

Bushmeat and beyond: historic and contemporary use in Africa

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Introduction

Humanity has used wildlife since time immemorial for food, clothing, income and medicinal purposes (MacKinney, 1946; Milner-Gulland et al., 2003). Historically, African pangolins have been exploited for bushmeat, both for sustenance (i.e., as a protein source) and a source of income, and for the purported medicinal properties of their scales and other body parts (Boakye et al., 2016; Fa et al., 2006). This has involved all four species, the white-bellied (*Phataginus tricuspis*), black-bellied (*P. tetradactyla*), Temminck's (*Smutsia temminckii*) and giant pangolin (*S. gigantea*). This chapter discusses the many historical and contemporary uses of pangolins in Africa by geographic sub-region (West Africa, Central Africa, East Africa and Southern Africa). These uses broadly fall into three main categories (1) consumptive use as a source of food (i.e., bushmeat), (2) consumptive use of other body parts for medicinal or ethno-pharmacological applications, and (3) other uses (e.g., in spiritual remedies or as omens). The chapter does not provide in-depth detail on local trade dynamics, but uses are discussed in the context that in West and Central Africa in particular, pangolins are hunted or poached, and either consumed at a local (household or village) level, traded or exchanged for other commodities, or smoked and transported to towns and cities and sold in bushmeat markets (Cowlshaw et al., 2005; Ingram et al., 2019; Mambeya et al., 2018). Despite pangolins being protected by legislation in most range states (Challender and Waterman, 2017), though to varying degrees, law enforcement officers are often ill-trained and ill-equipped to detect pangolins, may be unaware that it is illegal to transport such products across borders, and/or may simply turn a blind eye to this illegal trade. The chapter concludes by evaluating the impact of local and national exploitation on pangolin populations.

West Africa

West Africa is inhabited by the three tropical African pangolins: white- and black-bellied, and giant pangolin. For the purposes of this chapter the region comprises Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Senegal, Sierra Leone, and Togo.

Nutritional use

Zeba (1998) observed that in most of the local languages in West Africa, the translation of "wildlife" etymologically is "bushmeat." Pangolins have been consumed as a source of bushmeat across the region historically (Ajayi, 1978; Ordaz-Nemeth et al., 2017; Petrozzi et al., 2016), and remain in substantial demand (Boakye et al., 2015; Gonedelé Bi et al., 2017; Greengrass, 2016; Fig. 15.1). All three native pangolin species are consumed, but the white-bellied pangolin is by far the most common species of pangolin found in bushmeat markets in the region, and is subject to widespread and often intensive exploitation for this purpose (Boakye et al., 2016; Bräutigam et al., 1994; Soewu and Ayodele, 2009). Boakye et al. (2016) found that in Ghana, white-bellied pangolins constituted 82% of 341 pangolins traded along bushmeat commodity chains compared with 18% comprising black-bellied pangolins. Anadu et al. (1988) found that white- and black-bellied pangolins, grouped together as tree pangolins, ranked eighth among the mammals that consumers in southwestern Nigeria most preferred. In contrast, Hoyt (2004) noted that in Liberia, white-bellied pangolins ranked twelfth behind the giant (third) and black-bellied pangolin (eighth) in a taste preference exercise of wild mammals consumed by urban communities.

Given the substantial demand for pangolins as bushmeat, they are regularly found in



FIGURE 15.1 A descaled black-bellied pangolin (*P. tetradactyla*) being prepared for consumption. *Photo credit: African Pangolin Working Group.*

bushmeat markets, and are hunted for such markets. [Anadu et al. \(1988\)](#) found that white- and black-bellied pangolins constituted 0.7% of all animals traded at a market and along roadsides in southwestern Nigeria. Similarly, white-bellied pangolins comprised 0.32% of total mammal biomass traded in Swali market in Bayelsa State ([Akani et al., 2015](#)). [Fa et al. \(2006\)](#) estimated that approximately 28,000 kg/year of biomass representing white-bellied pangolins (approximately 10,000 individuals) was extracted for bushmeat by hunters in the Cross-Sanaga Rivers region of southeastern Nigeria. In Liberia, [Bene et al. \(2013\)](#) reported that white- and black-bellied pangolins constituted 1.76% and 1.35%, respectively, of hunters' total catch in Nimba County. [Greengrass \(2016\)](#) estimated that white-bellied pangolins constituted 2.6% and 0.78% of

the total catch in two hunting camps (Neechebu and Chanedae, respectively) in the vicinity of Sapo National Park, Liberia.

