

THE INTERNET BASED TRADE IN MADAGASCAR'S CRITICALLY ENDANGERED TORTOISE SPECIES: A PRELIMINARY STUDY IDENTIFYING THE CONSERVATION THREATS

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Introduction

Wildlife trade is an issue fundamental to global biodiversity conservation. Directly and indirectly, this trade is increasing demand and consumption on natural resources at an alarming rate (Broad *et al.*, 2003). Reptiles are thought to make up about 43% of the trade (Alacs & Georges, 2008), representing one of the largest taxa groups (Reeve, 2002). Madagascar's four Critically Endangered (IUCN, 2009) tortoise species, the spider tortoise *Pyxis arachnoides* (Fig. 1a), flat tailed tortoise *Pyxis planicauda*, radiated tortoise *Astrochelys radiata* (Fig. 1b) and the ploughshare tortoise *Astrochelys yniphora*, have suffered considerable conservation pressures in recent years from both habitat destruction (Walker *et al.*, 2004; Pedrono, 2008) and suspected pressure from illegal collection and export to support the pet trade (O'Brien *et al.*, 2003; Walker *et al.*, 2004). Since 2004 legal commercial trade in all four species has been restricted as a result of their Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I status. In addition to this all four species are protected under Malagasy national law (Pedrono, 2008). Despite this *A. radiata* has consistently been one of the most widely traded species of tortoise within the pet markets of south-east Asia in recent years (Nijman & Shepherd, 2007).

Currently the internet provides a convenient and powerful medium for both legal and illegal wildlife traders to advertise and sell their wares, often anonymously (Wu, 2007; Alacs & Georges, 2008). Since early 2009 Madagascar has been in a state of civil disorganisation as a result of a government coup. Subsequently, wildlife crime, in particular poaching and smuggling, is thought to have increased (Mittermeier, pers. comm.). For example, during 2008 and again in 2009 thieves stole eight juvenile and four adult *A. yniphora* respectively from the Durrell Wildlife Preservation Trust release site close to the species' only captive breeding facility in the world, based in Madagascar (Blanck; Lewis; pers. comms.). This represented a significant loss for one of the world's most threatened chelonian species. This suspected increase in illegal activity within Madagascar has led the author to discuss the results of a preliminary monitoring



Fig. 1a. Madagascar spider tortoise *Pyxis arachnoides arachnoides* within its natural habitat in the forests of Tsimanampesotse National Park, south west Madagascar.



Fig. 1b. Shell of the radiated tortoise (*A. radiata*) Faux cap, south west Madagascar. This juvenile displays clear, intricate carapace patterning; such individuals sell for a premium price on the international pet trade. Photos by Ryan C.J. Walker.

protocol for commercial offers of tortoises, in the hope of indicating the extent of the problem.

Methods

Between September 7th and 29th 2009 the key words '*Pyxis arachnoides* for sale' were entered into the Google™ internet search engine. This phrase was repeated for *P. planicauda*, *A. radiata* and *A. yniphora*. Following this, the four phrases were repeated in German, Japanese, Spanish, Bahasa Indonesia, Bahasa Malaysia and French. Languages were chosen based on the native languages of the most popular receiving nations for traded *P. arachnoides* documented in Walker *et al.* (2004). It is worth noting that during 2009 the Chinese market has been rife with suspected illegal trade for, in particular, the two *Astrochelys* species (Lewis, pers. comm.) plus Thailand appears to be a receiving country for many of these species (Nijman & Shepherd, 2007), possibly as a result of direct flights between Antananarivo and Bangkok creating an easy smuggling route. However, the logistical problems associated with gaining reliable translations for Chinese and Thai websites (Wu, 2007) resulted in the omission of this portion of the trade within the study.

Table 1 shows the data collected for each positive hit during each internet search. The prices of the animals advertised for sale were interpreted as starting prices. In most cases, once negotiation begins, end selling prices can be much higher than advertised prices. In many cases in the pet trade, starting prices are used as 'attractors' posted by the dealers (van Dijk, pers comm.). For ease of analysis and consistency the starting price of each specimen offered for sale was converted to US\$, based on exchange rates for 29-09-09. In cases where sellers did not specify the number of specimens of a particular species for sale, it was assumed that at least one animal was available so only one tortoise was recorded for that particular positive hit.

The web based CITES trade database (<http://www.unep-wcmc.org/citestrade/>) was interrogated for records of trade for the four species during 2009. To allow for time for CITES signatory nations to report any trade activities to CITES (31st October each year, Reeve, 2006) and sufficient time for the data to be loaded into the database, the database was accessed on 12-10-2010.

