

**SALINITY TOLERANCE OF *AEGICERAS CORNICULATUM*
AND *CERIOPS TAGAL*, IN THE COASTAL AREA OF
KARACHI, PAKISTAN**



THESIS

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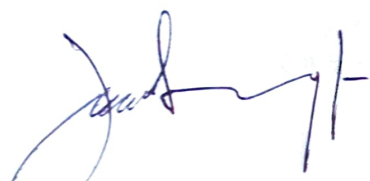
**ENVIRONMENTAL SCIENCE MASTER STUDY PROGRAM
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APPROVAL

SALINITY TOLERANCE OF *AEGICERAS* *CORNICULATUM* AND *CERIOPS TAGAL*, IN THE COASTAL AREA OF KARACHI, PAKISTAN

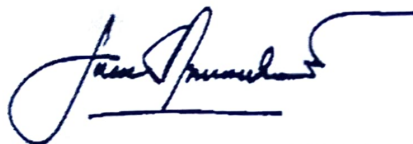
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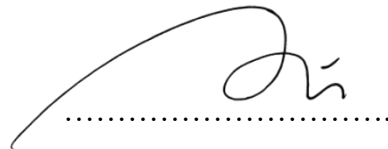


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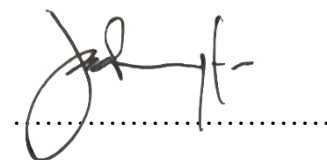
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STATEMENT

I, Muhammad Ayyaz with Student Identification number 30000121419030 hereby declare that this work entitled as ‘Salinity tolerance of *Aegiceras corniculatum* and *Ceriops tagal* in the coastal area of Karachi, Pakistan’ is truly an original work that I made myself and as a scientific work this thesis has never been submitted in any university or tertiary institution except as a fulfillment of the requirements to obtain a master degree (S-2) at Diponegoro University. To the best of my knowledge and belief, it does not include any previously published or written works by any other authors, except where due reference has been made in the text. Additionally, I certify that no portion of this work will ever again be used without the prior consent of Diponegoro University and, as applicable, any partner institution responsible for the joint awarding of this degree in my name for any other degree or diploma at any university or tertiary institution. If at a later date it is found that all or part of this thesis is not a result of my own work or plagiarism in certain parts, I agree to receive the sanction of revocation of the academic degree that I hold and other sanctions in accordance with the applicable laws and regulations.

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SEKOLAH PASCASARJANA

DEDICATIONS

I would like to dedicate my Thesis to my parents, who supported me throughout my education and career, to my brother, sister, and my friends who supported me in all good and bad time, dedications will also go to my very dear friend Maria Ashraf and my very Respected Teacher Professor Dr Waqar Ahmed, all family members and friends.



The logo of Universitas Diponegoro Semarang is a shield-shaped emblem. It features a central yellow sun with rays, flanked by two white birds with outstretched wings. The sun and birds are set against a white background with a subtle floral pattern. The shield is bordered by a yellow and grey outline. The text 'UNIVERSITAS DIPONEGORO' is written in a semi-circle at the top, and 'SEMARANG' is written at the bottom.

MOTTO

“The most complete gift of God is a life based on knowledge”

(Imam Ali R.A)

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I would like to give my sincere thanks to Allah (S.W.T), for being there for me providing me with physical and mental support. It is through Allah's grace that this Thesis was completed successfully. This Thesis is submitted as partial requirements for the attainment of Master Degree in Environmental Science from Diponegoro University Semarang, Indonesia. I would also like to use this opportunity to sincerely thank each and every one who has been there for me both physically and mentally to complete this Thesis.

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I understand that this thesis is far from being perfect and still has room for improvement. Hence, criticism and suggestions are definitely welcome for further improvement of the thesis. Thank you.

