

Wildlife

Smoke and Mirrors

China's complicity in the
global illegal pangolin trade

October 2020

ACKNOWLEDGEMENTS

This report was written and edited by the Environmental Investigation Agency UK (EIA UK). It has been produced with funding from the UK Government through the Illegal Wildlife Trade Challenge Fund and EJF Philanthropies.

EIA would like to thank Brent Stirton and the Sangha Pangolin Project for providing photographs included in this report.

The contents of this publication are the sole responsibility of EIA UK.

ABOUT EIA

We investigate and campaign against environmental crime and abuse.

Our undercover investigations expose transnational wildlife crime, with a focus on elephants and tigers, and forest crimes such as illegal logging and deforestation for cash crops like palm oil. We work to safeguard global marine ecosystems by addressing the threats posed by plastic pollution, bycatch and commercial exploitation of whales, dolphins and porpoises. Finally, we reduce the impact of climate change by campaigning to eliminate powerful refrigerant greenhouse gases, exposing related illicit trade and improving energy efficiency in the cooling sector.

EIA UK

62-63 Upper Street,
London N1 0NY UK
T: +44 (0) 20 7354 7960
E: ukinfo@eia-international.org
eia-international.org

EIA US

PO Box 53343
Washington DC 20009 USA
T: +1 202 483 6621
E: info@eia-global.org
eia-global.org

Environmental Investigation Agency UK

UK Charity Number: 1182208
Company Number: 07752350
Registered in England and Wales



Above: 12.7 tonnes of pangolin scales seized by authorities in Singapore in April 2019. This was the second of two seizures in the same month totalling 25.6 tonnes. Both shipments were en-route to Vietnam from Nigeria.

The scales in the second seizure came from two pangolin species – white-bellied pangolin (*Phataginus tricuspis*) and giant ground pangolin (*Smutsia gigantea*)

Front cover ©Brent Stirton: Temminck's ground pangolin (*Smutsia temminckii*) rescued from the illegal wildlife trade in Zimbabwe by the Tikki Hywood Foundation.

CONTENTS

Summary	4
Introduction	6
International prohibitions, national authorisations	8
Chronic problems: continued endorsement of pangolin scale use	11
A bottomless pit: China's dubious pangolin scale stockpile management system	14
Pangolin business: the medicines advertised online	22
In the mail: the pangolin products with international shipping	27
Time for action: Chinese Government must close its legal pangolin scale market	28
Recommendations	30
Appendix I	32
Appendix II	32
Appendix III	33
Appendix IV	34
Notes & References	38



©Chris Renshaw

Summary

The world's eight pangolin species are experiencing catastrophic levels of poaching and trafficking to feed demand for their scales, meat and other body parts. In 2016, the global community agreed to make the international commercial trade in pangolins and their parts and derivatives illegal.

In recent years, Chinese law enforcement authorities have demonstrated the capability to disrupt the transnational trafficking of pangolin scales by organised crime groups. This progress is undermined by the fact that the Chinese Government continues to permit pharmaceutical companies and hospitals to commercially produce and sell traditional Chinese medicine (TCM) products containing pangolin scales.

While pangolins have long been traded across Africa and Asia, and in some non-range states, China is currently the main consumer market for the vast quantities of pangolin scales trafficked globally every year.

China's consumer market for pangolin scales is enabling transnational organised crime groups to



Above: Black-bellied pangolin (*Phataginus tetradactyla*) in Dzanga-Sangha Protected Area, Central African Republic. This species is listed as Vulnerable on the IUCN Red List.

profit from the illegal high-volume exploitation of pangolins. Between 2016-20, EIA conducted undercover investigations into pangolin trafficking across the Africa-to-Asia supply chain. These have uncovered criminal networks involved in the active sourcing and export of vast quantities of pangolin scales.

In this report, EIA exposes how a fundamentally flawed stockpile and TCM product certification system run by the Chinese Government is used by at least 56 pharmaceutical companies to produce a minimum of 64 commercially available medicines containing pangolin scales. We find that this regulatory system is convoluted and lacks transparency and traceability, making it highly susceptible to abuse by pangolin traffickers. We document how the 2020 edition of the TCM pharmacopoeia continues to list pangolin scales as an ingredient in eight patent medicines and that

China's national medicine insurance scheme continues to cover pangolin scale medicine.

China's Wildlife Protection Law is playing a pivotal role in ensuring the commercial trade in pangolin scales persists. This legal context legitimises the consumption of pangolin scales in medicines and stimulates consumer demand for products that are pushing pangolins towards extinction.

We make specific policy and enforcement recommendations at the end of the report, including the need for the Chinese Government to fully prohibit the acquisition, sale and possession, including for medicinal purposes, of all parts and products of pangolins and other globally threatened species, including those from captive-bred sources.

Introduction

China is the primary destination for the vast quantities of pangolin scales trafficked internationally every year from across Asia and Africa by transnational criminal networks.¹

In 2016, the global community agreed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) that all commercial international trade in the eight pangolin species would be made illegal.² Despite this, the Chinese Government continues to permit pharmaceutical companies and hospitals to trade in traditional Chinese medicines (TCM) containing pangolin scales.

Over the past 10 years, there has been a seemingly endless and growing number of media reports on the many tonnesⁱ of pangolin scales seized from global illegal trade every year. It is estimated that the equivalent of 745,000 pangolins have been trafficked to supply all the scales seized between 2000-19.³ Eighty per cent of these scales were seized between 2016-19. In its latest World Wildlife Crime report, the UN Office for Drugs and Crime concluded that 71 per cent of pangolin scale seizures that took place between 2007-18 were destined for China.^{4, ii}

Building on recent reports documenting the growing trade in African pangolins to China,⁵ this report reveals how the Chinese Government is complicit in perpetuating global demand for pangolin scales. At the centre of this complicity is an inherently flawed regulatory system in which pharmaceutical companies can commercially produce and sell pangolin scale medicines.

The Chinese Government claims its wildlife product traceability scheme ensures pangolin scales used in approved medicines originate only from old verified stockpiles, but there is a mismatch between availability and demand. Lacking traceability and transparency, the regulatory system has pervasive opportunities for laundering pangolin scales illegally sourced from throughout Asia and Africa.

The trafficking of pangolin scales into China is devastating wild pangolin populations. All eight pangolin species are classified as being at risk of extinction on the International Union for Conservation of Nature (IUCN) Red List.^{6,7,8,9,10,11,12,13} Patchy information exists on the actual numbers of pangolins remaining in the wild, but in areas of Asia they are known to have disappeared completely.^{14,15,16} Some pangolin populations are thought to have declined by as much as 80 per cent in the 21 years between 1998 and 2019.¹⁷

In 2019, the worsening plight of pangolins was confirmed when three species – two African and one Asian – were re-classified into higher categories of extinction risk.¹⁸

The IUCN cited the growing impacts of poaching, illegal trade and habitat loss in the escalating vulnerability of pangolins. Further reductions of between 30-80 per cent are possible during the coming decades if urgent action to curb demand for pangolin products and protect their habitat is not taken.

Pangolin scales: a long history of commercial trade

Pangolins have a long history of being used for multiple purposes across Asia, Africa and America and the use of their scales for medicinal purposes has been documented in many range states.^{19,20} In China, the first record of pangolin scales being used for medicine is from a sixth century Chinese herbal medicine book ('Shen Nong's Classic of Materia Medica' - 本草經集注).

Throughout the 20th century, large volumes of Asian pangolin scales were legally and illegally traded from across South-East Asia to China for use in TCM.²¹ Asian pangolin skins were also heavily traded to make leather products such as boots in the United States, Mexico and Japan.²² This overexploitation devastated populations of the Chinese (*Manis pentadactyla*) and Sunda (*Manis javanica*) pangolins across the region and in China pangolins declined by 94 per cent between the 1960s and 2000s.²³

In the early 1990s, the domestic supply of pangolins in China had become so low that traders were increasingly sourcing large quantities from South-East Asian countries such as Laos, Vietnam and Myanmar.²⁴ A ripple of major pangolin declines ensued and between 1996 and 2014 the conservation status of both the Chinese and Sunda pangolins had moved from being Near Threatened to Critically Endangered on the IUCN Red List.^{25,26} In 2019, the Philippine pangolin (*Manis culionensis*)²⁷ was listed as Critically Endangered and now the other five species are facing a similar fate.

In 2016, after decades of concern over the levels of legal and illegal international pangolin trade, at the 17th Conference of Parties (CoP17) of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) all eight pangolin species were up-listed to Appendix I of the convention.²⁸ This entered into force in January 2017, making it illegal for pangolins and their parts and derivatives to be traded internationally for commercial purposes. A CITES Resolution adopted at CoP17 encouraged pangolin consumer states to implement measures to reduce demand for illegal pangolin specimens.²⁹



©Brent Stirton

A crisis: high-volume transnational pangolin scale trafficking

Transnational pangolin trafficking is an exceptionally profitable criminal enterprise that involves sophisticated methods of operation and the territories of at least 32 countries.³⁰ While Asia was the primary source of pangolin scales throughout the 20th century and the start of the 21st century, since 2008, as Asian pangolins have become increasingly imperiled, criminal networks have shifted to heavily exploiting African pangolins.³¹

The majority of pangolin scales are trafficked to China using maritime shipping services and the top smuggling routes involve Nigeria, Cameroon, the Democratic Republic of the Congo (DR Congo), Malaysia, Singapore, Vietnam, Hong Kong.³²

Between 2016-20, EIA has conducted undercover investigations into pangolin trafficking across the Africa-to-Asia supply chain. These have uncovered criminal networks involving nationals of China, Vietnam, Nigeria, Guinea, Cote d'Ivoire and DR Congo, which are actively sourcing and exporting vast quantities of pangolin scales. Between June 2019 and August 2020 alone, EIA separately engaged 23 traffickers who together claimed to be in possession of 116 tonnes of pangolin scales, an amount comparable to the total quantity publicly reported as seized in 2019.ⁱⁱⁱ

EIA's investigations have documented how pangolin scale buyers from China and Vietnam are connected to suppliers from African countries in networks heavily

Above: 3.6 tonnes of seized pangolin scales in the car park of the offices of Cote d'Ivoire's Transnational Crime Unit (UCT) in August 2018.

reliant on corruption. The involvement of corrupt customs officers, clearing agents, freight forwarders and transportation company staff enables pangolin scales to reach their intended destinations.

As corroborated by seizure data, EIA has found that a high proportion of pangolin sourcing activity is taking place in West and Central Africa. This involves an extensive sourcing footprint stretching across the region's tropical forests and savannas.

Pangolin scale shipments are either sent directly to the primary destination, China, usually with a transshipment location en route, or via a transit hub such as Vietnam or Hong Kong. Shipments through these transit hubs may also undergo transshipment en route from African countries. In Vietnam, shipments are broken down into smaller batches to be smuggled into China overland. EIA has documented pangolin scale traffickers who are also involved in the trafficking of other high-value illicit commodities such as elephant ivory, rhino horn, tiger parts and products as well as illegal donkey skins and timber.

Consumer markets for pangolin scales, especially in China, enable transnational organised crime groups to profit from the illegal high-volume exploitation of pangolins.³³ It is a crime that drives biodiversity loss, fuels corruption, weakens criminal justice systems, depletes the resource base of rural communities and undermines security.



International prohibitions, national authorisations

CITES and the continued trafficking of pangolins into China

Pangolins have been subject to varying levels of international trade controls under CITES since its inception as a treaty in 1975. Meaning that the tragedy of the global pangolin trafficking crisis has unfurled for almost half a century in full view of CITES Parties.

Acknowledging the risks posed to pangolins by overexploitation, in 1975 all Asian species were included on Appendix II (at the time only three Asian species were recognised) and one African species, Temminck's ground pangolin (*Smutsia temminckii*).³⁴ Reflecting concerns that Asian pangolins were experiencing high levels of international trade, they underwent Reviews of Significant Trade (RST)^{iv} in 1988, 1992 and 1999.^{35,36,37}

While pangolin products were being imported in large volumes by various countries, including the US, Mexico and Japan, these trade reviews pointed to "very high demand" from China. Most of the demand in China was for pangolin scales to be used in TCM, while in the US and Mexico it was for pangolin skins to be made into luxury cowboy boots.

Above: At CITES CoP17 in September 2016 in Johannesburg, South Africa Parties agreed to uplist all eight pangolin species from Appendix II to I.

