

## PITTAS (PITTIDAE) OF SINGAPORE

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### INTRODUCTION

There are four species of pitta recorded from Singapore. Two species of pitta, *Pitta moluccensis* (blue-winged pitta) (Fig. 1) and *Pitta sordiad cucullata* (hooded pitta) (Fig. 2) are winter migrants, while *Pitta megarhyncha* (mangrove pitta) (Fig. 3) is a rare resident, and *Pitta granatina coccinea* (garnet pitta) (Fig. 4) has been extinct in Singapore since 1960 (Wang & Hails, 2007). The blue-winged pitta generally breeds in south and east Myanmar, and south China through Thailand, Laos, Cambodia, Vietnam and the northern Peninsular Malaysia, and migrates southwards to Sumatra and Borneo during the winter (Glenister, 1971; Jeyarajasingam & Pearson, 1999; Erritzoe, 2004; Robson, 2005). The hooded pitta, is distributed from the Himalayan foothills from north India, east to north Myanmar, south China, north Vietnam, south to north Bangladesh, Thailand, south Laos and Cambodia, migrating south as far as Sumatra and Java during the winter months. The garnet pitta is found in the extreme south of Myanmar and peninsular Thailand, Peninsular Malaysia and east Sumatra. Lastly the mangrove pitta is distributed from south Bangladesh patchily through the west coast of peninsular Thailand, western and eastern Peninsular Malaysia, East Sumatra, Riau Archipelago and Bangka Island.



Fig. 1. A blue-winged pitta seen in the undergrowth of the Ginger Garden at the Singapore Botanic Gardens. (Photograph by: Alvin Francis Lok Siew Loon).



Fig. 2. A hooded pitta at the Bidadari Cemetery at the Upper Serangoon Road area. (Photograph by: Alvin Francis Lok Siew Loon).



Fig. 3. A mangrove pitta perched on the prop root of a bakau tree (*Rhizophora* species) in Krabi, Thailand. (Photograph by: Ingo Waschki).



Fig. 4. A garnet pitta in the undergrowth of Taman Negara National Park, Pahang, Peninsular Malaysia. (Photograph by: Ong Kiem Sian).



Fig. 5. A hooded pitta at the Bidadari Cemetery at the Upper Serangoon Road area at noon resting on one leg on a branch. (Photograph by: Johnny Wee).

Pittas belong to the order Passeriformes, suborder Eurylaimi and family Pittidae (Erritzoe, 2004). The family Pittidae is monogeneric (with only one genus, *Pitta*) with 30 species and 91 subspecies. Pittas generally inhabit moist tropical forest, semi-forest, and scrub lands with many species preferring proximity to watercourses. This preference for water appears to be linked with the fact that pittas appear to bathe regularly, after which much time is devoted to preening. This is often followed by sun-bathing in some pitta species, including the hooded pitta. In their typical forest habitat, pittas generally occur in the dark moist undergrowth with a ground cover of leaf litter, but also in limestone areas with steep-sided ravines. Habitat, however, varies with the species, with the rainbow pitta frequently encountered in monsoonal and eucalyptus type forests, the blue-winged pitta is usually found in bamboo thickets, the garnet pitta frequents swamp forest, while the mangrove pitta as its name suggests, is confined mainly to mangrove forest.

Pittas are generally diurnal birds requiring daylight in order to locate their food (Erritzoe, 2004). Pittas are also very shy birds and thus very difficult to observe. When alarmed, pittas tend to hop into the nearest thick vegetation cover available rather than taking to flight, although the garnet pitta has also been observed to take to the tops of trees when alarmed. Pittas tend to be solitary except during the breeding season. Young birds also do not have close contact with their parents unless hungry. This strategy of being solitary has its advantages as it allows better protection from predators and also helps to lower the risk to transmission of parasites and disease. Pittas are, however, recorded to join loose flocks during the migratory season. During the hottest parts of the day and other periods of rest, pittas often stand on one leg (Fig. 5) and remaining very quiet, making them very hard to spot during these periods. Standing on one leg is apparently employed by pittas to reduce heat loss (by reducing exposed surface area), so as to conserve energy.

