



Interspecific Amplexus of a Green Paddy Frog, *Hylarana erythraea* (Schlegel 1837), and a Philippine Narrowmouth Toad, *Kaloula conjuncta negrosensis* (Peters 1863), on Negros Island, Philippines

Paulo Miguel Kim¹, Clarence P. Gamez², and Vince Angelo Gicaraya¹

¹Biodiversity Research Laboratory, Institute of Biology, University of the Philippines Diliman, Quezon City, Philippines (vggicaraya@up.edu.ph)

²Energy Development Corporation, Ticala, Valencia, Negros Oriental, Philippines

Interspecific amplexus, during which a male frog attempts to mate with an individual of a different species (usually a female), is a globally common but likely underreported phenomenon among anurans (D'Amore et al. 2009; Brischoux and Lorrain-Solignon 2023). Such behavior is often attributed to environmental factors like habitat overlap, high levels of male competition, and mistaken identity, particularly in disturbed or fragmented habitats (Pearl et al. 2005; Mollov et al. 2010; Reading 1984; Serrano et al. 2022; Soni et al. 2024). In the Philippines, interspecific amplexus has been recorded among both endemic species (e.g., Palawan Horned Frog, *Pelobatrachus ligayae*, and Philippine Toad, *Ingerophrynus philippinicus* [Lorenzo and Realubit 2019]; Philippine Sticky Frog, *Kalophrynus sinensis*, and Big-eyed Frog, *Hylarana grandocula* [Flores et al. 2022]; *K. sinensis* and Philippine Oriental Frog, *Occidozyga laevis* [Sabanal et al. 2022]) and between native and introduced species (South American Cane Toad, *Rhinella marina*, and Asiatic Treefrog, *Polypedates leucomystax* [Webb and Zdunek 2023]), highlighting how anthropogenic changes to the environment can increase the frequency of these encounters. We herein document a new case of interspecific amplexus between the endemic Philippine Narrowmouth Toad (*Kaloula conjuncta negrosensis*) and the introduced Green Paddy Frog (*Hylarana erythraea*).

At 1020 h on 2 March 2025, we observed a male *K. c. negrosensis* engaged in amplexus with a female *H. erythraea* (Fig. 1) inside a man-made well during a visit to the Forest Camp Resort, Taft Street, Valencia, Negros Oriental, Philippines (9.28722, 123.12083; elev. 296 m asl). Other anuran species found in the well included the Philippine Wart Frog (*Limnonectes visayanus*) and Philippine Oriental Frog

(*Occidozyga laevis*). Our observations were opportunistic, not part of a scientific survey, and we did not handle, capture, or manipulate any organisms.

We identified *H. erythraea* by its (1) slender body, (2) smooth green dorsum, (3) distinct black lateral stripes extending from the snout through the eyes and well developed tympana and onto the body, (4) long hindlimbs, and (6) extensively webbed toes — adaptations that enhance its semi-aquatic lifestyle (Inger 1954). This introduced species has an



Figure 1. Interspecific amplexus between a male Philippine Narrowmouth Toad (*Kaloula conjuncta negrosensis*) and female Green Paddy Frog (*Hylarana erythraea*) in the Forest Camp Resort, Taft Street, Valencia, Negros Oriental, Philippines. Photo by P.M. Kim.

extensive distribution in the Philippines, where it occurs in lowland freshwater habitats, including disturbed ponds, rice paddies, and streams (Diesmos et al. 2006).

In contrast, the small and stocky *K. c. negrosensis* is characterized by (1) a compact, rounded body, (2) broad, flattened, expanded toe and fingertips, (3) minimal to absent webbing, and (4) a small head with a narrow mouth, a feature typical of the genus. This endemic species primarily inhabits lowland and montane forests, where it occupies tree cavities, vegetation, and wetland areas such as marshes, ponds, and streams, with males frequently vocalizing during the breeding season (Inger 1954). Although *K. c. negrosensis* can persist in disturbed environments, including agricultural lands and gardens near human settlements, it is more commonly associated with forested areas adjacent to water sources.

Although *H. erythraea* is frequently encountered in lowland stream systems and anthropogenically disturbed habitats, *K. c. negrosensis* is typically restricted to forested environments near water. In this instance, both species were in a man-made well at the Forest Camp Resort, an ecotourism site located at forest edge and adjacent to a rocky river. The presence of unidentified tadpoles suggested prior breeding activity in the well, although we were unable to identify the species. Based on our observations, this instance of interspecific amplexus could have been facilitated by the site's isolation, an inference admittedly based on a single observation. Although other individuals of *Kaloula* were present in the well, we made no attempts to capture them and their sexes (apart from the male exhibiting interspecific amplexus) were not verified.

