



# Awer Honey-Hunting Culture With Greater Honeyguides in Coastal Kenya

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The remarkable mutualism between humans and greater honeyguides (*Indicator indicator*) is known still to thrive in only a few places in Africa. Here, we report on the honey-hunting culture of the marginalised Awer people in Kenya, historically a hunter-gatherer culture who today practise a mixed economy including significant amounts of foraging for wild foods. As part of a larger effort to document cross-cultural honey-hunting traditions in Africa, we interviewed six Awer honey-hunters to document their cultural practices. The interviewees reported that they depend on wild honey as a source of income, and that they readily seek the cooperation of honeyguides. Honey-hunting skills and the calls/whistles used to communicate with honeyguides are learnt from their fathers and other elders in village. The best time to honey-hunt is in the months following the big rains (August–December), when interviewees go out honey-hunting once a week on average. Honeyguides are not actively rewarded with wax, as it is believed that once a bird is fed it will not cooperate again for some time, and therefore after the honey harvest is complete, all remaining wax comb is buried. Honey-hunting practices are declining in this region, which interviewees attributed to drought and a lack of interest by the youth. These findings expand our understanding of how human-honeyguide mutualism persists across a range of human cultural variation.

**Keywords:** *Indicator indicator*, honeyguide, mutualism, humans, cultural heritage

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## INTRODUCTION

Human-wildlife mutualisms involve reciprocally beneficial interactions between humans and free-living, wild, non-human animals (Dounias, 2018). They are rare, diverse and poorly documented. In particular, the functional components of human-wildlife mutualism (e.g., the interspecific signals used to coordinate the interaction) can vary geographically, yet we lack detailed studies of most populations. Moreover, many examples of human-wildlife mutualism are either extinct or declining, and it is vital that we assess the threats to surviving cases (van der Wal et al., in review).

Greater honeyguides (*Indicator indicator*) and humans (*Homo sapiens*) cooperate in different parts of Africa to gain access to the contents of bees' nests (Isack and Reyer, 1989). The birds guide people to bees' nests, which are then harvested for honey and brood using smoke and tools, and the birds feed on the beeswax left behind. This remarkable human-bird mutualism could plausibly be ancient, given that both honeybees (*Apis mellifera*) and the greater honeyguide lineage existed

in Africa when *Homo* gained control of fire and smoke up to 1.9 m.y.a. (Wrangham, 2012). In the present day, honey-hunting cultures vary in traits relevant to the honeyguide, for example in the signals used to communicate with honeyguides (Isack and Reyer, 1989; Wood et al., 2014; Spottiswoode et al., 2016; Laltaika, 2021), and in peoples' customs of rewarding the bird (Isack, 1999; Wood et al., 2014; Spottiswoode et al., 2016; Laltaika, 2021).

Although honey-hunting remains widespread throughout the continent, it is dwindling or has disappeared in many places (Isack, 1999; Gruber, 2018; van der Wal et al., in review). Only a few human cultures remain that rely heavily on selling or trading honey and related products obtained from wild bees (Figure 1A), rather than from apiculture with man-made beehives. Factors contributing to the fading or local disappearance of honey-hunting practices across Africa include, first, loss of human interest due to easier access to alternative sources of sugar for humans (Queeney, 1952; Isack, 1999; Spottiswoode et al., 2016), growing popularity of beekeeping (Gruber, 2018; Tanleque-Alberto et al., 2019), and increased opportunities for Western education (Isack, 1999; Laltaika, 2021). Second, there can be loss of opportunity for honey-hunting with honeyguides due to loss of habitat loss for bees and honeyguides (Isack, 1999; Laltaika, 2021), and exclusion of humans from protected nature reserves (Dean et al., 1990; Brockington and Wilkie, 2015). For the honeyguide this means fewer people are responding to its call, reducing the yield of their guiding behaviour and thus potentially undermining this unique partnership (Queeney, 1952; Isack, 1999). However, the distribution and diversity of honey-hunting practices with honeyguides has never been systematically surveyed, limiting our understanding and reducing our ability to safeguard this inter-species partnership (van der Wal et al., in review).

