

Long-term Functional Sperm Storage by a Female Common House Gecko, *Hemidactylus frenatus*, from the Ryukyu Archipelago, Japan

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Abstract: A female *Hemidactylus frenatus*, collected on 7 June 2004 and housed alone in a cage, produced a total of six clutches, each consisting of one or two eggs, until 24 June 2005. All eggs but one, including the one egg composing the last clutch, hatched to produce hatchlings that included a male. This indicates that females of this broadly distributed gecko can store functional sperms for more than one year. Such ability may have played an important role in the colonization by this gecko of tropical and particularly subtropical regions of Asia and the Pacific islands.

Key words: Captive observation; Functional sperm storage; *Hemidactylus frenatus*; Reproduction

It has been reported that in some reptiles females store sperm in the oviducts and thus can produce fertile eggs after certain intervals from copulation (see Girling [2002] for review). The tropical house gecko, *Hemidactylus frenatus*, is one of the species for which such asynchrony between copulation and ovulation was documented (Church, 1962). Based on histological observations, Murphy-Walker and Haley (1996) reported the presence of a site in the oviducts for sperm storage in this species. They also demonstrated, on the basis of captive observations at room temperature

in Hawaii, that female *H. frenatus* can produce developing eggs at least 36 weeks after copulation. However, because their observations were terminated without examining fertility for any subsequent clutches, the maximum storage period of functional sperm in female *H. frenatus* remains uncertain. In this note, we report a case of much longer storage of functional sperm by a female *H. frenatus*.

One female *H. frenatus* was captured on 7 June 2004 on Okinawajima Island, Japan. This female, 50.1 mm in snout-vent length and 44.2 mm in tail length at capture, was housed alone in a cage and kept at room temperature in our laboratory, which is also located on Okinawajima Island. Water was constantly supplied in a plastic cup on the floor of the cage. Crickets were provided as food along with supplementary calcium powder. Eggs laid were incubated at temperatures of 24–32°C. Hatchlings were raised for a few months with crickets and then were sexed on the basis of gonadal and/or hemipenial observations.

The results of observations on the reproductive performance by this female are summarized in Table 1. It produced a total of ten eggs in six clutches in captivity. One egg of the clutch laid on 27 July 2004 did not hatch. The remaining eggs, including the one laid on 24 June 2005 (i.e., 382 days or > 54 weeks after capture of the female) hatched. Of the nine hatchlings, seven were females and one was male. The remaining one could not be sexed due to its death and damage from crickets in our absence from the laboratory.

The presence of a male among the hatchlings seems to preclude the possibility of parthenogenesis by the female (Murphy-Walker and Haley, 1996). The present results indicate that the period of functional sperm storage by the female *H. frenatus* can exceed one year. This value is one and a half times greater than the sperm storage period demonstrated by Murphy-Walker and Haley (1996).

Hemidactylus frenatus is known to be a successful colonizer, rapidly extending its range over the tropical and subtropical regions of Asia and Oceania through human activities

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TABLE 1. Reproduction of the captive female *H. frenatus* observed in this study.

Clutch no.	Clutch size	Date of deposition	Hatching	Sex
1	2	16 June 2004	yes/yes	f/f
2	2	27 July 2004	yes/no	f/-
3	2	1 Sept. 2004	yes/yes	f/f
4	2	middle May 2005*	yes/yes	m/f
5	1	6 June 2005	yes	f
6	1	24 June 2005	yes	unknown**

* Date not specified in detail due to our absence.

** Hatchling dead and damaged by crickets before gonadal and hemipenial investigation.

(Bauer and Henle, 1994; Moritz et al., 1993; Ota, 1989). The female's ability to store functional sperm for more than a year would be highly advantageous in colonizing a new locality. This seems to be particularly true when colonizing more or less seasonal subtropical regions, where reproductive activity of this gecko may be confined to only half of the year (Ota, 1994).

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