Notes

First record of daytime coral spawning in Malaysia

Alvin J. Chelliah* and **Sue Y. Chen**

Reef Check Malaysia, Kuala Lumpur, Jalan Ampang, Wilayah Persekutuan Kuala Lumpur, 50450, Malaysia

**Corresponding author: alvin@reefcheck.org.my*

Received: 09 Apr. 2026 || Revised: 15 Jul. 2026 || Accepted: 19 Oct. 2026 || Available Online: 26 Nov. 2026

How to cite:
Chelliah AJ, Chen SY. 2026. First record of daytime coral spawning in Malaysia. The Palawan Scientist. 18(2):in press. https://doi.org/10.69721/TPS.J.2026.18.2.13

ABSTRACT

Scleractinian corals mainly reproduce at night through highly synchronized broadcast spawning, with over 60% of species being hermaphroditic. Although multispecies synchronous coral spawning events have been documented at night in Malaysia and daytime spawning in scleractinian corals has been reported at several locations worldwide, no records of daytime coral spawning have been documented in Malaysian waters. During a field survey at Tioman Island Marine Park on 07 April 2026, spawning was observed in six colonies of *Porites rus* (Forskål, 1775) at depths of 5 to 7 m. Colonies measuring 0.5 to 1.5 m in diameter spawned between 0825H and 0900H during low tide, five days after the full moon, with the event lasting approximately 35 min. This observation therefore represents the first documented record of daytime spawning in scleractinian corals in Malaysia and the first report of daytime spawning in *P. rus* in Malaysian waters.

Keywords: diurnal, *Porites*, scleractinian, Tioman

More than 60% of scleractinian corals are hermaphrodites that reproduce via broadcast spawning, which typically occurs at night and is highly synchronized within populations (Harrison and Wallace 1990; Baird et al. 2009). Researchers have documented multispecies synchronous coral spawning at night at several coral reef locations in Malaysia. At Pulau Tioman, at least eight coral species from three genera (*Acropora*, *Montipora* and *Porites*) were observed to spawn synchronously (Chelliah et al. 2015). Similarly, in Pulau Bidong, a total of 15 coral species representing four genera (*Acropora*, *Montipora*, *Merulina* and *Porites*) participated in synchronous spawning events (Tan et al. 2020). At Pulau Lankayan, synchronous spawning was recorded in 14 coral species from three genera (*Acropora*, *Cyphastrea* and *Platygyra*) (Gan et al. 2021).

UNCORRECTED PROOF

©2026, Western Philippines University

Daytime spawning is rare among scleractinian corals and, when observed, typically occurs in the early morning or late afternoon (Bronstein and Loya 2011). During a survey conducted at Tioman Island Marine Park, a total of six colonies of *Porites rus* (Forskål, 1775) measuring 0.5 to 1.5 m in diameter were observed spawning in the morning (Figure 1). All colonies were recorded spawning during low tide at depths of 5 to 7 m between 0825H and 0900H on 07 April 2026, five days after the full moon. The spawning event lasted approximately 35 min. The survey was conducted from 0745H to 0930H, with approximately 1 h and 45 min spent in the water. The sea surface temperature and the water temperature at the depths where corals were observed spawning were both 28°C. Weather conditions were calm and clear, with no wind or strong waves. On the day spawning was observed, high tides occurred at 1322H (2.9 m) and 2355H (2.1 m), while low tides occurred at 0550H (0.7 m) and 1945H (1.7 m). During the observed spawning event, the tidal level ranged from approximately 1 to 1.5 m. The moon was in a waning phase, with 71% illumination.

