

(276)

Trophic Ecology of Ichthyofauna Associated with the SS Orestes Shipwreck: Insights into Artificial Reef Ecosystems in Sri Lanka

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Abstract

The SS Orestes shipwreck, located at a depth of 24 meters and 4 km off the coast of Unawatuna-Sri Lanka, has evolved into a thriving marine ecosystem over time. It serves as a vital artificial reef, providing a unique habitat for diverse marine life. The present study aimed to identify the feeding habits of ichthyofauna inhabiting the shipwreck to understand their ecological roles and interactions within this artificial ecosystem. Data was recorded through direct underwater observations and video recordings over a period of three months, from January to March 2024. An extensive review of existing literature on the dietary habits of the observed species was carried out. Video surveys documented a total of 31 fish species belonging to 18 different families. The ichthyofauna exhibited diverse feeding strategies, categorized into four trophic guilds based on their feeding habits namely, carnivores, herbivores, omnivores, and planktivorous with significant representation across all four guilds. Carnivorous species (38.71%) such as *Cheilodipterus artus*, *Gnathanodon speciosus*, and *Lutjanus fulviflamma* were prevalent, highlighting the role of the shipwreck as a hunting ground for predatory fish. Herbivorous species (16.13%), including *Acanthurus lineatus* and *Thalassoma lunare*, were also well-represented, indicating the presence of plant material and algae for grazing. Omnivorous species (22.58%) like *Pterocaesio chrysozona*, *Heniochus diphreutes* and planktivorous species (22.58%) like *Neopomacentrus filamentosus*, *Chromis xanthochira* and *Pempheris analis* further contributed to the ecosystem's complexity. Therefore, notable trophic interactions included grazing by herbivores on algal growth, predation by carnivores on smaller reef-dwelling organisms, and scavenging activity among detritivores, observed. The findings highlight the shipwreck's role in supporting complex food webs and sustaining ichthyofaunal diversity. Although this study relied on literature to infer feeding behaviors, future research incorporating gut content analysis would provide more precise insights into species-specific trophic interactions. This would further enhance the understanding of the ecological importance of artificial reefs in supporting marine biodiversity and their role in ecosystem conservation in Sri Lanka.

Keywords: Artificial reefs, SS Orestes shipwreck, Ichthyofauna, Feeding habits