Cytochemical procedures have been used to study the anterior pituitary gland (adenohypophysis) of the Kenyan fruit bat Eidolon helvum (Kerr, 1792) during various reproductive phases, which comprise preovulatory, ovulatory, delayed implantation and pregnancy phases. The main purpose for these histophysiological investigations is to identify adenohypophyseal celltypes whose hormonal secretions directly or indirectlyinduce delayed implantation in the fruit bat under study.

In a light-microscope study based on the size, shape and tinctorial affinities, six cell types have been identified in the adenohypophysis. There are three types of basophils notable for the presence of acid muccopolysaccharides in their cytoplasm, two types of acidophils notable for the presence of phospholipids and lipoproteins in their cytoplasm and the chromophobes which do not contain any stainable garnules. Periodic Acid Schiff's (PAS) reaction for carbohydrates has been used to distinguish between he basophils nad acidophils. All the PAS positive cells are referred to as basophils. PAS in combination with other dyes for example Alcian Blue have enabled further differentiation of basophils into three types, namely, type I basophil, type II basophil and type III basophil.

Two types of acidophil cells in which carbohydrates are absent w ere identified namely: type I and II by their negative reaction with Period Acid Schiff's technique for mucoid substances and positive reaction with either Orange G or azocarmine B ('Azan Stain). The precise differentiation of the two acidophils is achieved by employing Brooke's (1964) method for lipids. The sixth celltype which lacks stainable granules was identified as the Chromophobe. The basophils type I, II and III were identified as Thyroid Stimulating Hormone (TSH), Follicle Stimulating Hormone (FSH), and Leutinizing Hormone (LH) cells respectivelyo n the basis of their tinctorial affinities. The adicophil cell type I and II were identified as somatotrophs (STH cells) and prolactin cells (PRL) respectively. Further the hormonal assays of progesterone, LH and prolactin at various reproductive phases was carried out by Radio-Immuno Assays (RIA) and Enzyme - Linked Immuno Assays (ELISA). The level of progesterone hormone was highest during pregnancy 56.45 ng/ml and lowest at delayed implantation period 1.626 ng/ml. The level of prolactin hormone was highest (7.67 ng/ml) during the period of delayed implantation and lowest 0.89 ng/ml at pre-ovulatory period. The level of LH was lowest during delayed implantation period (2.08 ng/ml).

Electron microscopic (EM) studies on these cell types identified various cell organelles including nuclei, endoplasmic reticulum, mitochondria, ncleoli, Golgi apparatus, secretory vesicles etc. Six morphologically distinguishable cell types in the anterior pituitary gland of the female bat were identified.

These cells were designated as type I-VI (TSH, FSH, LH, STH, PRL/LTH and chromophobes) on the basis of their secretory granules and other cytoplasmic organelles.

When the female bats enter delayed implantation stage there is a remarkable rise in the number of granular prolactin cells (Brooke's method) with a concomitant depletion in the FSH and LH cells. These alterations in the adenohypophyseal cells are acoompanied by weight changes in the ovary and uterus.

These observations suggest the involvement of prolactin in inducing delayed implantation. Hyperprolactinaemia suppresses gonadal function, probably by a short-loop inhibition of LH/FSH release. The mean values of the numbers of various types of cells observed and hormonal assays of LH, progesterone and prolaction during the different reproductive stages were calculated and the relationship between them determined using the chi-squared in a large table and regression techniques (Parker, 1979; Gomez and Gomez, 1984). Consequently, for the mean (In) cell and the mean (In) hormonal values, the standard errors were calculated.

In E. helvum implantation occurs roughly 90 days after conception. During delayed implantation period the conceptus develops only as far as the bilaminar blastocyst stage. During this period, conspicuous changes occur in the endometrium, lining epithelium, and glands of the uterus.

The reason for such a long delayed implantation period (±90 days from the zygote until implantation during the bilaminar blastocyst stage) can only be to ensure that the juveniles will leave the maternity at a time which coincides with the higher reainfall peaks when availability of fruits is at a maximum (Mutere, 1967). Moreover, since implantation is considered a promising target for contraception, the present study might help in future to define targets of attack for the development of new contraceptive agents for human use and welfare, taking into consideration the role of prolactin in both male and female subjects.