

The animal welfare implications of civet coffee tourism in Bali

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Abstract

There is a growing demand for civet coffee (also known as 'Kopi Luwak' in Indonesia), a luxury coffee produced from coffee cherries that have been eaten and partially digested by civets. Traditionally made using scat collected from the wild, the trend for 'caged' civet coffee, where live civets are taken from the wild and housed in captive conditions, is increasing. There is a rapidly expanding civet coffee tourist industry that has emerged within the last five years in Indonesia. The present paper is based on observations of the housing conditions of 48 wild-caught common palm civets (*Paradoxurus hermaphroditus*) at 16 of these tourist-orientated coffee plantations in Bali. A score between 0–4 indicating welfare concerns was given for eight husbandry factors at each plantation, including: mobility, hygiene, surfaces, shelter, noise, food, water, and social interactions. In addition, interviews were conducted with senior tour guides at each of the plantations to gather information regarding tourist activities and the civet coffee production taking place therein. The data allowed for a welfare assessment to be made, which highlights the inadequate conditions and negative impact on common palm civets associated with the caged commercial production of this luxury product, which are not associated with traditional collection of scat from wild-living civets. We hope that our findings will inform tourists and tour operators about the ethical implications of visiting these attractions.

Keywords: animal welfare, common palm civet, Kopi Luwak, *Paradoxurus hermaphroditus*, welfare assessment, wildlife tourism

Introduction

Civets are small mammals native to Asia and Africa. Wild civets are one of the least studied mammals, due to their nocturnal lifestyle and secretive nature (Krishnakumar *et al* 2002). However, we do know that they are largely solitary, primarily arboreal, and omnivorous, consuming insects, fruit, nuts and plant matter (Macdonald 2009). African civets (*Viverra civetica*) have been farmed for many years for their musk, which is used in the global perfume industry (Dorset & Dandelot 1970; Mason 1984). Welfare concerns regarding the keeping of civets for the purposes of musk production have been highlighted in the scientific literature. For example, Tolosa and Regassa (2007) reported on the welfare and health of wild-caught captive African civets. In this study, 15 farms comprising 107 civets were visited across western Ethiopia. The authors reported that the civets housed at the farms suffered from poor diet and housing, and had a high incidence of parasitic disease. Furthermore, the trapping methods used, their adaptation to captivity, and the musk extraction method were all extremely stressful and painful to the civets. The authors concluded that the husbandry practices involved in farming civets for musk production have serious animal welfare implications. They suggested that further research is needed to explore specific welfare parameters.

In addition to farming civets for musk production, there is an emerging trend to trap wild civets for the purpose of producing civet coffee (known as 'Kopi Luwak' in Indonesia). The common palm civet (*Paradoxurus hermaphroditus*) is one of the primary species used, and Indonesia appears to be the main producer of this coffee (Shepherd 2012; D'Cruze *et al* 2014). Other countries known to produce the coffee include: East Timor, the Philippines, Thailand, Vietnam and Ethiopia (D'Cruze *et al* 2014). Civet coffee is an exclusive coffee and is one of the most expensive types on the market (Vega 2008). It is unique in the fact that it is produced using coffee cherries that have been eaten and partially digested by civets (Vega 2008). The digestive juices of the civets are claimed to slightly ferment the beans, adding a nutty flavour which is highly prized by some gourmet coffee drinkers (Meziane 2007). The practice of taking civets from the wild and housing them in captive environments to produce civet coffee has increased as a result of the rising demand for this luxury product from a variety of countries, including the United States (D'Cruze *et al* 2014). To date, the animal welfare concerns resulting from civet coffee production have received little attention. One exception is an undercover investigation conducted by the British Broadcasting Corporation (BBC) in 2013, which

Table 1 Civet husbandry factor table.

