

A note on the illegal trade and use of pangolin body parts in India

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INTRODUCTION

Of the eight extant species of pangolin (Pholidota: Manidae), the Indian Pangolin *Manis crassicaudata* and Chinese Pangolin *M. pentadactyla* occur in India (Figs. 1, 2 and 6). The Indian Pangolin is widely distributed across the country, occurring in Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal. The species also occurs in Bangladesh, Pakistan, Nepal and Sri Lanka (Srinivasulu and Srinivasulu, 2004; Baillie *et al.*, 2014). The Chinese Pangolin is native only to the north and north-eastern States of India, including Arunachal Pradesh, Assam, Meghalaya, Nagaland and Sikkim, and also occurs in Bangladesh, Bhutan, Nepal, Myanmar, China, Lao PDR, Taiwan, Thailand and Viet Nam (Srinivasulu and Srinivasulu, 2004; Challender *et al.*, 2014a). Although the two species are similar morphologically, the scales of the Indian Pangolin are relatively larger than those of the Chinese Pangolin and have 11–13 rows of scales across the back compared to 15–18 rows in the Chinese Pangolin. A terminal scale is also present on the ventral side of the tail of the Indian Pangolin, but absent in the Chinese Pangolin (Pocock, 1924; Heath, 1995; Prater, 2005).

Major threats to pangolins in India include hunting and poaching for local consumptive use (e.g. as a protein source and an ingredient in traditional medicine), and for international trade (Challender *et al.*, 2014a; Challender, 2011; Baillie *et al.*, 2014). Hunting of pangolins has recently been recorded in Arunachal Pradesh, Pariyar Tiger Reserve (Kerala), the Western Ghats and eastern States of India, including Odisha (Mitra, 1998; Mishra *et al.*, 2004; Mohanty, 2011; Mishra *et al.*, 2011; Gubbi and Linkie, 2012).

PROTECTION STATUS

The Chinese Pangolin is listed as Critically Endangered, and the Indian Pangolin as Endangered, on *The IUCN Red List of Threatened Species*. These listings are based on evident (Wu *et al.*, 2004; Wu and Ma, 2007) and suspected,



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Fig. 1. Indian Pangolin *Manis crassicaudata*.

rapidly declining populations (Challender *et al.*, 2014a; Challender, 2011; Baillie *et al.*, 2014). Hunting, poaching and associated trade takes place despite both species being listed on Schedule I of India's *Wildlife (Protection) Act, 1972*, which strictly prohibits these activities. Moreover, since 1975 both the Chinese and Indian pangolins have been included in Appendix II of CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, to which an annotation was added at the 11th meeting of the Conference of the Parties in 2000. This annotation established zero export quotas for wild-caught Asian pangolins traded for commercial purposes and which prohibits trade of this nature (CITES, 2000a). Despite these measures, pangolins in India continue to be exploited for local consumptive uses and are frequently found in illegal trade, both domestically and internationally (e.g. Baillie *et al.*, 2014), but information on the extent of trade is limited and inconsistent. This is partly because these species are widely distributed geographically, making it difficult to quantify hunting and



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Fig. 2. Chinese Pangolin *Manis pentadactyla*.

poaching activities, localities and associated trends, and because illegal trade in pangolins is characteristically clandestine. Notwithstanding these difficulties, the aim of this article is to review available information on recent illegal trade involving pangolins and their derivatives and use of their body parts by traditional medicine practitioners in India.

METHODS

Information for this article was acquired from various sources. It included a review of available literature on the consumption and use of pangolins in India sourced using “Google scholar”, and the collation of data on confiscations involving pangolins and their derivatives in India, which were sourced from national and regional newspapers and online news articles reporting on the trade in pangolins and their derivatives between 2009 and 2014. Although it should be noted that media-reported science data can be erroneous and inaccurate, there is little alternative when seeking to compile data on trades which are clandestine. In addition to Google searches, news articles were also found by means of a Google alert, which regularly searches the internet for designated keywords and sends an email to a designated email address. Although most news accounts reported some information on trade (e.g. the number or weight of pangolin scales confiscated), they failed to report the species involved, but, as explained below, trade likely involved both the Indian and Chinese species.

