

## Yeast microbiome of *A. officinalis*: Differences in its taxonomic and functional composition among the plant compartments

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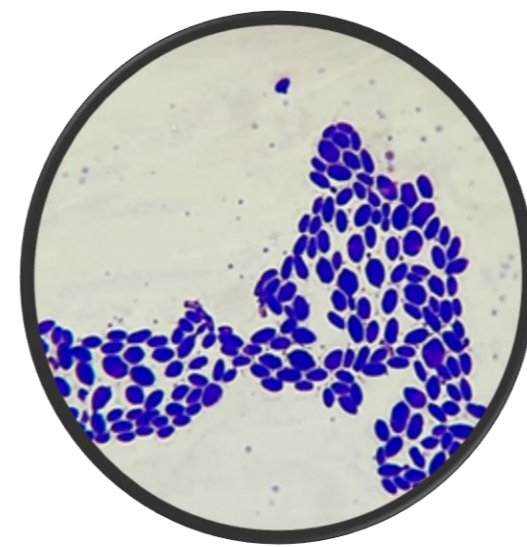
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## INTRODUCTION & AIM

Mangrove ecosystems are renowned for their rich fungal diversity, housing a plethora of multicellular fungi and yeasts.

- The plant microbiomes - develop immunity, suppress diseases, supply nutrients, and protect from biotic and abiotic environmental stresses.
- In recent years these studies have progressed significantly.
- Studies have helped define plant microbiomes and plant-microbiome interactions.
- Structure of plant microbiomes - result of a series of forward and backward interactions between the plant, the microbes
- Few of studies have provided insights into the plant microbiome (Crop plant)- a very limited studies of mangrove microbiome
- Majority of these studies are limited to bacterial communities.
- The yeast communities of mangroves- manglicolous yeast.
- Manglicolous yeast have superior qualities over their terrestrial counterparts with regard to their Bioprospecting potentials.
- Our knowledge of the distribution and basis of interaction of manglicolous yeast is inadequate.
- This study was taken up to fill this gap in our knowledge.



## METHOD

Isolation of manglicolous yeasts from plant parts

### Work Plan

#### Isolation and Identification of Yeast biome

Plant parts were collected from *R. mucronata*, and *A. officinalis*

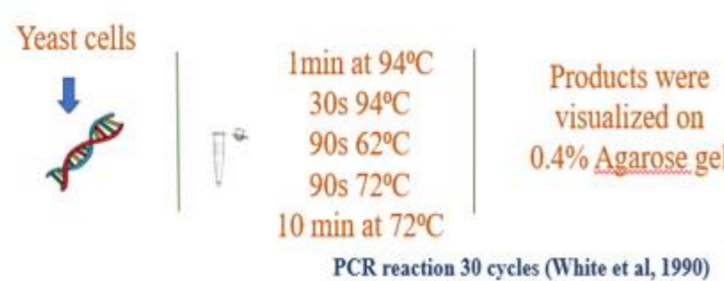
Yeasts isolation - Whickerham's media (Fell et al, 2001)

Yeasts identification- Microscopic and Biochemical (Barnett et al, 1998)

