

Record of the occurrence of a house lizard in Yamagata City, Yamagata Prefecture

Naoyuki Fujiyama^{1, †} and Yutaka Miyazawa¹

Among the 14 species of house lizard (Reptilia: Squamata: Gekkonidae) distributed in Japan, Schlegel's Japanese gecko, *Gekko japonicus* (Duméril et Bibron, 1836), exceptionally shows a distribution range expanding northward and covering eastern Japan (Wada 2003; Toda and Yoshida 2005; Herpetological Society of Japan 2021). The northern limit of *G. japonicus* distribution in Japan is reported in the literature to be Akita Prefecture (Toda and Yoshida 2005), although there is a record of the occurrence of this species in Hachinohe City, Aomori Prefecture (Wada 2003), and it is also known that this species had invaded southern Hokkaido by 2003 (Wada 2003; Herpetological Society of Japan 2021). In general, the distribution of *G. japonicus* in northern Japan is patchy (Wada 2003).

Regarding the distribution of *G. japonicus* in Yamagata Prefecture, it has been well known that an isolated population, distinct from its other areas of distribution, is present in Sakata City (Wada 2003; Yamagata Prefecture 2003). The presence of *G. japonicus* in Sakata City is probably due to human-mediated introduction from the Hokuriku region around 400 years ago, while *G. japonicus* distributed in Japan as a whole is originated from probable human-mediated ancient introduction from the eastern part of continental China approximately 3,000 years ago (Chiba et al. 2022). Previously, the distribution of *G. japonicus* in Yamagata Prefecture was considered to be restricted to the area around Sakata Port (Yamagata

¹ Faculty of Science, Yamagata University, Yamagata 990-8560, Japan

[†] Corresponding author

Naoyuki Fujiyama

Faculty of Science, Yamagata University, Kojirakawa-machi 1-4-12, Yamagata 990-8560, Japan.

E-mail: n_fujiyama@sci.kj.yamagata-u.ac.jp

Prefecture 2003), however, this house lizard had expanded its range to include Tsuruoka City and Yuza Town by 2010 (Shonai Nippo Press 2010). The distribution of *G. japonicus* in Yamagata Prefecture is basically restricted to the Sea of Japan side, and thus far there is no record of the occurrence of this species in the eastern inland part of Yamagata Prefecture, including Yamagata City, with the exception of an episodic observation in Yonezawa City (Yamagata Prefecture 2003).

On 3 August 2023, 19:03 p.m., an individual of a house lizard was observed on the surface of a utility pole at Higashihara-machi, Yamagata City, Yamagata Prefecture (38° 14' 54.8" N, 140° 20' 40.5" E, 166 m a.s.l.)

(Figure 1). We did not collect this individual; however, based on its appearance, we identified it as *G. japonicus*. *Gekko japonicus* possesses large granular scales on both back and limbs, and this distribution pattern of scales is different from those observed in other two congeneric species distributed in Honshu, namely, *G. tawaensis* Okada, 1956 (no large scales on both back and limbs) and *G. hokouensis* Pope, 1928 (no large scales on limbs) (Herpetological Society of Japan 2021). If our identification is correct, this observation is the first record of the occurrence of *G. japonicus* in Yamagata City.

The origin of the house lizard we observed in Yamagata City is uncertain. Its presence may have resulted from an accidental introduction by transportation activities of humans or from natural range expansion from other established habitats. It is also unclear whether a house lizard population has been established in Yamagata City. No further observations have been recorded, despite our frequent visit to the location where we observed the house lizard, suggesting it is unlikely that a population of the house lizard has established in Yamagata City. This interpretation is consistent with the results of a computer modeling study based on the current distribution pattern of *G. japonicus* in relation to climate conditions, which predicted a relatively low probability of the establishment of a

population in the inland part of Yamagata Prefecture (Kim et al. 2020). To reveal the origin and the situation of the house lizard occurred in Yamagata City, further investigations regarding the distribution of *G. japonicus* in the area between its known habitats (in particular the Sea of Japan side of Yamagata Prefecture) and Yamagata City, as well as continuous investigation in Yamagata City, are indispensable.

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Figure 1. An individual of a house lizard observed at Higashihara-machi, Yamagata City, Yamagata Prefecture, Japan, on 3 August 2023.

Scale bar: 1 cm.