

## BARBETS OF SINGAPORE PART 1: *MEGALAIMA LINEATA HODGSONI* BONAPARTE, THE LINEATED BARBET, SINGAPORE'S ONLY EXOTIC SPECIES

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### INTRODUCTION

*Megalaima lineata*, the lineated barbet, belongs to the order Piciformes (woodpeckers and relatives), family Capitonidae (barbets), and subfamily Megalaimatinae (typical asian barbets) (Shorts & Horne, 2002). This species has two subspecies—*Megalaima lineata hodgsoni* (Fig. 1), which is an exotic species in Singapore, and distributed from northwest India and Nepal east towards western Yunnan, south to Orissa, Bangladesh, Manipur, southern Myanmar, South and Central Vietnam to northern Peninsular Malaysia but absent in southern Peninsular Malaysia and Singapore, although Wells (2002) reported them spread south naturally in Peninsular Malaysia, and the other subspecies, *Megalaima lineata lineata*, is found in Java, and Bali, both in Indonesia (Glenister, 1971; Jeyarajasingam & Pearson, 1999; Robson, 2005; Shorts & Horne, 2002; Wang & Hails, 2007).



Fig. 1. *Megalaima lineata hodgsoni* adult photographed at the Bukit Batok Nature Park. (Photograph by: Mark Chua).



Fig. 2. Adult bird starting to excavate a nesting hole on an albizia (*Falcataria moluccana*) tree's branch. (Photograph by: Mark Chua).

*Megalaima lineata hodgsoni* like *Megalaima lineata lineata* is about the size or bigger than a common myna (*Acridotheres tristis*), has a short, heavy-set beige to pinkish, not laterally compressed beak which is used to excavate nest holes (Fig. 2) (Shorts & Horne, 2002). It has short nasal and chin bristles, which do not extend past half the length of the beak. The head, nape and breast are generally cream with light to dark brown streaks, extending slightly to the belly. It also has a distinct bright yellow eye ring surrounded by naked yellow skin, and has bright yellow feet. The rest of the bird is predominantly bright green.

A prerequisite for barbet habitats seems to be trees with sufficient dead wood in their branches, which is suitable for excavating cavities for roosting as well as nesting, and brooding can be for as long as 11 hours and which is extended during cool or rainy days (Shorts & Horne, 2002). Wells (2002) has, however, reported the preference of the lineated barbet for living trunks and branches for nesting. The lineated barbet is found in varied habitats ranging from evergreen (including pine), deciduous, sal, and teak forests, woodlands, open secondary forest, plantations and gardens, especially when fruiting trees are in season, and where there is sufficient vegetation cover (Shorts & Horne, 2002). In India, with its long history of human occupation and tolerant attitude towards wildlife, some barbets, such as the lineated barbet which is usually confined to forest, do exploit fruiting trees in urban areas as well as orchards, where they can become a pest (Shorts & Horne, 2002). This situation is akin to that in Singapore, where the original population of lineated barbets which were confined to secondary forests, is now venturing out into housing estates, parks and their connectors, to exploit fruiting ornamental trees planted by the National Parks Board (NParks).

The lineated barbet, like most barbets, is well known as a frugivore, but generally has a varied diet that comprises mainly of fruits, especially those of figs (*Ficus* species; Fig. 3), flower petals as well as nectar from *Bombax* and *Erythrina* (del Hoyo et. al., 1999). Lineated barbets have been observed to feed on the fruits and flowers of the exotic species—*Cecropia* species, *Falcataria moluccana*, and *Ptychosperma macarthurii* (Fig. 4) as well as fruits of *Macaranga*, *Mallotus* and *Prunus* species (A. F. S. L. Lok, pers. obs.; M. Chua, pers. comm.). Their favourite fruits are however those of figs, which they depend strongly on, especially those of the strangler, Malayan banyan (*Ficus microcarpa*) and the yellow-stemmed fig (*Ficus fistulosa*). Because of their predominantly fruit diet, barbets are thus major dispersers of seeds of plants and are therefore important in maintaining the health of the ecosystem (Shorts & Horne, 2002). This has, however, negative effects especially when it feeds on exotic plant species such as albizia (*Falcataria moluccana*), cecropia (*Cecropia* species), and MacArthur's palm (*Ptychosperma macarthurii*) (Fig. 4), dispersing their seeds into forest areas, and potentially extending the range of these exotic plants.



