Diet and Foraging Ecology of Fork Tailed Drongo (*Dicrurusadsimilis*) in Leventis Foundation Nigeria, Agricultural School South West Nigeria

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Abstract— *This research study investigated the diet and foraging ecology of the Fork Tailed Drongo (Dicrurusadsimilis) inLeventis Foundation Nigeria Agricultural Training School, South Western Nigeria. Direct field observation method was used to collect data for 12 months on the diet and foraging ecology of these bird species. The study area was divided into three compartments according to land use types (secondary forest, Farmland and Developed Area). The result revealed that the Fork Tailed Drongo consumed variety of insects and pla nt species resources in the study area.Grasshoppers, butter flies and termites are the majorfood source and they also consumed the leaves and flowers of the Moringaoleifera and seeds, fruits of some tree species. Insect species provided the highest food source of 86% and plant species 14%. The result revealed that the Fork Tailed Drongo utilized the three Compartments within the study area and that secondary forest provided highest food materials of 65%, Farmland 23% and Developed area 12%.*

Keywords— Avian species, Diet, Foraging ecology, Foraging strategies, and Conservation.

I. INTRODUCTION

The Fork Tailed Drongo (*Dicrurusadsimilis*)is a small passerine bird which belongs to the family Dircruridae.The plumage is entirely black and the eye is the colour of red wine, closer inspection reveals a deeply forked tail, which is actually a result of the outer rectrices being curved at the end (Borrow and Demey, 2011).These are aggressive and fearless birds, given their small size, and will attack much larger species, including birds of birds of prey. If their nest or young are threatened. Fork Tailed Drongo live in a variety of habitats, ranging from forest to savanna and including garden and farmland in most parts of Nigeria (Elgood, 1973). It is a resident breeder in Nigeria and the bird is usually seen in pairs or small parties and only rarely in larger groups. They are fairly terrestrial, foraging on the ground in grasslands and cultivation (Chari, et al, 1982). However detailed studied on the diet and foraging ecology and is lacking in Nigeria. This paper present detailed information on the diet and foraging ecology of Fork Tailed Drongo was studied in Leventia Foundation Nigeria, Agricultural Training school Ilesa, South Western Nigeria.

II. MATERIALS AND METHOD

Study Area

Leventis Foundation Agricultural Training School, Ilesa is located on the former premises of the former Farm Institute Ilesa in Tropical rain forest zone with central coordinates of 078.055' 032 N and 068.33.55 E. It is about 45 km from Oshogbo the capital of Osun of State, Southwest Nigeria. Two rivers run across the area creating a valley of watershed and the land mass is 360 ha including the administrative blocks. The area is 360-400 m above the sea level which is characterized by lateritic soils, sloping topography and hydromorphic valley bottom soils typical for most of the southwestern part of Nigeria. Annual rainfall varies between 1600 and 2000 ml, mean annual temperature is 30 °C and the relative humidity is not below 40 % during dry season and 100 % during the wet season (Mengistu, and Salami,2007).The study site experiences a bimodal annual rainfall pattern, between April and July and from September to October, separated by dry season. Vegetation is predominantly rainforest, including wetlands along the rivers and P*anicum maximum* dominated open land. Among the common trees are*Celtiszenkerii*,

Triplochitonscleroxylon, Antiarisafricana, Pycnanthusangolensis and Alstoniaboonei(Keay 1989).

Data Collection

Diet and feeding activities:

The study area was divided into three compartments according to land use types, Secondary Forest, Farmland and Developed Area. Present study on the diet and feeding ecology of Fork Tailed (*DicrurusAdsimilis*) was made on 36 groups ranging in size from 2 to 12 individuals. The data was collected during a continuous period of 12 months from January, to December, 2014. Direct observations method as described by (Akinpelu, 2004) was used for this study. Data were collected from the field by using binocular (Bushnell 7 x50) whenever found necessary. The observations were made early in the morning or latein the evening when common Fork Tailed are actively feeding with least disturbance to the birds. Individual groups of these birds were followed for periods varying from 2 to 6 hours. While following groups it was usually possible to keep some birds in view at all times, but rarely possible to see all members of the group together. During each scan, observations on the foraging habitat, type of feeding method employed, feeding session, size of the flock, type of diet and association with other bird species were recorded. Seasonal changes in the feeding habits of the Fork Tailed Drongo were studied too.