In 2000, at CITES CoP11, a proposal for the uplisting of all Asian pangolins from Appendix II to I was rejected and instead 'zero export quotas' were established for the Asian species.^{38,39} This happened even though the RST process concluded that all Asian species met CITES criteria for listing under Appendix I. In response to proposals for the uplisting, the Chinese Government pushed back, stating it believed more information was required about Asian pangolins before any transfer to Appendix I was made.⁴⁰

In the following years, the global legal trade in Asian pangolins dropped off considerably.⁴¹ However, seizure data indicate that, despite the increasingly imperilled status of Asian pangolins, the zero-export quota was undermined by continued demand, primarily from China, where the domestic market not only persisted but was legally encouraged.^{42,43} This was while other major destination countries for legal imports pre-2000 such as the US, Mexico and Japan registered abrupt declines in legal imports and minimal seizures.^{44,45}

In the decade following the introduction of zero export quotas for the Asian species, there was limited international attention on the pangolin trade and role of demand from consumers in China, despite reports of the growing trafficking of pangolin meat and scales into China from South-East Asian countries such as Vietnam, Indonesia and Malaysia.^{46,47}



关于加强赛加羚羊、穿山甲、稀有蛇类资源保护和规范其产品入药管理的通知

国家林业和草原局政府网 <http://www.forestry.gov.cn/> 2007-11-12 来源：各司局

【字体：大 中 小】 打印本页

各省、自治区、直辖市林业厅(局)、卫生厅(局)、工商行政管理局、食品药品监督管理局(药品监督管理局)、中医药管理局，内蒙古、吉林、龙江、大兴安岭森工(林业)集团公司，新疆生产建设兵团林业局：

赛加羚羊、穿山甲、蛇类均是生态、经济、科研价值极高的陆生野生动物，其产品是许多传统中医临床用药的重要原料来源。为保护好上述物种资源，兼顾我国传统中医药的可持续发展，在各级政府的指导和关心下，各级林业、卫生、工商、食品药品监督管理和中医药管理等部门在控制资源消耗、研究人工繁育技术、规范经营利用行为、打击违法犯罪活动等方面

In 2010, the CITES Secretariat issued an alert (CITES Alert No. 37) highlighting that illegal trade in pangolins was expanding. Then, in 2014, the Secretariat described the illegal trade in pangolins as “escalating at an alarming rate”.^{48,49} It listed several seizures of pangolin meat and scales and stated that China was reported as the final destination for the majority of these. Meanwhile, an emerging legal and illegal trade in pangolin scales from African countries to Asia was picking up pace. Heeding recommendations from the First Pangolin Range States Meeting in 2015, all eight pangolin species were eventually uplisted to Appendix I at CoP17, making their international commercial trade illegal.⁵⁰

Adopted at CoP17, Resolution Conf. 17.10 on the ‘Conservation of and trade in pangolins’ encourages consumer states to reduce demand for illegal pangolin products. As written, this fails to go far enough in calling for the closure of legal domestic pangolin markets or for traditional medicine industries to eliminate the use of pangolin parts and derivatives. Something for which there is precedent in CITES Resolutions and Decisions for wildlife experiencing high levels of illegal trade including elephants, Asian big cats, rhinos and the Tibetan antelope.^{51,52,53,54}

Laws in China permit commercial pangolin scale trade

Controls on the trade in pangolins in China date back to at least 1977 when their export was banned because it was thought a cancer cure could be derived from pangolin body parts.⁵⁵ This was at a time when many thousands of pangolins were being exported from China to Hong Kong, possibly for the skin trade to the US.⁵⁶

In 1987, acknowledging the worsening conservation status of pangolins in China, the Chinese pangolin (*Manis pentadactyla*) was listed as a “Level II protected wild medicinal material species” under the TCM wild materials management regulation.⁵⁷ The listing meant that any harvesting or hunting of pangolins from the wild required a Government permit and export was limited. Under this regulation, Level II listed species were those with a reduced distribution and depleted population.

Pangolins first received formal protection in China in 1989 when the Chinese pangolin was listed as a species subject to second-class special state protection under the Wildlife Protection Law of 1988.^{58,59} This meant that pangolins could only be legally hunted or captured from the wild with a hunting licence.

In 2020, the Chinese pangolin as well as Sunda (*Manis javanica*) and Indian (*Manis crassicaudata*) pangolins were listed as species subject to first-class special state protection.^{60,61} This means that breaches of the Wildlife Protection Law relating to these three species will now incur more severe penalties. The trade of species under special state protection for consumption as food has been banned in China since 2014.⁶² However, a central tenet of the original Wildlife Protection Law, as well as later amended versions passed in 2004 and 2016,⁶³ is that protected species can be subject to commercial trade and utilisation. So, even though the Chinese pangolin was listed as a protected species, and consumption as food prohibited, exemptions in the 1988 law allowed for the commercial sale, purchase and use of pangolins and their parts for other purposes.

Above: State Forestry Administration Notice 242 from 2007 outlining how pharmaceutical companies and hospitals can produce and sell pangolin scale medicines.

In the latest 2017 version of the law, commercial use of species subject to special state protection is outlined in Article 27. This exemption gives provincial forestry departments the authority to approve the sale, purchase and utilisation of species subject to special state protection for certain uses, including TCM. This has created a regulatory environment in which possession of a protected species is not illegal and the products of pangolins and other globally threatened wildlife such as leopards, Asiatic black bears, musk deer, Saiga antelope and hawksbill turtles can be legally traded in TCM.^{64,65,66,67}

Non-native pangolins are subject to domestic protections by virtue of their CITES listing. Article 35 of the Wildlife Protection Law stipulates that CITES-listed species can be managed as species under special state protection. Earlier notifications have also conferred domestic protections upon non-native CITES-listed species.^{68,69} However, while commercial import and export of all pangolins is currently prohibited, application of the strictest domestic protections are not necessarily guaranteed. As Article 35 of the Law also gives the National Forestry and Grassland Administration (NFGA, formerly the State Forestry Administration, or SFA) a mandate to 'approve', and thereby potentially alter, protections for non-native species.

In 2003, the SFA and the State Administration for Industry and Commerce (SAIC, now subsumed as part of the State Administration for Market Regulation) launched a pilot system to regulate the commercial trade and use of wildlife under special state protection and their products through a centralised body called the China Wildlife Mark Centre (CWMC).⁷⁰ The CWMC is responsible for the research, development and coordination of the commercial utilisation of wildlife in China. It set out a certification system that formalised the use and consumption of nationally protected wildlife by commercial manufacturers, such as pharmaceutical companies, through a registration and labelling scheme called the China National Wildlife Mark (CNWM) – often referred to as a 'special marking'.

In 2007, SFA notice 2007 No. 242 announced that pangolins (known as "Squama Manitis" in TCM terminology^v) were to be regulated under the CNWM Scheme.⁷¹ This joint notice was issued by the SFA, the Ministry of Health, the SAIC, the State Food and Drug Administration (SFDA, later renamed the National Medical Products Administration, or NMPA) and the State Administration of Traditional Medicine (SATM, later renamed the National Administration of Traditional Chinese Medicine, or NATCM).

Notice 2007 No. 242, which also covered saiga antelope horns and 'rare' snakes, stated that appointed hospitals and licensed pharmaceutical companies could legally acquire raw pangolin scales from an inventoried national stockpile as outlined in annual national and provincial quotas. The 2007 notice allows for appointed hospitals to use and prescribe raw pangolin scales, while licensed pharmaceutical companies can sell and manufacture processed 'patent'^{vi} pangolin scale

medicines that are registered and packaged according to the CNWM guidelines.

Subsequent notices by the SFA, NMPA and NATCM in 2008 and NFGA pangolin scale quota announcements further outlined how licensed pharmaceutical companies can manufacture over-the-counter patent medicines based on Government-approved formulas, as well as yinpian (Figure 1).^{72,73,74,75,76,77,78,79,80}

In 2020, the NFGA published a new notice on pangolins outlining how it plans to strengthen the protection and management of pangolins.⁸¹ This notice recognises that pangolin populations are deteriorating, ends licenced pangolin hunting and makes some strong statements on their protection. These include measures to strengthen the protection of wild populations, crack down on pangolin trafficking and illegal sale and raise public awareness of pangolin conservation issues. However, it completely fails to address the existence of the legal market for pangolin scale medicine.

Figure 1: Explanation of yinpian. Image of pangolin scale yinpian obtained by EIA investigators from the social media account of a pangolin trafficker based in Asia



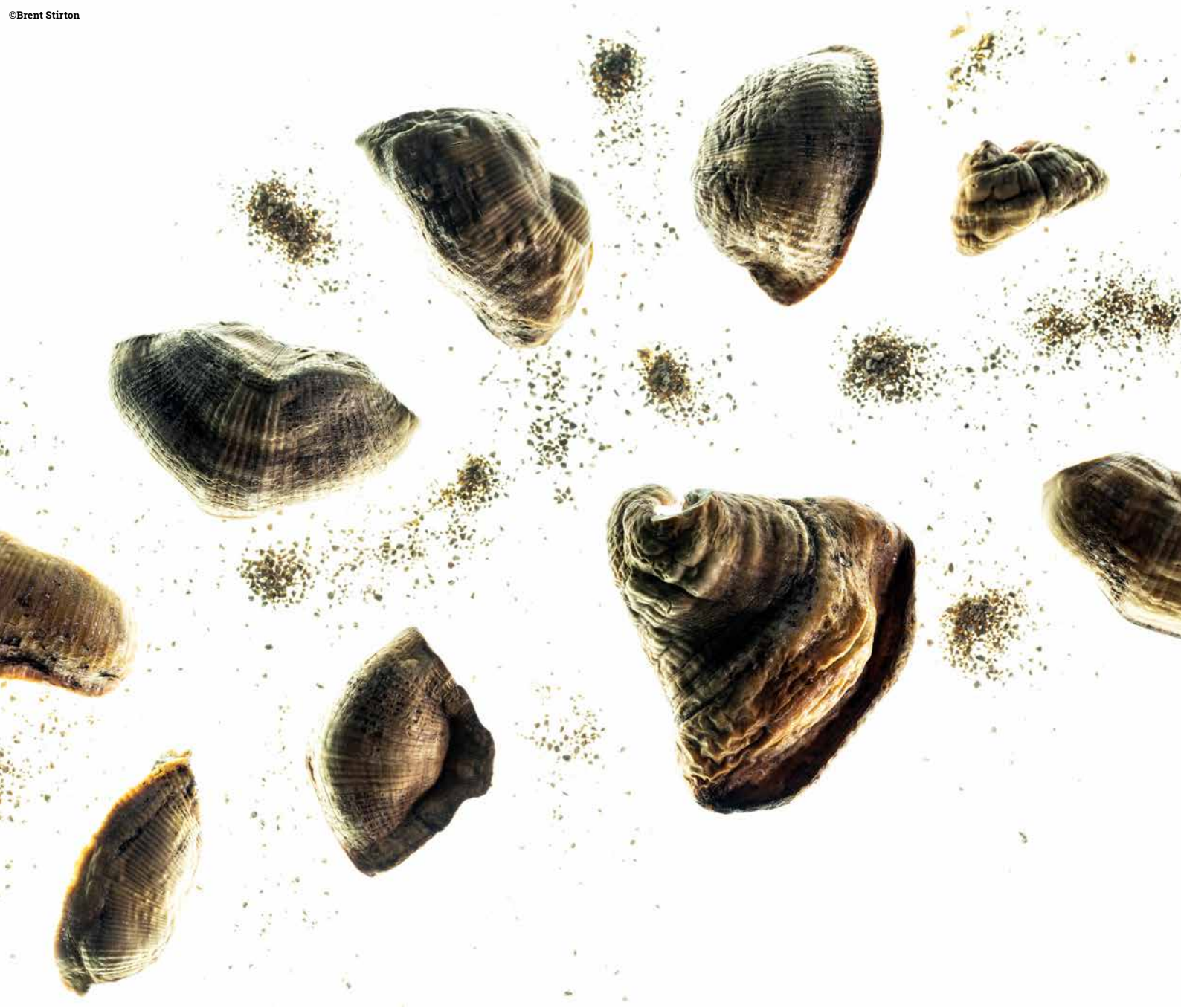
Yinpian are TCM ingredients that have been semi processed for manufacturing into processed medicine or cooking into a decoction.

Raw pangolin scales are washed and cleaned from impurities, and then heat-dried to make yinpian.

The NFGA guidelines state that pangolin scale yinpian can only be sold to licensed pharmaceutical companies or prescribed by appointed hospitals – yinpian cannot be sold in retail outlets.

To date, the NMPA has yet to set out a legal definition of what constitutes yinpian, leaving ambiguity over this regulation.

Though it is not clearly indicated, the 2015 Chinese pharmacopeia described pangolin scales that have been treated with heat (炮山甲), and/or those then treated with vinegar (醋山甲), as pangolin scale yinpian.



Chronic problems: continued endorsement of pangolin scale use

Removal of pangolin scales from the TCM pharmacopoeia?

In June 2020, The Health Times of the People's Daily, a China Communist Party-owned newspaper, published a news story announcing that pangolins had been removed from the Chinese Governments' official TCM pharmacopoeia and would not appear in the 2020 edition of the book.⁸² It reported the reason for this as the "exhaustion" of wild pangolin populations. Even though there was no official Government notice, this news was widely reported in the international media, with some interpreting it as a ban on the use of pangolin scales in TCM.^{83,84,85}

Above: Semi-processed 'yinpian' pangolin scales available for sale in a traditional Chinese medicine outlet in Guangzhou, China in 2018

Soon after the news was reported, EIA obtained a copy of the 2020 TCM pharmacopoeia and established that "pangolin" – described as the Chinese pangolin in the 2015 edition – had been removed from a section listing 'key TCM ingredients'. However, pangolin scales were still included as an ingredient in patent medicines.⁸⁶ Patent medicines are those which have been formally approved for commercial production by the Chinese Government.

Eight patent medicine formulae listing pangolin scales as an ingredient remain in the 2020 TCM pharmacopoeia.⁸⁷ These include 'Zaizao Wan', which comes in pill form and is used to help blood circulation (Figure 2), and 'Awei Huapi Gao', a treatment used to relieve, among other things, abdominal pain (see Appendix A for full list).

In China, legal trade in medicinal products is not always restricted to ingredients and patent medicines listed in the pharmacopoeia. EIA has identified 72 additional patent medicines containing pangolin scales on four official Government medicine lists from the Ministry of Health and NMPA (Figure 3).^{88,89,90,91}

Since patent medicines containing pangolin scales remain in official Government lists and there have been no new Government notices banning the use

of 'registered' pangolin scale stockpiles by licenced pharmaceutical companies and hospitals, Notice 2007 No. 242 still stands (Figure 4). This means that a minimum of 221 pharmaceutical companies (identified through the open-source research presented on page 22) and 713 hospitals can still produce and sell patent medicines containing pangolin scales.^{92,93}

The implication of the removal of the Chinese pangolin from the raw ingredients section of the pharmacopoeia is not immediately clear. Although unconfirmed, it is very likely that pangolin scale yin pian can still be used and prescribed by licenced hospitals. A similar situation currently exists with farmed bear bile, which is excluded from the raw ingredients section but is still used in official patent medicines and even funded and promoted by the Chinese Government's national medical insurance scheme.⁹⁴

Below: Examples of medicinal conditions purportedly treated by pangolin scale TCM products, as per pharmacopoeia.

