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# The twice-vanishing ‘pardalote’: what future for the Kinglet Calyptura?

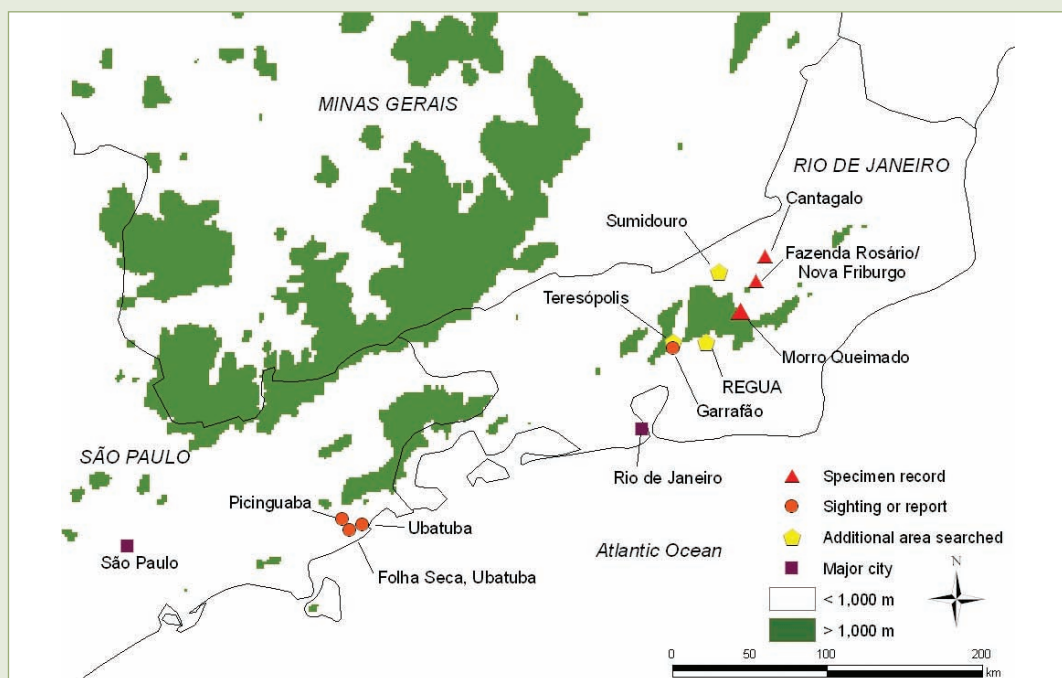
Frank Lambert and Guy M. Kirwan

*Tiny, gorgeous, regal, elusive, mysterious and long-feared extinct: the allure of Kinglet Calyptura Calyptura cristata is arguably greater than any other bird in the Neotropics. Almost 15 years after the last certain record, two field ornithologists who have dedicated many months to trying to find it comment on its status and chances for survival.*

The following remarks on Kinglet Calyptura *Calyptura cristata* derive from an investigation of its status during 2006 by FL and from interviews carried out by FL and GMK over a number of years. The information is in places speculative, but mostly it is based on evidence gathered in Brazil, and from discussions about the species and its (presumed) habitat and range with local experts. Our purpose is primarily to encourage additional searches for *Calyptura*, and to assist in identifying where to look.

**T**he diminutive Kinglet Calyptura is unquestionably one of the most enigmatic birds in the Neotropics. Long considered to be the smallest cotingid, the species is now generally accepted to form part of the ‘Schiffornis assemblage’ of taxa (which includes another genera

of tiny ‘cotingas’, the *Iodopleura* purpletufts) for which there is gathering momentum for their recognition at family level, as the Tityridae (e.g. by the South American Classification Committee, for which see *Neotropical Birding* 2: 21–23). Nonetheless, *Calyptura* remains unsampled



Map of the known range of Kinglet Calyptura *Calyptura cristata*, showing specimen localities and sight records, as well as the locations searched by FL in 2006 (Andy Symes/BirdLife International)



genetically, so its precise position is in doubt<sup>24</sup>. In the mid-20th century, Olalla<sup>13</sup> suggested that *Iodopleura* and *Calyptura* might form a family apart, but this proposal never seems to have mustered support. Kinglet *Calyptura* was described by L. P. Vieillot in 1818, as *Pardalotus cristatus* (the ‘pardalote’ of our title), and between then and 1890, c.55 specimens were collected<sup>6,10</sup>. Until recently, it was generally considered that the provenance of all of these specimens was the state of Rio de Janeiro in south-east Brazil. It transpires, however, that there is one from the state of São Paulo<sup>23</sup>, collected in 1819 or the first half of 1820.

