TABLE I

Sl. No.	Name	Formula	M.P. °C	Yield %	Nitrogen % Found	Nitrogen % Calc.
1.	2:5-bis-(*p*-diethylamino benzylidene)-R.	$C_{34}H_{37}N_3O_2$	194	57·14	8·32	8·09
2.	2 : 5-bis-(2-methyl-4-N : N–dimethylamino–benzylidene)-R	$C_{32}H_{33}N_3O_2$	220	48·14	8·50	8·55
3.	2:5-bis-(2-methyl-4-N : N-diethylamino–benzylidene)-R	$C_{36}H_{41}N_3O_2$	178	43·4	7·47	8·18
4.	2:5-bis-(*p*-diethylamino–benzylidene)-R′	$C_{35}H_{39}N_3O_2$	223	29·41	7·64	7·88
5.	2:5-bis-(2-methyl-4-N : N–dimethyl-lamino-benzylidene)-R′	$C_{33}H_{35}N_3O_2$	214	29·09	8·34	8·32
6.	2:5-bis-(2-methyl-4-N : N–diethylamino-benzylidene)-R′	$C_{37}H_{43}N_3O_2$	173	66·03	8·61	8·23

R = 1 : 6-Dioxojulolidine. R′ = 8–Methyl-1 : 6-dioxojulolidine.

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ANTIVIRAL PROPERTY OF TEA

WHILE screening substances for antiviral property, we found that an infusion of tea leaves inhibits the growth of several species of enteroviruses in cell culture. Four different commercial brands of tea leaves or "dust" yielded similar results; therefore experiments with one brand are reported here. An extract wes made by adding boiling distilled water to tea leaves in the proportion of 3 ml to 1 gm, allowing to stand at room temperature for 1 hour, collecting the supernatant and passing through a bacterial filter. The pH was adjusted to 7 with IM NaOH.

Cell cultures were prepared from kidneys of bonnet monkeys (*Macaca radiata*) as described previously[1]. Undiluted tea extract was toxic to these cells; 0·1 ml of 1 : 2 dilution in cell culture maintenance medium (MM) was not toxic to cells in tubes containing 1 ml of MM. Strains of our stock viruses were obtained from the Centre for Disease Control, Atlanta, U.S.A., passed in cell culture and stored frozen in the laboratory.

Stock virus suspensions were diluted in serial decimal steps in MM. To one set of dilutions equal volumes of a 1 : 2 dilution of tea extract and to another parallel set, equal volumes of MM were added and all tubes were held at 4° C for 1 hour. Quadruplicate tubes of cell culture were inoculated with these mixtures and they were examined for cytopathic effect daily for 7 days. The resultant infectivity titres of control and tea-treated viruses, calculated according to a standard formula[2] are presented in Table I.

TABLE I

The effect of tea infusion on the infectivity titres of enteroviruses

Virus species	Infectivity titre of virus ($TCID_{50}$/ml) Control	Tea-virus mixture	Per cent inhibition
Poliovirus type 1[7]	10^7	$10^{6\cdot33}$	79
Poliovirus type 2	10^7	$10^{5\cdot33}$	99·98
Poliovirus type 3	$10^{6\cdot5}$	$10^{3\cdot66}$	99·86
Coxsackievirus B, type 1	$10^{6\cdot66}$	10^3	99·78
Coxsackievirus B, type 2	$10^{6\cdot33}$	$10^{2\cdot33}$	99·99
Echovirus type 7	$10^{6\cdot33}$	$10^{5\cdot66}$	78
Echovirus type 11	$10^{6\cdot33}$	$10^{3\cdot5}$	99·85

TABLE II

The effect of tannic acid and caffeine on the infectivity titres of enteroviruses

Virus species	Infectivity titre of virus ($TCID_{50}$/ml)			Per cent inhibition by	
	Control	Virus-tannic acid mixture	Virus-caffeine mixture	Tannic acid	Caffeine
Poliovirus type 2	$10^{7\cdot33}$	$10^{5\cdot66}$	$10^{6\cdot5}$	97·9	85
Poliovirus type 3	$10^{5\cdot33}$	$10^{4\cdot66}$	$<10^{2}$	78	>99·95
Coxsackievirus B, type 1	$10^{5\cdot66}$	$10^{4\cdot33}$	$10^{3\cdot33}$	95·4	99·54
Coxsackievirus B, type 2	$10^{5\cdot5}$	10^{3}	10^{2}	99·69	99·96
Echovirus type 11	10^{6}	$10^{3\cdot5}$	10^{5}	99·69	90

Seven species of viruses were tested and over 99·75% inhibition was observed with 5 of them. Two agents, namely poliovirus type 1 and echovirus type 7 were not inhibited to a similar extent. These results have been further confirmed in that the same dilution of tea extract completely inhibited 100 $TCID_{50}$ of each of the 5 sentitive virus species, but not poliovirus type 1 or echovirus type 7.

Commercial tea is manufactured from the tender leaves of *Camellia theifera* The main constituents of its infusion are caffeine, theophylline, theobromin, xanthine, tannic acid, gallic acid and certain fats and oils[3]. Therefore we examined if some of these compounds have antiviral property. Theophylline and theobromin did not inhibit the growth of viruses, but both tannic acid and caffeine were found to be antiviral. The results of experiments along the same lines as described before, but using tannic acid (0·1%, w/v) and caffeine (2%, w/v) instead of tea, are summarised in Table II. All the species of viruses inhibited by tea were found to be also inhibited to varying degrees by tannic acid and/or caffeine. Although tannic acid is known to have antiviral properties[4], we are not aware of any earlier reports of such property attributed to caffeine. Further studies are in progress.

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AN INDIGENOUS UV PHOTOELECTRON SPECTROMETER

IN this communication we would like to briefly report the successful design and fabrication of an indigenous UV Photoelectron Spectrometer for the study of electronic structures of atoms and molecules in gas or vapour phase. The spectrometer consists of a helium lamp, a 127° cylindrical secoor analyser and an electron detector. The helium discharge tube comprises of two water-coolel aluminium electrodes connected through 1·5 mm dia, 40 mm long quartz capillary[1]. Helum gas is introduced with a fine needle valve and pumped at the end of the discharge capillary. The lamp is operated by a 1·5 kV DC supply at 75 mA current to give HeI (584 Å, 21·22 eV) resonance radiation. HeI radiation is collimated to the photoionization chamber through a 1 mm dia., 30 mm lang Pyrex glass capillary. By reducing the gas pressure in the discharge tube, HeII (304Å, 40·8 eV) radiation could be obtained. The reaction chamber itself is a 6 mm diameter stainless steel tube connected to the reaction gas inlet and pumping system to maintain a gas pressure of about 1 mm.

The energy analyser system consists of 127° cylindrical sectors[2] (60·3 mm mean diameter, 60 mm long) separated by 12 mm. Slits of 1 mm × 10 mm