This observation increases the number of published instances of interspecific amplexus in the Philippines and highlights the likelihood of such interactions in disturbed environments where native and introduced species overlap. The occurrence of both *K. c. negrosensis* and *H. erythraea* in a man-made well at an ecotourism site suggests that human-modified habitats can serve as novel contact zones and facilitate interspecific interactions (Pearl et al. 2005; Serrano et al. 2022). Although we observed no evidence of successful breeding, interspecific amplexus can interfere with reproductive output and behavior in amphibians (Hettyey and Pearman 2003; D'Amore et al. 2009). Further studies on amphibian behavior and reproductive ecology in disturbed habitats could provide valuable insights into the adaptive responses of native anurans to environmental changes, as interspecific amplexus is known

to impose energetic costs on males and can result in injury or lost reproductive opportunities for females (Pearl et al. 2005; Serrano et al. 2022).

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Literature Cited

- Brischoux, F. and L. Lorrain-Soligon. 2023. Anuran swingers: Misdirected mating attempts occurred early during anuran diversification. *Biological Journal of the Linnean Society* 141: 529–539. <https://doi.org/10.1093/biolinnean/blad108>.
- D'Amore, A., E. Kirby, and V. Hemingway. 2009. Reproductive interference by an invasive species: An evolutionary trap? *Herpetological Conservation and Biology* 4: 325–330.
- Diesmos, A.C., M.L. Diesmos, and R.M. Brown. 2006. Status and distribution of alien invasive frogs in the Philippines. *Journal of Environmental Science and Management* 9: 41–53.
- Flores, A.B.A., R.R. Pantorilla, and O.M. Nuñez. 2022. Interspecific amplexus between *Kalophrynus sinensis* (Peters, 1867) and *Pulchrana grandocula* (Taylor, 1920) in Rogongon, Iligan City, Philippines. *Southeast Asia Vertebrate Records* 2020: 28–29.
- Hettyey, A. and P.B. Pearman. 2003. Social environment and reproductive interference affect reproductive success in the frog *Rana latastei*. *Behavioral Ecology* 14: 294–300. <https://doi.org/10.1093/beheco/14.2.294>.
- Inger, R.F. 1954. Systematics and zoogeography of Philippine Amphibia. *Fieldiana Zoology* 33: 181–531. <https://doi.org/10.5962/bhl.title.5571>.
- Lorenzo II, A.N. and N.D.C. Realubit. 2019. Interspecific amplexus between *Ingerophrynus philippinicus* and *Megophrys ligayae* on Palawan Island, Philippines. *Southeast Asia Vertebrate Records* 2019: 74–75.
- Mollov, I., G. Popgeorgiev, B. Naumov, N. Tzankov, and A. Stoyanov. 2010. Cases of abnormal amplexus in anurans (Amphibia: Anura) from Bulgaria and Greece. *Biharean Biologist* 4: 121–125.
- Pearl, C.A., M.P. Hayes, R. Haycock, J.D. Engler, and J. Bowerman. 2005. Observations of interspecific amplexus between western North American ranid frogs and the introduced American Bullfrog (*Rana catesbeiana*), and a hypothesis concerning breeding interference. *American Midland Naturalist* 154: 126–134. [https://doi.org/10.1674/0003-0031\(2005\)154\[0126:OOIABW\]2.0.CO;2](https://doi.org/10.1674/0003-0031(2005)154[0126:OOIABW]2.0.CO;2).
- Reading, C.J. 1984. Interspecific spawning between Common Frogs (*Rana temporaria*) and Common Toads (*Bufo bufo*). *Journal of Zoology* 203: 95–101. <https://doi.org/10.1111/j.1469-7998.1984.tb06030.x>.
- Sabanal, B.T., M.J.M.M. Achondo, J.T. Torrefiel, and L.E.D. Gamalo. 2022. Interspecific amplexus between *Kalophrynus sinensis* Peters, 1867 and *Occidozyga laevis* (Günther, 1858) on Mindanao Island, Philippines. *Herpetology Notes* 15: 467–469.
- Serrano, F.C., J.C. Díaz-Ricaurte, and M. Martins. 2022. Finding love in a hopeless place: A global database of misdirected amplexus in anurans. *Ecology* 103: e3737. <https://doi.org/10.1002/ecy.3737>.
- Soni, S.P., V. Apte, P. Joshi, and V.P. Cyriac. 2024. Barking up the wrong frog: Global prevalence of misdirected amplexus in anuran amphibians. *Biological Journal of the Linnean Society* 145: blae062. <https://doi.org/10.1093/biolinnean/blae062>.
- Webb, M.S. and P. Zdunek. 2023. Interspecific amplexus of *Rhinella marina* (Linnaeus, 1758) and *Polypedates leucomystax* (Gravenhorst, 1829) on Mindoro Island, Philippines. *Southeast Asia Vertebrate Records* 2023: 5–6.