

Abstracts of Articles in English

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Medicinal Importance of Bryophytes — A Review

Ajit Pratap Singh, Virendra Nath and Ashish Kumar Asthana

Bryology Laboratory, National Botanical Research Institute
(Council of Scientific and Industrial Research), Lucknow 226 001, India

Abstract — Bryophytes in the plant kingdom have some importance in ecosystem and plant life as alga on one hand and ferns on the other in relation to origin and development of plants. Due to water retention capacity, environmental contribution and possession of medicinal entity, various species of liverworts and mosses have been used in different ways since long. The medicinal properties of this plant group have come to light only three decades ago. The plants *Chiloscyphus polyanthus*, *Diplophyllum albicans*, *Polytrichum juniperinu*, etc. may be used for curing deadly cancer while *Marchantia ploymorphia*, *Marchantia stellata*, *Diplophyllum taxifolium*, *Diplophyllum albicans*, *Polytrichum commune*, *Wiesnerella denudata* for the tumor suppression. *Sphagnum* spp. are in use since ancient times in the form of bandages. This plant group is of great importance because of its chemical variability and diversity. In this paper, a brief description of twenty eight such plants is presented with their medicinal uses.

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Viral Diseases of Lilies & Their Management — A Review

Raja Ram, Anupama Sharmaj, Devendra Dhyani, Anil Sood and A.A. Zaidi

Floriculture & Biotechnology Division, Institute of Himalayan Bioresource Technology
(Council of Scientific and Industrial Research), Palampur 176 061, India

Abstract — Lilies are cut flowers and pot plants of commercial important because of their shape, attractive colour and large size. Among lilies, Oriental, Asiatic, Easter and Tiger lilies are most popular. The popularity of these lilies is gradually increasing in India. Netherlands, Japan and United States are the main cut flower and bulb producing countries. However, their production is affected by the viral diseases. Therefore, it is important to make the plants virus free so that their commercial value can be increased by improving the quality. Liliiums are generally propagated vegetatively and during the propagation of infected plants the virus is transferred from one generation to other. That is why a large number of plants get infected. Lilies are susceptible to a number of viruses, viz. *Lily symptomless*, *Tulip breaking*, *Cucumber mosaic*, *Tobacco rattle*, *Arabis mosaic*, *Lily rosettle*, *Tobacco ring spot*, *Citrus tatter leaf*, *Lily virus X*, *Tulip virus X*, *Lily reovirus*, *Tulip top breaking*, *Tulip bend breaking* and *Narcissus mosaic* viruses. Vegetative propagation has been found to be helpful in transfer and spread of viruses. That is why most of these viruses have been reported from major lily growing areas of the world. In this article various viral diseases of lilies are reported along with their management. Lilies can thus prove to be a good source of foreign exchange earnings.

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Influence of Plant Regulators on the Rooting and Sprouting Performance in Stem Cuttings of *Jatropha pandurifolia* 'Rosea' under Mist

V. N. Gupta, S. K. Datta and B. K. Banerjee
Floriculture Section, National Botanical Research Institute
(Council of Scientific and Industrial Research), Lucknow 226 001, India

Abstract — The effect of two hormones, indole-3-butyric acid (IBA) and naphthalene acetic acid (NAA) in their various concentrations (1000, 2000, 3000, 4000 and 5000 ppm), on the rooting and sprouting of stem cuttings of *Jatropha pandurifolia* L. 'Rosea' is reported. It is observed that best results in terms of average number of roots, average length of roots and stems are obtained on treatment with 400 ppm of these plant growth regulators. The higher concentration of these growth regulators (5000 ppm) is not so effective. The survival of plants is also highest (89%) on treatment with 4000 ppm of IBA.

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Use of Nitrification Regulators for Increasing Efficiency of Urea: A Comparative Study

S. S. Tomar, J. P. Sharma and B. M. Sharma
Division of Agricultural Chemicals, Indian Agricultural Research Institute (ICAR),
New Delhi 110 012, India