Husbandry factor	0	1	2	3	4
Mobility	Small cage with highly restricted movement and no natural vegetation or environmental enrichment	Intermediate of 0 and 2	Large cage with some restrictions on movement and no natural vegetation or environmental enrichment	Intermediate of 2 and 4	Large enclosed area with unrestricted movement and naturally occurring natural vegetation
Hygiene	Old and new faeces and urine present, moist surface and stench observed	Intermediate of 0 and 2	Some new faeces, urine and most surfaces with no stench observed	Intermediate of 2 and 4	No new faeces, urine, moist surfaces or stench observed
Surfaces	Unnatural surface composed solely of wooden slats or metal wire	Intermediate of 0 and 2	Unnatural concrete surface with some natural occurring substrate and vegetation	Intermediate of 2 and 4	Natural surface composed of naturally occurring substrate and vegetation
Shelter	Very little or no cover from direct sunlight/rain available	Intermediate of 0 and 2	Some shelter from direct sunlight/rain available	Intermediate of 2 and 4	Full shelter from direct sunlight/rain available
Noise	Direct vicinity to traffic, system, large crowds, electronic noise	Intermediate of 0 and 2	Occasional traffic, small groups, no electronic noise	Intermediate of 2 and 4	No noise except natural sounds
Food	Unnatural diet, limited variety, inadequate amounts	Intermediate of 0 and 2	Semi-natural diet, adequate variety and adequate amounts	Intermediate of 2 and 4	Natural diet, good variety and required amounts
Water	No free access to clean water	Intermediate of 0 and 2	Limited access to clean water	Intermediate of 2 and 4	Full access to clean water
Social interaction	No choice of interaction or solitude	Intermediate of 0 and 2	Limited choice of interaction or solitude	Intermediate of 2 and 4	Full choice of interaction or solitude

received media attention for highlighting the welfare and conservation concerns of civet farming for civet coffee production (D’Cruze *et al* 2014).

Civet coffee has been traditionally produced via the collection of excreted coffee beans from wild civet scat (D’Cruze *et al* 2014). This does not pose a welfare threat as the civets are not directly involved — left undisturbed in their natural environment (D’Cruze *et al* 2014). When wild animals are trapped, taken from their natural habitat and then housed in an artificial captive environment for commercial purposes, this has the undoubted potential to compromise welfare as well as provoking obvious ethical concerns (Baker *et al* 2013).

Civet coffee plantations are being utilised as a new type of tourist attraction in Bali. Given this growth, and existing concerns surrounding the ‘caged’ civet coffee industry, a pressing need exists to audit the impact these tourist attractions have on the welfare status of the animals involved (Moorhouse *et al* 2015; Schmidt-Burbach *et al* 2015).

The overall objective of this study was to use a rapid scoring method to assess the housing conditions of common palm civets housed in civet coffee plantations located along a major tourist trail on the island of Bali. The results highlight the welfare issues associated with the civet coffee tourism industry in this part of the world. It is hoped that these data presented will alert the increasing number of consumers and tourists, who are visiting the plantations, to the impact that their patronage will have on the welfare of the animals involved and ultimately reduce demand.

Materials and methods

Subjects and housing

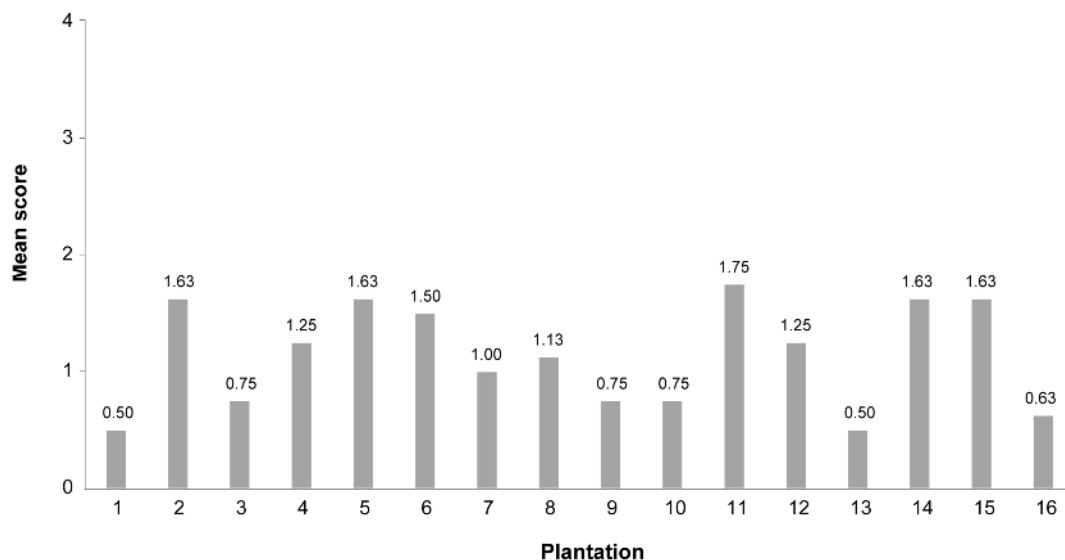
Sixteen plantations housing common palm civets were visited in May 2013 by two scientific researchers. All of these plantations were in close proximity to Bali’s main tourist entry point (Denpasar/Kuta); nine were in Gianyar, and seven were in Bangli. Currently no information exists as to the number of plantations keeping civets in Bali. As it was essential to gain an accurate view of the civets’ housing conditions, plantation visits were unannounced and all of the plantations were open to the public. The number of civets observed at each site ranged from 1–6, and the housing conditions of 48 civets were observed in total.