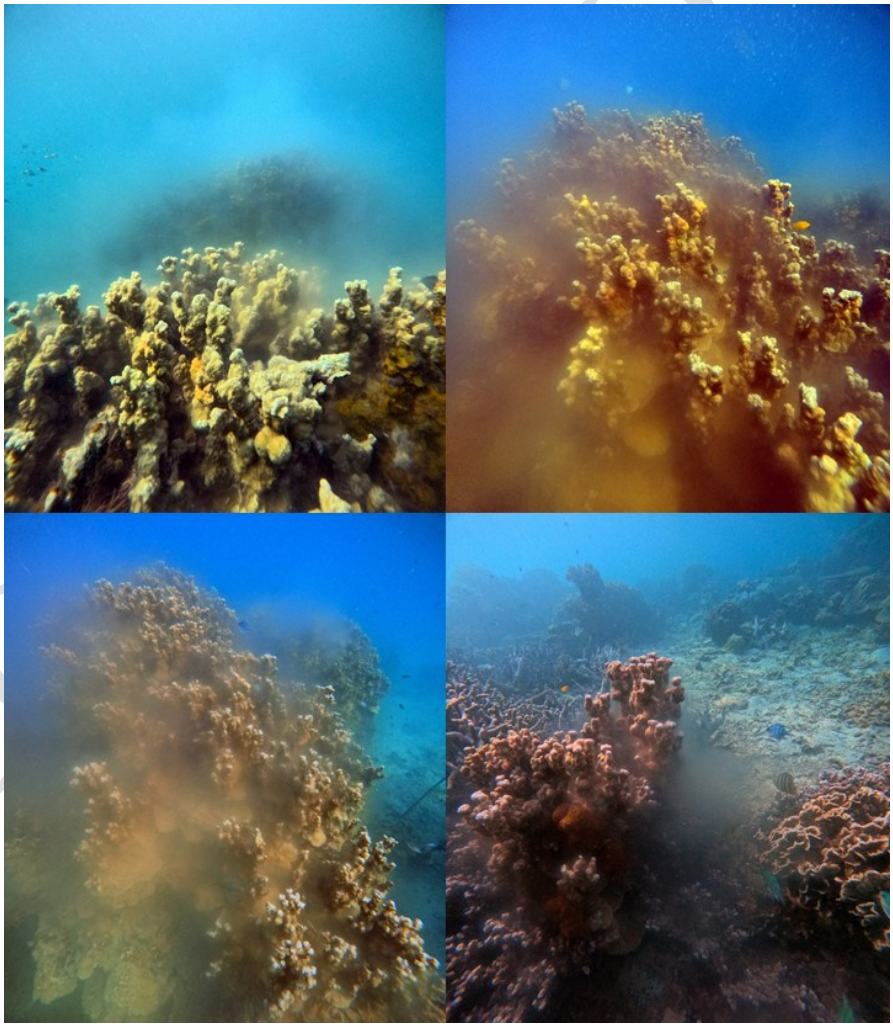

Figure 1. Photographs of four of the six *Porites rus* (Forskål, 1775) colonies observed spawning during the daytime at Tioman Island Marine Park, Malaysia.

©2026, Western Philippines University

UNCORRECTED PROOF

Porites rus is generally regarded as a gonochoric spawning coral species (Penland et al. 2004). Populations from the western Pacific and the South Indian and Pacific Oceans have been reported as gonochoric spawners (Penland et al. 2004; Moritz et al. 2025), whereas populations from the Western Indian Ocean have been suggested to exhibit gonochoric brooding reproductive strategies (Bronstein and Loya 2011). However, the reproductive mode of *P. rus* observed in the present study could not be conclusively determined because the sexes of the colonies were not identified. Despite this uncertainty, the timing of the spawning event was consistent with previous reports from Chumbe Island (Bronstein and Loya 2011) and the South Indian and Pacific Oceans (Moritz et al. 2025), where spawning was also reported five days after the full moon. Future research should therefore determine the sex of *P. rus* colonies and extend spawning observations across multiple consecutive months and a broader geographical range to clarify the reproductive mode and reproductive periodicity of *P. rus* in Malaysia.

Although research on daytime coral spawning in Malaysia remains in its early stages, the present findings provide a valuable baseline for future investigations of daytime spawning patterns in Malaysian waters. Daytime spawning has previously been recorded from several locations, including the Galapagos Islands (Glynn et al. 1996), Hawaiian waters (Maté 1998), the Gulf of Thailand (Plathong et al. 2006), the Red Sea (Bouwmeester et al. 2011) and Chumbe Island (Bronstein and Loya 2011). However, to the best of our knowledge, no daytime coral spawning events have previously been documented in the literature for Malaysia. This study therefore represents the first documented record of daytime spawning in scleractinian corals in Malaysia and the first report of daytime spawning in *P. rus* in Malaysian waters.

FUNDING

This observation on day coral spawning was taken while carrying out reef monitoring activities funded by SC Johnson.