Abstract — Nitrogenous fertilisers have a great role in sustainable agriculture. In tropical soils, the efficiency of soil-applied nitrogen is abysmally low because of losses due to volatilisation, denitrification and leaching. It not only causes a great economic loss to the farmers but also results in environmental pollution. This loss of soil nitrogen can be reduced to some extent by the use of suitable nitrification regulator chemicals which reduce the rapid conversion of ammoniacal nitrogen to nitrite and nitrate nitrogen, and hence regulate the denitrification process. These chemicals, due to their high cost, are beyond the reach of a common farmer even today. On the basis of pot culture studies carried out in I.A.R.I. Farm soil a typical Usorchrept, six coated urea preparations, viz. urea plus Karanj seed hexane extract (KSCU); neem seed hexane extract (NSCU), alpha-hexachlorocyclohexane (a-HCH), 1,2,4-trichloro-5-nitrobenzene (NTTCU), 2-(N-4,5-dichloro-2-nitrophenyl) aminoethanol (DCEU) and dicyandiamide (DCDU), are evaluated in wheat crop, in field during rabi season of 1988-99. All these treatments, at two per cent of nitrogen, gave better dry matter yield (both grain and straw) in experimental crop and exhibited greater N-uptake and N-recovery as compared to urea alone. HCHU, NTCU and DCEU were comparable to DCDU in regulating N-uptake from soil applied urea as indicated by dry matter yield of wheat crop. None of the treatments has shown any detrimental effect on soil health after harvest of the crop.

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Development of Simple Low Cost Techniques for Recovery of Value Added Metals Causing Industrial Pollution

Jai Raj Behari

Industrial Toxicological Research Centre
(Council of Scientific and Industrial Research), Lucknow 226 001, India

Abstract - Heavy metals are important constituents of industrial effluents, ore wastes and fly ash. Although some of them are essential for living organisms, their accumulation at one place becomes a source of environmental pollution and threatens the health of living beings. Nickel, molybdenum and chromium are such metals which enter the environment through industrial wastes and it is important to reduce their concentration from the industrial wastes. Taking this into consideration, attempt has been made to analyse and recover these metals from the industrial ore wastes, viz. 'Acid pickling sludge', from Steel Authority of India Ltd, Durgapur and Salem plants. The dried powdered sludge is digested with acid and analysed for these metals by atomic absorption spectroscopy. The samples are then separately subjected to leaching in dilute acetic acid, ammonium hydroxide and neutral medium and the leachates are analysed for the same metals. The results demonstrate that mobilization of metals is more likely in dilute acids and it is possible to recover these metals by simple techniques from industrial wastes. Also, the physical properties of the ore wastes collected from two plants seems to be different which might have resulted in the difference in recovery of molybdenum from acidic or alkaline medium from different sources.

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Application of Shot Peening Technique on Agricultural Equipments

Jiwan Kumar Pandit

Structural Design and Engineering Division,
Structural Engineering Group, Vikram Sarabhai Space Centre,
Thiruvananthapuram 695 022, India

Abstract — Equipments used for agricultural purposes generally fail early due to impact, wear and fatigue. To increase their service-life and effective working, some structural changes on their surface become necessary. Shot Peening, is one such process, which improves the surface properties of a metal, resulting in increased life-span of the equipment. This has emerged as one of the most useful techniques. The different forces and severe environmental conditions experienced by agricultural equipments during their operation are estimated and accordingly appropriate shot-peening technique is used to improve their life-span and efficiency. This leads to saving of extra-effort and time required in frequent changing of tools and equipments. This paper presents a brief description of this technique.

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Wind Energy: An Important Step Towards Rural Upliftment — A Study

R. D. Chauhan

Vikram Sarabhai Space Centre, Thiruvananthapuram 695 022, India

Abstract — Realising the continuous exploitation and loss of natural energy resources, a study on extraction of energy from wind has been presented. The calculations of wind speed and the energy present in wind in India, are presented. The variation of wind velocity with respect to altitude is briefly described. Some data related to wind power in India are presented. The relation between the Solidity Ratio and Blade Tip Speed has been highlighted. The advantages and limitations of wind power generation are described. It is concluded that wind energy can play an important role towards the upliftment of rural areas.

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The Heap of Coconuts — The Mathematical Approach

Kedar Nath Shukla

Vikram Sarabhai Space Research Centre, Thiruvananthapuram 695 022, India

Abstract — Discussion on the 18th question of Hilbert in connection with the packaging of coconuts or other round objects like oranges, apples, etc. is presented. Seven questions propagated by Clay Mathematical Institute in Massachusetts (USA) for finding solutions are briefly mentioned. These include the hypotheses/concepts put forth by Reimann, Poincare, Birth Swinnerton Dyer, Hodge, Young-Mills and Navier-Stokes. The solution of each question will fetch one million US dollars.

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Towards Self-Reliance of Rural Women of Himachal Pradesh Through Biotechnology — An Experiment

Madhu Sharma, Anil Sood & P. S. Ahuja

Division of Biotechnology, Institute of Himalayan Bioresource Technology,
Palampur 176 061, India

Abstract — A number of government and non-government organization are involved in the programmes related to upliftment and economic emancipation of the rural women. In this direction, the Institute has initiated a training programme in the tissue culture for these women and the present article outlines details of the efforts made. Among the points discussed include tissue culture, orchid micropropagation and the criteria for selection of the orchid species.