Husbandry scoring and interviews

Two researchers employed by World Animal Protection scored the civets’ housing conditions using the civet husbandry factor table, which is comprised of eight different husbandry factors (Table 1). Each of the husbandry factors referred to generic conditions that remained consistent across the cages and animals. These were: mobility, hygiene, surfaces, shelter, noise, food, water and social interactions (see Table 1 for full descriptions). A score between 0 and 4, based on all of the civets on display, was given for each of the husbandry factors at each plantation. Thus, individual scores for each civet’s housing conditions were not given. Guiding definitions in each category were given for scores 0, 2 and 4, while

Table 2 Civet coffee questionnaire.

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- 1) Are the caged civets found on the premises used to produce civet coffee?
 - 2) Do you sell civet coffee that has been produced using wild civet scat?
 - 3) Do you sell civet coffee directly to tourists visiting your premises?
 - 4) Can you please provide an indication of quantity (kg) sold to tourists per day?
 - 5) Do you sell civet coffee to international customers?
 - 6) Can you please provide an indication of quantity (kg) sold internationally per year?
 - 7) Can you please provide an explanation of why customers should purchase civet coffee?
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Figure 1

Mean combined husbandry score for each plantation. Detailed explanation of the scoring system utilised is provided in Table 1.

scores 1 and 3 represented conditions intermediate of the adjacent scores. A combined mean score was calculated for each plantation and total mean scores for all assessed plantations were also calculated for each category. The methods were adapted from The World Association of Zoos and Aquariums (WAZA 2013) guidelines. In addition to the assessments of the civets' housing conditions, further detailed information was gathered at each plantation through interviews. One tour guide at each of the facilities was asked a number of questions (Table 2). The researchers interviewed the first tour guide that approached them, or went to the onsite shop and asked for assistance. An Indonesian translator conducted the interviews, and both researchers were present at each interview.