To estimate the number of pangolins the reported trade represents (Table 1), five adult Indian Pangolins which died in captivity at Nandankanan Zoological Park, Odisha, India (NKZP) between 2009 and 2014, and three formalin-preserved Indian Pangolin young were physically examined to collect information on the number of scales present on this species. These were found to range from 444–519 (474 ± 22 , $n=8$), in 11 rows across the back of each specimen. In November 2014, an Indian Pangolin which died in captivity at NKZP was weighed before disposal, which presented an opportunity to acquire data on the proportion of the animal’s body weight comprising scales. The skin with scales weighed 3.5 kg of the animal’s total weight (10.3 kg), or 34% of its total body weight. The authors used these parameters to estimate the number of pangolins in trade. It is understood that the skin and scales of the Chinese Pangolin make up less (about 25%) of the animal’s total body weight (Heath, 1992; also see Zhou *et al.*, 2012).

ILLEGAL TRADE IN PANGOLINS IN INDIA

The protected status of Asian pangolins in most of their range States, including India, indicates that current trade violates both national regulations, e.g., the *Wildlife (Protection) Act, 1972*, and contravenes CITES where trade is international in nature. Reported seizures involving pangolins occurred in multiple States in India during the six-year period (2009–2014; see Table 1).



Fig. 3. Map showing locations (▲) in India of seizures of pangolin body parts between 2009 and 2014.

They comprised more than 5913 kg of scales and two whole pangolins. Seizures took place in 10 States, with the majority taking place in Manipur (25), followed by Assam (5), Mizoram (5), West Bengal (3), Karnataka (3), Tamil Nadu (2), Uttarakhand (2), Uttar Pradesh (2), Chhattisgarh (1) and Odisha (1) (Fig. 3).

While pangolin meat is typically consumed or sold in local markets, scales are delivered to middlemen from Kolkata, Chennai and from border towns such as Siliguri in west Bengal, Moreh in Chandel district, Manipur, Shillong in Meghalaya and Aizwal in Mizoram (Sharma, 2014; present study), and from where they are typically destined for China via Myanmar and Nepal. Myanmar and Nepalese nationals apprehended with pangolin scales and Indian nationals apprehended with Myanmar currency and pangolin scales supports the evidence of this trade link. As confessed by apprehended smugglers during interrogation in some of the reported seizures, the confiscated body parts appear to have originated from Haryana, Odisha, Nagaland, Meghalaya, Madhya Pradesh, Uttarakhand, and south Indian States including Karnataka and Tamil Nadu. At times, pangolin scales were also seized with Tiger *Panthera tigris* bone, deer antlers, the drug *pseudoephedrine*, and arms and ammunition, indicating that trade in pangolins has strong links with trade in other wildlife and drugs and arms. Those apprehended included both men and women, and the number of suspects arrested in each case varied from one to 11 or more, which suggests an organized criminal aspect to this trade.

Although it is unknown which species of pangolin were in trade during the period covered by this investigation—especially where scales only were confiscated—on the basis that scales from an adult Indian Pangolin weigh

about 3.5 kg, it can be estimated that a minimum of 1690 animals were involved. Although this estimate is based on a very small sample size, studies have shown that scales from other Asian pangolin species typically weigh less (Zhou *et al.*, 2012), and it is known that scales in the Indian species are larger and therefore likely weigh more (Pocock, 1924; Heath, 1995), providing some support for these estimates.

Local trade in the scales and meat of the Indian Pangolin has also been reported from Andhra Pradesh, Kerala, Odisha, Manipur, Mizoram, Tamil Nadu, Tripura and West Bengal (Mitra, 1998; CITES, 2000b; Misra, 2000), while collection of the Chinese Pangolin for meat and scales, and seizures of such items, have been reported in various parts of Manipur, Nagaland and Assam (CITES, 2000b). Finger rings made of pangolin scales have also been found for sale at Alashuni fair in Odisha (Mohanty, 2011) (see Fig. 5).

Pangolins are caught when sighted or are dug out of their burrows using different techniques including smoking the animals out and flushing them out with water; pitfall traps and hunting with dogs are also reported to be used to hunt and trap pangolins (Kumara, 2007; Mohanty, 2011; Gubbi and Linkie, 2012). The animals are then killed by being placed in boiling water or with the use of a club to render them unconscious (Mohanty, 2011). The scales are then typically removed by skinning the dead animal or peeling off the scales (Misra, 2000).

