



Interspecific Amplexus between Male Terai Treefrogs, *Polypedates teraiensis* (Dubois 1987), and Female Large Treefrogs, *Zhangixalus smaragdinus* (Blyth 1852)

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During the breeding season, adult male anurans emit species-specific advertisement calls to attract conspecific females (Duellman and Trueb 1986; Wells 2007). Anurans distinguish mates through visual, chemical, or acoustic signals (e.g., Bowcock et al. 2008; Belanger and Corkum 2009). Interspecific amplexus has been recorded from anuran species worldwide (e.g., Shahrudin 2016; Bhattarai et al. 2018; Groffen et al. 2019; Lalnunhlua et al. 2021), and many authors have discussed the factors responsible for its occurrence (e.g., Höbel 2005; Wogel et al. 2005; Mollov et al. 2010; Machado and Bernarde 2011; Vivek et al. 2014; Shahrudin 2016).

The Terai Treefrog (*Polypedates teraiensis*) is a rhacophorid first described by Dubois (1987) as a subspecies of *Polypedates leucomystax* (as *Rhacophorus leucomystax teraiensis*) from eastern Nepal and later elevated to full species by Ao et al. (2003). *Polypedates teraiensis* has been recorded from eastern Nepal, India (West Bengal, Meghalaya, Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Sikkim, Tripura, Gujarat, and Madhya Pradesh), Bangladesh, Myanmar, and possibly adjacent China (Lalremsanga et al. 2015; Purkayastha et al. 2020; Frost 2021). The Large Treefrog (*Zhangixalus smaragdinus*) is a rhacophorid described by Blyth (1852) from the Naga Hills, Asám (present Nagaland) in India. The species has been



Fig. 1. Male Terai Treefrogs (*Polypedates teraiensis*) in amplexus with female Large Treefrogs (*Zhangixalus smaragdinus*) on 31 March 2018 (A) and 23 April 2018 (B) in an abandoned water tank in Tlangnuam, Aizawl, Mizoram, India. Photographs by Lalkhawngaiha Sailo.



Fig. 2. A male Terai Treefrog (*Polypedates teraiensis*) in amplexus with a female Large Treefrog (*Zhangixalus smaragdinus*) on 5 May 2019 in an abandoned water tank in Tlangnuam, Aizawl, Mizoram, India. Photograph by Lalkhawngaiha Sailo.

recorded from northeastern India (Assam, Arunachal Pradesh, Nagaland, Mizoram, Manipur, Meghalaya, West Bengal), Nepal, southeastern Tibet in China, and possibly northern Bangladesh (Frost 2021). Herein, we present multiple observations of interspecific axillary amplexus between male Terai Treefrogs and female Large Treefrogs in Tlangnuam, Aizawl, Mizoram, India (23°42.177'N, 92°42.026'E; elev. 937 m asl).

All observations were in an abandoned water tank. The first amplexing pair (Fig. 1A) was observed at about 2030 h on 31 March 2018, the second (Fig. 1B) at about 1730 h on 23 April 2018, and the third (Fig. 2) at about 1700 h on 5 May 2019. The amplexing pairs were undisturbed. Snout-vent lengths, ambient temperatures, and humidities were not recorded. To the best of our knowledge, these are the first documented incidents of amplexus between male Terai Treefrogs and female Large Treefrogs.

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Literature Cited

Ao, J.M., S. Bordoloi, and A. Ohler. 2003. Amphibian fauna of Nagaland with nineteen new records from the state including five new records for India. *Zoos' Print Journal* 18: 1117–1125. <https://dx.doi.org/10.11609/JoTT.ZPJ.18.6.1117-25>.