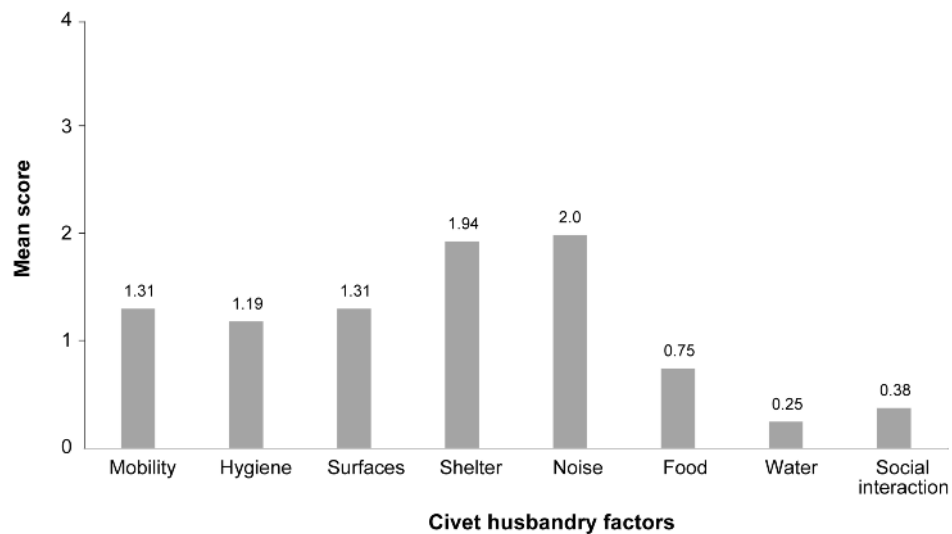
Results

Housing conditions

All of the plantations had a total mean score of 2 or less (see Figure 1) out of a possible 4. The total mean score for each factor across all of the 16 plantations also received a score of 2 or less (see Figure 2).

Captive conditions varied from small carrying cages with wire flooring (largest observed approximately $0.5 \times 0.5 \times 0.5$ m), to medium-sized wooden hutches with slatted flooring (largest observed approximately $1 \times 1 \times 1$ m) and larger wire-fenced concrete enclosures (largest observed approximately $10 \times 5 \times 3$ m; length \times width \times height). In the majority of cases, one civet was housed in each cage,

Figure 2



Mean score for each husbandry factor across the 16 plantations. Detailed explanation of the scoring system utilised is provided in Table 1.

Table 3 Location, number of civets and cages at each plantation.

Plantation number	Location	Small cages		Medium cages		Large cages		Totals	
		Cages (n)	Civets (n)	Cages (n)	Civets (n)	Cages (n)	Civets (n)	Cages (n)	Civets (n)
1	Gianyar	6	6	0	0	0	0	6	6
2	Gianyar	1	1	3	3	1	2	5	6
3	Gianyar	0	0	1	1	0	0	1	1
4	Gianyar	3	3	0	0	0	0	3	3
5	Gianya	0	0	0	0	3	3	3	3
6	Gianya	0	0	0	0	3	5	3	5
7	Bangli	0	0	1	1	0	0	1	1
8	Bangli	0	0	0	0	1	3	1	3
9	Bangli	0	0	2	2	0	0	2	2
10	Bangli	0	0	2	2	0	0	2	2
11	Bangli	0	0	2	2	1	1	3	3
12	Bangli	0	0	0	0	1	1	1	1
13	Bangli	0	0	2	3	0	0	2	3
14	Gianyar	0	0	2	2	0	0	2	2
15	Gianyar	0	0	2	2	2	2	4	4
16	Gianyar	0	0	3	3	0	0	3	3
Totals		10	10	20	21	12	17	42	48

however at four of the plantations more than one civet was housed in a single cage (see Table 3). Cages and hutches were typically barren with no form of natural substrate or other types of enrichment present. Some of the larger enclosures did provide limited natural substrate and vegetation within. The smaller carrying cages typically lacked any form of cover or shelter. In contrast, medium-sized hutches were typically fully covered, with small shelter boxes, without direct access to full natural light. Larger enclosures were typically partially covered, providing a mixture of shaded and non-shaded areas. With regards to hygiene, captive conditions ranged from wet surfaces covered in old and new faeces and urine to partially moist surfaces with some evidence of daily husbandry. In terms of noise, conditions ranged from cages close to traffic and loud stimuli to enclosures situated in surroundings with minimal artificial stimuli. No other species of civet were seen at the plantations. Other mammals, including flying foxes (*Pteropus vampyrus*) and porcupines (*Hystix* spp) were seen, however their housing conditions were not assessed.

Interviews

The answers from the interviews conducted revealed that all 16 of the plantations were open to the public and intended to attract business from international tourists visiting Bali. Interviews also revealed that all of the plantations had been opened within the last five years. Fourteen of the 16 plantations produced caged civet coffee on-site. The two plantations that did not produce caged coffee on-site confirmed that they kept civets purely as a tourist attraction. They reported that this was mainly because many international tourists do not know what a common palm civet looks like. All of the plantations had civet coffee on sale that was claimed to be sourced from both wild and caged civet scat. Of these, 15 plantations claimed that they sold wild civet coffee because it was popular with visiting tourists, and one sold it to supplement caged civet coffee sales. Only one of the plantations sold civet coffee internationally. When asked what the benefits of civet coffee were compared with other types of coffee, tour guides at 12 of the plantations claimed that the primary benefit was 'superior taste'. Primary benefits at the additional three plantations included: reduced symptoms of memory loss and stomach ache, improved blood pressure and symptoms of diabetes, and aphrodisiac properties.