Promote blood circulation and bruise recovery
Relieve amenorrhea and aid blood circulation in breasts (promote lactation)
Reduce inflammation and expel pus
Promote blood circulation in the body
Relieve menstrual clots and uterine tumours
Unblock milk ducts (promote lactation)
Heal boils and skin abscesses
Relieve rheumatism and muscle aches
Heal stroke-induced paralysis
Relieve muscle numbness and spasms
Note: Pangolin scales are used in combination with other ingredients to deliver the purported function

Figure 3: Pangolin scales are included in five separate Chinese Government patent medicine lists

Figure 2: Pangolin scales remain in the 2020 TCM pharmacopoeia

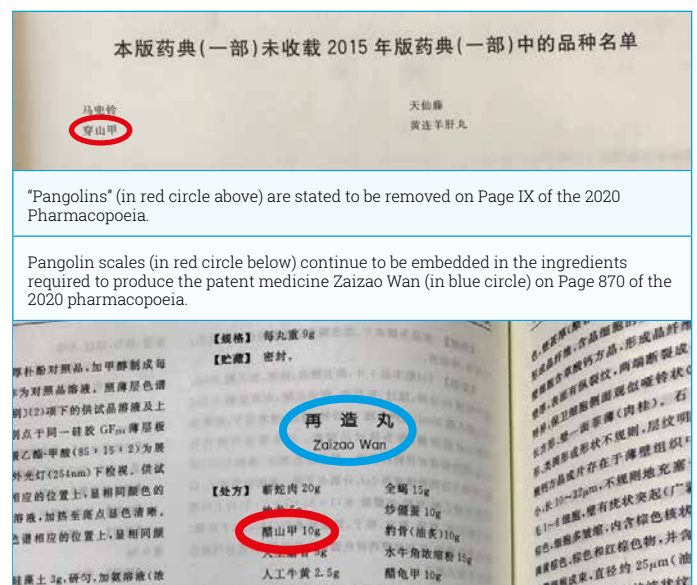
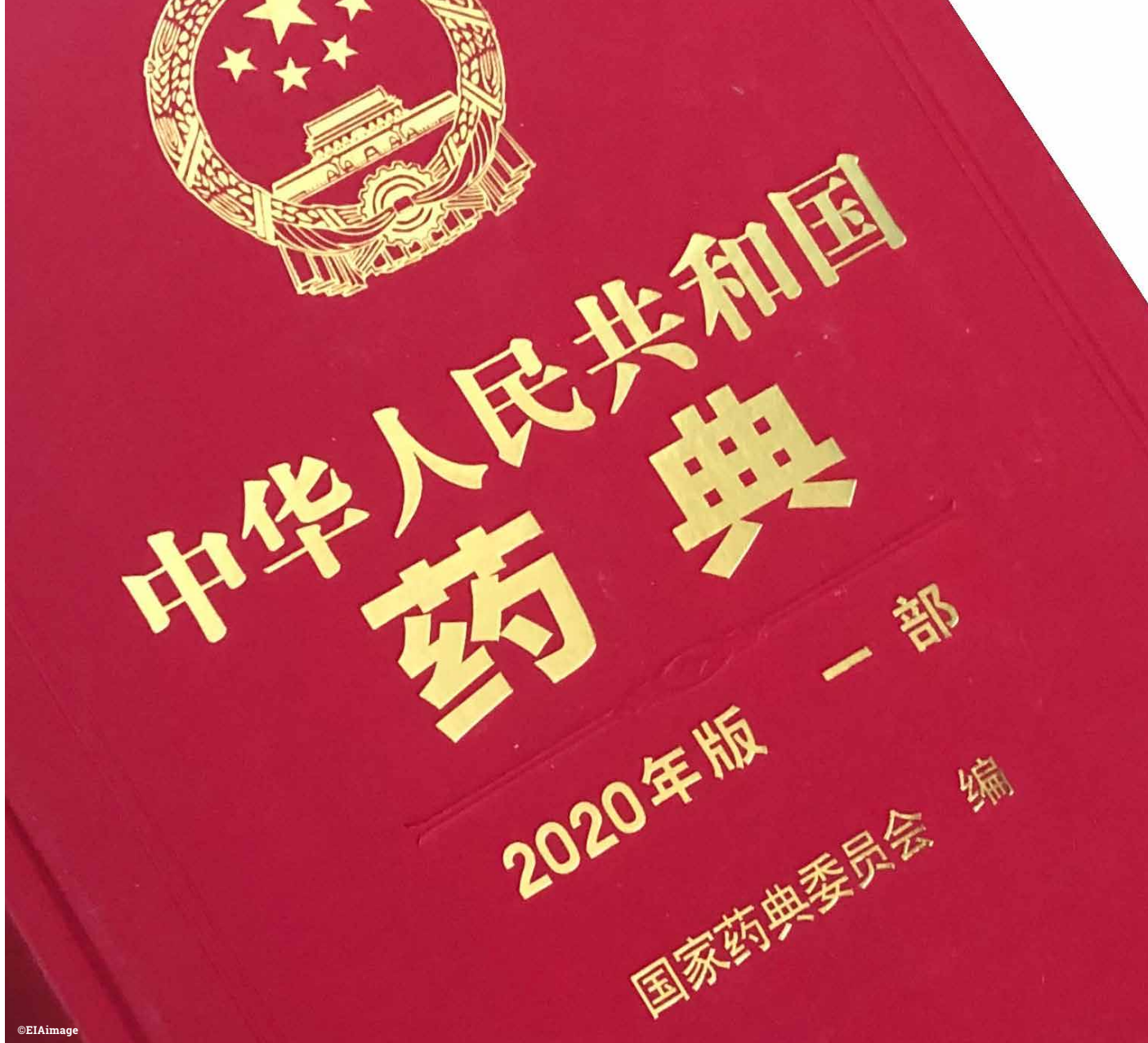


Figure 4: Legal status and medical insurance coverage of raw pangolin scales and patent pangolin medicines in China

Source	No. of formulae containing pangolin scales
National Standard for Chinese Patent Drugs by the Ministry of Health (卫生部药品标准中药成方制剂)	54
List of new medicines approved by the National Medical Products Administration (新药转正标准)	8
List of processed Chinese medicine approved by the National Medical Products Administration (国家中成药标准汇编)	6
Registered standards (注册标准)	4
The Pharmacopoeia (中国药典)	8

	Raw pangolin scales	Processed pangolin products (patented formula)
Legal?	YES - only for pharmaceutical companies and hospitals Although "pangolin" as a raw material has been removed from the pharmacopoeia, there has been no official Government notice banning its use. Therefore, pharmaceutical companies and hospitals can continue to use pangolin scales from registered stockpile.	YES Out of the 80 patented TCM formulas registered: • 8 are from the Pharmacopoeia (see App. A) • 72 are from other official sources
Covered by National Insurance?	NO The government has removed pangolins in decoction form, i.e. yin pian, from being covered by national insurance.	YES 5 Items are still covered by national insurance (see Appendix B).



©EIAimage

The end of pangolin scale medical insurance?

In August 2019, China's National Healthcare Security Administration and Ministry of Human Resources and Social Security released a joint notice updating an existing 2017 list of medicines covered under its national medical insurance scheme.^{95,96} Initial reports stated that medicines containing pangolin scales broadly were no longer covered by national medicinal insurance.⁹⁷

EIA has established that in 2019, while pangolin scale yinpian was removed from the list, the insurance

scheme actually added a patent pangolin scale medicine to its coverage list (Weiling Guici Gao, which also uses donkey-hide gelatin) and continues to cover four patent medicines containing pangolin scales that were on the 2017 list (Figure 5). These include Zaizao Wan, Ba Du Gao, Huixiang Juhe Wan and Zhi Xue Wan (Appendix B). Although it is not clear why pangolin scale yinpian was removed from the insurance list and not the patent medicines, this demonstrates that the Chinese Government, by directly funding the consumption of pangolin scale medicines, is actively incentivising their use by TCM consumers and stimulating demand.

Figure 5: Continued cover for pangolin medicine on national medical insurance

Top: Pangolin scales are included in five separate Chinese Government patent medicine lists. The 2020 edition of the TCM pharmacopoeia contains eight different pangolin scale medicines.

药品分类代码	药品分类	编号	药品名称	备注
		乙	493 五宝宁胶囊	
		乙	494 神效止痛膏	
Z410P	兽用制剂			
		甲	495 鹿角胶丸(鹿角)	
		乙	496 鹿角丸	
Z410S	民族医药			
		甲	497 华佗再造丸	
		甲	498 八宝丹	
		甲	499 补脑汁(补脑)	
		乙	500 补脑汁(补脑)	国家基本药物
		乙	501 天山珠丸(珍珠)	
		乙	502 珍珠散	
		乙	503 珍珠散	
		乙	504 珍珠散(珍珠)	
		乙	505 珍珠散(珍珠)	
		乙	506 珍珠散(珍珠)	
		乙	507 珍珠散(珍珠)	
		乙	508 珍珠散(珍珠)	
		乙	509 珍珠散(珍珠)	
		乙	510 珍珠散(珍珠)	
		乙	511 珍珠散(珍珠)	
		乙	512 珍珠散(珍珠)	
		乙	513 珍珠散(珍珠)	
		乙	514 珍珠散(珍珠)	
		乙	515 珍珠散(珍珠)	
		乙	516 珍珠散(珍珠)	

(二) 不得纳入基金支付范围的中药饮片

阿胶、白糖参、朝鲜红参、穿山甲(醋山甲)、煅山甲、玳瑁、冬虫夏草、蜂蜜、阿胶、龟鹿二仙胶、蛤蚧油、海狗油、海马、海马粉、羚羊角尖粉(羚羊角镑片)、羚羊角粉、鹿茸(鹿茸粉、鹿茸片)、马宝、玛瑙、牛黄、珊瑚、麝香、天山雪莲、鲜石斛(铁皮石斛)、西红花(番红花)、西洋参、血竭、燕窝、野山参、移山参、珍珠、紫河车

各种动物脏器(鸡内金除外)和胎、鞭、尾、筋、骨

Pangolin yinpian (in red circle) is stated as removed from the national insurance scheme in the government announcement. Other animal products removed include donkey-hide gelatin (ejiao), saiga antelope antler powder and hawksbill turtle, among others.

However, in the same announcement, the national insurance scheme continues to cover processed medicine, such as Zaizao Wan (in blue circle), which require pangolin scales (and leopard bone) as a mandatory ingredient according to the patent formula in the pharmacopoeia 2020.

A bottomless pit: China's dubious pangolin scale stockpile management system

Over the years, EIA has documented how China's systems for regulating legal domestic trade in the parts and products of protected species are fundamentally flawed or are open to abuse, facilitating illegal trade.

This has included exposés of how the SFA/NFGA's CNWM scheme has been abused by China's wildlife trade industry to sell illegally sourced tiger products and elephant ivory.^{98,99,100,101} As tonnes of trafficked pangolin scales flow from source countries across Africa and Asia into China, the same flawed systems for regulating commercial wildlife use are being used by pharmaceutical companies to produce pangolin scale medicines (Figure 6).

Figure 6: How China fails to strictly regulate its domestic pangolin scale trade

- There is common interpretation that the Chinese government holds centralised stockpiles of pangolin scales registered in 2007 and then disburses these through quotas to pharmaceutical companies and hospitals. This is not the case, China has a decentralised system of registered stockpiles held privately by private entities.
- Provincial forestry departments have mandate under the Wildlife Protection Law (Article 27) to licence companies and hospitals to trade in pangolin scales according to certain guidelines. Using the Article 27 exemption, at least one province as recently as 2019 is approving a huge and active trade in pangolin scale stockpiles between companies.
- The NFGA's CNWM labelling scheme is purported to provide traceability around the provenance of pangolin scales traded by pharmaceutical companies. In reality, pharmaceutical companies are selling TCM medicines with pangolin scales that are listed as having an "unknown" origin. This shows the NFGA is unable to verify the origin of pangolin scales entering the legal trade. Abuse of this system has been widely documented for other species.

Far right, top: With the majority of pangolin scales seized from illegal trade destined for China, it is likely that illicit pangolin scales are being laundered into the legal supply chain.

The 2006 stockpile inventory

The Chinese Government has never publicly disclosed the origins or size of its "national" pangolin scale stockpile yet at CITES CoP18, in August 2019 it claimed that it strictly regulates the use of inventoried pangolin scale stockpiles.^{102,103} The basis of this regulation is the CNWM scheme (page 10) which is purportedly intended to ensure traceability around the use of Government-verified stockpiles.

In 2006, the SFA issued Notice No. 3 requiring all individuals and private companies with pangolin scale stockpiles to declare the quantity and time of acquisition of their stock to the relevant provincial forestry department.¹⁰⁴ Provincial forestry departments were then required to inspect and verify the privately held stockpiles and report these to the SFA. This was under a national audit of selected wildlife product stockpiles, which also included leopard bone and bear bile, as part of the CNWM scheme. Following this initial inventory, any private traders with unregistered new stocks of pangolin scales were required to submit documents as evidence of legal origin before they could "sell, process, utilise or export" them.

With pangolins thought to be commercially extinct in China from the mid-1990s,¹⁰⁵ the potential origins of the stockpiles declared during the 2006 inventory are dubious and legally questionable, especially given the lack of transparency around the stockpile management system. At the time, sources could have included legal imports under CITES, Government seizures and illicit international supply chains. CITES trade records for the period up to the national stockpile inventory in 2006 show that only a limited quantity, 7.6 tonnes of pangolin scales, were legally imported into China and these were in 1994 and 1996.¹⁰⁶

The sheer volume of documented pangolin scale trafficking into China from across South-East Asia between 2000-07¹⁰⁷ make it likely that the stockpiles registered in 2006 consisted of Asian pangolin scales sourced illicitly. If this included stocks seized by the Chinese Government, this would have been contrary to the recommendations of CITES Resolution Conf 9.10, which outlined that confiscated parts and derivatives of Appendix II species be disposed of to benefit "enforcement and administration" of the Convention.¹⁰⁸



©EFAimage

Annual quotas

Between 2008-14, seven national-level annual pangolin scale usage quotas were issued by the SFA, totalling 186 tonnes and averaging 26.6 tonnes a year (Appendix C).¹⁰⁹ These quotas provided a limit on the amount of registered privately held pangolin scale stocks that could be approved by provincial forestry departments for transfer between private entities (such as wildlife trading and pharmaceutical companies) and to hospitals in each province.

Since 2015, no records of national pangolin scale quotas are available from any official Chinese Government online archive. Despite this, provincial forestry department documents and the ongoing sale of TCM medicines labelled as containing pangolin scales clearly show that the CNWM Scheme has continued to run.