Clockwise from top:

View from Garrafão, below Teresópolis, Rio de Janeiro, looking south, where Kinglet *Calyptura Calyptura cristata* was observed in October 1996 (Guilherme Serpa)

Folha Seca, near Praia Dura, south-west of Ubatuba, São Paulo, where Kinglet *Calyptura Calyptura cristata* was claimed in early March 2006 (Guy M. Kirwan)

Kinglet *Calyptura Calyptura cristata* (Tomasz Cofa; e-mail: tomek1@orunia.nsm.pl)

Since the 19th century, however, *Calyptura* has more or less performed a disappearing act, with only one multi-observer sighting in the last



119 years, despite a concerted search for it in suitable forest in the Nova Friburgo region in the early 1980s by Derek Scott and Michael Brooke (see Collar *et al.*<sup>6</sup>). With this in mind, and with funding to cover some of his expenses from the British Atlantic Rainforest Trust and Birdfair/RSPB Research Fund for Endangered Birds, FL set out to try to find the species during a two-month survey between mid-September and mid-November 2006. Much of this search was undertaken within the Reserva Ecológica Guapiçacu (colloquially known by the acronym REGUA) near Cachoeiras de Macacu, as well as in the environs of Teresópolis, and between Nova Friburgo and Sumidouro, all in north-central Rio de Janeiro, and in the foothills of the Serra do Mar (at Folha Seca, near Ubatuba) in north-east São Paulo. FL failed, however, to find Kinglet Calyptura.

## Notes on historical records

According to BirdLife International<sup>3</sup>, the specimen record suggests that Kinglet Calyptura was not uncommon in the mid-19th century, even in second growth. The majority of specimens, however, tell us very little because early collectors in this part of Brazil, and elsewhere, were largely negligent in providing locality (and other associated) data for many of their specimens. Indeed, some specimen data from this part of Brazil in the same era have proved misleading. For example, the holotype of Black-hooded Antwren *Formicivora erythronotus* was long presumed to have been collected near Nova Friburgo (one of the general localities for the Calyptura), at >1,000 m, but was eventually rediscovered at sea level on the coast, near Angra dos Reis, at the foot of the Serra do Bocaina, c.225 km to the south-west<sup>4,14</sup>.

In the first (but with hindsight quite possibly erroneous) description of the antwren's behaviour, Burmeister<sup>5</sup> stated that the species lives in small groups in the forest undergrowth near Nova Friburgo. As noted by Pacheco<sup>14</sup>, Paynter & Traylor<sup>16</sup>, Collar *et al.*<sup>6</sup> and others, there are problems with several of Burmeister's Brazilian localities, especially as his collection appears to have included some material taken by and for the Hamburg-born C. H. Bescke, who lived in Friburgo and was the probable source of the specimen Gustav Hartlaub used to describe the antwren in 1852. It seems likely that the *Formicivora erythronotus* locality is just one example of these problems, and this idea is reinforced by the fact that on current knowledge *F. erythronotus* appears confined to low-elevation scrubby forest and no-one has since claimed the species around

Nova Friburgo or elsewhere in the Serra dos Órgãos. There seems to be no strong rationale why the species would not be still extant there, if indeed the specimens had originated from that area. Although there is no particular reason to doubt published localities for Kinglet Calyptura, some of the published information concerning this species is unquestionably vague and could have the potential to mislead, as we shall see.

One locality that has been documented for three *Calyptura* specimens collected by P. W. Lund, a Danish biologist, between August 1827 and June 1828, is the environs of Rosário, perhaps principally Morro Queimado (Rio de Janeiro)<sup>6</sup>. According to Niels Krabbe<sup>11</sup> (*in litt.* 2006). Morro Queimado is located alongside the rio Bengala and at most within a few hours walk of Rosário (apparently a *fazenda*), where Lund lived while he "went on frequent hunting trips to Morro Queimado". However, whilst FL was unable to locate Rosário (which is generally considered to lie at c.22°16'S 42°32'W: see Collar *et al.*<sup>6</sup>) and Morro Queimado during his visit to Brazil, David Miller (pers. comm.) has subsequently revealed that Morro Queimado was the headquarters of a *fazenda* of the same name depicted in the background of an aquatint produced in the late 1820s. The name 'Morro Queimado' means 'burnt hill' and was sometimes used synonymously with 'Nova Friburgo' when George Gardner visited in 1840<sup>12</sup>. Apparently the name Morro Queimado refers to the area around the farm headquarters (probably the present base of Anchieta College, Nova Friburgo). According to Miller, who lives near Nova Friburgo, the probable altitude of the original forest around Morro Queimado would have been 600–900 m. The climate, rainfall and humidity would have been very similar to those that exist in original forest on the scarp slopes at similar altitudes today, meaning that Kinglet Calyptura might be able to persist there.

