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Food processing displayed by the common fiscal during hatching season

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Abstract
Birds display various characteristics when raising their new generations. These may include feeding and protection. In the current observation, the common fiscal birds displayed a unique food processing technique which involved drying the captured prey before feeding their chicks.

Keywords: birds, food processing, characteristics

Introduction
Birds living characteristics have been extensively studied and some of the notable interesting features include migration pattern, feeding and breeding and mating behavior (Del Hoyo *et al.*, 2006; Yosef, 2008; Brooke *et al.* 2008) [3, 13, 1]. These animals have a wide range of food and some depend on plant where they eat leaves, flowers, shoots, fruits and seeds, other birds prey on other animals such as insects, other birds, reptiles, amphibians, mammals and fish. In this case animals are caught and killed before being preyed while other birds scavenge on dead animals (Harris and Franklin 2000; Hockey *et al.*, 2005) [6, 7, 8]. Little is known about the presence of food processing behavior and we do not know if they can be modified with the change of the environment. In most African settings documentation of bird's behavior is seldom studied and as a result some of the interesting features that are displayed by these animals pass unnoticed. During my holiday at Getembe area of the Mogabiri village in Tarime District I observed food processing behavior that was displayed by the Common Fiscal known as *Nserrecho* in Kuria language. The preys were impaled on the sisal leave thorns and left for several days to dry before is slowly hauled to feed chicks. This is a novel finding that is displayed by the Common fiscal found in Getembe area, Tanzania.

Observations
This behavior was studied for three consecutive dry and wet seasons within 4 years in an area covering 3500m^2 in Mogabiri village, Tarime district, Mara region. The area contained banana plantations, maize and cassava farms, long trees, shrubs and sisal. The sisals were planted in order to mark the boundary between the small neighbouring farms. One day as I was passing from my house, which is about 200 meters away I saw a large grasshopper impaled on the sisal thorn via its thorax. The leaf that contained an insect was pointing away from the footpath and it was not easy to see it. I was attracted to take a closer look and at the same time inspect for the presence of a similar phenomenon in the other leaves. I went back and identified three more places where the animals were well secured onto the thorns of the sisal leaves (Fig. 1 and 2). From that day I decided to visit the area regularly, but I was not sure on what placed the insects on the thorns of the sisal leaves. I did not know what caused this whether I was observing a game played by boys tending to the cows or something strange. However, I do not recall to have done similar thing during my boyhood, we never played such game I do not remember to have caught insects and impale on the sisal leaves.

As I was thinking about this phenomenon I decide to ask the local people and they gave mixed explanations ranging from cattle tending boys, witchcraft, and one of them suspected the birds by the local name *Nserrecho (*Kuria language), but did not know the reason behind that behavior. With time and closer look into this situation I realized that the Common Fiscal is constantly seen at the study area. One day I saw the it emerging from the sisal and when I made inspection I found that body parts of the insect that I saw the previous day were missing. I realized that the remains were collected by the bird. This observation together with what I heard from the local people allowed me to make a conclusion that Common Fiscal must be catching the animal and secure them on the thorns of the sisal leaves. But the questions that remained were the reason behind this behavior; is it for storage purposes or because there is plenty of food.

Nature of a catch
The animals that were seen secured onto the sisal thorns included the grasshopper, frogs, mice, rat pups, butterfly, caterpillars and moths. Other stored food items could not be easily identified due to drying and hence distortion of the anatomy. Among them the grasshoppers were frequency seen (Fig. 1a). In many cases it appeared dead, but on some occasions the grasshopper appeared to be alive and moving the limbs and the antenna. The methods for securing the insects onto the sisal leaves thorns appeared different. In many cases the thorn penetrated the entire thorax and in some situations the insects were impaled with the head pointing upwards and the sisal thorn penetrating the entire abdomen. Frogs were also commonly observed prey second to the insects and all of them were found dead (Fig. 1b). In very rare situation the field mice and rat pups were observed impaled onto the sisal leave thorns. These animals were well secured with the thorn penetrating the abdomen and avoiding the thoracic region. I thought this was intelligently done in order to avoid the ribs and other bones of the thorax.

The impaled animals were left to dry; some animals such as

small insects took 3 days while the rodents and frogs were kept to dry for up to 3 weeks. After sufficient drying process the preys were chopped into small pieces that were hauled to feed the chicks; on the average it took 3 days to exhaust the entire grasshopper (Fig. 2a and b). Both male and female birds appeared to visit and guard the impaled animals an indication that they were all involved in processing food for the chicks.

Fig 1a

Fig 1b

1. Photographs showing the impaled Grasshopper (**a**) and a Frog (**b**); note that the dried animal will be chopped in piecemeal and hauled to feed the chicks (see Fig 2).