Results

Ninety-four tortoises were recorded as being offered for sale across ten countries (Table 2) during September 2009. However, the total is probably much higher, as 26.9% (n=7) of the dealers failed to specifically state the number of animals they had for sale (Table 1; Fig. 2). The most commonly traded species was *P. arachnoides* comprising 69.1% (n=65) of the animals offered (Table 2). Only one *A. yniphora* was advertised for sale.

Table 1. Data collected during internet search for sales of each of Madagascar's tortoise species.

● = complete data collected for each positive hit for the particular species. ▲ = some data available, but not listed for every positive hit.

	<i>P. arachnoides</i>	<i>P. planicauda</i>	<i>A. radiata</i>	<i>A. yniphora</i>
Name of dealer/company	●	▲	▲	●
Nation where dealer is based	●	●	●	●
Language of website	●	●	●	●
Number of specimens offered for sale	▲	▲	▲	●
Transaction currency	●	●	●	●
Age of specimen(s)	▲	▲	▲	●
Sex of specimen(s)	▲	▲	▲	●
Sub species of specimen(s) (<i>P. arachnoides</i> only)	▲	-	-	-
Are the specimen(s) listed as captive bred? (yes/no)	●	●	●	●
Website URL	●	●	●	●
Is the specimen(s) sold with the appropriate legal documentation (yes/no)	▲	▲	▲	●

Table 2. Number of individual tortoises for offered for sale and number of dealers from each country supplying tortoises with ranges in advertised asking price (starting price) and % of animals from each nation listed without an asking price (starting prices). †= Individuals advertised for exchange not sale. * = Including dealers who do not specifically state the exact number of tortoises for sale. X = subsequently confirmed as being a fake advertisement.

Species	Country of sale	Number of individuals for sale	Number of sellers/dealers	Range of price per adult animal (\$US)	Range of price per Juvenile animal (\$US)	% of animals listed for sale with no stated price
<i>P. arachnoides</i>	USA	11	5*	375.00 - 1,000.00 (±282.40)	325.00-500.00 (±226.03)	-
	United Kingdom	2	1	†	-	-
	Germany	14	4	1,443.04 - 1,603.38	-	50
	Indonesia	3	2	-	-	100
	Japan	12	2	1,993.20 - 4,220.24 (±599.55)	-	-
	Czech Republic	2	1	1,830.06	-	-
	France	6 ^X	1	174.91	-	-
	Austria	4	1	-	-	100
	USA	2	2*	1,200.00	1,200	50
	Czech Republic	2	1	1,946.94	-	-
	Switzerland	1	1*	1,544.00	-	-
	Malaysia	1	1	861.00	-	-
	USA	3	2*	1,450.00 - 1,900.00	-	-
<i>A. radiata</i>	United Kingdom	1	1*	-	-	100
	Germany	8	3*	2,040.64 - 5,101.60 (±1,082.21)	-	12.5
	Japan	5	1	27,726.15 - 28,839.65 (±642.87)	-	-
	France	4	1	1,443.04	1,443.04	-
	Austria	1	1*	-	-	100
	Malaysia	1	1	1,926.55	-	0

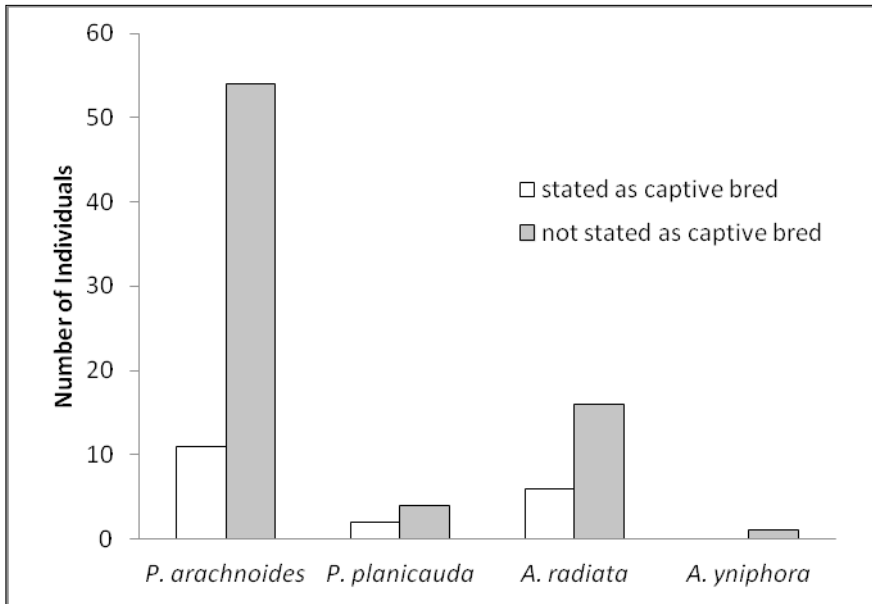


Fig. 2. Number of individual tortoises advertised for offers of sale over the internet during September 2009, divided into two groups: (1) individuals advertised as captive bred; (2) individuals not stated as captive bred.