## Recent records

BirdLife International<sup>3</sup> reports just one widely accepted contemporary sighting of Kinglet Calyptura: a pair seen at a locality known as Garrafão (550 m) below Teresópolis in the Serra dos Órgãos in 1996 (see photograph, p. 5). Ricardo Parrini first observed the birds on 27 October and they were seen subsequently by four other Brazilian birders during the next three days. Pacheco & Fonseca<sup>15</sup> detailed the circumstances surrounding this sighting. However, there are three other unconfirmed reports that possess some credibility, as follows.

1. Tomas Sigrist claims to have seen two *Calyptura* in a mixed-species flock in the subcanopy of tall forest along a steep slope adjacent to a river and waterfalls, in July 1990<sup>21</sup>. The specific locality was in riverine forest at Picinguaba (150 m), near Ubatuba in São Paulo; presumably this locality lies somewhere within the Parque Estadual da Serra do Mar (Núcleo Picinguaba). Sigrist reports that the birds perched on small lianas and vertical branches, sometimes climbing up and flying rapidly around. They were in constant movement, following a flock of tanagers, euphonias and tyrannids, and the male once raised its crest.

2. On 27 March 1997, Ladd Hockey (pers. comm.) saw a bird that he subsequently identified (from the illustration in Sick<sup>19</sup>) as Kinglet *Calyptura* along a road about 2 km from the Ubatuba Experimental Station, also within the Parque Estadual da Serra do Mar. Hockey described his sighting to various birders shortly afterwards, and to GMK in November 2001. In an e-mail to Fernando Pacheco, Hockey stated that he watched the bird for about five seconds on a branch below the outer leaves of a tree that was directly overhead, at a distance of about 5 m. It was small with a short tail, greenish-yellow colour, wingbars and a red crest that appeared to be permanently raised. Unfortunately, Ladd Hockey's wife, Petra Hockey, a very experienced birder, did not see the bird, the two of them birding apart at the time of the observation.

3. On 4 March 2006, Martin Schaefer reported on the internet news group, NEO-ORN, that he and his wife had observed a Kinglet *Calyptura* in the subcanopy of secondary forest along a road at Folha Seca (23°27'50.94"S 45°09'44.53"W; see photograph, p. 5) near Ubatuba. The bird was in a mixed-species flock. Schaefer reported that the bird had a deep scarlet coronal stripe bordered by thick black stripes, an olivaceous back, and a yellow breast with an olive tinge. Two white wingbars contrasted with the otherwise dark blackish wings.

Although there is no reason to doubt the validity of the 1996 Teresópolis record, which was observed by several of the 'cream' of the Brazilian ornithological establishment, serious doubts have been raised by Brazilian and other ornithologists concerning the other recent reports. For example, whilst Schaefer's description could fit *Calyptura*, it is so brief and inadequate that no rarities committee, for example, would probably accept it. The description does not, for example, mention

its tiny size or very short tail, both characteristics that most birders would surely mention at the very beginning of a description. Furthermore, the plumage details are rather vague, not mentioning, among other traits, the yellowish forehead, white markings on the tertials, yellow rump, yellow belly and undertail-coverts, or presence of a crest. Furthermore, one of the four species identified as forming the mixed-species flock, namely Red-legged Honeycreeper *Cyanerpes cyaneus*, does not occur in the area (or indeed, anywhere nearby: GMK pers. obs.; Ricardo Parrini pers. comm.). Moreover, it must be noted that many experienced birders visit the area every year (many more than visit Garrafão), and several birders have subsequently visited the site specifically to look for Kinglet *Calyptura*, yet nobody has claimed *Calyptura* before or since. Richard Raby (pers. comm. to GMK) visited Folha Seca the next day, on 5 March 2006, but did not see anything resembling *C. cristata*. FL spent a total of seven days unsuccessfully scrutinising mixed-species flocks and generally searching for *Calyptura* at and within 300–400 m of the exact site where Schaefer claimed to have seen the species.