Despite scant data on the population status of pangolins in India, Tikader (1983) reported that populations of both the Indian and Chinese pangolins

had been greatly reduced by hunting. Given that it is difficult to maintain and breed pangolins in captivity (Yang *et al.*, 2007; Mohapatra and Panda, 2014; Heath and Vanderlip, 1988) and that the trade appears to be commercial in nature (see Table 1), it is believed that the current trade must involve wild-caught animals only. The magnitude of this trade in a relatively short time period (six years) suggests it could also potentially be unsustainable (Fig. 4), especially when bearing in mind these data likely reflect only a small proportion of actual trade levels. Although the authors have not accounted for all the biases in seizure data, which would require larger data sets and advanced modelling (e.g., Underwood *et al.* 2013), trade is nevertheless persistent (Fig. 4). Again, not accounting for biases, it could be that decreasing volumes of pangolin scales seized (see Fig. 4) are associated with declining wild populations.

There have also been reports of the involvement of tribal communities such as *Padhis*, *Saperas*, *Bawarias* and *Mongias* in the capture of pangolins (Sharma, 2014). Pangolin scales were reported to be sold for Rs1000/kg in Mizoram in 1996 and increased to Rs12000–13000/kg in different parts of Mizoram in 2013 (Chinlampainga *et al.*, 2013). Despite the apparent decline in the volume of scales seized, trade is nevertheless persistent and can be attributed to high demand from China primarily, where scales are used in traditional medicines, and to increasing prices, which are driving the illegal trade in pangolins from South Asia, as well as from Africa and Southeast Asia (Pantel and Chin, 2009; Challender, 2011; Challender and Hywood, 2012).

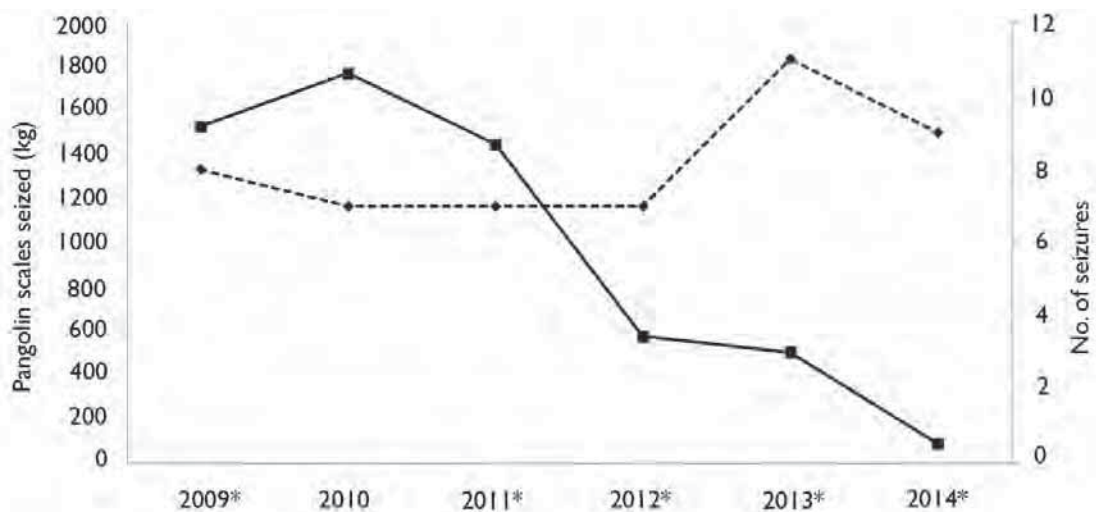


Fig. 4. Reported amount of pangolin scales seized per year (solid line) and the number of seizures per year (dashed line) between 2009 and 2014. An asterisk denotes years where seizures have involved scales but data on weight in some confiscations were not available, or the seizure involved a live pangolin.