As part of a larger effort to document little-known honey-hunting cultures across Africa, we describe the honey-hunting culture of the Awer people in Lamu County in Kenya, as reported in interviews with six Awer honey-hunters. The Awer people are heavily endangered and their traditional culture is facing extinction (Save Lamu, 2019), such that documenting their honey-hunting culture now is paramount. Here we report Awer stories and experiences as described by the honey-hunters, to help document this cultural heritage and strengthen our understanding of how human-honeyguide mutualism is maintained across diverse contexts in Africa.

## METHODS

### Awer Culture

The Awer (sometimes written as *Aweer*) are one of the smallest indigenous cultural groups (<4,000 individuals) in Lamu County (6,273 km<sup>2</sup>, population: 143,920 in 2019 census) in Kenya's Coast Province near the Somalian border (Kenya National Bureau of Statistics, 2019). The Awer are sometimes also referred to as the "Boni," but this name is not well-liked as the name carries derogatory undertones; the word likely comes from the southern Somali word "bon" which referred to low caste people who lived by hunting wild game (Nunow, 2012). The other cultures in Lamu are the Bajuni (the largest group,

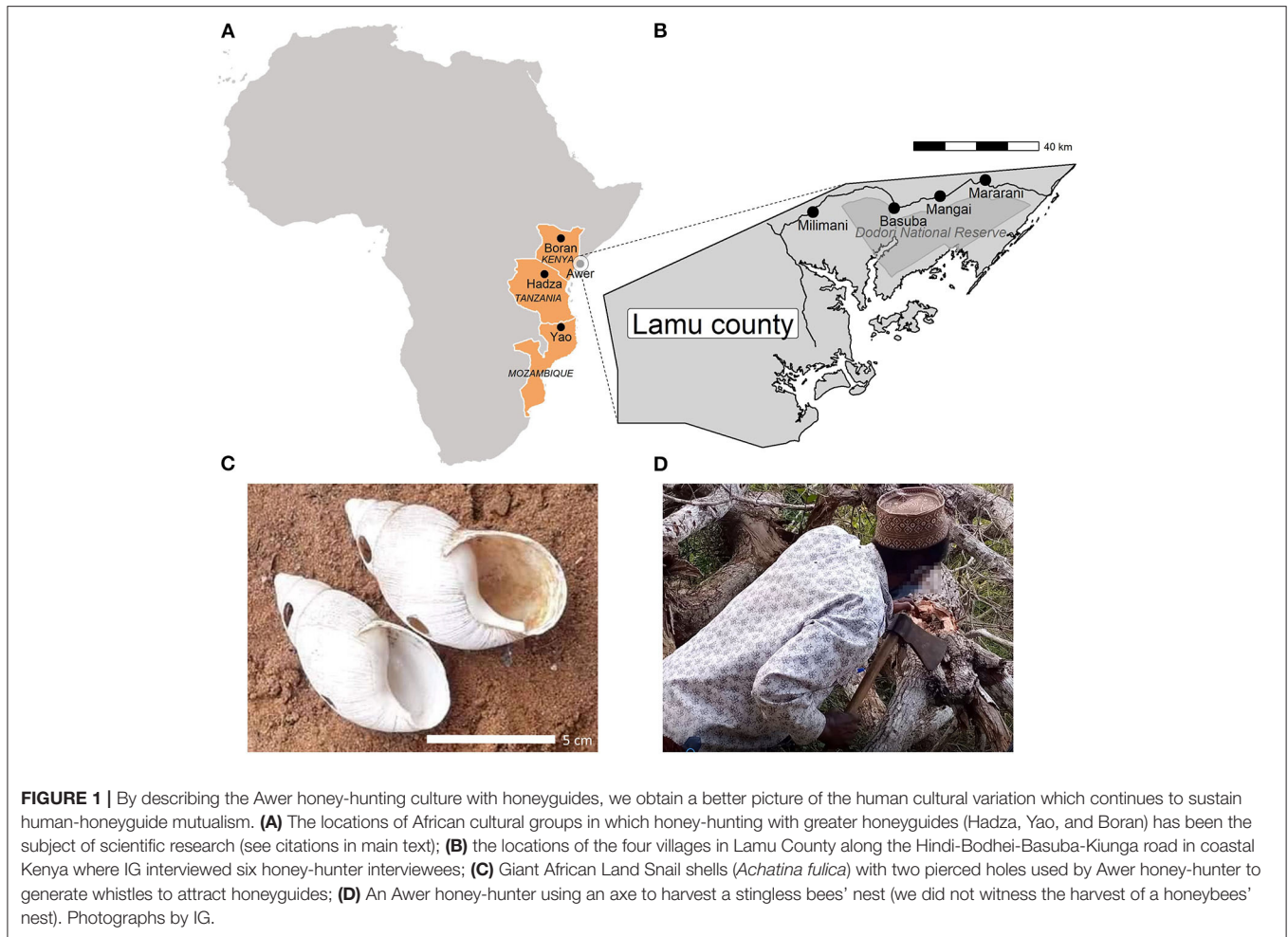
who fish, and farm), Sanye (historically hunter-gatherers), and Orma (pastoralists) (Nunow, 2012; Save Lamu, 2019). The Awer live spread across ca. 12 villages (Nunow, 2012) along the Hindi-Bodhei-Basuba-Kiunga road running between the Dodori National Reserve [to the South (covers 877 km<sup>2</sup>; Figure 1B)] and the Boni National Reserve in Garissa County to the north (covers 1,339 km<sup>2</sup>).