Tomas Sigrist's record from Ubatuba, whilst now published, apparently lay 'dormant' for some 15 years. Keeping a record of such a rare species quiet for so long certainly casts some doubt on its validity, especially given that he claims to have seen the birds so well. However, it might be remarked that this is not the only instance of a sighting of so rare a species in Brazil being belatedly publicised.

## Habitat requirements of Kinglet *Calyptura*

Almost nothing is known about Kinglet *Calyptura*, especially its life history. We cannot be sure about its altitudinal preferences, or its habitat requirements. BirdLife International<sup>3</sup> states that seasonal movements are suspected. Many species of Atlantic Forest birds are altitudinal migrants, especially amongst obligate frugivores and nectarivores, e.g. hummingbirds and several cotingas and tanagers, and that such movements can be more pronounced or even 'forced' by exceptional seasonal climatic events is well known (GMK pers. obs.). The evidence for Kinglet *Calyptura* being one of these migratory species appears largely circumstantial, and based upon the notion that the Teresópolis birds were seen for a few days and then 'vanished' and because there are several records of Buff-throated Purpleletuft *Iodopleura pipra* from the same locality, which are also assumed to pertain to migrants<sup>25</sup>.









The remainder of the photographs in this article feature common Atlantic Forest frugivores that FL saw while searching for Kinglet Calyptura.

Facing page, clockwise from top left:

Male Blue Manakin *Chiroxiphia caudata*, Mata da Balbina, Bahia, Brazil (Lee Dingain)

Male Flame-crested Tanager *Tachyphonus cristatus*, Praia Vermelha, Ubatuba, São Paulo, Brazil (Arthur Grosset; [www.arthurgrosset.com](http://www.arthurgrosset.com))

Male Ruby-crowned Tanager *Tachyphonus coronatus*, Folha Seca, Ubatuba, Brazil (Markus Lagerqvist; [www.pbase.com/lagerqvist](http://www.pbase.com/lagerqvist))

Female Buff-throated Purpletuft *Iodopleura pipra*, Fazenda Angelim, Ubatuba, São Paulo, October 2007 (Hadoram Shirihi/ *The photographic handbook to the taxonomy of birds of the world*)

This page:

Top: Brassy-breasted Tanager *Tangara desmaresti*, Parque Estadual Intervales, São Paulo, Brazil (Arthur Grosset; [www.arthurgrosset.com](http://www.arthurgrosset.com))

Bottom: Green-headed Tanager *Tangara seledon*, Parque Nacional de Itatiaia, Rio de Janeiro, Brazil (Markus Lagerqvist; [www.pbase.com/lagerqvist](http://www.pbase.com/lagerqvist))



Nonetheless, as Whittaker & Kirwan<sup>25</sup> recounted, the available data from many parts of the range of the latter species are distinctly ambiguous as to the latter's migratory habits, and the 'jury remains out' as to whether altitudinal movements are a regular component of this species's natural history. All that is known about diet is that Kinglet Calyptura apparently eats both fruit and arthropods, since Lund reported finding insect remains and small seeds in the stomachs of the three birds he collected<sup>6,11</sup> (Niels Krabbe *in litt.* 2006). The only historical account of the species is provided by Jean Théodore Descourtilz, a French artist who was also a naturalist and who worked for the Museu Nacional, Rio de Janeiro until his death in 1855. The reliability of what Descourtilz wrote about Kinglet Calyptura (such as his assertion that it occurred throughout Brazil) and other Brazilian birds is unknown, and perhaps suspect since he appears to have primarily been an artist, although he was the first person to give some insight into the function of the purple pectoral tufts of the male Buff-throated Purpletuft (cf. Snow<sup>22</sup>). Nevertheless, his remarks about the ecology of and habitat use by Kinglet Calyptura are all that was published during the 19th century.

Descourtilz<sup>7</sup> stated that Kinglet Calyptura inhabited the interior mountains, preferring higher and wilder places in virgin forests. It clambered about in vines and explored clumps of *Tillandsia* bromeliads in search of small berries, insects and dew. It was apparently fond of *marianeira* fruits (*Acnistus arborescens*: Solanaceae) and seemed to be most abundant at their ripening season, although could be seen throughout the year. Most frequently, however, he stated that the species was found in second growth in abandoned clearings, where it lived in pairs, constantly moving amongst the mid-height foliage, never venturing to the treetops, and calling back and forth with a surprisingly loud voice (described by Lund as a sparrow-like "chirp"<sup>11</sup>, and by Descourtilz as "brief, raucous and disagreeable").

