

Title: Study on Isolation and Characterization of Antimicrobial components from Avicenna marina Mangrove Plant species (IRG-ICEM 2022/23-6)



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Abstract

Mangrove regions are considered as one of the most biologically diverse and beneficial ecosystem on earth. These regions play host to a wide range diversity of shrubs, trees and plant species like Avicenna marina. Avicenna marina serves as an important plant species for environmental protection and sustainability. Due to its rich phytochemicals and botanical contents, a plethora of researchers have reported the therapeutic efficacy of Avicenna marina in treating cancer, diabetes, inflammations, Bacterial and other ailments. Hence, this research project will provide critical insights into the phytochemical and antimicrobial properties of Avicenna marina. Phytochemical analysis of Avicenna Marina were examined in Health and Safety Laboratory, mangroves are facing numerous threats, primarily from aquaculture, agriculture, seaside activities, and infrastructure development, which has resulted in their depletion and degradation worldwide. Global efforts to restore and/or conserve mangroves have been widely reported in the literature. Despite the vast studies on mangroves in the literature, there is currently no study that has critically examined global developmental efforts on the conservation and restoration of mangroves. Previous reviews in international scientific databases such as Scopus have revealed studies solely focused on one aspect of either preservation or conservation but a critical analysis of both topics as they relate to mangroves.

