

BARBETS OF SINGAPORE PART 2: *MEGALAIMA HAEMACEPHALA INDICA* LATHAM (COPPERSMITH BARBET), SINGAPORE'S ONLY NATIVE, URBAN BARBET

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INTRODUCTION

There are four known native species of barbet recorded from Singapore (Wang & Hails, 2007), with three from the subfamily Megalaimatinae, and one from the subfamily Calorhamphinae (Shorts & Horne, 2002). Two of the four species, the blue-eared barbet (*Megalaima australis duvauceli*; subfamily Megalaimatinae) and the brown barbet (subfamily Calorhamphinae; *Calorhamphus fuliginosus hayii*) are now extinct (Wang & Hails, 2007; Wells, 1999). Three of the native barbet species are strictly forest-dwelling species and the coppersmith barbet (*Megalaima haemacephala*), which is the species featured in this article, is our only urban-dwelling species. The coppersmith barbet belongs to the order Piciformes (woodpeckers and relatives), family Capitonidae (barbets), subfamily Megalaimatinae (typical asian barbets) (Shorts & Horne, 2002). There are nine subspecies of *Megalaima haemacephala* extending from northeastern Pakistan, east to South China, South to Sri Lanka, Singapore, Vietnam, Sumatra, Java, Bali and the Philippines with the most subspecies found in the Philippine archipelago (Glenister, 1971; Jeyarajasingam & Pearson, 1999). The subspecies found in Singapore is *Megalaima haemacephala indica* (Fig. 1) and ranges from northeastern Pakistan, South China, Sri Lanka, Vietnam and southwards through the Malay Peninsula, differing from other subspecies by subtle differences in facial and body plumage colour (Shorts & Horne, 2002).

Megalaima haemacephala indica is a small chunky green barbet with a short, black, not laterally compressed beak that is used to excavate nest holes (Shorts & Horne, 2002). They have long nasal and chin bristles, which extend to nearly the entire length of the beak. It has a red forehead and crown with yellow patches above and below the eye, which is surrounded by red orbital skin, and black eye stripes, and a moustache. The nape, collar and lesser covert areas are a bluish green. The chin and throat are yellow with a red and black stripe/patch at the intersection with the breast. The breast, belly, flanks, and vent areas are predominantly cream streaked with green. The remainder of the bird such as the mantle, back, rump, uppertail coverts, tail feathers, and the wing are generally green, tinged in some parts with blue. The legs are also bright red.

Like other barbet species, a prerequisite for the *Megalaima haemacephala indica*'s habitat seems to be the presence of trees with sufficient dead wood in their branches, which is suitable for excavating cavities, and which are required for nesting as well as roosting (Shorts & Horne, 2002). *Megalaima haemacephala indica* individuals which roost singly, appear to spend an even longer part of the day roosting compared to other barbet species. Immature birds usually roost with their parents, but returning earlier to the roost than the parents to avoid exclusion from the nest hole by the adult birds. Like other barbets, the *Megalaima haemacephala indica*'s roosting period may also be extended during cool or rainy days. Generally, *Megalaima haemacephala indica* individuals are never found in closed forest areas, although they are found in areas where there are clearings in the forest from logging but is most well-adapted to living along forest edges, woodland, scrub and gardens, and as such have become very common throughout its range (Glenister, 1971; Jeyarajasingam & Pearson, 1999). It is because of this adaptability that this subspecies has been able to extend its range even though other barbets have been unable to, or have even had their ranges reduced owing to forest clearance.

Megalaima haemacephala indica, like most barbets, is well known as a frugivore, but generally has a varied diet that consists mainly of small fruits, such as those of figs (*Ficus* species) (Fig. 2) as well as over ripe larger fruits that are soft, and small insect prey including beetles, crickets, mantids, winged termites, and various insect larvae (Shorts & Horne, 2002). We have observed that their favourite fruits are those of figs, on which they are strongly dependent, especially the fruits of stranglers such as Malayan banyan (*Ficus microcarpa*) and the Benjamin fig (*Ficus benjamina*) as well as the bodhi tree (*Ficus religiosa*) which is a common urban fig (Fig. 2). Because their diet is predominantly fruits, these barbets are thus major dispersers of the seeds of small-fruited plants and thus important in maintaining the health of the ecosystem (Shorts & Horne, 2002). However, this may have a negative impact, especially when and if they feed on exotic fig species such as the Benjamin fig or the bodhi tree (Fig. 2) dispersing their seeds into forest areas later (Fig. 3), and extending the range of these exotic plants. Like all barbets, this subspecies must necessarily exploit animal