It is worth noting that the birds seen by Ricardo Parrini were in an area of mainly secondary regrowth, with some taller epiphyte-laden trees. Furthermore, the sighting was made in October, a time of year when, at least in 2006, *marianeira* plants were synchronously fruiting in the same area (FL pers. obs); this phenomenon was noted as being widespread both sides of the mountain range, with fruits in season from late September at some localities. There is a large patch of these small shrubs along the main watercourse c.200–300 m from where Parrini observed Kinglet Calyptura. Being rich

in saponins, the fruits of *marianeira* are eaten by a wide variety of bird species; during four days of watching the patch mentioned above, FL observed 12 species of tanager, three species of euphonia, two species of thrush, two tyrants, Blue Manakin *Chiroxiphia caudata* and Rufous-capped Motmot *Baryphthengus ruficapillus* eating the fruits. The whitish fruits are too large for some of these species to swallow whole (typically 8.5–9.0 × 10–12 mm in size) but they are soft and birds are able to tear pieces off, which is probably what Kinglet Calyptura would need to do.

During one of the Kinglet Calyptura observations described by Pacheco & Fonseca<sup>15</sup> (presumably involving the same pair seen by Parrini), two birds landed atop a tree adjacent to mistletoe. One individual, which was not seen well enough to identify with certainty on this occasion, disappeared from view and was potentially in the mistletoe feeding on fruits. There are many mistletoe plants in the taller trees within the area where the observations were made; FL counted 21 mistletoe plants in the crown of one tall deciduous tree there. During four days spent watching fruiting mistletoes in this tree during August and early September 2006 FL recorded few avian visitors. However, it was often very windy and there was intermittent rain, making it more difficult to detect any visits by smaller species. The only regular visitors appeared to be Grey-capped Tyrannulet *Phyllomyias griseocapilla* and Plumbeous Pigeon *Patagioenas plumbea*.

Mistletoes would seem to be an ideal food source for a bird such as Kinglet Calyptura since the fruits are of a manageable size, and BirdLife International<sup>3</sup> noted that "the 1996 sightings suggest that it may specialise on mistletoe". The account by Descourtilz<sup>7</sup> suggests that other epiphytes (e.g. *Tillandsia* bromeliads) might be important to Kinglet Calyptura. It is worth noting that the modern-day genus *Tillandsia* does not produce fruits that a small bird like *Calyptura* could eat. However, *Tillandsia* previously included the genus *Vriesea* when Descourtilz described the habits of the bird. This is a large genus containing many of the larger species of bromeliads, at least some of which are exploited ornamentally. It is unclear if birds can eat their fruits: Ricardo Parrini (*in litt.* 2009), who has taken a particular interest in avian diets for many years, has no knowledge of any bird species taking *Vriesea* fruits, but César Cestari (in Resumos XVII Congresso Brasileiro de Ornitologia) has found that *V. altadaserrae* is one of the epiphytes most visited by birds such as tanagers.



## Unpublished notes on habitat and behaviour

As mentioned above, Ricardo Parrini (pers. comm. 2006) saw his two birds in second growth, a fact unclear from the account of Pacheco & Fonseca<sup>15</sup>. The impression gained therein is that the birds were subsequently seen in some fairly high trees and that this was the same place that Parrini had seen them. However, Ricardo Parrini (pers. comm. 2006) saw the birds atop some fairly dense, 3–4 m-high trees, best described as second growth, whereas they were subsequently seen c.150–200 m away in significantly taller trees. Also in slight contradiction to the account by Pacheco & Fonseca<sup>15</sup>, who mention that the crest was permanently raised, Ricardo Parrini (pers. comm.) noted that the birds would raise and lower their crests, rather like Buff-throated Purpletuft.

## Why is Kinglet *Calyptura* so rare?

Evidence suggests that Kinglet *Calyptura* is a very scarce species, though its small size would make it easy to overlook if it spends much of its time in the canopy of epiphyte-laden trees, although it needs to be remembered that some of the historical evidence is at variance with this; Lund, for instance, mentioning the species as inhabiting “shrubby”<sup>11</sup>. Surely, however, it cannot be extinct.