Medicinal use

Pangolins are used extensively in traditional medicines in West Africa ([Djagoun et al., 2012](#); [Soewu and Adekanola, 2011](#)). Most West Africans in rural areas depend on traditional medicine for their healthcare needs ([Boakye et al., 2014](#); see also [World Health Organization, 2013](#)) and market stalls selling plant and animal parts for this purpose are common in both rural and urban areas ([Ntiamao-Baidu, 1987](#); [Fig. 15.2](#)). In Sierra Leone, 22 pangolin body parts are used to treat



FIGURE 15.2 A white-bellied pangolin (*P. tricuspis*) skin on sale at a traditional medicine market. Photo credit: African Pangolin Working Group.

medical conditions, and there is a similar pattern in Benin, Ghana and Nigeria where white-bellied pangolin body parts including the head, heart, blood, eyes, intestines, tongue, and scales are prescribed by traditional healers to treat a multitude of ailments (see [Table 15.1](#)). There are differences in the use of body parts between countries, but scales are prescribed for the greatest variety of medical conditions, ranging from rheumatism to leprosy ([Table 15.1](#)).

Other uses

Other uses include as spiritual remedies and as omens, which largely afford people protection or confer good fortune. A range of

pangolin body parts are used (see [Table 15.2](#)). In Benin, scales of the white-bellied pangolin are used to prevent accidents and provide protection from gun shots or knife wounds. [Boakye et al. \(2014\)](#) found scales of all three tropical African pangolins to be important in protecting people from witchcraft, in the preparation of charms, and for warding off evil spirits among the Temne and Limba ethnic groups in Sierra Leone and the Ashanti in Ghana. In Nigeria, scales have greatest application among the Ijebus and Aworis in the southwest of the country and are used to treat mental illness, kleptomania, for the conferment of good luck and warding off witches, as in Ghana and Sierra Leone ([Table 15.2](#)). The scales may be used in isolation or with other

TABLE 15.1 Body parts of the white-bellied pangolin (*P. tricuspis*) prescribed for ailments and other conditions by traditional healers in Benin, Ghana, Nigeria, and Sierra Leone.

Body part	Ailment/condition treated	Country
Bile	Menstrual pain, scrotal mass	Ghana ^a
Bone	Skin scars, wound healing, rheumatism, joint pains and stiffness, convulsions, headache, stroke, waist pain, asthma, bed-wetting, fever, broken leg, skin rash, breast cancer	Benin ^b , Ghana ^a , Nigeria ^c , Sierra Leone ^d
Blood	Wound healing, elephantiasis, rheumatism, stomach disease, heart disease	Sierra Leone ^d
Brain	Heart disease, stomach disease, mental illness	Sierra Leone ^d
Claws	Asthma, stretch marks, heartburn, infertility	Ghana ^a , Sierra Leone ^d
Eyes	Conjunctivitis, impotence, mental illness	Ghana ^a , Nigeria ^c , Sierra Leone ^d
Female sex organ	Ejection of placenta	Nigeria ^c
Foot	Heel fissure, back pain, elephantiasis, athlete's foot, broken bones	Benin ^b , Sierra Leone ^d
Forefoot	Impotence, elephantiasis	Sierra Leone ^d
Head	Infertility, headache, skin disease, toothache, heart disease, paralysis, stroke, asthma, hernia, fever, body aches, gonorrhoea, claw hand, mental illness	Benin ^b , Ghana ^a , Nigeria ^c , Sierra Leone ^d
Heart	Prevention of miscarriage, stomach disease, heart disease	Benin ^b , Ghana ^a , Sierra Leone ^d
Internal organs	Food poisoning	Nigeria ^c
Intestines	Stomach disease, headache	Benin ^b , Sierra Leone ^d
Liver	Asthma	Sierra Leone ^d
Male sex organ	Hernia, headache, elephantiasis, athlete's foot, infertility, impotence	Sierra Leone ^d
Meat	To aid normal development in premature babies, stomach disease, rheumatism, epilepsy, hypertension, body pain, infertility, menstrual pains, coughing, prevention of miscarriage, convulsion, anemia, common childhood diseases	Ghana ^a , Sierra Leone ^d
Oil	Skin rash, stretch marks, heel fissure, skin disease, knee pain, skin scars, heart disease, claw hand, body aches, elephantiasis	Sierra Leone ^d
Scales	Muscular pain, back pain, headache, excessive menstrual bleeding, menstrual cramps, bed-wetting, stroke, chicken pox, epilepsy, heart disease, wound healing, dry skin, skin rashes, sores, cracked heels, convulsions, arthritis, ear infection, stomach disorders, leprosy, to aid normal development in premature babies, elephantiasis, impotence, infertility, broken bones, waist pain, skin scars, stomach disease, inflammation of the navel, nail infections, arthritis, rheumatism, epilepsy, blood cleansing, stomach ulcer, stroke, venereal diseases, to ensure safe childbirth, mental illness, as an aphrodisiac/for male potency	Ghana ^a , Nigeria ^c , Sierra Leone ^d