The Awer are historically hunter-gatherers and their livelihood continues to depend on the harvesting of wild forest resources in the reserves, such as fruits, plants and honey (Nunow, 2012; Waswala-Olewe et al., 2014), although it no longer includes hunting game meat as this has become prohibited in Kenya. In recent times the Awer have also adopted subsistence farming and various market activities (Waswala-Olewe et al., 2014). The habitat in the reserves is characterised by a mosaic of semi-evergreen lowland dry forest, acacia thornbush and lowland cultivated savanna (Kuchar and Mwenda, 1982). The Awer currently face environmental and political stressors, which is driving the loss of their traditional livelihoods. More specifically, deforestation for infrastructure projects (such as the Lamu Port Project; Nunow, 2012) and security threats from Islamist militant group Al-Shabaab across the Kenya-Somalia border mean that the Awer are facing marginalisation and extreme poverty.

### Data Collection

IG interviewed six active honey-hunters (all male, and aged 25, 37, 44, 52, 54, and 65) in four different Awer villages (Figure 1B): Mangai ( $n = 3$  interviewees; 1° 44.98' S 41° 10.345' E; 368 inhabitants in 2019), Mararani: (1° 42.19' S 41° 18.179' E; 250 inhabitants in 2019), Milimani (1° 47.722' S, 40° 48.501' E; 360 inhabitants in 2019), and Basuba (1° 47.023' S 41° 2.455' E; 617 inhabitants in 2019) in September 2020 (Kenya National Bureau of Statistics, 2019). Upon arrival in each village, IG first approached the headman to explain our intended data collection. In all cases, the headman granted permission to pursue interviews, and provided a list of honey-hunters in his village, who were all male. IG then located and approached one or more honey-hunters in that village for one-on-one interviews, depending on their availability. We asked interviewees a set of questions about their honey-hunting culture and activities, concerning the importance of honey, how honey-hunting skills are learnt, timing and frequency of honey-hunting, their relationship with honeyguides, bees' nest harvesting practices, and whether a change over time is perceived (questions in Supplementary Material).

Interviews were done in person, in Kiswahili, and sometimes Kisomali, and independently of each other by ensuring that respondents in the same village did not overhear the responses of other respondents. Informed consent was sought before the start of each interview. The six honey-hunters all gave highly consistent answers and results presented in this paper apply to all interviewee responses, unless indicated otherwise. The interview questions (translated to Kiswahili by JvdW and IG) and answers (translated from Kiswahili or Kisomali by IG) are presented as Supplementary Material.



**FIGURE 1** | By describing the Awer honey-hunting culture with honeyguides, we obtain a better picture of the human cultural variation which continues to sustain human-honeyguide mutualism. **(A)** The locations of African cultural groups in which honey-hunting with greater honeyguides (Hadza, Yao, and Boran) has been the subject of scientific research (see citations in main text); **(B)** the locations of the four villages in Lamu County along the Hindi-Bodhei-Basuba-Kiunga road in coastal Kenya where IG interviewed six honey-hunter interviewees; **(C)** Giant African Land Snail shells (*Achatina fulica*) with two pierced holes used by Awer honey-hunter to generate whistles to attract honeyguides; **(D)** An Awer honey-hunter using an axe to harvest a stingless bees' nest (we did not witness the harvest of a honeybees' nest). Photographs by IG.