The greatest concentration of dealers was within the USA, where five dealers were offering *P. arachnoides* for sale and two were offering *P. planicauda* and *A. radiata* respectively (Table 2). This suggests that, in this brief study, the American and Japanese hobbyists are the main buyers of *P. arachnoides* at least. Tortoises commanded the highest starting prices in Japan, but price varied considerably for each species across the internet. *P. arachnoides* was recorded as being offered for as much as \$4,220.24 in Japan and as little as \$174.91 when offered for sale by a private individual in France. This French advertisement has subsequently been confirmed as being fake in an attempt to gain a deposit and steal the money (Blanck, pers comm.). Juveniles were stated as being offered for sale in the USA for up to \$500.00 (Table 2). *P. planicauda* varied in price from nearly \$2,000.00 in the Czech Republic to an individual advertised for \$861.00 in Malaysia (Table 2). The *A. yniphora* for sale in Malaysia was offered for \$1,926.55. The most valuable species was *A. radiata*, with animals selling for as much as \$28,839.65 (Table 2). Figure 2 shows that 80.6% (n=75) of the tortoises for sale were not stated as captive bred. However, some of these animals may have been *P. arachnoides* specimens which may well have been (or claimed to have been) wild-caught animals imported before February 2004, when

they were listed as Appendix II, or the 3-month transitional period after date of transfer from Appendix II to I.

Only three individual *A. radiata* sold in Japan were advertised as being supplied with any documentation to legitimize claims of captive breeding or that they were legally obtained animals. These three animals were claimed to be micro-chipped and registered under Japan's Law for the Conservation of Endangered Species of Wild Fauna and Flora (LCES). These individuals were advertised for sale for between \$27,726.15 and \$28,839.65. The CITES database only reports the movement of two radiated tortoises between the Czech Republic and Germany during 2009. The precise date of the movement of the animals is not recorded. Both animals were recorded as being exported alive and for personal use.

Discussion

Very little baseline data exists on monitored internet trade in Madagascar's tortoise species, since all species were listed as CITES Appendix I. *P. arachnoides* was the last species to be listed on Appendix I in 2005 (Walker *et al.*, 2004). The data submitted by CITES signatory countries is woefully inadequate at following any of the legitimate trade in these threatened species, with trade for only two *A. radiata* listed during all of 2009. This suggests that dealers are not submitting data to the relevant authorities when these animals are traded across national borders or data is getting lost within the respective national CITES systems. The inaccuracies in data submitted and reported within the database have been highlighted as a shortcoming of the system (Blundell & Mascia, 2005; Reeve, 2006).

There were many problems in the correct reporting of exports of *P. arachnoides* prior to the ban in trade in 2004, with 2,651 leaving the country in 2001 alone, exceeding Madagascar's trade quota of 1,000 by more than 50% (Walker *et al.*, 2004). It is a very difficult task to find out the exact number of poached and smuggled animals within the trade. However, the large number of animals openly advertised with no reference to their origin (i.e. captive bred or not) is cause for concern. O'Brien *et al.* (2003) and WWF (2010) calculated that between 45,000 and 48,000 radiated tortoises were illegally harvested annually, with a proportion of these animals being consumed locally as bush meat. However, a proportion of this figure comprises animals which enter the international pet trade.

There are no means of checking whether tortoises are being sold with CITES permits or not and have been approved by local authorities to be captive bred, except probably for the three LCES registered *A. radiata* in Japan. These three LCES registered radiated tortoises were the most expensive animals offered for sale, suggesting that legitimate animals come at a premium price. But this is no guarantee that the animal is legitimately

captive bred, as recently incidents of the falsification of LCES cards have been recorded within Japan for dealers selling radiated tortoises (TRAFFIC, 2008).

