

Marine Platyhelminthes of the Maldives: A Review of Their Diversity and Distribution

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BACKGROUND

The Maldives is a highly biodiverse Indo-Pacific archipelago characterized by a wide variety of ecosystems. Despite this biodiversity, marine invertebrates remain poorly studied, particularly Platyhelminthes (flatworms). This phylum includes both free-living species and parasitic taxa. Their diversity is often underestimated because of cryptic species, similar morphologies, secretive habits, small body size, and host-specific lifestyles. Although neighbouring Indo-Pacific regions have revealed considerable flatworm diversity through targeted surveys, information from the Maldives remains scattered and incomplete, making a comprehensive assessment necessary.

AIM

Provide a comprehensive overview of Platyhelminthes in the Maldives by assessing their species richness and describing their occurrence patterns and geographic distribution throughout the archipelago. It also aimed to identify inconsistencies and knowledge gaps in the available information and to highlight priorities for future research.

EXPERIMENTAL METHODS



Literature review on Platyhelminthes biodiversity and distribution

Seven relevant studies from literature

Citizen-science observations verified using photographic and geographic information, while unreliable identified records were excluded

Occurrences were assigned to **northern, central, or southern** administrative atolls, to **compare distribution** and sampling intensity

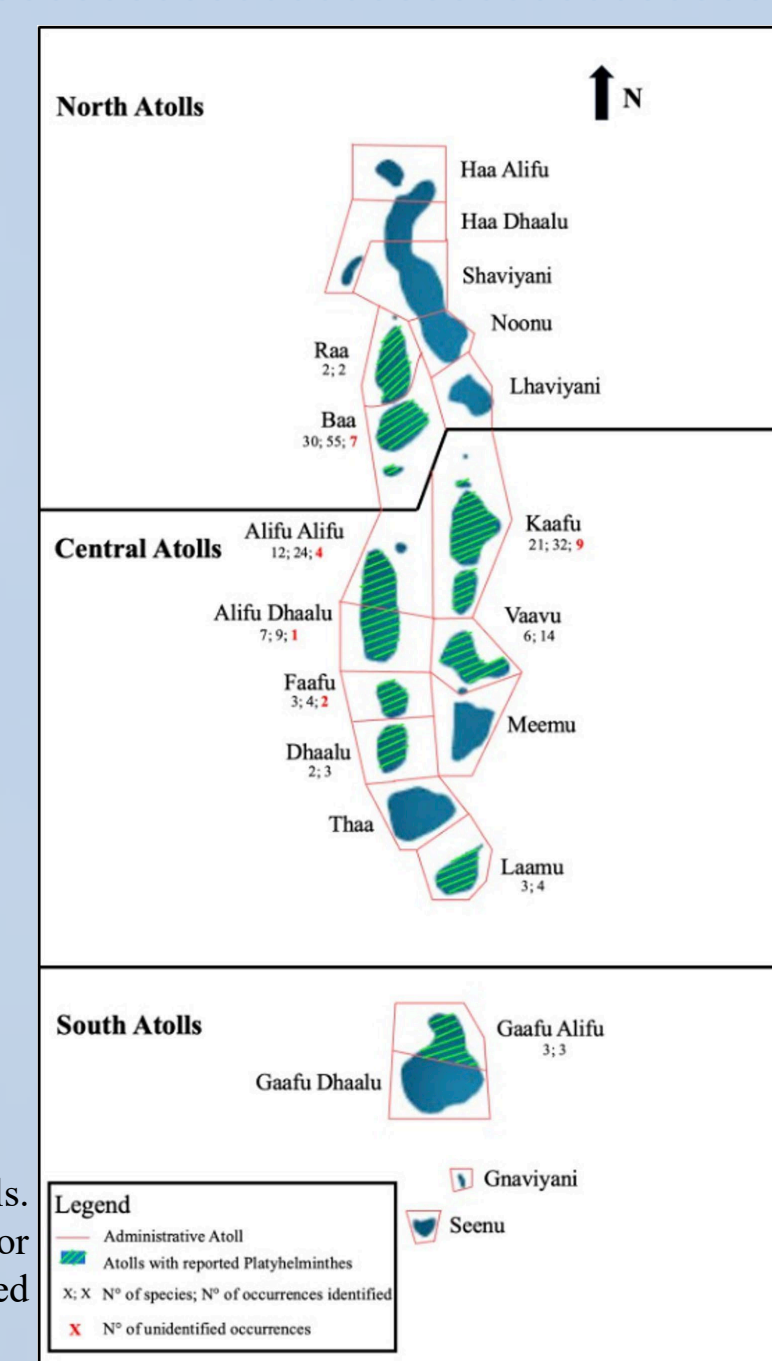
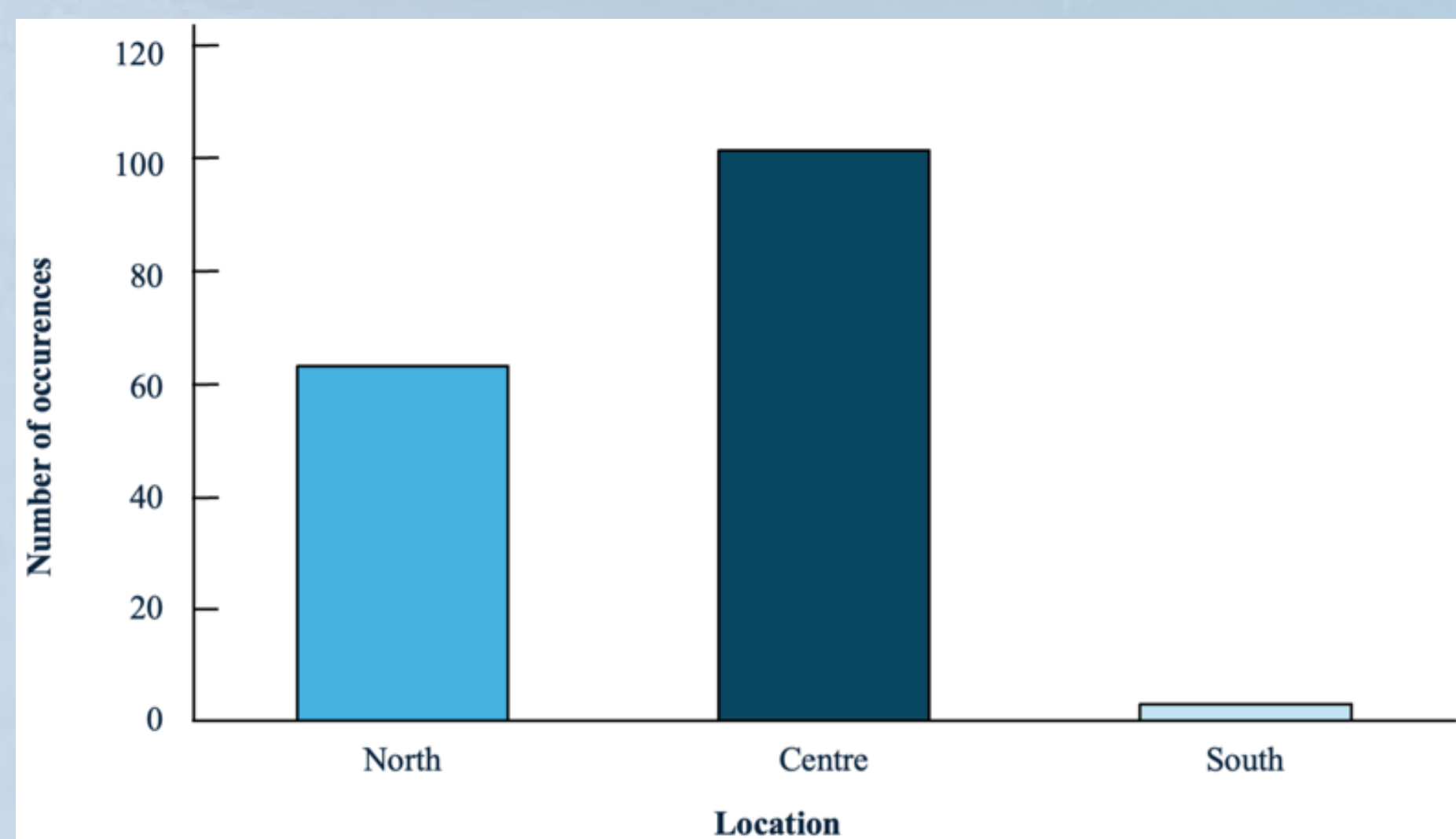