Date of seizure	Weight (kg)	Location of seizure (mode of transport)	Notes	Data source(s)
7 January 2009	116	Pallel gate, Imphal, Manipur (in truck)	Destined for Moreh, Manipur	www.e-pao.net** (13.1.2009)
16 February 2009	340	Bongyang check gate, Moreh, Manipur	Seized with deer antlers	TOI* (27.2.2009)
23 February 2009	4.5	Bongyang check gate, Chandel, Manipur	Seized with deer antler, and Tiger paw and bone	TOI* (27.2.2009)
22 June 2009	580	Imphal-Moreh road, Mampur		TRAFFIC (2010)
2 July 2009	2.8	Bongyang check post, Imphal, Manipur (in van)	1 person arrested	www.e-pao.net** (3.7.2009)
3 July 2009	2.3	Bongyang check post, Imphal, Manipur (in jeep)	2 people arrested	www.e-pao.net** (6.7.2009)
14 September 2009	482	Moreh, Imphal, Manipur		TOI* (16.9.2009)
22 November 2009	365 scales#	Lamkhang, Chandel, Manipur	3 people arrested. Seized with drugs/arms/ammunition	TRAFFIC (2010)
16 June 2010	555	Lokopriya Gopinath Bordoloi airport Guwahati airport, Assam	Speed post parcels booked from Dimapur, Nagaland and Berhampur, Odisha; Destined for Myanmar.	Sharma (2014) www.ndtv.com** (20.6.2010)
17 June 2010	164	Lokopriya Gopinath Bordoloi airport, Guwahati, Assam	Seized with Tiger bones	
19 June 2010	146.8	Railway mail service station, Guwahati, Assam	and China via Imphal. Seized along with Tiger bones	The Assam Tribune* (18.6.2010)
31 July 2010	2.5	Kamalapur village, Bellary, Karnataka	Procured locally, 7 people arrested	TOI*(24.7.2010)
22 September 2010	250	Pallel, Thoubal, Manipur	Destined for Moreh	Deccan Chronicle* (1.8.2010), The Hindu* (2.08.2010)
19 November 2010	138.6	Netaji Subhas Chandra Bose International Airport, Kolkata, West Bengal.		www.e-pao.net** (5.11.2013)
26 November 2010	511.65	Netaji Subhas Chandra Bose International Airport, Kolkata, West Bengal	1 person arrested	DRI (2010)***
3 June 2011	1200	Khudengthabi, Chandel, Imphal, Manipur	Procured from Chennai, Tamil Nadu, destined for Myanmar via Imphal	DRI (2010)***
23 June 2011	12	Khudengthabi, Chandel, Imphal, Manipur (in jeep)	3 women arrested	www.e-pao.net** (4.6.2011)
29 June 2011	12	Khudengthabi, Chandel, Manipur	3 women arrested	www.e-pao.net** (30.6.2011)
29 June 2011	1800 scales#	Sita track junction, Chandel, Manipur	1 person arrested	www.e-pao.net** (30.6.2014)
20 August 2011	65	Khudengthabi, Moreh, Imphal, Manipur (in bus)	3 local tribal youths arrested	www.e-pao.net** (30.6.2014)
21 October 2011	144	Sonabarighat, Silchar, Assam (in bus)	Procured from South Indian States, destined for China via Myanmar	TOI* (23.8.2011)
2 November 2011	14	Khudengthabi, Chandel, Manipur	2 people arrested with Myanmarese currency Procured from south Indian States, destined for China via Myanmar	TOI* (24.10.2011)
20 January 2012	90	Vairengte Check gate, Mizoram (in truck)	2 people arrested. Procured from south Indian State and destined for China.	www.e-pao.net** (3.11.2011)
? May 2012	12	Chandel district, Imphal, Manipur	Destined for border town of Moreh.	The Telegraph (31.1.2013)
7 July 2012	19.8	Central Forest Division, Sekmai, Manipur (in jeep)	Seized with pseudoephedrine drug	TOI* (5.5.2012)
29 July 2012	1 pangolin#	Gurguria range, Simlipal Biosphere Reserve, Odisha	2 people arrested, transporting from Dimapur to Imphal	www.e-pao.net** (13.7.2012)
28 August 2012	5	Thamnapokpi, Thoubal, Manipur		Anon. (2013)
				www.kanglaonline.com** (31.8.2012)

Table 1. Reported seizures of pangolin body parts in India (2009–2014).

? =date not specified, # =weight not specified, * =Daily Newspaper, ** =Online news report, *** =Press note, TOI =Times of India, DRI = Directorate of Revenue Intelligence, West Bengal, India

