Apodidae: Lump *Apus nipalensis* with *Apus affinis*

These are treated as two distinct species in Avilist and this proposal examines the validity of this treatment. The null hypothesis is that all taxa under *Apus affinis* and *Apus nipalensis* belong to a single species.

Draft 1 (20082025): Initial draft submitted to Tropical Asian RAG by Praveen J & Tim Inskipp
Draft 2 (22092025): Comments from James Eaton, Keren Sadanandan, Wich'yanan (Jay) Limparungpatthanakij, and Bob Dowsett incorporated. All agree with the proposal.

Avilist 1.0

Taxa	Authority	Range
Apus nipalensis nipalensis	(Hodgson, BH, 1837)	Nepal to southeastern China, Myanmar, Thailand, Indochina, and Philippines
Apus nipalensis subfurcatus	(Blyth, E, 1849)	Malayan Peninsula to Borneo, Sumatra, and adjacent islands; perhaps this form spreading through Sulawesi and Moluccas
Apus nipalensis furcatus	Brooke, RK, 1971	Java and Bali; probably this form spreading through Lesser Sundas
Apus nipalensis kuntzi	Deignan, HG, 1958	Taiwan
Apus affinis galilejensis	(Antinori, O, 1855)	northern and sub-Saharan Africa and eastward to Pakistan
Apus affinis bannermani	Hartert, EJO, 1928	Bioko, São Tomé, and Príncipe (Gulf of Guinea)
Apus affinis aerobates	Brooke, RK, 1969	southwestern Mauritania to Ethiopia, Somalia, central Angola, and South Africa
Apus affinis theresae	Meinertzhagen, R, 1949	western and southern Angola to southern Zambia and South Africa
Apus affinis affinis	(Gray, JE, 1830)	southern Somalia to northern Mozambique, Pemba Island, and Zanzibar, to India
Apus affinis singalensis	Madarász, G, 1911	southern India and Sri Lanka

Diagnosability of *A. nipalensis* (following Birds of the World)

1. Slightly longer tail.
2. Slight, though usually discernible, tail fork.
3. Blacker, notably on head and tail-coverts.
4. Narrower white rump band.

Diagnosability of *A. nipalensis* in South Asia (where they 'meet' *A. affinis*) (Rasmussen & Anderton 2012)

1. Smaller and better-defined white throat-patch.
2. Narrower white rump-band, not visible from below.
3. Little or no pale on forehead.
4. The tail is more definitely forked than *affinis s.s.*, but less forked than eastern subspecies of *nipalensis s. l.*. Tail can appear rounded when fanned.

Subspecies Diagnosability (following Birds of the World)

5. *subfurcatus*: blacker, especially on the upper head (vis-a-vis *nipalensis*).
6. *furcatus*: has the deepest tail-fork and browner underparts.
7. *kuntzi*: intermediate between *nipalensis* and *subfurcatus*, with the most heavily streaked rump of any subspecies.
8. *galilejensis:* very pale, especially on tail-coverts and forehead (vis-a-vis *affinis*).
9. *theresae*: like *galilejensis*, but with slightly darker upper-tail coverts.
10. *aerobates*: darker (vis-a-vis *affinis*), especially on wings and tail, with *'gyratus'* birds darkest and largest within the *affinis* group.
11. *bannermani*: darkest subspecies, with heaviest throat-streaking.
12. *singalensis*: blacker (vis-a-vis *affinis*), especially on head and uppertail-coverts, some showing slight tail-fork.

Types of the species

Cypselus Nipalensis Hodgson, 1837, central region of Nepal, restricted to Kathmandu Valley, Nepal by B. Biswas

Cypselus affinis J. E. Gray, 1830, Ganges [=Ganga], India, restricted to Cawnpore [=Kanpur] by E. C. Stuart Baker

Traditional Treatments

Treatment as two distinct species - *Apus affinis* and *Apus nipalensis*

- All editions of *Howard & Moore* from 2nd edition corrigenda onwards.
- All versions of BirdLife International from 2007 (V.00) onwards.
- All versions of Clements checklist from 4th edition onwards.
- All versions of IOC checklist from 1.0 onwards.

Treatment as a single species

- All versions of Peter's checklist.
- Vaurie's checklist of Western Palearctic
- All editions of *Howard & Moore* up to and including 2nd edition

- Both editions of *Birds of South Asia - the Ripley Guide* (Rasmussen & Anderton 2005, 2012)
- All editions of Birds of the Indian Subcontinent including Grimmett *et al.* 2011.