Fig. 3. Adult bird feeding on the syconia of a yellow-stemmed fig (*Ficus fistulosa*) tree at Bukit Batok Nature Park. (Photograph by: Mark Chua).

However like all barbets, the lineated barbet must of necessity exploit animal foods when feeding its young, immediately after the eggs hatch or when they require nutrients essential for growth and development so have also been observed, on occasion, to take frogs, insects such as termites, as well as nesting and small birds (Shorts & Horne, 2002). Termites are especially exploited during the rainy months when there is a significant emergence of termites (Shorts & Horne, 2002). Barbets have also regularly been reported to take other small birds as meals, presumably during their breeding season. A gold-whiskered barbet was on two separate occasions observed killing and eating a Eurasian tree sparrow, and a flowerpecker (Lim, 2008; Redzlan Abdul Rahman, 2008).

Breeding of the lineated barbet generally takes place in the rainy season when food is more abundant (Shorts & Horne, 2002). In Singapore, chicks are usually reported from Feb. to Mar. (Wang & Hails, 2007), possibly at the end of the rainy season when there is an increase in fruits as well as insect prey such as winged termites. The lineated barbet is reported to begin feeding its young on insects or a mixture of insects and fruits (Shorts & Horne, 2002). Initial feeding is reportedly regurgitated, with the chicks usually being fed 6–15 times per hour, or sometimes reaching 20 feedings an hour. As the chicks mature, less animal matter is fed and more fruits are brought back to the nest. The nest cavity is constantly cleaned throughout the season with faecal material being carried away from the nest by the parent birds and disposed. As with other piciforms, the nesting period is rather long, and the development of the chicks is slow, averaging 35–38 days. The lineated barbet is also reported to be double-brooded, with the parent birds starting the second brood within days of the first brood's fledging.

Shorts & Horne (2002) have noted that the lineated barbet, like most barbets, travels very short distances from tree to tree in search of food and has an undulating flight pattern, and in general, barbets tend to travel only between 10–12 km beyond their area they are usually found.

Barbets generally drink when they are able to, and may exploit water-filled cavities in trees for a bath (Shorts & Horne, 2002). O'Neill (2007) reported a lineated barbet taking a long bath in a tree hole in Penang, Peninsular Malaysia.

The male lineated barbet's territorial calls are a loud, mellow "poo-poh", uttered once every second as well as a rapid bubbling "koh-koh-koh-koh-koh".



Fig. 4. A pair exploiting a fruiting MacArthur's palm (*Pythosperma macarthurii*) tree, a commonly planted ornamental palm. (Photograph by: Mark Chua).

The lineated barbet is not globally threatened, and common in many of the countries where it is found (Shorts & Horne, 2002). Threats to the lineated barbet, as with all barbets, are the loss of their forest habitat, and to a far much lesser extent, from poaching for the cage-bird market (Shorts & Horne, 2002). In Singapore, where it was introduced, this species has shown how adaptable it is by managing to exploit various food sources, and has even extended its range.

### PAST AND PRESENT RECORDS

The lineated barbet was reportedly introduced in 1996, and listed as an uncommon and localised bird in Singapore (Wang & Hails, 2007). It was apparently brought into Singapore for the bird trade although it has waned in popularity so is generally not imported any more. Previously this subspecies was reportedly restricted to the central and southern areas of Singapore, with birds being spotted in the Bukit Batok Nature Park (BBNP), Bukit Timah Nature Reserve (BTNR), Gymkhana Avenue, Hillview Avenue area, Kent Ridge Park, Lorong Sesuai, and Toh Tuck Road (Wang & Hails, 2007; R. Subaraj, pers. obs.; A. F. S. L. Lok, pers. obs.). In these areas, the bird is usually seen high up in albizia (*Falcataria moluccana*) trees especially at the quarry areas of the BBNP and BTNR, but moving lower to feed on the syconia of the yellow-stemmed fig (*Ficus fistulosa*).

