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## Multiple lines of evidence confirm that Hume's Owl *Strix butleri* (A. O. Hume, 1878) is two species, with description of an unnamed species (Aves: Non-Passeriformes: Strigidae)

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### Abstract

Genetic and morphological analyses revealed that the type specimen of Hume's Owl *Strix butleri*, the geographical provenance of which is open to doubt, differs significantly from all other specimens previously ascribed to this species. Despite the absence of vocal data definitively linked to the same population as the type specimen, we consider that two species-level taxa are involved, principally because the degree of molecular differentiation is close to that seen in other taxa of *Strix* traditionally recognised as species. Partially complicating this otherwise straightforward issue is the recent description of "Omani Owl *S. omanensis*" from northern Oman based solely on photographs and sound-recordings. We consider that there is clear evidence of at least some morphological congruence between the *butleri* type and the phenotype described as "*omanensis*". As a result, we review the relative likelihood of three potential hypotheses: that "*omanensis*" is a synonym of *butleri*; that "*omanensis*" is a subspecies of *butleri*; or that "*omanensis*" and *butleri* both represent species taxa. Until such time as specimen material of "*omanensis*" becomes available for genetic and comparative morphological analyses, we recommend that this name be considered as a synonym of *butleri*, especially bearing in mind the possibility (not previously considered in detail) that the type of *butleri* could have originated in Arabia, specifically from Oman. We describe other populations heretofore ascribed to *S. butleri* as a new species.

**Key words:** taxonomy, mitochondrial DNA, *Strix butleri*, *Strix omanensis*

### Introduction

The range of Hume's (Tawny) Owl *Strix butleri* encompasses eastern Egypt, through Sinai, southern and eastern Israel, Palestinian Territories, Jordan and much of the Arabian Peninsula (Mikkola 2012, Dickinson & Renssen 2013; Fig. 1). In addition, there are two possible records on the island of Socotra, off the Horn of Africa (Jennings 2010: 423), and the type specimen was originally believed to have come from "Omara, on the Mekran Coast" (Hume 1878: 316), in what is now southern Pakistan (= Ormara, 25°10'N, 64°34'E; Fig. 1), although some authors have erroneously placed Ormara in southeastern Iran (Goodman & Sabry 1984). Despite being known now to be comparatively widespread, e.g., occurring in at least 33 30-minute × 30-minute quadrants in Arabia (Jennings 2010) and at many localities in Israel (Shirihai 1996), Hume's Owl was virtually unknown until rather recently (Hüe & Etchécopar 1970). Indeed, the first-ever specimen of *butleri* (now in the Liverpool World Museums), collected by C. W. Wyatt in Wadi Feiran, Sinai (28°43'N, 33°35'E), in 1864, lay unnamed for more than a decade, until Hume had published his description of *butleri* (Tristram 1879). There was just one definite record in Arabia prior to the 1970s—a specimen collected in 1950 (Meinertzhagen 1954)—and the species was known from just three atlas squares on the peninsula pre-1984, in western and central Saudi Arabia and southwest Oman (Jennings 2010: 423, although two other records are listed by Goodman & Sabry 1984, and Jennings himself mentioned an aural-only record in February 1948); none in Egypt outside Sinai prior to 1982 (Goodman & Sabry 1984) and just

evidentially weak at the present time) and that it will be defensible to consider “*omanensis*” as a *taxon inquirenda* until such time, at least, as genetic data become available for the northern Omani population.

Finally, much of this confusion is unlikely to have resulted if a type *specimen* of “*omanensis*” was available and could be compared morphologically and genetically to that of *butleri*. Robb *et al.* (2013) cited three reasons why they elected not to collect a bird: the perceived rarity of their new taxon; collecting a bird would make it more difficult to study “*omanensis*” in the field; and the taking of a specimen would attract local disapproval; we evaluate each of these reasons in turn. Firstly, it seems unlikely that the “*omanensis*” population will prove to be especially rare, or even endangered. Indeed, at least two new localities for birds with the same vocalization were reported (one of them retrospectively) within just two months of the “*omanensis*” description (van Eijk 2013; <http://gryllosblog.wordpress.com/2014/02/>), while Jennings (2014) pointed out the relative uniformity in habitat between northern Oman and highlands in the United Arab Emirates, where an unidentified *Strix* was heard in April 2006, in Wadi Wurrayah. What is here referred to as *S. hadorami* was, until a few decades ago, widely considered to be one of the most poorly known birds in the Middle East, yet has since proven to be locally common. Therefore, we see no reason to assume that “*omanensis*” must be rare; rather, it may be merely geographically restricted. Secondly, although it is possible that taking a specimen might have made it more difficult to study “*omanensis*” in the field, this would have been true only for a brief time. Thirdly, no evidence that legal collection of a specimen would have been “unacceptable” locally was proffered.

