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**STUDY OF THE ECOLOGY OF SOME ENDANGERED SPECIES
OF WILDLIFE AND THEIR HABITATS**

Ecology of the Lesser Florican (*Sypheotides indica*)
and the Bengal Florican (*Eupodotis bengalensis*)

Project No. 8851-658-04

THE LESSER FLORICAN IN SAILANA (M.P.)



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OBSERVATIONS ON LESSER FLORICAN BEHAVIOUR

INTRODUCTION

One of the species identified for detailed study under the Endangered Species Project of the Bombay Natural History Society is the Lesser Florican (Sypheotides indica) whose present status is a cause for concern and whose ecology is little known. During the monsoon of 1984, some of the previously explored grasslands of western M.P., the Kota and Bhilwada regions of Rajasthan, and the Shivpuri district of Northern M.P., were surveyed and studied between August 21 and October 10.

An examination of recent reports, (Yahya 1982, Gupta 1983 - unpublished reports) showed that patchy areas existing as "unprotected" private grasslands seem to hold a larger number of floricans than the protected areas of the Forest Department. One such protected area, Sailana Kharmor Sanctuary was selected for intensive study (as suggested by earlier teams (Yahya 1982, Gupta 1983) in order to study the florican in its natural habitat. This was timed to coincide with the breeding season and was accompanied by a survey of other unprotected and protected areas in the vicinity.

STUDY AREA :

Sailana Kharmor Sanctuary, declared as such in June 1983, lies on the Tropic of Cancer on latitude $23^{\circ}27'N$ and longitude $75^{\circ}E$ covering 354.570 hectares of grassland and grazing land including some patches of crop fields, along and within its boundary. (See Map).

Floricans in Sailana thrive in a pure grassland habitat dotted with Butea bushes, less than one metre high (Average height of 168 Butea bushes = 52.43 cm). Six gently undulating low ridges gradually slope down towards a reservoir, Gordhansagar, with the ruins of the Ex-Maharaja's hunting lodge on its banks. Its dam forms one of the borders of the sanctuary and this area is called Shikarwadi.

The grassland sanctuary is bounded by three villages Sailana, Adwanya and Gordhanpura and their grazing lands and crop fields. The whole area of 354.570 hectares is now jointly owned by the villagers and is called Naulakha grass 'beed'. This is maintained solely for hay production.

In this habitat there is very little human disturbance in the grassland areas except for a few graziers on their way to the grazing grounds in the Shikawadi area. One main cart-track cuts through the grassland linking Sailana with Dhamnod village.

An observation tower outside Sailana gives a birds-eye view of the whole area.

Some of the dominant taller grasses of the region are Pseudanthesterea, Iseilema antheboroides, Cymbopogon martini, Chrysopogon fulvus, Heteropogon contortus, Apluda mutica and others. Wild rice, Oryza rufipogon, grows in watery ditches, and in lightly disturbed areas, Brachiaria, Eragrostis, Digitaria spp, Setaria spp. Bothriochloa, Dicanthium sp. Aristida funiculata, and many others grow as shorter vegetation. A few Phoenix palms grow along the streamlets running between the ridges to the reservoir. A single species of ground orchid, Habenaria marginata occurs here sparingly in the monsoon.

Animals occurring here are very few and include Indian foxes (Vulpes bengalensis), reptiles like black cobras (Naja naja oxiana), Striped Keelbacks (Amphiesma stolata) Monitor lizards (Varanus Sp), Agama minor, Calotes, and some others, besides toads (Bufo melanostictus) and fishes in the reservoir.

Birds of a grassland ecosystem - harriers, larks partridges and quail are plentifully seen (See Appendix Bird List).

Insects of this ecosystem include abundant grasshoppers and blister beetles (See Appendix Insect List)

STUDY PERIOD :

I. Total study trip time.	50 days
Total survey time (New areas)	7.5 days
Total travel time	4.5 days
Total time at known areas other than Sailana	7 days
Total non-field time (plant-pressing, writing work etc.)	2.5 days
Total time spent at Sailana Sanctuary	28.5 days

II. Sailana K.S. : Field days : 28.5

Mornings: 30 a) Display seen : 25 Mornings
b) No display seen : 5 Mornings

Evenings: 27 a) Display seen : 13 Evenings
b) No display seen : 14 Evenings

Total display time Calculated. :-

a) For 10 birds at Sailana } 59 hrs 41 min.
b) For 1 bird at Sardarpur. ,

Total field time including surveys in known and new areas.

264 hrs 35 min.

CLIMATE :

The weather varied from very overcast, rainy and windy to hot, sunny and windless days. Floricans were recorded displaying under both conditions and preferentially during mornings.

The temperature varied between minimum 20°C to max 40°C. Humidity showed considerable fluctuation between 46% to 70% with highest humidity recorded when rain laden cool winds swept across the grassland and lowest recorded with absence of morning dew in the grasses, following a spell of sunny weather.

Wind direction was found to vary with the time of the day and its velocity decreased as the weather become increasingly sunny. Wind direction and velocity seemed to be important factors in the display of the male florican. (More studies will be done in the next breeding season to find the correlation between the weather and the display).

METHODS :

General field observations were carried out with the aid of binoculars (7x35, 8x40) and SLR cameras were utilized in taking photographs of the habitat and of displaying males observed from a hide. A telescope (- x -) was utilised for a short term almost at the tail-end of the display season and yielded some of the best observations. The whole sanctuary was surveyed on foot and a rough map was drawn with approximate numbers of males and females plotted on it.

Whenever a male was spotted, observations were made on his display-jumps most of the time and any other behaviour noted if and when expressed. Observations were made at a distance of about 300 m from dawn (about 06.00 hrs) to late afternoons and evenings (till after sunset) during the active period of the floricans.

Floricans displayed about 300 m from each other and hence from a vantage point, with the most easily visible male as the focal animal, jumping frequencies of as many as four other males could be recorded at a time. This was possible only when the telescope was available. Thus detailed notes were made on the activities of the visible floricans.

A hide was utilised for the purpose of getting photographs of the displaying male as well as for behavioural observations.

A collection of the local flora and insect fauna was also made and crop-pattern of the area noted.

A list of birds of the area was made and a weekly census of the birds and insects carried out to give more information about the area. Both grassland and grazed land were censused for insects. Daily record of temperatures and humidity was maintained to enable study of climatic factors affecting the local florican populations.

Female and immature floricans were recorded whenever observed and details of voice and calls made.

No intensive search was undertaken to find nests and eggs of floricans since walking through grass involved creating very visible trails and the danger of their being used by predators like foxes and lizards.

For territorial studies, the following were measured for five birds:-

1. Number of jumping spots.
2. Distance between jumping spots (arenas) used by males.
3. Distances between territories occupied by each male.
4. Number of Butea bushes around each arena.
5. Distance of bush from the arena.
6. Height of bushes surrounding the arena.

