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## Citizen science frontiers horseshoe crab population regain at their spawning beach in East Peninsular Malaysia (Article)

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### Abstract

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*Carcinoscorpius rotundicauda* and *Tachypleus gigas* may co-exist and share common spawning grounds elsewhere but at Balok (East Coast of Peninsular Malaysia), *C. rotundicauda* is an understudied species. Neglected as research candidate because of inaccessible spawning grounds, smaller size and less commercial value than *T. gigas* and also, difficulty to attain from the wild has made *C. rotundicauda* population status remaining unidentified at Balok. This standpoint drove the present attempt because anthropic activities like structure placement and mining are point-source for runoffs that load sediments into Balok River. While erosion-accretion events have altered Balok River width, the shore sediments in Balok Beach were transitioned between medium-fine and fine sand between years 2012 and 2016. Eventually by year 2016, the *C. rotundicauda* were depositing 5117 eggs in 91 nests from 200 to 1000 m range along this corridor facing South China Sea. From this yield, *C. rotundicauda* released 2880 eggs in 56 nests during the Southwest monsoon, 1254 eggs in 19 nests during the Northeast monsoon and 983 eggs in 16 nests during the Inter-monsoon seasons. Though female *C. rotundicauda* opted to lay their eggs in shallow burrows at lower shorelines, the absence of erosion and substantial silt and clay (>20%) deposition facilitates *C. rotundicauda* embryogenesis with brief periods of temperature and salinity shocks during day-time falling tides. This encourages *C. rotundicauda* to emerge with increasing abundance and carry out bi-monthly spawning at Balok Beach. In short, shore restoration initiatives like systematic boat docking, proper disposal of nets and waste and, periodic fish-catching operations were effectively led by the Balok fisher citizen scientist. This successful community joint-cooperation proves that citizen-led caretaking of degraded beaches offers marine life protection and are practical for coastal area management especially at areas where other oviparous animals such as turtles and crocodiles are harboured. © 2018 Elsevier Ltd

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- Merostomata
- Tachypleus gigas
- Testudines

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