

# A longevity record of the Japanese Gecko, *Gekko japonicus* (Duméril & Bibron, 1836), in the wild

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Longevity is a major life-history characteristic of animals and provides key information in studying ontogenetic, demographic, adaptive, and evolutionary processes (Castanet, 1994). Reptiles, in particular, exhibit remarkable interspecific variation in life-history traits. Consequently, the relationships of activity time (Stark et al., 2020), thermoregulation (Moreira et al., 2021), protective adaptations (Reinke et al., 2022), and encephalisation (Stark and Pincheira-Donoso, 2022) with life span have been examined, making reptiles an ideal taxonomic group for evaluating evolutionary theories of longevity through comparative studies. Much of the available longevity information for reptiles is, however, derived from captive records (e.g., Werner et al., 1993; Castanet, 1994; Bronikowski, 2008; Stark et al., 2018). Given that longevity from captive records may overestimate lifespan in the wild (Scharf et al., 2015), field-based data are essential for accurate comparative analyses. The genus *Gekko*, a group of gekkonid lizards comprising approximately 98 species distributed across Southeast and East Asia (Matsukoji et al., 2026; Uetz et al., 2026), exhibits high ecological and morphological diversity. Despite this diversity, longevity records for this genus from wild populations are lacking, and available information is derived exclusively from captive individuals and has hitherto been reported for only five tropical or subtropical species (Table 1). Here, we report a longevity record for the Japanese Gecko, *Gekko japonicus* (Duméril & Bibron, 1836), in the wild, based on an individually marked specimen recovered from the stomach contents of a predator.

On 21 July 2012 at 21:34 h, we captured a yearling

*G. japonicus* (snout-vent length [SVL] = 37.8 mm; tail length [intact tail] = 34.3 mm; body weight = 1.1 g) on the wall of a wooden building in the Ashiu Forest Research Station, Kyoto University, Kyoto, Japan (35.3091°N, 135.7158°E; 362 m elevation). Considering that this species typically hatches between July and September with an SVL of 26–29 mm (Ota and Tanaka, 1996), this individual was presumed to be a yearling hatched the previous year. On the next day, we marked this gecko using unique toe-clipping combination (left forelimb I digit; right hindlimb I and II digits) and released it at the capture site.

On 11 May 2024 at 21:00 h, we captured a juvenile Japanese Rat Snake, *Elaphe climacophora* (Boie, 1826), (SVL = 536 mm; tail length = 135 mm; body weight excluding stomach contents = 28.2 g) on a metal fence in the same station (35.3092°N, 135.7169°E; 367 m elevation). By forced regurgitation of its stomach contents, we recovered two adult *G. japonicus* (Fig. 1). The first individual regurgitated was a male without marking (SVL = 59 mm; tail length [regenerated tail] = 60 mm; body weight = 3.6 g). The second one was a male with toe-clipping marks (SVL = 67 mm; tail length [regenerated tail] = 52 mm; body weight = 5.2 g). Based on the toe-clipping pattern, we identified this gecko as the same individual released 12 years before. After forced regurgitation, we released the snake at the capture site.

Our finding demonstrates that *G. japonicus* can survive for at least 12 years in the wild. Because this longevity estimate was inferred from a predation event, an extrinsic mortality factor, it may represent a conservative estimate of the species' potential lifespan. Nonetheless, this record is expected to contribute to our understanding of longevity within the genus *Gekko* from two points. First, this study provides a rare field-based longevity record. To the best of our knowledge, no longevity estimate for species of the genus *Gekko* has been presented based on direct field evidence (but see Kurniati and Phadmacanty, 2022). Second, this record substantially expands the climatic range represented in