No other taxonomic treatment has ever been proposed.

Genetics

In a molecular phylogeny study (Päckert *et al.* 2012) for Old World swifts of genera *Apus* and *Tachymarptis* (tribe *Apodini*) based on a taxon-complete sampling at the species level with phylogenetic reconstructions based on two mitochondrial and three nuclear markers, all samples under both species clustered in an African-Asian clade along with *A. caffer*, *A. batesi*, and *A. horus*. *A. affinis* and *A. nipalensis* were consistently found to be paraphyletic but the work did not strongly recommend a taxonomic consequence due to limitations in sampling. There were no samples from the Himalaya; except for an *A. affinis* specimen from Pakistan, no other samples from the Indian subcontinent were used, and *A. nipalensis* sample was from Taiwan (see Fig.1 below). Despite having no specimens from the presumed contact zone, molecular evidence for this split was equivocal. **They suggested a classification retaining both under the same species, as in Peters (1940) & Vaurie (1965), despite the morphological distinctiveness on grounds of tail furcation**.

Incomplete mitochondrial lineage sorting with cytochrome-b haplotypes shared among species and across large geographic distances was observed in this pair. Mitochondrial introgression caused by extant or past gene flow was ruled out as an explanation for the low interspecific differentiation because all nuclear markers appeared to be highly unsorted among other *Apus* species too. Apparently, these originated from very recent dispersal and/or speciation events, they concluded.

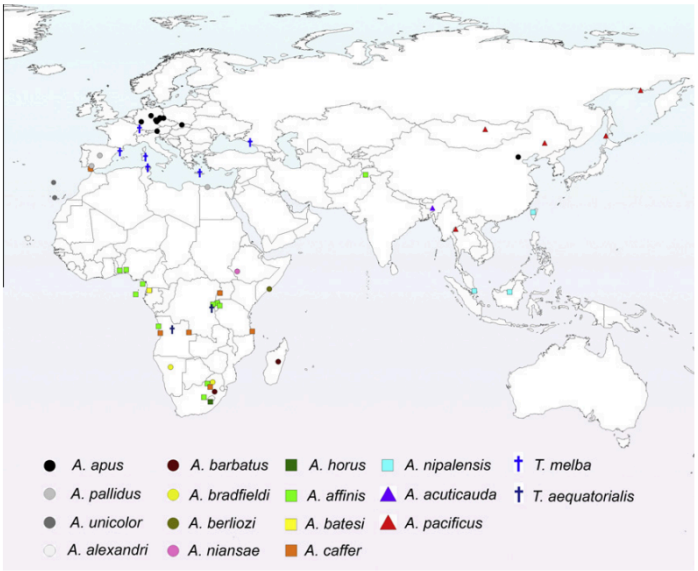


Fig. 1. Origin of samples used in this study, shown for 17 swift species of genera *Apus* and *Tachymarptis*; map based on georeferenced locality data, constructed with DIVA-GIS 5.2.0.2 (Hijmans et al., 2001).