Indeed, it is often very difficult to legitimize the advertisements for tortoises, with the recent common practice of fraudsters, particularly in Europe, to place fake advertisements, asking for a deposit or full payment then failing to supply the animals (Blanck, pers. comm.). This was the case with the advertisement for six *P. arachnoides* offered in France. The *A. yniphora* offered for sale in Malaysia is almost certainly wild caught and probably one of the individuals released from the captive breeding centre in Madagascar (Lewis, pers. comm.), as the species has never been bred in captivity outside Madagascar, apart from one isolated case in Honolulu Zoo in the 1970s (Juvik *et al.*, 1991). The cost of a single ploughshare tortoise for sale recorded in this study is relatively cheap, compared with documented cases of transactions of up to \$35,000 for this species on the black market (Blanck; Lewis; unpublished data). The rarity of *A. yniphora* and subsequent value of this species has meant that it is a very attractive species to smugglers and dealers, with many illegally acquired individuals being openly traded (Pedrono *et al.*, 2001), particularly in south-east Asia. Currently, loopholes in the law in Malaysia state that it is not illegal to buy/sell/own this threatened species. However, this loophole has been closed through the introduction of new laws in late 2010 (Sheppard, pers. comm.).

The results show that the USA and Japan still remain the major traders in Madagascar's tortoises since the Walker *et al.* (2004) study, but the price of these traded tortoises has increased significantly. This would be consistent with re-sale of animals legally stockpiled before *P. arachnoides* was included in Appendix I, as the animals would be of higher value now that the legal supply of wild-caught animals has come to an end.

Walker *et al.* (2004) and Ceballo & Fitzgerald (2004) reported that *P. arachnoides* used to sell for up to \$1,200.00 a pair and \$175.00 each in the USA; however, this has increased to up to \$1,000.00 each (for what is probably the starting negotiation figure) in the USA, while the value of the species in Japan is currently over seven times the prices stated by Walker *et al.* (2004). However, prices of exotic pets in Japan are greatly inflated compared with the rest of the world, with animals that display particularly attractive or unusual markings or patterns selling for way over the normal going rate (Kameoka & Kiyono, 2005). *A. radiata* specimens displaying high amounts of cream/yellow on their carapaces are good examples of much sought after animals (Olge, pers. comm.). The starting prices/attractors of *P. planicauda* have increased from the \$160.00 stated by Ceballo & Fitzgerald (2004) to up to \$1,200.00. Low prices around the time of the Ceballo & Fitzgerald (2004) study in the USA were thought to be the result of the previous bout of political instability causing the US market to become flooded by large

numbers of poached animals (Lewis, pers. comm.), ahead of *P. planicauda*'s transfer to Appendix I in 2002 (CITES, 2002).

The price increase in recent years might be a result of high mortality of imports which took place seven years ago due to the difficulty of keeping the species successfully in captivity (Lewis, pers. comm.). However, these results should be interpreted with caution and may be skewed slightly on account of the study only capturing data from a three week snapshot in time and not including data from China which has become one of the largest global markets for exotic pets (Sze & Dudgeon, 2006; Wu, 2007). Indeed, the variation from country to country or region in what is considered a desirable or valuable specimen and the inflated prices in Japan make it very difficult to compare the international price trend for these species. It would be prudent in future studies to include a greater range of languages and a greater range of key word searches to include common names, local names and in the case of the *Astrochelys* species their previous taxonomic classification (*Geochelone*) and also to undertake the study over a longer period of time.

Currently the demand for the *Pyxis* species in south-east Asia is minimal, with the demand for the *Astrochelys* species growing enormously. The Durrell Wildlife Preservation Trust report that over 75% of all ploughshares sold in 2009 were in south-east Asia and China (Lewis, unpublished data). In 2008, 136 *A. yniphora* were recorded for sale, with the species highly represented for sale in China, Thailand, Malaysia and Indonesia with starting prices ranging from 1,000 to 25,000 Euros, dependent upon size and age (Blanck, unpublished data). Recent historically high levels of trade (within pet markets) in south-east Asia for *A. radiata* are confirmed by Nijman & Shepherd (2007).

There is no doubt that confirming if the information posted on the internet is indeed accurate or even true is difficult, highlighted by some of the data collected in this study subsequently known to be false as it was posted by fraudsters.

The effect of illegal trade is having a devastating effect on wild populations of these species. *P. arachnoides* has had its range reduced by 71% (Walker, unpublished data), while the range of *A. radiata* is thought to have declined by one fifth in just the last 25 years (O'Brien, 2003), with collection for the pet trade considered to be one of the drivers threatening these species. As well as monitoring web based trade, up to date, comprehensive field based harvesting assessments for all four species need to be undertaken. Any commercial harvest and subsequent smuggling are unsustainable on account of the species' low reproductive potential and already depleted wild populations (O'Brien *et al.*, 2003; Leuteritz *et al.*, 2005; Pedrono, 2008), with at least *A. yniphora* facing imminent threat of extinction in the wild as a result of poaching to support the pet trade (Pedrono, 2008).

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