The main reasons why Kinglet *Calyptura* is so scarce presumably relate to habitat loss, though both Descourtilz’s account and the 1996 observation near Teresópolis suggest that it can tolerate second growth and also occurs at the forest edge<sup>7,15</sup>. It might well be that this is a primary forest species that, like many others, visits the forest edge occasionally—if it were a bird of second growth or edge habitats it would surely not be so rare, or at least be seen more regularly. But, if it is an altitudinal migrant (see above) and forest at some elevations used by the species has been lost, then it could indeed be in dire trouble. During the period when most specimens of Kinglet *Calyptura* were collected there were still vast tracts of superb forest. That the species once inhabited the forests between the Serra dos Órgãos and the rio Paraíba seems unquestionable, considering that Lund (apparently) collected birds from this area, whilst Collar *et al.*<sup>6</sup> speculated that the species might have been taken as far north as the vicinity of Sumidouro, which lies c.30 km from Nova Friburgo.

FL spent several days exploring this area and visited various forest patches. A present-day appraisal gives the impression that there is still a considerable amount of forest, with fairly large patches (up to 20–30 ha, perhaps) on many hilltops and even in some valleys. However, a closer inspection shows that all of this forest is regrowth, probably nowhere any older than 40–60 years, and that it generally supports very few, if any, bromeliads or other epiphytes. The forests are currently dominated by deciduous legumes. During the early part of the period that *Calyptura* specimens were being collected, the forests in this region were, on the basis of historical accounts, strikingly different. George Gardner, an intrepid Scottish botanist who travelled widely in Brazil in 1836–41, provided us with an insight into what the forests were like at that time.

In March 1841, Gardner<sup>9</sup> travelled on foot and horse from Serra dos Órgãos to the rio Paraíba, observing that “by far the greater part of the country through which we travelled was in a state of nature, being covered with virgin forests, abounding in tree-ferns and palms”. He also stated that, during this trip, he passed through “some of the finest forest I had yet seen in the province”, this being within a few kilometres of the Paraíba. Gardner then traveled north along a road roughly running parallel to the river, through “a most magnificent forest, the trees being of great size and in general with very straight stems, often rising unbranched to a height of upwards of one hundred feet”. He goes on to say that “...I could not help feeling deep regret, that in these regions many square leagues of such forests were being cut down and burned, in order to make room for plantations of coffee”. Near Porto D’Anta (*anta* meaning tapir, a species—South American Tapir *Tapirus terrestris*—that was common at the time, but is now locally extinct) Gardner observed numerous monkeys. Further east, in the vicinity of Porto da Cunha (west of the small town of Cantagalo, one of the few specific *Calyptura* localities), Gardner again mentions the forests to be “the most magnificent that it is possible to imagine”, but also that “immense tracts [of coffee] are planted...’ around Cantagalo nearby.

Forests in the lowlands between Serra dos Órgãos and the coast were also very impressive at that time, even to high elevation. When Gardner journeyed into the Serra dos Órgãos (1837) he stayed at a farm at an altitude of 3,000 feet (c.900 m), en route to which he found forest with trees up to 50 m tall! He also noted that there were many strangler figs (locally called *cipó matador*), as well as another fig tree of “enormous height



Top: Male Burnished-buff Tanager *Tangara cayana*, Parque Nacional de Itatiaia, Rio de Janeiro, Brazil (Markus Lagerqvist; [www.pbase.com/lagerqvist](http://www.pbase.com/lagerqvist))

Bottom: Male Black-goggled Tanager *Trichothraupis melanops*, Parque Nacional de Itatiaia, Rio de Janeiro, Brazil (Markus Lagerqvist; [www.pbase.com/lagerqvist](http://www.pbase.com/lagerqvist))





Top: Azure-shouldered Tanager  
*Thraupis cyanoptera*, Teresópolis,  
Rio de Janeiro, Brazil (Arthur  
Grosset; [www.arthurgrosset.com](http://www.arthurgrosset.com))

Bottom: Palm Tanager *Thraupis*  
*palmarum*, Parque do Zizo, São  
Miguel Arcanjo, São Paulo (Arthur  
Grosset; [www.arthurgrosset.com](http://www.arthurgrosset.com))

and thickness of stem". (Surprisingly, FL found very few strangler figs anywhere in the Serra dos Órgãos region, even in better areas of forest.)

