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Science as a hobby: studying the social life of *Ropalidia marginata*

Science should be done as romance. Certainly some factors shape the transformation of science as a hobby into science as a profession. Raghavendra Gadagkar (page 845) describes how his interest for studying the primitive eusocial wasp, *Ropalidia marginata*, developed as a means to understanding the origin and evolution of social life in insects. He chose his weekend hobby of wasp watching over molecular biology, which he passionately pursued until he came across Madhav Gadgil's paper on *R. marginata*, published in this journal. One of the motivations for the transformation of his hobby into a career was his deep interest in reading scientific literature and books.



In this paper, he reviews three important areas of his work, including what wasps do, why do they cooperate in a colony and how they choose their queens. He classifies the wasps as sitters, foragers and fighters based on their behaviours. An important finding that came out from the studies was regarding queen, which matched the sitter category and not the aggressive fighter. Among the primitive eusocial wasps, this behavioural caste differentiation of queen being non-aggressive is unique to *R. marginata*. Another intriguing aspect of his research is identifying the mechanism by which queen's successor is chosen. Later, he reflects on

the pursuit of science in India. Trying to work in an untouched field, looking at things outside of the subject and identifying one's strengths and weaknesses, help in a research career.

Microbiologically influenced corrosion on rails

S. Maruthamuthu *et al.* (page 870) report the role of bacteria on rail corrosion which has been a cause of concern for Indian Railways. The study focuses on the role of bacteria, viz. heterotrophic bacteria, manganese oxidizers, iron bacteria and ureolytic bacteria on rails. The bacterial groups have been isolated, identified using 16S rRNA gene analysis and corrosion behaviour of rails has

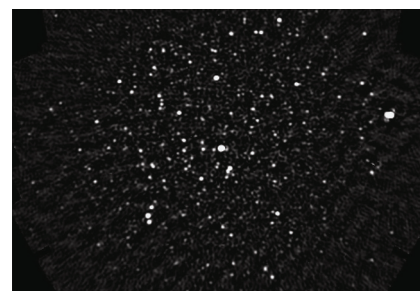


also been studied by using synthetic urine with bacteria isolated from rails. Surface analysis revealed that the nature of FeOOH in the bare steel was converted as ferric oxides and hydroxides, due to bacterial corrosion. It is discussed that the role of biofilm may create differential pH gradient due to ammonia and carbonic acid production on the metal surface, enhancing the electrochemical reaction of metal surface. Dry-wet conditions of rail surfaces and heterogeneity biofilm formed by ureolytic bacterial species enhance the corrosion in open atmosphere by metabolizing urea. It can be inferred that the biofilm formation in natural environment gives temporary protection where the presence of chloride and other ions enhance the corrosion

by breaking the temporary protective biofilm. The study throws light on the thrust areas to be studied including bacterial physiology involved in corrosion of rail materials in atmosphere. Studies on control measures on rail corrosion will be useful for our Indian society.

Murchison Widefield Array

Today, the most challenging questions that astronomers are seeking answers to have gone far beyond the intellectual and technological capabilities of individuals, single institutions, and even nations. The world is seeing a steep rise in the number of multinational, large-scale astronomical projects where the collaborative spirit of individuals with diverse and distinct culture, language or religion binds them together in the pursuit to



unravel the secrets of the Universe. India's long tradition and strong expertise in the field make it a desirable partner in such projects. Joining the team of American and Australian astronomers, researchers from the Raman Research Institute in Bangalore are developing a next-generation low frequency radio telescope that will be able to peak at events that happened soon after the Big Bang and bear the mark of how the first luminous sources in the universe were created. The Murchison Widefield Array telescope that will be deployed in the radio-quiet Western Australia Outback is yet another grand human endeavour towards understanding the Universe and our place in it. See page 841.