Two birds were ringed with metal bands and their wings dyed to ascertain feasibility of ringing and colour-marking for future studies.

OBSERVATIONS ON LESSER FLORICAN BEHAVIOUR :

At least fifteen birds were definitely noted in the sanctuary. Of these, eleven were identified. Five were studied more intensively, five less intensively and one not at all. One male was observed for over two hours at Sardarpur on September 9. Sailana males were identified by the ridges they occupied as shown below:-

<u>RIDGE NUMBER</u>	<u>IDENTITY OF MALES</u>
Ridge 1	1A
Ridge 2	2A, 2B, 2C, 2D, 2E.
Ridge 3	3A, 3B, 3C.
Ridge 4	4A
Ridge 6	6A

Male 2D, the male on ridge 5 and the three males in the plantation area at the south-eastern corner of the sanctuary were not studied.

TIME OF DISPLAY :

Floricans were observed displaying from as early as 7 mins before sunrise, at 06.08 hrs (September 26-4A) to as late as 40 mins after sunset at 19.00 hrs (September 11-2C) Males 2B and 2C were also observed displaying till noon (September 12) while 3A was displaying even 1.45 hrs later, when the sky was partially overcast-to-sunny (September 14).

In Tarkhedi, Sardarpur, in a flat cultivated habitat, the two males observed from one spot on August 24, were still displaying at 19.15 hrs.

Towards the end of the breeding season, by September 26 increasingly warm weather reduced the display intensity and even the few displaying males were seeking shelter under nearby Butea bushes as early as 08.00 hrs (4A and 6A were the only two displaying males after this date).

In general males were observed displaying every day from morning to evening, and with decreased intensity in the afternoon when the sky was clear.

TERRITORIALITY :

All breeding males occupied territories 300 - 500 meters from each other where they stayed throughout the day foraging occasionally. Early mornings were probably utilised for more intensive foraging since males were seen occasionally flying into their territories at this time and then begin displaying. Thus,

- (a) On September 18, at 07.55 hrs, male 2B came flying from the west, flew over 2C and settled in his own territory, beginning display 20 mins later at 08.15 hrs.
- (b) On September 19, male 2C was noted flying into his territory from 3A's area to the south at 08.02 hrs. and begin displaying immediately on alighting, at 08.04.
- (c) On September 22, 2B was noted flying into his territory from 3A's direction (S) as late as 08.55 and after one alarm-like call in mid-air, landed and began displaying immediately.

In case of any disturbance, a male would temporarily leave his territory, alighting on another's area to feed for a while, and then walk or fly back to his own area. Thus,

- (a) On September 9, in Sardarpur, near Dhulat village a male was selected for ringing. His behaviour was recorded as:-

07.15 : On the trappers approach to locate his arena, he skulked but did not fly off. Trappers came back.

07.22 : He resumed display on his arena facing the west wind.

07.55 : On the approach of two observers, he flew off NW, landing about 200 m away, in tall grass.

08.25 : He was observed creeping back steadily.

08.28 : He resumed display.

09.15 : When flushed again he flew off again NW and settled in the grass about 150 m away. The trap was laid and trappers came back at 09.35.

09.45 : He resumed display a little N of the original spot. We failed to trap him, but watched him display till 10.45 unconcerned by the presence of a dog and later 2 men passing about 50 m behind him. He eventually moved away east and was observed foraging.

10.45 : He ducked and hid when an observer walked past him and did not appear again even after 30 mins.

(b) On September 13 in Sailana at 10.00 male 2B, flushed by a Marsh Harrier flew west towards 2C's territory, swerved 180° into the breeze and alighted about 100 m from a displaying 2C. He did not run on landing but sat facing the ENE wind. After foraging for a few minutes and walking gradually about 10 m in the direction of his own territory he flew back to his arena. Just before landing he assumed the display posture in the air with chest fluffed out, legs almost tucked and neck held back like a duck's. Vigorous display followed immediately (10.10 hrs).

(c) Two hours earlier, at 08.10, 2A was seen to fly about 50 m south, when flushed by a grazier and land in grass, ahead of the cattle.

(d) On September 20, on ridge 2, at 07.00 we flushed 2A, who flew to 2B's area to the North. Five minutes later from ridge 3, we watched him fly back to the same spot, which was 5 m from the main cart-track.

(e) On September 27, male 4A left off displaying at 17.45 and flew into a jowar field about 200 m away, when we approached his area to put in stakes for measurements. In less than 5 mins he attempted to come back while we were still there; but instead of flying off he sought refuge under a Butea bush about 40 m from us. On our moving away some distance, he rushed to his spot, and resumed vigorous display.

All male floricans, showed a very strong territorial drive and in their natural habitat it was hard to really disturb them. They took disturbances very casually, not flying more than 200 - 300 m away. They seemed even more unafraid in crop-field habitats near villages as observed in Sardarpur. In fact, they flew longer distances during foraging trips (as evidenced from flight height). We never had a single encounter when a florican flew away and disappeared. Otherwise throughout the day they never left their territories, appearing predictably where expected. Further evidence of florican territoriality was provided by the 2 males ringed by us on September 6 and 7 at Amba, near Sailana.

Both males had been captured shortly after setting the traps and in both cases they did not fly off while the trap was being set. They merely skulked through the grass for about 200 m as we watched them. Both ringed males were found displaying normally in their own territories when observed over a period of almost a month following the ringing.

SOCIAL BEHAVIOUR :

All males observed throughout the study period were solitary. They did not have any encounters, though they maintained territories within the hearing of other males.

At Sailana 4 to 6 males would be in close proximity and all would erupt almost simultaneously into frenzied display-jumps at the sight of a female florican flying overhead (September 12, 07.20). When the female happened to land between two territories as on September 19 at 11.15 at the edge of a soyabean field, she not only set 4 males displaying but the closest two came towards her to the extreme limits of their territories, still displaying but not leaving their respective territories.

Even the immature or non-breeding male observed on September 11, at 17.45 showed no interest in the displaying 2C in whose territory the former was foraging for more than half an hour not more than 20 m from 2C. We watched it forage unconcernedly till it disappeared from view.

Many of the floricans observed were visible only when they displayed. When on the ground usually only the head and neck were visible. Only two birds 3A and 3C were watched for longer periods while out in the open.

On August 23, male 3A was watched from 08.00 - 09.00. During this period he displayed only twice but spent much

time in resting, with tail cocked for drying and head on back, or standing quietly or foraging leisurely and occasionally preening.

In four observations of 3C in late September, foraging, display, preening and wary behaviours were watched using a telescope.

In both cases birds were in short grass and kept tails cocked until the dew and rain on the grass dried off. Male 2C was observed in more detail only when a hide was used.

In spite of their wariness, two of the males, 2A and 2B had territories with cart-tracks passing very close to their jumping arenas.