Peterson (2014) recently emphasized the extreme importance of type specimens, even in modern-day ornithology, a sentiment that we broadly support. Given that non-destructive sampling can sometimes elucidate taxonomic problems concerning new species described without such material (e.g., Nguembock *et al.* 2008), we believe that, at the very least, Robb *et al.* (2013) should have refrained from describing their new taxon until they had a vouchered genetic sample that they had compared with the type of *S. butleri*. Nevertheless, it is also true that a complete analysis of relevant specimen material has enabled a more thorough understanding of the present case.

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## References

- Aharoni, J. (1931) Drei neue Vögel für Palastina und Syrien. *Ornithologische Monatsberichte*, 39 (6), 171–173.
- Alström, P., Mild, K. & Zetterström, D. (2003) *Pipits and Wagtails of Europe, Asia and North America*. Christopher Helm, London, 496 pp.
- Andrews, I.J. (1995) *The Birds of the Hashemite Kingdom of Jordan*. Privately published, Musselburgh, Scotland, 185 pp.
- Baha el Din, S. & Baha el Din, M. (2001) Status and distribution of Hume’s (Tawny) Owl *Strix butleri* in the Eastern Desert of Egypt. *Bulletin of the African Bird Club*, 8 (1), 18–20.
- Bandelt, H.J., Forster, P. & Rohlf, A. (1999) Median-joining networks for inferring intraspecific phylogenies. *Molecular*