2. Photograph of the Grasshopper (**a**) with missing head and some legs; and Frog after a few days only a small portion remained on the sisal thorn (**b**).

Fig 2a

Fig 2b

Discussion

The Common Fiscal is a member of shrike family found in most parts of Sub-Sahara Africa including Tanzania (Hall and Moreau 1970; Zimmerman 1996; Hockey *et al.* 2005) [4, 15, 8]. Other names given to this bird include Fiscal strike, Jacky Hanger, and Butcher bird. Its scientific name is *Lanius collaris* and about seven subspecies have been identified. In Tanzania two subspecies *Lanius collaris capelli* and *Lanius collaris humeralis* have been described (Lefranc, 1997; Harris and Franklin, 2000; Hockey *et al.*, 2005) [10, 11, 6, 7, 8]. This bird has been widely studied and documented in the different parts of

the world (Cooper 1971; Macdonald 1980; Zack 1986; Yosef *et al*. 2000) [2, 12, 14]. However, little is known about its feeding behavior and the secret behind being among the most successful bird on earth. The Common Shrike has the habit of impaling the prey on the thorns or sharp objects. This phenomenon has been described by many authors and most of them have come to the conclusion that the impaled food is stored for later consumption (Sinclair *et al*. 2002) [9]. Some authors have suggested that if food item is small it is eaten on the spot, but if it is larger it is either eaten on its perch or impales it on a thorn (Hockey *et al.* 2005) [8]. Many observers have not considered other possibilities behind this habit of storing food displayed by the Common Fiscal. The current observation suggests that the custom of impaling the prey on the thorns that is displayed by the Common Fiscal is for drying purposes and thereafter feeding the chicks.

Tarime District displays two important features that may be of interest in the current observation; first it experiences both the dry and rainy seasons. Dry season is normally very short and occurs in the months of June, July and August. Secondly, the availability of animals and insects does not show seasonal variation. These observations indicate that storage of the prey is not dictated by the availability. Logically one would think that during dry season the insects become scarce and therefore storage of food would seem necessary for the Common Fiscal. However, this is not the case; storage is most prevalent during rainy season (December through April). This observation indicates that the habit of impaling the prey on the thorns is done for other reason(s) and may not be due to scarcity or excessive availability of prayed animals. Close observations and consultation with local people in Tarime indicates that hatching of the Common Fiscal is at the maximum during rainy season. Therefore, impaling of food items on thorns is mostly likely done in order to feed chicks. It is logical therefore to conclude that the impaled animals are used to feed the chicks. During this time many birds of other species are also seen at our environment and the months of December, January, February and March appears to be the maximum time for hatching for many bird's species. Observations made in Southern Africa have also suggested that nest occurs during rainy season (Lefranc 1997; Harris and Arnott 1998; Zimmerman *et al.* 1996) [10, 11, 15].

Absence of impaled animals during dry season coincides with the period where the Common Fiscals are not breeding. This observation may indicate that storage and drying of food items is done for the purpose of feeding the chicks. Animals are kept to dry for a period between 3days to about 3 weeks depending on the nature of the prey. Insects such as grasshopper took fewer days compared to the mice and frogs. After being dried the animal is hauled to the nests to feed the chicks. The entire animal is not hauled at a single sitting; it is taken in small pieces until it becomes finished. The body parts that take lesser time to dry are consumed first. In the case of grasshopper head is chopped first, then the thorax and the abdomen becomes last. The reason for this is not clear; whether fast drying body parts are taken first is a matter for future observation. Such findings may add knowledge to the understanding of the feeding behavior among the Common Fiscal found in Mogabiri village at Tarime District. Past studies have not documented on the disposal pattern of the impaled animals (Hockey *et al.* 2005) [8]. It will be interesting to see if this behavior is displayed by the Common Fiscal in different geographical locations or if it specific to those found in Tarime District, Tanzania.

Past studies have showed that the Common Fiscals feed the chicks for up to 3 weeks and thereafter, they come out of the nests but remain within the parent's territory for a few more weeks (Hockey *et al.* 2005) [8]. It has also been suggested that during the initial period after hatching the chicks are fed mainly by the female and in later days the male bird take the responsibility (Hockey *et al.* 2005) [8]. In the current observation it was difficult to separate the male and females, as they were both seen emerging from the storage site, an indication that they were both involved in the processing of food items.

Conclusion

Feeding behavior and secrets during raising the next generation is very crucial for most successful birds on earth. Many bird's observers have linked the impaling of the prey behavior with the habit of storing food for later usage. However, the current observation suggests that the custom of impaling the prey on the thorns that is displayed by the Common Fiscal is for drying purposes and thereafter feeding the chicks. These observations indicate that storage of the prey is not always dictated by the availability, but also processing of food items.

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