

Notes on the Natural History of Marshall's Iora

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It was sensational news when Marshall's Iora (White-tailed Iora *Aegithina nigrolutea*) was rediscovered in 2006 by Chinthaka Kaluthota in the Yala East National Park (Siyoth Vol. 1). Upul Wickremasinghe and Chinthaka Kaluthota informed me that the species was netted subsequently, and a male was ringed at Thanamalvila, on the periphery of the Lunugamvehera National Park. Now that the species is confirmed to occur in Sri Lanka, information on its natural history needs to be gathered. That information base will then lead to proper scientific studies.

I observed several individuals of the Marshall's Iora in Thanamalvila, in and around the general area where netting had previously been carried out. My observations were made from 20th through 22nd October 2007. I present those observations here, to give an insight into the natural history of the Marshall's Iora in Sri Lanka. Those observations would assist in locating the species in the field and studying it. The present account deals with number of pairs observed, appearance of individuals, vocalization, nature & use of habitat, food & feeding, sociality, territoriality, courtship, and biogeography.

Number of Pairs

I expected Marshall's Iora to possess a fairly large home range (simply, the land 'owned' by an individual) as in the case of Common Iora (*Aegithina tiphia*) that is commonly encountered in the dry zone. I therefore did not expect to see more than a pair of Marshall's Iora in this location¹.

I believe that I observed four pairs of Marshall's Iora. The first pair was observed repeatedly over the three days since their territory was less than 100 meters from my home base. This pair was observed approximately for a total of 7 hours. Each observation session ranged from 20 minutes to 2 hours or so. As I got to know their territory fairly well I could easily find one or both individuals with little effort. Another pair was seen about 250 meters south of the activity centre (The area within a territory where the owner spends most of its time) in the first pair's territory. I

observed the pair for about 30 minutes. This second pair moved further away from the first pair's territory. Another individual was heard about 400 meters northeast of the first pair's activity centre. The bird was calling with the distinct Marshall's Iora contact call (see under 'Vocalization'). So, I assumed that it represented a pair. The fact that Marshall's Iora was breeding at the time further supports this possibility.

This pair was not observed after this. Yet another pair was seen about 1500 meters northwest of the first pair's activity centre. Of these four pairs, two (the first and second) were seen clearly at close range (from 2 to 15m, with binoculars and spotting scope when necessary) and it was noted that they were not ringed. This observation was important as a bird has earlier been ringed in this locality. This suggested the possibility that there could be more than two pairs living in the area.

Appearance

I would like to refer to three features of Marshall's Iora that attracted my attention; the size, bill, and wing markings. A detailed description of the external morphology of the species is presented by Chinthaka Kaluthota in Siyoth Volume 1.

Size - Marshall's Iora is only a little bigger than the Purple-rumped Sunbird *Nectarinia zeylonica* and appears a little smaller than the Common Iora. This difference in size could possibly have important implications on the size of prey the two species of Iora consume, leading to ease tensions of habitat sharing (see 'Sociality and Territoriality' below).

Bill - Marshall's Iora apparently has a slimmer and shorter bill than the Common Iora. Accordingly, there could be differences in their feeding behavior. That is to say, the feeding techniques or the frequency with which they are used could be different. This too would facilitate co-existence.



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Plate 1. Female Marshall's lora

Wing Markings - White wing bars and white on edges of secondaries and tertials are very bold in Marshall's lora. The wing bars appeared like elongated bands made with blotches of white. Alternatively, the white on the flight feathers reminded me the pattern on a lark's flight feathers. All observed individuals were in breeding plumage.

Vocalization

The following description of vocalization is based on auditory observations. The individuals of the Marshall's lora called frequently during the three days I observed them. The reason for frequent calling could be breeding. The calls of the Marshall's lora were in general similar to those of the Common lora. However, they were different in pitch and to some extent in the pattern. Marshall's lora had two basic calls; the chirrup and the whistle that sounds like 'chooteey'.