(Continued)

TABLE 15.1 (Continued)

Body part	Ailment/condition treated	Country
Sex organ (male and female)	Infertility	Sierra Leone ^d
Skin	Dermatosis	Benin ^b
Tail	Impotence, acute hemorrhagic conjunctivitis, paralysis, claw hand, convulsions, fainting, stomach disease, elephantiasis, waist pain, heel fissure, protection against snake bites and scorpion stings	Sierra Leone ^d
Toes	Acute hemorrhagic conjunctivitis, epilepsy	Ghana ^a , Sierra Leone ^d
Tongue	Asthma	Benin ^b
Thorax	Goiter	Ghana ^a , Nigeria ^c
Vertebral bones	Stroke	Nigeria ^c
Waist	Prevention of miscarriage	Benin ^b
Whole animal	Prolonged or continuous menstrual bleeding, elephantiasis, leprosy	Ghana ^a , Nigeria ^c , Sierra Leone ^d

^aBoakye, M.K., Pietersen, D.W., Kotzé, A., Dalton, D.L., Jansen, R., 2016. Unravelling the pangolin bushmeat commodity chain and the extent of trade in Ghana. *Hum. Ecol.* 44 (2), 257–264.

^bAkpona, H.A., Djagoun, C.A.M.S., Sinsin, B., 2008. Ecology of the three-cusped pangolin *Manis tricuspis* (Mammalia, Pholidota) in the Lama forest reserve, Benin. *Mammal.* 72 (3), 198–202.

^cSoewu, D.A., Adekanola, T.A., 2011. Traditional-medical knowledge and perception of pangolins (*Manis sps [sic]*) among Awori People, Southwestern Nigeria. *J. Ethnobiol. Ethnomed.* 7, 25.

^dBoakye, M.K., Pietersen, D.W., Kotzé, A., Dalton, D.L., Jansen, R., 2014. Ethnomedicinal use of African pangolins by traditional medical practitioners in Sierra Leone. *J. Ethnobiol. Ethnomed.* 10, 76.

TABLE 15.2 Body parts of the white-bellied pangolin (*P. tricuspis*) prescribed for spiritual remedies by traditional healers in Benin, Ghana, Nigeria and Sierra Leone.

Body part	Prescribed for	Country
Bone	Spiritual protection, protection from witchcraft	Ghana ^a , Nigeria ^b , Sierra Leone ^c
Blood	Protection against witchcraft	Sierra Leone ^c
Claws	Protection from witchcraft	Ghana ^a , Sierra Leone ^c
Eyes	Kleptomania, spiritual protection	Ghana ^a , Nigeria ^b , Sierra Leone ^c
Flesh	To confer abilities for divination, good luck, protection, safety	Nigeria ^b
Head	Financial rituals, spiritual protection, good luck, safety, kleptomania, induction in to wizard groups	Benin ^d , Ghana ^a , Nigeria ^b , Sierra Leone ^c
Head and tail tip	Entrepreneurial prowess	Nigeria ^b
Internal organs	To treat sexual poison “magun”	Nigeria ^b

(Continued)

TABLE 15.2 (Continued)

Body part	Prescribed for	Country
Intestines	Good luck	Sierra Leone ^c
Leg	Spiritual protection, financial rituals	Ghana ^a
Limbs	Good fortune	Nigeria ^b
Limbs and internal organs	Financial rituals	Nigeria ^b
Meat	To increase intelligence, spiritual protection, financial rituals, charms for chiefs	Ghana ^a , Sierra Leone ^c
Scales	To be cutlass proof, spiritual protection, protection from witchcraft, good luck, high productivity on the farm/financial rituals, kleptomania	Benin ^d , Ghana ^a , Nigeria ^b , Sierra Leone ^c
Tail	Kleptomania, high productivity on farm, spiritual protection	Sierra Leone ^c
Toes	Spiritual protection	Ghana ^a , Sierra Leone ^c
Thorax	Prevention of rain	Nigeria ^b , Sierra Leone ^c
Whole animal	Financial rituals, conferring invisibility, good fortune, prosperity	Ghana ^a , Nigeria ^b , Sierra Leone ^c

^aBoakye, M.K., Pietersen, D.W., Kotzé, A., Dalton, D.L., Jansen, R., 2016. Unravelling the pangolin bushmeat commodity chain and the extent of trade in Ghana. *Hum. Ecol.* 44 (2), 257–264.

^bSodeinde, O.A., Adedipe, S.R., 1994. Pangolins in south-west Nigeria – current status and prognosis. *Oryx* 28 (1), 43–50; Sodeinde, O.A., Soewu, D.A., 1999. Pilot Study of the traditional medicine trade in Nigeria. *TRAFFIC Bull.* 18, 35–40; Soewu, D.A., Adekanola, T.A., 2011. Traditional-medical knowledge and perception of pangolins (*Manis sps [sic]*) among Awori People, Southwestern Nigeria. *J. Ethnobiol. Ethnomed.* 7, 25.