Fig. 1. *Megalaima haemacephala indica* adult photographed on a bodhi tree (*Ficus religiosa*) branch in Lake View Promenade just outside the Japanese Garden. (Photograph by: Alvin Francis Lok Siew Loon).

foods for feeding its young, immediately after the eggs hatch or when they require nutrients essential for growth and development (Shorts & Horne, 2002).

Breeding of *Megalaima haemacephala indica* generally takes place during the rainy season when food is more abundant (Shorts & Horne, 2002). In Singapore, nest-building is reported from Dec. to Jul., broods are observed in Jan. to Jul., and chicks recorded from Jul. to Sep. (Wang & Hails, 2007). We have observed immatures from Jun. to Sep. and which are duller coloured than the adults, lacking the all red colouration, and streaky coloured all the way to the throat (Fig. 4). Courtship begins with much singing, throat-puffing, bobbing of the head, and tail flicking (Shorts & Horne, 2002). Courtship involves allopreening sessions as well as frequent feeding of the female by the male, with the female usually passing back the item proffered in a teasing fashion (Redzlan Abdul Rahman, 2008). In *Megalaima haemacephala indica* individuals that are solitary roosters, early breeding season is indicated by pairs taking turns to excavate the nesting site, which is also part of the courtship behaviour (Shorts & Horne, 2002). We have also observed this subspecies using its tail as a prop while excavating the nest cavity which is usually about 2–15 m above the ground, with a 4–5 cm diameter entrance (Fig. 5). The cavity is usually freshly excavated, or old nest cavities may be used after passing an inspection and cleaning. The nest cavity is usually 15–80 cm deep with 2–4 eggs laid, but the usual clutch size is three (Shorts & Horne, 2002).

We have observed that the incubation of eggs are done by both parents, which takes about 15 days, after which the nestlings are fed by both parents for the next 30 or so days. The parent birds begin feeding their young insects larvae, or a mixture of insects and fruits (Fig. 6) (Shorts & Horne, 2002). Initial feeding is reportedly regurgitated with the chicks usually being fed 6–15 times per hour, sometimes reaching 20 feedings an hour with the parents not traveling far from the nesting tree. 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 nesting season with faecal material being carried away from the nest by the parent birds and disposed (Fig. 7). This subspecies is also reported to be double-brooded barbets because under certain circumstances, a second brood may be started depending on the availability of food with the newly fledged young chased away. Fledging was observed to take only two days of leaving the nest or even faster if the situation calls for it (Figs. 8 & 9).



Fig. 2. Adult bird eating a bodhi tree syconium. (Photograph by: Alvin Francis Lok Siew Loon).