Introduction

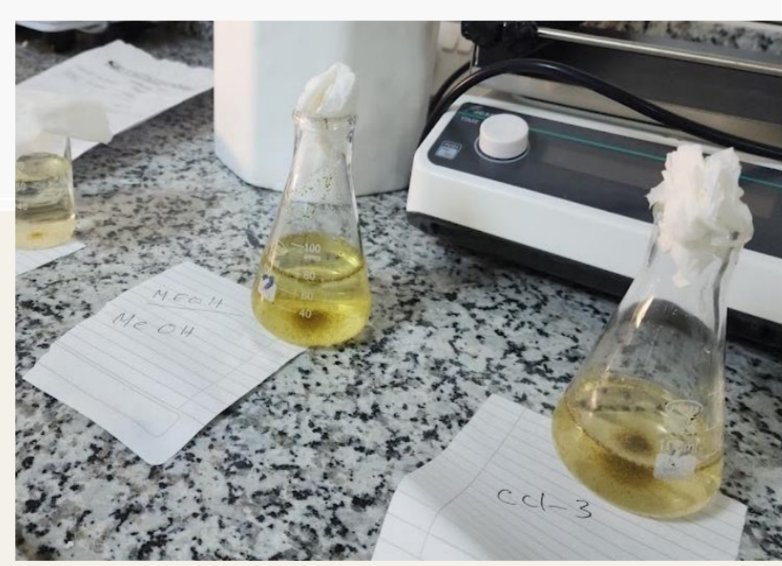
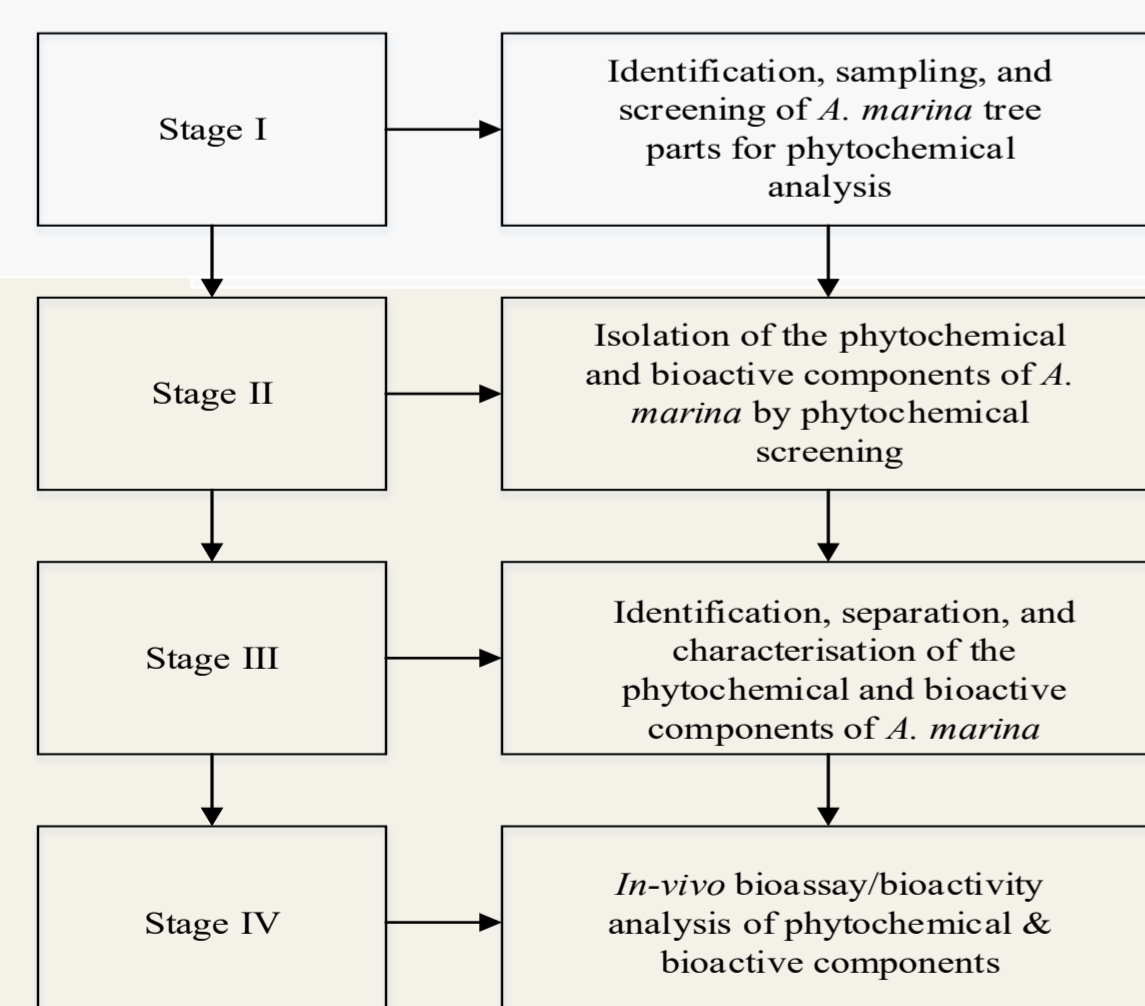
The mangrove regions are regarded as some of the most biologically diverse and beneficial ecosystems on the planet (IUCN, 2022). The mangrove forests play crucial roles in providing sustenance, habitats, and protection for numerous animal and plant/tree species in the ecosystem (Clough, 2013; Pushparajah, 2005). The mangrove forests also serve as carbon sinks as well as natural barriers for the protection of the coastal regions, coastal sediments, and aquatic/terrestrial vegetation from erosion, floods, hurricanes, storms, and cyclones among others natural disasters (Pendleton *et al.*, 2012; Bouillon *et al.*, 2008; Maher *et al.*, 2013). The mangrove forest ecosystem consists of a rich diversity of shrubs, trees, and other plants species (Bouillon *et al.*, 2008; Maher *et al.*, 2013). Over the years, researchers have also discovered that *A. marina* also has numerous benefits to humanity. It provides fuelwood, firewood, food, shelter, and protection for numerous communities residing in or around mangroves (IUCN, 2022). Similarly, there have been reports that *A. marina* has ethnomedicinal and traditional healing properties (Khafagi *et al.*, 2003; Thatoi *et al.*, 2016). For example, the fruits, leaves, and stem bark of *A. marina* is used to treat skin and gastrointestinal disorders (Thatoi *et al.*, 2016). Other researchers have reported on the anticancer, antidiabetic, anti-inflammatory, anti-HIV (Thatoi *et al.*, 2016) as well as anti-fungi properties of *A. marina* (Behbahani *et al.*, 2014). Overall, the studies indicate that *A. marina* is rich in phytochemicals and botanical substances such as flavonoids, fats, oils, and acids, which possess medicinal, antimicrobial, and pharmacological properties.

