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No longer based on photographs alone: refuting the validity of golden-crowned langur *Presbytis johnaspinalli* Nardelli 2015 (Mammalia, Primates, Cercopithecidae)

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Abstract

Increasingly, new species are being described without there being a name-bearing type specimen. In 2015, a new species of primate was described, the golden-crowned langur *Presbytis johnaspinalli* Nardelli, 2015 on the basis of five photographs that were posted on the Internet in 2009. After publication, the validity of the species was questioned as it was suggested that the animals were partially and selectively bleached ebony langurs *Trachypithecus auratus* (É. Geoffroy Saint-Hilaire, 1812). Since the whereabouts of the animals were unknown, it was difficult to see how this matter could be resolved and the current taxonomic status of *P. johnaspinalli* remains unclear. I present new information about the fate of the individual animals in the photographs and their species identification. In 2009, thirteen of the langurs on which Nardelli based his description were brought to a rescue centre where, after about three months, they regained their normal black colouration confirming the bleaching hypothesis. Eight of the langurs were released in a forest and two were monitored for two months in 2014. The description of their behaviour, photographs and analysis of their cytochrome b genes confirms them as ebony langurs. There is no evidence to support the notion that the golden-crowned langur represents intermediates between melanistic and erythristic ebony langurs, nor that it represents a new species. As such, *Presbytis johnaspinalli* Nardelli, 2015 is a junior synonym of *Trachyptihecus auratus* (É. Geoffroy Saint-Hilaire, 1812). This case underscores the importance of assembling a sufficiently varied amount of data prior to describing new species and studying the actual type specimens.

Key Words

Colobinae, Indonesia, new species, taxonomy, Trachypithecus

Introduction

Increasingly, new species are being described without there being a name-bearing type specimen; photographs, videos, DNA analysis and analysis of vocalisations can all be valid datasets to base the description of species on (e.g. Dubois and Nemésio 2007; Donegan 2008; Robb et al. 2013; Marshall and Evenhuis 2015; Krell and Marshall 2017). Occasionally, however, a new species is described where the researcher has not seen or observed the new species and all is based on photographs or other material that is present in the public domain. Descriptions of species by authors without first-hand knowledge of the type specimen(s) are explicitly discouraged by the International Code of Zoological Nomenclature (Recommendation 73b: "An author should designate as holotype a specimen actually studied by him or her, not a specimen known to the author only from descriptions or illustrations in the literature", ICZN 1999). The main difficulty with relying on photographs, descriptions or illustrations only is that, when the validity of the new species is questioned, there is no type specimen to refer back to.

In 2015, the description of new primate species, the golden-crowned langur *Presbytis johnaspinalli* Nardel-

li 2015, was published in the "International Zoo News" (Nardelli 2015). The description was based solely on the basis of five photographs that had been posted on the Internet. One animal depicted in the photograph was selected as the holotype and ten others as syntypes (all should have been selected as syntypes or one individual should have been the holotype and the other individuals paratypes if the langurs were individually recognisable, which they were not). The golden-crowned langur is largely black with yellowish hair around the face, on the top of the head and vent, a pattern not seen in already described species. Nijman (2015) provided more details on the circumstances in which these and related photographs were taken and how they ended up in the public domain. The animals in the photographs all linked back to a single trader in an animal market in the town of Mantingan, Ngawi Regency, in the Province of East Java, Indonesia [-7.37, 111.16]. There, on 6 November 2009, 15 langurs were confiscated. They were brought to the East Javan Nature Conservation Agency (BKSDA) offices in Surabaya and, from there, they were transferred to the Petung Sewu Rescue Centre also in East Java. These events were publicised in the Indonesian media and by Indonesian welfare NGOs and some of these reports were accompanied by photographs of langurs in cages; five of these were selected by Nardelli as the basis for his description. Nijman (2015) also concluded that the animals in the photos were not *Presbytis* Eschscholtz, 1821 langurs, but partially-bleached *Trachypithecus* Horsfield, 1823 langurs, most likely ebony langurs *Trachypithecus auratus* (É. Geoffroy Saint-Hilaire, 1812). Ebony langurs are endemic to the Indonesian islands of Java, Bali and Lombok and come in two morphs, a more common melanistic one (hence the English name) and a rarer and geographically-restricted erythristic one. Nijman (2015) postulated that the golden-crowned langur represented melanistic ebony langurs that had their chests and hairs surrounding the face bleached so they became bicoloured. Nardelli (2016) gave a rebuttal to the suggestion that these animals were partially-bleached ebony langurs (a practice he questioned) and provided some more details on a 2016 visit to the Mantingan animal market (no langurs were observed). He also included a transcript of an interview with I Kurniawan, an animal keeper of the Petung Sewu Rescue Centre, who took care of the partially-bleached langurs after their seizure and up to their release in the forest.