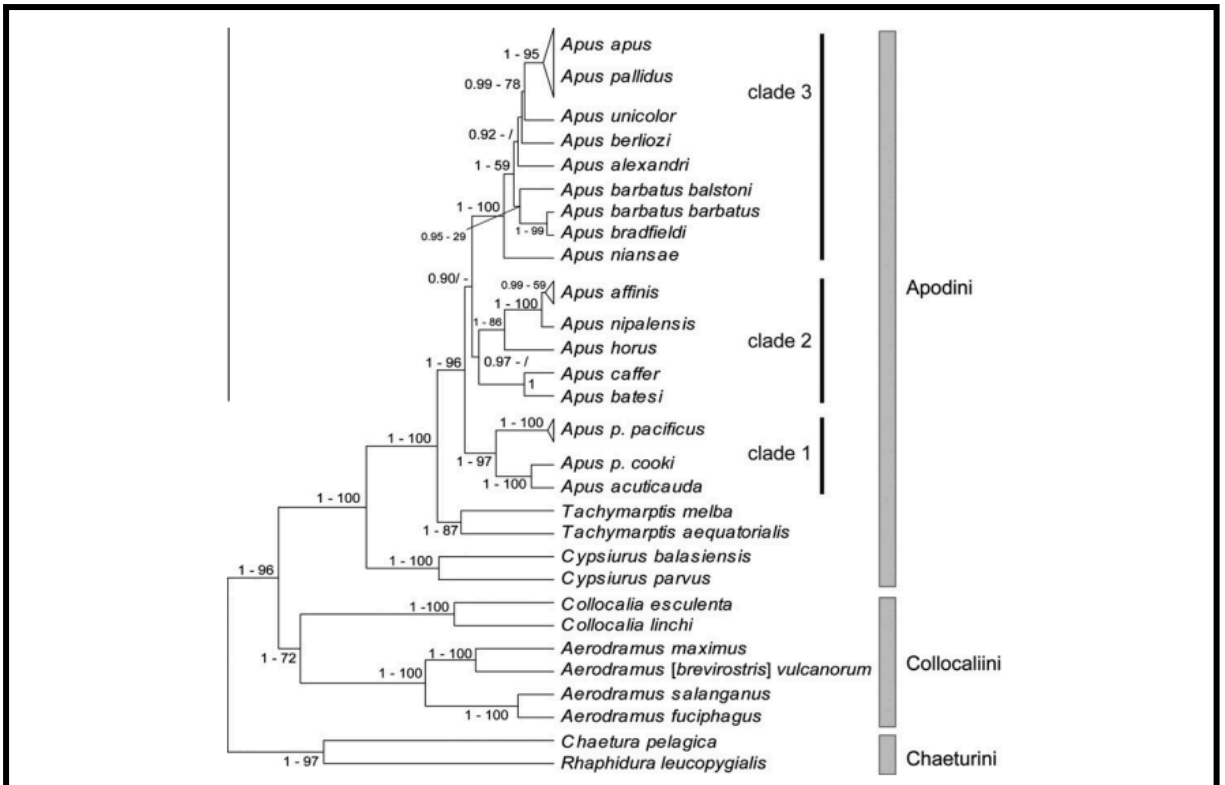


Fig. 2. Multigene phylogeny of Old World swifts based on 3601 bp of concatenated mitochondrial and nuclear sequences (cytb: 887 bp; 12S rRNA: 1016 bp; fib7: 951 bp; GAPDH11: 372 bp; 12884: 375 bp); Bayesian inference of phylogeny BEAST, Markov chain length 30,000,000 generations, burnin: 9000, partitioned by gene and codon (codon partition for cytb); the tree was rooted with *Amazilia tzacatl* as a distant outgroup (a posteriori pruned from the tree; multiple outgroups a priori assigned in RAxML analysis *Amazilia* plus the two Chaeturini sequences); node support from posterior probabilities and from likelihood analysis with RAxML indicated at nodes; species showing intraspecific fragment length polymorphism (marker 12884) represented by two different individuals (*A. p. pacificus* and *A. affinis*), also two Palearctic species showing strong incomplete mitochondrial lineage sorting (*A. apus*, *A. pallidus*) represented by two individuals each; for *A. alexandri* only mitochondrial sequences were available.

