Table 1 *Field trial of Penfluron against the larvae of Anopheles stephensi*

	0·1 ppm				0·01 ppm				0·001 ppm			
	Larval instars				Larval instars				Larval instars			
	II	III	IV	Pupae	II	III	IV	Pupae	II	III	IV	Pupae
Pre-spray density	100	138	235	98	205	198	235	122	173	302	238	105
Density on												
Day 1	88	122	203	95	192	156	198	120	161	278	203	105
Day 2	82	105	168	95	156	122	133	118	138	205	183	105
Day 3	76	86	123	92 (All adults emerged)	103	106	102	118 (All adults emerged)	120	193	162	105 (All adults emerged)
Day 4	58 (29 D 29 M)	63 (12 D 51 M)	105		92 (29 D 63 M)	88 (18 D 70 M)	98 (16 D 82 M)		98 (25 D 73 M)	180 (18 D 162 M)	125 (3 D 122 M)	
Day 5	29	51	99 (36 D 63 M)		63	70	82		73	162	122	
Day 6	17	42	63		48	53	61		56	150	112	
Day 7	0	30	41		30	47	50		42	135	102 (3 D 99 M)	
Day 8		22 (12 D 10 M)	35 (35 M)		28 (17 D 11 M)	35 (6 D 29 M)	50 (50 M)		40	120 (1 D 119 M)	99	
Day 9	–	10	35		11	29	50		35 (4 D 31 M)	119	99	
Day 10	–	10	35		11	29	50		31	111	99	
Suppression (%)	100	93	84	7	90	85	79	3	82	63	58	Nil

D, Died; M, Moulted to next higher instar.

Chief, Insect Reproduction Laboratory, USDA, Agricultural Research Centre, Beltsville, Maryland, USA, for the gift of the compound.

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STUDIES ON NON-SPECIFIC ESTERASES IN THE OVARY OF INDIAN HOUSE SPARROW, *PASSER DOMESTICUS*

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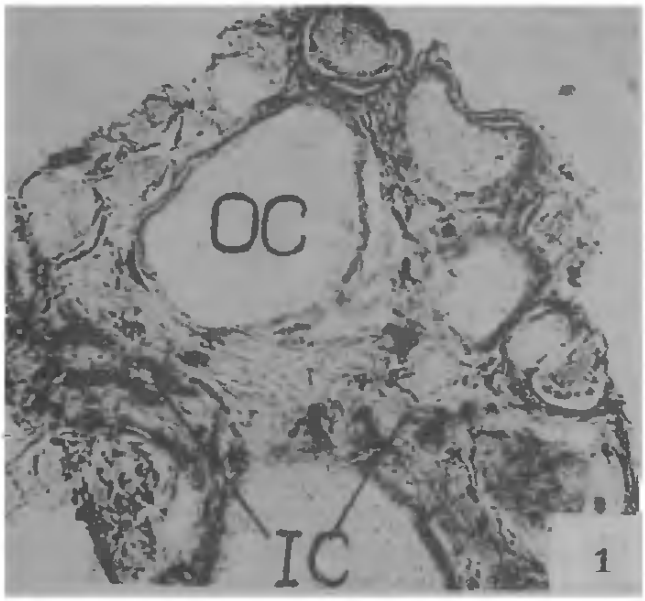
HISTOCHEMICAL localization of non-specific esterases in corpora lutea and its role in the catabolism of steroid precursors are well studied in mammalian ovaries[1,2], uterus[3] and also in non-gonadal sites such as nasofrontal glands of *Hipposideros speoris*[4] and the vaginal gland cells of *Cynopterus sphinx sphinx*[5]. However, there is no study on the lysosomal and nonlysosomal esterases in the ovary of sparrows. Therefore the present note