The discovery and description of the golden-crowned langur as a new species and the suggestion that it probably represents partially- and selectively-bleached individuals, was discussed widely on blogs, forums, news sites, but also in the broader scientific literature. Krell and Marshall (2017) considered 66 cases of new species that were described without name-bearing whole-body type specimens at the time of description and presented their views on these species' current status (e.g. valid, identified as a hybrid, synonymised). For the golden-crowned langur and three other species, their conclusion was 'unresolved'. A similar conclusion was drawn by Pine and Gutiérrez (2018): "It is currently unresolved whether the name is based on artificially modified animals or individuals of a new or already known species and to what genus the animals belonged." Rossi et al. (2018) briefly discussed the description of *Presbytis johnaspinalli* and the partially artificial bleaching, but did not draw a conclusion on their status, noting that the issue deserves further enquiries. F. Nardelli, commenting on a blog post (Butler 2015), suggested that the only way to settle the matter was to examine the animals themselves and/or to then analyse their DNA to refute or confirm their species' status ("Thus it should be substantiated by live specimen(s) to be found soon to check first of all if artificially colored and their DNA").

Methods

I reviewed the available literature, including comments made on blogpost where appropriate and I obtained some additional information through email correspondence with Drs F. Nardelli, D. Brandon-Jones, E. Meijaard, G. Sangster and the late C. Groves. All translations from Bahasa Indonesia are mine. In addition, I report on data I collected on ebony langurs during numerous visits to eastern Java in the period 1994 to 2018 (Nijman 2000, 2013, 2019). The information provided by Nardelli (2016), although not interpreted by him as such and research conducted since, also allows us to make a more firm conclusion about the nature of the golden-crowned langur. While some of the debate about *Presbytis johnaspinalli* centred on the fact that the description was based on photographs that were posted on the Internet, that Nardelli had no first-hand experience in observing the animals and whether the *International Zoo News* was an appropriate medium to publish a description of new species, I here focus only on the validity of the golden-crowned langur as a species. I address three specific points.

1. The occurrence of the erythristic form of the ebony langur and its relevance to interpreting the golden-crowned langur.
2. The occurrence and the prevalence of bleaching langurs in animal markets in Java and its possible function.
3. What happened to the langurs after they were confiscated and how that provides us with additional information on the nature of the golden-crowed langur?

Results

Are golden-crowned langurs intermediates between the two colour morphs?

D. Brandon-Jones (in Dasgupta 2015) stated that there is a fairly large area in southeast Java where the ebony langur population may be entirely of the erythristic morph. He went on to say that there are museum specimens that are not entirely orange and it is very likely that such spec-

imens occur on the boundary of the area where most, if not all, langurs are orange. As such, Brandon-Jones considered golden-crowned langurs merely as intermediates between the melanistic and erythristic morph of the ebony langur. Nardelli (2016) stressed that, in the Manang area, the erythristic morph is present. Assuming that Manang is a typo for Mantingan, the town where the animal market is situated, this may give the impression that the golden-crowned langurs are somehow linked to the presence of the erythristic morph of the ebony langur in the area.