More recently, Miller *et al.*<sup>12</sup> catalogued the demise of the original forest in the region where Kinglet Calyptura is known to have been collected. Despite the huge gold and diamond rush of the 18th century in adjacent Minas Gerais, most forests in this part of Rio de Janeiro remained intact until the arrival of coffee, a crop ideally suited to the climate of the Serra dos Órgãos anticline (i.e. inland of the mountains). As the supply of readily accessible minerals in Minas Gerais decreased, miners moved south across the rio Paraíba do Sul to the very base of the Serra dos Órgãos. Coffee plantations were established here in the 1780s and by 1790 had been consolidated and become highly profitable, with not only miners but also others from Rio de Janeiro joining the boom.

After 1808 traders poured into the country, and Miller *et al.*<sup>12</sup> estimate that by 1820, 15% of the Serra dos Órgãos anticline had been deforested to plant coffee. The principal area for coffee (and sugar cane) cultivation included Cantagalo and areas north-east of Nova Friburgo. The planters were 'miners' of the topsoil, not true farmers, as they generally moved to new land after only one crop of coffee (c.20 years). From the 1830s, coffee cultivation spread rapidly in the area north of Rio, as well as elsewhere in the south-east of the country, in São Paulo and Minas Gerais, and Brazil rapidly became the world's largest exporter. Indeed, coffee continued to spearhead the Brazilian economy until the first third of the 20th century<sup>8</sup>.

Accelerating this process of destruction, when the railroad 'finally' arrived in the late 1860s<sup>2</sup>, these companies were given vast concessions of forested land as a source of timber, not only to construct the tracks but also to fuel the engines. Taken together, coffee estates, timber extraction and the railway devastated what had been superb ombrophylous forest, and almost none remained on the anticline of the Serra dos Órgãos by the early 20th century<sup>12</sup>.

It is worth noting that, today, the forest patches where Kinglet Calyptura is believed to have been collected inland of the Serra dos Órgãos are notably drier than those on the coastal side, receiving only c.50% of the annual rainfall that falls on the other slope. As noted by Miller *et al.*<sup>12</sup> the pattern of rainfall probably remains much as it was when both areas were forested, but the intact forests of the anticline would have afforded a much greater humidity, less evaporation loss, heavier local rains and certainly a far lower mean

annual temperature. David Miller (pers. comm.) has calculated that the bromeliads of virgin forest in the Serra dos Órgãos typically contain some 18,000 litres of suspended water per ha, which greatly influences the humidity. This group of plants is conspicuously absent from the secondary forests inland of the Serra dos Órgãos today; this is one of the main reasons why the microclimate within the forest patches in that area today is significantly drier than that of original forests.

All of the above does not alter the fact that we know so little, and perhaps nothing meaningful, of the Kinglet Calyptura's habitat preferences, meaning that we can only speculate whether the habitat changes described above have played any role in the apparent decline of this tiny sprite. Nevertheless, it seems worthwhile to record such historical changes in the search for a mechanism to understand how a bird apparently relatively common up to c.150 years ago could suddenly have become so rare, especially given that at mid and higher elevations much seemingly suitable forest remains within the species's core known range. Collar *et al.*<sup>6</sup> had already remarked on the modern state of forests in the immediate vicinity of Nova Friburgo and the very significant destruction that had occurred in this region, especially on the floors and lower slopes of valleys.

## Future searches for Kinglet Calyptura

As mentioned above, it seems very doubtful that Kinglet Calyptura is extinct, or even that the observations in 1996 somehow pertained to the last, remnant, population. The Kinglet Calyptura's tiny size makes it a very difficult species to detect, and the most likely way to find one would probably be to spend time watching fruiting plants that it might visit. FL's search using this method was unsuccessful, but it seems very likely that the species does eat fruits regularly, as do cotingas and other related birds. On account of its small size, however, it may not need to eat more than a few fruits to become satiated, so its visits to fruiting plants may be very brief indeed, and hence easily overlooked.

Many observers and authors have been tempted to consider purpletufts *Iodopleura* and Kinglet Calyptura as being rather closely related, doubtless in consequence of their both being tiny 'cotingids', although Snow<sup>22</sup> noted that the former is a rather peculiar and individual genus. Purpletufts sally for insects, in some respects rather like miniature Swallow-wings *Chelidoptera tenebrosa*, as well as feeding on



fruits, especially mistletoes. However, birds often perch quietly and for quite prolonged periods in close proximity to berry-bearing plants and trees, making observation comparatively easy once their habits are learnt. Despite the association that has often been made between *Calyptura* and *Iodopleura*, it is quite possible that their feeding habits are strikingly different, and to some extent the 1996 observations underpin this theory.