## RESULTS

### How Important Is Honey in Awer Culture?

All interviewees reported that they collected wild honey to sell, to trade and to consume. Brood (honeybee larvae) is mostly given to children to eat. The selling of honey was described as an important source of income. One litre of honeybee *Apis mellifera* honey (“malab,” commonly kept in jerry cans) was sold at a set price of 1,000 Kenyan Shillings. One litre of stingless bee honey (“noi”) was sold for 1,500 Kenyan Shillings. Interviewees reported that they mostly sold and traded honey within their own communities, and with the Bajuni people who typically do not honey-hunt (although some have beehives). Beeswax was not harvested specifically, despite efforts by the international NGO “Arid Lands Information Network” in the early 2000s to share skills on how to make candles and soap.

### How Is Honey-Hunting With Honeyguides Learnt?

All interviewees reported that they learnt to honey-hunt with honeyguides from their fathers and other elders in village.

Interviewees also reported that they learnt the signalling calls and whistles that they use to communicate with honeyguides (see below) from their fathers and other village elders. They reported that honey-hunting is a basic skill known to all Awer men, but that only a subset of men in their respective villages specialise in honey-hunting and make it their living. They estimated the number of active honey-hunters in each of the four villages to be >15 in Basuba, 30 in Marani, 15–20 in Mangani, and 8 in Milimani.

### What Is the Best Time of the Year to Go Honey-Hunting?

All interviewees reported that the best time to honey-hunt (i.e., the honey-hunting high season) was August–December, after the big rains end. In response to the question how often they went honey-hunting per month in the honey-hunting high season, the median answer was 7 times (individual answers: 4, 7, 7, 10, 10, 10). Some honey-hunting trips were 1 day long, while others were longer and involved trips up to 20 km

from home. One interviewee said that his frequency of honey-hunting trips increased when the financial situation of his family dwindled.

## How Do Awer Honey-Hunters Attract Honeyguides to Find Bees' Nests?

All interviewees reported that they used different calls depending on the “phase” of the honey-hunt. To attract the honeyguide, they consistently whistled “fuuj fuuj guuj” or whistled on the shell of a Giant African Land Snail (*Achatina fulica*) (Figure 1C; Supplementary Video). This shell whistle is not used in any other context besides attracting honeyguides. Interviewees reported that once the honeyguide arrives and starts chattering its guiding call, the human follower switches to “iiigeeh” and/or a repetitive grunt (“hah, hah,” sometimes interspersed with “a-weh”) which is said to indicate to the bird: “lead me.” The greater honeyguide is referred to as “Miris” in Awer language; males are called “Bateh” and females “Tumuji.” Interviewees said that they are able to differentiate the sexes by morphology and sound: the male is bigger, has a red bill and is louder (“kr”), while the female is softer (“tjir”). Two interviewees said that the female honeyguide is slightly more active (i.e., calls more), but all interviewees agreed that both sexes are equally good at guiding to a bees' nest. Interviewees described honeyguides as only leading to *Apis mellifera* nests, while stingless bees' nests are found without the help of honeyguides (Figure 1D). All interviewees said that cooperation with the bird is always preferred over finding bees' nest on their own, but the bird is sometimes not found, so they do not always rely on the bird to find wild honey. The average time to attract a honeyguide was said to vary a lot (from immediately after leaving the village to going a full day without finding one), and was attributed to luck. All interviewees said that once the bird arrives, it takes ~15–30 min to find a bees' nest, at which point the honeyguide falls silent in or nearby the tree with the bees' nest.

All interviewees also reported that they have sometimes been guided to animals other than bees, namely snakes ( $n = 4$  interviewees), lions ( $n = 5$  interviewees) and other animals ( $n = 6$  interviewees). These events were not interpreted in any particular way, and one interviewee explicitly attributed this to chance.