Figure 1. Map of the Maldives divided by administrative atolls. Green squares refer to atolls with reported Platyhelminthes; for every atoll, the number of species, identified and unidentified records, is specified

RESULTS

FAMILY	SPECIES	LOCATION	SYN. STUDIES	GBIF	TTD	WEB
Ancyrocephalidae	<i>Euryhalorena cognata</i> (Kotikky & Galli, 2012)	Center: Kaafu	Kotikky, 2012	X		
	<i>Euryhalorena distincta</i> (Kotikky & Galli, 2012)	Center: Kaafu	Kotikky, 2012	X		
	<i>Euryhalorena ternstroemi</i> (Kotikky & Galli, 2012)	Center: Kaafu	Kotikky, 2012	X		
Cryptogonimidae	<i>Cyrtosoma thomasi</i> (Miller & Cribb, 2007)	Center: Alifu Alifu		X		
	<i>Leboserchia polygona</i> (Miller, Downie & Cribb, 2009)	Center: Alifu Alifu		X		
	<i>Retroscia sublinea</i> (Miller & Cribb, 2007)	Center: Alifu Alifu		X		
Euryleptidae	<i>Varianthus charadrius</i> (Miller et al., 2010)	Center: Alifu Alifu		X		
	<i>Lameteria thalassia</i> (Miller & Cribb, 2007)	Center: Alifu Alifu	Miller & Cribb, 2007	X		
	<i>Lameteria mediterranea</i> (Miller & Cribb, 2007)	Center: Alifu Alifu	Miller & Cribb, 2007	X		
Lacistorhynchidae	<i>Martignella fuscopunctata</i> (Prudhoe, 1978)	North: Baa Center: Kaafu	Cannon, 2003	X	X	
	<i>Bombocylindrus spirammarum</i> (Pattner 1931)	Center: Kaafu		X		
	<i>Platysira ornata</i> (Laidlaw, 1902)	South: Gaafu Alifu		X		
Phaeociridae	<i>Austrotrichia maldiviana</i> (Kotikky 1977)	Center: Kaafu		X		
	<i>Protholothium elegans</i> (Laidlaw, 1902)	Center: Kaafu		X		
	<i>Protholothium elegans</i> (Laidlaw, 1902)	South: Gaafu Alifu		X		
Pseudocerotidae	<i>Nymphozoon orsaki</i> (Newman & Cannon, 1996)	North: Baa Center: Dhaalu, Faafu, Kaafu, Laamu	Andersson et al., 2012	X	X	
	<i>Pseudoceros beauforti</i> (Laidlaw, 1903)	North: Baa Center: Alifu Alifu, Alifu Dhaalu, Dhaalu, Faafu, Kaafu, Laamu, Vaavu		X	X	
	<i>Pseudoceros dimensis</i> (Newman & Cannon, 1994)	North: Baa		X	X	
