

SHORT SCIENTIFIC NOTES

Studies on Freeze-dried Nickel Acetate

The application of freeze-drying for the synthesis of inorganic materials, especially oxides of metals, was first reported in 1968¹. Since then, many inorganic compounds like niobates², carbides³ and doped oxide catalysts⁴ have been prepared by this technique and their properties studied. Preliminary investigations on the successful freeze-drying of nickel acetate and some studies on the same are reported in this communication.

The starting material in the present study was reagent grade nickel acetate, $\text{Ni}(\text{CH}_3\text{COO})_2 \cdot 4\text{H}_2\text{O}$. A 5% solution of the salt in water was sprayed directly into a container of liquid nitrogen by means of a capillary connected to a nitrogen cylinder, to achieve flash-freezing. The frozen mass (in the form of granules) was transferred to a 500 ml flask which formed the drying chamber of the apparatus which in turn was connected to a vacuum system separated by cryogenic traps maintained at -195°C . Keeping the drying chamber between -10 and -20°C and the pressure below 0.1 Torr, the frozen mass was freed of the solvent by sublimation till a fine powder was left behind. The heat of sublimation was supplied by an infrared lamp which was periodically directed on the frozen sample.

Chemical Analysis of the final powder showed it to be $\text{Ni}(\text{CH}_3\text{COO})_2 \cdot 4\text{H}_2\text{O}$. Calculations based on weight loss by thermogravimetric analysis and d_{hkl} values obtained from X-ray powder patterns confirmed the stable species to be only tetrahydrate. Infra-red spectra taken in Nujol mull and KBr pellet for the freeze-dried and reagent grade nickel acetate were identical.

Thermal studies employing TGA, DTG and DTA has revealed that the dehydration (100 – 200°C) and decomposition (beginning around 200°C) stages overlap over a narrow temperature range and that the final product of decomposition around 400°C is crystalline nickel oxide. Surface area values and electron micrographic examination of the final oxide product indicated formation of chain-like aggregates made up of spherical particles with little porosity.

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A Dwarf Mutant in Kalimoonch-64—A Scented Variety of Rice

A spontaneous dwarf mutant was observed in the population of a tall and scented variety Kalimoonch-64 in *Kharif* (wet season) of 1971. Its progeny was grown in *Kharif* 1972 along with its parent and IR 8 as checks.

The mutation, apart from reducing plant height from 103.2 cm to 60.5, increased the number of tillers from 9.2 to 12.8, panicle length from 29.4 to 31.4 cm and the number of spikelets per panicle from 179 to 219. The yield of grain per plant (56.2 gm) was 27.3% higher than the parent variety (44.3 gm) and approached that of IR 8 (60.7 gm) in spite of an increase in the sterility from 29.0 to 38.3%. The grain length, breadth and weight recorded slight decrease. Scent and the number of days to flowering, however, remained unaffected.

The data indicate that mutant strain is not inferior to its parent in grain quality attributes. Having the advantage of its dwarf stature and greater yield potential, the mutant strain may replace its parent variety in Madhya Pradesh.

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Meloidogyne incognita Infesting the Cover Crops of Rubber in Kerala

Calpogonium mucunoides and *Pueraria phaseoloides*, the two important leguminous plants are widely grown in rubber plantations in Kerala as cover crops for preventing soil erosion and also for maintaining the fertility status and moisture content of soil. Root samples of these plants collected from rubber plantations at Kottayam, Konni and Nagercoil revealed the presence of the root-knot nematode *Meloidogyne incognita*. In the initial stages the root galls are easily distinguished from the root nodules due to their irregular shape and hard texture. In the older plants majority of roots are converted into heavy mass of root galls having irregular shape. Goodey *et al.* (1959) recorded *Meloidogyne arenaria* and *M. incognita* v. *acrita* on *Calpogonium mucunoides* and *M. javanica* on *Pueraria phaseoloides*. They also noted *M. incognita* v. *acrita* and *M. javanica* as pests of rubber, *Heavea brasiliensis*. But so far the present author was not able to detect the presence of any species of the root-knot nematode on rubber plants except the species of *Helicotylenchus* and *Boleodorus*. Since both these cover crops are having a perennial nature and are growing continuously in the same plantations it may be possible that this nematode may also infest the roots of rubber trees as well.

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Didymella applanata and *Penicillium capsulatum*

The present note deals with the description of two fungi which have not earlier been recorded from India.

Didymella applanata (Niessl) Sacc., *Sylloge Fungorum*, 1, 546, 1882. Collected on dead twigs from Mount Abu. Specimen deposited with C.M.I., Kew (Herb. IMI 162197 type) and Botany Department, University of Jodhpur (J.U.M.L. 94).

Pseudothecia scattered, immersed with erumpent ostioles, sub-globose, 200-250 μ in diam.; asci cylindric-clavate, short-stalked, 60-70 \times 11-13 μ , thick-walled above, 8-spored; ascospores biseriate, slightly clavate, 1-septate, hyaline, 12-18 \times 5-6 μ .

Penicillium capsulatum Raper & Fennell, *Mycologia*, 40, 528-530, 1948. Isolated from soil. Culture deposited with C.M.I., Kew (Herb. IMI 166269 type) and Botany Department, University of Jodhpur (J.U.M.L. 203).

Colonies on Czapek's agar consisting of comparatively thin, close-textured mycelial flet, tough, tearing irregularly with surface appearing velvety, deeply furrowed, commonly raised depressed in central area, in grey-green shades, reverse uncoloured or light-green, later showing orange to pinkish shades; conidiophores ascending, arising primarily from creeping hyphae, upto 100 μ in length, 1.4-2.7 μ in diam., branching irregularly, occasionally over their entire length but more abundantly in terminal areas; penicilli monoverticillate, borne on branches of varying length, occasionally more or less clustered; sterigmata borne irregularly, but typically in simple cluster, ranging from 4 to 10 in verticil, usually crowded, parallel or divergent, 8-10 \times 2-2.2 μ ; conidia elliptical, commonly capsule shaped, 2.7-4.0 \times 1.4-2.7 μ , smooth-walled.

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