CHAPTER VI
OCCURRENCE OF CATARACT IN ROOF RATS (RATTUS RATTUS L.)

INTRODUCTION

The term cataract is used to mean the occurrence of an optical discontinuity in the lens of such magnitude as to cause a noticiable dispersion of light. In a more restricted sense it is an accumulation of irreversible coagulated lenticular protein. The begining of true cataract may be very insidious; thus the alteration in protein during cataract formation may present so many variations in morphology and be the result of many kinds of physical and biochemical disturbances.

In Aligarh city, the 'roof' rat, Rattus rattus L., is a serious pest; infesting a wide variety of habitats like godowns, hotels, flour-mills and residential buildings. Over the years, the rats have been live trapped in wonder traps and autopsied in our laboratory for other behavioural studies. During autopsy, some of them have been found with glassy eyes.

As a matter of routine, heads of all such rats were severed from the trunk and preserved in 70% alcohol with notes on data, place of capture, weight, sex, etc.

The rats found with defects in the eyes having been diagnosed as 'cataract', a detailed description of it is given here.
METHODS

The heads of all 46 rats with glassy eyes were taken to local Institute of Opthalmology for detailed examination. All eyes were examined on a 'slit lamp' (Model 900, HaasG-Strutt, Bern, Swiss made).

Condition of 'Cornea' and of 'lens' in each eye was noted separately.

Prevalence of the disease according to sex, body weight or age of rats, was analysed afterwards.

RESULTS AND DISCUSSION

The rats with glassy eyes were trapped mainly from 'Raja' Restaurant and a few shops nearby in the busiest part of the city; that is from only one of the total seven localities tried (Fig. 16). Most such rats were also trapped in the first trapping period, from February to May. Thereafter rats with defective eyes were only occasionally found in the span of four years of trapping period. None were ever trapped from any other locality.

In the first sample of 234 rats, 46 rats (19.6%) had glassy eyes; 30 of them were females (22.0% of total females) and 16 were males (17.7% of total males). Only one eye was affected in 8 rats (17.4%) and both eyes in 38 rats (82.6%)
Fig. 16

The figure represents the locations from where the rats, *Rattus rattus* were trapped. The rats with glassy eyes were trapped mainly from Raja Restaurant and few from shops denoted by the encircled black dots in the map.
Over the subsequent years, the number of affected rats was less than 1% of the total. All were adult females.

The histogram (Fig. 17) gives the weight distribution of rats of the first sample with glassy eyes. Apparently rats of all weight-groups were affected. Occurrence was not confined to rats of any particular age.

The glassy appearance of eyes, was detected by 'slit-lamp' examination that condition of cornea varied widely from 'cloudiness' to complete 'Opacity'. The opacity may have been developed due to decrease in the percent of water and by an increase in the percent of protein, a senesence change. Apart from this, many physical and chemical changes then follow affecting the active metabolism of the cells and results in accumulation of pigment and alteration in the lens (Watson, 1950).

The lens in almost all cases examined was, however, found completely 'opaque' with no parasite or inclusions in vitreous or aqueous humour. The diagnosis of cataract was, therefore, confirmed. Accordingly, the rats with glassy eyes were fully blind when trapped.

As the city habitats provide optimum condition of living to rodent pests (Watson, 1950; Spillet, 1968), they are found to survive even gross physical infirmities as loss
Weight distribution of the rats, *Rattus rattus*, of the first sample with glassy eyes. The rats of affected weight-groups are indicated by the darkened portion of the figure.
of limb (Barnett, 1958). The present observation shows that loss of vision likewise in 'roof' rats, does not affect their normal life or survival.

It would appear that occurrence of 'cataract' was noted in a busy locality over-crowded with rats. Removal trappings, therefore, resulted in marked reduction of the disease. Probably competition for limited resources of food, had earlier resulted in malnutrition. This probably caused the spread of 'cataract' in the population. Diets deficient in aminoacids are thus known to produce 'cataract' in laboratory rats (McCoy, 1962).

Although there are no such records of wild rats, specially the urban rats which eat large amounts of garbage and are healthier than rural rats (Davis, 1940); deficiency diseases as 'cataract' may yet occur in populations that outgrow their food supplies. Our observations fully prove this.

**SUMMARY AND CONCLUSION:**

In a live trapping of 'roof' rat, *Rattus rattus* L., many rats were found with glassy eyes. Detailed examination showed the prevalence of cataract in the population; which declined, however, because of removal trapping over the subsequent years. Deficiency disease as 'cataract' may yet occur in populations that outgrow their food supplies.