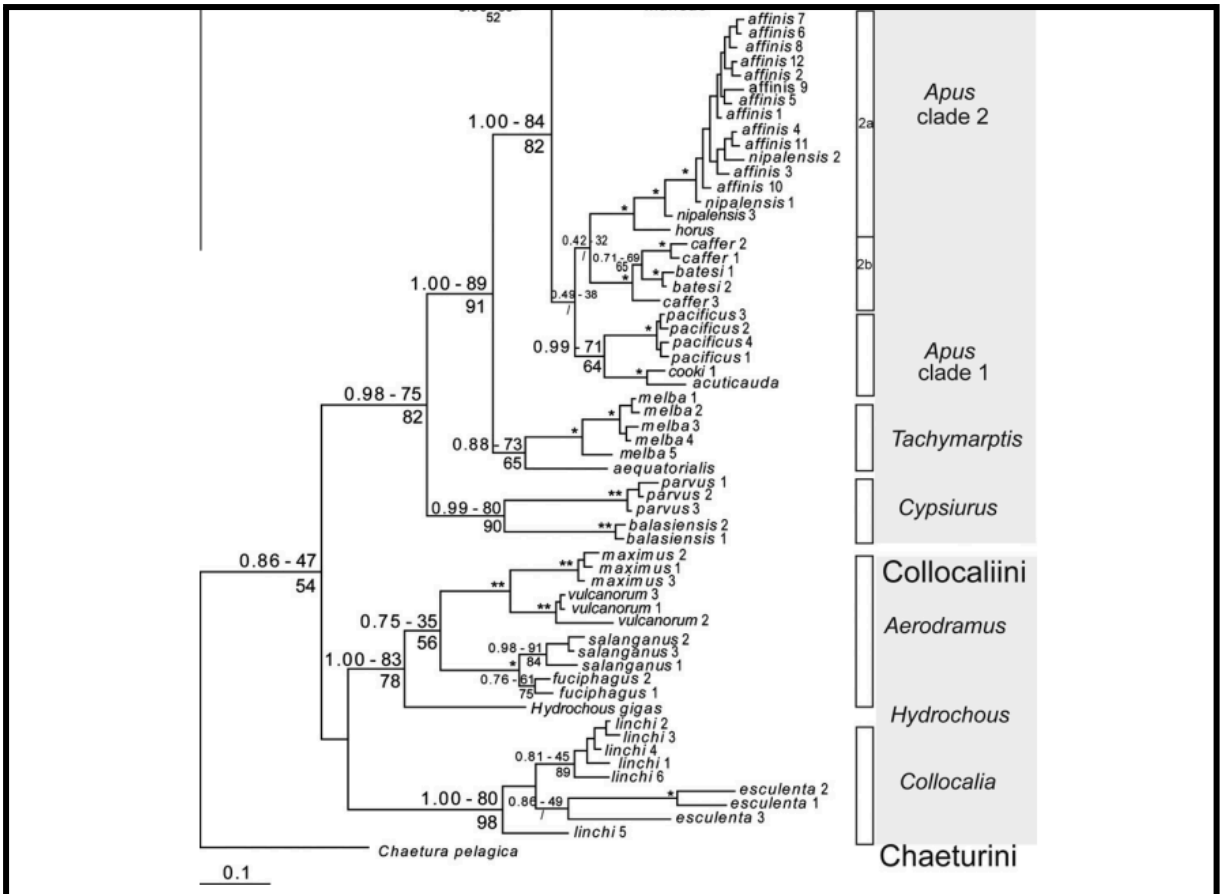


Fig. 3. Molecular phylogeny of swift genera *Apus*, *Tachymarptis* and *Cypsiurus* plus further outgroups of Collocaliini and Chaeturini based on 841 bp cytochrome *b*; each haplotype represented by one sequence only; the tree was rooted with one sequence of *Podargus strigoides* (a posteriori pruned from the tree); Bayesian inference of phylogeny with MrBayes, Markov chain length 1,000,000 generations, HKY + I + Γ model with best-fit model settings applied, support values indicated at nodes (Bayesian posterior probabilities/ML, MP bootstrap below nodes), **maximum node support, 1.0 pps or 100% ML and MP bootstrap; *strong support, 1.0 pps, ML and MP bootstrap >90%.

Morphology (museum studies)

Abdulali (1966) and Brooke (1971) are the two works that examined the morphology of the specimens in the museum collections.

Abdulali found some differences in the Nepal specimens from the Indian specimens but found the Sri Lankan specimens to be intermediate in terms of the shades of upper plumage. He did not propose a clear two-way divide amongst the examined subspecies, and hence the variation seems to be largely clinal. Also, see Abdulali (1972).

Brooke's analysis was no different - though the darkest subspecies was clearly *subfurcatus,* a range of intermediate features were described in other subspecies and a clean phylogeny based on morphology and morphometrics seem impossible. However, Brooke made a closing statement that served as the defining suggestion of this split.

