Erlenmeyer' flasks containing 35 ml of solid Murashige and Skoog (MS) medium[4], using ripe sclerotia of the fungus. The sclerotia were surface sterilized with 0·01% $HgCl_2$ solution before putting them on the surface of MS medium. The flasks were incubated at 26 ± 2° C for 30 days. The cultures were purified by picking up hyphal tips manually[5]. One of the mono-conidial cultures so raised was multiplied after 25 to 30 days. The fungus was then maintained on modified calcium nitrate agar (CNM) medium[6]. Calcium nitrate, 2·0 g/l dihydrogen potassium phosphate, 2·50 g/l; magnesium sulphate, 1·25 g/l; maltose 2% and peptone

1·20 g'1 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.

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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.