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# HOME RANGE AND GROWTH RATE OF FRINGE-TOED SAND LIZARD *(ACANTHODACTYLUS CANTORIS CANTORIS)* AT HAWKSBAY AREA, KARACHI.

**HAFIZUR REHMAN, SYED IFTIKHAR AHMED & SHAMIM FAKHRI**

***Zoological Survey Department, Government of Pakistan, Karachi.***

**ABSTRACT** : - Hawks bay area is an important breeding ground of Fringe-Toed sand lizard *(Acunthodoctylus Cantoris Cantons).* This work was intended to study the habitat, home range and growth of the species. The study was based on 48 visits. During the whole study period 240 specimens of *Acanthodactylus Cantoris Cantoris* were captured to find its home range and growth rate. The recaptured specimens were also examined from time to time.

**KEY WORDS:** Reptiles, Lacertidae, Sindh, Pakistan, ecology & biology.

**Introduction** : This study of the family Lacertidae has not been done by any research worker previously. In July, 19981 initiated the study of the common Indian Fringe-Toed sand lizard *(Acanthodactylus Cantons Cantoris)* at hawksbay, Karachi, Sindh. This study was continued up to June 2000. The results of two years of the work are reported here as final result,

**Material and Methods:** The entire study was restricted to Hawkesbay area on N-W side along the sea-shore (a distance about two Kilometer). The study area was purely sandy with scattered xerophytic habitat in which grass and Acacia species were dominant.

All specimens were captured by me and the staff of the Department who walked along the edge of plants and captured the individuals by hands. Each captured location was later checked, photographed and notes were made on local habitat, with temperature from the exact places where Indian Fringe-Toed sand lizard were first seen. The anal temperatures of the specimens were also taken by electronic thermometer in the field immediately alter captured. Few specimens were taken for the study in the laboratory of the Zoological Survey Department, Karachi, and Sample of the insects were also taken from the study area in each visit. Sex of each lizard was determined utilizing the presence of the male reproductive organ or not. This organ can only be readily seen when the specimens are captured.

Each specimen was also measured - both the total length and specially the snout to vent length. Measurements were taken by measuring tape. Each specimen was weighed by spring balance, to the nearest gram. A note was made whether the specimen was shedding its skin or not. The time of the day, each lizard caught, also noted. All lizards were permanently marked by a toe clipping method that would allow identification of individual animal at some future time. This was important for information on both movements of individuals animals, and for future data on growth. Almost all lizards so handled were released in their home area within a maximum of half an hour after initial capture.

The study area was visited twice in a month, for a total 24 times in a year. The crew consisted of three persons who performed all the measurement etc, needed on the specimens captured in the field and also obtained considerable information regarding the seasonal abundance of insects on the sand dunes as well as under the bushes of the study area. These data help to find out comparisons of the type to obtain seasonal variations. Usual arrival time at the side was 8:00 A.M. and the work was generally finished by 6.00 P.M. (7 Hours).

**Results and Discussion:**

The following tentative results are based on 48 visits or total man hours efforts of 336 Hrs. About 240 specimens were captured with 52 specimens recaptured recorded in two years (about 22%). These individuals were found on the side almost every time we visited the area, and their exact location and exact position was plotted and noted each time.

**Time of Capture:** Information from the site show that individuals wake as early as 7.00 A.M. However our records do show that the peak activity period during March-October at hawkesbay area is at 9-10 hrs. Though there is a slow and even build up in activity from the morning to this maximum period, there is a sharp drop between 11 to 16 hrs that can correlated with the rapidly ambient temperatures close to the ground surface at this tune of the day. Thus high noon and after noon temperatures result in significantly reduced activity.

There is some evidence in my data that there is also a slight peak in the late after noon (probably at about 1700 hrs.) for our records show the possibility of increased activity at that time-after the heat of the day has passed. The histogram (Fig. 1) provides the data currently available for activity period of the Hawkesbay individual.

**Sex Ratio:** My result shows that there is a balanced ratio of 1:1 for males and females. Out of 240 specimens there are 118 males and 122 females providing a calculate ratio of

Overall Size Range**:** The parameter selected for determining size is the snout to vent length (SVL). The reason for using this measurement rather than snout to tail is that the tail tips are often missing in adults specially females. Thus the measurement SVL is much more accurate and can be obtained from every individual regardless of injuries or losses. The average size of all individuals at Hawkesbay is 65.5 mm (N-240), with males significantly larger than females (average male SVL 67.3 + 3.3 mm. average female SVL 3.9 ±3.3 mm). The frequency distribution curves for SVL for both the sexes are normal, suggesting no abnormal predation at any size in these class sizes of the two sexes at Hawkesbay. The study also shows that males obtained a greater SVL than adult females and the females will only breed with large male able to manipulate the females during courtship. Thus large size in male is apparently adaptive and important in breeding.

**Weight:** Overall range in total weight at Hawkesbay is 6.0-10.5 gms. The average weight is 7.4 gms (N=240). As expected, males are heavier man females (average male weight 7.4 +1.1 gm; average female weight 6.0 + 0.9 gm). These weights are equivalent to what would be expected in animals of similar length in other habitats, so that the Hawkesbay population is normal in respect of length/weight ratios.