## How Are the Bees' Nests Harvested?

All interviewees reported that they use smoke to subdue the bees. If the bees' nests are within reach, a hole is cut out of the tree, but when they are out of reach, five honey-hunters said that they cut down the tree, and one said he always climbs the tree. If after opening a bees' nest, it is found to contain no honey, the wax combs are not removed from the bees' nests, for the purpose of giving the bees the opportunity to continue building, such that the nest survives. With the nest entrance now enlarged, this wax is now accessible to honeyguides (but still defended by stinging bees). When a bees' nest with honey is found, all wax combs (with and without honey) are removed. At the harvest site, the honey is squeezed out of the combs into jerry cans by hand, and when containers are

filled the remaining harvest is eaten, and/or carried home (if on a single-day trip). The remaining wax left-overs (from which honey is already squeezed) are also often taken home, and given to children to chew or eat. Empty wax combs are not taken home.

## Are Honeyguides Rewarded?

Five out of six honey-hunters said that they do not actively reward the honeyguide with bees' wax, as they believe that once the bird is fed it will not cooperate again, and therefore they bury any wax combs with no or little honey. All five non-rewarding interviewees reported that, when you reward a honeyguide, the bird stays silent until the next honey-hunting season. Then, when the rains come, the story goes that the bird will drink water and vomit everything they have eaten that season. One interviewee said that he leaves behind bees' wax most of the time, because there are so many honeyguides that even if you feed one, another hungry one will come along.

## Have Honey-Hunting Practices Changed?

When asked to compare current honey-hunting practices with those in the past, five out of six interviewees said that there are now fewer bees and less honey, and consequently less honey-hunting. Two interviewees attributed this to drought in the area. Two interviewees said that the youth are busy with other activities such as education or farming. One interviewee mentioned that in the past honey-hunting was only done for food, whereas currently it is also done to sell honey as a business.

## A Folktale on How Human-Honeyguide Mutualism Started

Lastly, one interviewee shared an Awer folktale to explain the mutualism's origin: “One day the bees called for a ceremony for all animals with feathers (i.e., birds), and unfortunately the honeyguide was not invited. The meal served at the ceremony was honey. When the honeyguide realised they were the only bird not invited, and all other birds were talking about how sweet and tasty the honey was, it felt annoyed and disappointed with the bees. When the honeyguide finally tasted the honey, it decided that from then on it would partner up with humans to always have the first taste of honey, and punish the bees by destroying their nests.”

## DISCUSSION

Honey plays an important role in Awer culture, similar to other hunter-gatherer cultures such as the Hadza (Marlowe et al., 2014; Wood et al., 2014), Baka (Gruber, 2018), Ndorobo (Van Zwanenberg, 1976; Kenny, 1981; Laltaika, 2021) and Waata (Ville, 1995) people, as well as several non-hunter-gatherer cultures like the Boran (Isack and Reyer, 1989; Isack, 1999) and Yao (Spottiswoode et al., 2016) people who rarely or never practise beekeeping and have limited cash economy for buying honey or sugar (Figure 1A). Honey-hunting with honeyguides is a skill learnt from the elders, like in the Hadza (Wood et al., 2014) the Boran (Isack, 1999), Yao (Spottiswoode et al., 2016) people. Honeyguides play a key part in locating bees' nests



in Awer honey-hunting culture, as Awer honey-hunters report that cooperation with these birds lowers the search costs of locating wild bees. The bird's help is not guaranteed, however; its presence is likely reliant on bee and honeyguide density. In addition, the mutualism is also of cultural value, as evidenced by the Awer folktale on how human-bird relationship started. These results are consistent with our understanding that human-wildlife mutualism provides both material and non-material benefits to human partners and their communities (van der Wal et al., in review).

The context-dependent calls used by Awer honey-hunters to communicate with honeyguides add to our understanding of the mosaic of cultural variation in honey-hunter calls across Africa (Isack and Reyer, 1989; Wood et al., 2014; Spottiswoode et al., 2016). Whistling on snail shells to attract honeyguides is also used by the Boran people, roughly 600 km north (Isack and Reyer, 1989; Isack, 1999), and by Somali pastoralists living in the south of (neighbouring) Garissa County, who notably also use these snails (or horns of herbivores: Lesser Kudu *Tragelaphus imberbis*, Topi *Damaliscus lunatus* and Hirola *Beatragus hunteri*) to whistle to their grazing livestock (goats and sheep) (IG pers. obs.). The Awer, Boran and Somalis are all Cushitic cultures living in similar habitats, and share migration routes and resources (Campbell and Tishkoff, 2010). They frequently interact when hunting, or when trading and/or selling of goods like honey and milk, potentially allowing for cultural interchange.