Right: State Forestry Administration Notice 174 outlining the quantities of pangolin scales available for trade through the national stockpile for 2013-14. The national quantity made available was 25.9 tonnes.

The screenshot shows a document header with the logos of the State Forestry Administration and the National Park Administration, and the title '自然保护区管理司' (Natural Reserve Administration). The main title of the notice is '国家林业局关于下达2013-2014年度库存穿山甲片原料年度消耗控制量的通知 (林护发〔2013〕174号)'. The notice is dated 2013-07-06 and is addressed to various provinces and autonomous regions. It details the annual consumption control quotas for pangolin scale raw materials, including specific quotas for different grades of scales (3g, 5g, 6g, 9g, 10g) and instructions on how to use the national stockpile.

Mismatch between quotas and demand

The annual quotas allotted by the SFA represent only a fraction of the quantities requested by pharmaceutical companies. For example, the Ningbo city forestry department’s 2009 annual quota announcement for individual companies stated that Zhejiang province approved the use of 364.4kg of registered pangolin scales by private entities.¹¹⁰ This was stated to represent only four per cent of the total quantity requested by companies.¹¹¹ This would put the total quantity of pangolin scales requested at over 8.6 tonnes, which was 230 per cent greater than the allotted quota. This points to a significant mismatch between the quantities of pangolin scales required to meet production demands of pharmaceutical companies and availability through the national quota system.

Problematic provenance traceability

EIA has found images of 23 CNWM special marking labels issued between 2009-13 visible on the packaging of TCM medicines advertised online (Figure 7). As per SFA guidelines, the origin on these labels can be listed as either ‘Wild’, ‘Farmed’ or ‘Unknown’. Of 12 labels that are legible, five stated the pangolin scales contained in the medicines were from a ‘Wild’ source and the remaining seven from an ‘Unknown’ source. This implies that the SFA has approved the commercial use of pangolin scale stockpiles for which it is unable to verify the provenance, a requirement clearly stated in the 2007 stockpile management guidelines. This is a clear example of the CNWM special marking scheme failing to perform its purported function in ensuring traceability and legality of pangolin scales used by pharmaceutical companies.



Figure 7: Special marking labels drawn from pangolin scale medicine products advertised by pharmaceutical companies online

Above: Examples of TCM medicines containing pangolin scales with the CNWM special marking labels

<p>京万红痔疮膏 Jingwanhong Zhichuang Gao Squama manitis/W/etc Tj24/10/4kjk1kkx5h</p>	<p>Five products stated the scales were extracted from the wild</p>	<p>万方五香膏 Wanfang Wuxiang Gao Squama manitis/W/etc Zj20/09/0000377640</p>	
<p>茴香橘核丸 Huxiang Juhe Wan Squama manitis/W Tj16/09/0000001497</p>		<p>茴香橘核丸 Huxiang Juhe Wan Squama manitis/W/etc Tj16/09/0000001497</p>	<p>利咽灵片 Liyanling Pian Squama manitis/W/etc Bj28/11/bkfk9kkhev</p>
<p>穿山甲片制膏 风湿痹康胶膏</p>	<p>Seven products stated the scales' source were unknown:</p>	<p>三鞭温阳胶囊 Sanbian Wenyang Jiaonang Squama manitis/N/etc Sx07/13/rk2kkkkkts</p>	
<p>风湿关节炎丸 Fengshi Guanjiayan Wan Squama manitis/N/etc Tj10/12/xk4kqkkq9j</p>		<p>烧伤止痛药膏 Shaoshang Zhitong Yaogao Squama manitis/N/etc Hb06/13/ykuk9kkk6</p>	<p>生乳汁 Shengruzhi Squama manitis/N/etc Gz05/10/vkrkpkkska</p>
<p>龟龄集 Guilingji Squama manitis/N/etc Sx07/13/9k1kkkknke</p>		<p>通络生乳糖浆 Tongluo Shengru Tangjiang Squama manitis/N/etc Tj12/09/bkakskkkcd</p>	<p>通络生乳糖浆 Tongluo Shengru Tangjiang Squama manitis/N/etc Tj12/09/bkakskkkcd</p>



Limited legal supplies to meet demand

There is no up-to-date information on the level of demand for pangolin scales in China but between 1990-93, one pharmaceutical company was reported to have acquired 70 tonnes of pangolin scales and, in 1991, imports of 63 tonnes of pangolin scales into China were recorded.¹¹² In 2002, it was thought that about 80-100 tonnes of pangolin scales were consumed for medicine in the country every year.^{113,114} Pangolin scale quota allocations between 2008-14 do not even come close to meeting these dated estimates of supply and demand.

Following the 2006 national inventory and guidelines set out by the SFA in the 2006 (No. 3) and 2007 (No. 242) notices, no further pangolin scale stockpile registration or usage guidelines have been published. This means it is possible that newly acquired stockpiles have continued to be registered with provincial forestry departments. Plausible sources of new pangolin scale stocks would include imports permitted through CITES,^{vii} seized stock sold or auctioned by the Government to companies and hospitals and stock sourced through illicit international supply chains.

Even though the NFGA, China TCM Association and the TCM industry have proactively promoted the captive-breeding of pangolins as an option to generate commercial supplies of pangolin scales,¹¹⁵ a scientific evaluation of its commercial viability clearly shows that it is not feasible.¹¹⁶ It is not possible that stockpiles have been harvested from pangolins bred in captivity.

In 2016, the SFA issued a draft regulation on the disposal of seized wildlife products.¹¹⁷ While it is not known whether this was ever officially issued, the regulation states that if certain conditions are met, seized wildlife products can be auctioned by the Government and the proceeds turned over to the State treasury.

EIA is aware of one example of pangolin scales being auctioned by the Chinese Government. In 2013, Anhui provincial forestry department commissioned a company based in Anhui province to auction a stock of pangolin scales. Given the sale price of RMB 1.47 million (\$200,000), the auction likely involved a significant quantity of pangolin scales. More recent examples from Anhui provincial forestry department documents show that two pharmaceutical companies were given approvals in 2018 and 2019 to trade in “seized” and “auctioned” stock.¹¹⁸

While Government officials have publicly stated that seized pangolin scales are on occasion destroyed,¹¹⁹ these examples demonstrate that they have also entered commercial supply chains and plausibly continue to do so. The Chinese Government seized a minimum of 67.5 tonnes of pangolin scales between 2010-19¹²⁰ and there is a lack of public information as to how these have been stored or disposed of.

Any continued sale or auctioning of seized pangolin stocks by the Chinese Government would be contrary to CITES's latest recommendations on the disposal of confiscated Appendix I specimens outlined in Resolution Conf. 17.8.¹²¹

The lack of transparency around the Government's pangolin scale stockpile management system means that public scrutiny over the origins of new stocks is near impossible. With limited legitimate sourcing channels, serious questions arise as to how pharmaceutical companies and hospitals can generate the gigantic quantities of unprocessed pangolin scales required to satisfy demand.

Above: A TCM outlet in Guangzhou, China. Under the national pangolin scale guidelines, stores such as this cannot sell raw or semi-processed (yinpian) pangolin scales but many do so.



Companies sourcing scales from Africa

EIA's open-source investigations have identified examples from two Chinese provinces – Anhui and Guangdong – showing that wildlife trading companies have sourced pangolin scales through international supply chains and sold these on to pharmaceutical companies.

A CITES export permit and Air Waybill obtained through an EIA undercover investigation show that a company involved in the 2018 sale of two tonnes of pangolin scales, as detailed in an Anhui provincial forestry department document, imported multiple tonnes of pangolin scales from an African country to China two years earlier in 2016.¹²² This raises questions as to whether the scales used in the 2018 sale were those imported in 2016 or scales laundered through the company's registered stockpile. CITES trade database records show that China declared the import of 17.6 tonnes of pangolin scales between 2010-17, 15 tonnes of which originated from African countries.¹²³

Guangdong provincial forestry department awarded seven separate approvals to a wildlife trading company and one of its subsidiaries for the import of pangolin scales from African countries between 2015-17.¹²⁴ At least two of these approvals were granted soon after the CITES Appendix I uplisting was adopted in September 2016, flouting the will of the parties (Figure 8). A further two were issued after the uplisting entered force in January 2017, therefore allowing the company to import scales in violation of CITES. The documents also show that one of the wildlife trading companies sold a large quantity of pangolin scales to a pharmaceutical company based in Guangdong province, which in turn supplied the stock to a large State-owned pharmaceutical company based in Hebei province.

Above: Black-bellied pangolin (*Phataginus tetradactyla*) in Dzanga-Sangha Protected Area, Central African Republic. This species is listed as Vulnerable on the IUCN Red List

The Anhui documents show there has been a minimum of 24 approved transactions involving either the sale or purchase of inventoried quota stockpiles between companies in the province. These have involved 17 approvals for the purchase of stockpiles from other companies, all but one of which were based outside of Anhui province, and seven approvals for the sale of stockpiles to companies in other provinces. The documents specifically mention that the approvals were issued as permitted by Article 27 of the Wildlife Protection Law (Figure 9).

Further examination of the quantities traded under each provincial forestry department approval reveals an average pangolin scale quantity of 841.6kg per transaction. This quantity exceeds what most provinces are allotted per year. This brings into question how each pharmaceutical company can obtain such a

large quantity of inventoried pangolin scales from the national stockpile, and whether such transfers between pharmaceutical companies contradict the annual quota guidelines. These clearly state that no additional quota can be granted by provincial forestry departments, and the use of allotted pangolin scales cannot be extended into subsequent years.

Under the 2006 (No. 3) and 2007 (No. 242) notices, provincial forestry departments must verify, register and inventory stockpiles held by each pangolin scale stock owner. However, once verified, legal origin does not need to be demonstrated at any stage of trading, processing, and exporting. Given the difficulties in tracing the origins of pangolin scale stockpiles, this convoluted trade in quota stocks between private entities could very easily be exploited to launder illicitly sourced pangolin scales into the legal supply chain.

Below: In 2017, The Beijing News reported a story about the purchase of 1.5 tonnes of inventoried pangolin scales by Beijing Tong Ren Tang (Bozhou) Yinpian Co. Ltd from Sichuan Huatang Pharmaceutical Co. Ltd.

中药公司被曝采购3000斤穿山甲片

2月16日晚，微信公众号“原本山川”发文称，“穿山甲濒临灭绝主要因为食用和药用，不仅食用要禁止，所谓合法药用也要禁止”。该帖子还披露安徽省林业厅批准同仁堂(亳州)饮片有限责任公司从四川省华堂药业有限公司购入已封存的穿山甲片1500公斤。安徽省林业厅向新京报记者证实，确有此行政许可决定书。



新《野生动物保护法》第26条规定，禁止出售、收购、利用国家重点保护野生动物及其制品。图/视觉中国

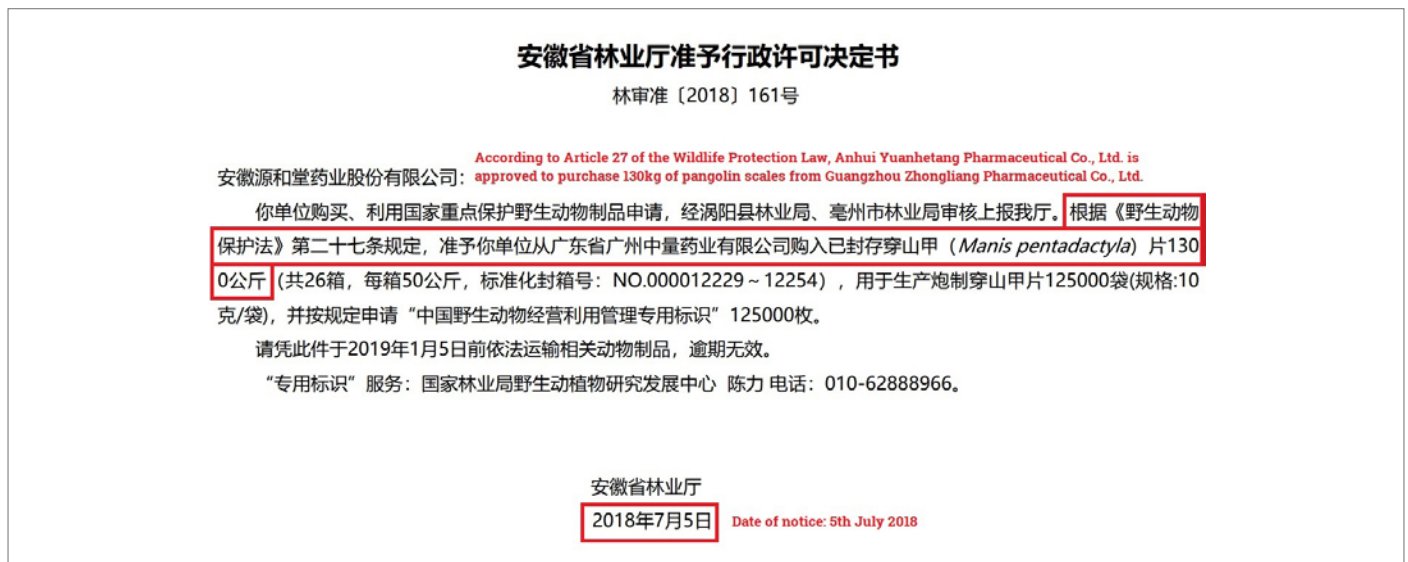
供货方称是存货；公司人员透露以每公斤18万元价格卖出；安徽省林业厅批准采购行为遭质疑

2月16日晚，微信公众号“原本山川”发文称，“穿山甲濒临灭绝主要因为食用和药用，不仅食用要禁止，所谓合法药用也要禁止”。该帖子还披露安徽省林业厅批准同仁堂(亳州)饮片有限责任公司从四川省华堂药业有限公司购入已封存的穿山甲片1500公斤。