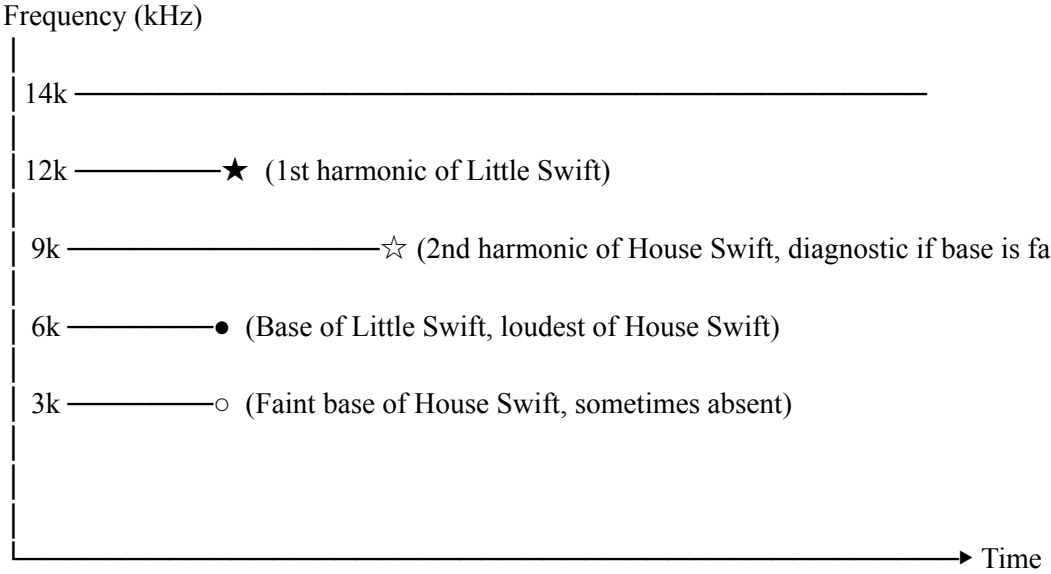
"**If *nipalensis* does not intergrade with nominate *affinis,*** are the long and fork tailed, barred races of east Asia a separate species despite the similarity in breeding habits?"

Vocalisation

There are no published studies examining the vocalisation of different populations. However, the following detail from the Birds of the World (presumably by P. F. Boesman), that seem to indicate different harmonic spacing for the trill call (6 KHz for *A. affinis* and 3 Khz for *A. nipalensis*) -

- *A. nipalensis* has a faint base frequency around 3kHz (sometimes seemingly absent).
- *A. affinis* typically has trill starting around 6kHz [=loudest] with first harmonic at 12kHz. For A. *nipalensis*, the loudest harmonic is at 6kHz, and next one at 9kHz.

Details of the sample size and their geography are not provided. However, no clear differentiation within the subspecies of *A. affinis*, as per this analysis.



An illustration of the differences mentioned in Birds of the World

Aurally, *A. affinis* calls may be more shriller, metallic and clearer while *A. nipalensis* calls sound a bit grating or slightly harsher or raspy. Please listen to the recordings in *Merlin* - *affinis* from Kenya and *nipalensis* from Malaysia.

Identification complexities based on morphology

Separation based mainly on constantly longer, more forked tail and narrower rump-band is questionable for the South Asian subspecies. Although the longest tailed *nipalensis* are outside the range of *affinis*, there is considerable overlap. It is likely that no specimens from the western Himalaya (Himachal Pradesh east to Nuwakot) have been sampled, thus leaving open the possibility that tail length and other measurements are clinal. The width of the rump-band is not a useful feature – based on measurements [n=120] in Abdulali (1966) *affinis* in north-west India have a narrower band than *nipalensis* from Kathmandu. Infact Abdulali (1966) could not assign a particular specimen from Mumbai to either *affinis* or *nipalensis* group. No information on measurements of the depth of the tail-fork in *A. n. nipalensis* has been traced but a drawing of the tail (locality of specimen not stated) in Chantler and Driessens (2000) shows a very slight fork compared with other eastern subspecies, and this may be matched by some individuals of *A. affinis singalensis* from Sri Lanka or northern Kerala, which 'can show slight tail-fork' (Chantler and Driessens 2000). Birds from south-west India are believed to be *singalensis* or related to the same (Abdulali 1966). A review of photographs on the Macaulay Library website indicates that geographical variation in the extent of the tail-fork is complex and requires further investigation. Some individuals that should be *affinis*, e.g. from Gujarat

(1, 2, 3, 4, 5, 6) and West Bengal (1, 2, 3, 4) show a slight tail-fork – and one migrant from Lakshadweep shows a very distinct fork. Conversely, individuals that should be *nipalensis*, e.g. from Sikkim, Hong Kong (1, 2) and Malaysia (1, 2, 3, 4, 5, 6) show no fork, whereas one nesting individual from Jalpaiguri (West Bengal) shows a much deeper fork than *A. n. nipalensis* as illustrated by Chantler & Driessens (2000). However, there are a few Andaman records where the photographed birds (1, 2, 3) almost certainly belong to *subfurcatus*, making them the westernmost distribution for that subspecies.