The purpose of the Following Study for identification, sampling, and screening of *A. marina* tree parts for phytochemical analysis. Sample preparation, particle separation, screening for phytochemical analysis

Key words: Phytochemical analysis, Avicenna Marina, Avicenna Mangroves, leafs, Bio molecules

Methodology –

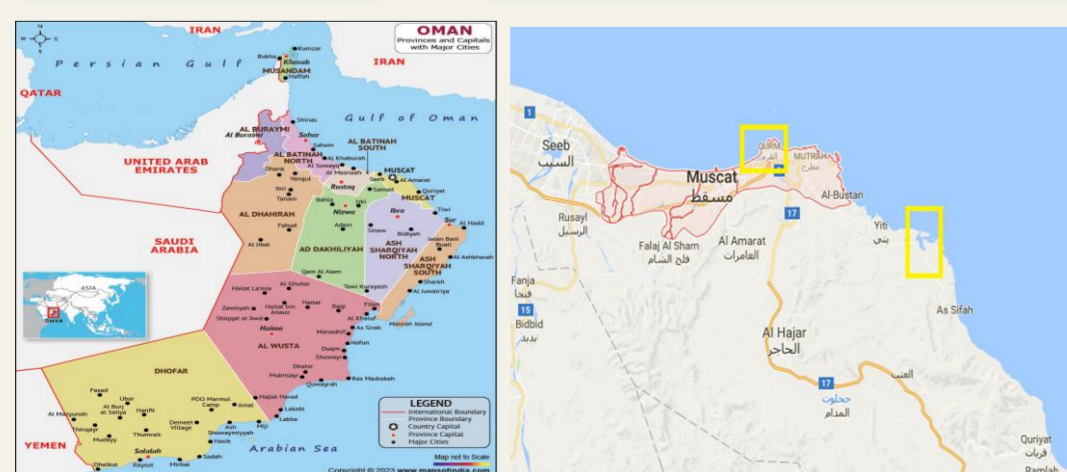
The methodology for this research project is presented in the flow chart in Figure 1. As outlined earlier, the study will critically examine and highlight the phytochemical and antimicrobial properties of Avicenna marina species for future pharmacological, ethnomedicinal, and therapeutic applications. The research project will be carried out in four main stages as depicted in outlined in Figure 1. The proposed research methodology for the study was modified from the procedures described in the scientific literature by Zamir *et al.* (2013). The mangrove plant leaves bark are collected in Qurum Beach areas for covered in herbarium sheet – ICEM-HSEM Herbarium sheets,



Phytochemical Extraction Process – Avicenna

Biological activity	Assay	Test conducted	Plant extract
Opposite Microbial	Diffusion – hot Plate	+ Gram Positive ethanol	Leaves of Avicenna
Anti Candidal	Diffusion – hot Plate	Ethanol	Leaves of Avicenna
Cytotoxicity	Assay	+ Gram Positive ethanol	Leaves of Avicenna