Nesting was also frequently reported in albizia tree branches where cavities are excavated. A particular nest was observed in the beginning of Mar.2007 at BBNP in the trunk of a wild cinnamon (*Cinnamomum iners*) trunk, 3 m above the ground, behind the public toilet slightly into the forest. The nest-building was not noted, and the birds were observed to have already started incubation. During this period, the parent birds alternated incubating in the nest. At this time, no faecal sacs were removed from the cavity and no food was brought back to the nest, indicating the eggs had not yet hatched. Later in the month, the parent birds were observed to return to the nest every 15–20 minutes indicating that the eggs had hatched, and chick feeding had commenced. All food brought to the nest was fruits and no insect prey was observed. On 14 Apr.2007, only one chick was observed to have fledged indicating an unusually small clutch, a clutch usually consisting of 2–4 (Wells, 1999). The parent birds were observed to coax the single juvenile out of the nest hole with food bribes, returning to the nest with fruits, and when the juvenile came out to feed, the parent would pull back and fly to a near branch with the food still in its beak (Fig. 5). After much persuasion, the juvenile finally emerged clumsily from the nest hole, almost falling out, before flying to accompany its parent on the nearby tree branch (Fig. 6). Feeding continued for a day before the juvenile and parents disappeared. The fact that the chick was fed only fruits and not insects probably indicated the lack of insect prey and hence the small clutch size. This lack of insects in the forest areas of Singapore, is possibly caused by the constant fumigation of the forest boundaries by the National Environmental Agency (NEA) in its attempts to eradicate mosquitoes so as to control the spread of dengue, but leaving the forest fringe areas and further in, depauperate of insects.

In mid-Oct.2008, lineated barbets were heard in the Western Catchment Area in Singapore near the Poyan and Murai Reservoirs. Later in mid-Nov.2008, lineated barbets were spotted in the abandoned agricultural land which is now a Singapore Armed Forces training ground that is bordered by Choa Chu Kang to the north, Lim Chu Kang to the west, Jurong West to the south, and Bukit Batok to the east, where these birds are most likely to have originated. It is probably from this abandoned agricultural land, that the barbets are extending their range into the Western Catchment Area to the west via Lim Chu Kang. These birds have also extended their range to the Chinese and Japanese Gardens south to the area where former Tang Dynasty Village stood via a park connector adjacent to Yuan Ching Road. These birds probably arrived from the agricultural land mentioned above via the old Jurong West housing estate, which is only 2–3 km away. The lineated barbet has also been reported feeding on the fruits of a *Livistona* species at the Singapore Discovery Centre. In these urban, garden-park, and wasteland areas, lineated barbets were observed to be exploiting fruiting trees planted by the NParks as well as fruiting secondary forest species. Planted fruit trees favoured include the bodhi tree (*Ficus religiosa*), Benjamin fig (*Ficus benjamina*), Malayan banyan (*Ficus microcarpa*) as well as other figs (*Ficus* species), jambu air laut (*Syzygium grande*), common kelat (*Syzygium lineatum*), *Syzygium complanatum* (= *Eugenia oleina*), MacArthur's palm, as well as *Livistona* species and other palms. Abandoned agricultural land plants that seem to be favoured by this species include albizia, Benjamin fig, cecropia, MacArthur's palm, Malayan banyan, yellow-stemmed fig, as well as other abandoned horticultural species with edible fruit (Shorts & Horne, 2002).

### CONCLUSIONS

Although Shorts & Horne (2002) describe the lineated barbet as predominantly a forest bird, this species can exploit new habitats and food sources. We have also seen how park connectors, and green corridors such as a mosaic of abandoned wasteland interspersed with housing estates, are still suitable for this adventurous forest bird to utilise and extend its range. It is pleasurable to observe the colourful and predominantly urban, copper-smith barbet (*Megalaima haemcephala*) sharing its habitat with the lineated barbet as well as other forest-dwelling, frugivorous species such as the pied imperial pigeon (*Ducula bicolor*) in the Jurong area, because of the numerous fruit trees planted by the NParks. They add colour to our otherwise dull, urban, feral bird population of common mynas, Eurasian tree sparrows, house crows (*Corvus splendens*), Javan mynas (*Acridotheres javanicus*), and rock pigeons (*Columba livia*).



Fig. 5. Photograph sequence of the parent coaxing its chick out of the nest hole with some sort of black fruit or seeds as a bribe. (Photograph by: Tey Boon Sin).



Fig. 6. The chick finally left its nest hole reluctantly. (Photograph by: Tey Boon Sin).

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