Discussion

All of the plantations received total average score of 2 or less out of a possible 4, indicating that all of the civets were experiencing compromised welfare due to some of their very basic needs not being met. When looking at the individual husbandry factors all of the plantations received a husbandry score of 1 or less for water ($M = 0.25$), which meant that all of the civets observed, had either no water or limited access to clean water. The plantations received a total mean score of 0.75 for food, demonstrating that the majority of the civets had an unnatural or semi-natural diet, with limited variety, and inadequate amounts. In the wild, palm civets have a varied omnivorous diet, consuming plant

matter, insects, fruit and nuts (Macdonald 2009), which does not appear to be replicated in these captive environments. Furthermore, feeding enrichment was not observed on any of the plantations. The presence of feeding enrichment for wild animals housed in captivity has been shown to reduce stress and abnormal and stereotypic behaviour (Schipper *et al* 2008). This has been demonstrated in a variety of species ranging from chimpanzees (*Pan troglodytes*) (Morimura 2007) to mice (*Mus musculus*) (Würbel *et al* 1998). It is therefore of great concern that the civets observed on the plantations had neither substrate to forage in, nor food items to manipulate. A lack of feeding enrichment can lead to boredom and stereotypic behaviour, and its provision is a simple, yet effective means to improve welfare in captive animals (Carlstead 1996).

The factor mobility received a total mean score of 1.31, which meant that some of the civets were housed in small cages with highly restricted movement, and others had slightly larger cages, which still imposed restrictions on movement. In the majority of cases, natural vegetation and environmental enrichment was not provided. It is well known that animals housed in cages without enrichment often experience stress, frustration, boredom and increased susceptibility to disease (Broom & Johnson 1993). All Asian species of civets are partially arboreal, and are adapted to the forest environment (Macdonald 2009); they need trees to climb and ground to forage in. A key requirement for adequate welfare is the ability to perform species-specific behaviours (Broom 1991).

Hygiene conditions and the surface of the cages were also of concern. A total mean husbandry score of 1.19 was given for hygiene for all plantations, indicating that old and new faecal material were commonly present. Surfaces received a mean score of 1.31 with many of the civets' cages being composed of wooden slats or metal wire. Such flooring can cause painful abrasions and wounds to the feet of animals. Research has explored the effect different flooring has on the health of animals, particularly domestic pigs (*Sus domesticus*). Mouttoto *et al* (1998) found that pigs housed on partially or totally slatted flooring had a higher prevalence of foot lesions and bursitis compared with pigs housed on straw. In addition, a study by Lewis *et al* (2005) found that slatted steel flooring caused injuries to piglets' feet and limbs. In the current study, although civets' physical health — specifically their feet — was not assessed, it is possible that the flooring observed in these enclosures could cause injury as has shown to be the case in other species.

Out of the eight husbandry factors, shelter and noise received the highest total mean scores; 1.31 and 2, across the plantations. These scores indicate that the civets had a degree of shelter from rain and direct sunlight. All of the plantations received the same score of 2 for noise. This meant that civets were exposed to noise from small groups of people, but were not exposed to electronic or traffic noise. However, since all the civets had been taken from the wild, noise from people is likely to be novel and, as such, potentially negative for the nocturnal civets. The final

husbandry factor to be scored was social interactions; the total mean score for this was 0.38. Thirteen of the plantations received a score of 0, indicating that the civets had no opportunity for social interactions and three scored 2. The civets housed in these three plantations had a limited choice of interacting with other civets. Little is known about civet behaviour, but in the wild they are primarily solitary (Macdonald 2009). Solitary species do still interact with others, for example wild tigers (*Panthera tigris*) have been observed interacting with conspecifics (Szokalski *et al* 2012), and of course interactions are essential and instinctive for reproductive purposes. Swaisgood and Shepherdson (2005) suggest that solitary species may cope less well in captivity, compared to social species because they do not benefit from interactions with conspecifics. Furthermore, as not all social interactions impact positively on welfare, further research is required into the motivations of civets to interact socially, and the subsequent implications of this regarding management.