DISPLAY BEHAVIOUR OF ADULT MALES :

Of the 28.5 field days in the Sailana Kharmor Sanctuary (SKS) floricans were observed displaying on all but 5 out of the 30 mornings and on 13 out of the 27 evenings spent there. Morning as well as evening display was observed from the day of our reaching Sailana, August 21, upto September 22. Thereafter, excepting September 27, only morning display was recorded for the last 2 displaying males, upto October 5, after which not a single bird was found displaying anywhere in the sanctuary. October 10 was our last field day.

Display was noted from the mornings through afternoon to evening in the study area at the height of the breeding season. In the mornings display was observed from about 25 mins after sunrise upto 5.45 hrs later during the day, extending upto 45 mins after sunset in the evenings.

On September 26, male 4A began display as early as 7 mins before sunrise while earlier, on September 14, male 3A was displaying as late as 13.45 hrs in the sunny afternoon.

Detailed information on jumping males was obtained for 10 birds in Sailana and 1 bird in Sardarpur (Chadawat male).

WEATHER CONDITIONS DURING DISPLAY PERIOD :

Floricans were most actively displaying and in larger numbers till September 24 during which time weather conditions were mostly rainy, windy and overcast to partially clear. Within 3 to 4 days of continuous sunny weather number of displaying birds decreased suddenly and under continued hot, bright, conditions only 2 birds displayed - one on ridge 4 and one on ridge 6.

At the end of 14 days of sunny weather, from September 20 to October 3, only one male 6A was still active. After October 4, no male was seen or heard displaying in the entire study area.

A favourable change in climate was noted again for a period of 4 days from October 6 to October 9 during which the sky was very overcast and floricans were expected to resume displaying, but in spite of combing the study area not a single bird was seen.

There was evidence that the birds had not left the area because recently moulted feathers were found on more than two occasions on the cart-track on ridge 1.

During the active period overcast skies were accompanied by strong to mild winds which turned to light breeze as the weather became increasingly sunny. Wind changed direction very often and a particularly strong wind at night left all the tall grasses thoroughly flattened, making it very difficult to walk through. Only Chrysopogon ~~sp.~~ Cymbopogon martini and some Heteropogon contortus were left standing, and the lone displaying male 6A was using a small patch of grazed grass about 5 m in diameter (September 30). The only other floricans seen were in flight.

Humidity showed an unsteady decrease coincident with slowly increasing temperature. The morning of October 6 was the 1st day when there was no dew at all on the grass.

Though many of the observations were during cloudy overcast days the weather normally cleared by the afternoons and the floricans continued their display. On 17 out of 24 observation periods, males performed between 10.00 and 12.00 noon. On September 14, male 3A was watched at 13.45 displaying for an hour and was continuing when we left.

By the time the weather cleared grass had shot up to about 1.5 m in height and this had a definite impact on the displaying males.

Birds displayed normally even during the wettest period and 2 males, 3A and 3C were noted holding their tails cocked until dry (August 23, September 21) but once grass height increased over a meter they did not display even under the most favourable conditions.

DISPLAY :

Often, after a probable foraging trip a male came flying to his territory, to land near his jumping arena. He stood still, without crouching and running, and looked around before moving into his jumping area. Normal display was resorted to almost immediately.

In normal position when on the ground, the male stood in grass of body height, the head and the neck moving in a periscope-like manner, scanning all around before quietly withdrawing down into the grass. On hearing another male he looked abruptly in that direction and towards any other male heard, also turning the head sideways as if listening and looking around jerkily, beak at an alert questing upward slant, showing the white of the chin. The white at the edge of wings gave the base of the neck a white ruff. Looking around was accompanied by vigorous stamping around on one spot.

On early mornings the birds were often completely drenched with dew and rain. Under such conditions, when on the ground, the tail was held cocked, neck indrawn or upright, wet body feathers ruffled and wings held loosely, slightly drooping at the ends. The birds also rushed around on the same spot, stamping sharply.

When looking around, the auricular plumes lie perpendicular to the neck going backwards and upwards, curling inwards and fluttering in the breeze; but when about to commence a jump, the plumes are abruptly erected above the head from both sides, the plumulets also erected sideways and throat feathers erected with throat looking inflated and pouch-like; while jumping head and neck feathers, are also erected.

Sometimes instead of jumping, he relaxes and all feathers go back to normal position.

In a typical display jump, when goaded by the calls of other males, the auricular plumes and other feathers are again erected and neck withdrawn straight down in a low body crouch (no arching of neck noticed). The bird then takes a jump straight up, closed bill still slanting upwards, neck almost touching back, legs swung forwards and upwards with the momentum of the jump and wings clattering - the sound when heard being almost like a quick drumming. At the apex of the jump, legs are vibrated occasionally in midair.

During descent when there is a wind or breeze the partially bent legs held slightly apart are vigorously pedalled 4 to 6 times, seemingly for balance before landing.

Sometimes, with a lull in the wind, legs may not be pedalled as the bird parachutes down on partially opened downcurved wings; but when legs are pedalled, the bird lands pedalling and is consequently jerked forward on reaching the ground. He then rears back, crouching and proceeds to stamp around on the arena.

When watched from a distance, the bird is seen to land heavily straight down on the spot of take off and disappear into the grass, then emerging slowly after a moment to scan around.

The leap taken was about 2 m high, always at the same spot and lasted for about 1 second. The interval between the jumps ranged from 15 seconds to 1 hr 45 mins. In presence of a female, a few of the jumps were successive, the birds taking off immediately on landing.

One significant observation was of the displaying male facing the wind during jumps. When there was no wind or a light breeze, the bird jumped facing different directions.

JUMPING AREAS AND ARENAS :

Territories of 8 males were measured after the jumping areas were located. Of these, jumping arenas of 6 males were located for more intensive measurements. 4 of these males, 2A, 2V, 2B and 3C were spaced in a roughly quadrilateral area about 300 m from each other at approximately the same height occupying prominent spurs overlooking the valley between ridge 2 and ridge 3. The 5th male 3A, jumped on the southern side of ridge 3 and the sixth male 4A, about half a kilometer away from these displayed on the eastern slope of ridge 4. Jumping arenas could not be located for 2D and 3B because measurements were taken long after the birds had stopped displaying and the grass was overgrown.

All birds were found to have more than one jumping arena in their territories and every arena was encircled by half meter high Butea bushes at a radius of about 10 m.

Males 2C and 3C had the largest number of jumping arenas and they were the most active of all the males observed. All six arenas of 2C were between 8 and 30 m of each other, while the two original jumping arenas of 3C were 200 m from the four spots used later.

Each arena was clearly visible, the bird having stamped around and jumped repeatedly for a number of days on it. All arenas were of the same size and the one measured for a ringed male at Aamba was 43 cms in diameter.