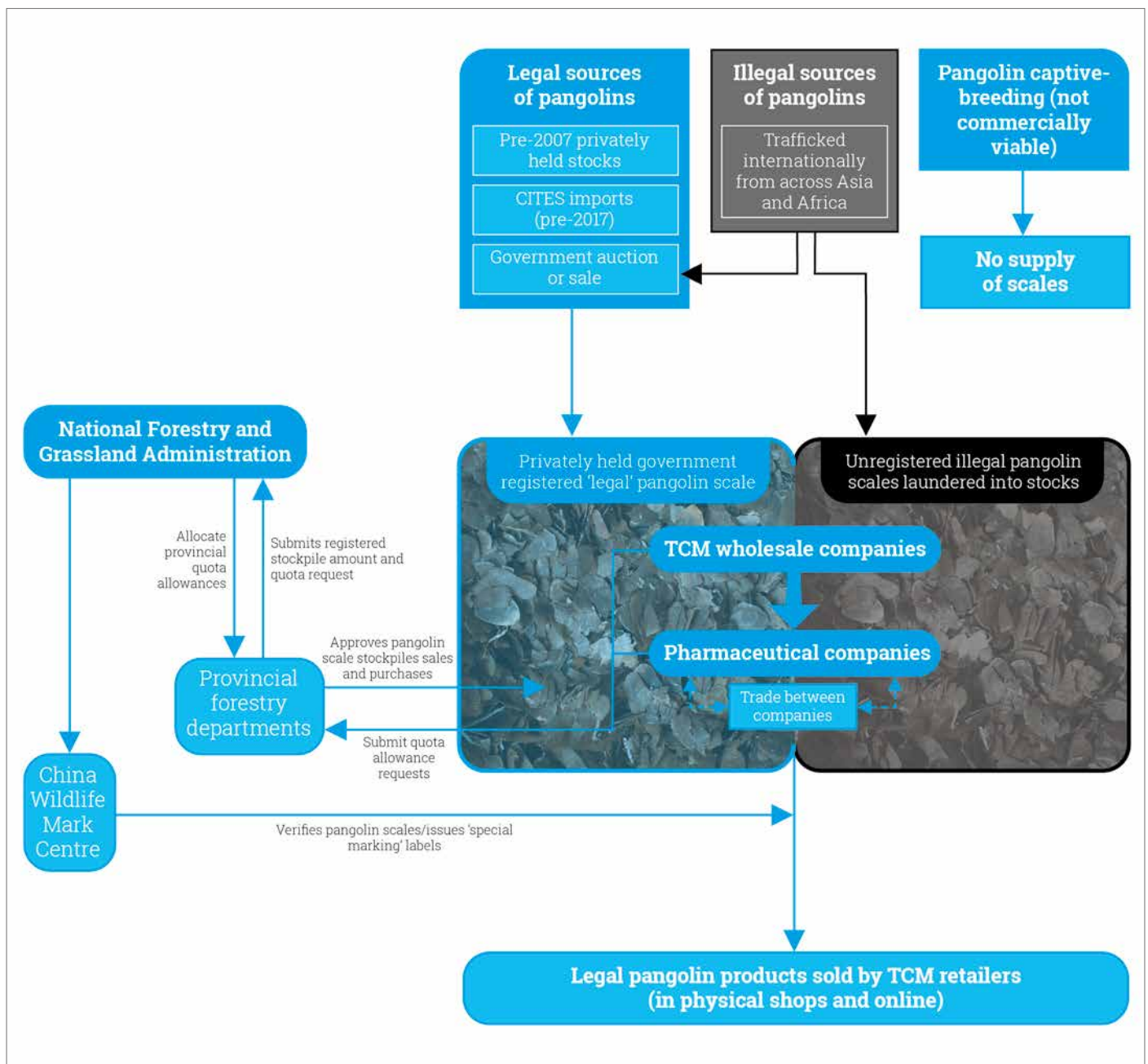
2月17日上午，安徽省林业厅向新京报记者证实，确有此行政许可决定书。而供货的四川省华堂药业有限公司表示，出售的穿山甲片都是以前的存货。不过，该公司并未透露穿山甲片的具体来历。

昨日下午，国家林业局新闻处相关工作人员作出回应，他表示，近期接到很多媒体关于穿山甲保护

Figure 9: Anhui provincial forestry department 2018 approval for pangolin scale transfer referencing Article 27 of the Wildlife Protection Law



Below: The regulatory system run by the Chinese Government that permits pharmaceutical companies to produce and sell pangolin scale medicines.



Pangolin business: the medicines advertised online

To document the availability of legal pangolin scale medicines in China and the role of TCM pharmaceutical companies in the pangolin trade, EIA's open-source investigation focused on the products advertised by manufacturers online.

A staggering 56 pharmaceutical companies were identified to be advertising a total of 64 pangolin scale medicines. The medicines were also found to include the products of other globally threatened and Appendix I listed species including leopard bone, natural musk from musk deer and bear bile. The companies identified included China's largest TCM pharmaceutical company, Beijing Tong Ren Tang Co Ltd, which has subsidiaries across the world and whose investors include major European and US investment funds.

All companies found to be selling pangolin scale medicines were given a right to reply by EIA before publication of this report; we received no responses.

Methodology

By searching the term "pangolin" in Chinese (穿山甲, Chuan Shan Jia) – on TCM reference websites, EIA identified 80 known patent TCM formulations in official Government medical standards which contain pangolin scales as an ingredient. By searching each formulation on the National Medical Products Administration (NMPA) website (nmpa.gov.cn) we built a list of 221 pharmaceutical companies issued with approvals to produce 318 medicine products.

Each NMPA approval contains a unique identification code comprising a letter and eight numbers, which is printed on the product packaging (Figure 10). While this code demonstrates that a company has approval by the

NMPA to produce and sell the medicine, it does not verify the final products produced contain legally sourced wildlife ingredients. The Government verification of the legality of the pangolin scales contained within the product is provided by the CNWM special marking label, which has a different code. Through our research, we identified 23 distinct CNWM labels (page 16).

To confirm the medicines were under production and being advertised for sale, we used web search engines to identify the websites of pharmaceutical companies with approvals to sell medicines which may, according to official standards, contain pangolin scales. Of 221 companies identified, we located 56 that were actively advertising patent pangolin scale medicines online. A total of 64 products were found on manufacturer websites and 101 products on third party sites (including hwzyjt.com, hayao.com, ypk.39.net and yao.xywy.com). The following pages list the products available from four companies: China Beijing Tong Ren Tang Group Co Ltd, Tianjin Zhongxin Pharmaceuticals Group Co Ltd, Hangzhou Zhuyangxin Pharmaceutical Co Ltd and Shenyang Dongling Pharmaceutical Co. Ltd (Figure 11). The other products found are listed in Appendix D.

Given the likelihood that additional pharmaceutical companies may well be producing and selling TCM products containing pangolin without publishing details on an easily identifiable website, the 165 products identified represent the absolute minimum number of pangolin scale TCM products available for sale in China.

Figure 10: Government approval information found on pangolin medicine products



Figure 11: Eight patent traditional Chinese medicine products containing pangolin scales advertised for sale by pharmaceutical companies in China

Company 1	
Company name	China Beijing Tong Ren Tang Group Co., Ltd. 中国北京同仁堂(集团)有限责任公司
Based in: Beijing	Subsidiaries or affiliates in: Australia, Brazil, Brunei, Cambodia, Czech Republic, Germany, Hong Kong, Indonesia, Italy, Macau, Malaysia, Netherlands, New Zealand, Poland, South Africa, Singapore, South Korea, Sweden, Switzerland, Thailand, United Arab Emirates, United Kingdom, United States and Vietnam.
Product 1	Liyangling Pian [Easy throat tablet] 利咽灵片 Tong Ren Tang Technologies Co. Ltd. 北京同仁堂科技发展股份有限公司制药厂
Product page:	Product image:
	
http://www.tongrentangkj.com/index.php?m=content&c=index&a=show&catid=89&id=707	
Ingredient list [Pangolin circled in red]:	
【成份】穿山甲(制)、土鳖虫、僵蚕、牡蛎(煅)、玄参。	
CNWM permission: Bj28/11/bkfk9kkhev; Bj28/14/5k7k2kknkp	 NMPA permission: Z11020295
Source The source of the pangolin scales used in this product is labelled as "wild"	Permits ref: Permits issued by the State Forestry Administration in 2012 (permit number 林护动植便字[2011]113号) and in 2014 (permit number 京绿动植许[2014]190号)
Product 2	Huixiang Juhe Wan [Funnel pain-relieving pill] 茴香橘核丸 Beijing Tong Ren Tang Pharmaceutical Co., Ltd. 北京同仁堂制药有限公司
Product page:	Product image:
	
http://www.trt-pharma.com/trt_product_n.asp?id=31	
Ingredient list [Pangolin circled in red]:	
【成份】盐小茴香、八角茴香、盐橘核、荔枝核、盐补骨脂、肉桂、川楝子、醋延胡索、木香、醋香附、醋青皮、昆布、槟榔、乳香(制)、桃仁、穿山甲(制)。	
CNWM permission: N/A	NMPA permission: Z11020659
Source N/A	Permits ref: N/A

Product 3	Zaizao Wan [Rejuvenation pill] 再造丸 Beijing Tong Ren Tang Company Limited – Pharma 北京同仁堂股份有限公司同仁堂制药厂	
	Product page: 	Product image: 
https://gf.tongrentang.com/menu518/gfDetail/848.html		
Ingredient list [Pangolin circled in red]: <p>【成份】蕲蛇肉、全蝎、地龙、炒僵蚕、穿山甲、骨节（油炙）、人工麝香、水牛角浓缩粉、人工牛黄、醋龟甲、朱砂、天麻、防风、羌活、白芷、川芎、葛根、麻黄、肉桂、细辛、附子（附片）、油松节、桑寄生、骨碎补（炒）、威灵仙（酒炒）、粉萆薢、当归、赤芍、片姜黄、血竭、三七、乳香（制）、没药（制）、人参、黄芪、炒白术、茯苓、甘草、天竺黄、制何首乌、熟地黄、玄参、黄连、大黄、化橘红、醋青皮、沉香、檀香、广藿香、母丁香、冰片、乌药、豆蔻、草豆蔻、醋香附、两头尖（醋制）、神曲、红曲。</p>		
CNWM permission: N/A	NMPA permission: Z11020189	
Source N/A	Permits ref: N/A	


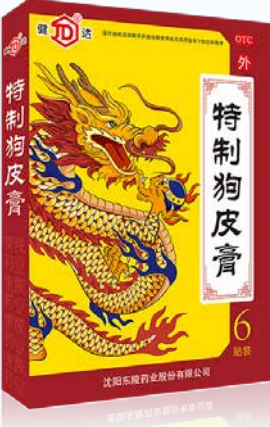

Company 2		
Company name	Tianjin Zhongxin Pharmaceuticals Group Co. Ltd (Darentang Pharmaceuticals Factory) 天津中新药业集团股份有限公司 (达仁堂制药厂)	
Based in: Tianjin	Subsidiaries or affiliates in: N/A	
Product 1	Fengshi Guanjiayan Wan [Rheumatoid arthritis tablet] 风湿关节炎丸	
Product page: 	Product image: 	
http://www.darentang.com.cn/mobile/product/detail/85.html		
Ingredient list [Pangolin circled in red]: <p>【成份】马钱子（调制粉）、麻黄、当归、苍术、续断、桃仁、红花、乳香（制）、没药（制）、千年健、地枫皮、羌活、地龙、桂枝、穿山甲(制)、木瓜、牛膝。</p>		
CNWM permission: Tj10/12/xk4kqkkq9j	 NMPA permission: Z11020295	
Source The source of the pangolin scales used in this product is labelled as "unknown"	Permits ref: Permits issued by the State Forestry Administration to in 2012 (permit number 林护动植便字[2012]51号)	

Company 3

Company name	Hangzhou Zhuyangxin Pharmaceutical Co. Ltd 杭州朱养心药业有限公司	
Based in: Hangzhou	Subsidiaries or affiliates in: N/A	
Product 1	Wan Ling Wu Xiang Gao [Rheumatism relieving cream] 万灵五香膏	
Product page:	Product image:	
		
http://www.zuyaxi.com/product_detail/4.html		
Ingredient list [Pangolin circled in red]:		
<p>[主要成份] 麝香、马钱子、生川乌、穿山甲、乳香（制）、没药（制）、桃仁、红花、赤芍、当归、川芎、续断、姜活等二十余味名贵中药材。</p>		
CNWM permission: [Unclear]		NMPA permission: Z33020534
Source The source of the pangolin scales used in this product is labelled as "wild"	Permits ref: N/A	

Product 2	Wu Xiang Shang Gao [Anti-inflammation cream] 五香伤膏	
Product page:	Product image:	
		
http://www.zuyaxi.com/product_detail/6.html		
Ingredient list [Pangolin circled in red]:		
<p>[药物组成] 穿山甲、乳香（制）、没药（制）、冰片、辛夷、肉桂、生川乌、红花、血竭、马钱子等27味。</p>		
CNWM permission: N/A	NMPA permission: Z33020236	
Source N/A	Permits ref: N/A	

Company 4	
Company name	Shenyang Dongling Pharmaceutical Co. Ltd. 沈阳东陵药业股份有限公司
Based in: Shenyang	Subsidiaries or affiliates in: N/A
Product 1	<p>Tianglong Ba Du Gao [Tianlongba poison ointment] 天龙拔毒膏</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Product page:</p>  <p>http://www.sydlly.com.cn/product/21.html</p> </div> <div style="width: 45%;"> <p>Product image:</p>  </div> </div> <p>Ingredient list [Pangolin circled in red]:</p> <p>【成份】蜈蚣、黄连、乳香、玄参、大黄、白芷、独活、蓖麻仁、冰片、当归、猪牙皂、防风、密陀僧、五倍子、没药、生草乌、薄荷油、羌活、生川地、地、全蝎、黄柏、地骨皮、穿山甲、冬青油、盐酸茶海拉明。</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CNWM permission: [Unclear]</p>  </div> <div style="width: 45%;"> <p>NMPA permission: Z21020450</p> </div> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Source The source of the pangolin scales used in this product is labelled as "unknown"</p> </div> <div style="width: 45%;"> <p>Permits ref: N/A</p> </div> </div>

Product 2	<p>Tezhi Goupi Gao [Body-pain relief cream] 特制狗皮膏</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Product page:</p>  <p>http://www.sydlly.com.cn/product/28.html</p> </div> <div style="width: 45%;"> <p>Product image:</p>  </div> </div> <p>Ingredient list [Pangolin circled in red]:</p> <p>【成份】枳壳、细辛、赤石脂、青风藤、天麻、青皮、羌活、乌药、生川乌、甘草、白芷、黄柏、川芎、木香、远志、桃仁、白术、生草乌、小茴香、穿山甲、菟丝子、川楝子、蛇床子、威灵仙、大枫子、赤芍、牛膝、补骨脂、续断、附子、杜仲、香附、僵蚕、当归、陈皮、肉桂、儿茶、乳香、血竭、没药、丁香、樟脑、水杨酸甲酯、薄荷油、冰片、盐酸茶海拉明、颠茄流浸膏、氢醌。辅料为橡胶、羊毛脂、凡士林、液状石蜡、松香、立德粉。</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CNWM permission: [Unclear]</p>  </div> <div style="width: 45%;"> <p>NMPA permission: Z21020445</p> </div> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Source The source of the pangolin scales used in this product is labelled as "unknown"</p> </div> <div style="width: 45%;"> <p>Permits ref: N/A</p> </div> </div>
------------------	--

In the mail: the pangolin products with international shipping

EIA has found six pangolin scale medicine products manufactured in China available for purchase with international shipping on e-commerce platforms. Some of the e-commerce platforms used are the world's largest, such as eBay and Taobao (owned by Alibaba) (Figure 12).