**Density:** The total distance included in the study at Hawkesbay is 2km. along the border of the sea shore, in which 240 individuals have been taken. As sufficient data are avail able in the study area so more sophisticated analysis method has been applied. It is concluded that there are 40 Indian Fringe-Toed Sand Lizards (adult) for every 0.125 km. Since adult Indian Fringe-Toed Sand Lizards studied in other areas have a normal activity range of about 35-40m. However the density at Hawkesbay is greater than most other areas studied probably because of high food density.

**Growth:** 54 (22%) adult in individuals were recaptured so far during the study at Hawkesbay. The growth is recorded at least after every month of first time captured. The growth of each recaptured individuals was found to be increased from 5-6 mm. (S VL) in its original length in one month or about l/6mm or 0.16 mm per day which is the normal growth of a lizard provided the food resources is high. The growth variation in different seasons of the year has been calculated which is different due to utilization of fat during hibernation period. In the same way the weight of each recaptured individuals was found to be increased from 0.2-0.3 gm. per month i.e. in 30 days or about 0.01 gm per day. For adults the growth in length, compared to increase in weight ratio is about 0.06gm/mm. which is approximately what has been described in adults of other lizard species of similar body proportions.

My future study regarding the food and feeding habits of this species at the study site will add more valuable information regarding the reason of growth. The comparative nutritional and caloric values of different insects found in the gut contents of this species helped to get the best conclusion about the growth of this species in different period (dry and the wet seasons) of the year.

**Annual Movement Patterns:** Data from Hawkesbay clearly shows that Indian Fringe-Toed Sand Lizards may be moving about during almost every month of the year. However, it is clear that December and January show least movement of these lizards in the field than all the months sampled so far.

During December and January, some individuals were found in borrows; a few were seen moving about over the surface; some were seen basking in the sun next to their borrows. However during the trips of the middle of December through the end of month, and again from the middle of January through the first week in February very few lizards were seen or found at all. It is anticipated that activity begins to increase again during the last half of February and especially during the month of monsoon (July-August), when breeding, egg laying and abundant food all contribute to a high sighting ratio.

**Fortnightly to Monthly Movement Patterns:** These records are based on recaptures of marked animals. It has been observed that the most Indian Fringe-Toed Sand Lizards remain in more or less certain areas and not wandering over the entire area. Farther analysis of this preliminary information suggests that males move significantly farther than females. This may be related to their generally greater size or to their sex.

Average home range of females is significantly smaller than that of males (females average 12m; males 25m). This variation of averages of both groups suggests that males are more variable in the size of their home ranges man females. However, the present data shows that home range of the males is significantly larger than expected on the basis of the lizard size, and this is undoubtedly related to the tendency for adult males to wander

farther than females at all times of the year and under all conditions.

Considerably more work on comparative movements of males and females has been conducted on the information of body temperatures of the lizards. The comparison between body temperatures of both sexes establishes that males, in their greater wandering, are thus subjected to greater fluctuation in body temperatures and females, perhaps because of their contained eggs, tend to avoid as great temperature extremes.

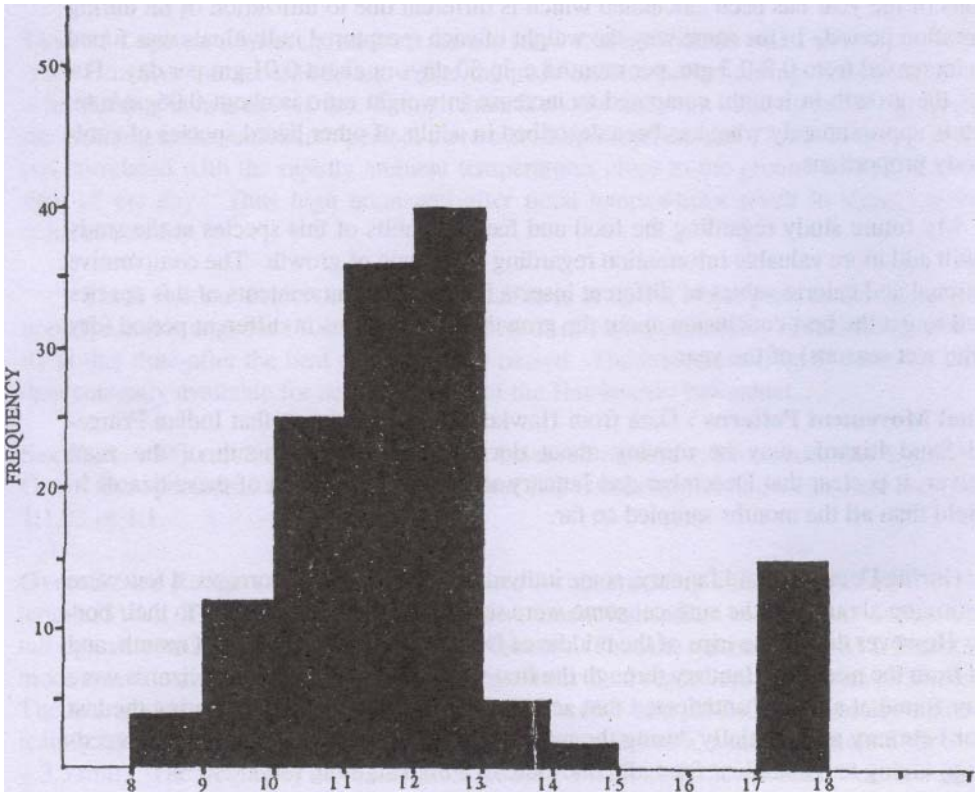


**Fig. 1. Histogram showing activity period.**

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