Date of seizure	Weight (kg)	Location of seizure (mode of transport)	Notes	Data source(s)
4 September 2012	63	Bawgakwn, Aizawl, Mizoram	Seized from house, 1 arrest. Destined for Myanmar	The Telegraph (5.9.2012)
6 September 2012	386	Tuirial airfield village, Mizoram		The Arunachal Times* (7.9.2012)
7 February 2013	30	Kansrao forest, Rajaji National Park, Uttarakhand	3 people arrested	The Hindu* (23.2.2013)
20 April 2013	11	Anwarganj railway station, Kanpur, Uttar Pradesh	Procured from Irsa, Baital and Hashangabad area, Madhya Pradesh; destined for north-east India	TOI* (21.4.2013)
17 July 2013	85	Beltola area, Guwahati, Assam	1 person arrested with pseudoephedrine tablets. Destined for China via Myanmar	Business Standard* (18.7.2013) Nithart (2013)
31 July 2013	70	Debidanga, Jalpaiguri, Siliguri, West Bengal (in train)	Procured from Kalka, Haryana and destined for Nepal; 5 Indian/2 Nepalese nationals arrested, natives of Chennai, Nagaland, Manipur, Siliguri and Nepal	The Hindu* (1.8.2013)
31 July 2013	2.5	Thoubal, Imphal, Manipur	Woman and son apprehended	Nithart (2013)
12 August 2013	25	Davangere, Karnataka	Collected locally, destined for China via Myanmar	www.news.chennaionline.com** (13.8.2013); Sharma (2014)
7 August 2013	80	Aizawl, Mizoram		TOI* (6.8.2013)
28 August 2013	148	Vairengte, Kolasib district, Mizoram	Procured from Shillong, destined for Myanmar	Sharma (2014)
7 September 2013	30	Vengal village, Thiruvallore district, Tamil Nadu	5 people arrested including Myanmar nationals	Sharma (2014)
18 September 2013	23	Khudengthabi, Manipur	7 people apprehended	Nithart (2013)
30 December 2013	1 pangolin#	Goria, Sugguja district, Chhattisgarh	7 people apprehended	Central Chronicle* (30.12.2013)
10 January 2014	2	Dandeli-Anashi Tiger Reserve area, Karnataka	1 person apprehended	www.sahilonline.org** (10.1.2014)
11 March 2014	Pangolin skin# with scales	Tengnoupal along Imphal-Moreh road, Imphal, Manipur (in van)	2 people apprehended	www.e-pao.net** (12.3.2014)
21 March 2014	18.3	Imphal, Manipur	3 women and 1 man apprehended;	www.e-pao.net** (14.3.2014)
17 July 2014	0.4	Serou, Thoubal district, Manipur (in van)	procured from Imphal bound for Moreh	www.e-pao.net** (19.7.2014)
24 October 2014	1.7	Khudengthabi check post, Imphal, Manipur	1 woman apprehended	The Assam Tribune* (28.10.2014)
22 September 2014	43	Nawapur in Ballia district, Uttar Pradesh	1 person arrested	TOI* (27.9.2014)
7 November 2014	4	Gopichettipalyam village, Tamil Nadu	Procured from Pachmarhi, Madhya Pradesh	Deccan Chronicle* (20.11.2014)
3 November 2014	10	Saperabasti, Doiwala area, Dehradun, Uttarakhand	11 people arrested	The Pioneer (4.11.2014)
13 November 2014	10.7	Moreh, Manipur	1 person arrested	www.e-pao.net** (19.11.2014)
			1 person sentenced to 2 months' gaol	Sanghati Express* (30.11.2014)

Table 1 (ctd). Reported seizures of pangolin body parts in India (2009–2014).

? =date not specified; # =weight not specified; * =Daily Newspaper; ** =Online news report; *** =Press note, TOI =Times of India, DRI = Directorate of Revenue Intelligence, West Bengal, India

USE OF PANGOLIN BODY PARTS IN INDIA

Despite regulations, pangolin body parts continue to be used in traditional medicines throughout India (Mitra, 1998). For instance, Mahawar and Jaroli (2008) reported 109 animal species with 270 uses in traditional medicine in different parts of India, including pangolins. The meat, bile, scales and claws of pangolins are reportedly used by tribal communities including the *Paudi Bhuyan* tribe of Odisha, *Biate* tribe of Assam, *Katkaris* folk of Maharashtra, *Gond* tribe of Madhya Pradesh, *Mizo* ethnic group of Mizoram, and the *Nyishi* and *Galo* tribes of Arunachal Pradesh (Table 2). Although the use of pangolin body parts in these applications is steeped in tradition, exploitation of pangolins for these purposes is illegal. Unfortunately, as little is known about the population status of pangolins in India, it is not possible to determine whether offtake of pangolins for these purposes is sustainable. However, it does

appear, at least based on this evidence, that if offtake for traditional medicinal applications occurs in parallel with exploitation for national and/or international trade, it could well be unsustainable. Further research into pangolin use, exploitation and trade in India, and in South Asia more broadly, is therefore required urgently to obtain a better understanding of the pervasive threat of exploitation and trade in the region (e.g. Challender *et al.*, 2014b; Mahmood *et al.*, 2012).