Under CITES, the international trade in these pangolin medicine products would be illegal since they would be defined as containing “any readily recognisable part or derivative thereof” as outlined in CITES Resolution

Conf. 9.6 (Rev. CoP16)¹²⁷ This demonstrates the significant potential for China's legal pangolin scale medicine market to generate products that are exported and therefore enter illegal international trade.

Figure 12: Examples of e-commerce platforms with pangolin scale medicines available for sale with international shipping

Pangolin product “Jing Wan Hong” sold on eBay.com

Shipping: \$3.00 (approx. HKD 23.85) Standard Shipping from China to Hong Kong/Taiwan to worldwide

<https://www.ebay.com/itm/2pcs-JingWanHong-jing-wan-hong-20g-tube-Free-shipping-New/392347620637?epid=1540999885&hash=item5b59bd951d:g:7lkaAQSw-EJdMoTl>

Pangolin product “DuJi DuJiao Gao” (杜记独角膏) sold on Taobao

运费 广东广州 至海外 快递: 999.00

Shipped from Guangzhou to overseas

<https://detail.tmall.com/item.htm?id=528794870885&spm=a21wu.12321156-tw.0.0.3e277aebXkcfH>



©Brent Stirton

Time for action: Chinese Government must close its legal pangolin scale market

In 2016, following years of pressure from the international community and wildlife campaigners, the Chinese State Council issued an order banning the processing and sale of elephant ivory.¹²⁸ This recognised that closing the legal domestic ivory market would help combat the global trafficking of ivory.

Now is the time for similar leadership from the Chinese Government to eliminate consumer demand for traditional Chinese medicines containing the products of globally threatened species.

The findings presented in this report show that China's legal trade in pangolin scale medicine has a high

potential to be driving the global pangolin trafficking crisis. On the horizon, the growing global expansion of TCM through China's Belt and Road Initiative will potentially exacerbate the threat trafficking poses to wildlife,¹²⁹ including pangolins. Meaningful action from the Chinese Government to close its domestic market for pangolin scale medicines is urgently required.



China's Wildlife Protection Law, particularly Article 27, plays a pivotal role in ensuring a flawed system for regulating the commercial trade in pangolin scales persists. This legal context legitimises the consumption of pangolin scales in medicine and stimulates consumer demand for an illicit product that is sustaining transnational organised crime and pushing pangolins towards extinction.

Most TCM medications do not use the body parts of globally threatened wildlife and the replacement of pangolin scales in TCM is feasible. Recently, academics have pointed out that herbal substitutes with similar purported functions do exist.¹³⁰

Pangolins carry coronaviruses and may have played an intermediary role in the 2019 spillover of coronavirus (SARS-CoV-2) from bats to humans in China.^{131,132,133,134} While the science on this link is not conclusive, it does demonstrate that the trade in pangolins poses a global human health risk. The pangolin scale

medicine supply chain involves many stages in which humans can be exposed to the viruses they carry.¹³⁵

In February 2020, China announced regulations prohibiting the consumption of terrestrial wild animals as food, a measure intended to safeguard human health.¹³⁶ This failed to also prohibit the trade in wild animals for other purposes such as traditional medicine.¹³⁷ The use of wildlife parts in medicine is also a risk factor in disease spillover since it requires the capture, transport and processing of animals.

Stakeholders in China are already calling for the wildlife consumption ban to extend beyond food and include the medicinal use of wildlife.¹³⁸ Action from the Chinese Government to end the use of wild animals, such as pangolins, in medicine is a critical measure needed to prevent future pandemics and protect the world's rapidly declining biodiversity.

Above: Temminck's pangolins (*Smutsia temminckii*) rescued from the illegal wildlife trade in Zimbabwe by Tikki Hywood Foundation.

Recommendations

The Chinese Government should:

- Prohibit the acquisition, sale or possession, including for medicinal purposes, of all parts and products of pangolins and other globally threatened species, including those from captive-bred sources. This can be achieved by amending the Wildlife Protection Law, including key Articles such as 25, 27 and 28 to unambiguously prohibit commercial use of wildlife under special State protection or CITES Appendix I listed species¹³⁹
- Remove pangolins and other globally threatened species entirely from the TCM pharmacopoeia and other nationally approved medicine lists to end the production of patent medicine containing these species as an ingredient
- Destroy Government and privately held stockpiles of pangolin scales where they are no longer needed for criminal justice, scientific or training purposes
- Clarify the penalties for pharmaceutical companies and hospitals which illegally source, manufacture or sell pangolin scales
- Implement an extensive demand-elimination and consumer behaviour change campaign to end the use of pangolins and other globally threatened species in TCM
- Continue successful efforts to investigate and prosecute transnational criminal networks involved in pangolin trafficking, in cooperation with source and transit countries

The companies named in this report should:

- Immediately cease production and sale of products containing pangolin scales
- Revise formulations of these products and replace pangolin scales with herbal alternatives from sustainable sources
- Make a public statement that they will no longer use the products of wildlife threatened by trade

Investors of these companies should:

- Withdraw investments in the companies detailed in this report pending assurances that the company will cease the use and sale of pangolins and other wildlife threatened by trade
- Review investment portfolios and publicly announce divestment in companies using wildlife threatened by trade

CITES Parties should:

- Call for urgent action by China to eliminate consumer demand for pangolin scale products, including the closure of its domestic legal market for TCM containing pangolin scales
- Call for the adoption of an amendment to Resolution Conf. 17.10 on the conservation of and trade in pangolins so that it strongly encourages Parties with high levels of consumer demand for pangolin specimens to eliminate demand for these, including closing legal domestic markets
- Call for the adoption of an amendment to Resolution Conf 17.10 so that the Secretariat is instructed to report to the Standing Committee and the Conference of the Parties on the status of pangolins in the wild, their conservation and trade controls in place
- Call for urgent action by pangolin range, transit and consumer states to address pangolin trafficking, using intelligence-led investigations and implementation of legislation aimed at disrupting transnational organised crime, including money laundering laws

Source and transit countries, especially Nigeria, Cameroon, the Democratic Republic of the Congo, Malaysia, Singapore, Vietnam and Hong Kong should:

- Where necessary, strengthen legal frameworks for the protection of pangolins and other globally threatened wildlife, and those related to combating transnational organised crime
- Resource and undertake multi-agency intelligence-led investigations into the criminal networks involved in pangolin scale trafficking, including the corrupt facilitators and enablers implicated, and deliver successful prosecutions with proportionate penalties



Appendix I: full list of pangolin products still in pharmacopoeia 2020

Name of formula	English translation	Purposes
再造丸	Zaizao Wan	Improve blood circulation
拔毒膏	Ba Du Gao	expel pus and other toxics, anti-inflammatory
金蒲胶囊	Jin Pu Jiaonang	Treat gastric cancer and esophageal cancer; clear phlegm and other toxics
妇科通经丸	Fuke Tong Jing Wan	Relieve menstrual cramps and resolve blood stasis
麝香脑脉康胶囊	Shexiang Nao Mai Kang Jiaonang	Relieve stroke and hemiplegia
龟龄集	Guiling Ji	Strengthen kidney, improve memory and sleep, reduce cough and loss of appetite
阿魏化痞膏	Awei Huapi Gao	Relieve abdominal pain and tight chest
茴香橘核丸	Huixiang Juhe Wan	Relieve pain and testicular swelling

Appendix II: full list of pangolin products still covered by national insurance

Name of formula	English translation	Source of patented ingredient list that contains pangolin
再造丸	Zaizao Wan	Pharmacopoeia 2020 (中国药典)
拔毒膏	Ba Du Gao	Pharmacopoeia 2020 (中国药典)
茴香橘核丸	Huixiang Juhe Wan	Pharmacopoeia 2020 (中国药典)
威灵骨刺膏	Wei Ling Gu Ci Gao	List of new medicines approved by the National Medical Products Administration (新药转正标准)
痔血丸	Zhi Xue Wan	National Standard for Chinese Patent Drugs by the Ministry of Health (卫生部药品标准中药成方制剂)

Appendix III: Annual consumption of pangolin scales stockpile, announced by NFGA

Annual consumption of pangolin scales stockpile (in kg) ⁱⁱⁱ								
	Total	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Beijing 北京	35,548	2,591	4,370	6,270	6,343	5,975	5,000	5,000
Zhejiang 浙江	26,758	3,900	3,721	3,355	3,555	3,927	4,100	4,200
Shanghai 上海	24,718	3,960	3,876	2,860	3,360	3,562	3,700	3,400
Jilin 吉林	13,749	1,400	1,411	2,405	2,606	2,247	2,230	1,450
Guangdong 广东	13,706	2,400	367	1,978	1,870	1,650	2,720	2,720
Liaoning 辽宁	13,100	2,521	688	2,776	2,675	1,575	1,565	1,300
Yunnan 云南	8,520	1,900	1,550	852	1,352	1,666		1,200
Sichuan 四川	7,952	402	1,100	900	1,400	1,400	1,400	1,350
Jiangxi 江西	7,237		2,251	993	1,493		1,600	900
Tianjin 天津	6,019	495	1,248	1,348	972	950	536	470
Hebei 河北	5,301		307	859	1,359	1,155	900	720
Hubei 湖北	3,989	831	579	380	650		800	750
Shanxi 山西	3,340	1,428		396	223	564	380	350
Shandong 山东	2,895	820	597	679				800
Henan 河南	2,346	792	711	323	32	159		330
Heilongjiang 黑龙江	2,228	226	381	339	344	289	300	350
Shaanxi 陕西	2,188	1,038	235	546	19		350	
Guizhou 贵州	1,907		1,300	301				306
Inner Mongolia 内蒙古	1,463	240	305	206	457	256		
Chongqing 重庆	1,290			720			220	350
Hunan 湖南	600		540				60	
Tibet 西藏	520				520			
Anhui 安徽	360			360				
Fujian 福建	190		190					
Qinghai 青海	142	142						
	186,067	25,085	25,726	28,845	29,229	25,374	25,861	25,946

Notes

i "Tonnes" = metric tonnes (1,000kg).

ii For seizures in which the destination was known.

iii Note: seizure data are subject to biases associated with law enforcement effort/detection and reporting.

iv The CITES Review of Significant Trade procedure, defined in Resolution Conf. 12.8 (Rev. CoP17), was designed to identify species that may be subject to unsustainable levels of international trade.

v It is typical for the traditional Chinese medicine industry to use non-taxonomic terms, which obfuscates which species are being used in medicine.

vi Chinese patent medicines are medicines in traditional Chinese medicine comprising multiple ingredients combined in standardised quantities in a ready-to-use form such as tablets, oral solutions or dry suspensions.

vii Including those imported in 2016/2017 from the DRC on falsified CITES permits, more information: p6 <https://cites.org/sites/default/files/eng/com/sc/69/E-SC69-29-02-02.pdf>

References

1. UNODC, World Wildlife Crime Report 2020, United Nations Office on Drugs and Crime, 2020. Available online: https://www.unodc.org/documents/data-and-analysis/wildlife/2020/World_Wildlife_Report_2020_9July.pdf
2. CITES. 2016. Notification to the Parties: Amendments to Appendices I and II of the Convention. CITES CoP17. Available online: <https://cites.org/sites/default/files/notif/E-Notif-2016-063.pdf>
3. Challender D.W.S., Heinrich S., Shepherd C. R., Katsis L. K.D. 2020. Chapter 16 - International trade and trafficking in pangolins, 1900–2019, Editor(s): Challender D.W.S., Nash H. C., Waterman C., In Biodiversity of World: Conservation from Genes to Landscapes, Pangolins, Academic Press, Pages 259–276.
4. UNODC, World Wildlife Crime report, 1.
5. C4ADS. 2020. Tipping the scales: Exposing the Growing Trade of African Pangolins into China's Traditional Medicine Industry. Available online: www.c4reports.org/tipping-the-scales
6. Pietersen, D., Jansen, R. & Connelly, E. 2019. *Smutsia temminckii*. The IUCN Red List of Threatened Species 2019: e.T12765A123585768. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12765A123585768.en>. Downloaded on 28 August 2020.
7. Ingram, D.J., Shirley, M.H., Pietersen, D., Godwill Ichu, I., Sodeinde, O., Mombolou, C., Hoffmann, M., Gudehus, M. & Challender, D. 2019. *Phataginus tetradactyla*. The IUCN Red List of Threatened Species 2019: e.T12766A123586126. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12766A123586126.en>. Downloaded on 28 August 2020.
8. Nixon, S., Pietersen, D., Challender, D., Hoffmann, M., Godwill Ichu, I., Bruce, T., Ingram, D.J., Matthews, N. & Shirley, M.H. 2019. *Smutsia gigantea*. The IUCN Red List of Threatened Species 2019: e.T12762A123584478. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12762A123584478.en>. Downloaded on 28 August 2020.
9. Pietersen, D., Mombolou, C., Ingram, D.J., Soewu, D., Jansen, R., Sodeinde, O., Keboy Mov Linkey Iflankoy, C., Challender, D. & Shirley, M.H. 2019. *Phataginus tricuspis*. The IUCN Red List of Threatened Species 2019: e.T12767A123586469. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12767A123586469.en>. Downloaded on 28 August 2020.
10. Schoppe, S., Katsis, L. & Lagrada, L. 2019. *Manis culionensis*. The IUCN Red List of Threatened Species 2019: e.T136497A123586862. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T136497A123586862.en>. Downloaded on 28 August 2020.
11. Challender, D., Willcox, D.H.A., Panjang, E., Lim, N., Nash, H., Heinrich, S. & Chong, J. 2019. *Manis javanica*. The IUCN Red List of Threatened Species 2019: e.T12763A123584856. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12763A123584856.en>. Downloaded on 28 August 2020.
12. Challender, D., Wu, S., Kaspal, P., Khatiwada, A., Ghose, A., Ching-Min Sun, N., Mohapatra, R.K. & Laxmi Suwal, T. 2019. *Manis pentadactyla* (errata version published in 2020). The IUCN Red List of Threatened Species 2019: e.T12764A168392151. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12764A168392151.en>. Downloaded on 28 August 2020.
13. Mahmood, T., Challender, D., Khatiwada, A., Andleeb, S., Perera, P., Trageser, S., Ghose, A. & Mohapatra, R. 2019. *Manis crassicaudata*. The IUCN Red List of Threatened Species 2019: e.T12761A123583998. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12761A123583998.en>. Downloaded on 28 August 2020.