However, the long drawn, low noise whistle that is uttered by the Common lora around noon was not heard from the Marshall's lora. The chirruping call of the Marshall's lora was readily distinguishable from the similar call of the Common lora. The former was softer; I would say 'higher pitched' compared to the corresponding call of the Common lora. The pattern of sounds that ends the call was also different to that of the Common lora. The whistles too were 'higher pitched' Marshall's lora.

Habitat

The habitats of all four pairs of Marshall's lora were structurally similar in that they had mainly two strata of vegetation. The trees varied from approximately 5 to 12 meters in height, the majority varying from 5-7. These included *Cassia siamea* ('Wa'), *Azadirachta indica* ('Kohomba'), *Phyllanthus indicus* ('Karaw'), *Flueggea leucopyrus* ('Katupila'), and *Bauhinia racemosa* ('Maila'). The trees were widely spaced forming an open wood. On average, a tree occurred approximately every 6.5 sq. meters. The overall canopy cover was around 15 per cent. The 'Wa' trees were in flower. Below the tree stratum, there was an understorey of dense, thorny and non-thorny shrub about 1-2 meters in height. 'Andara' (*Acacia leucophloea*) and Lantana (*Lantana camara*) were very common in this stratum. Another feature of the birds' habitat was its proximity to open water. However these water holes are seasonal ones that dries out during the drought. Three out of the four pairs had a small tank or a water-hole each on the boundaries of their territories. It was not ascertained whether the other pair too had such a water source, however, its location was close to the stream 'Kirindi Oya', which is also seasonal. The proximity of territories to open water might have advantages in seasonal thermal comfort for Marshall's lora, especially during the breeding season. However, this requires further investigation.

The activity centre of the first pair had been cleared of lower stratum of vegetation for agriculture. Only scattered trees were available during my stay and several of these were lopped. It is possible that some of the trees may be felled or the rest lopped to make way for more fields. Apart from clearing the vegetation, the ground was ploughed with a tractor. Ploughing had been done 2-3 days prior to observations and was continuing about two hundred meters away from the first pair's activity centre during the observation period.

It is expected that the Marshall's lora habitat will give way to a banana plantation. This would have adverse effects on the species. The banana plants would not offer sufficient foraging spaces (micro sites) for a fine-grained forager such as Marshall's lora². If the trees of the upper stratum are left intact, the harmful effects of replacing the understorey vegetation would be reduced. However, current farming practice does not leave an upper tree stratum within banana plantations. Nevertheless, any harmful effects of banana plantation would affect only the first pair, since only their territory falls totally within the

agricultural field. It would be interesting to see if the pair moves to a new territory and survives. However, the universal rule is: Loss of territory leads to loss of its occupants.

Habitat Use, Food & Feeding

The observations presented in this section were made on the 'first pair' of Marshall's lora. The birds foraged together or separately in early mornings. As the day advanced they foraged separately. In evenings they foraged together again. When they were separated, the male and the female were not far apart. Judging from the female's calls in reply to the male's contact calls, she was around 75 meters away from him. The reason for the male and female foraging separately could be differential niche utilization, differential use of the territory, or nesting. I speculate that it is not nesting for two reasons. The birds did not collect nest material; therefore it is unlikely that they were building a nest. The courtship behaviour I describe below (under 'Courtship') suggests that the pair was in the early stages of breeding, *i.e.* prior to nesting. So, they could not be incubating or brooding either. Hence, I suggest the reason why the female was not seen regularly with the male was differential niche or territory utilization³. Otherwise, the female could have been after some special food items due to physiological demands of breeding which is a seasonal difference in niche use.