Pittas are extremely territorial, and many species have elaborate territorial displays (Erritzoe, 2004). The hooded and garnet pittas have a bowing display, and this takes place when two birds meet along the boundaries of their territories. This displays starts off with each bird standing in an upright posture followed by a stiff slow bow till the bird's breast nearly touches the floor and takes place for 5–20 seconds accompanied by a purring sound. Pitta calls are easy to imitate and consist of short monosyllabic or disyllabic, fluty notes, with a few sounding like words from the human language. Calls in pittas are very important and are used by males to state their territorial claims. Pittas are extremely vocal during the pre-egg laying period in the breeding season. The mangrove pitta is often very vocal while brooding, but remains silent while on the nest. Pittas often only call in the early mornings and in the evening when there is dappled light and when the air is cool. Cloudy weather also evokes some pittas to call throughout the day. The blue-winged and the hooded pittas have even been recorded calling during the night, when the moon is bright and clear. Pitta calls often stimulate other individuals to respond. The alarm calls of pittas are rather uniform and are best described as “keow”, “keew”, “skyeew” or “eeyow”.

Pittas feed on a variety of foods, but the most common are earthworms (Fig. 6), and snails (Fig. 7) (Erritzoe, 2004). Pittas consume 10–30% of their body weight in food daily. Pitta diets comprise of a variety of invertebrates such as ants, beetles, bugs, centipedes (Fig. 7), spiders, and termites, as well as small frogs, skinks and snakes. However, the garnet pitta has been known to consume plant matter. Pittas feed in the wet undergrowth by brushing or sweeping aside dead leaves with sideways motion of their bills. Pittas have a keen sense of smell, which they utilise to find concealed prey such as earthworms which are often burrowing in the soft earth. Pittas are also very resourceful birds and occasionally use inanimate objects such as stones to smash snail shells.

Information on pitta breeding is very poorly known, although some breeding information has been collected from captive breeding (Erritzoe, 2004). Pittas are monogamous birds and are solitary breeders (in pairs and not in groups) defending against intruders. The breeding season is generally timed with the onset of the rainy season, which coincides with the increase abundance of arthropods. Rain also makes the soil soft and moist, bringing the earthworms, which retreat deeper into the earth during the drier season up to the soil surface, where they are easily found by foraging birds. Another reason for breeding during the rainy season is that because of the increase in rainfall, the vegetation gets lush, thus providing more cover for the nest and nestlings. However the blue-winged pitta in the northern states of the Malay Peninsula such as Kedah, Perlis, and Penang has been observed to breed in fruit plantations during the months of May–Aug. which is the dry season. These shy and elusive birds are ground nesters and are more easily observed during this nesting period. It is thought that they migrate northwards into Thailand with their young after the breeding season, thus explaining why not a single blue-winged pitta is observed or heard in Kedah, Penang and Perlis outside the nesting months. During the period prior to nest-building, they can often be observed hopping all over the ground digging up earthworms and catching other insects and invertebrates such as crickets, grasshoppers and even the occasional centipede (Figs. 6, 7).

During nest-building period, blue-winged pittas are observed to build their nests of dried material and fine roots, which they collect fervently (Erritzoe, 2004). Their nests are usually built right on the ground, or amongst low scrub and undergrowth but have also been observed in birds nest ferns (*Asplenium nidus*) growing on the trunks and branches of fruit trees. Their nests are rarely located high in the trees. Their nests are usually dome-shaped and sheltered with



Fig. 6. A blue-winged pitta returning to its nest with a mouthful of earthworms after heavy rain. (Photograph by: Nelson Khor).



Fig. 7. A blue-winged pitta with a centipede and snail. (Photograph by: Nelson Khor).