^cBoakye, M.K., Pietersen, D.W., Kotzé, A., Dalton, D.L., Jansen, R., 2014. Ethnomedicinal use of African pangolins by traditional medical practitioners in Sierra Leone. *J. Ethnobiol. Ethnomed.* 10, 76.

^dAkpona, H.A., Djagoun, C.A.M.S., Sinsin, B., 2008. Ecology of the three-cusped pangolin *Manis tricuspis* (Mammalia, Pholidota) in the Lama forest reserve, Benin. *Mammal.* 72 (3), 198–202.

ingredients. In Nigeria, the seeds of the plant *Aframomum melegueta* are ground and mixed with powdered, roasted pangolin scales, and the powder is added to maize porridge (*akamu*) for consumption (Soewu and Adekanola, 2011).

Central Africa

Central Africa hosts the three tropical African pangolin species. For the purpose of this chapter the region comprises Angola, Cameroon, Central African Republic (CAR), Chad, Democratic Republic of the

Congo (DRC), Equatorial Guinea, Gabon and Republic of Congo.

Nutritional use

Pangolins are a preferred bushmeat species in Central Africa. They are frequently recorded among the top species in taste preference studies (Kümpel, 2006). In a study in Cameroon, respondents scored the white-bellied pangolin highly on taste, ranking it third out of ten species they hunted and trapped (Wright and Priston, 2010). Offtake of pangolins relative to other species also appears to be increasing. Ingram et al. (2018) estimated that at least 0.4

million tropical African pangolins are harvested annually in Central Africa, including for bushmeat, and that the proportion of pangolins hunted of all animals increased between the 1970s and 2010s.

In Cameroon, DRC, Equatorial Guinea, Gabon and Republic of Congo, pangolins are openly sold at roadside restaurants, in bushmeat markets, and at restaurants in capital cities (e.g., Libreville, Malabo, Yaoundé; [Albrechtsen et al., 2007](#); [Cronin et al., 2015](#); [Dethier, 1995](#); [Dupain et al., 2012](#); [Mambeya et al., 2018](#); [Mbate, 2012](#)). In Kisangani, DRC, the number of giant pangolins in the market increased seven-fold between 2002 and 2009, although the number of other medium-sized (10–50 kg) animals in the market decreased significantly; small (<10 kg) animals increased over the same period ([van Vliet et al., 2012](#)). In Cameroon, [Infield \(1988\)](#) reported that around Korup National Park, pangolin meat is highly favored, and [Bobo](#)

[and Kamgaing \(2011\)](#) found that white-bellied pangolins were the second most harvested animal in villages northeast of Korup National Park. Both arboreal species (white- and black-bellied pangolin) are harvested by ethnic Mbo and Banyangi hunters in the Banyang-Mbo Wildlife Sanctuary ([Willcox and Nambu, 2007](#)). In Equatorial Guinea, pangolins made up an increasing proportion of the total carcasses at Central and Mundoasi markets between 1991 and 2003 ([Kümpel, 2006](#)) and between 2003 and 2010 ([Gill, 2010](#)). Giant pangolins, which do not occur on Bioko Island, are shipped to the Malabo market on Bioko from mainland Equatorial Guinea and Cameroon ([Cronin et al., 2015](#); [Hoffmann et al., 2015](#); [Ingram et al., 2019](#); [Fig. 15.3](#)). In Gabon, the price of both arboreal and giant pangolins rose in sampled forest-gate villages, in Makokou (provincial town) and Libreville between 2002/03, and 2014 ([Mambeya et al., 2018](#)). These price increases



FIGURE 15.3 Giant pangolins (*S. gigantea*) are hunted and poached in West and Central Africa, and consumed or sold as bushmeat. *Photo credit: Stuart Nixon.*

were significant: in Libreville prices for giant pangolin rose by 211% and for arboreal pangolins by 73%, while inflation rose by 4.6% (Mambeya et al., 2018). This study also highlighted that Asian industry workers frequently request pangolins from hunters; this additional demand may explain price increases, or potentially the rarity of the species, and warrants further research.

There has been less research in CAR, Angola and Chad, but pangolins are hunted and consumed in these countries. Research in CAR has shown that Baka and non-Baka communities eat pangolins (Bahuchet, 1990; Hodgkinson, 2009), and that within the Bofi ethnic group, both Babingas-Bofis and Gbayas-Bofis catch pangolins for consumption (Lupo and Schmitt, 2002; Vanthomme, 2010). Giant pangolins are also regularly observed for sale in urban markets in CAR despite being a protected species (Fargeot, 2013). There is little available information on the use of pangolins as bushmeat in Angola and Chad. Svensson et al. (2014) reported that white-bellied pangolins are sold openly on roadside bushmeat markets in Angola, and Bräutigam et al. (1994) reported that local consumption of pangolins occurs in Chad and likely continues to take place.