The arena was visible as a round or oval red - brown patch of mud in a sea of grass. The grass on that spot had all been stamped out and a few pebbles on flat rock exposed. Often old droppings were seen stamped into the earth and during mornings fresh droppings could be sometimes obtained on the arenas. The surrounding grass was about 2 ft high.

On a single day a male would use all his jumping arenas for display. This was noticed when a hide was put near male 2C.

When the grass was too tall, the only 2 males displaying on grazed patches of very short grass, left indistinct patches where they jumped. They jumped here only for some time in the mornings but not evenings. They began jumping sporadically in other areas nearby without making any arena.

<u>MALES</u>	<u>DISTANCE BETWEEN 2 MALES</u>
2A - 2B	193.4 m.c.
2B - 2C	246.2 "
2C - 2D	292.0 "
2C3* - 3C1	246.5 "
3C3 - 2A2	362.0 "
3A1 - 3C4	82.5 "
3A - 3B	544.00"
3A - 4A	550.0 "
3B - 4A	442.0 "
	<hr/>
Average	332.12"

* eg. 2C3 : Third arena of 2C.

M	Males	No. of Jumping Arenas	Distance Between Arenas	No. of <u>Butea</u> Bushes around Arena	Average Distance of <u>Butea</u> Bushes from the Arena	Average Height of <u>Butea</u> around Arena	
Spot:							
1.	2A	2	Spot 1-2=41.5 m	1) 10 2) 9	7.66 m	37.73 cm	
2.	2B	3	" 1-2= 7.5 m " 1-3=106.5m	1) 2 2) 3 3) 13	9.56 m	66.77 "	
3.	2C	6	" 1-2=37.9 m " 2-3=15.0 m " 3-4=8.5 m " 1-6=19.0 m " 2-4=10.5 m " 1-5=27.5 m	1) 11 2) 14 3) 8 4) 13 5) 13 6) 10	8.24 m	45.23 "	
4.	3A	2	" 1-2=30.6 m	1) 11 2) 4	13.11 m	43.80 "	
5.	3C	6	" 1-2=8.0 m " 1-3=200.0m " 3-4=29.0 m " 3-5=19.5 m " 5-6=5.7 m	(1+2) 13 3) 10 4) 10 (5+6) 14	11.61 m	68.63 "	
Total					168	Av.10.36 m	Av.52.43 cm

NUMBER OF DISPLAY JUMPS :

During the display period, each male was seen to have a different intensity of display. When observed simultaneously out of 4 to 5 displaying males, 1 or 2 always jumped more often than the others.

Average number of jumps per hour in the morning for all males taken into account was 62 jumps (2531 jumps in 41 hrs 10 mins of display) and 40 jumps in the evening (746 jumps in 18 hrs 35 min of display).

On September 21, the same four males were observed both in the morning between 07.30 and 10.20, as well as evening between 16.30 and 18.45 and their jumps counted. All showed an increased intensity in the evening. The weather was partially overcast to sunny.

<u>MALE</u>	<u>JUMPS PER HOUR</u>	
	<u>MORNING</u>	<u>EVENING</u>
2C	4.94	40.44
3C	56.12	61.78
3A	8.12	25.78
2A	15.88	36.44

The male under visual observation was the most active one, 3C.

A breakdown of observation hours and the number of jumps recorded is given in the table below:

	MALES	<u>NO. OF OBSERVATION HOURS</u>			TOTAL NO. OF JUMPS	JUMPS PER HOUR
		<u>MORNING</u>	<u>EVENING</u>	<u>TOTAL</u>		
1.	1A	0.45	--	0.45	70	93
2.	2A	11.30	2.15	13.45	404	29
3.	2B	20.25	2.15	22.40	369	16
4.	2C	28.00	7.50	35.50	1136	32
5.	2D	-	-	-	-	-
6.	2E	0.15	-	0.15	17	68
7.	3A	9.15	3.15	12.30	221	18
8.	3B	2.00	0.45	2.45	162	59
9.	3C	11.15	2.15	13.30	583	43
10.	4A	2.40	-	2.40	52	20
11.	6A	7.35	-	7.35	221	29
12.	CHADAWAT MALE	2.10	-	2.10	42	13

Of the 24 days of detailed observations, on 6 occasions in the morning and once in the evening 2, 4 or 5 birds were under simultaneous observation with one of the birds under visual observation taken as the focal animal. Most of the time was spent in counting the display jumps. A total of 59 hrs 45 mins, was clocked as display time.

On September 15, Male 2C, another more active bird was watched displaying between 08.30 and 10.15 in the morning, averaging 39 jumps per hour (68 jumps in the 1 hr 45 mins) and between 17.15 and 18.00 in the evening, averaging 12 jumps per hour (9 jumps in 45 mins).

OTHER DISPLAY BEHAVIOUR OF MALE (Refer Pg. 7, e.g., (b))

On September 13, 2B was flushed at 10.00 to 2C's territory by a Marsh Harrier which did not pursue him. 2B foraged for a few min where he landed (about 200 m away) gradually walking in the direction of his own territory. After a while he flew back to his arena and just a few metres before landing assumed the display posture in midair, partially bent legs braking the air and neck held back in a duck-like fashion, chest foremost. Immediately on landing (10.10 hrs) vigorous display followed.

ANTAGONISTIC BEHAVIOUR OF MALES :

We never observed any close interaction between males, adult or immature, neither casual nor aggressive.

They tolerated the presence of another male in their territory if that male did not display, as on September 13 (above) though jumping intensity increased until the other male flew away. Even the immature male foraging and walking quietly about 20 to 40 metres from a displaying 2C provoked no aggression from 2C who only displayed more vigorously for 35 mins until the immature male moved casually out of sight.

Conversely, the intruding males showed no aggression, but on all occasions observed, merely foraged and never displayed in another's territory.

INTERACTIONS BETWEEN ADULT MALES AND FEMALES :

Adult males and females were never observed moving together but the following activities were noted:

1. September 12 - Sailana - Weather sunny, NE Wind.

7.20 : A female flew towards ridge 2 from ridge 3 probably flushed by the chowkidar and settled near a soyabean field in a Butea bush. Nearby males, 2C and 2D began displaying more vigorously.

7.30 : After 5 jumps male 2C took a few quick steps to the west in the direction of the female and disappeared in a clump of grass and did not display for 10 minutes.

7.40 : Back on its spot, 2C resumed jumping.

2. September 19 - Sailana - Weather very hot and sunny.

TIME	JUMPS PER		REMARKS
	5 Mins		
	MALES		
	2C	3C	
10.50	3	7	Males 2C and 3C jumping sporadically.
10.55	-	-	
11.00	-	-	
11.05	-	-	
11.10	3	1	
11.15	3	3	A female came flying low from a corner of ridge 2, below male 2C and landed at the periphery of the soybean field in the shallow valley between ridges 2 and 3.
11.20	11	7	2 of 2C's jumps were almost simultaneous. Both males jumping vigorously at the extreme edges of their respective territories. Third male 3A stimulated to jump twice.
11.25	4	4	Male 2C decreased jumping intensity.
11.30	1	6	Male 2C silent, while 3C jumping, more vigorously. Fourth male 2D stimulated.
11.35	?		Male 2C silent, no longer seen, 3C still vigorously jumping when we left the area. Was 2C in contact with the female?