There are several places where the species might persist. Firstly, there is no good reason to suppose that it does not still occur near Teresópolis. Ricardo Parrini (pers. comm.) notes that there are inaccessible fingers of untouched forest on the very steep slopes above the site where he found the species in 1996, and he believes that the birds may have wandered out of those areas. This is certainly plausible, but it seems just as likely that the species could be anywhere in the area. There are good areas of forest both above and below where the sightings occurred, and the gardens in the area where he saw the birds still contain a significant number of large original forest trees packed with epiphytes.

There are also residential areas around Nova Friburgo with large gardens full of big trees that might repay investigation, and FL was told of a bird locally known as *amarelinho de coroa vermelha*, which translates crudely as 'the small yellow bird with a red crown'. FL spent only one day in the area where this species is said to occur, and although it is highly conceivable that the species concerned is Golden-crowned Warbler *Basileuterus culicivorus* (although the crown stripe is usually hard to see without binoculars), the possibility that a bird like *Calyptura* could survive in such habitat should not be ruled out; after all, the 1996 record was from a well-vegetated housing estate. Urban habitats often contain tall trees and many fruiting plants (*marianeira* occurs in and around the gardens of Nova Friburgo), yet they are not usually the focus of searches for birds such as this. In the case of Nova Friburgo, however, there is no adjacent forest in particularly good condition, unlike at Teresópolis. The forests below Teresópolis extend north-west along the slopes of the Serra dos Órgãos to the recently established Reserva Ecológica Guapiaçu. The forest at lower elevations here is all secondary (up to 40 years old), but at elevations above 500–600 m there is very good primary forest, in places with very tall trees and many epiphytes. Whilst FL spent a considerable amount of time looking for *Calyptura* in this area, it is difficult to gain good views of the canopy, and during his visit there were many windy days when detecting such

a small (canopy?) bird would have been almost impossible. So this lack of success should not be taken to mean that the bird does not occur in this excellent reserve, and we strongly recommend further searches in its more inaccessible parts.

Finally, whilst most Brazilian and other Neotropical ornithologists and birders give little credence to the claims from the Ubatuba area, at the base of the Serra do Mar, it must be noted that the habitat there appears equally good for a bird like *Calyptura*. Tall, wet forest replete with numerous epiphytes persists down to sea level in places. Furthermore, the recent revelation that Kinglet *Calyptura* at one time occurred even farther south than this<sup>23</sup> means that the theory (voiced by D. F. Stotz in Ridgely & Tudor<sup>17</sup>) that the species might persist in the Ubatuba region gains fresh impetus. And it should not be forgotten that Black-hooded Antwren, originally believed to have been a montane bird from the Nova Friburgo area, was eventually rediscovered on the coast in this general region, so we suggest that further searches for *Calyptura* in the environs of Ubatuba and Paraty are warranted. It might also be noted that Kinglet *Calyptura* could still be found even further afield. Ruschi<sup>18</sup> reported *Calyptura* from the state of Espírito Santo, a statement that has been widely disbelieved, but it should be noted that another globally threatened and poorly known bird, Cherry-throated Tanager *Nemosia rourei*, recently 'resurfaced' in the same state<sup>1</sup>, whilst the inconspicuous Black-legged Dacnis *Dacnis nigripes* went unrecorded in Espírito Santo for almost 70 years until its rediscovery in the municipality of Vargem Alta<sup>26</sup> (Ana Cristina Venturini pers. comm.).

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Clockwise from left:

Male Violaceous Euphonia *Euphonia violacea*, Folha Seca, Ubatuba, Brazil (Markus Lagerqvist; [www.pbase.com/lagerqvist](http://www.pbase.com/lagerqvist))

Male Chestnut-bellied Euphonia *Euphonia chalybea*, Parque Nacional de Itatiaia, Rio de Janeiro, Brazil (Hadoram Shirihi/ *The photographic handbook to the taxonomy of birds of the world*)

Male Orange-bellied Euphonia *Euphonia xanthogaster*, Serra Bonito, Camacan, Bahia, Brazil (Arthur Grosset; [www.arthurgrosset.com](http://www.arthurgrosset.com))

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