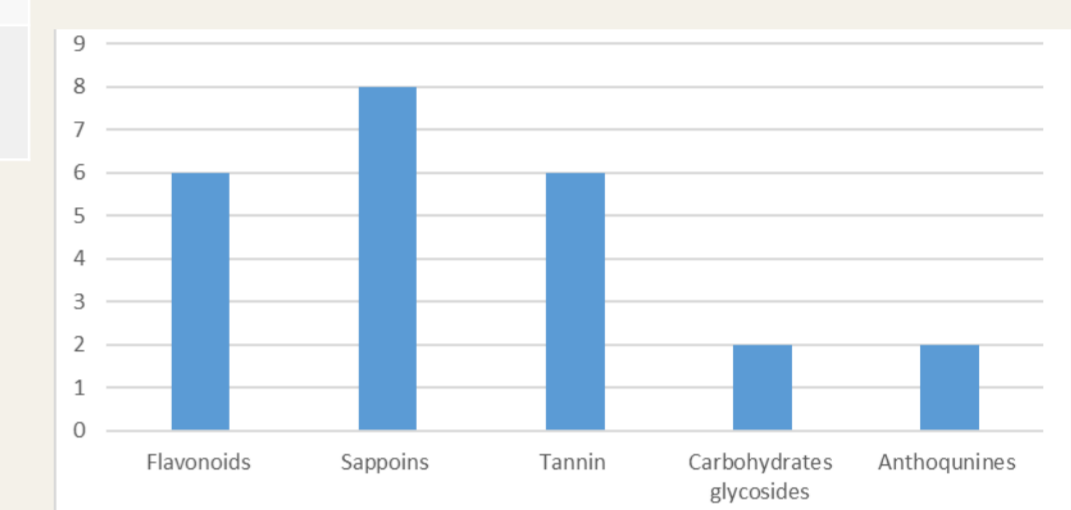
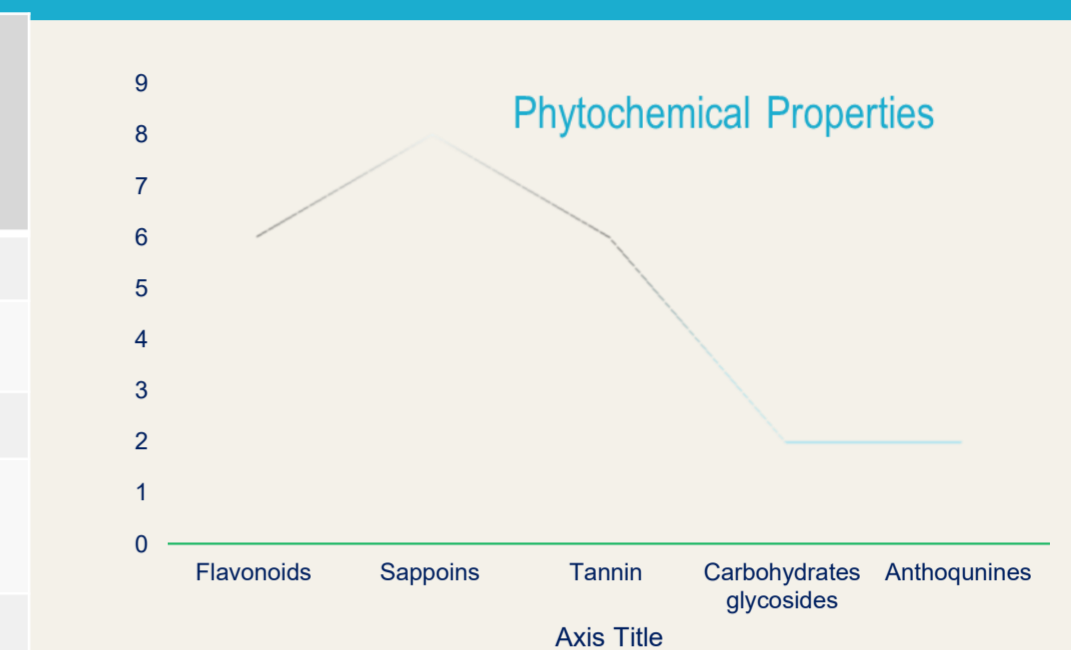
Bio – extraction Process assay



Study area

Results

Sno	Name of the plant	Avicenna PLANT Leaves	Avecenia Bark
1.	Flavonoids	+++	-
1.	Sappoins	++++	+
1.	Tannin	+++	-
1.	Carbohydrates glycosides	+	++
1.	Anthoquinines	+	++
	Alkaloids		
6	Terpenes	-	-
7			