III. RESULTS

In this study it was observed that the Fork Tailed Drongo consumed variety of food-intake through the day: Tailed Drongo was observed to plunge diving to catch small insects. They were observed to dive from the height of between 5 to 7m.From the result obtained it showed that the Fork Tailed Drongo consumed variety of plant and insect species. The percent of insect fed upon was higher (86.6%) than that of than that of plant species (14.4%). The result also revealed that butter flies constituted the dominant insect consumed (17.1%) while *Azadirachtaindica was the highest seeds consumed (5.8%). From the result obtained in this study it showed that the Fork Tailed Drongo has the ability to consumed leaves and flowers of certain plants such as recorded on Table 2. Tanyteryspryeri was least consumed insect specieswhileFicusexapanratais the least consumed plant apecies. Fork Tailed Drongo has the ability to consumed aldult winged insects, larve and catappilar of insects and seeds, fruits, flowers and leaves of plant species.*

Table 1 Insect Species consumed by Fork Tailed Drongo in the Study Area

Common Name	Scientific Name	Family	Parts Consumed	Observations (%)
Butter fly	*Graphiumpylades*	Papilionidae	Adult winged	5.8
	Papilliocynorta	Papilionidae	Adult winged	1.3
	Amouristartarreu	Danaidae	Adult winged	2.4
	Leptocsiamarginea	Pieridae	Adult winged	2.2
	Eritismelania	Hesperidae	Adult Winged	0.6
	Anthenelachares	Hesperidae	Adult Winged	2.6
	Colotisevippe	pieridae	Adult winged	2.2
Termite	*Macrotermesbellicosus*	Termitidae	Adult winged	2.8
	Macrotermesnatalensis	Termitidae	Adult winged	4.5
Honey Bee	*Apismellifera*	Apidae	Adult winged	3.2
Green Bug	*Nezeraviridula*	Pentatomidae	Adult winged	1.2
Caterpillars	*Anaphavenata*	Notodontidae	Whole	2.1
	Anaphereticulata	Notodontidae	Larva	2.3
	Anapheinfracta	Notodontidae	Larva	1.1
moths	*Platysphinxphyllis*	Sphingidae	Ault winged	1.6
	Ebodinalagoana	Tortricidae	Adult winged	1.6
	Phragmataeciafuscifusa	Cossidae	Adult winged	0.8
Grasshoppers	*Acridiumperigrinum*	Acrididae	Adult winged	3.9
	Cyrtacanthacrisaeruginosa	Acrididae	Adult winged	4.8

	unicolor			
	Schistocercagregaria	Acrididae	Adult winged	9.3
			Adult winged	8.9
	Zonocerusvariegatus	Pyrgomorphida	Whole	3.7
Beetles	*Oryctes boas*	Scarabaeid	Whole	0.4
	Analeptestrifasciata	Scarabacidae	Whole	3.9
	Blaps sp.	Tenebrionidae	Adult winged/Larva	4.7
	Tenebriosp	Tenebrionidae	Adult winged	3.2
Spiders	*Steatodatriangulosa*	Theridiidae	Adult	0.8
Weevils	*Rhychophorusphoenic*	Curculionidae	Adult winged	3.9
Dragon fly	*Tanyteryspryeri*	Petalurdae	Adult winged	0.3
Black ants	*Campinotuspinnilucnicus*	Formicidae	Adult winged	0.5
				86.6