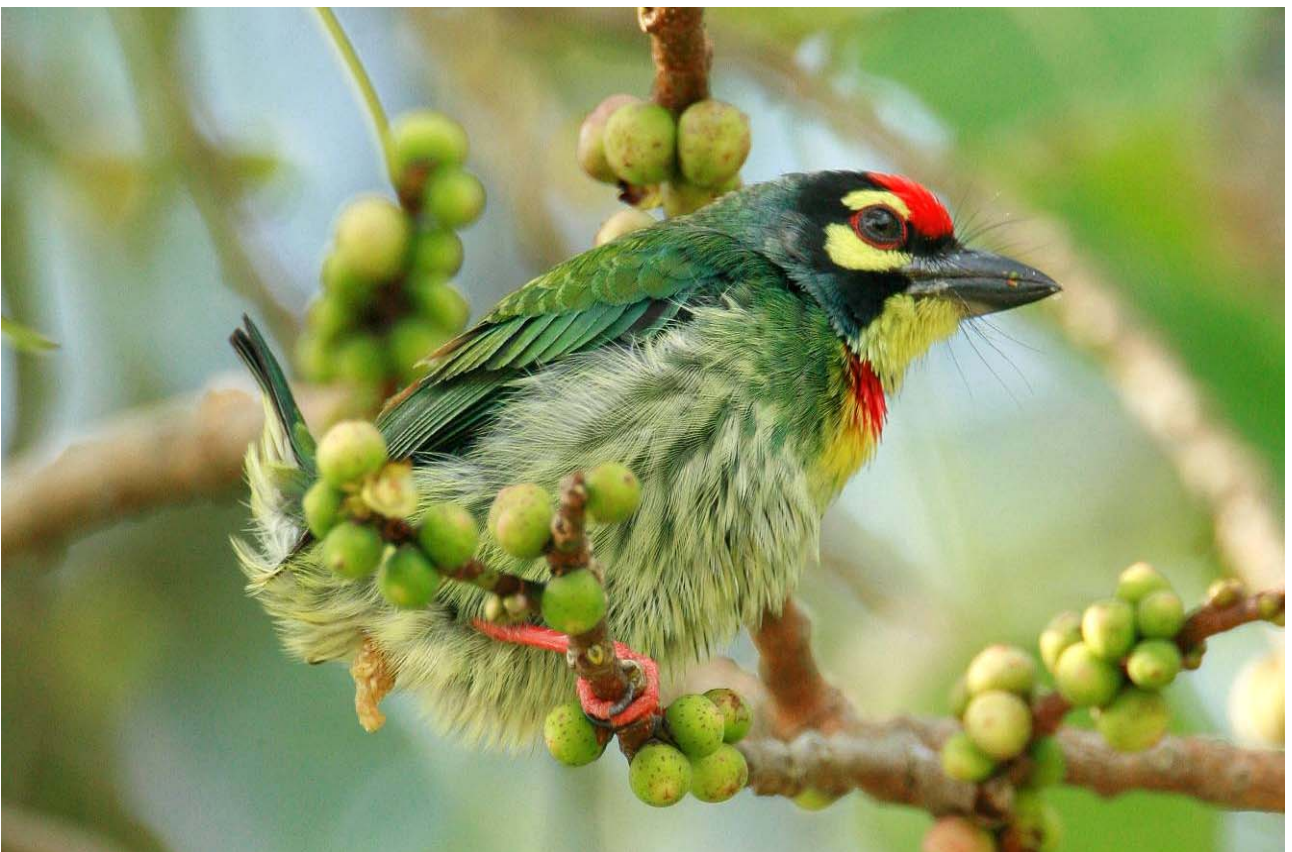


Fig. 3. Adult bird passing out seeds of a bodhi tree syconia. (Photograph by: Alvin Francis Lok Siew Loon).



Fig. 4. A dull-coloured immature bird clearly lacking the red of the adult plumage. (Photograph by: Johnny Wee).



Fig. 5. An adult bird peering out from its nest hole. (Photograph by: Mark Chua).



Fig. 6. A parent bird feeding its chick a bodhi tree syconium. (Photograph by: Lee Tiah Kee).



Fig. 7. A parent bird removing faecal material from the nest hole, while the other parent returns with food. (Photograph by: Lee Tiah Kee).



Fig. 8. A plantain squirrel seen gnawing away at the nest site, causing the chick to abandon the nest (Photograph by: Lee Tiah Kee).



Fig. 9. The worried parent bird returning to the nest to find it badly damaged (Photograph by: Lee Tiah Kee).

Megalaima haemacephala indica's song is usually heard throughout the day from a top a tree and consist of a long series of "tok" or "tonk" notes that varies in tempo greatly, but is around 80–200 notes per minute but usually less (Shorts & Horne, 2002; Robson, 2005).

Megalaima haemacephala indica is not globally threatened and is the most common barbet in Singapore (Wang & Hails, 2007). Although the ranges of many species of barbet are not expanding or are even decreasing because of the increase in deforestation, the non-forest *Megalaima haemacephala indica* is the only tropical Asian barbet that has undergone natural expansion of its range as well as increase in numbers, and this is probably owed to its liking for non-forest habitats such as plantations, gardens, and urban areas (Shorts & Horne, 2002).