- Biology and Evolution*, 16 (1), 37–48.  
<http://dx.doi.org/10.1093/oxfordjournals.molbev.a026036>
- Baur, H. & Leuenberger, C. (2011) Analysis of ratios in multivariate morphometry. *Systematic Biology*, 60 (6), 813–825.  
<http://dx.doi.org/10.1093/sysbio/syr061>
- Bensasson, D., Zhang, D.X., Hartl, D.L. & Hewitt, G.M. (2001) Mitochondrial pseudogenes: evolution's misplaced witnesses. *Trends in Ecology & Evolution*, 16 (6), 314–321.  
[http://dx.doi.org/10.1016/s0169-5347\(01\)02151-6](http://dx.doi.org/10.1016/s0169-5347(01)02151-6)
- Beolens, B. & Watkins, M. (2006) *Whose Bird? Men and Women Commemorated in the Common Names of Birds*. Christopher Helm, London, 400 pp.
- Butler, E.A. (1877) Astola, a summer cruise in the Gulf of Oman. *Stray Feathers*, 5, 283–304.
- Cheke, R.A. & Mann, C.F. (2008) Family Nectariniidae (sunbirds). In: del Hoyo, J., Elliott, A. & Christie, D.A. (Eds.), *Handbook of the Birds of the World. Vol. 13. Penduline-tits to Shrikes*. Lynx Edicions, Barcelona, pp. 196–320.
- Clouet, M. (2011) Sur l'avifaune des massifs du désert oriental Égyptien. *Alauda*, 79 (3), 237–240.
- Dickinson, E.C. & Remsen, J.V. (Eds.) (2013) *The Howard and Moore Complete Checklist of the Birds of the World. Vol. 1. Fourth Edition*. Aves Press, Eastbourne, 461 pp.
- Drummond, A.J., Ashton, B., Buxton, S., Cheung, M., Cooper, A., Duran, C., Field, M., Heled, J., Kearse, M., Markowitz, S., Moir, R., Stones-Havas, S., Sturrock, S., Thierer, T. & Wilson, A. (2013) Geneious v5.4. Available from: <http://www.geneious.com/> (accessed 19 November 2014)
- van Eijk, P. (2013) Presumed second locality for Omani Owl. *Dutch Birding*, 35 (6), 387–388.
- Eriksen, J. & Victor, R. (2013) *Oman Bird List: The Official List of the Birds of the Sultanate of Oman*. Seventh Edition. Sultan Qaboos University, Muscat, 288 pp.
- Fregin, S., Haase, M., Olsson, U. & Alstrom, P. (2012) Pitfalls in comparisons of genetic distances: a case study of the avian family Acrocephalidae. *Molecular Phylogenetics and Evolution*, 62, 319–328.  
<http://dx.doi.org/10.1016/j.ympev.2011.10.003>
- Gallagher, M. & Woodcock, M.W. (1980) *The Birds of Oman*. Quartet Books, London, 310 pp.
- Goodman, S.M. & Sabry, H. (1984) A specimen record of Hume's Tawny Owl *Strix butleri* from Egypt. *Bulletin of the British Ornithologists' Club*, 104 (3), 79–84.
- Heidrich, P. & Wink, M. (1994) Tawny Owl (*Strix aluco*) and Hume's Tawny Owl (*Strix butleri*) are distinct species: evidence from nucleotide sequences of the cytochrome *b* gene. *Zeitschrift für Naturforschung*, 49, 230–234.
- Hüe, F. & Etchécopar, R.-D. (1970) *Les Oiseaux du Proche et du Moyen Orient*. N. Boubée & Cie, Paris, 948 pp.
- Hume, A.O. (1878) *Asio butleri*, sp. nov.? *Stray Feathers*, 7, 316–318.
- Jennings, M.C. (Ed.) (2010) Atlas of the breeding birds of Arabia. *Fauna of Arabia*, vol. 25. King Abdulaziz City for Science & Technology & Fauna of Arabia, Riyadh & Frankfurt, 751 pp.
- Jennings, M. (2014) A new species of owl from Oman. *The Phoenix*, 30, 1–2.
- Katoh, K., Misawa, K., Kuma, K. & Miyata, T. (2002) MAFFT: a novel method for rapid multiple sequence alignment based on fast Fourier transform. *Nucleic Acids Research*, 30 (14), 3059–3066.  
<http://dx.doi.org/10.1093/nar/gkf436>
- Khaleghizadeh, A., Scott, D.A., Tohidifar, M., Musavi, S.B., Ghasemi, M., Sehhatiasabet, M.E., Ashoori, A., Khani, A., Bakhtiari, P., Amini, H., Roselaar, C., Ayé, R., Ullman, M., Nezami, B. & Eskandari, F. (2011) Rare birds in Iran in 1980–2010. *Podoces*, 6 (1), 1–48.
- Kirwan, G.M. & Grieve, A. (2010) Studies of Socotran birds V. On the validity of *Anthus similis sokotrae* and a few remarks on Arabian and northeast African populations of Long-billed Pipit *A. similis*. *Sandgrouse*, 32 (1), 43–49.
- König, C., Weick, F. & Becking, J.-H. (1999) *Owls: A Guide to the Owls of the World*. Pica Press, Robertsbridge, 462 pp.
- König, C., Weick, F. & Becking, J.-H. (2008) *Owls: A Guide to the Owls of the World*. Second Edition. Christopher Helm, London, 528 pp.
- Leshem, J. (1981) The occurrence of the Hume's Tawny Owl in Israel and Sinai. *Sandgrouse*, 2, 100–102.
- Meinertzhagen, R. (1930) *Nicoll's Birds of Egypt. Vol. 1*. Hugh Rees, London, 348 pp.
- Meinertzhagen, R. (1954) *Birds of Arabia*. Oliver & Boyd, Edinburgh & London, 624 pp.
- Mendelssohn, H., Yom Tov, Y. & Safriel, U. (1975) Hume's Tawny Owl (*Strix butleri*) in Judean, Negev and Sinai Deserts. *Ibis*, 117 (1), 110–111.  
<http://dx.doi.org/10.1111/j.1474-919x.1975.tb04193.x>
- Mikkola, H. (2012) *Owls of the World: A Photographic Guide*. Christopher Helm, London, 512 pp.
- Nguembock, B., Fjeldså, J., Couloux, A. & Pasquet, E. (2008) Phylogeny of *Laniarius*: molecular data reveal *L. liberatus* synonymous with *L. erlangeri* and “plumage coloration” as unreliable morphological characters for defining species and species groups. *Molecular Phylogenetics and Evolution*, 48, 396–407.  
<http://dx.doi.org/10.1016/j.ympev.2008.04.014>
- Nijman, V. & Aliabadian, M. (2013) DNA barcoding as a tool for elucidating species delineation in wide-ranging species as illustrated by owls (Tytonidae and Strigidae). *Zoological Science*, 30 (11), 1005–1009.  
<http://dx.doi.org/10.2108/zsj.30.1005>
- Pacheco, M.A., Battistuzzi, F.U., Lentino, M., Aguilar, R., Kumar, S. & Escalante, A.A. (2011) Evolution of modern birds revealed by mitogenomics: timing the radiation and origin of major orders. *Molecular Biology and Evolution*, 28 (6),

1927–1942.