Phytochemical constituents from Avicenna Marina Plant Extracts

High: +++
 Medium ++
 Low +
 ABSENT -

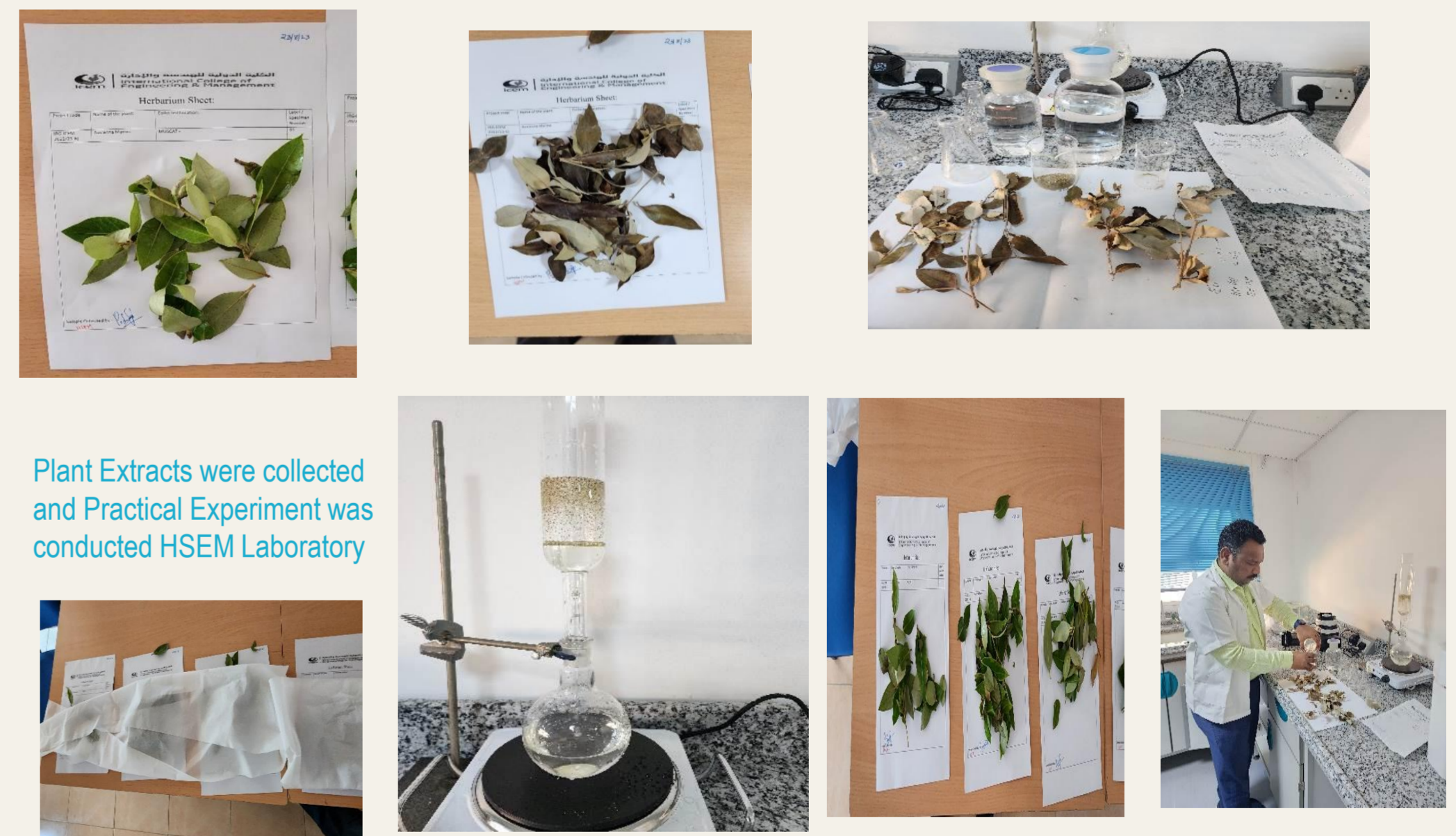
Findings / Conclusions

Avicenna Marina present study chloropharm, methanol extracts are highly exhibited for testing bacterial and fungal strains. Avicenna marina exhibited considerable anti bacterial activity tested relevance to the microbial stains, Avicenna marina exhibited more efficient inhibition against in anti Bacterial Properties among the all the pathogen most resistant bacteria. Results shown Avicenna mangrove plant leaves extracts showed anti microbial activity. Avicenna Marina has potential source of medicinal properties – ethnotaxonomical importance phytochemical screening on biological activity in the selected plant species shown sepoin has minor toxicity observed. Phytochemical analysis of Avicenna marina a significance importance for conservation and management of mangroves in Sultanate of Oman High amount of Sapiens are present in the following extracts. Following study proved the Avicenna Marina Plants have significant anti bacterial anti-fungal properties were observed

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Images



Plant Extracts were collected and Practical Experiment was conducted HSEM Laboratory

Biography of author

Dr.P.S.Raju currently working as Assistant Professor in Health and safety Environmental Management Department from International college of engineering and Management an Environmentalist, (Environmental, Social Governance E.S.G) Project Management Professional, Occupational Health and Industrial Hygienist, Marine Biotechnologist, Molecular Biologist, Green Lead Auditor, Climate Change, Sustainability practitioner, Experience implementing the Sustainable Development Goals (SDG) of the United Nations (UNSDG), the Millennium Development Goals, and Experience working with numerous international organizations, including the World Bank and the United Nations Environment Programmes,



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