3. September 22 - Sailana - Weather sunny, light NW breeze.

9.25 : Ridge 3 female came flying to ridge 2 calling "Phew - Phew" 3 to 4 times and landed between 2A and 2B's territories in full view of four vigorously displaying males. 2A continued displaying for 10 more minutes.

9.40 : Male 2A jumped once and was silent in the grass for 3 - 4 mins, at the end of which the females flew up and went towards ridge 3 back again calling 7 times while 2A resumed his display. This female had buff coloured wings patches.

BEHAVIOUR OF FEMALES :

Female floricans were observed on 10 days of the total study time of 28.5 days.

In all, in Sailana we saw 3 adult females one each on ridges 1, 2 and 3 and 1 immature bird with whitish buff patches on wings, on ridge 2. One female was seen quietly but openly foraging in Sardarpur grazing areas near some Cattle Egrets and cattle. Three females were flushed on September 1, in the evening at Bhilwada in the grasslands of Kalsanse village. All were solitary.

Ridge 1 female was flushed by us on three successive days, August 21, 22 and 23 and later in the day at 9.00 on August 23, we watched her foraging openly and walking more than 200 metres slowly and steadily until she disappeared over a ridge in her area. We never saw her again.

Ridge 2 female was probably nesting in the soyabean field on ridge 2, between the territories of 2B, 2C and 2D. We observed her only twice on September 12 and 13.

On September 12 :

7.20 : She flew to her area from ridge 3 probably flushed by the Chowkidar and stimulated the males around her. Male 2C was seen stopping his display and going towards her.

On September 13

8.10 : She was flushed from the soyabean field by a Marsh Harrier hovering about 3 feet over her just above the tallest soyabean plant. It poised to land when she abruptly flew out from just below it and flew low for about 50 meters

whimpering "Phew - Phew" in a different tone from the male, 4 to 5 times and landed in the adjacent maize field near a Sarus Crane. The Harrier did not pursue the female but after having let the female land, still hovered, poised and looking into the plants. It was chased off by one of us just as it prepared to land. The bird flew off reluctantly. This area was not searched for nest or eggs/chicks.

RIDGE 3, female was observed only twice on September 21 and 22.

On September 21

17.55 : She was observed flying from 3A's area to 2A in full view of 5 males displaying. After she landed in 2A displayed vigorously.

2A's area,

On September 22 : She was observed 4 times during the day.

1. 9.25 : She came calling "Phew - Phew" 3 to 4 times from 3A's area and landed between 2A and 2B.
2. 9.40 : She flew out again and calling 7 times, went back towards 3A's area and landed there.
3. 11.00 : She was again flushed further south by a fisherman going towards Gordhansagar.
4. 18.00 : She was again seen flying from 3A's area to 2A's area.

VOICE :

Male as well as female floricans gave the alarm call "Phew - Phew" repeatedly only when in flight, especially when flushed. The females on ridge 2 gave a distress call that sounded more like a whimpering when flushed by a persistent Marsh Harrier. One could distinguish the difference in the alarm calls of the males from the females but more observations are needed to confirm this. Sometimes when flushed, both sexes would also fly away silently.

FLIGHT :

Both the sexes flew strongly at a constant height of about 50 metres above the ground. The flight was reminiscent of a whistling teal with the same steady wing beats and out-stretched neck. Legs were stretched out behind the body as the bird planed in the strong wind. We never saw them fly more than about 500 metres except the male at Aamba who was ringed. He flew more than a kilometre north and landed in some bushes outside a village.

OTHER BEHAVIOUR :

Some data were also obtained on other behaviours like foraging, preening and wary behaviour.

Males were seen occasionally indulging in all three behaviours throughout the study period. They would either stop display and feed actively or passively around their jumping areas, or they foraged passively in another's territory before returning to their own, to display. They were seen preening themselves in the mornings while drying out the dew from their feathers.

A surprising degree of wariness was exhibited by males towards Sarus Cranes, the only large birds in the sanctuary. They always stopped display when a crane approached and even fled through the grass if it came too close. The cranes on the other hand showed no more than a mild interest in a displaying male and ignored the floricans at all other times. This degree of caution was not shown by the floricans towards others such as birds of prey like Harriers.

Only two females were seen walking and foraging passively one in Sailana and one in Sardarpur, when the grass was short. All other females were flushed or seen in flight.

Almost all observations were made at a distance of about 300 m and hence no details could be noted down. However, fresh droppings of the birds have been collected and preserved for analysis of foods eaten, along with a collection of insect fauna of that region.

Once the grass began ripening and males were no longer displaying, routine field observations seemed no longer fruitful. A representative collection of plants and insects was already made, as was the list of birds and other animals. We concluded field work and closed our field station at Sailana on October 10 after a last bird and insect census.

ACKNOWLEDGEMENTS

The Forest Department of Madhya Pradesh extended us their fullest cooperation during our entire study trip. We wish to acknowledge the assistance given us by Shri J. J. Dutta, Principal Chief Conservator of Forests and Mr N. K. Joshi, Chief Wildlife Warden for permission to study the floricans.

Mr P. M. Lad, Conservator of Forest, took very active interest in the entire project and we wish to acknowledge our special thanks to him. Our survey trips around Sailana and Sardarpur and the successful ringing of two floricans were entirely due to his enthusiasm and active participation. His role in arousing conservation consciousness in villages of Sardarpur, is greatly appreciated.

Mr D. R. Varma, DFO - Sailana, provided us accommodation facilities and all his staff cooperated in making our stay a comfortable one. We thank them all.

We acknowledge the generous assistance given us by Mr Bharat Singh during our survey trip to Kota, Rajasthan and thank him for introducing us to Mr Hitendra Singh of Bhilwada who kindly let us survey the floricans in his private grass 'beed'.