14. Duckworth, J.W., Salter, R.E., Khounboline, K., 1999. Wildlife in Lao PDR: 1999 Status Report. IUCN, Wildlife Conservation Society, Centre for Protected Areas and Watershed Management, Vientiane, Lao PDR.
15. Newton, P., Nguyen, V.T., Robertson, S., Bell, D., 2008. Pangolins in peril: using local hunters' knowledge to conserve elusive species in Vietnam. *Endangered Species Research* 6, 41–53.
16. Yang, L., Chen, M., Challender, D.W., Waterman, C., Zhang, C., Huo, Z., Liu, H. and Luan, X., 2018. Historical data for conservation: reconstructing range changes of Chinese pangolin (*Manis pentadactyla*) in eastern China (1970–2016). *Proceedings of the Royal Society B: Biological Sciences*, 285(1885), p.20181084.
17. Challender, D., Willcox, D.H.A., Panjang, E., Lim, N., Nash, H., Heinrich, S. & Chong, J. 2019. *Manis javanica*. The IUCN Red List of Threatened Species 2019: e.T12763A123584856. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12763A123584856.en>. Downloaded on 28 August 2020.
18. EIA. 2019. Illegal trade pressure on pangolins pushes three species further up the risk register. Environmental Investigation Agency UK. London, United Kingdom. Available online: <https://eia-international.org/news/illegal-trade-pressure-on-pangolins-pushes-three-species-further-up-the-risk-register/>
19. Xing, S., Bonebrake T.C., Cheng W., Zhang M., Ades G., Shaw D., Zhou Y. 2020. Chapter 14 - Meat and medicine: historic and contemporary use in Asia, Editor(s): Challender D.W.S., Nash H. C., Waterman C., In Biodiversity of World: Conservation from Genes to Landscapes, Pangolins, Academic Press, Pages 227–239.
20. Soewu D., Ingram D.J., Jansen R., Sodeinde O., Pietersen D.W. 2020. Chapter 15 - Bushmeat and beyond: historic and contemporary use in Africa, Editor(s): Challender D.W.S., Nash H. C., Waterman C., In Biodiversity of World: Conservation from Genes to Landscapes, Pangolins, Academic Press, Pages 241–258.
21. Challender D.W.S., et al. International trade and trafficking in pangolins, 1900–2019, 3.
22. Heinrich, S., Ross, J.V. and Cassey, P., 2019. Of cowboys, fish, and pangolins: US trade in exotic leather. *Conservation Science and Practice*, 1(8), p.e75.
23. Wu, S.B., Liu, N., Zhang, Y. & Ma, G.Z. 2004. Assessment of threatened status of Chinese Pangolin (*Manis pentadactyla*) [in Chinese]. *Chinese Journal of Applied and Environmental Biology* 10, 456–461.
24. CITES. 2000. Prop. 11.13. Consideration of proposals for amendment of Appendices I and II. CITES CoP11.
25. Challender, D., et al., *Manis pentadactyla*, 12.
26. Challender, D., et al., *Manis javanica*, 11.
27. Schoppe, S., et al., *Manis culionensis*, 10.
28. CITES. Amendments to Appendices I and II of the Convention, 2.
29. CITES. 2016. Resolution Conf. 17.10. Conservation of and trade in pangolins. CITES CoP17. <https://www.cites.org/eng/res/17/17-10.php>
30. EIA. 2020. Global pangolin seizures dataset. Environmental Investigation Agency UK. London, United Kingdom.
31. Challender, D.W.S. and Hywood, L., 2012. African pangolins under increased pressure from poaching and intercontinental trade. *TRAFFIC Bulletin* 24 (3).
32. Wildlife Justice Commission. 2020. Scaling up: The Rapid Growth in the Industrial Scale Trafficking of Pangolin Scales 2016–2019. Available online: https://wildlifejustice.org/wp-content/uploads/2020/02/The_Rapid_Growth_in_the_Trafficking_of_Pangolin_Scales_2016-2019.pdf
33. C4ADS. Tipping the scales, 5.
34. Challender D., O'Criodain C. 2020. Chapter 19 - Addressing trade threats to pangolins in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Editor(s): Challender, D. Nash H.C., Waterman C., In Biodiversity of World: Conservation from Genes to Landscapes, Pangolins, Academic Press, Pages 305–320.
35. Broad, S., Luxmoore, R., Jenkins, M., 1988. Significant Trade in Wildlife, A Review of Selected Species in CITES Appendix II. IUCN Conservation Monitoring Centre, Cambridge, UK.
36. CITES. 1992. Doc. 8.30. Significant Trade in Appendix-II Species – Animals, Report from the Animals Committee. World Conservation Monitoring Centre and IUCN/SSC Trade Specialist Group.
37. CITES. 1999. Review of Significant Trade in Animal Species included in CITES Appendix II, Detailed Review of 37 species. World Conservation Monitoring Centre, IUCN Species Survival Commission and TRAFFIC, Cambridge, UK.
38. CITES. 2000. Prop. 11.13. Consideration of proposals for amendment of Appendices I and II. CITES CoP11. Available online: <https://www.cites.org/sites/default/files/eng/cop/11/prop/13.pdf>
39. CITES. 2000. Amendments to Appendices I and II of the Convention. CITES CoP11. Available online: https://www.cites.org/sites/default/files/eng/cop/11/other/E-Amendments_App.pdf
40. Ibid., 12.

41. Heinrich, S., Wittmann, T.A., Prowse, T.A., Ross, J.V., Delean, S., Shepherd, C.R. and Cassey, P., 2016. Where did all the pangolins go? International CITES trade in pangolin species. *Global Ecology and Conservation*, 8, pp.241-253.
42. Liou, C. (ed). 2006. The state of wildlife trade in China: Information on the trade in wild animals and plants in China 2006. TRAFFIC East Asia, China. Available online: https://www.trafficj.org/publication/08-State_of_Wildlife_China.pdf
43. Ling, X. 2008. The Pangolin Trade in China. Proceedings of the Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia. 30 June to 2 July 2008, Singapore Zoo. Edited by Pantel, S. and Chin, S.Y. Available online: <https://www.traffic.org/site/assets/files/5760/proceedings-of-workshop-on-conservation-asian-pangolins.pdf>
44. CITES. 2020. CITES trade statistics derived from the CITES Trade Database, UNEP World Conservation Monitoring Centre, Cambridge, UK. Available online: <https://trade.cites.org/>.
45. EIA. Global pangolin seizures dataset, 30.
46. Challender D. 2011. Asian pangolins: Increasing affluence driving hunting pressure. *TRAFFIC Bulletin* 23, pp. 92-93.
47. TRAFFIC Southeast Asia (2004). Armoured but endangered. *Asian Geographic* (4). Available online: https://wwf.panda.org/wwf_news/?15278/Armoured-but-endangered
48. CITES. 2014. SC65 Doc. 27.1 Enforcement matters: report to the secretariat. Standing Committee 65, Geneva, Switzerland. Available online: <https://cites.org/sites/default/files/eng/com/sc/65/E-SC65-27-01.pdf>
49. Zhou, Z., Zhou, Y., Newman, C. and Macdonald, D.W. 2014. Scaling up pangolin protection in China. *Frontiers in Ecology and the Environment*, 12: 97-98.
50. CITES. 2016. SC 66 Doc. 50.2 Report of the first pangolin range states meeting. Standing Committee 66, Geneva, Switzerland. Available online: <https://cites.org/sites/default/files/eng/com/sc/66/E-SC66-50-02.pdf>
51. CITES. 2019. Resolution Conf. 10.10 (Rev. CoP18) Trade in elephant specimens. Available online: <https://cites.org/sites/default/files/document/E-Res-10-10-R18.pdf>
52. CITES. 2019. Resolution Conf. 12.5 (Rev. CoP18) Conservation of and trade in tigers and other Appendix I Asian big cat species. Available online: <https://www.cites.org/sites/default/files/document/E-Res-12-05-R18.pdf>
53. CITES. 2016. Resolution Conf. 11.8 (Rev. CoP17) Conservation of and control of trade in the Tibetan antelope. Available online: <https://www.cites.org/sites/default/files/document/E-Res-11-08-R17.pdf>
54. CITES. 2016. Resolution Conf. 9.14 Conservation of and trade in African and Asian rhinoceroses. Available online: <https://www.cites.org/sites/default/files/document/E-Res-09-14-R17.pdf>
55. Webster, M., 1977. China's back door. *Oryx*, 14(1), pp.61-66.
56. Broad, S., Luxmoore, R. and Jenkins, M. eds., 1988. Significant trade in wildlife: a review of selected species in CITES appendix II. International Union for Conservation of Nature and Natural Resources.
57. SAMR. 1987. Regulations of wild TCM materials [in Chinese]. Available online: http://gkml.samr.gov.cn/nsjg/fqs/201902/120190217_289772.html
58. The State Council (1988). Wildlife Protection Law of the Republic of China. [in Chinese]. http://www.npc.gov.cn/zgrdw/npc/xinwen/2018-11/05/content_2065670.htm. 8 November.
59. SFA. 1988. List of state protected animals of 1988. [in Chinese]. Available online: <http://www.forestry.gov.cn/main/3954/20180104/1063883.html>
60. NFGA. 2020. Pangolins uplisted to first-class protected species [in Chinese]. Available online <http://www.forestry.gov.cn/main/72/20200608/093808350793059.html>
61. NFGA. 2020. List of state protected animals of 2020 [in Chinese]. National Forestry and Grassland Administration. Available online: <http://www.forestry.gov.cn/main/153/20200619/092731170435586.html>
62. National People's Congress. 2014. Eating precious wild animals will face criminal liability (in Chinese). Available online: http://www.npc.gov.cn/zgrdw/npc/xinwen/lfgz/lfd/2014-04/22/content_1860598.htm
63. EIA. 2019. China's Wildlife Protection Law. Environmental Investigation Agency UK, London, United Kingdom. Available online: <https://eia-international.org/wildlife/saving-tigers/tiger-farming/chinas-wildlife-protection-law/>
64. EIA. 2020. Unbelievable: Chinese government recommends injections containing bear bile to treat coronavirus. Environmental Investigation Agency UK, London, United Kingdom. Available online: <https://eia-international.org/news/unbelievable-chinese-govt-recommends-injections-containing-bear-bile-to-treat-coronavirus/>
65. EIA. 2020. A Bitter Pill to Swallow: China's flagrant trade in leopard bone products. Environmental Investigation Agency UK, London, United Kingdom. Available online: <https://eia-international.org/wp-content/uploads/EIA-report-Bitter-Pill-to-Swallow-spreads.pdf>
66. Cui, S., Milner-Gulland, E.J., Singh, N.J., Chu, H., Li, C., Chen, J. and Jiang, Z., 2017. Historical range, extirpation and prospects for reintroduction of saigas in China. *Scientific reports*, 7, p.44200.
67. Lam, T., Lingxu, Takahashi, S. and Burgess, E.A., 2012. Market forces: an examination of marine turtle trade in China and Japan. TRAFFIC East Asia. Available online: <https://www.traffic.org/publications/reports/market-forces-an-examination-of-marine-turtle-trade-in-china-and-japan/>
68. SFA. 1993. Notice of the Ministry of Forestry on Approving Certain Endangered Wild Animals as National Key Protected Wildlife. 14/4/1993 [In Chinese]. Available online: <http://zhuceabc.com/plus/view-1534-1.html>
69. NFGA. 2019. National Endangered Management Office Announcement No. 4 of 2019. 'List of Wild Animals and Their Products whose Trade Is Prohibited or Restricted by International Conventions to which the People's Republic of China has concluded or participated' [In Chinese]. Available online: <http://www.forestry.gov.cn/bwwz/2790/20191202/104327216263159.html>
70. SFA. 2003. Notice of cleaning up and rectifying wildlife products and manufacturers & launch of the labeling trial pilot, issued by SFA and SAIC [in Chinese]. Available online: <http://www.forestry.gov.cn/sites/main/main/gov/content.jsp?TID=1072>
71. SFA. 2007. Notice on enhancing the protection on resources of saiga antelope, pangolin and rare snake, as well as the regulating on their products for medicine use (Linhuifa [2007] No.242) [in Chinese]. Available online: <http://www.forestry.gov.cn/main/4818/content-796751.html>
72. State Food and Drug Administration. 2008. Principles for the treatment of Chinese medicine varieties containing endangered medicinal materials (Guo Shi Yao Jian Zhu [2008] No. 271). Available online: <https://www.chinacourt.org/law/detail/2008/06/id/126640.shtml>
73. Shanghai Traditional Chinese Medicine Trade Association. 2008. Saiga pangolin rare snake raw materials are only used in designated Chinese medicine hospitals [in Chinese]. Available online: <http://www.stcma.cn/index.php?m=content&c=index&a=show&catid=15&id=2041>
74. SFA. 2008. Notice on Consumption Rate of Pangolin Scales and Rare Snakes in 2008-2009 [in Chinese]. Available online: <http://www.forestry.gov.cn/main/4818/content-796975.html>
75. SFA. 2009. Notice on Consumption Rate of Pangolin Scales and Rare Snakes in 2009-2010 [in Chinese]. Available online: <http://www.forestry.gov.cn/zrbh/4833/88561/7.html>
76. SFA. 2010. Notice on Consumption Rate of Pangolin Scales in 2010-2011 [in Chinese]. Available online: <http://www.qikan.com/article/gjgb20100404.html>
77. SFA. 2011. Notice on Consumption Rate of Pangolin Scales in 2011-2012 [in Chinese]. Available online: <https://www.forestry.gov.cn/main/4818/20110810/797383.html>
78. SFA. 2012. Notice on Consumption Rate of Pangolin Scales in 2012-2013 [in Chinese]. Available online: <http://www.forestry.gov.cn/main/4818/content-797353.html>
79. SFA. 2013. Notice on Consumption Rate of Pangolin Scales in 2013-2014 [in Chinese]. Available online: <https://www.forestry.gov.cn/zrbh/4833/88621/1.html>
80. SFA 2014. Notice on Consumption Rate of Pangolin Scales in 2014-2015 [in Chinese]. Available online: <https://wenku.baidu.com/view/ae557933abea998fcc22bcd126ff705cc175ccb.html>
81. NFGA. 2020. Notice of the NFGA on further strengthening the protection and management of pangolins [In Chinese]. Available online: http://lcj.als.gov.cn/art/2020/7/1/art_1000_307090.html
82. The Health Times. 2020. No more medicinal use! Pangolin removed from the Pharmacopoeia [in Chinese]. Available online: <http://www.jksb.com.cn/html/xinwen/2020/0609/163148.html>
83. Alberts, E.C. 2020. Banned: No more pangolin scales in traditional medicine, China declares. 010/06/2020. Mongabay. Available online: <https://news.mongabay.com/2020/06/banned-no-more-pangolin-scales-in-traditional-medicine-china-declares/>
84. CNN. 2020. China removes pangolin scales from traditional medicine list, helping protect world's most trafficked mammal. 11/06/2020. Available online: <https://edition.cnn.com/2020/06/10/asia/china-pangolin-protection-medicine-intl-hnk/index.html>
85. Briggs, H. 2020. Hope for pangolins as protection boosted in China. 10/06/2020. BBC. Available online: <https://www.bbc.co.uk/news/science-environment-52981804>
86. EIA. 2020. China's widely publicised new pangolin protections might not mean a total ban on use of the species. Environmental Investigation Agency UK, London, United Kingdom. Available online: <https://eia-international.org/news/chinas-widely-publicised-new-pangolin-protections-might-not-mean-a-total-ban-on-use-of-the-species/>
87. Pharmacopoeia of the People's Republic of China. 2020. Volume 1. Beijing: People's Medical Publishing House.
88. NHC. National Standard for Chinese Patent Drugs of the National Health Commission of the PRC [in Chinese]. Available online: <https://db.yaozh.com/chufang?comprehensivesearchcontent=穿山甲>
89. NMPA. List of new medicines [in Chinese]. Available online: <https://db.yaozh.com/chufang?comprehensivesearchcontent=穿山甲>
90. NMPA. List of approved processed Chinese medicine [in Chinese]. Available online: <https://db.yaozh.com/chufang?comprehensivesearchcontent=穿山甲>

