

Article

Integrated Taxonomy Revealed Genetic Differences in Morphologically Similar and Non-Sympatric *Scoliodon macrorhynchos* and *S. laticaudus*

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Citation: Lim, K.C.; White, W.T.; Then, A.Y.H.; Naylor, G.J.P.; Arunrugstichai, S.; Loh, K.-H. Integrated Taxonomy Revealed Genetic Differences in Morphologically Similar and Non-Sympatric *Scoliodon macrorhynchos* and *S. laticaudus*. *Animals* **2022**, *12*, 681. <https://doi.org/10.3390/ani12060681>

Academic Editor: Martina Francesca Marongiu

Received: 27 January 2022

Accepted: 5 March 2022

Published: 8 March 2022

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Simple Summary: In this study, the species identities of similar-looking coastal spadenose sharks from different areas were clarified by adding new molecular markers and more individual body measurements, including animals from the Malaysian Peninsula that had not been examined previously. Collective evidence showed that there are two genetically distinct species that do not overlap in their spatial occurrence. The Malacca Strait acts as a boundary delineating the distribution range of the Pacific spadenose shark *Scoliodon macrorhynchos* to the east and, of the Northern Indian Ocean, *S. laticaudus* to the west. In addition, the need to determine the species status of *Scoliodon* animals from Indonesian waters was identified. The present study reinforced the need to rely on comprehensive genetic information in addition to external characteristics to assess the species identities and distribution range for small sharks and rays that have apparent contiguous coastal distribution with limited dispersal abilities.

Abstract: Previous examination of the mitochondrial *NADH2* gene and morphological characteristics led to the resurrection of *Scoliodon macrorhynchos* as a second valid species in the genus, in addition to *S. laticaudus*. This study applied an integrated taxonomic approach to revisit the classification of the genus *Scoliodon* based on new materials from the Malaysian Peninsula, Malaysian Borneo and Eastern Bay of Bengal. Mitochondrial DNA data suggested the possibility of three species of *Scoliodon* in the Indo-West Pacific, while the nuclear DNA data showed partially concordant results with a monophyletic clade of *S. macrorhynchos* and paraphyletic clades of *S. laticaudus* and *S. cf. laticaudus* from the Malacca Strait. Morphological, meristic and dental characteristics overlapped between the three putative species. Collective molecular and morphological evidence suggested that the differences that exist among the non-sympatric species of *Scoliodon* are consistent with isolation by distance, and *Scoliodon macrorhynchos* remains as a valid species, while *S. cf. laticaudus* is assigned as *S. laticaudus*. The Malacca Strait acts as a spatial delineator in separating the Pacific *S. macrorhynchos* (including South China Sea) from the Northern Indian Ocean *S. laticaudus*. Future taxonomic work should focus on clarifying the taxonomic status of *Scoliodon* from the Indonesian waters.

Keywords: spadenose sharks; integrated taxonomy; synonymy; Indo-West Pacific; morphometrics; genetics; distribution range