The Awer do not actively reward the honeyguides that have led them to a bees' nest. Instead, they limit the birds' consumption to try to ensure that the bird will stay hungry and lead them to more bees' nests. While there has been some debate about whether honey-hunters always actively reward honeyguides (Giaino, 2016), the Awer present another case of a culture in which non-rewarding and active suppression of the bird's payoff is culturally established, like the Hadza people in Tanzania (Wood et al., 2014). As with the Hadza, the mutualism with the Awer continues to thrive. This is likely because even when humans actively attempt to deprive the honeyguide from a reward, scraps of wax inevitably remain inside or around the newly exposed nest; these are likely to provide sufficient benefit to make the bird's guiding efforts worthwhile (Wood et al., 2014). It therefore seems clear that active rewarding by humans is not essential to provide sufficient wax payoff to the bird to ensure the maintenance of mutualism.

The Awer also represent another culture in which honeyguides are reported to guide humans to animals other than bees. Reports of honeyguides occasionally guiding humans to mammals and snakes appear to be ubiquitous across honey-hunting cultures (e.g., Boran: Isack, 1999; Swazi: Gcina S. Dlamini pers. comm.; Yao: David J. Lloyd-Jones & CS, unpubl. data; Waata: Ville, 1995; also see: Friedmann, 1955). However, Awer interviewees did not report being guided to any bee species besides honeybees. Although both honeybee and stingless bee honey are harvested and sold by the Awer, stingless bees' nests are found without the help of honeyguides. This contrasts with human-honeyguide mutualism in northern Mozambique where honeyguides commonly lead Yao people to stingless

bees (Spottiswoode et al., 2016), and in northern Tanzania where honeyguides on very rare occasions lead Hadza people to stingless bees (Brian M. Wood pers. comm.) even though honey from stingless bees is important to the Hadza diet (Marlowe et al., 2014; Wood et al., 2014). This variation between honeyguide populations with respect to what types of bees they lead people to may reflect either learnt or innate variation in honeyguide foraging strategies across Africa (Spottiswoode et al., 2016).

With the Awer people facing multiple severe threats, their honey-hunting culture is also at risk of extinction. It is likely that habitat degradation and restricted forest access following major urban development plans for Lamu county (Nunow, 2012; Save Lamu, 2019) and the threat posed by Al-Shabaab will hamper Awer honey-hunting culture, and thus Awer cooperation with honeyguides. We found no evidence that a switch to beekeeping is occurring in the Awer community (but see Waswala-Olewe et al., 2014). However, beekeeping following European methods is commonly promoted by governments and NGOs. If such a switch does occur, this could also threaten the mutualism, as has been reported in other areas (Ville, 1995; Gruber, 2018). Interference from human outsiders seems to be a frequent factor leading to dwindling honey-hunting culture elsewhere in Africa (Gruber, 2018; Laltaika, 2021). A better understanding of the drivers of what makes certain families in a community continue to specialise in honey-hunting could help to inform how to safeguard honey-hunting practices from extinction.

Measures to safeguard human-wildlife mutualism should only be taken if communities involved in human-wildlife mutualism voice a need or interest for them, and then need to be designed in collaboration with local stakeholders through a transparent co-management process (van der Wal et al., in review). Improving the management of community-owned land built on indigenous cultural values is the aim of the Awer Community Conservancy, which was jointly formed in 2013 by Awer communities supported by the Northern Rangeland Trust. Such conservation models that prioritise both biodiversity and traditional cultural practices probably form the best chance to safeguard the remaining honey-hunting cultures left in Africa, and thus human-honeyguide mutualism. Moreover, through documentation of remote or little-known honey-hunting cultures, we can increase our understanding of the diversity of human cultural variation within which human-honeyguide mutualism remains active. We encourage further research and reporting on poorly documented honey-hunting cultures, as this will help us understand the extent of human cultural variation to which human-honeyguide mutualism is subject across the African continent, and inform locally appropriate safeguarding measures.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author/s.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Science Faculty Human Ethics Committee at the University of Cape Town (approval no. FSREC 46-2019). The participants provided their informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

IG conducted the interviews. All authors conceived the study and wrote the manuscript.

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## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcsc.2021.727479/full#supplementary-material>

**Supplementary Table |** Supplementary methods and results.

**Supplementary Video |** Awer honey-hunter call.

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