Fig. 8. Brown-speckled eggs in a nest of the blue-winged pitta. (Photograph by: Nelson Khor).



Fig. 9. Three chicks in the nest after approximately one week of incubation. (Photograph by: Nelson Khor).



Fig. 10. The three well-developed chicks just before forced fledging by the parent birds. (Photograph by: Nelson Khor).

a front-facing entrance. Usually 3–4, lightly speckled eggs are laid per nest (Fig. 8), with the male and female birds taking turns to incubate and tend to the eggs. When one parent sits is on the nest, the other is often found perching on a nearby low branch keeping guard or is out foraging for food. The incubation period was approximated at 7–10 days which is rather short, although Erritzoe (2004) reports incubation typically lasting 14–16 days in the blue-winged pitta, and 15–16 days for the hooded pitta, after which dark brown chicks emerge (Fig. 9).

Feeding three hungry chicks is more than a full-time job for both parents, as they need to return with a lot of food at very regular intervals, often perching on a low branch nearby and checking for threats before diving down into the nest to deliver the meals. At its peak, the interval for feeding was never more than 30 minutes and sometimes both parents would return with mouthfuls of earthworms (Fig. 6), especially on rainy days when earthworms are easier to find. Being ground-nesters, the chicks were observed to mature quickly, taking on faint adult colorations only after a few days (Fig. 10) and were encouraged by both parents to fledge much earlier than high-nesting birds. What was observed was perhaps the first ever event of both parents actively tearing away the canopy of the domed nest, exposing the three grown chicks. This act was assumed to be affirmative action taken by both parents to force fledge their chicks. By this time, the chicks were capable of short hops and flight to nearby low branches where they remained still dependant on both parents for food for a few days. After fledging, the chicks with both parents were still observed in the general vicinity of the nest for at least two days, after which the absence led us to assume that they must have migrated northwards or returned to forested areas in the area.

Information of pitta courtship is very poorly known, although some courtship behaviour has been collected of the hooded pitta (Erritzoe, 2004). During courtship the male hooded pitta, chases the female around for a period of time, followed by both individuals stretching to their maximum height then relaxing back to their normal posture, bobbing their tail up and down and producing a growling noise. Some wing-flicking also occurs.

Most pittas are sedentary—rarely making long movements—although some post-breeding dispersal does take place (Erritzoe, 2004). Only four species and a subspecies of pitta are true migrants, taking long journeys south during the winter periods. Among these five subspecies and species, the blue-winged and hooded pittas are found in Singapore during the winter months. Little is known about pitta migration as recaptures of tagged bird are extremely difficult, with an average of 0.45% recovery. We do know however that these movements are usually nocturnal and usually in loose flocks. They birds are also known to use the same rest points year after year with little variation with respect to time of visit.



Fig. 11. A hooded pitta found dead in the Jurong West area at a multi-storey carpark. (Photograph by: Low Choon How).

Populations of the blue-winged pitta in southern Myanmar and Thailand leap-frog southward to Sumatra and Borneo, often stopping over in Singapore and the Riau Islands, before proceeding onwards (Erritzoe, 2004). The hooded pitta, on the other hand, has been known to make differential migration trips, with the sexes separating outside the breeding season. Out of 11 hooded pittas caught in the Straits of Malacca during the Nov.–Dec. months, ten were females.