Pseudocerotidae	<i>Pseudoceros palmeri</i> (Newman & Cannon, 1994)	North: Baa		X	X	
	<i>Pseudoceros gardineri</i> (Laidlaw, 1902)	Center: Kaafu		X		
	<i>Pseudoceros glaucus</i> (Newman & Cannon, 1994)	North: Baa Center: Alifu Alifu, Alifu Dhaalu, Faafu		X	X	
Pseudocerotidae	<i>Pseudoceros griseus</i> (Ratto, 1977)	North: Baa		X	X	
	<i>Pseudoceros prudhoei</i> (Newman & Cannon, 1994)	North: Baa		X	X	
	<i>Pseudoceros spinulosus</i> (Laidlaw, 1903)	North: Baa, Baa Center: Alifu Alifu, Kaafu, Vaavu		X	X	
Pseudocerotidae	<i>Pseudoceros stellatus</i> (Newman & Cannon, 1994)	North: Baa		X	X	
	<i>Pseudoceros inflexus</i> (Prudhoe, 1989)	North: Baa		X	X	
	<i>Pseudoceros huxleyi</i> (Collingwood, 1876)	Center: Kaafu		X		
Pseudocerotidae	<i>Pseudoceros duplicatus</i> (Prudhoe, 1989)	North: Baa		X	X	
	<i>Pseudoceros goshawii</i> (Newman & Cannon, 1994)	Center: Kaafu	Newman & Anderson, 1997	X	X	X
	<i>Pseudoceros ligusticus</i> (Bock, 1913)	North: Baa Center: Kaafu		X	X	
Pseudocerotidae	<i>Pseudoceros monstrosus</i> (Newman & Cannon, 1994)	North: Baa Center: Alifu Alifu, Kaafu, Vaavu		X	X	
	<i>Pseudoceros parvulus</i> (Newman & Cannon, 1994)	North: Baa		X	X	
	<i>Pseudoceros punctatus</i> (Laidlaw, 1902)	Center: Kaafu		X	X	
Pseudocerotidae	<i>Pseudoceros scutellatus</i> (Newman & Cannon, 1994)	North: Baa Center: Vaavu	Newman & Anderson, 1997	X	X	X
	<i>Pseudoceros stimpsoni</i> (Newman & Cannon, 1996)	North: Baa		X	X	
	<i>Pseudoceros unicolor</i> (Newman & Anderson, 1997)	North: Baa, Baa Center: Alifu Alifu, Alifu Dhaalu, Kaafu, Laamu	Newman & Anderson, 1997	X	X	
Pseudocerotidae	<i>Pseudoceros zebra</i> (Laidlaw, 1903)	North: Baa		X	X	
	<i>Thysanoceros nitrospiralatus</i> (Hymen, 1959)	North: Baa, Alifu Alifu, Alifu Dhaalu, Vaavu		X	X	
	<i>Pseudoceros nitrospiralatus</i> (Hymen, 1959)	South: Gaafu Alifu		X	X	
Pseudocerotidae	<i>Pseudoceros nitrospiralatus</i> (Laidlaw, 1903)	Center: Kaafu		X	X	