Medicinal use

There are few documented ethnopharmacological uses of pangolins in Central Africa in the scientific literature. However, rural people near Korup National Park, Cameroon, report that white- and black-bellied pangolin scales are used to treat stomach disorders (Bobo and Ntum Wel, 2010). They are typically burnt and/or ground into a powder and mixed with palm oil or water which is then ingested to purge the stomach. Boki and Anyang people use the scales to treat coughs (Mouté, 2010). A report from Chad indicates

that pangolin derivatives have been used to treat malaria (see Bräutigam et al., 1994).

Other uses

Pangolins have various associations and spiritual connections with people in Central Africa. This includes an association with fertility and attraction (see Chapter 12). However, not all associations are good omens. For the Mbuti people in eastern DRC, pregnant women are advised not to consume white-bellied or giant pangolins because it is believed that the animals “may cause a fatal bleeding during delivery” (Ichikawa, 1987). The Baka hunter-gatherers in Republic of Congo and Cameroon associate an illness with white-bellied pangolins, whereby infants are afflicted with an abdominal disorder if their parents consume the meat before birth or during the lactation period (Sato, 1998). In the Salonga-Lukenie-Sankuru landscape in the DRC, the giant pangolin is considered a totem animal, which if not shared will result in a death in the family (Abernethy et al., 2010). This species is also a totem for the Nkundu people, who hunt it under specific cultural norms; this includes the need to prepare the carcass at sacred sites (Steel et al., 2008).

Pangolin derivatives are also used as tools. In southwest Cameroon, the scales of arboreal pangolins are used as blades and their skins are used to make drums (Bobo et al., 2015).

East Africa

For the purposes of this chapter, East Africa encompasses Burundi, Ethiopia, Kenya, Malawi, Rwanda, Somalia, South Sudan, Tanzania, Uganda and Zambia. Three species of pangolin occur in the region, including Temminck’s, giant and white-bellied, while the

black-bellied species may occur marginally in Uganda (see [Chapter 8](#)).

Nutritional use

There has been little research on the use of pangolins in East Africa compared to West, Central and Southern Africa, but uses have been documented. In Tanzania, Banyamwezi hunters were recorded hunting Temminck's pangolin for bushmeat in the mid-1990s ([Carpaneto and Fusari, 2000](#)). In Uganda, [Olupot et al. \(2009\)](#) reported that in 2007–08, two Temminck's pangolins were killed in the Kafu Basin and Murchison Falls Conservation Area respectively, likely for bushmeat consumption.

Medicinal use

Ethnozoological use of pangolins in East Africa is limited. In Tanzania, scales from Temminck's pangolin have been used to reposition fetuses in pregnant women and to help expel the placenta following parturition (see [Marshall, 1998](#)). Crushed scales have also been used to treat nose-bleeds ([Kingdon, 1974](#)).

Other uses

Pangolins are sometimes associated with human attraction. In Uganda, women in the Buganda subnational kingdom buried the scales of giant pangolins under the doorsteps of their lover's homes, in the presence of a diviner, to influence them to fulfill their desires ([Kingdon, 1974](#)).

There is also a reported association between pangolins and rain. [Walsh \(1995/96\)](#) reported that the Sangu people of southwest Tanzania conducted ritual sacrifices of pangolins, which are thought to be associated with predicting rain, and thus the abundance of food, but such sacrifices were rare ([Walsh, 1995/96](#); see

[Chapter 12](#)). This is mirrored in other parts of Tanzania and Malawi where sighting a pangolin is a sign that rain will fall ([Bräutigam et al., 1994](#); [Mafongoya and Ajayi, 2017](#)). Across several countries in East Africa, pangolins are also associated with good luck (see [Chapter 12](#)).

Pangolin derivatives are also used as protective charms. The scales of the giant pangolin are reported to have been mixed with tree bark by women in Uganda to neutralize evil spirits ([Kingdon, 1974](#)). Around Ruaha National Park and the Mbomipa Wildlife Management Area, Tanzania, Temminck's pangolin scales are used to ward off bad people and bad luck ([Mbilinyi, 2014](#)). In Malawi, the scales are reportedly used as protection against bad omens ([Marshall, 1998](#)). [Bräutigam et al. \(1994\)](#) report that smoke from burning pangolin scales has been used to ward off lions in Acholi, Uganda. They have also been used to repel wild animals in Tanzania ([Marshall, 1998](#)).