Owing to their brilliant colours, pittas have always been desirable subjects for aviculture (Erritzoe, 2004). Pittas are difficult to breed because of their dependence on thick, lush foliage and a predominantly insectivorous diet. Hence pittas are extremely expensive to maintain in collections, such as zoos and bird parks, which very often have to replenish their collections with newly caught individuals, thus contributing to added pressure on wild pitta populations. Pittas are often also found in bird markets in Thailand, Surabaya and Jakarta (Indonesia) and even in Serangoon North bird shops (Singapore) despite the protection their birds are supposed to be afforded. In India, pittas are even collected for the pot. The main threat to these beautiful birds is habitat destruction. Pittas are extremely dependent on rainforest, which used to occur in large extensive tracts, but have in recent years been reduced to only 7% of the earth's surface (Erritzoe, 2004). Logging and forest-burning are the main culprits of such forest devastation, leaving pittas with very restricted habitat. Amazingly even though pittas have undergone such survival threats, no pitta species has yet to become extinct. Nine species have, however, been listed as globally-threatened, with two species of pitta—Gurney's pitta (*Pitta gurneyi*) and the whiskered pitta (*Pitta kochi*) being listed under the Appendix I of the Conservation of the International Trade in Endangered Species (CITES), while the fairy pitta (*Pitta nympha*) is listed under Appendix II. Three pittas—the garnet, giant (*Pitta caerulea*), and mangrove pittas are considered near-threatened. The garnet pitta is near-threatened, because its habitat of lowland evergreen forest below 600 m altitude, has suffered massive destruction throughout its range and has gone extinct in Singapore for the same reason. The mangrove pitta, on the other hand, is strictly confined to mangroves, which has been heavily exploited for timber, fuel and building materials and even for land reclamation for development in Singapore. This species is now considered nationally critically endangered in Singapore, because of habitat destruction (Lim et al., 2008).



## PAST AND PRESENT RECORDS

**Hooded pitta.** – The hooded pitta breeds in the north (Himalaya, south west China, Indochina, Myanmar and Thailand) and winters in the south (Malay Peninsula, Singapore, Sumatra and Java) (Erritzoe, 2004). This southwardly passage starts mainly in Nov. and peaks in Dec. (Wang & Hails, 2007). We have observed this species at the Bukit Timah Nature Reserve (BTNR), Bukit Batok Nature Park (BBNP), Central Catchment Nature Reserves (CCNR), Singapore Botanic Gardens (SBG), and Hindhede Nature Park (HNP). Dead or injured birds have also been collected on Jurong Island and various urban areas.

Robinson (1927) reported that the hooded pitta settles in mangrove forest belts upon arriving from the north in Oct., and moving inland later, although we have not observed such behaviour in Singapore in recent years. This could probably be explained by the fact the mangrove forests in Singapore currently, are very narrow corridors and not as substantial as previously. These birds are normally forest dwellers but in Singapore, we have also observed them to utilise scrub, secondary forest and wooded gardens.

For the 2008 winter season, the first sighting of this species was on 30 Nov.2008 by G. Sreedharan at Jurong Lake Park, close to the former Tang Dynasty Village and the Far East Flora nursery (G. Sreedharan, pers. comm.). This individual was observed spending most of its time up on several trees, taking cover in thick vegetation such as a large *Baphia* thicket when approached to closely.

Another sighting of the hooded pitta was made by Con Foley on the 7 Dec.2008 at Bidadari Cemetery in the Serangoon area (C. Foley, pers comm.). This winter months there has seen much activity at Bidadari Cemetery for both bird photographers and birds alike. This location revealed many interesting winter migrants such as *Aviceda leuphotes* (black bazas), *Pitta sordid* (hooded pitta), *Caprimulgus indicus* (grey nightjar), *Turdus obscurus* (eyebrowed thrush), *Gorsachius melanolophus* (Malayan night heron) and many others (Tsang, 2009). The cemetery was opened in 1908 as a multi-religious burial ground and is located at the junction of Upper Serangoon Road and Upper Aljunied Road. However, under the Singapore Government's 1998 Master Plan, the area was designated for high-density public housing and other facilities and was closed in 1972. Exhumation started in 2001 and completed in 2006. The area is lightly wooded with matured trees, and is now very park-like with more and more people are finding the area attractive for birdwatching. The old trees are not manicured and hence numerous hemiparasitic mistletoes and epiphytic ferns and orchids can be seen festooning the branches. In this locality we observed 2–3 hooded pittas on the same day. The birds were most active in the early mornings when they can be seen hopping around the base of some trees in search of worms, crickets, snails, and other insects. In the late mornings the birds became very inactive retreating into thick shrubbery at the base of the tree or on low branches where they could be seen standing on one leg (Fig. 5) for most of the day till the evening, when they started feeding again.