Marshall's loras foraged in both the tree and the shrub strata of the vegetation. They foraged in 'Karaw', 'Maila', 'Wa', and 'Kohomba' trees. The male spent most of his time on 'Wa' and 'Kohomba' trees. About half that time was spent probing flowers for which, its slender bill would be a very useful adaptation. The birds foraged even in a 'Kohomba' tree in which all the leaves had turned brown, due to fire, and searched dry twigs of 'Maila' as well. Foraging among dry, gnarled, and sometimes brittle leaves seemed to be common habit. The pair once foraged in a tangle of uprooted lianas which were completely dry and had twigs but no leaves. The partiality to clumps of dry leaves is reminiscent of the Orange-billed Babbler (*Turdoides rufescence*) that has the same habit. Both male and female foraged in 'Andara' thickets too. Foraging in dry vine tangles, 'Andara' thickets, and among dry leaves in trees may reflect the affinity or adaptability of Marshall's lora to harsher environments where green foliage would be in short supply. Such affinity or adaptability would have important biogeographic implications (see 'Biogeography').

The pair used a small area of the territory at any one



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Plate 2. Male Marshall's lora

foraging session. This was so whether they fed alone or together. They repeatedly visited the same trees for long periods. I followed the male continuously for about two hours one morning, only to find that the area it had moved in was about 30 meters across at the widest points. I speculate that frequent visits to same trees could be the result of cleared understorey, which has taken away an entire stratum of foraging space. If so, foraging in a very small area would be an initial response to severe loss of available habitat. Being a fine-grained forager, the Marshall's lora spends much time in one patch before switching to another. For the same reason, it could theoretically possess smaller territories than those of a 'coarse-grained forager'. However, such resolution of foraging space is not the only determinant of territory size.

Marshall's lora used several feeding techniques. Gleaning was the predominant technique, in the sense that it was used more frequently than the others. It involved picking food items while perching on outermost twigs of tree crowns and shrub. The birds searched various micro sites including surfaces of twigs, forks, leaves, leaf axils, and flower axils. From time to time, food was searched for and picked by hanging head down or sideways. Probing was another technique that was used mostly when feeding among flowers or dry leaves. The second most frequent feeding technique would be flower probing, at least at the time of year when 'Wa' trees are in flower. The other techniques used by Marshall's lora were hover-picking (*i.e.* picking food while hovering) and fly-catching (*i.e.* catching prey in flight by pursuit). A bird once dropped a food item that it was banging on the

perch. The item was recovered before it had fallen a mere 40 cm. Acute vision and good nerve and muscle coordination would underlie such rapid reactions. The most frequent type of feeding was gleaning, probing came next whereas hover-picking while fly-catching was the least frequent. However, the relative frequencies of different feeding techniques would change from time to time⁴.

The food finding rate (not necessarily the feeding rate) of Marshall's lora varied considerably. However, it was generally quick. I saw the male feeding on three food items within the span of 3 minutes. This was in the activity centre of the territory. On another occasion however, the same male found only one item for 14 minutes of foraging.

The Marshall's lora fed only on arthropods within my observations. It took a hairy caterpillar, non hairy green caterpillar, and a mite or an insect larva. It banged some of the food items on its perch before eating it. Both types of the caterpillar were treated this way. The purpose of banging is to remove the internal organs of its prey. The hairy caterpillar's internal organs slid out easily on being banged. Only the hairy case was eaten. On another occasion a green caterpillar was eaten. It was banged on the perch but the internal organs of the caterpillar, which appeared sticky, did not come out easily. So the bird entwined that part of the viscera which had emerged on to a twig. Once it was fastened the bird carefully dragged the green case sideways freeing it from the viscera and ate the casing⁵. However, Marshall's lora would eat some food items without banging or removal of the viscera. The mite (or insect larva) which was picked while searching among dry leaves of a 'Maila' tree was eaten alive without banging.

