



SCO-Young Scientist Profile

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Details of research work carried out in S&T (limit to 200 words)

Food colorants and novel drugs are current requisite to combat food demand and new diseases. My research mainly focused on these aspects to fulfil the gaps. In my Ph.D. I studied genetic diversity of bioluminescent bacteria. I studied the in vitro applications of bioluminescent *Vibrio* and *Photobacterium* species. Luciferase -the enzyme responsible for light emission was extracted from these bacteria and used as a biosensor to test various heavy metals. Despite biosensor application, some of these bacteria produced indole and phenolic compounds, which demonstrated potential drug application against multi-resistant pathogenic bacteria. Further, from 2016 to 2018, my postdoctoral research focused on marine pigmented bacteria from Andaman waters, Port Blair. This work revealed that Andaman waters comprise unexplored and novel marine pigmented bacterial species, which can be used in food colorants, dye, drug, and textiles. My research on pigmented bacteria showed them as potential natural resources of antioxidant, antimicrobial, anticancer, and natural colorant. Later in 2018-2019, I worked on coral reefs to restore the degrading reef regions; and discovered many reef associated animals producing fluorescence which can be utilized for fluorescent based imaging studies. Currently, in NIO, Goa, I am expanding my research on chemistry, genetics, and applications of these resources.

Associated SCO-YSC Theme: “Biotechnology and Bioengineering”

Statement of Innovation (Brief information on new innovative ideas including startup / entrepreneurs- limit to 150 words)

In doctoral research, I elucidated “luciferase” enzyme from luminous *Vibrio* and *Photobacterium* bacteria for toxicity assays. These bacteria are rich in coral reef environments of Andaman waters. The isolated bacteria are used as bio-sensors in the laboratory to differentiate toxic pollutants. In contrast, from pigmented bacteria, I isolated “prodigiosin” compound from bacteria *Zooshikella* sp. and Actinomycete *Streptomyces* sp.. This pigment was elucidated by optimized methodology, purified, chemical characterized, and biological properties were carried out. For coral reef studies, I developed a method to identify corals buried in the sedimentation areas. Fluorescent based line transect method was developed to survey the live coral covers. For the first time I developed a fluorescent based technique to identify coral diseases in Gulf of Mannar, Tamil Nadu. For now, in NIO, Goa, I am focused on deep-sea bioluminescent and fluorescent invertebrates, to utilize these unexplored creatures for biomedical applications like anticancer studies.

Shanghai Cooperation Organization- 1st Young Scientists Conclave (SCO-YSC 2020)
A virtual event organised in India at CSIR-IICT, Hyderabad
Theme: Shaping SCO-STI Partnership: Young Scientists Perspectives

Major awards/ Achievements (*Upto 3 awards*)

- 20th ISBC young researcher Travel award received from International Society for Bioluminescence and Chemiluminescence-**2018**
- National Postdoctoral Fellowship from SERB, New Delhi - **2016**
- INSPIRE Fellowship from Department of Science and Technology - **2012**
- First rank holder in M.Sc. Andhra University, Visakhapatnam, A.P – **2011**

Possible collaboration with SCO countries (*limit to 100 words*)

I am looking for researchers who are interested to make collaboration on the chemistry of novel food colorants, fluorescent markers, and drugs from deep-sea microbes and invertebrates for natural colorants and anticancer studies. Apart from applications, I am working on deep-sea biodiversity and evolutionary origins of life, particularly opsins and pigments. So, interested researchers may contact me for genomics and other studies. Bioluminescence based kits are being developed in my lab, so, those who are working in toxicology studies may collaborate.

Key words (*relevant to research work conducted as well as proposed innovation, 5-6 words*)

Bioluminescence; pigments; fluorescent proteins; food colorants; anticancer activities; evolutionary studies.