- Belanger, R.M. and L.D. Corkum 2009. Review of aquatic sex pheromones and chemical communication in anurans. *Journal of Herpetology* 43: 184–191. <https://doi.org/10.1670/08-054R1.1>.
- Bhattarai, S., P. Gotame, C.P. Pokheral, B.R. Lamichhane, R.C. Kandel, and N. Subedi. 2018. Interspecific amplexus of a Six-lined Treefrog, *Polypedates taeniatus* (Boulenger 1908), and a Chunam Treefrog, *P. maculatus* (Gray 1830) (Anura: Rhacophoridae), in Chitwan National Park, Nepal. *Reptiles & Amphibians* 25: 29–30. <https://doi.org/10.17161/randa.v25i1.14225>.
- Blyth, E. 1852. Report of Curator, Zoological Department. *Journal of the Asiatic Society of Bengal* 21: 341–358.
- Bowcock, H., G.P. Brown, and R. Shine. 2008. Sexual communication in cane toads, *Chaunus marinus*: what cues influence the duration of amplexus? *Animal Behaviour* 75: 1571–1579. <https://doi.org/10.1016/j.anbehav.2007.10.011>.
- Duellman, W.E. and L. Trueb. 1986. *Biology of Amphibians*. McGraw-Hill Book Co., New York, New York, USA.
- Dubois, A. 1987 (“1986”). Miscellanea taxinomica batrachologica (I). *Alytes* 5: 7–95.
- Frost, D.R. 2021. *Amphibian Species of the World: An Online Reference*. Version 6.1. American Museum of Natural History, New York, New York, USA. <https://amphibiansoftheworld.amnh.org/index.php>. <https://doi.org/10.5531/db.vz.0001>.
- Groffen, J., Y. Yang, A. Borzée, and Y. Jang. 2019. Interspecific amplexus between *Glandirana tientaiensis* (Chang, 1933) and *Odorrana schmackeri* (Boettger, 1892) at the Fuchun River, eastern China. *Herpetology Notes* 12: 41–42.
- Höbel, G. 2005. *Rana palustris* (Pickerel Frog) and *Ambystoma maculatum* (Spotted Salamander) Reproductive behavior. *Herpetological Review* 36: 55–56.
- Lalnunhluva, S. Lalronunga, P.L. Lalsawmliana, C. Lalrinchhana, and E. Lahlmingliani. 2021. Interspecific amplexus between a male Yang's Frilled Treefrog, *Kurixalus yangi* Yu, Hui, Rao, and Yang 2018, and a female Brauer's Brown Treefrog, *Polypedates braueri* (Vogt 1911), with recommendations for English common names. *Reptiles & Amphibians* 28: 467–468. <https://doi.org/10.17161/randa.v28i3.15681>.
- Lalremsanga, H.T., S. Sailo, C. Lalrinchhana, S. Lalronunga, and Lalrothuanga. 2015. Herpetofaunal survey on Tam Dil National wetland, Mizoram, India, pp. 207–216. In: A.K. Sanyal, S.K. Gupta, and S. Manna (eds.), *Biodiversity and Livelihood: Proceedings of the National Conference in Biodiversity – Issues, Concern & Future Strategies*. West Bengal Biodiversity Board, Kolkata, West Bengal, India.
- Machado, R.A. and P.S. Bernarde. 2011. Multiple and heterospecific amplexi between the toads *Rhaebo guttatus* and *Rhinella marina* (Anura: Bufonidae). *Herpetology Notes* 4: 167–169.
- Mollov, I.A., G.S. Popgeorgiev, B.Y. Naumov, N.D. Tzankov, and A.Y. Stoyanov. 2010. Cases of abnormal amplexus in anurans (Amphibia: Anura) from Bulgaria and Greece. *Biharean Biologist* 4: 121–125.
- Purkayastha, J., N. Khan, and S. Roychoudhury. 2020. A Preliminary Checklist of Herpetofauna Occurring in Rowa Wildlife Sanctuary, Tripura, India, pp. 225–233. In: N. Roy, S. Nautiyal, S.K. Agarwal, and S. Baksi (eds.), *Socio-economic and Eco-biological Dimensions in Resource Use and Conservation, Environmental Science and Engineering*. Springer Verlag, Berlin, Germany.
- Shahrudin, S. 2016. Interspecific amplexus between male *Rhacophorus promianus* and female *Polypedates leucomystax* from peninsular Malaysia. *The Herpetological Bulletin* 135: 30–31.
- Vivek, S., M. Dinesh, K.R. Kumar, Y. Divaker, and K.K. Sharma. 2014. Interspecies mating interactions between *Duttaphrynus stomaticus* (Marbled Toad) and *Sphaerotheca breviceps* (Indian Burrowing Frog) at the Central Aravalli Foothills, Rajasthan, India. *Herpetology Notes* 7: 139–140.
- Wells, K.D. 2007. *The Ecology and Behavior of Amphibians*. The University of Chicago Press, Chicago, Illinois, USA.
- Wogel, H., P.A. Abrunhosa, and J.P. Pombal-Junior. 2005. Breeding behaviour and mating success of *Phyllomedusa rohdei* (Anura, Hylidae) in south-eastern Brazil. *Journal of Natural History* 39: 2035–2045. <https://doi.org/10.1080/00222930500044581>.