Southern Africa

Temminck's pangolin is the only species of pangolin to occur in Southern Africa, which for the purposes of this chapter includes Botswana, Mozambique, Namibia, South Africa, Swaziland, and Zimbabwe. This region has a multitude of ethnic tribal communities and there is a long history of utilizing Temminck's pangolin as a food source, to treat medical conditions, and in spiritual rituals.

Nutritional use

There are records of Temminck's pangolin having been hunted for bushmeat in South Africa ([Jacobsen et al., 1991](#); [Pietersen et al., 2016](#); [van Aarde et al., 1990](#)), Zimbabwe ([Ansell, 1960](#); [Coulson, 1989](#)) and Botswana ([Setlalekgomo, 2014](#)). There are no traceable

records for Namibia, but it seems likely that hunting and consumption has occurred in the country; it has occurred in Mozambique (D.W. Pietersen, pers. obs.). However, pangolins are consumed much less frequently than in West and Central Africa. This may be in part because of the fattiness of the meat (Bräutigam et al., 1994). Farm workers in the Kalahari region of South Africa are known to have eaten pangolins found as roadkill or that have been electrocuted on game farm fences, but apparently do not actively source them for food (Pietersen et al., 2014). The trade in bushmeat in Southern Africa has received little research attention (Hayward, 2009; Warchol and Johnson, 2009) and its extent and impact on Temminck's pangolin populations remains unknown.

Medicinal use

The use of traditional medicines is centuries old in Southern Africa. Historically, a specialist activity of rural herbalists and "Sangomas" (traditional healers who use natural plant and animal remedies), there is a thriving commercial trade in traditional medicine in Southern Africa (Cunningham and Zondi, 1991; Williams and Whiting, 2016), in part because the majority of rural people in Southern Africa consult traditional healers to treat medical conditions. Particularly "powerful" species are readily harvested over large areas, including neighboring countries, and sold in urban commercial markets (e.g., Faraday market, Johannesburg; Williams and Whiting, 2016). Pangolins are one of the most sought-after mammals in such markets in Southern Africa (Cunningham and Zondi, 1991), where their scales and bones can be found (Whiting et al., 2011), but availability of the species is low. Williams and Whiting (2016) posit this is because they are extremely difficult to source in the wild. Pangolin scales

are also in demand in Zimbabwe, where they have long been regarded as a powerful medicine (Duri, 2017; Smithers, 1966). Pangolin body parts are infrequently seen in markets in Namibia and Mozambique, though Marshall (1998) reported that substantial demand exists in both countries. The specific body parts that are prescribed for particular ailments has received little attention. Setlalekgomo (2014) and Baiyewu et al. (2018) investigated the use of pangolins for traditional medicine in Botswana and South Africa respectively. Like in West Africa, body parts ranging from the liver and lungs, to the brain, blood, fat and scales are prescribed by traditional healers for ailments including arthritis, excessive menstrual bleeding, chicken pox, earache and diabetes (Table 15.3).

Other uses

Chance encounters with certain species are often associated with an omen or belief system in Southern Africa. Amongst the Shona people of Zimbabwe and the amaZulu of South Africa, it is considered a very good omen to come upon a pangolin, and typically the animal is captured and presented as a "valuable" gift to a chieftain, head of state or traditional healer (Coulson, 1989; Pietersen et al., 2014). By presenting a pangolin to a traditional healer, it is believed that person will receive protection and well-being (Challender and Hywood, 2012). Amongst the Venda and Tswana people of South Africa, special songs are sung and a sheep is slaughtered when a pangolin is sighted, and special treatment is bestowed upon the individual(s) who sighted the animal by the chief and tribesmen (Baiyewu et al., 2018).

Pangolins have been heavily associated with climatic phenomena, including rainfall (as in East Africa) and drought. It is widely believed in South African tribal culture that if the blood of a pangolin is spilled on the ground, it will

TABLE 15.3 Body parts of Temminck's pangolin (*S. temminckii*) prescribed for ailments by traditional healers in Botswana and South Africa.

Body part	Aliments treated
Scales	Body pains, arthritis, headache, back pain, swollen feet/legs, foot ache, excessive menstrual bleeding, menstrual cramps, illness in babies, stroke, chicken pox, epilepsy, heart disease, wounds, skin problems/dry skin, skin rash, sores, tuberculosis, tiredness, cancer, chest pains, cracked heels, diabetes, goiter, hypertension, persistent cough
Blood	Excessive menstrual bleeding, menstrual cramps, heart disease, nose bleeds, hypertension, chest pains, blood cleansing, for general health and well-being
Meat	Hearing problems, ear sores, earache, skin problems/dry skin, skin rash
Fat	Blood disease, nose bleed, skin problems/dry skin, skin rash, hearing problems, earache, blood cleansing
Heart, liver, intestines, lung	Nose bleeds, skin disease, internal parasites in children, asthma in children, to increase fertility
Claws	Aches and pains