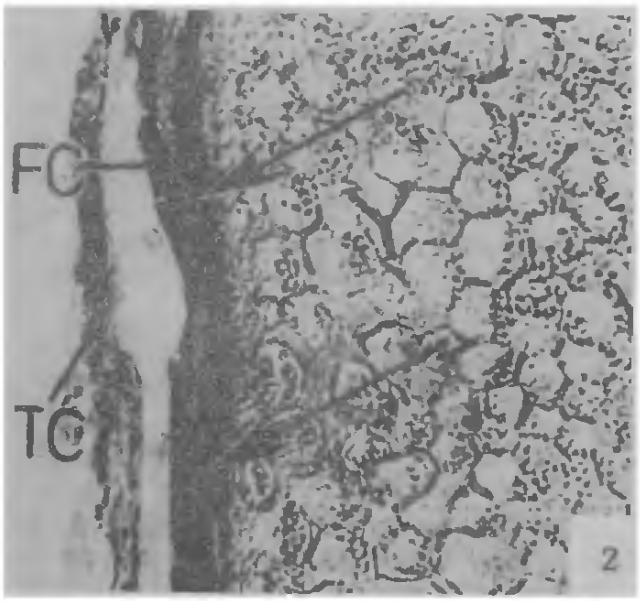
is concerned with esterases and their role in steroid secretions of the sparrow ovary.

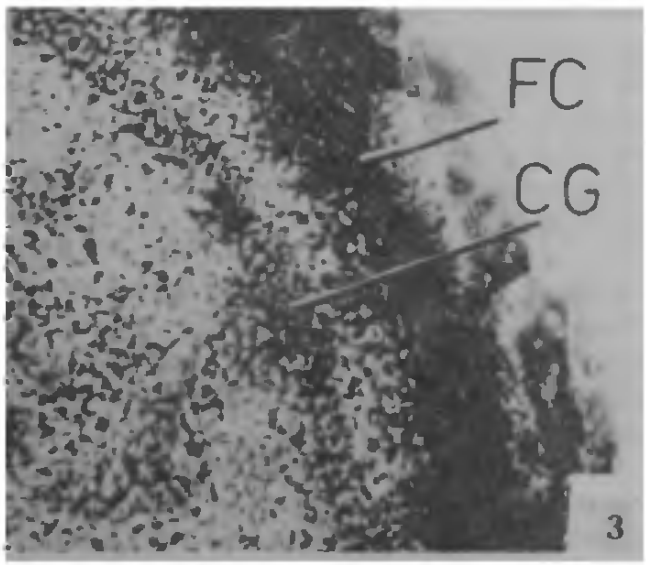
Adult female sparrows, *P. domesticus* were collected during their active breeding period (March–April) and also after post breeding period (May–June). The birds were sacrificed by decapitation and the functional ovaries were dissected out and fixed in cold (4°C) Baker's fixative for 24 h, and then transferred to Holt's gum sucrose[6]. The cryosections (5–6 μm) were washed in chilled distilled water (15°C).

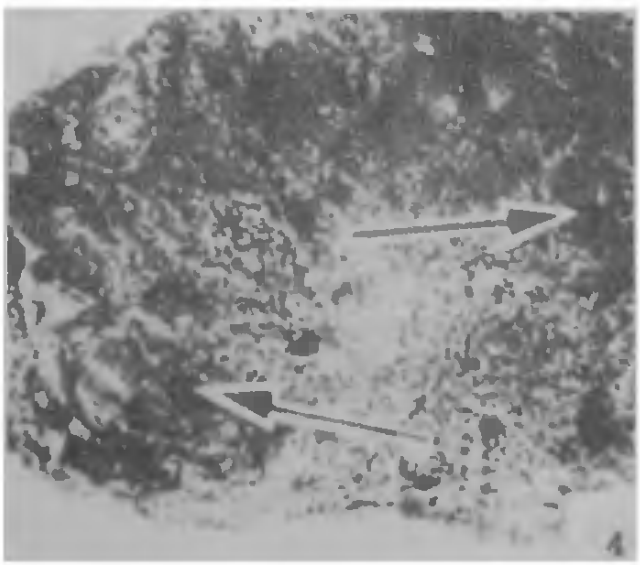
The following two histochemical techniques were employed for enzyme localization in the ovarian sections: (i) α-napthyl acetate (Sigma) as a substrate with Fast Blue B as a coupler[7], and (ii) 5-bromoindoxyl acetate (Sigma) as substrate with ferri-ferrocyanide as redox buffer[8]. Eserine sulphate (10^{-4} M) was used as an enzyme inhibitor.