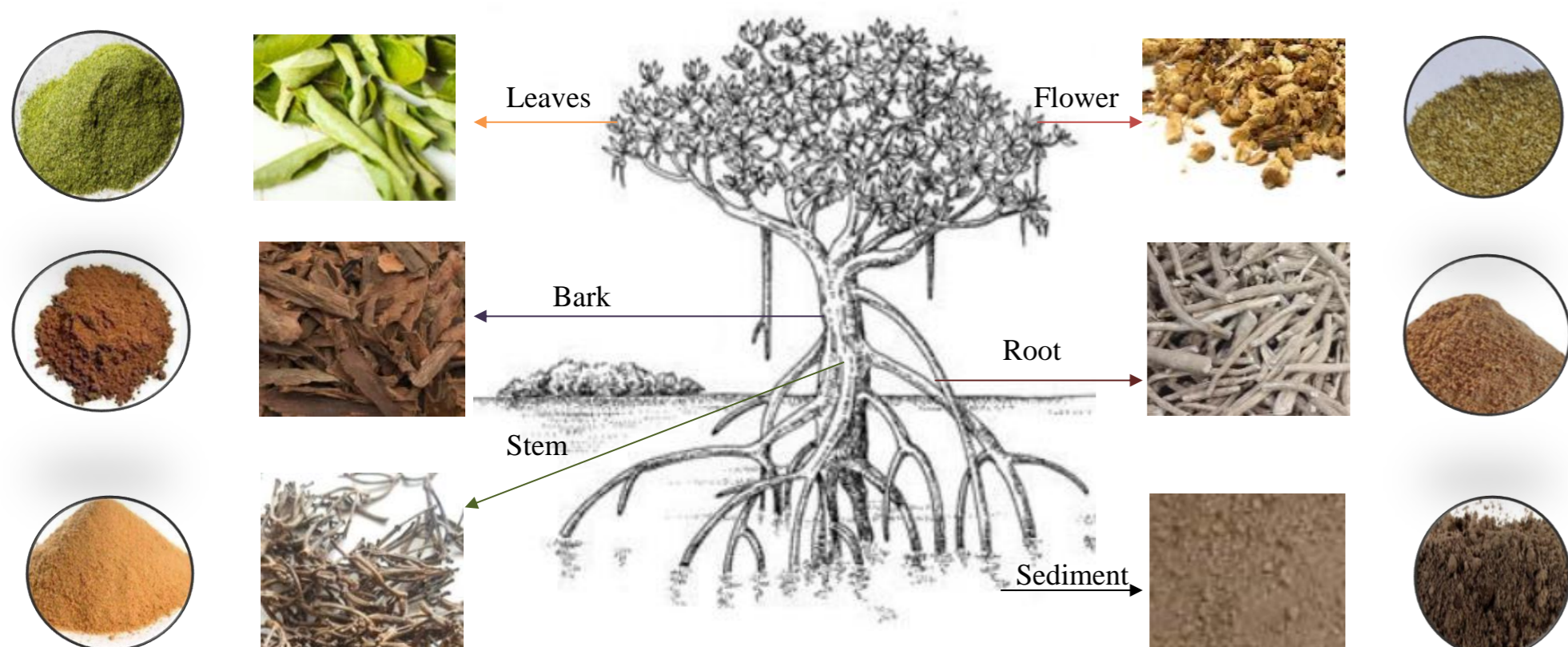
Molecular identification- ITS 1 and ITS 4 primers (Harju et al, 2004)

#### Plant elemental composition

Physicochemical Parameters- CHNS-Elemental & Cation (K, Ca, and Na) - atomic absorption spectrophotometry



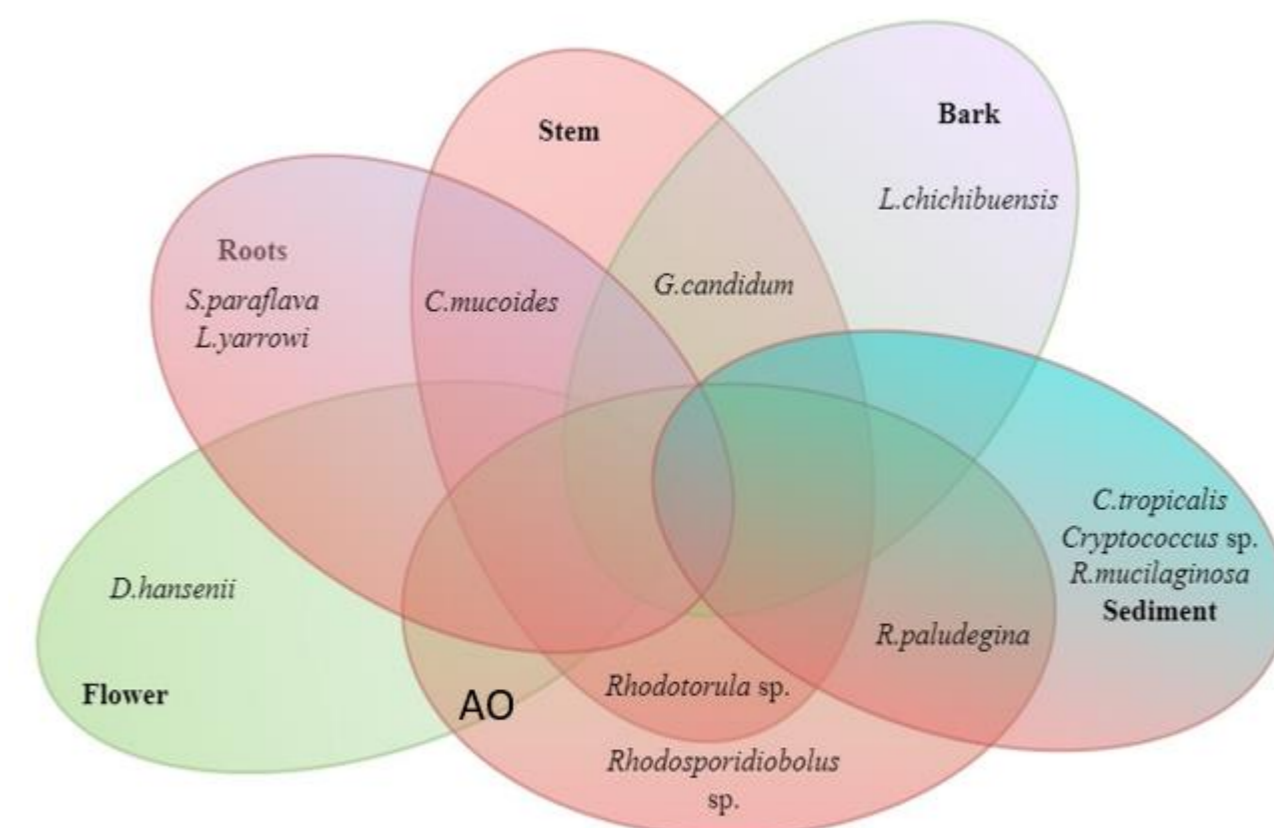
Sample preparation for plant elemental composition analysis