Sociality & Territoriality

I observed social interactions between the Marshall's lora and other bird species. These observations may indicate the position of Marshall's lora in the social dominance hierarchy with respect to some other species within the community. Two pairs of Common loras shared their habitat with two pairs of Marshall's loras. The pair of Common loras sharing the habitat with the 'first pair' of the Marshall's lora was collecting nest material - dry bark from lianas in the territory of the Marshall's lora. When Marshall's lora was absent the Common lora collected nest material within the territory of the Marshall's lora, mated there and also, foraged there. However, when Marshall's lora was in the territory, it repelled the Common lora. The

female Marshall's lora chased the female Common lora into a different perch, and the male too joined in the aggression. The males of the two species engaged in a threat display. This involved both males half-spreading their wings sideways and somewhat drooping, so that the white in the wings was clearly seen. On the first day, this display sent the pair of Common loras fleeing into a tree approximately 5 meters away. However, on the second day, it did not flee immediately and displayed 'gaping' (keeping its bill open about halfway) for around 10 seconds before fleeing⁶. Both species uttered a 'scolding' type of a call in this aggressive encounter.

Territorial aggression reveals the boundary of the aggressor's territory. So, it was clear that the two pairs of Marshall's and Common loras had overlapping territories. Usually, the territory holder dominates over other individuals of its own or closely related species in its territory. That could be why the Common lora was repelled, which suggests that it was subordinate to the Marshall's lora. This was reversed when the female Marshall's lora ventured into the territory of the Common lora. She was chased away by the male Common lora from a tree, about 15 meters away from the place where the earlier confrontation took place. Observations on the areas used by these two pairs of loras indicated that the territory of the Common lora was larger than that of the Marshall's lora.

The Marshall's lora was not aggressive towards an Asian Brown Flycatcher (*Muscicapra daurica*) and the Common Tailorbird (*Orthotomus sutorius*) when they fed in the same tree.

Marshall's lora was socially subordinate to the Common Woodshrike (*Tephrodornis pondicerianus*) and probably to the Red-vented Bulbul (*Pycnonotus cafer*) as well. The Common Woodshrike attacked the male Marshall's lora and chased it away. I did not see what caused the aggression. However, both the species were foraging within the territory of the Marshall's lora just before the aggressive encounter. So, the cause of aggression could probably have been related to food. A lower level of aggression among birds is shown by the behaviour called 'perch-taking'.

Here, the dominant individual takes the perch of the subordinate individual making it shift to another perch. Once, the Marshall's lora took the perch of a male Purple-rumped Sunbird. On another occasion, when a pair of Red-vented Bulbuls arrived, where a Marshall's lora was foraging, it shifted its perch. In this instance, the Red-vented Bulbul did not occupy the perch of the lora although it influenced the perch shifting.

Patterns of Activity & Attitude

The Marshall's loras became less active towards noon. The individuals were sedentary and they called less frequently around midday than in the mornings and evenings. The 'first pair' that I could observe regularly, was seen preening during this time. On one occasion, as the male was preening on a low bush (about 2m tall), I approached him from behind to take photographs. When I was within two meters of him, the female arrived and perched next to the male. She was facing me and I was careful not to disturb them since both birds saw me. The female appeared disturbed by my presence. She stretched her neck in a variety of directions trying to peep through the foliage to get a better view of me. She was clearly wary. Within a minute she flew off to another branch of a tree about two more meters away and about a meter above the previous perch. The male continued preening keeping to his original perch. This observation may indicate that the male Marshall's lora is bolder than the female. However, it may also indicate that the male was more accustomed to my presence; hence, he was not worried by me. I believe that I have probably observed this particular male on more occasions than the female.