Further research and limitations

Despite the limitations referred to hereafter, we believe that the data collected during this investigation provide the basis for welfare assessment. The methodology used in this study was designed to be implemented during short visits to venues. As a result of this rapid assessment, some detail was lost. For instance, an average husbandry factor score was given for all of all the civets housed in each of the coffee plantations. In future studies it would be beneficial to assess each individual civet's housing conditions separately, to allow for a more precise welfare score. Time was a limiting factor at each of the venues. If more time was available it would have been beneficial to score the civets' housing conditions over a number of days or hours, to create an average score, accounting for external influences. This limitation may have had some impact on the scores, in the case of food, for example, the civets may have been fed at set points in the day, which may have been missed by the researchers when scoring this factor. Similarly, noise may have varied throughout the day; it is possible that the civets were subjected to noise from large groups of people or electronic equipment at specific times of the day.

Further research is needed to collect data on civet ethology, such as stereotypic and abnormal behaviour. This would allow a far broader and more detailed welfare assessment to be made (Mason 2006). Future studies could also use surveys to explore the attitudes of the tourists who visit the civet coffee plantations and purchase the coffee. Such information would allow us to not only gain an insight into this practice but also hopefully influence consumer and tourist activities.

Animal welfare implications

As far as we are aware, this is the first study to explore the emerging civet coffee tourist industry in Bali and to offer an assessment of the housing conditions of civets kept in these plantations. Although the scoring method was necessarily basic and had its limitations, it is clear that the scores given for all eight husbandry factors at each of the locations were very low. The Five Freedoms, originally

drafted to guide domesticated farm animal welfare are considered to be essential for basic welfare (Botreau *et al* 2007), and it is clear that the civets observed in this study were not experiencing them. As a result, these initial observations suggest that civets housed in the plantations were subject to poor welfare.

All common palm civets housed on these farms are wild-caught, apparently due to the difficulties associated with captive breeding and the availability of wild individuals. There was no sign of breeding at any of the facilities. Very little is known of the extent of the trade in common palm civets in Indonesia, or of the impact trade may have on the welfare and conservation of wild populations. Although harvest quotas from designated locations are in place, a recent study highlighted that all observed trade in civets from the markets of Medan was illegal (Shepherd 2012). Given the challenges in regulating these emerging caged production methods, we conclude that trying to improve the conditions on these plantations is not the way forward. Even were conditions to be improved and plantation staff educated as regards the needs of civets, it remains highly likely that the welfare of the civets would still be compromised since they are wild animals and not habituated to captive conditions. Ideally, laws need to be enforced as, at present, laws protecting species and their trade are largely ignored across Indonesia (Shepherd 2012), and improved to prohibit caged civet coffee production (D'Cruze *et al* 2014). Global leaders in coffee certification, UTZ Certified and SAN Standards have already taken steps to address the issue of caged civet coffee within their standards, recognising that coffee produced in this way is in direct conflict with ethical and sustainable production. In contrast, traditional production methods for civet coffee do not pose a threat to the welfare and conservation of civets as these methods do not involve the removal of civets from their natural habitats. Instead, workers are employed merely to collect excreted coffee beans directly from plantations. This process could result in a mutually beneficial co-existence, allowing people to profit from an animal which may otherwise be considered a nuisance due to consumption of coffee berries on plantations. From a consumer perspective, civet coffee collected by this traditional method is also considered to produce a higher quality product.

As caged civet coffee production methods (or 'civet farming') has only recently been uncovered, and associated tourism has also only emerged within the last five years in Bali, it is unsurprising that coffee retail and tourism guidelines are yet to address the welfare and conservation implications of this practice, not to mention other animal tourism attractions in Indonesia. In recognition of this, we support calls for the development of: (i) an international, independent certification scheme that would set a transparent industry standard for traditionally sourced civet coffee; and (ii) a global regulatory body to inspect and sanction the civet coffee tourism industry, and to educate the global tourist community on the welfare and conservation implications of farming civets.

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