This species has also recently been seen in Housing and Development Board residential estates. On 22 Dec.2008 a hooded pitta was discovered in Jurong West. This sighting was made by Low Choon How (2008) at Jurong West St. 65, who rushed home to obtain his camera to photograph this gem. Upon returning to the sight, he managed to photograph the bird perching on a low branch of a planted tree, before it flew off. The next day however, the same bird was found motionless on the floor at a multi-storey carpark, probably after flying into the windshield of a car, or glass window (Fig. 11).

There have also been two offshore records for Singapore coming from Pulau Tekong Besar on 4 Dec.1984 and from St. John's Island on 30 Mar.1995 (Ollington et al., 1998).

**Blue-winged pitta.** – The other uncommon winter migrant to Singapore, is the blue-winged pitta. Like the hooded pitta, the blue-winged pitta breeds in South China, Vietnam, Myanmar, Thailand, and as far south as the northern Peninsular Malaysian states. Previously this was thought to be strictly a passage migrant, with a mainly Oct.–Dec. autumn passage and a mainly Mar.–Apr. spring passage (Ollington et al., 1998). While this is still mainly true, we now know that a few birds winter at the CCNR and SBG. During winter, this pitta flies south to the southern parts of Peninsular Malaysia, Singapore, Sumatra, Borneo, and Java (Wang & Hails, 2007). In Singapore we have observed this species in the CCNR, Changi, Medway Park, Pulau Tekong, Pulau Ubin, Singapore Botanic Gardens, and West Coast Park, in varied habitats such as forest, wooded gardens and secondary scrub. A recent sighting was made in Dec.2008 at the Singapore Zoo, near the komodo dragon exhibit (Tey, 2008). Here the blue-winged pitta was observed smashing a snail shell on the ground, after which it hopped into the undergrowth to feed.

On 17 Jan.2009, Kennie Pan observed a blue-winged pitta along the Malayan Railroad tracks behind the Clementi Institute of Technical Education (ITE) (K. Pan, pers. comm.). The bird was first observed in the late evening, and upon spotting its observer, the bird proceeded to hop into the ITE compound after which it disappeared. This same bird was also spotted on several other occasions at the same locality, all in the early morning or late evening periods, when lighting conditions made photographing the bird difficult. During the same period, another blue-winged pitta was also spotted at the Ginger Garden at the SBG close to Halia Restaurant. This bird, on the other hand, was very friendly and

came as close as 1.5 m from people (Fig. 1). The blue-winged pitta would appear every morning around 0730–0830 hours, and feed till about 1100 hours after which it would hop into the undergrowth to escape the heat. It would reappear again after 1630 hours for another round of feeding before disappearing into the undergrowth to roost. On 11 Feb.2009 another blue-winged pitta was spotted along the Cyathea Trail at the Lower Peirce Reservoir in the CCNR at around 1100 hours and another at MacRitchie on 4 Feb.2009 at about 1900 hours.

Interestingly, two blue-winged pittas were reported and photographed at the Kranji Nature Trail in Jul.2008. The birds were first heard calling by Pauline Lee on 12 Jul.2008 and subsequently confirmed by photographs of Con Foley on 18 Jul.2008 (Low, 2008). It was reported again on 20 Jul.2008 and there have been no subsequent reports. The occurrence of this species at this time of the year is intriguing as the nearest nesting location to Singapore is several hundred kilometres in Taman Negara.

**Garnet pitta.** – The garnet pitta, which was considered an uncommon resident, and has been extinct in Singapore since the 1949 (Gibson-Hill, 1949). There was an unconfirmed sighting of this species at the BTNR on 7 Dec.1988 following its extinction (Wang & Hails, 2007). All the sightings following Gibson-Hill's last sighting was however considered erroneous by Wang & Hails (2007) owing to lack of photographic evidence.