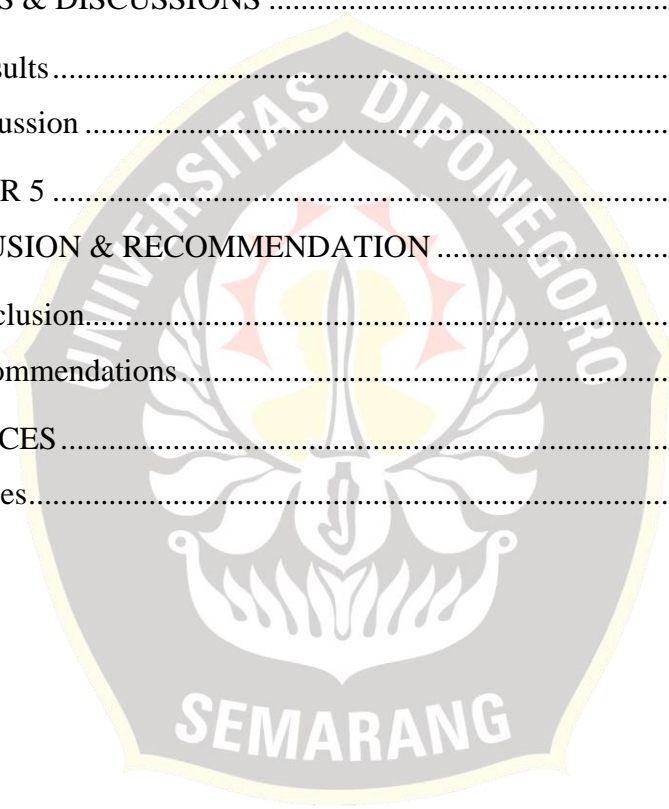
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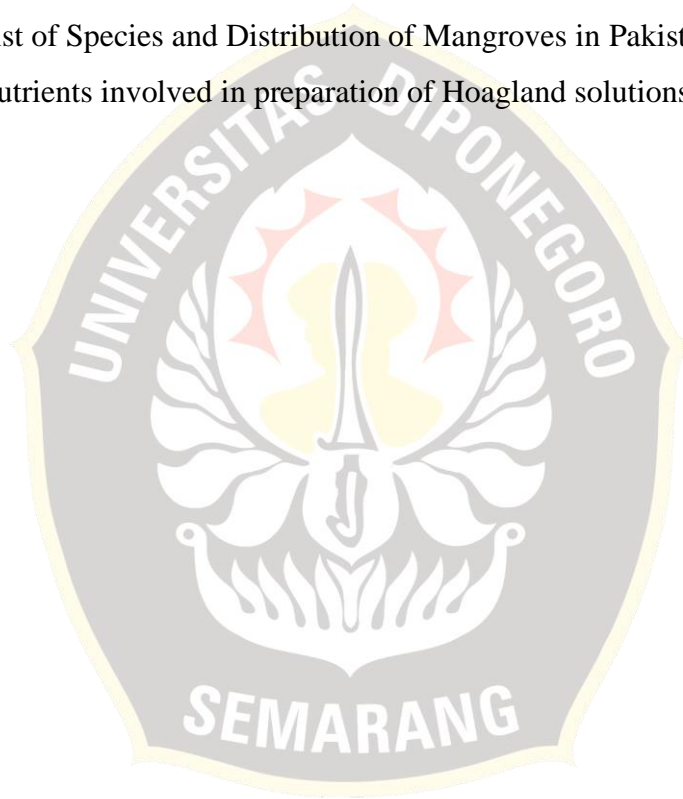
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GLOSSARIUM

- AC : *Aegiceras corniculatum*
CT : *Ceriops tagal*
ID : Indus delta
TF : Tidal fluctuation
PC : Propagules Collection
LC : Local Communities
PE : Plant Extract
SR : Salinity Regimes
HS : Hoagland Solution
CA : Coastal Area
MF : Mangrove Forest
HN : Halophytic Nature
ST : Salinity Tolerance
WP : Water Pollution

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ABSTRACT

Mangrove forests are the main elements that are essential to maintaining ecosystems in harsh environments. These forests stabilize shorelines, maintain water quality, protect against storms and flooding, preserve habitat and biodiversity, offer migratory birds shelter and breeding grounds, prevent seaports and coastlines from eroding due to wave action and siltation, and provide domestic animals with food. The study's goal is to evaluate the mangrove species' resistance to salinity. Propagules of *Ceriops tagal* (*C. tagal*) and *Aegiceras corniculatum* were procured for this purpose from the Indus delta and were cultivated in pots with sandy soil sub-irrigated with 0, 25, and 50% nitrogen-fortified seawater. Six months of experimentation were spent raising seedlings. Although the species of *Aegiceras* did not do well in the greenhouse, *Ceriops tagal*'s development peaked at a salinity of 25% saltwater and fell as the salinity increased. Additionally, a non-secretor, *C. tagal* gathered more sodium and chloride ions while severely limiting the availability of other ions. Therefore, this species might certainly be employed to restore intertidal habitats, which regularly get freshwater. The initial propagules weight, size of the propagules, length of the plants, and number of leaves were all measured as seedlings were experimentally cultivated for six months. Maximum growth was seen in 50% seawater, and it got worse as the salinity rose. Additionally, fresh water is provided three times each week to flush out the extra salt content. In a greenhouse setting, it has been found that medium and large-sized propagules perform better than small-sized ones. It is essential that seeds from plants be suited to endure the environmental circumstances in which they spread and settle if they are to effectively reproduce. The propagules of viviparous mangrove species seem ideal for establishment and spread inside the greenhouse environment.

Keywords: *Indus Delta; Aegiceras corniculatum; Ceriops tagal; Salinity; Propagules; Mangroves*