The occurrence of the erythristic morph has been well documented, both through study of museum specimens and field surveys (Brandon-Jones 1995; Nijman 2000). They are found in the 11 easternmost Regencies of East Java (out of 29 Regencies), but not on Bali or Lombok. Contra to Brandon-Jones's statement, there are no populations (or to my knowledge even groups) where all the individuals are of the erythristic morph. Out of ~180 ebony langur groups, I have observed in this region over the last 25 years, about 15% contain one or more erythristic individuals. The highest number of erythristic individuals in a population was on Mt. Penanggungan [-7.61, 112.62] in the mid 1990s (~15–20%) and the western flank of Mts. Ijen [-8.06, 114.24] in the early 2000s (~20%). Van Bemmel-Lenneman and van Bemmel (1940) reported that, in the 1930s in the higher parts of Mt. Semeru [-8.11, 112.92], the erythristic morph was more common than the melanistic one (I have not visited this area). In the absence of populations or regions where all ebony langurs are of the erythristic morph, the suggestion of golden-crowned langurs are intermediates between the melanistic and erythristic morph is moot (as then we would expect to see intermediates within groups as well, which we do not). Nardelli (2016) is incorrect to state that the erythristic form occurs in Mantingan (or nearby Mt. Lawu [-7.63, 111.19]). The closest area from Mantingan where the erythristic form is found is on Mt. Kelud [-7.94, 112.31] and Mt. Arjuna-Welirang [-7.73, 112.59], both ~130 km to the east (Brandon-Jones 1995; Nijman 2000).

Does bleaching of langurs occur regularly and what is its purpose?

Nardelli (2016) asked the question who would possibly bleach more than ten langurs at a time, something he considered a complex, risky, ingenious and time-consuming task, to sell them for a mere US$20 each at a local animal market? The short answer is a 40 years old trader of wild birds and mammals in the Mantingan animal market by the name of M. Sabar and/or his co-workers, as reported in the Indonesian media (Pudji 2009). I. Kurniawan (in Nardelli 2016) recounted several instances in 2003 and 2009 when the Petung Sewu Rescue Centre received a total of 41 partially-bleached ebony langurs that were confiscated in Mantingan (I observed several of these langurs in the Petung Sewu Rescue Centre in September 2003). In addition, the Indonesian NGO ProFauna photographed one partially-bleached ebony langur in Mantingan between May and July 2009 (ProFauna 2009), suggesting the practice of bleaching is, or was, not uncommon. With reference to this, they state that "Especially for Javan [= ebony] langur, when the primate is still a baby, its fur is attractively orange, but when it grows older, its fur gets darker and turns to black. To deceive the customers, some animal traders dye a juvenile or adult langurs' fur orange. The traders also add that those dyed langurs are endangered and originally from Kalimantan [= Indonesian Borneo] hoping that they get more money" (ProFauna (2009: page 25).

To answer the second part of Nardelli's question, one has to consider not the absolute price of the langur, but the added value that selective bleaching brings, both in terms of raising the asking price and in terms of attracting customers and increasing the ease of selling. To put US$20 (in 2009) in context, we can compare it to the minimum monthly wage. This is set annually by the Indonesian government for each Regency. For the Regency in which Mantingan is situated for the year 2009, the minimum monthly wage was US$69; with 15 langurs present at the time the seizures took place, even if bleaching raises the price by a mere US$5, the additional income exceeds the monthly minimum wage at virtually zero additional monetary costs.

What happened to the golden-crowned langurs that were confiscated?

I. Kurniawan (in Nardelli 2016) described in detail what happened to the individual langurs that formed the basis of the description of the golden-crowned langurs. For 2009, he recalled there was a seizure of 13 langurs that were coloured or bleached at the Mantingan animal market. According to Kurniawan, it took less than three months for the bleached area to grow out and to be replaced by its original black colour; younger individuals changed back to normal faster than adult ones. Two of these langurs, a male and a female now named Bobby and Rus, had their parts of their cytochrome b gene sequenced by two different research teams, who compared their haplotypes to those reported by Roos et al. (2008). Roos et al. (2008) sequenced 573 base pairs (bp) from 50 ebony langurs and found 19 haplotypes, labelling them aaA (*T. auratus auratus* A), aaB etc. For Bobby, 503 bp were sequenced confirming him to be an ebony langur with haplotype aaC (Rahmawati 2013; Rahmawati et al. 2015). For Rus, at least 468 bp were successfully sequenced and it showed a one base-pair difference to haplotypes aaB, aaG and aaJ (Mushlih et al. 2011), confirming her also to be an ebony langur.