GENERATIVE AI STATEMENT

Generative AI was not used.

ETHICAL CONSIDERATIONS

Not applicable.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no competing interests.

ACKNOWLEDGMENTS

©2026, Western Philippines University

UNCORRECTED PROOF

The authors would like to thank the Department of Fisheries Malaysia for their continued support as well as the two anonymous reviewers for their guidance and feedback.

REFERENCES

Baird AH, Guest JR, Willis BL. 2009. Systematic and biogeographical patterns in the reproductive biology of scleractinian corals. Annual Review of Ecology, Evolution, and Systematics. 40:551-571. https://doi.org/10.1146/annurev.ecolsys.110308.120220

Bouwmeester J, Berumen ML, Baird AH. 2011. Daytime broadcast spawning of *Pocillopora verrucosa* on coral reefs of the central Red Sea. Galaxea, Journal of Coral Reef Studies. 13(1):23-24. https://doi.org/10.3755/galaxea.13.23

Bronstein O, Loya Y. 2011. Daytime spawning of *Porites rus* on the coral reefs of Chumbe Island in Zanzibar, Western Indian Ocean (WIO). Coral Reefs. 30(2):441. https://doi.org/10.1007/s00338-011-0733-7

Chelliah A, Bin Amar H, Hyde J, Yewdall K, Steinberg PD, Guest JR. 2015. First record of multi-species synchronous coral spawning from Malaysia. PeerJ. 3:e777. https://doi.org/10.7717/peerj.777

Gan SH, Waheed Z, Chung FC, Spiji DA, Sikim L, Saleh E, Tan CH. 2021. In situ observations of coral spawning and spawn slick at Lankayan Island, Sabah, Malaysia. Marine Biodiversity. 51(1):10. https://doi.org/10.1007/s12526-020-01158-5

Glynn PW, Colley SB, Gassman NJ, Black K, Cortés J, Maté JL. 1996. Reef coral reproduction in the eastern Pacific: Costa Rica, Panamá, and Galápagos Islands (Ecuador). III. Agariciidae (*Pavona gigantea* and *Gardineroseris planulata*). Marine Biology. 125(3):579-601. https://doi.org/10.1007/bf00353270

Harrison PL, Wallace CC. 1990. Reproduction, dispersal and recruitment of scleractinian corals. In: Ecosystems of the world. Elsevier, Amsterdam. p. 133-207.

Maté JL. 1998. New reports on the timing and mode of reproduction of Hawaiian corals. In: Cox EF, Krupp DA, Jokiel PL, editors. Reproduction in reef corals results of the 1997 Edwin W Pauley summer program in marine biology. Hawaii Institute of Marine Biology. Technical Report No. 42. p. 7.

Moritz C, Andréfouët S, Azam C-S, Berthe C, Fourrière M, Goyaud A, Grouazel M, Siu G, Taiarui M, Trinh A-M and others. 2025. Shining a light on daytime coral spawning synchrony across oceans. Global Ecology and Biogeography. 34(7):e70072. https://doi.org/10.1111/geb.70072

Penland L, Kloulechad J, Idip D, van Woesik R. 2004. Coral spawning in the western Pacific Ocean is related to solar insolation: evidence of multiple spawning events in Palau. Coral Reefs. 23(1):133-140. https://doi.org/10.1007/s00338-003-0362-x

Plathong S, Baird AH, Chen CA, Chanmethakul T, Suwonno V, Buaphet P, Soontornpitakkool S. 2006. Daytime gamete release from the reef-building coral, *Pavona* sp., in the Gulf of Thailand. Coral Reefs. 25(1):72-72. https://doi.org/10.1007/s00338-005-0065-6

Tan CH, Mohd Safuan CD, Idris I, Mohd Noor MRH, Samshuri MA, Kamarrudin N, Zaidi PN, Jaafar SNT, Baird AH. 2020. Multispecific synchronous coral spawning on Pulau Bidong, Malaysia, South China Sea. Bulletin of Marine Science. 96(1):193-194. https://doi.org/10.5343/bms.2019.0067

***ROLE OF AUTHORS: AJC** – concept, data collection, drafting, and revision of the manuscript; **SYC** – analysis of data, drafting and revision of the manuscript*

UNCORRECTED PROOF

©2026, Western Philippines University