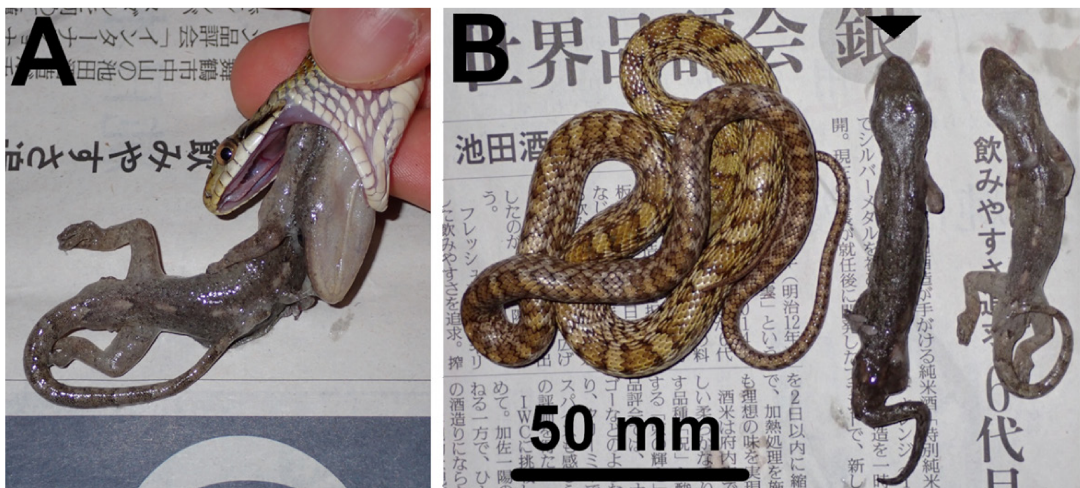
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**Table 1.** Longevity records of species in the genus *Gekko* with associated climatic conditions. Body weight (g) was based on the maximum body weight from Feldman et al. (2016), except for *Gekko japonicus*. Body weight for *G. japonicus* was based on unpublished data from Tepei Jono Mean annual temperature (°C) and temperature seasonality (standard deviation  $\times$  100) were obtained from 30 arc-second WorldClim layers (Fick and Hijmans, 2017) following Stark et al. (2018). Climate data of *G. japonicus* were estimated based on the capture site in 2012 (35.3092°N, 135.7169°E).

Species	Max longevity	Body weight (g)	Data source	Mean annual temperature (°C)	Temperature seasonality	References
<i>Gekko gecko</i>	23.5	129.3	Captivity	23.8	227.9	De Magalhaes and Costa, 2009
<i>Gekko smithii</i>	18.0	113.8	Captivity	25.3	80.4	Werner et al., 1993
<i>Gekko petricolus</i>	8.8	19.6	Captivity	26.3	154.0	Slavens and Slavens, 2000
<i>Gekko monarchus</i>	8.0	20.1	Captivity	25.1	44.5	Werner et al., 1993
<i>Gekko vittatus</i>	5.0	48.2	Captivity	24.8	52.0	Slavens and Slavens, 2000
<i>Gekko japonicus</i>	12	8.8	Wild	12.0	863.8	This report



**Figure 1.** A juvenile *Elaphe climacophora* and its two prey items. (A) The snake regurgitating two *G. japonicus*. (B) The juvenile *E. climacophora* and two *G. japonicus*. The gecko indicated by the black arrow is the individual marked 12 years before. Photo by Akira Mori.

longevity data of *Gekko*. As Table 1 shows, previous reports have focused exclusively on tropical and subtropical species. In contrast, the present longevity record of *G. japonicus* originates from a markedly colder and more seasonal environment in the temperate zone, providing the data from the temperate end of the genus' distribution. Stark et al. (2018) reported that reptiles inhabiting colder and more seasonal environments tend to live longer when being controlled for body weight. The longevity record of *G. japonicus* reported here is consistent with this hypothesis, because this species may live longer than similar-sized tropical congeners. However, given the reliance on a single record and the lack of comparative longevity data for other wild populations and congeners, further empirical

evidence is required to determine whether this pattern holds across *Gekko*.

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