



## *Sensitive tools for the assessment of Environmental and Human risk*

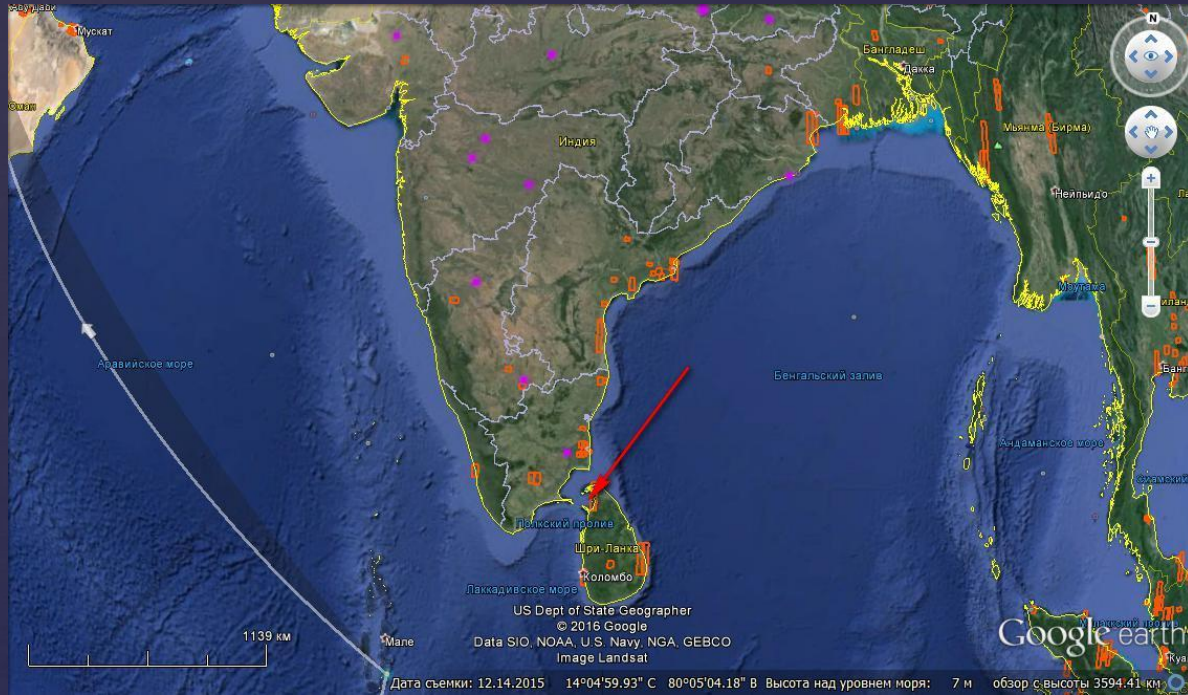
Existence of coral reefs are in danger by an increasing range of environmental and anthropogenic impacts (Palk Bay, Southeast Coast of India)

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# Introduction:

- The defensive mechanism of the immune system plays a vital role in prevention of infection and in the maintenance of tissue integrity of corals;
- study focused on the biomarker enzymes involved in defensive mechanism of selected corals of Palk Bay situated at southeast of India;



Pic.1. Location of Palk Bay, India

# Materials and methods

- ❖ Six different coral specimens(1. *Acropora formosa* (AC), 2. *Echinopora lamellosa* (EL), 3. *Favia fava* (FF), 4. *Favites halicora* (FH), 5. *Porites* sp. (POR), and 6. *Anacropora forbesi* (AN)) were collected from three different locations and six steps of activities were carried out:
  - *Tissue Homogenate for Enzyme Assays;*
  - *Peroxidase and Phenoloxidase;*
  - *Superoxide Dismutase Activity;*
  - *Catalase Activity;*
  - *Glutathione Peroxidase Activity;*
  - *Statistical Analysis;*

# Discussion:

- As phenoloxidase (PO) plays a crucial role in defensive mechanism of invertebrates, the presence of PO activity in all 6 coral species indicates the presence of baseline level of antimicrobial defense;
- The study presents, *A. forbesi*, *F. halicora*, and *A. formosa* are showed lowest phenoloxidase activity, It reveals that these corals are susceptible to bleaching, thermal stress, and diseases, at the same time, *F. favus*, *E. lamellose*, and *Porites* sp. indicated higher disease resistance towards pathogens;
- The low level of PO activity in *A. formosa* and *A. forbesi* showed that branching corals are more susceptible to diseases;

# Analyzing of research:

- The paper discussed application of multiple biomarkers to assess risk of corals;
- It is concluded that till today oxidative biomarkers are the most frequently used category of biomarkers to assess adverse effects of a wide variety of pollutants;
- Several biomarkers enzymes involved in melanin synthesis pathway (phenoloxidase (PO) and peroxidases (POD)) and free radical scavenging enzymes (super oxide dismutase (SOD), catalase (CAT)) and glutathione peroxidase (Gpx) were determined in selected scleractinian corals;

# Analyzing of research:

- The results of this study described that the corals *E. lamellosa*, followed by *F. favus* and *Porites* sp., were exhibited maximum activities of defensive enzymes. Accordingly, it was concluded that these corals were highly resistant towards the coral pathogens;
- When the corals of *A. formosa*, *F. halicora*, and *A. forbesi* exhibited minimum activities of the defensive enzymes indicating susceptibility to coral pathogens, these susceptible corals are prone to disease and should be prioritized to prevent transmittance of disease;

# References:

1. R. AnithaJothi, G. Umagowsalya, K. Duraikannu, B. Ramkumar, M. Santhana krishnan, and C. M. Ramakrtinan, "Isolation and characterization of microbes associated with White pox diseased coral (Acroporidae) from Palk Bay, southeast coast of India," *Asian Journal of Marine Science*, vol. 1, no. 1, pp. 6–8, 2013.
2. R. Anithajothi, N. Nagarani, G. Umagowsalya, K. Duraikannu, and C. M. Ramakritinan, "Screening, isolation and characterization of protease producing moderately halophilic microorganism *Halomonas meridiana* associated with coral mucus," *Toxicological & Environmental Chemistry*, 2014.
3. S. R. Dunn, "Immunorecognition and immunoreceptors in the Cnidaria," *Invertebrate Survival Journal*, vol. 6, pp. 7–14, 2009
4. <http://www.hindawi.com/journals/bmri/2014/806598/>
5. And so on more than 30 references...

Attentions... this is my end of  
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