Identification complexities based on vocalization

There is a very small number of good quality *trill* recordings in public domain (ML & XC) from the region of interest - Nepal, NE India, Bhutan, Bangladesh, W. Bengal, Myanmar, and Thailand. However, listen to the more grating recordings of birds from the range of *A. a. singalensis* - making it once again difficult to assign a clean phylogeny. Similarly, recordings from the *affinis* range like this one from South Africa sounds as grating as recordings from Taiwan or Malaysia, making vocal separation really hard or even impossible.

Sympatry

Potential sympatry in the Himalaya questionable.

The only evidence for the occurrence of *A. affinis* in Nepal is the presence of 14 specimens in the collection of the Field Museum of Natural History, Chicago (2008), all collected from Nuwakot, Nuwakot District, in March 1967, by C. Maser. Three of these are described as embryos, five more as nestlings preserved in alcohol, and the remaining six are described as preserved in alcohol (see Fig. 4, 5). Most of them show a slight tail-fork, like that of *A. n. nipalensis* illustration in Chantler & Driessens (2000). There are also several specimens of *A. nipalensis* in the same collection, collected from Hetauda in May-June 1947 by Koelz and Rupchand, and examined by B. Biswas (Biswas 1961). Brooke (1971) gave the distribution of *A. affinis* as extending 'into the foothills of the Himalaya as far as Hetora [Hetauda] in Nepal, beyond which it is replaced by *nipalensis* there and in the Assam hills.' He provided no reference for this information but in his introduction he stated that 'I have seen material from the places named except where an authority is cited.' Presumably he examined the material in FMNH and considered that Hetauda specimens were *affinis* not *nipalensis*. There are no specimens of *affinis/nipalensis* from Nepal west of Nuwakot so it is not possible to verify Brooke's statement that all birds west of that site are *affinis*.

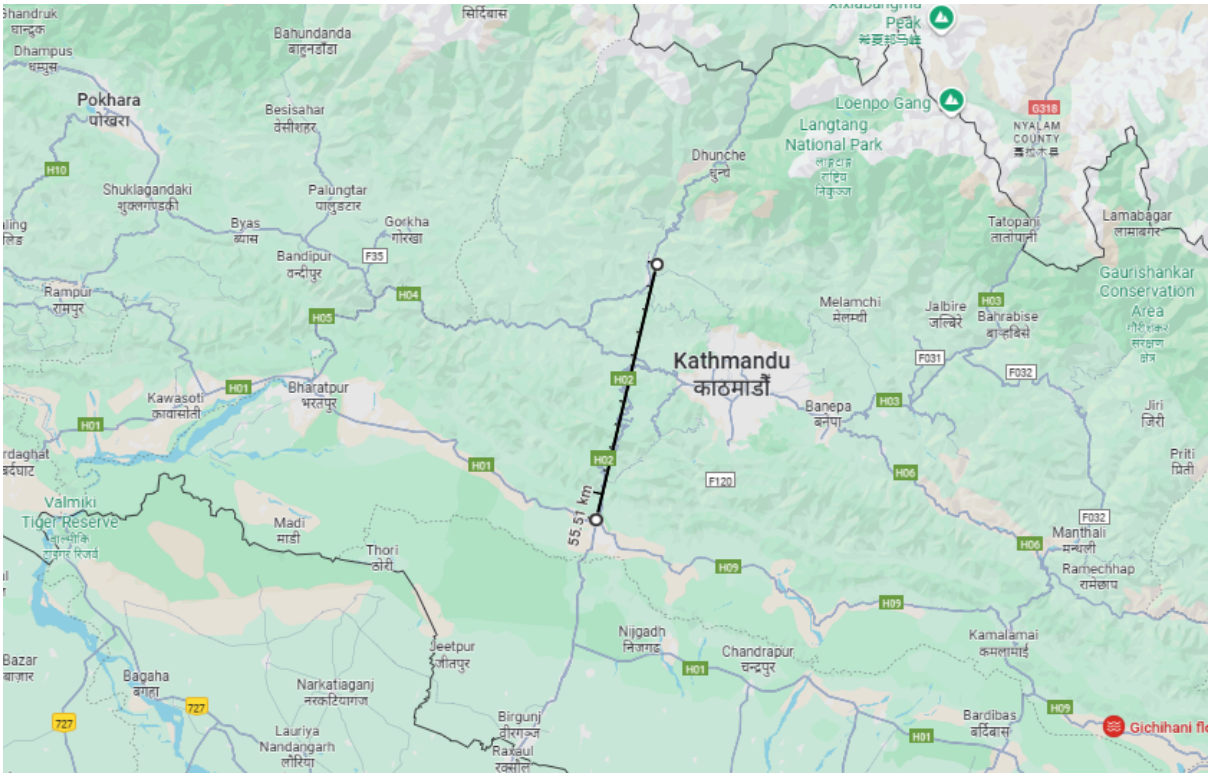


Fig 4. Map showing the proximity of Nuwakot district (north point, where Fig 5, 6 came from) and Hetauda (south point).

