

Of frog legs and turtle soup in Singapore

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The Republic of Singapore is an island city-state situated in Southeast Asia and has a total land mass of 721.5 square kilometres. While it is now known as a sprawling metropolis, it was a very different place not too long ago. Go back less than a century and you would find Malayan tigers (*Panthera tigris tigris*) roaming the jungles. These tigers often preyed on livestock, causing friction with the local communities; on 26 October 1930, the last wild Malayan tiger was shot and killed. Photographic records show that exotic meats (pangolin, monitor lizards, snake, etc) were sold openly in food markets in the 1960s. Times have changed and with it, so has the Singaporean society. Over the years Singapore has lost 95% of its historical forests due to rapid urbanisation. Although only a small portion of undisturbed forested land remain, Singapore remains a hotspot for biodiversity. There are 30 lizard species, at least 55 species of

snakes, 24 anuran species, six native chelonian species, one crocodylian (*Crocodylus porosus*), and one caecilian species on mainland Singapore.

The implementation of tough wildlife laws has protected the native flora and fauna that are still extant on the island. Together with the educational efforts of various government agencies, non-governmental organisations, and schools, the younger generation are taught the plight that both wildlife and their natural habitats face. Community outreach events also broaden the demographic reach; people from all age groups and walks of life are exposed to conservation messages. This is still an on-going process as while the younger folk generally shy away from exotic animal products, some of the older generation still believe in the benefits of certain products.



Figure 1. Species from left to right: Asiatic softshell turtle (*Amyda cartilaginea*), Chinese softshell turtle (*Pelodiscus sinensis*), red-eared slider (*Trachemys scripta elegans*). Photographed by David Tan.



Figure 2. *P. sinensis* in nylon mesh bags in shallow water to be sold for food. The mesh bags were presumably used to prevent bites.

The commonly consumed meats in Singapore are chicken, beef, pork, mutton, duck, and seafood. Other less common, more exotic but legal meats include frog, turtle, and crocodile. The majority of the latter are consumed in the form of herbal turtle soup, crocodile soup, Chinese frog dishes, and a Chinese dessert known as guilinggao or tortoise jelly. Packaged frozen crocodile meat can be found in the local supermarkets; these are farm-bred and imported from Indonesia. The three commonly available chelonian species sold for the food trade are Asiatic softshell turtle (*Amyda cartilaginea*), Chinese softshell turtle (*Pelodiscus sinensis*), and red-eared slider (*Trachemys scripta elegans*) (Figure 1). Both *P. sinensis* and *T. scripta* are not native to Singapore and imported from Indonesia and China; both species have also been classified as invasive due to errant pet practices and religious mercy release. *P. sinensis* are used for herbal soups while the hard carapaces of *T. scripta* are used for tortoise jelly.

American bullfrog (*Lithobates catesbeianus*) is the only anuran species sold for human consumption; these are farm-bred locally and sold throughout the country at Chinese restaurants. All the species mentioned above are those sold openly in wet markets and food stalls. According to a recent local news report, there are only four remaining stalls that still legally sell live turtles. Furthermore, tenders for new stalls have been banned since 2012. Dried Tokay gecko (*Gekko gecko*) was still openly sold in traditional Chinese medicine (TCM) stores due to the unfounded belief that dried gecko contained the cure for HIV/AIDS and cancer. A TRAFFIC report found the trade of dried gecko to have declined significantly by 2013, and sales within Singapore have stopped since the species was listed in the CITES Appendix II in 2019.

Given the rich biodiversity and strict wildlife laws, I wanted to find out whether food markets and traditional Chinese medicine stores in Singapore still sold exotic meats and products. The methods were simple and concise. I selected two wet markets around the island which have high traffic flow: the sites were Chinatown complex (site 1), and Tiong Bahru wet market (site 2). The TCM stores I surveyed were also around the Chinatown area. Information such as where the animals originated from, the numbers of animals sold and for what purpose were gathered by means of oral questioning.

Site 1: I first surveyed this site in December 2018 and found just two stalls selling exotic meats. *T. scripta*,

A. cartilaginea, and *P. sinensis* were the only chelonian species being sold. The only amphibian species encountered was *L. catesbeianus*. I performed another survey in February 2019, just before the Lunar New Year; the species remained the same, however the number of individuals seemed to have diminished. The impending festivities might have caused the surge in sales.

I surveyed TCM shops around Smith Street and Temple Street, both within the Chinatown vicinity in May 2019 but found no instances of exotic meats being sold.

Site 2: I surveyed this market in March 2019 but failed to detect any presence of exotic meats at any of the stalls, neither were there any stalls with



Figure 3. An *A. cartilaginea* in shallow water with visible wounds on the rear left margin of the carapace.

the facilities to house livestock. I did not carry out a second follow-up survey at this location.

None of the stallholders were particularly receptive with being questioned about the provenance of their animals even though everything was sold openly. One of them mentioned that the *A. cartilaginea* and *P. sinensis* were imported from Indonesia; these included both farm-raised and wild caught animals. The reliability of the statement is questionable. The conditions the animals were kept in were dismal; many had injuries from overcrowding or abrasion from being confined in nylon nets (Figure 2). Space was extremely limited even for the animals that were housed alone; most could barely turn in the containers (Figure 3). Water depth provided for the animals were also inadequate, almost all were kept in water below the carapace. All photographs were taken discreetly. These animal welfare issues should definitely be addressed by the local authorities; namely the Animal & Veterinary Service (AVS).

Before commencing the surveys, I expected to find Malayan box turtle (*Cuora amboinensis*), giant Asian pond turtle (*Heosemys grandis*), and spiny turtle (*Heosemys spinosa*) in the markets. These three species are found locally in Singapore and due to their terrestrial to semi-aquatic habits, might prove easier to capture than fully aquatic softshell turtles. However as mentioned above, only *A. carilaginea*, *P. sinensis* and *T. scripta* were sold in the markets. One of my goals when I first decided to do these surveys

was to ascertain if these stalls sold native species and if so, whether they were locally poached. I achieved one portion of my goal but the other portion cannot be proven due to noncompliance on the stallholders' ends; there was no way to tell with certainty if the *A. cartilaginea* were locally poached. However one can take solace from the fact that it was the only locally found species available for sale in the market.

The demand in the consumption of exotic meats can be inferred from the number of stalls that sell them. There are no more than twenty food stalls in the country that still sell turtle soup, and even fewer with crocodile meat. The practice of consuming exotic meats is no longer commonplace, and in some ways frowned upon by a more modern society; just last year, an online petition garnered over 7000 signatures in a bid to remove the sale of rabbit meat in a local restaurant. The future of the exotic meat industry in Singapore looks grim as the mindset of the society moves towards a more wildlife-friendly and sustainable direction.