

# Surveys on tokay gecko trade as traditional Chinese medicine in Hong Kong put spotlight on imports from Indonesia and Vietnam

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## Abstract

Tokay geckos are traded in large volumes in Hong Kong, though the sustainability and legality of this trade are unclear. Two studies have been published on Hong Kong's tokay gecko trade. We examine the findings of both and make consolidated recommendations to ensure trade is not detrimental to this species.

## KEYWORDS

sustainable trade, tokay gecko, wildlife trade

Tokay geckos *Gekko gekko*, found throughout South Asia, Southeast Asia and southern China, are traded in the millions for use in traditional medicine and for pets (Caillabet, 2013; Nijman & Shepherd, 2015). For medicinal trade, tokay geckos are killed, gutted, flattened and dried; before use, they are rehydrated or ground into a powder. Almost all tokay geckos in trade are wild-caught (Nijman et al., 2012). To regulate international trade in this species, in 2019, tokay geckos were included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), to which all range countries are signatories. Both importing and exporting countries are required to report numbers and sources of geckos traded annually.

In January 2024, two papers were published on tokay gecko trade in Hong Kong, including one in this journal (Chan et al., 2024; Wang et al., 2024). The research for each paper was conducted independently in consecutive years. Wang et al. visited

169 traditional Chinese medicine shops/clinics in September–December 2021 (the 2021 survey), and Chan et al. visited 150 shops in June–July 2022 (the 2022 survey). We combined data from these two studies to summarize areas of strong agreement, strengthening these findings for both studies and reporting on and reconciling differences between the studies. We compare the estimated magnitude of trade and source countries with official trade statistics from the CITES trade database for 2021 and 2022.

Tokay geckos were commonly observed for sale in both studies, with 59% (2021) and 37% (2022) of the shops surveyed selling the species. In most cases, geckos were sold as dried pairs. Prices per pair varied by size and origin, but both studies reported similar mean prices: US \$15.34 ± 4.62 in 2021 and US\$12.61 ± 10.96 in 2022. There was a clear preference for tokay geckos from Wuzhou (China), seen as of superior medicinal quality.

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Although trade magnitude was calculated differently in each study, we believe that the results are easily reconciled. The 2021 study used reported data on annual sales times the percentage of shops observed selling tokay geckos (58%) to estimate that 249,000 tokay geckos are traded in Hong Kong each year. The 2022 study estimated, based on the average number of geckos observed for sale in a shop and the percentage of shops selling geckos, that 14,500 tokay geckos were available for sale on any given day. Assuming a turnover time of 6 weeks per pair (i.e., on average, a pair is sold 6 weeks after arrival in the shop, which seems reasonable given a low price of US\$13–15/pair), then the annual sale of a quarter of a million tokay geckos for medicinal purposes in Hong Kong is a good working estimate to guide us further.

From a conservation and trade regulation perspective, one of the more perplexing findings from these two studies was that in both years, vendors reported that aside from China's mainland, tokay geckos were sourced from Thailand and Vietnam, but not from Indonesia. In an earlier study, 5 vendors stated that geckos were imported from Thailand, Vietnam, and China's mainland (Dufour et al., 2022), while two vendors stated that while tokay geckos had previously been imported from Indonesia, that this was no longer the case. Genetic data from geckos sold in these shops support this observation, with the majority of individuals likely originating from Thailand, Lao, and southern China, with only 2 of 29 individuals sampled aligning with a clade including individuals originating from Indonesia (among other SE Asian countries) (Dufour et al., 2022).

From the 2022 study, we estimate that annually up to 57,800 tokay geckos are imported into Hong Kong from Thailand and another 26,700 from Vietnam. The former aligns reasonably well with CITES data reported by Hong Kong for Thailand (68,600 in 2021; 180,200 in 2022) but not for Vietnam (0 in 2021 and 2022). Tokay geckos are not included in the national list of protected species in Vietnam; catching and transporting tokay geckos requires permits issued by the Provincial Forest Protection Department (Caillabet, 2013). Vietnam has never reported the export of tokay geckos to the CITES Secretariat, nor has any other CITES Party ever reported importing tokay geckos from Vietnam. Indonesia is by far the world's largest exporter of tokay geckos, and for both 2021 and 2022, it reported the export of ~5 million individuals (assuming a mass of 250 g for a fresh specimen: Caillabet, 2013), 99% of which went to China's mainland. According to the Indonesian customs agencies in Central and East Java, tokay geckos have been exported in large volumes from Indonesia to Hong Kong, at least in 2020 and 2021 (Fardianto, 2022; Hastanto, 2020), despite the lack of records in the CITES trade database. Therefore, at least some of the tokay geckos recorded in Hong Kong that were said to be sourced from

China's mainland may have in fact originally derived from Indonesia. More research is required to determine the true origin of tokay geckos sold in Hong Kong.

Both the 2021 and 2022 studies document continued large-scale trade in tokay geckos and highlight ongoing documentation issues which hinder monitoring of trade in this species. The difference in the estimated number of imports based on different data sources (shop keepers, CITES data, government records) underscores the need for increased standardized monitoring. Although tokay geckos are listed as 'Least Concern' on the IUCN Red List, unmanaged trade in this species is unlikely to be sustainable. We urge all CITES Parties to carry out a review of trade in this species. In 2021, Tokay geckos were added to the list of CITES species regulated by Hong Kong under Cap. 586 (The Protection of Endangered Species of Animals and Plants Ordinance)—a helpful start. Going forward we recommend (1) increased monitoring of trade in this species, including non-detriment findings to ensure trade does not negatively impact wild populations, (2) increased effort to identify sources of tokay geckos imported into Hong Kong, and (3) that CITES Management Authorities from exporting countries (e.g., Indonesia, Thailand, and Vietnam) ensure that accurate records are submitted on trade in this species and to continue vigilance against illegal wild capture where prohibited by local laws.

## AUTHOR CONTRIBUTIONS

**Jovy Y. S. Chan:** Writing—review and editing. **Caroline Dingle:** Writing—original draft; writing—review and editing. **Vincent Nijman:** Conceptualization; writing—original draft; writing—review and editing. **Chris R. Shepherd:** Writing—review and editing.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

## DATA AVAILABILITY STATEMENT

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