Fig 5. Photos of *Apus affinis/nipalensis* (dorsal) from Nuwakot, Nepal. Photo: Daryl Coldren/John Bates, FMNH

Fig 6. Photos of *Apus affinis/nipalensis* (ventral) from Nuwakot, Nepal. Photo: Daryl Coldren/John Bates, FMNH

Photographs of the full series (Fig. 7-11) indicate that presence of a tail fork/notch does not seem to be a useful feature in Nepal. Colouration of the upper parts is variable with extreme examples visibly different - but no clear way to separate them into two groups.

Fig 7. A series from Hetauda, Nepal (ventral view). Photo: Daryl Coldren/John Bates, FMNH

Fig 8. Dorsal view of the same series as Fig. 7. As can be seen there is a gradation on the upper part colours, particularly on the crown and forehead, with some individuals being at the extremes of the scale while others being intermediate. Photo: Daryl Coldren/John Bates, FMNH

Fig. 9: Two specific individuals from the above series depicted to show the extremes. In the photo of the full series, these are the fourth and the first specimen from the left. Photo: Daryl Coldren/John Bates, FMNH

Fig. 10. Specimens from Kathmandu. Photo: Daryl Coldren/John Bates, FMNH

Fig. 11. Specimen from Chitlang, near Kathmandu (left) and from Morang district (right) in extreme SE Nepal, in the terai. See map below. Photo: Daryl Coldren/John Bates, FMNH