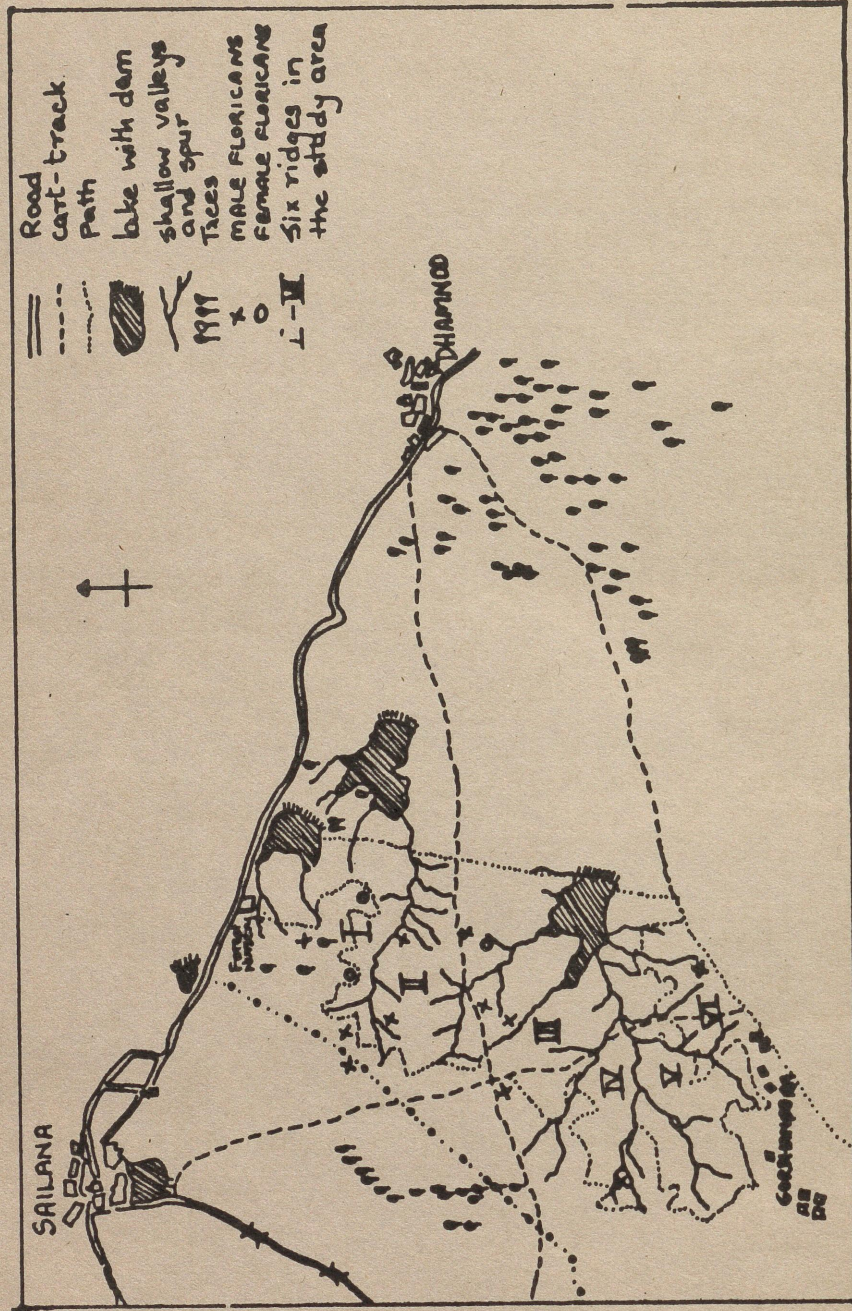
We thank Mr Balwant Singhji of Jaora for giving us valuable information and Mr R. P. Dube, Deputy Ranger, for providing assistance in the survey of floricans in Jaora.

We thank Mr M. Almeida, for identification of the plant material collected in Sailana. We also thank the Director, Blatter Herbarium and the staff for their cooperation.

We also thank Dr S. Adam Shafae of Aligarh Muslim University for identifying grasshoppers collected in Sailana, and Mr Naresh Chaturvedi of BNHS for helping with identification of other insects.

ASAD R RAHMANI
USHA BHUTIA
MEENA HARIBAL

21st December 1984.



BIRDS SEEN IN SAILANA KHARMOR SANCTUARY

BETWEEN AUGUST 21 AND OCTOBER 12, 1984

- | | |
|-------------------------------------|----------------------------------|
| 1. Pond Heron | <u>Ardeola grayii</u> |
| 2. Cattle Egret | <u>Bubulcus ibis</u> |
| 3. Lesser Whistling Teal | <u>Dendrocyona javanica</u> |
| 4. Spotbilled Duck | <u>Anas poecilorhyncha</u> |
| 5. Cotton Teal | <u>Nettapus coromandelianus</u> |
| 6. Blackwinged Kite | <u>Elanus caeruleus</u> |
| 7. Pariah Kite | <u>Milvus migrans</u> |
| 8. Buzzard sps. | <u>Buteo sps.</u> |
| 9. Longbilled Vulture | <u>Gyps indicus</u> |
| 10. Whitebacked Vulture | <u>Gyps bengalensis</u> |
| 11. Scavenger Vulture | <u>Neophron percnopterus</u> |
| 12. Pale Harrier | <u>Circus macrourus</u> |
| 13. Montagu's Harrier | <u>Circus pygargus</u> |
| 14. Marsh Harrier | <u>Circus aeruginosus</u> |
| 15. Shikra/Sparrowhawk | <u>Accipiter sps.</u> |
| 16. Short-toed Eagle | <u>Circaetus gallicus</u> |
| 17. Redheaded Merlin | <u>Falco chicquera</u> |
| 18. Lesser Kestrel | <u>Falco naumanni</u> |
| 19. Kestrel | <u>Falco tinnunculus</u> |
| 20. Painted Partridge | <u>Francolinus pictus</u> |
| 21. Grey Partridge | <u>Francolinus pondicerianus</u> |
| 22. Rain Quail | <u>Coturnix coromandelica</u> |
| 23. Peafowl | <u>Pavo cristatus</u> |
| 24. Sarus Crane | <u>Grus antigone</u> |
| 25. Whitebreasted Waterhen | <u>Amauornis phoenicurus</u> |
| 26. Lesser Florican | <u>Sypheotides indica</u> |
| 27. Pheasant-tailed Jacana | <u>Hydrophasianus chirurgus</u> |
| 28. Curlew | <u>Numenius arquata</u> |
| 29. Blackwinged Stilt (at
Aamba) | <u>Himantopus himantopus</u> |
| 30. Stone Curlew | <u>Burhimus oedicephalus</u> |

