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## CYTOTOXIC AND GENOTOXIC POTENTIAL OF SOME COMMONLY USED FOOD COLOURS

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**Abstract:** A literature review using the Scopus database to collect papers on the cytotoxic potential of Synthetic food colours/Hazardous effects of Synthetic food dyes was done to confirm the relevance and significance of research on food dyes (food colourants). Through the literature search, 65 publications from 2002 to 2022 were located, reviewed, and further discussed. One of the primary findings is that natural dyes are increasingly replacing synthetic colourants in meals. This suggests that natural dyes significantly impact processed foods as they gradually replace those made via synthesis. Studies on exposure to synthetic food dyes and surveillance are being conducted. Innovative food technology and fresh extraction and stabilization methods are a severe problem. Using bio-residues as a source of food dyes is another novel area.

**Keywords:** Synthetic food dyes, Cytotoxicity, Genotoxicity, Natural food colours

## NANO-FERTILIZERS: POSSIBILITIES FOR THE SUSTAINABLE AGRICULTURE

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**Abstract:** Fertilizers and pesticides are less effective for many reasons, including inefficiency in distribution and use, and more energy requirement and water resources impacting agricultural ecosystems. Ensuring and maintaining food security is a global task, and the agricultural technologies must be changed and be effective over time due to negative factors such as climate change, population growth and decreasing in agricultural areas. Due to spiralling growth of population, the agriculture sector is facing a tremendous pressure for the food production and its economics. Nano-fertilizers may be important substances in crop production because decreasing per capita land-holding area and increasing population, conventional fertilizers having low nutrient use efficiency, causing of environmental pollution and more requirement of costly labour for their application. Recently nano-technology based products i.e. nano-fertilizers can improve plant growth and production by ensuring the distribution of nutrients in plant system. The framework is yet to be seen, because the main task in the coming years will be to create new and effective products in agriculture. They have more nutrient use efficiency. They should improve ecological biodiversity, sustainable agriculture and food quality. They should also economic viable. This study reviews the potentiality and possibilities of nano-fertilizers for improving plant performance under abiotic stress.

**Keywords:** Nano-fertilizers, Nano- particles, Sustainable agriculture, Nutrient, Soil fertility

## TAXONOMIC ACCOUNT OF TWO RED SEAWEED GENERA *PORPHYRA* C. AGARDH AND *PYROPIA* J. AGARDH (BANGIALES: RHODOPHYTA) IN INDIA

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**Abstract:** The red seaweed genus *Porphyra* is one of the economically important seaweeds, and belongs to the bladed order Bangiales of Rhodophyta. The recent global molecular assessment of the order Bangiales has led to many nomenclatural changes in the genus *Porphyra* and the resurrected genus *Pyropia*, under which 51 taxa of the genus *Porphyra* have been shifted. Therefore, presently *Porphyra* is represented by four taxa and *Pyropia* by five taxa in India. The study also revealed that of the nine taxa studied, seven taxa including all four taxa of *Porphyra* and three taxa of *Pyropia* are endemic to the Indian coast. The present paper deals with the comprehensive taxonomic account of these two important genera of red seaweeds in India.

**Keywords:** Endemic, Indian coast, *Porphyra*, *Pyropia*, Rhodophyta, Taxonomy.

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## RICE CULTIVATION: UNDER COW BASED NATURAL FARMING VS CONVENTIONAL FARMING

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**Abstract:** The present study was undertaken with a view to study socio-economic profile, natural farming practices, cost and return and resource use efficiency of CBNF adopter farmers in middle Gujarat. The study covered 3 districts and total 60 CBNF adopters and 60 non-CBNF farmers from Ahmedabad, Kheda and Vadodara districts. To study the production, cost and return from farmers (both categories of farmers practicing cow based natural farming and conventional farming) of rice, required primary data was collected from the farmers in the agricultural year 2019-20 of *rabi* and *kharif* season. The results revealed that the per hectare average yield of rice of CBNF farms was less (40.88 quintal) as compared to non-CBNF farms (55.83 quintal) and average gross return per hectare earned by CBNF farmers was about ₹ 94089 and by non-CBNF farmers it was ₹ 108790 per hectare. The study also explained per hectare cost of cultivation was less in CBNF as compared to non-CBNF. Resource use efficiency highlighted that in CBNF system, MVP-MFC ratio was found more than one for all variables *i.e.*, human labour (1.98), seed (11.50), jeevamritha (9.59), manure (16.20), irrigation (16.20) and bio-pesticide (169.52) which indicated under-utilization of these inputs which clearly indicated that there might be substantial scope for increasing the production of rice, whereas, in non-CBNF system, the result of MVP-MFC ratio indicated that there was a substantial scope for increasing the production of rice through judicious use of critical inputs particularly seed, fertilizer, manure, irrigation and pesticides as they were still under-utilized.

**Keywords:** Jeevamritha, CBNF, Resource use efficiency, Rice

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## ESTIMATION OF GAP AND ECONOMIC ANALYSIS OF CLUSTER FRONTLINE DEMONSTRATION ON SESAME CROP

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**Abstract:** The most crucial factor for supporting an increase in agricultural productivity is the degree of acceptance of improved agricultural technology in the innovation diffusion process. Comparing the yield differences between farmers' practices and the improved package of sesame practices under Cluster Front Line Demonstrations (CFLD) on sesame (*Sesamum indicum L.*) crop was the main objective of the current study. Sesame which is commonly known as 'Til' is one of the earliest domesticated plants of India. Due to the presence of a strong antioxidant, the seeds of plants produce valuable

edible oil, which is why sesame seeds are referred to as the seeds of immortality. There are two types of recognised seeds: black and white. The goal of the project was to determine how frontline demonstration technologies might affect the productivity of sesame crops in the Hisar district of Haryana. In the year 2018, field demonstrations of sesame improved variety RT-351 was carried out across 20 hectare area. In comparison to local farmers' practices, the technologies that have been exhibited have resulted in an average production increase of 26.29%. The 1.12 q ha<sup>-1</sup> average extension gap highlighted the necessity for proper demonstration of improved package and practices for farmers to obtain instruction through a variety of extension initiatives in order to embrace better agricultural technology. The aforementioned data indicate that cluster demonstrations, which encourage farmers to utilise the kinds of scientific production techniques that were on display in the CFLD plots, may boost sesame crop yield.

**Keywords:** Sesame, Frontline demonstration, technology gap, Farmers practice