Only eight of the original 13 langurs survived and these were released in 2013 and 2014 on Mt. Biru [-7.76, 112.49], close to the Rescue Centre, in at least two different groups. Bobby and Rus were released as part of a group of four (the other two females being a melanistic and an erythristic ebony langur imported from the UK)

and this group was subsequently monitored in November and December 2014 by Qomariah (2015) (Fig. 1). Qomariah (2015) reconfirms that both Bobby and Rus were confiscated in Ngawi in November 2009 and photographs of both langurs included in her dissertation show that they are unequivocally ebony langurs of the melanistic morph. In terms of activity budgets (44.2 ± 7.8% feeding, 43.6 ± 7.9% resting, 9.8 ± 3.7% moving, 2.5 ± 2.5% social), Bobby's calling (described as "ek ok, ek ok") and diet (leaves: 30 species, fruit: five species), the group very much behaves in line with what has been observed in other ebony langurs (summarised in Nijman, in press). It is also worth noting that the diet and the call as reported by Qomariah (2015) is distinctly different from *Presbytis* langurs (these are more frugivorous and male calls are best described as exhalation notes consisting of tchiks, in some species preceded by purr notes).

Figure 1. Ebony langurs *Trachypithecus auratus* (É. Geoffroy Saint-Hilaire, 1812). From left, clockwise: partially-bleached individual in the office of the East Javan Nature Conservation Agency in Surabaya (November 2009); partially-bleached individual in the Matingan animal market (May-July 2009); a previously partially-bleached male Bobby after his release back into the wild (November 2014); a previously partially-bleached female Rus after her release back into the wild (November 2014); Bobby grooming Rus (December 2014).

Discussion

In discussing the description and the validity of golden-crowned langur, attention was invariably drawn to the fact that it was based on photographs taken at an animal market by people other than the author of the species and that they were subsequently posted on the Internet, as well as whether or not the langurs in the photographs were indeed bleached or dyed (Butler 2015; Krell et al 2017; Pine and Gutiérrez 2018; Rossi et al. 2018). More than once, parallels were drawn to the case of the yellow-necked parrotlet *Forpus flavicollis* Bertagnolio & Racheli 2010; this species was also described on the basis of a photograph of animals in trade (when the birds were in a rescue centre in Colombia, Bertagnolio and Racheli 2010). However, the widespread knowledge that a related parrot species, the spectacled parrotlet *F. conspicillatu* (Lafresnaye, 1848), when in trade, is frequently dyed to increase their price and novelty value quickly led to the acceptance that the yellow-necked parrotlet was, in fact, not a new species (Notton 2011; Krell et al. 2017). Perhaps the unfamiliarity with the widespread bleaching and dying of mammals in animal markets in Asia led to a hesitance in accepting the possibility that the golden-crowned langur was also a concocted species. Fortunately, in this case, primates are often treated differently from other mammals, birds or reptiles and the individuals depicted in the photographs ended up in a rescue centre. There, they were taken care of by dedicated keepers who kept track of their histories, they were given names allowing them to be traced, their genetics were studied and their behaviour and well-being were monitored after their release. Combining all this information does allow us to, retrospectively, make an assessment of the validity of the description of the golden-crowned langur as a distinct species.

Conclusion

On the basis of the above, I conclude that the langurs that formed the basis of the description of the golden-crowned langur were indeed ebony langurs that were partially bleached. This is no longer supported only by photographs, but also observations of the behaviour and analysis of parts of the mtDNA of two of the animals depicted in the photographs. There is no evidence to support the

notion that golden-crowned langurs represent intermediates between melanistic and erythristic ebony langurs, nor that it represents a new species. As such, *Presbytis johnaspinalli* Nardelli 2015 is a junior synonym of *Trachyptihecus auratus* (É. Geoffroy Saint-Hilaire, 1812). This case of the golden-crowned langur underscores the importance of assembling a sufficiently varied amount of data prior to describing new species and studying the actual type specimens.

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