PAST AND PRESENT RECORDS

During the last century, *Megalaima haemacephala indica* has spread naturally from northern Peninsular Malaysia southwards, reaching Singapore in Jan.1957 (Tweedie, 1960; Wells, 1999) and has since become the commonest barbet here. The earliest record of the subspecies in southern Peninsular Malaysia, comes from Singapore where a pair was shot at the Bukit Timah Nature Reserve (BTNR) in the late 1920s (Robinson, 1927), prior to main colonisation of this subspecies in larger numbers in the 1950s (Gibson-Hill, 1949). Owing to the above mentioned, and the fact that the spread of this species took place naturally, because of landscape change and not from release of captive birds, we consider this species native. This is unlike the lineated barbet (*Megalaima lineata hodgsoni*) population here, which originated from birds released from captivity (Lok et al., 2009).

In Singapore the *Megalaima haemacephala indica* is found throughout the island but is more common in the south and east, and more frequently observed in Sentosa and St. John's Island (Pulau Sakijang Bendera), found frequently in parks, gardens, open wooded country as well as Housing Development Board (HDB) estates, and cemeteries, and is never found in old secondary forest and primary vegetation (Wang & Hails, 2007). We have also frequently observed this subspecies in a short bodhi tree at a carpark outside the Japanese Garden, where these birds are seen in great numbers feeding in relative calm when the tree is fruiting (Figs. 1–3).

We have also observed nesting in Singapore at many locations and in many host tree species including an albizia (*Falcataria moluccana*) tree (15 m up) at Bukit Batok Nature Park, a common acacia tree (*Acacia auriculiformis*) (10 m up) in Bukit Brown Cemetery, a jacaranda (*Jacaranda obtusifolia*) tree (10 m up) in the Chinese Garden, a yellow flame (*Peltophorum pterocarpum*) tree (5 m up) and in a common acacia tree (8 m up) in Lim Chu Kang Muslim cemetery, and in a *Fragraea fragrans* (tembusu) tree (20 m up) in the Singapore Botanic Gardens. Nests were observed to always

be excavated from a dead branch of a tree. The subspecies has also been recorded nesting in dead palm stems, including that of the lipstick palm (*Cyrtostachys renda*) at Jalan Keli on 16 Apr.2007, a stem which appeared too narrow for a nest to be excavated from it (Tang, 2007).

Nest disturbance by other species is rare, and we have observed that a parent usually stays close to the nest site, to defend it against intruders. On 26 Jun.2008, we noticed a nest hole at the Singapore Botanic Gardens, that was excavated from a dead branch of a tembusu tree (20 m up). The parents were feeding the young and there appeared to be only a single chick. Food provided by the parents consisted mainly of berries, fig syconia, and other kinds of fruit, but there was one occasion when one of the parents brought in what looked like a winged-insect. On 10 Jul.2008 the chick was observed to be fed at more frequent intervals, indicating that the chick has grown larger and probably close to fledging. A few days later, on 15 Jul.2008 at around 0930 hours a plantain squirrel was observed to be lingering around the nest after which it started to gnaw holes into the dead branch where the nest was, causing great distress to the nestling, which was forced to abandon the nest just as the squirrel gnawed into the cavity (Figs. 8 & 9). The gnawing left significant damage to the nesting hole and the chick being fearful, flew quite a distance from the nest and was not seen again. Later, one of the parents returned to the nest to find it in ruins, and started calling for the chick desperately, but to no avail. This squirrel-barbet encounter was very interesting, because throughout the nesting period, neither of the barbet parents was observed flying too far from the nest to forage, usually lingering around the vicinity of the nest to guard it against intrusions. We are uncertain of the squirrel's motives which could have been predation but if so, it would have made more sense to enter the nest by its entrance to block the chick from escaping.

CONCLUSIONS

Because of its adaptability to a range of habitats and tolerance to human encroachment, *Megalaima haemacephala indica* was successful in spreading naturally from Peninsular Malaysia southwards, reaching Singapore in Jan.1957 and has since become the commonest barbet here. Although the ranges of many species of barbet are not expanding or are even decreasing because of increased deforestation, this non-forest bird is the only tropical Asian barbet that has undergone expansion of its range as well as increase in numbers, and this is probably because of their preference for non-forest habitats such as plantations, gardens, and urban areas. Their versatility to exploit different habitats and food sources will definitely ensure that this little urban gem will continue to thrive in the face of our ever-changing Singapore landscape.

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