Source: Baiyewu, A.O., Boakye, M.K., Kotzé, A., Dalton, D.L., Jansen, R., 2018. Ethnozoological survey of the traditional uses of Temminck's pangolin (*Smutsia temminckii*) in South Africa. *Soc. Anim.* 26, 1–20; Setlalekgomo, M.R., 2014. Ethnozoological survey of the indigenous knowledge on the use of pangolins (*Manis sps [sic]*) in traditional medicine in Lentsweletau Extended Area in Botswana. *J. Anim. Sci. Adv.* 4 (6), 883–890.

result in drought (Baiyewu et al., 2018; Niehaus, 1993). In the Venda and Tswana tribes, the animal is believed to “come flying down from the skies” during lightning and thunderstorms and the animal is often seen following such an event (Baiyewu et al., 2018). Bräutigam et al. (1994) report that increased harvesting of pangolins in Namibia was believed to be in response to increased demand for these rain-making tokens. In contrast, the amaZulu people in South Africa believe that if a pangolin is seen there will be a drought and to prevent this from happening the animal must be killed (Kyle, 2000). In Mozambique, Temminck's pangolin is associated with rain, and live pangolins can be a sign of abundance or famine (Bräutigam et al., 1994).

In Botswana, it is considered a bad omen if a pangolin is seen by a person and it does not curl up on spotting them, or if it is seen walking on two legs. It is believed that any pregnant woman who crosses its trail will give

birth to a baby with scaly skin, and if a person treads on a pangolin's trail (i.e., spoor), they will develop cracked heels (Setlalekgomo, 2014).

Temminck's pangolin parts are used in a variety of spiritual remedies. Baiyewu et al. (2018) and Setlalekgomo (2014) examined such uses in South Africa and Botswana respectively (Table 15.4). Pangolin scales and blood have the greatest application by traditional healers in rural areas. Many of these spiritual associations relate to the bringing of good luck, conferring protection or power, and cleansing. Scales are often carried in a wallet to “protect” money, carried in a car to prevent accidents, or even swallowed to increase longevity or to avoid confessing to a wrong-doing. Blood is sometimes carried on a person in a vial and, with fat, is mixed with building materials used in the construction of homes or animal pens to ward off evil spirits (Baiyewu et al., 2018). In the KwaZulu-Natal Province of South Africa, the burning of scales

TABLE 15.4 Body parts of Temminck's pangolin (*S. temminckii*) prescribed for spiritual remedies by traditional healers in Botswana and South Africa.

Body part	Spiritual remedies
Scales	Prevention of lightning strikes, protection against severe weather, good luck, promotion, physical fortification, spiritual fortification, fortification in babies/children, protection against evil spirits/deeds, fire prevention, love charms, longevity, spiritual cleansing, to help chiefs stay in power, protection of cattle and livestock, cattle fertility, protection of crops against witchcraft
Blood	To help chiefs stay in power, spiritual and physical fortification, prevention of lightning strikes, protection against severe weather; cattle fertility, protection of cattle and livestock, protection against evil spirits, spiritual cleansing, blood cleansing, general health and well-being, to attract lovers, to attract customers
Fat	Protection against evil spirits or bad luck, ritualistic rites, spiritual cleansing, blood cleansing
Heart, liver, intestines, lung	To help chiefs stay in power, prevention of bewitching, protection against evil spirits/deeds
Head, brain, eyes, nose	To protect a cattle kraal (enclosure) and livestock against evil and predators, mind control, premonition
Claws	Good luck, fortification
Skin, carcass	Protection of cattle and livestock
Whole animal	To help chiefs stay in power, good luck, promotion, protection against evil spirits/deeds

Source: Baiyewu, A.O., Boakye, M.K., Kotzé, A., Dalton, D.L., Jansen, R., 2018. Ethnozoological survey of the traditional uses of Temminck's pangolin (*Smutsia temminckii*) in South Africa. *Soc. Anim.* 26, 1–20; Setlalekgomo, M.R., 2014. Ethnozoological survey of the indigenous knowledge on the use of pangolins (*Manis sps [sic]*) in traditional medicine in Lentsweletau Extended Area in Botswana. *J. Anim. Sci. Adv.* 4 (6), 883–890.

and inhalation of the smoke is believed to reduce hysteria (Cunningham and Zondi, 1991).