**Mangrove pitta.** – The only remaining resident pitta species in Singapore is the mangrove pitta, which is now considered globally near-threatened (Collar et al., 1994). This species is now considered critically endangered in Singapore because of the loss of its mangrove habitat (Lim, 1989; Lim, 1992; Lim, et al., 2008). The mangrove pitta has been extinct on Singapore Island since 1979 when its last refuge at Tanjong Karang was cleared (Lim, 1992), although Richard Ollington has mentioned that he heard it at West Beach North on 30 Mar.1981 (R. Ollington, pers. comm.).

Although the mangrove pitta has been extinct on Singapore Island for approximately 20 years, there have been recent sightings of this species at the Sungei Buloh Wetland Reserve (SBWR), which may be owed to mangrove clearance on the Malaysian side of the Johore Straits at Johore, displacing birds to Singapore. The first of these mainland sightings was made in Apr.2001 when one bird was spotted at the main pond of the SBWR by RS. The second sighting was made by the staff members of the SBWR when one bird spent two weeks at the mangrove boardwalk area (Yeo, 2008). The most recent, alleged sighting of this species on Singapore Island was as recent as 2008, when two birds were spotted at the Kranji Nature Trail adjacent to the SBWR and stayed a few months (Low, 2008). However this sighting was later confirmed to be a misidentification, and were in actual fact blue-winged pittas based on calls and also photographic evidence provided by Con Foley (pers. comm.).

According to Wang & Hails (2007), only 10 individuals survive on both Pulau Ubin and Pulau Tekong. Based on our observations, in Pulau Ubin, only three birds were previously recorded and this number has increased to about 7–9 birds at present. This increase in number also coincided with the sighting of a black-and-red broadbill at Pulau Ubin and these were probably birds that were displaced by mangrove clearance at the mouth of the Johore River for the construction of a new port. On Pulau Tekong, at least seven mangrove pitta pairs have been recorded bringing the Singapore population to at least 21 birds.

Breeding of the mangrove pitta has only been recorded a handful of times in Singapore. Previous breeding of this species has been recorded from Pasir Panjang, Pulau Ayer Merbau, and Pulau Ubin (Wang & Hails, 2007). Eggs of this species have been recorded in mid-May and juveniles at the beginning of Jun. (Gibson-Hill, 1949). The most recent nesting record was made at Pulau Ubin in 2006, by photographer Foo Sai Khoon (Foo, 2008). This nesting according to Wang & Hails (2007) was said to have occurred in Jul.2006, although the observer clearly stated in his account that the nesting occurred during the monsoon season, and that two chicks were observed (Foo, 2008). The nest site was observed once a week, during the weekdays, to avoid attracting unwanted attention to the nesting site. Later, only one chick was observed, and was being attacked by ants. This chick was later rescued and sent to the Jurong Bird Park.

## CONCLUSIONS

At present the mangrove pitta is the only resident pitta species remaining in Singapore, and its future is intricately linked to the state of mangrove forests here. The only current substantial population of this globally near-threatened bird is on Pulau Tekong, and Pulau Ubin, where mangrove forests are more abundant, thus providing a better habitat than on Singapore Island. Maintaining the health of mangroves on these two island is of the utmost importance if we are to ensure a future for this mangrove specialist. The hooded and the blue-winged pittas, on the other hand, are regular winter migrants, and seem to be relatively adaptable birds with regards to their wintering habitats here in Singapore, utilising not only forested areas but also parks, park connectors, gardens and other green corridors found throughout Singapore. The only dangers these visiting pittas have are predation by feral cats and by possible collision into windows of buildings and windshields of cars. By maintaining a green Singapore, we will ensure that Singapore remains attractive to winter visiting bird species.

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