Courtship

On the morning of 22nd October, I saw the 'first pair' in courtship display. It took place on 'Andara' bushes (about 1.5m tall) by the side of a water-hole. The display involved vocalizing by both sexes as well as visual displays by the male. In the vocalizations, only the distinctive soft "chirrup" was uttered. It was voiced more frequently than in normal calling. This could be the song of the Marshall's lora. Some birds adopt the strategy of putting several similar calls together to produce songs. The three sunbird species and the Common Tailorbird are other examples of this type of songster in Sri Lanka. Observations on vocalizations during the non-breeding periods could reaffirm whether the courtship vocalizations of the Marshall's lora constitutes a song. The female Marshall's lora joined the 'song' of the male with her vocalizations. Her vocalizations too were soft chirrups. However, they were brief and repetitive. The two sexes continued vocalizations very much in the form of a duet. Interestingly, I heard another male 'singing' close by. However, it could not be seen. This second male was probably trying to attract the same female which was involved in courtship as described above.

The most striking fragment of the courtship display was

the 'parachute jump' by the male. Before parachuting, both sexes were perched about 2-3 meters apart and were 'singing'. Suddenly, the male sprang up in air for about 2 meters and dropped on a semi-circular path to the twig where the female was perched. The 'singing' continued during the parachuting. The male showed virtually all of his colours in this display. It had all its body feathers ruffled, showing its white rump and flanks conspicuously. The feathers of the crown were erected, the tail raised and slightly open. White was the prominent colour in the Marshall's lora parachuting display. This contrast with parachuting of the Common lora where yellow is the prominent colour.

Biogeography

The Marshall's and Common loras coexist in Thanamalvila. Further, Chinthaka Kaluthota's report on the rediscovery of the Marshall's lora (Siyoth Vol. I) shows that the two species coexist in the Yala East National Park as well. This is particularly important, since Marshall's lora replaces the Common lora in northwest India and Pakistan. The fact that these two forms coexist (sympatric) in Sri Lanka may reinforce the taxonomic status of Marshall's lora as a species. This is so because, in general, subspecies cannot coexist without interbreeding and thereby losing their distinctive characters. It seems doubtful whether Marshall's lora occurs elsewhere on the mainland (India) other than in the northwest, whereas the Common lora occurs in several geographic races. However, should there be current or recently extinct populations of the Marshall's lora elsewhere either in India or Sri Lanka, the situation would be worthy of taxonomic re-analysis. This would give a better insight into the taxonomy and biogeography of the two species, or even change part of it.

Marshall's lora populations in India and Sri Lanka show discontinuous distribution at present. This raises interesting questions on the biogeography of the species and can shed light on the biogeography and evolution of other species as well. For instance, just consider how Marshall's lora came to occur at two distant ends of the Indian sub-continent. Did the species colonize south eastern Sri Lanka in evolutionarily recent times? Or were other populations of Marshall's lora extant between northwest India and south eastern Sri Lanka? If so, what happened to them? Why is the Common lora not replaced by the Marshall's lora in Sri Lanka?

In India Marshall's lora is more of a 'harsh country' species that affects thorny scrubby habitats. The

Common lora in India and Sri Lanka is present in 'greener habitats' like tall forests and gardens. I speculate that human habitations may have favoured the Common lora through the introduction of leafy tree species in gardens. Marshall's lora may have found it more difficult to cope with these human-wrought changes. Further detailed studies on the ecology of the two species (eg. habitat preference, responses to territory quality etc.) are necessary before investigating these possibilities.

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1 Many birds have home ranges within which their activ-

ities are usually confined. We can outline home ranges through repeated observations of locations and movements of the owners. Birds defend home ranges (at least during the breeding season), they are then called territories. Hence, the number of individuals can reasonably be judged by knowing the number of territories in an area.

- 2 A fine-grained forager treats the environment as consisting of many 'foraging spaces' or 'grains' hence, thoroughly searches foraging patches.
- 3 Males and females of a species fulfilling different niches, or ecological roles, are known among birds. Usually, such differences would be reflected in biometrics of the sexes.
- 4 This will happen according to the changing availability and hence, with the changing importance, of different feeding substrates.
- 5 The internal organs of caterpillars might be distasteful. That may be why they are removed before eating.
- 6 Gaping is a common threat display among birds.

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