31. Redwattled Lapwing	<u>Vanellus indicus</u>
32. Yellowwattled Lapwing (Aamba)	<u>Vanellus malabaricus</u>
33. Green Sandpiper	<u>Tringa ochropus</u>
34. Common Sandpiper	<u>Tringa hypoleucos</u>
35. Ruff & Reeve (5.9.84 in flight)	<u>Philomachus pugnax</u>
36. Shipe sps.	<u>Gallinago</u> sps.
37. Gull sps. (Immature)	<u>Larus argentatus?</u>
38. Blue Rock Pigeon	<u>Columba livia</u>
39. Ring Dove	<u>Streptopelia decaocto</u>
40. Spotted Dove	<u>Streptopelia chinensis</u>
41. Little Brown Dove	<u>Streptopelia senegalensis</u>
42. Roseringed Parakeet (Aamba)	<u>Psittacula krameri</u>
43. Pied Crested Cuckoo	<u>Clamator jacobinus</u>
44. Brainfever Bird	<u>Cuculus varius</u>
45. Indian Cuckoo	<u>Cuculus micropterus</u>
46. Koel	<u>Eudynamys scolopacea</u>
47. Crow-Pheasant	<u>Centropus sinensis</u>
48. Eagle-Owl	<u>Bubo bubo</u>
49. Shorteared Owl	<u>Asio flammeus</u>
50. Spotted Owlet	<u>Athene brama</u>
51. Nightjar sps.	<u>Caprimulgus</u> sps.
52. House Swift	<u>Apus affinis</u>
53. Lesser Pied Kingfisher	<u>Ceryle rudis</u>
54. Whitebreasted King- fisher	<u>Haleyon smyrnensis</u>
55. Green Bee-eater	<u>Merops orientalis</u>
56. Bluecheeked Bee-eater	<u>Merops superciliosus</u>
57. Kashmir Roller	<u>Coracias garrulus</u>
58. Indian Roller	<u>Coracias benghalensis</u>
59. Hoopoe	<u>Upupa epops</u>
60. Common Grey Hornbill (In palace compound)	<u>Tockus birostris</u>
61. Redwinged Bushlark	<u>Mirafra erythroptera</u>
62. Ashycrowned Finch-lark	<u>Eremopterix grisea</u>

63.	Rufoustailed Finch-lark	<u>Ammomanes phoenicurus</u>
64.	Crested Lark	<u>Galerida cristata</u>
65.	Eastern Skylark	<u>Alauda guloula</u>
66.	Dusky Crag Martin	<u>Hirundo concolor</u>
67.	Swallow (29.9.84)	<u>Hirundo rustica</u>
68.	Wiretailed Swallow	<u>Hirundo smithii</u>
69.	Grey Shrike	<u>Lanius excubitor</u>
70.	Rufousbacked Shrike	<u>Lanius schach</u>
71.	Black Drongo (28.9.84 onwards)	<u>Dicrurus adsimilis</u>
72.	Starling (Aamba)	<u>Aplonis panayensis</u>
73.	Common Myna	<u>Acridotheres tristis</u>
74.	House Crow	<u>Corvus splendens</u>
75.	Redvented Bulbul	<u>Pycnonotus cafer</u>
76.	Large Grey Babbler	<u>Turdoides malcolmi</u>
77.	Streaked Fantail Warbler	<u>Cisticola juncidis</u>
78.	Warbler (eaten by shrike)	?
79.	Plain Wren Warbler	<u>Prinia subflava</u>
80.	Stone Chat	<u>Saxicola torquata</u>
81.	Pied Chat (28.9.84)	<u>Oenanthe picata</u>
82.	Indian Robin	<u>Saxicoloides fulvicata</u>
83.	Pipit sps.	<u>Anthus</u> sps.
84.	Blackheaded Yellow Wagtail	<u>Motacilla flava</u>
85.	Grey Wagtail	<u>Motacilla cinerea</u>
86.	Pied Wagtail	<u>Motacilla alba</u>
87.	House Sparrow	<u>Passer domesticus</u>
88.	Baya	<u>Ploceus philippinus</u>
89.	Whitethroated Munia	<u>Lonchura malabarica</u>
90.		

LIST OF SOME PLANTS COLLECTED IN SAILANA K S
IN SEPTEMBER - OCTOBER 1984

1. Families arranged alphabetically

1. ACANTHACEAE

1. Andrographis echioides (Linn) Nees
2. Rungia sp.

AMARANTHACEAE

1. Alternanthera sessilis (Linn) D.C.
2. Achyranthes aspera Linn
3. Celosia argentea Linn

ASTERACEAE

1. Launea nudicaulis (H.f.)
2. Glossocardia bosvallea D.C.
3. Eclipta erecta Linn
4. Blainvillea latifolia (Linn.f.) D.C.
5. Ageratum conizoides Linn
6. Echinops echinatus Roxb
7. Tridax procumbens Linn
8. Bidens biternata (Lour) Merr. & Shenaff
9. Vernonia sp.

BORAGINACEAE

1. Trichodesma amplexicaule Roth

CAPPARIDACEAE

1. Cleome viscosa Linn
2. Cleome simplicifolia H.f. & T.

COMMELINACEAE

1. Cyanotis fasciculata Sch. f.

CONVOLVULACEAE

1. Ipomoea nil L. (Roth)
2. Ipomoea pes-tigris Linn
3. Ipomoea eriocarpa R.Br.
4. Evolvulus alsinoides Linn.
5. Merremia emarginata Hallier, F.

CUCURBITACEAE

1. Mukia maderaspatana D.C.

CYPERACEAE

1. Cyperus iria Linn
2. Cyperus sp.
3. Fimbristylis dichotoma (Linn) Vahl
4. Fimbristylis sp.

EUPHORBIACEAE

1. Phyllanthus simplex, Retz.
2. Phyllanthus sp.
3. Euphorbia hirta, Linn.
4. Euphorbia geniculata, Orteg.
5. Euphorbia parviflora, Linn.
6. Acalypha indica Linn.

GENTIANACEAE

1. Enicostemma littoralis Blume

LABIATAE

1. Oscimum sanctum Linn.

MALVACEAE

1. Hibiscus esculentus Linn.
2. Sida spinosa Linn.

MOLLUGINACEAE

1. Mollugo pentaphylla Linn.

ORCHIDACEAE

1. Habenaria marginata Coleb.

OXALIDACEAE

1. Biophytum sensitivum DC.

PAPILIONACEAE

1. Indigofera cordifolia, Heyne
 2. Indigofera glandulosa, Willd.
 3. Indigofera linifolia, Retz.
 4. Indigofera oblongifolia ?
 5. Cassia absus Linn.
 6. Cassia mimusoides Linn.
 7. Cassia tora Linn.
 8. Alysicarpus vaginalis DC.
 9. Alysicarpus rugosus var. heyneanus DC.
 10. Alysicarpus tetragonolobus Edgen
 11. Alysicarpus pubescens Law
 12. Alysicarpus bupleurifolius (Linn) DC.
 13. Atylosia platycarpa Benth.
 14. Crotolaria calycina Schrank
 15. Crotolaria filipes Benth.
 16. Crotolaria linifolia Linn. f.
 17. Crotolaria oxixensis Willd.
 18. Desmodium triflorum DC.
 19. Desmodium diffusum DC.
 20. Desmodium sp.
 21. Heylandia latebrosa DC.
 22. Sesbania aculeata Poir
 23. Smithia geminiflora Roth
 24. Tephrosia tenuis Wall
 25. Phaseolus trilobatus (Linn.)
 26. Zornia gibbosa Spanoghe
- +4 Unidentified sp.