An intense staining was obtained in interstitial gland cells, theca cells, follicular cells and in yolk spheroids of matured ovum (figures 1 and 2). Strong eserine-resistant enzyme activity was found in cortical granules and granules of follicular cells (figure 3). The eserine-resistant lysosomal esterase activity was also evident in the cytoplasm of atretic follicles of post-breeding ovary (figure 4).









Figures 1–4. Developing oocyte (OC) and esterase positive interstitial cells (IC); **2.** Esterase reaction in follicular cells (FC), thecal cells (TC) and yolk granules (Y) in part of mature ovum; **3.** A magnified part of the mature ovum showing strong eserine-resistant lysosomal esterase in cortical granules (CG) and granules of follicular cells (FC), and **4.** Eserine-resistant lysosomal esterase in atretic follicle (arrows).

Esterase positive interstitial cells were found in the ovary of the sparrow. Such types of cells have been reported in the ovary of *Bufo stomaticus*, *Rana pipiens* and *Rana cyanophlyctis*[9,10]. The neutral lipids have been studied in the ovary of sparrow[11] and non-specific esterases at the same locus play an important role in the breakdown of neutral lipids such as triglycerides or cholesterol which are supposed to be steroid precursors[3].

Thus, the present histochemical investigations demonstrate the steroidogenic site of sparrow ovary and the presence of non-specific esterases in different parts of the sparrow ovary. Lysosomal esterases have been implicated in ovum activation, nutrition and in lysosomal-mediated degeneration of atretic follicles[12,13].

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PHYTOSTERILANTS TO CONTROL THE COTTON BUG, *DYSDERCUS CINGULATUS* F.

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INSECTS and plants have undergone constant interaction for millions of years and many plants have developed a number of defensive chemicals. A large number of plant species contain natural bioactive materials which could be used as toxicants, repellents, precocenes, antifeedants, juvenile hormone mimics and sterilants to combat insect attacks. The advantage with these materials is that their use does not appear to result in the emergence of resistant insect strains to the same degree as with synthetic insecticides. Secondly, these natural compounds can form the basis for development of new pesticides if their structure-activity relationships are understood.

Several plant derivatives and crude extracts are reported to be active as sterilants against many insects[1]. Reserpine[2], Ursenyl palmitate[3], leaf and root alkaloids of *Catharanthus roseus*[4], Azadirachtin[5] and leaf alkaloids of *Adathoda vasica*[6] have been shown to possess significant bioactivity.

Bougainvillea (Nyctaginaceae) is a common ornamental garden plant which is never attacked by insect pests. It is probable that the plant has some built-in chemical defences to ward off insect attacks. Srivastava *et al*[7] found that the stem extracts of the plant exhibited juvenile hormone activity against certain insects. It was interesting to know whether the leaf extracts also possess any bioactivity which could be utilized against insect pests. Another natural product of interest was the seed extracts of *Abrus precatorius* Linn. (Papillionaceae). The seeds of this plant are reported to interfere with the ovulation of the human female[8]. It could possibly display significant reproductive inhibition against insects. These two plants products were therefore selected for detailed study against the red cotton bug, *Dysdercus cingulatus* Fabr. (Hemiptera: Pyrrhocoridae).

Bougainvillea leaves were shade-dried and three types of extracts were made in three different solvents: petroleum ether, acetone and water, using a soxhlet apparatus. The extracts were designated as BGV_1, BGV_2 and BGV_3 respectively. Similarly, *Abrus* seeds of the scarlet red variety were ground well and extracted with petroleum ether and sodium