91. NMPA. Registered Standards [in Chinese]. <https://db.yaozh.com/chufang?comprehensivesearchcontent=穿山甲>
92. SFA. 2008. Notice No. 15. State Forestry Administration Announcement [in Chinese]. Available online: <http://www.forestry.gov.cn/sites/main/main/gov/content.jsp?TID=678>
93. SFA. 2015. Notice No. 8. State Forestry Administration Announcement [in Chinese]. Available online: <http://www.forestry.gov.cn/main/3457/20150508/763732.html>
94. EIA. 2020. Unbelievable, 64.
95. NHSA. 2019. Notice of the "National Basic Medical Insurance, Work Injury Insurance and Maternity Insurance Drug List". Medical Insurance Issue (2019) No. 46. Available online: http://www.nhsa.gov.cn/art/2019/8/20/art_37_1666.html
96. NHSA. 2017. Notice of the Ministry of Human Resources and Social Security on Issuing the National Basic Medical Insurance, Work Injury Insurance and Maternity Insurance Drug Catalog (2017). Available online: http://www.mohrss.gov.cn/SYrzzyhshbzb/shehuibaozhang/zcwj/201702/t20170223_266775.html
97. China Dialogue. 2020. China's state insurers have stopped covering pangolin medicines. Available online: <https://chinadialogue.net/en/business/11880-china-state-insurers-have-stopped-covering-pangolin-medicines/>
98. EIA. 2008. China, Ivory Trade and the Future of Africa's Elephants. Environmental Investigation Agency USA, Washington DC, USA. Available online: https://content.eia-global.org/posts/documents/000/000/396/original/China_Ivory_Trade_the_Future_of_Africas_Elephants.pdf?1468588570
99. EIA. 2012. Blood Ivory: Exposing the Myth of a regulated market. Environmental Investigation Agency UK, London, United Kingdom. Available online: <https://eia-international.org/wp-content/uploads/EIA-Blood-Ivory1.pdf>
100. EIA. 2013. Hidden in Plain Sight: China's Clandestine Tiger Trade. Environmental Investigation Agency UK, London, United Kingdom. Available online: <https://eia-international.org/wp-content/uploads/EIA-Hidden-in-Plain-Sight-med-res1.pdf>
101. EIA. 2014. Vanishing Point: Criminality, Corruption and the Devastation of Tanzania's Elephants. Environmental Investigation Agency UK, London, United Kingdom. Available online: https://content.eia-global.org/posts/documents/000/000/331/original/Vanishing_Point.pdf?1468593558
102. IISD. 2019. Earth Negotiations Bulletin Volume 21 Number 101, Saturday, 31 August 2019 - Summary of the 18th Meeting of the CITES Conference of the Parties 17-28 August 2019, Geneva, Switzerland. Available online: <https://enb.iisd.org/vol21/enb21101e.html>
103. EIA. 2019. Senior Pangolin Campaigner notes from Committee II discussion on Working Document 75, 25 August 2019.
104. SFA. 2006. SFA Notice 2006 No. 3 [in Chinese]. Available online: <http://www.forestry.gov.cn/main/4818/content-796795.html>
105. Wu, S., Liu, N., Zhang, Y. and Ma, G.Z., 2004. Assessment of threatened status of Chinese Pangolin (*Manis pentadactyla*). Chinese Journal of Applied and Environmental Biology, 10(4), pp.456-461.
106. CITES. CITES trade statistics, 44.
107. Chin, S.Y. and Pantel, S., 2009, June. Pangolin capture and trade in Malaysia. In Proceedings of the workshop on trade and conservation of pangolins native to South and Southeast Asia (Vol. 30, pp. 144-162).
108. CITES. 1994. Resolution Conf. 9.10. Disposal of Illegally Traded, Confiscated and Accumulated Specimens. Available online: <https://www.cites.org/sites/default/files/eng/cop/09/E9-Res.pdf>
109. CBCGDF. 2016. An overview of pangolin data: when will the over-exploitation of the pangolin end? Available online: <http://www.cbcdgf.org/English/NewsShow/5011/6145.html>
110. Ningbo Forestry Department. 2009. Annual consumption control volume of stock pangolin tablets and rare snake raw materials from 2009 to 2010 [in Chinese]. Available online: <http://www.fsou.com/html/text/lar/171457/17145716.html>
111. Ningbo Department of Forestry. 2009. Notice on Consumption Rate of Pangolin Scales and Rare Snakes in 2009-2010 [in Chinese]. Available online: http://pkulaw.cn/fulltext_form.aspx?Gid=17145716&Db=lar
112. Song, M. 1996. Directory for Import and export of the TCM Trade. TCM Press of China, Beijing. (In Chinese). (Import statistics from Samuel for pangolin and saiga)
113. Guo, Y., Zou, X., Chen, Y., Wang, D. and Wang, S., 1997. Sustainability of wildlife use in traditional Chinese medicine. Conserving China's Biodiversity, 1, p.3.
114. Wu, S.B., Ma, G.Z., Tang, M., Chen, H. and Liu, N., 2002. The status and conservation strategy of pangolin resource in China. Journal of Natural Resources, 17(2), pp.174-180.
115. South China Normal University School of Life Sciences. 2014. Professor Wu Shibao delivered a keynote speech at the seminar on the development prospects of pangolins. 09/06/2014. Available online: <http://life.scnu.edu.cn/a/20140609/3014.html>
116. Challender, D.W., Ades, G.W., Chin, J.S., Sun, N.C.M., Iian Chong, J., Connelly, E., Hywood, L., Luz, S., Mohapatra, R.K., de Ornellas, P. and Parker, K., 2019. Evaluating the feasibility of pangolin farming and its potential conservation impact. Global Ecology and Conservation, 20, p.e00714.
117. NFGA. 2016. Implementation regulations for the management and disposal of seized terrestrial wildlife and wildlife products (consultation draft). <https://eia-international.org/wp-content/uploads/implementation-regulations-for-the-management-and-disposal-....pdf>
118. Anhui provincial forestry department pangolin scale approval documents, 2014 - 2019.
119. China Daily. 2018. Customs officers seize smuggled rare animal parts [in Chinese]. 27/09/2018. http://m.china.org.cn/orgdoc/doc_1_29302_948940.html
120. EIA. Global pangolin seizures dataset, 30.
121. CITES. 2016. Resolution Conf. 17.8. Disposal of illegally traded and confiscated specimens of CITES-listed species. CoP17. Available online: <https://www.cites.org/sites/default/files/document/E-Res-17-08.pdf>
122. Anhui provincial forestry department pangolin scale approval documents, 2014 - 2019.
123. CITES. CITES trade statistics, 44.
124. Guangdong provincial forestry department pangolin scale approval documents, 2014 - 2019.
125. The Beijing News. 2017. Tongrentang was exposed to purchasing 1500 kg of pangolin tablets media: do not cut across the board [in Chinese]. 18/02/2017. Available online: <http://www.bjnews.com.cn/inside/2017/02/18/433639.html>
126. Anhui pangolin scale approval documents, 122.
127. CITES. 2013. Resolution Conf. 9.6 (Rev. CoP16) Trade in readily recognizable parts and derivatives. Available online: <https://cites.org/eng/res/09/09-06R16.php>
128. Office of the State Council. 2016. The General Office of the State Council on the Orderly Cessation of Commerciality Notice of processing and sales of ivory and products State Council Fa (2016) No. 103. [In Chinese]. http://www.gov.cn/zhengce/content/2016-12/30/content_5155017.htm
129. Hinsley, A., Milner-Gulland, E.J., Cooney, R., Timoshyna, A., Ruan, X. and Lee, T.M., 2019. Building sustainability into the Belt and Road Initiative's Traditional Chinese Medicine trade. Nature Sustainability, pp.1-5.
130. SCMP. 2018. Consider alternatives to pangolin scales, traditional Chinese medicine professors urge at conservation conference in Hong Kong. Available online: <https://www.scmp.com/news/hong-kong/health-environment/article/2162999/consider-alternatives-pangolin-scales-traditional>
131. Boni, M.F., Lemey, P., Jiang, X., Lam, T.T.Y., Perry, B., Castoe, T., Rambaut, A. and Robertson, D.L., 2020. Evolutionary origins of the SARS-CoV-2 sarbecovirus lineage responsible for the COVID-19 pandemic. Nature Microbiology.
132. Andersen, K.G., Rambaut, A., Lipkin, W.I., Holmes, E.C. and Garry, R.F., 2020. The proximal origin of SARS-CoV-2. Nature medicine, 26(4), pp.450-452.
133. Lam, T.T.Y., Jia, N., Zhang, Y.W., Shum, M.H.H., Jiang, J.F., Zhu, H.C., Tong, Y.G., Shi, Y.X., Ni, X.B., Liao, Y.S. and Li, W.J., 2020. Identifying SARS-CoV-2-related coronaviruses in Malayan pangolins. Nature, pp.1-4.
134. Xiao, K., Zhai, J., Feng, Y., Zhou, N., Zhang, X., Zou, J.J., Li, N., Guo, Y., Li, X., Shen, X. and Zhang, Z., 2020. Isolation of SARS-CoV-2-related coronavirus from Malayan pangolins. Nature, pp.1-4.
135. Dobson, A.P., Pimm, S.L., Hannah, L., Kaufman, L., Ahumada, J.A., Ando, A.W., Bernstein, A., Busch, J., Daszak, P., Engelmann, J. and Kinnaird, M.F., 2020. Ecology and economics for pandemic prevention. Science, 369(6502), pp.379-381.
136. National People's Congress. 2020. Decisions of the Standing Committee of the National People's Congress relating to a total prohibition on illegal wildlife trade [in Chinese]. Available online: <https://eia-international.org/wp-content/uploads/Decisions-of-the-Standing-Committee-of-the-National-People%E2%80%99s-Congress-24-February-2020.pdf>
137. Wang, H., Shao, J., Luo, X., Chuai, Z., Xu, S., Geng, M. and Gao, Z., 2020. Wildlife consumption ban is insufficient. Science, 367(6485), pp.1435-1435.
138. *ibid.*
139. EIA. 2020. Wildlife Protection Law recommendations 2020. Available online: <https://eia-international.org/report/wildlife-protection-law-recommendations-2020/>