To draw attention to the illegal pangolin trade in India, in January 2014 the Wildlife Crime Control Bureau, New Delhi, issued an alert to police, forest, Customs and postal authorities throughout the country to highlight the extent of this trade (Sharma, 2014). On 29 November 2014, one person apprehended with 10.7 kg of pangolin scales on 13 November 2014 at Moreh, Manipur, was sentenced to two months' imprisonment, suggesting that this alert may have started to translate into enforcement action and subsequent prosecutions.

PANGOLINS ARE KILLED BY BEING PLACED IN BOILING WATER OR WITH THE USE OF A CLUB TO RENDER THEM UNCONSCIOUS. THE SCALES ARE TYPICALLY REMOVED BY SKINNING THE DEAD ANIMAL OR PEELING OFF THE SCALES.

Species	Body part	Uses	Practitioner	Source
Indian Pangolin <i>Manis crassicaudata</i>	Scales (in an aqueous paste)	to reduce swelling and inflammation	traditional knowledge holders of south India	Dixit <i>et al.</i> , 2010
	Bile	to treat splenomegaly (enlargement of the spleen)	traditional knowledge holders of Mizoram and Arunachal Pradesh (AP)	Chinlamianga <i>et al.</i> , 2013
	Meat	to relieve muscle stiffness	ditto	ditto
	Scales (made into a ring)	to cure piles	<i>Paudi Bhuyan</i> tribe of Odisha, tribes of Similipal Biosphere Reserve, Odisha, and traditional knowledge holders of Mizoram and AP	Mohapatra <i>et al.</i> , 2013; Mishra <i>et al.</i> , 2011; Chinlamianga <i>et al.</i> , 2013
	Scales (dried and crushed to a powder and taken with water)	to get rid of hook worm	<i>Biate</i> tribe of Assam	Betlu, 2013
	Scales (made into a paste and applied to the armpit)	to get rid of armpit boils	<i>Katkaris</i> folk of Maharashtra	Kulkarni and Deshpande, 2011
	Scales tied across the lumber region	to get rid of back pain	<i>Gond</i> tribe, Madhya Pradesh	Bagde and Jain, 2013
Chinese Pangolin <i>Manis pentadactyla</i>	Skin/scales worn around neck	to prevent pneumonia	<i>Mizo</i> ethnic group of Mizoram	Lalmuanpui <i>et al.</i> , 2013
	Meat	consumed as a delicacy	<i>Nyishi</i> tribe of AP	Solanki <i>et al.</i> , 2005
	Scales	to heal wounds	ditto	ditto
	Skin	for cultural purposes	ditto	ditto
	Nails	for piercing boils (assumed antiseptic property)	<i>Nyishi</i> and <i>Galo</i> tribes of AP	Chakravorty <i>et al.</i> , 2011

Table 2. Use of pangolin body parts for traditional medicinal applications in India.



Fig. 5.
The scales of the Indian Pangolin are used as rings by some local people in Khordha, District of Odisha.

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DISCUSSION AND CONCLUSIONS

Despite legislative protection, illegal exploitation and trade in pangolin body parts continues to occur in India, which is having a seemingly deleterious effect on pangolin populations there (Baillie *et al.*, 2014). In addition to existing regulatory measures therefore, the authors propose that a series of additional measures are needed in order to relieve exploitative pressure on pangolins in India and to ensure the conservation of the species. These include continuing to raise awareness of the extent of the trade and the conservation predicament of pangolins with enforcement agencies—including the Indian Wildlife Department—and other stakeholders such as traditional medicinal users and practitioners, tribal communities and members of the public, in order to generate support for and catalyse conservation action. However, they also include



Fig. 6. Indian Pangolin *Manis crassicaudata*, Nandankanan Wildlife Sanctuary, Odisha, eastern India.

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urgently needed research on pangolin populations in India, on current offtake levels both for consumptive use locally as well as for trade, local and national level demand for pangolin derivatives, and research into the means through which local and tribal communities can become partners and stewards in pangolin conservation in India (for example, through the use of incentives or benefits). At the same time, initiatives are needed to reduce international demand for pangolin derivatives, which is currently being met in part by pangolin body parts from India, and on which conservation action has started (for example, WildAid, 2015). However it is only through a multi-faceted approach which encompasses all these elements that the exploitative threat to pangolins in India can be reduced, and their long-term conservation secured.

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