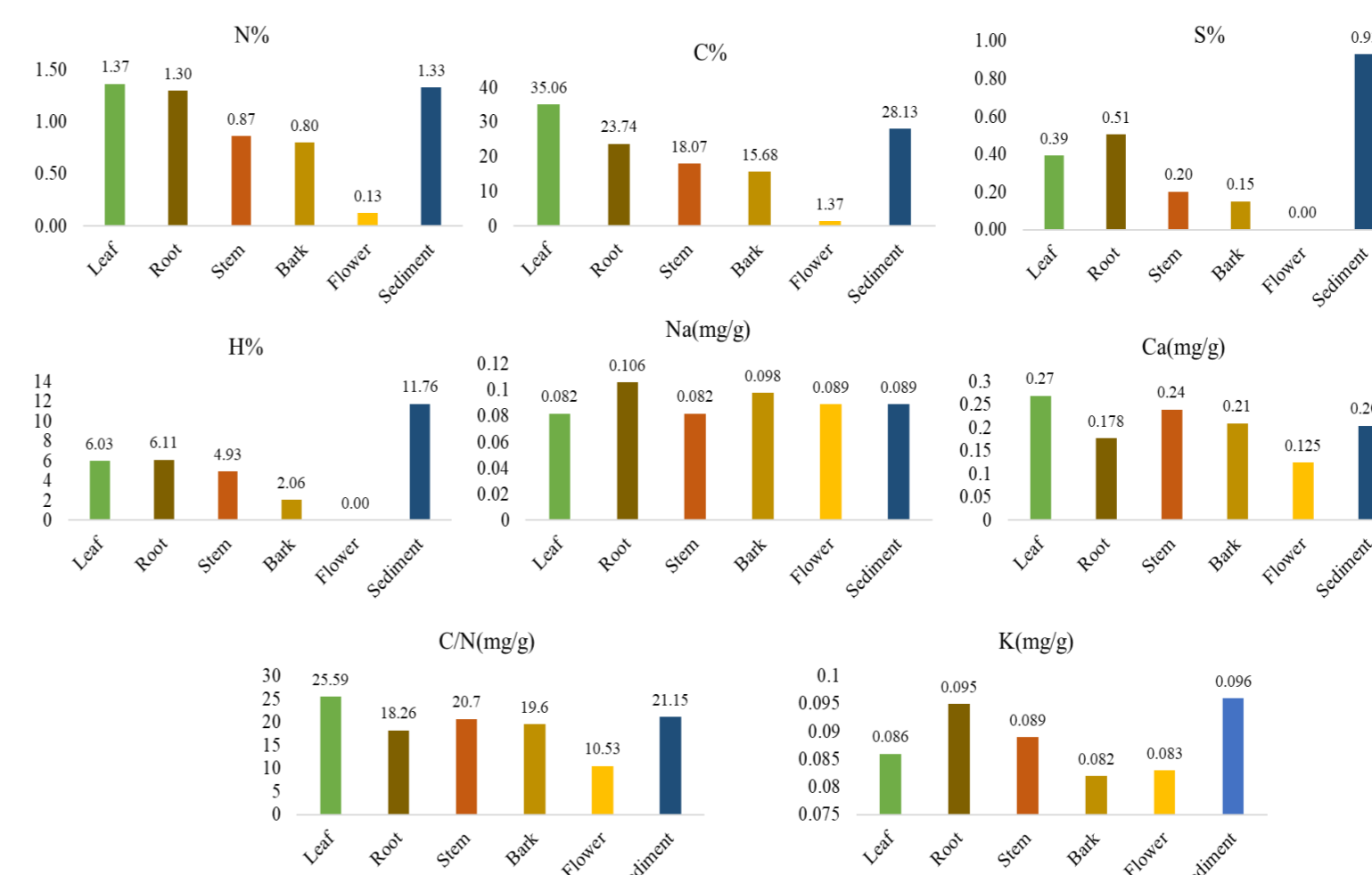
## RESULTS & DISCUSSION

### Diversity and Distribution of yeast biome

- C. tropicalis* was associated with all the plant
- R. mucilaginoso* only with flower and stem of *A. officinalis*.
- The species like *R. paludigena*, *K. natalensis*, *K. siamensis* only with *A. officinalis*.



### Plant elemental composition



#### Goodness-of-fit test

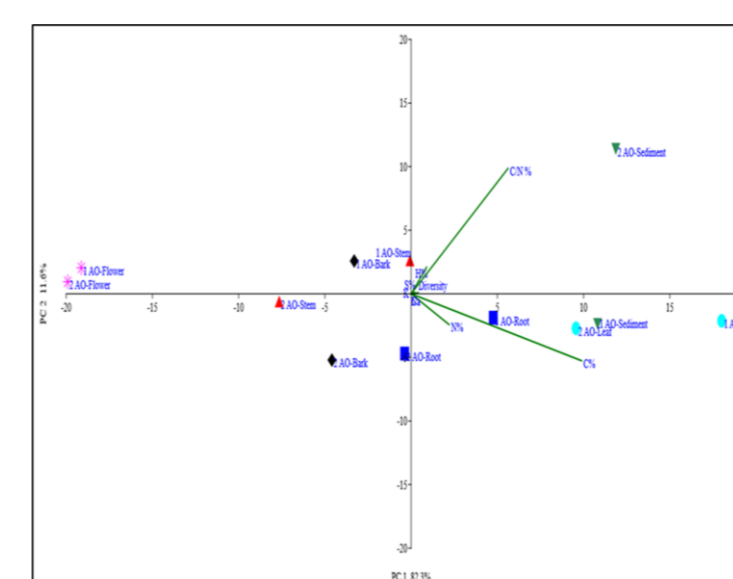
Macronutrient	R <sup>2</sup> Value	P Value
C	0.752	0.012
N	0.793	0.002
H	0.125	0.524
S	0.258	0.120
Na	0.881	0.001
Ca	0.296	0.124
K	0.446	0.054
C/N	0.814	0.001

(P<0.05)

Significant differences among plant organs in C content, C/N ratio, Na significantly correlated with their yeast diversity as well as richness

### Principal Component Analysis (PCA)

Relationship with proximate composition and yeast diversity



- Na content**- not significantly varied in mangrove plants A.
- Except **N%**, all nutrients varied in *A. officinalis*
- PCA analysis- except flower, bark the diversity of yeasts depend on the **C, N, H, S, Ca, K, Na**, and **C/N** content- both station

## CONCLUSION

- Yeasts were distributed in all the plant compartments
- C. tropicalis* have cosmopolitan in distribution and Autochthonous in nature
- Plant proximate composition** can facilitate the **yeast establishment**- Plant parts
- Carbon (C), Hydrogen (H), Nitrogen (N), Sulfur (S), and Calcium (Ca), Sodium (Na), and Potassium (K) Content: Significant differences among plant compartments of *A. officinalis*

## FUTURE WORK / REFERENCES

- These findings suggest that the elemental composition of mangrove plant species plays a crucial role in shaping the yeast communities associated with them.
- Our knowledge on the influence of plant composition on manglicolous yeast biota is inadequate
- Our understanding of the inter-relationships among yeast communities in different plant compartments remains limited, highlighting the need for further comprehensive investigations in this field.