<http://dx.doi.org/10.1093/molbev/msr014>

- Peterson, A.T. (2014) Type specimens in modern ornithology are necessary and irreplaceable. *Auk*, 131 (3), 282–286.  
<http://dx.doi.org/10.1642/auk-13-204.1>
- Price, T. (2008) *Speciation in Birds*. Roberts & Co., Greenwood Village, Colorado, 470 pp.
- Rasmussen, P.C. & Anderton, J.C. (2005) *Birds of South Asia: The Ripley Guide. Vol. 2*. Smithsonian Institution, Washington DC & Lynx Edicions, Barcelona, 683 pp.
- Robb, M., van den Berg, A.B. & Constantine, M. (2013) A new species of *Strix* owl from Oman. *Dutch Birding*, 35 (5), 275–310.
- Roberts, T.J. (1992) *The Birds of Pakistan. Vol. 1*. Oxford University Press, Karachi, 598 pp.
- Roselaar, C.S. & Aliabadian, M. (2009) Review of rare birds in Iran, 1860s–1960s. *Podoces*, 4 (1), 1–27.
- Rozen, S. & Skaletsky, H.J. (2000) Primer3 on the WWW for general users and for biologist programmers. In: Misener, S. & Krawetz, S.A. (Eds.), *Bioinformatics Methods and Protocols: Methods in Molecular Biology. Vol. 132*. Humana Press, Totowa, New Jersey, pp. 365–386.
- Scott, D.A. (2008) Rare birds in Iran in the late 1960s and 1970s. *Podoces*, 3 (1/2), 1–30.
- Scott, D.A. & Adhami, A. (2006) An updated checklist of the birds of Iran. *Podoces*, 1 (1/2), 1–16.
- Shirihai, H. (1975) “I found a Hume’s Owl”. *Kenaff Renanim (Jerusalem Birdwatching Club)*, 1, 10. [in Hebrew]
- Shirihai, H. (1996) *The Birds of Israel*. Academic Press, London, 682 pp.
- Smithe, F.B. (1976) *Naturalist’s Color Guide*. American Museum of Natural History, New York, 21 pp.
- Stamatakis, A. (2006) RAxML-VI-HPC: Maximum likelihood-based phylogenetic analyses with thousands of taxa and mixed models. *Bioinformatics*, 22, 2688–2690.  
<http://dx.doi.org/10.1093/bioinformatics/btl446>
- Stamatakis, A., Hoover, P. & Rougemont, J. (2008) A rapid bootstrap algorithm for the RAxML web servers. *Systematic Biology*, 57 (5), 758–771.  
<http://dx.doi.org/10.1080/10635150802429642>
- Svensson, L. (1999) *Identification Guide to European Passerines*. Fourth edn. Privately published, Stockholm, 368 pp.
- Ticehurst, C.B. (1927) The birds of British Baluchistan. *Journal of the Bombay Natural History Society*, 32, 64–97.
- Tristram, H.B. (1879) Letter to the Editor: *Asio butleri* and *Caprimulgus tamaricis*. *Stray Feathers*, 8, 416–417.
- Tristram, H.B. (1880) Letter to the Editor. *Ibis*, Series 4, 4, 245–246.
- Wink, M., El-Sayed, A.A., Sauer-Gürth, H. & Gonzalez, J. (2009) Molecular phylogeny of owls (Strigiformes) inferred from DNA sequences of the mitochondrial cytochrome b and the nuclear RAG-1 gene. In: Johnson, D.H., Van Nieuwenhuysse, D. & Duncan, J.R. (Eds.), *Proceedings Fourth World Owl Conference. Oct–Nov 2007, Groningen, The Netherlands. Ardea*, 97 (4), 581–591.