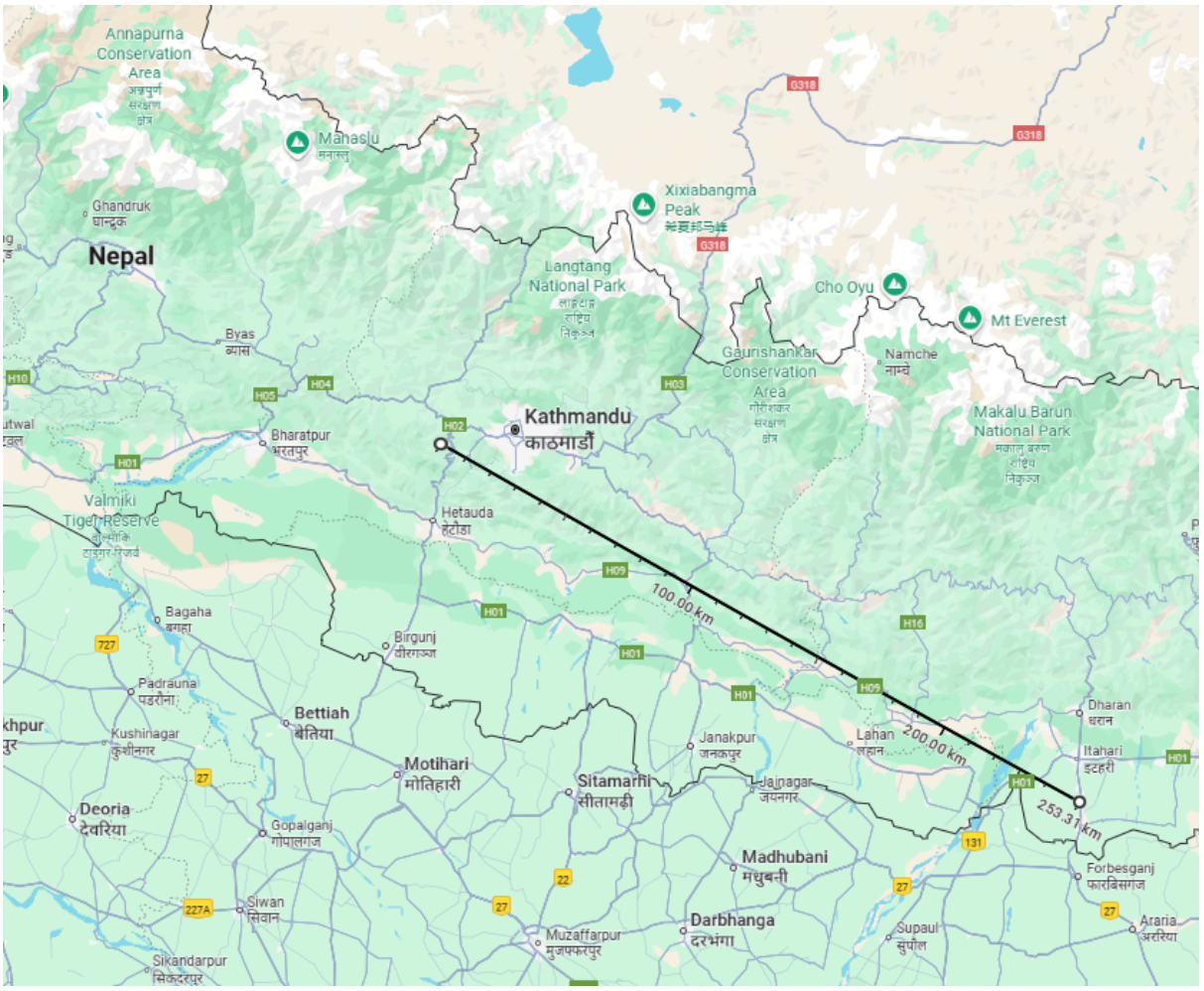


Fig. 12. Map showing the location of Chitlang near Kathmandu and Morang in SE Nepal

Conflict

A further complication arises from Hodgson's (1837) original description of *nipalensis*: 'Sooty black, glossed with green: chin, throat, and top of the neck in front, confluently white: a white bar across the rump: talons and bill, black: iris brown: nude part of toes, dusky-grey. Size small; 5½ by 12½ inches; and barely one oz. in weight: sexes alike: structure typical: tail, short and even.' Note the lack of forked tail. Brooke (1971) seems to have been the first author to describe *nipalensis* with a forked tail but he may have only examined specimens from the eastern part of its range, i.e. extralimital to the Indian subcontinent. It was necessary to re-examine the type specimen(s) of *nipalensis* in the Natural

History Museum, where four specimens were listed by Salvin & Hartert (1892) but it is not included in Warren's (1966) type catalogue, so presumably the specimens have been overlooked as possible types, or have been dismissed as not types. The specimen has now been located and it lacks a fork in the tail (Fig. 8).

Fig 8. Hodgson 'type' specimen of *Apus nipalensis* from Nepal, NHMUK #1845.1.9.549 'type label removed'. Photo: Tim Inskipp

Possible alternative two-species treatments

1. Recognise *nipalensis* (and *kuntzi*?) as belonging to the *affinis* group, with the remaining subspecies in that group bundled under the oldest name - *subfurcatus* - the depth of the tail-fork might be the main (only?) defining features.
2. Recognise *singalensis* as belonging to the *nipalensis* group.

These require more work in the future with possibly a biogeographic study of all subspecies and diversification patterns.

Conclusion

There is no current published evidence that demonstrates *A. affinis/nipalensis* complex is more than one species due to below reasons.

- Clear morphological features that can segregate all subspecies in *affinis* group and all subspecies in *nipalensis* group do not exist. Features like the width of rump band and extent of tail fork defined previously to separate the subspecies are untenable due to overlap. Even specimens in hand are difficult to assign to subspecies. Morphological traits may be clinal.
- No published analysis for different vocalisations with sufficient sample sizes.
- Presumed sympatry in Nepal is not proven, and probably does not exist.
- Published diagnosability not valid for the type specimen of *nipalensis.*
- Molecular phylogeny equivocal and recommends single species.

Considering the taxonomic uniformity of Avilist, the situation is similar to other cases (e.g. *Apus pacificus*, *Saxicola maurus*) where Avilist voted to keep species lumped together when evidence is equivocal or sampling was sparse.

Hence, we propose *A. nipalensis* and all its subspecies be treated as subspecies of *A. affinis* in Avilist.

Side Remark: Historical changes in subspecies distribution likely play a role, for e.g, southern *aerobates* and northern *galilejensis* now come into contact in Mauritania and Western Sahara. However, addressing this issue falls under the responsibility of the African RAG.

Acknowledgements: Daryl Coldren and John Bates from FMNH so kindly analysed their skins and sent us numerous photographs to elucidate the problem, we acknowledge their help, and also, all RAG members for their comments and suggestions.

- Tim Inskipp & Praveen J