Table 2 Plant Species Consumed by Fork Tailed Drongo in the Study Area

Common Name	Scientific Name	Family	Parts Eaten	Observations (%)
Moringa	*Moringaoleifera*	Leguminosea	leaves and flowers	**4.8**
Neam	*Azadirachtaindica*	Meliacea	Seeds	**5.4**
velvet fruit	*Daliumqiunense*	Leguminosea	seeds	**2.1**
Sweet Sap	*AnnonaSenegalensis*	Annonacea	Fruits and seeds	**0.4**
Ficus	*Ficuspolita*	Euphorbiaceae	Fruits and seeds	**0.9**
Ficus	*Ficusexasprata*	Euphorbiaceae	Fruits and seeds	**1.3**
				14.9

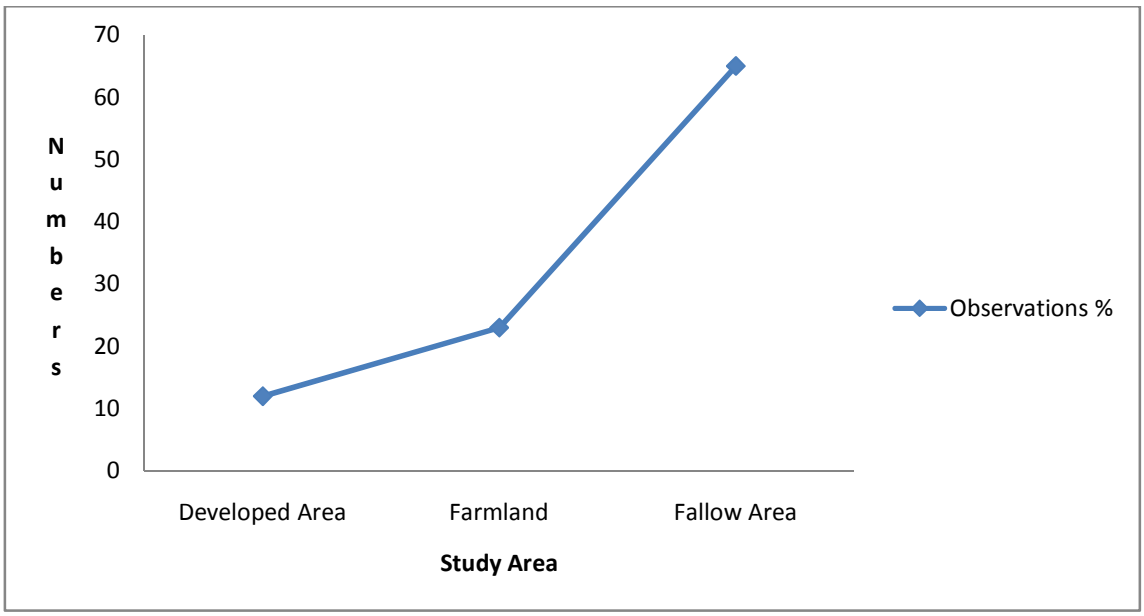

Fig.1: Percentage Utilization of Different Compartments in the study Area

IV. DISCUSSION

This study provides the first detailed description of the diet and foraging behaviour of the Fork Tailed Drongo in Nigeria It found that the Fork Tailed Drongo has a broad diet, consisting largely of insects and plant species. Among the most noticeable food consumed are *GraphiumpyladesMacrotermesbellicosusMacrotermesnatal ensisSchistocercagregariaMoringaoleifera* were PapilionidaeTermitidae**Acrididae** and Leguminosea. These bird species are known to feed comprehensively on insects (Mathew, et al, 1978) and seeds. Fruits, leaves and flowers of some plant species (Butler et al. 2005). From this study it was observed the Fork Tailed Drongo utilized three different habitats in the study area.it was observed to perched on electricity wire lines in the developed area and three branches shrubs in the rest compartments. This is in agreement with Lammers and Collopy (2007) who stated that avian predators are attracted to over-head utility power lines because they provide perches for various activities, including hunting prey. Brookers et al. (1990), and Yosef (2004) also documented the importance of perches for prey detection / hunting, vigilance, resting as well as other activities of insectivorous birds. From the field observations, Fork Tailed Drongo utilized the Forest compartment more than the rest compartments were there are tall trees of about 16 to 23m in height. This suggests that the Fork Tailed Drongo derived 65 % its food resources from the forest 23% from the farm land and 12% from the Developed Area. This is consistent with (Robinson and Holmes 1984). Who reported that vegetation structure, plant species composition, prey abundance and distribution, and interspecific competition significantly affect the foraging height selection of insectivorous bird species They further stated that three major foraging substrates, namely air, plants and ground, were recognized of which, the White-breasted Kingfisher, Indian Roller and Black Drongo fell under the plant guild because plant offers a greater variety of insect food (Morse, 1977). Gokula and Vijayan (2007) reported that birds took insect prey in various foraging substrates which *are* paddy and other crops, small stumpy vegetation, and trees, from both habitats. The Fork Tailed Drongo was observed during both breeding and non-breeding seasons, from the field observations during breeding season, nesting activities is always sited close to wetland, forest and farms. This observations is in agreement withPidgeon*et al.