REPTILES & AMPHIBIANS

# Interspecific Amplexus between *Buergeria buergeri* (Rhacophoridae) and *Bufo japonicus formosus* (Bufonidae)

Keigo Takahashi

Graduate School of Bioresource Sciences, Nihon University, Kameino 1866, Fujisawa, Kanagawa 252-0880, Japan
(k0f7g2x4@gmail.com; https://ocid.org/0000-0001-9657-8752)

Amplexus is a common reproductive behavior in frogs, in which the male clasps the female from the dorsal side and releases sperm toward the eggs she has laid (Okuno 1986; Robertson 1986; Kuramoto 1996). Amplexus is divided into several types according to the part of the female clasped by the male. For example, the type in which the male clasps the female's side is called axillary amplexus, and the type in which the male clasps the female's waist is called inguinal amplexus (Kuramoto 1996).

Amplecting behavior between different species (interspecific amplexus) has been reported around the world (Serrano et al. 2022). This behavior is widespread in the phylogeny of frogs (Serrano et al. 2022), with male-female combinations ranging from interspecific within the same genus (Rocha et al. 2015; Muansanga et al. 2021), interspecific within the same family but different genera (Shahrudin 2016; Groffen et al. 2019; Nuñez et al. 2022; Sailo et al. 2022), and among different families (Vivek et al. 2014; Gül et al. 2018; Lalremsanga et al. 2021). The factors that contribute to the occurrence of interspecific amplexus have been discussed by many researchers (Höbel 2005; Wogel et al. 2005; Mollov et al. 2010; Machado and Bernarde 2011; Vivek et al. 2014; Rocha et al. 2015; Lalremsanga 2021; Rabbe 2021). For example, overlaps in reproductive activities (Höbel 2005; Rocha et al. 2015; Lalremsanga 2021; Rabbe 2021), a smaller number of females (Wogel et al. 2005), chemical signal confusion (Mollov et al. 2010), low selectivity towards females (Machado and Bernarde 2011), long-term absence of conspecific females (Vivek et al. 2014), and explosive breeding (Machado and Bernarde 2011; Vivek et al. 2014) have been suggested.

*Buergeria buergeri* is a medium-sized rhacophorid frog, with a snout-vent length (SVL) between 37–44 mm for males and 49–69 mm for females. It is distributed only in Japan (Matsui and Maeda 2018). This frog species is found primarily in streams and forests in mountainous regions, and breeds in streams from April to August (Fukuyama et al. 1988; Matsui and Maeda 2018). This frog is a typical prolonged breeder; during the breeding season, males attract females by emitting an advertisement call on rocks in streams (Matsui and Maeda 2018). After forming an amplecting pair, amplected females search for spaces under the rocks in the water suitable for oviposition (Fukuyama et al. 1988).

*Bufo japonicus formosus* is a large-sized bufonid frog, with a SVL between 43–161 mm for males and 53–162 mm for females. It is distributed only in Japan (Matsui and Maeda 2018). The species inhabits a variety of environments ranging from lowlands to highlands and breeds in shallow standing water bodies (Okuno 1986; Matsui and Maeda 2018). Breeding seasons vary among localities, ranging from February to July and typically last less than a week at a single breeding site (Okuno 1986; Matsui and Maeda 2018). *Bufo j. formosus* is a typical explosive breeder, with males struggling intensely for females, causing disturbances to the more commonly seen (male-female) amplecting pairs, and resulting in male-male amplexus, and multiple-male amplexus (Okuno 1986).

**Figure 1.** Interspecific amplexus between an adult male *Buergeria buergeri* (on top) and a *Bufo japonicus formosus* of unknown sex, observed at the Uchigawa River, Japan. Photograph by Keigo Takahashi.





Reptiles & Amphibians ISSN 2332-4961
https://doi.org/10.17161/randa.v30i1.18738

Herein, I report, to the best of my knowledge, the first case of interspecific amplexus between *Buergeria buergeri* and *Bufo j. formosus* (Fig. 1). This observation was made at 0347 h on July 3 2022, on a rock in a shallow stream of the Uchigawa River in Minamiashigara City, Japan (35.3116, 139.0262; elev. 485 m asl). The river was approximately 10–60 cm deep, approximately 10 m wide, and was surrounded by mixed forest. No other frog species were present near the mis-amplecting pair, except for many male *B. buergeri* calling on the rocks. The ambient air temperature when the pair was observed was 23.8 °C, the weather was clear, and humidity was not measured. SVL in the paired state was measured using calipers; the male *B. buergeri* was approximately 40 mm and the *B. j. formosus* was approximately 70 mm. The *B. buergeri* was determined to be a mature male because it exhibited clasping behavior. Because it was outside the breeding season, I was unable to determine the sex or maturity of the *B. j. formosus* by the presence of nuptial pads or ovary eggs (the breeding season at the study site was in May). The type of interspecific amplexus was axillary amplexus. The pair was observed for 10 min, but the pair did not move and there was no release call emitted from the *B. j. formosus*.

*Buergeria buergeri* is a typical prolonged breeder, forming territory and actively calling to attract conspecific females (Matsui and Maeda 2018). In prolonged breeding frogs, females select mates (Wells 1977). Thus, the ability of male *B. buergeri* to identify species may be low. The body size of the *B. j. formosus* was 70 mm, slightly larger than typical female *B. buergeri*, suggesting that the male *B. buergeri* may have mistaken the similar-sized toad for a conspecific female. Because toads were observed feeding on insects at the study site for several nights prior to the observation, it is possible that the toad was mistakenly clasped during feeding.

## Acknowledgement

I thank Mr. Satoh for helping with the observation of frogs.

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