POACEAE

1. Tripogon jacquemontii Stapf.
2. Themeda quadrivalvis (Linn.) O. Ktze.
3. Thelepogon elegans Roth.
4. Sporobolus diander (Retz) P. Beauv.
5. Urochloa panicoides P. Beauv.
6. Setaria tomentosa (Roxb.) Kunth.
7. Setaria pallidifusca (Schumach) Stapf. & C.E. Hubb.
8. Setaria sp.
9. Setaria nervosum (Rottl.) Stapf.
10. Penissetum hohenackeri Hochst ex. Steud.
11. Echinochloa colonum L. (Link)
12. Panicum triperon Schult.
13. Panicum atrosanguineum Hochst ex. A. Rich
14. Panicum sp. / Isachne sp.
15. Heteropogon contortus (Linn.) P. Beauv.
16. Hackelochloa granularia (Linn.) O. Ktze.
17. Aristida funiculata Trin. et Rupr.
18. Arthraxon inermiss / lancifolius
19. Arthraxon prionodes (Steud.) Dandy
20. Andropogon pumilus Roxb.
21. Apluda mutica (Linn.) Hack.
22. Bothriochloa pertusa (Linn.) A. Camus
23. Brachiaria eruciformis (J.E.Sm.) Griseb
24. Chloris virgata Sw.
25. Coix lachryma - jobi Linn.
26. Cymbopogon martinii (Roxb.) Wats.
27. Cynodon dactylon (Linn.) Pers.
28. Eleusine indica (Linn.) Gaertn.
29. Eragrostis tenella (Linn.) Beauv.
30. Eragrostis gangeticus ?
31. Eragrostis sp.
32. Ischaemum rugosum Salisb.

33. Iseilema anthephoroides Hack.
34. Melanocenchris jacquemontii (Jaub) et Spach.
35. Oryza rufipogon Griff.
36. Oryza / Leersia sp.
37. Pseudanthistirea heteroclita Roxb.
38. Capillipidium huegelii (Hack.) Stapf.
39. Dactyloctenium aegyptium (Linn.) P. Beauv.
40. Digitaria stricta Roth. ex. Røem & Schult.
41. Digitaria ciliaris (Retz.) Koel
42. Digitaria sp.
43. Dicanthium aristatum (Poir) Hubb.
44. Dinebre retroflexa (Vahl) Panz.
45. Sorghum sp.
46. Chrysopogon sp.

(Crop-plants not included)

POLYGALACEAE

1. Polygala chinensis Linn.

PRIMULACEAE

1. Anagallis pumila

RUBIACEAE

1. Oldenlandia corymbosa Linn.
2. Borreria hispida (Linn.)
3. Borreria stricta (Linn. f.) Schum.
4. Neanotis sp.

SCROPHULARIACEAE

1. Sopubia delphinifolia Linn. & Dorn.
2. Striga angustifolia (Dorn.) Sald.

TILIACEAE

1. Triumfetta rhomboidea Jaq.
2. Triumfetta pentandra Rich.
3. Corchorus olitorius Linn.
4. Corchorus fascicularis Lam.

VERBENACEAE

1. Clerodendron serratum Spreng.

LIST OF SOME INSECTS COLLECTED IN SAILANA KSS

IN SEPTEMBER - OCTOBER 1984

<u>Order</u>	<u>Family</u>	<u>Species</u>	<u>Total spp.</u>
I <u>ODONATA</u>	1. <u>AESCHNIDAE</u> (Dragonflies)	-	1
II <u>ORTHOPTERA</u>	1. <u>MANTIDAE</u> (Praying Mantises)	-	7
	2. <u>ACRIDIIDAE</u> (Grasshoppers)	1. <u>Acrida exaltata</u> 2. <u>Hieroglyphus banian</u> 3. <u>Gastrimarus africanus</u> 4. <u>Chloebora</u> sp. 5. <u>Eyprepocnemis</u> sp. 6. <u>Crotogonus</u> sp. (+3 spp. unidentified.)	9
III <u>COLEOPTERA</u> (Beetles)	1. <u>SCARABAEIDAE</u> 2. <u>CHRYSOMELIDAE</u> 3. <u>MELOIDAE</u> 4. <u>CERAMBYCIDAE</u> 5. <u>CARABIDAE</u> 6. <u>CURCULIONIDAE</u> 7. <u>CANTHARIDAE</u> (8. Unidentified)	- - - - - - - -	9 1 2 3 4 1 2 (1)
IV <u>HEMIPTERA</u> (Bugs)	1. <u>LYGAEIDAE</u> 2. <u>PENTATOMIDAE</u> 3. (Nymph)	- - -	1 4 (1)
V <u>NEUROPTERA</u> (Lacewings, Ant-lions)	1. <u>MYRMELEONTIDAE</u>	-	2
VI <u>LEPIDOPTERA</u> (Moths, Butterflies)	1. <u>SATURNIDAE</u> 2. <u>ARCTIIDAE</u> 3. <u>NOCTUIDAE</u> (4. Unidentified)	- - - -	1 1 6 (3)

<u>Order</u>	<u>Family</u>	<u>Species</u>	<u>Total spp.</u>		
VI	<u>LEPIDOPTERA</u> (Butterflies)	1. <u>DANAIDAE</u>			
			1. <u>Danaus limniace</u>		
			2. <u>Danaus genutia</u>		
			3. <u>Danaus chrysippus</u>		
			4. <u>Euploea core</u>	4	
			2. <u>SATYRIDAE</u>	1. <u>Melanitis sp.</u>	1
			3. <u>NYMPHALIDAE</u>	1. <u>Neptis hylas</u>	
				2. <u>Hypolimnas misippus</u>	
				3. <u>Hypolimnas bolina</u>	
				4. <u>Precis orithiya</u>	
				5. <u>Precis hierta</u>	
				6. <u>Vanessa cardui</u>	6
			4. <u>LYCAENIDAE</u>	1. <u>Euchrysops cnejus</u>	
				2. <u>Lampides boeticus</u>	
				3. <u>Jamides celeno</u>	
				4. <u>Spindasis sp.</u>	
				5. <u>Zizeeria sp.</u>	5
			5. <u>PAPILIONIDAE</u>	1. <u>Tros aristolochiae</u>	1
	6. <u>PIERIDAE</u>	1. <u>Delias eucharis</u>			
		2. <u>Ixias marianne</u>			
		3. <u>Ixias pyrene</u>			
		4. <u>Catopsilia sp.</u>			
		5. <u>Eurema hecabe</u>			
		6. <u>Eurema sp.</u>	6		
VII	<u>DIPTERA</u> (Robberflies)	1. <u>ASILIDAE</u>	-	1	
VIII	<u>HYMENOPTERA</u> (Bees, Wasps)	1. <u>SPHECIDAE</u>	-	2	
		2. <u>ICHNEUMONIDAE</u>	-	1	
		3. Unidentified)	-	(1)	

UB:df:
21st December 1984.