* (2003) stated that micro-habitat and vegetative composition around nesting tree are important factors in relation to nest placement and success of avian species. The micro-habitat and vegetation in the habitat not only provide nesting-site and food but also fibers, twigs, grasses for nest construction..Fork Tailed Drongo is selective in their diet. From field observation it was noted that these bird species does not consumed all insects and fruits, seeds and flowers in the wild. This consistent with Royama, (1970) who reported that many bird species often feed selectively, and utilizes such factors as prey palatability, nutritive value, abundance and prey size and hardness. It appears that, though birds were living in suburban areas, they were still more dependent on wild plant species for food as compared to other frugivorous birds, thus causing minimal harm to human crops (Dhind,andSaini, 1994). The consumption of leaves and flowers of *MoringaOleifera*,was an interesting observation because leaf consumption is common not in birds. This is consistent with Anthal, and Sadi, (2013) who reported the consumption of leaves by Jungle Babbler *(Turdoidesstriatussindianus*). Feeding in these birds occurs intermittently throughout the day. The intensity of food-intake gets accelerated from the awakening after the reconnection calls and then gradually slows down. During dry season days, they start feeding in early hours (0600 to 0630 hours) but during wet season days, it starts as late as 0730 hours. The concentration of food intake again increases around 1430 hours in the dry season and 1530 hours in wet season. They spend on an average 62.2% of the day time for feeding in dry season (average day length-12 hours) and 56.12% in wet season (average day length-11 hours). Light rain showers are no obstacle for feeding to these birds but feeding activities are restricted during heavy rainfall. Many species of birds spend more than 50% of their day foraging and feeding, particularly in the morning and evening. This observation is in agreement with Kelly (1998) who stated that weather, especially temperature, affects the foraging behavior of insectivorous birds. Several studies have found temperature-related changes in the foraging behavior of birds and Gokula and Vijayan (2007) stated that food availability, habitat structure, and interspecific competition are also responsible for variation in the foraging behavior of birds.

In conclusion, many factors, such as time of day, season, ambient temperature, availability of prey, breeding season,and presence of predators, influence the foraging behavior of birds.

V. CONCLUSION

The results of this study clearly indicate that Fork Tailed Drongo consumed both insects and plantspecies resources available to them in the study area. But, compared to plant

species foods resources there variety of insect food resources which are mainly consumed in larger proportions. The Fork Tailed Drongo therefore help in the control and keep check on various harmful insects like grasshoppers, termites, caterpillars etc., which are injurious to the agricultural crops, stored grains and to some extent dispersal of seeds, The Fork Tailed Drongo are useful species for farmers.

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