Impact of local and national use on pangolin populations

In West Africa, the consensus of research on the bushmeat trade and traditional medicinal use of pangolins (e.g., Akpona et al., 2008; Boakye et al., 2014, 2015; Soewu and Adekanola, 2011) is that these activities are driving population declines in the three tropical African species (see also Chapters 8–10). Opinions of respondents interviewed on the use of pangolins in bushmeat and traditional medicine trades in the last 30 years indicate that there has been a steady decline in

pangolin numbers and distribution. Anadu et al. (1988) reported that bushmeat retailers in Bendel State (now Edo and Delta States), Nigeria, listed the white- and black-bellied pangolins among the species that were difficult to source (Anadu et al., 1988). Similarly, Sodeinde and Adedipe (1994) note that at the time of the research, hunters described white-bellied pangolins as rarer than in previous years. Traditional medicine practitioners interviewed by Soewu and Adekanola (2011) responded that pangolins had decreased in number and average body size over time.

In Central Africa, available evidence indicates that offtake for local use and trade is also likely unsustainable. Ingram et al. (2018) used local hunting data to estimate the exploitation of pangolin populations across the region.

They estimated that exploitation likely includes 0.4 million individuals annually, and based on a sample of 310 pangolins, 45% were sub-adults or juveniles. Moreover, it appears exploitation of pangolins in the region is increasing. [Ingram et al. \(2018\)](#) reported that the total annual catch of pangolins increased by ~150% from before (1975–1999) to post-2000 (2000–2014). The percentage of pangolin species in the catch also increased significantly from 0.04% in 1972 to 1.83% in 2014 ([Ingram et al., 2018](#)). Insights from local communities support the evidence that pangolins are becoming rarer. In Cameroon, local communities interviewed near Korup National Park in 2009 stated that giant pangolins were abundant 10 years prior to the survey, but in 2009 were very rare ([Ngoufo et al., 2014](#)). Although anecdotal, [Infield \(1988\)](#) noted that the species may have been extirpated from locations around Korup National Park, and [Mouté \(2010\)](#) reported that the species is no longer observed to the northeast of the park. [Abugiche \(2008\)](#) stated that the giant pangolin was feared locally extinct near 14 villages in the vicinity of Banyang-Mbo Wildlife Sanctuary in Cameroon. In Gabon, interviews with local Pouvi hunters in two villages revealed that the giant pangolin was either rare or had already disappeared from some areas ([Schleicher, 2010](#)).

There is little information on the impact of exploitation of East African pangolin populations. Trafficking of pangolin parts, mainly scales, in the region appears to be increasing based on seizure records, implicating, among other countries, Kenya and Uganda (see [Chapter 16](#); [Challender and Waterman, 2017](#); [Heinrich et al., 2017](#)). However, it is not known where pangolins are being sourced, or whether they are being targeted specifically for international trafficking or sourced as a by-product of bushmeat hunting.

Temminck's pangolin is highly sought-after in Southern Africa, and exploitation has had a negative impact on populations in parts of its range. In the KwaZulu-Natal Province of

South Africa, the species is considered to be locally extinct as a direct result of over-harvesting for traditional practices (see [Chapter 11](#); [Cunningham and Zondi, 1991](#); [Pietersen et al., 2014, 2016](#)). However, the species is elusive and rarely seen, which makes it challenging to determine the impact of use on populations elsewhere in the species' range (see [Chapter 11](#)). The low availability of the species in traditional markets in Southern Africa may be due to its scarcity, but further research on the status of populations is needed ([Chapter 34](#)).

Overall, evidence suggests that the number of pangolins being sold for bush meat and traditional medicine is likely unsustainable in many places in both the short- and long-term. Considering that hunting pressure is compounded by targeted exploitation for international trafficking (see [Chapter 16](#)), it is highly likely that pangolin populations are in decline across Africa (see [Chapters 8–11](#)). Further research is needed to quantify, qualify and monitor the impacts of local and national use on populations.

Conclusion

Use of pangolins across Africa follows similar patterns, but with some regional differences. The species are consumed as bushmeat, particularly in West and Central Africa, where there is substantial demand for all three tropical African species. The white-bellied pangolin is reportedly the most frequently used species and is most encountered in trade. The majority of rural African people still rely on traditional healers for their healthcare needs and pangolins are used for traditional medicinal purposes across Africa, potentially compounding exploitation for bushmeat. High human population growth forecasts in parts of Africa (e.g., DRC, Nigeria) suggest that the exploitative pressure on Africa's pangolin populations is unlikely to ease in the near

future. There is, therefore, an urgent need for research to understand exploitation levels and their impact on populations to inform conservation planning and management.

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International trade and trafficking in pangolins, 1900–2019

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Introduction

Pangolins and their derivatives have long been in commercial, international trade. This can be traced back to at least the early 20th century, but likely took place earlier, and has

continued in one form or another since, both legally and illegally, culminating in high volumes of pangolins and their parts being trafficked since the turn of the 21st century. This chapter examines international trade and trafficking in pangolins from 1900 to July 2019.