Table 1. Platyhelminthes species recorded from the Republic of Maldives. Data was compiled from systematic studies, Global Biodiversity Information Facility (GBIF), Turbellarian Taxonomic Database (TTD), and Maldives Marine Flatworms (WEB). In the 'Species' column, the authority is also provided alongside the scientific name.



- 39 species belonging to 9 families
- 170 records
- **Pseudocerotidae** family most represented

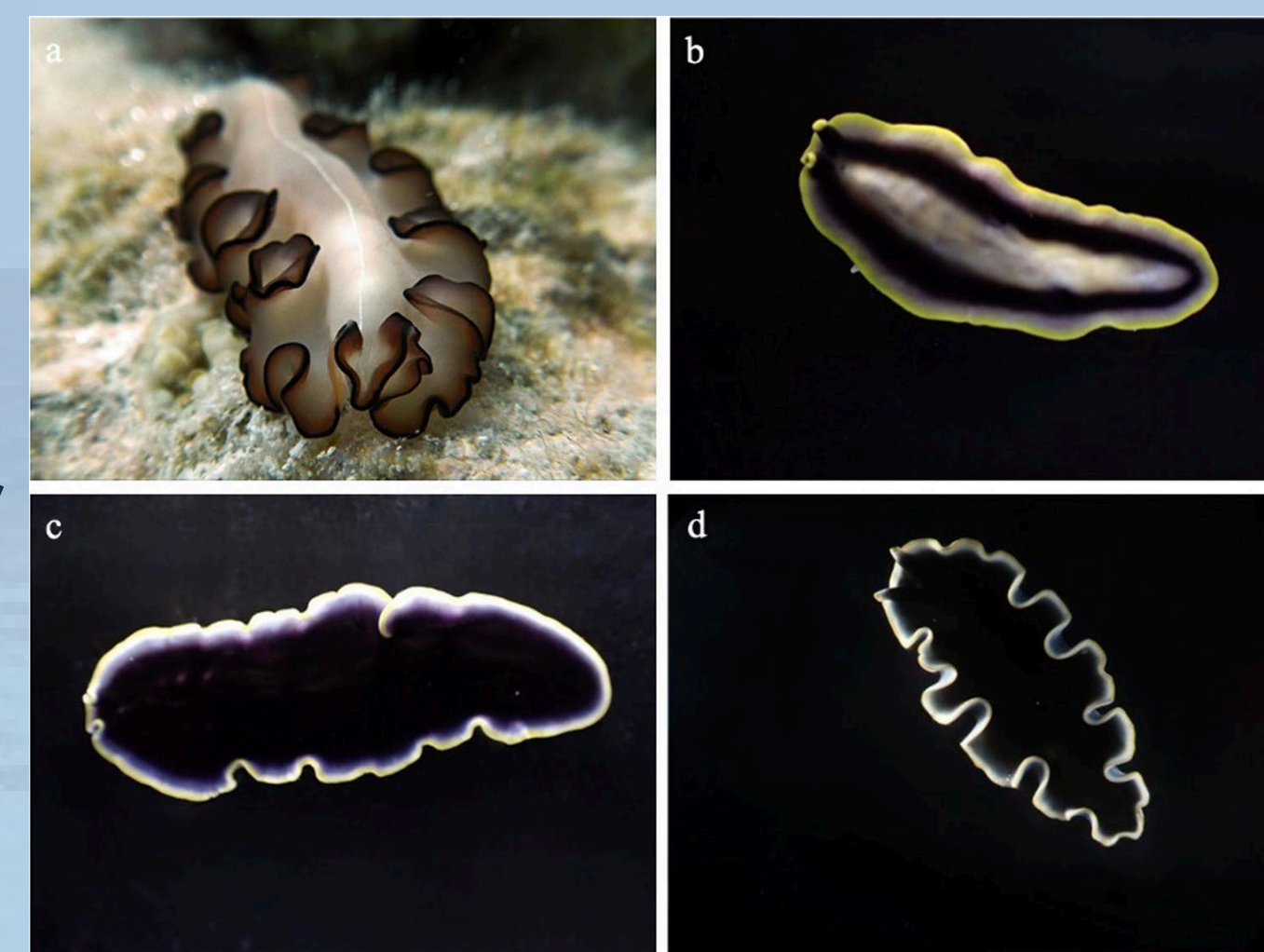


Figure 2. Photos of some listed species. (a) *Nymphozoon orsaki*; (b) *Pseudoceros paralaticlavus*; (c) *Pseudoceros prudhoei*; (d) *Pseudoceros duplicatus*. Pictures were taken by the authors

81% of photographed occurrences, probably because their **large size, bright colours, reproductive strategies, and prey availability** increase both abundance and detectability

Uneven distribution mainly in **northern** and **central** atolls

- Influence of **tourism** and **diving** activities
- Citizen-science data are affected by **spatial and taxonomic biases**
- **Cryptic**, nocturnal, meiofaunal, and **parasitic** taxa are likely substantially **underrepresented**
- **Lack of molecular analysis**

Figure 3. Distribution of Platyhelminthes in the Republic of Maldives, divided by geographic location. On the x-axis are displayed the number of occurrences, whereas on the y-axis the location of the findings, furtherly divided into North, Centre and South

CONCLUSION & FUTURE PERSPECTIVES

This study provides the first comprehensive review of Platyhelminthes in the Maldives and demonstrates that current knowledge remains limited and spatially uneven. Future research should prioritize systematic surveys of poorly explored atolls and combine morphological identification with DNA barcoding and other integrative approaches. These efforts will help uncover cryptic diversity, improve knowledge of species distributions, and support more effective conservation and management of Maldivian marine ecosystems.