

## SCIENCE NOTES AND NEWS

### Inactivation of Water-melon Mosaic Virus by Juice of *Portulaca grandiflora*

K. S. Bhargava and Rajendra Singh, Botany Department, University of Gorakhpur, Gorakhpur (U.P.), write :

Extracts from several plants are now well known for their inhibition of infectivity of plant viruses. While testing seventeen plant extracts against water-melon mosaic virus it was found that juice from *Portulaca grandiflora* has a powerful inhibitory effect. *Cucurbita pepo* L. var. *caserta* plant was used as a host for the systemic multiplication of the virus. The various treatments included (i) mixing of the plant juice with infective virus extract in equal proportions, and (ii) spraying the upper and lower surface of the host plant separately with the plant extract before inoculation with the virus. In all these treatments the juice of *Portulaca grandiflora* completely inhibited the activity of the virus. This extract withstood heating at 100° C. for 10 minutes and a dilution of 1 : 1000.

### On the Occurrence of *Pestalotiopsis gracilis* (Kleb.) Stey. on *Ixora coccinia* L.

S. S. Prasad and Roy A. B. Verma, Department of Botany, Bihar University (L.S. College), Muzaffarpur, write :

During the course of survey of the phytopathogenic fungi of Muzaffarpur, we came across a new leaf-spot disease of *Ixora coccinia* L. during the months of March and April in the year 1964, from which we isolated *Pestalotiopsis gracilis* (Kleb.) Stey. Pathogenicity of the organism was established on the host by artificial inoculations. The lesions were restricted to the lamina forming isolated patches and in the beginning they appeared as light brown discolourations on both the surfaces of the leaves. The colour of the spots gradually changed from brown to ash-grey on the upper surface of the leaves, on which were situated the acervuli of the pathogen in the form of black dots.

The conidia were straight, often slightly curved and occasionally slightly constricted at the septa. They were five-celled of which the three central cells were deeply coloured, while the basal and apical cells were hyaline. The

basal cell was provided with a beak and the apical one bore two to three setulae. The conidia measured  $18.65-25.43 \mu \times 5.9-7.32 \mu$ .

As far as known to the authors *Pestalotiopsis gracilis* (Kleb.) Stey. has not so far been reported from this country on any host. The specimen has been deposited in the herbaria of the Commonwealth Mycological Institute, Kew, England (No. 108542).

### An Aseptic Medium for Rearing the Rice Stem-borer *Proceras polychrysa* Meyr.

A. Perraju and K. Sivarama Krishnamurthy, Agricultural College, Bapatla, write :

The following composition of an aseptic medium was successfully used to rear larvae of the rice stem-borer, *Proceras polychrysa* Meyr. : Agar, powdered 0.6 gm., Cellulose 0.5 gm., Sucrose 0.3 gm., Glucose 0.7 gm., Casein 1.0 gm., Cholesterol 0.2 gm., Choline chloride 0.2 gm., Rice plant (tender leaves and stem) 30.0 gm., Minerals 0.2 gm. and Water 40 ml.

Of the several compositions used by other workers this was found to be most suitable for rearing this rice-borer. Standard methods prescribed for sterilising medium and egg mass were adopted.

### Evidence for "Weak" Force Interaction in Protons and Neutrons

Playing an important part in the sub-atomic world are two types of forces : the strong nuclear interactions which bind the nucleus together, and the weak interactions— $10^{12}$  times weaker—which bring about the disintegration of the nucleus. Protons and neutrons interact through the "strong" force. The only particles definitely known to participate in weak interactions are neutrinos, electrons and several of the mesons. Feynman and Gell-Mann predicted several years ago that there should be felt "weak" force effect in interactions of protons and neutrons. At a recent meeting of the American Physical Society in Berkeley, F. H. Bohm and E. Kankaleit presented results of their observations which appeared to confirm this prediction.

The experiment was designed to examine the direction of spin of gamma-ray photons released in the decay of the radioactive isotope hafnium 181. This particular isotope was selected because protons and neutrons in its nucleus were



expected to produce the clearest evidence for a weak interaction, if one existed, for protons and neutrons. If there were no influence from a weak interaction, exactly half of the photons produced in the radioactive decay should emerge with a right-handed spin, and exactly half with left-handed spin. Evidence for the "weak" force would be found if the numbers were not quite equal; this would indicate a violation of parity, which is permitted to nuclear events associated with "weak" forces.

The gamma-rays emerging from Hf (181) were sent through a large electromagnet, the polarity of which was reversed every 10 seconds. A large scintillation counter was suitably placed to count the photons received. The experiment determined for a large number of photons whether or not the polarity of the electromagnet had any effect on the number of photons reaching the counter. It showed that on the average left-handed and right-handed spin did not balance out for 3 out of every 10,000 photons. This was evidence that parity was not fully conserved and that the weak force was operative to a corresponding degree.—(*Scientific American*, February 1965.)

#### A Coherent Theory for Sub-Atomic Particles : $\tilde{U}$ (12) Theory

Professor Abdus Salam has presented a new theory that combines Einstein's special relativity with unitary symmetry  $SU(3)$ —the powerful technique for classifying the elementary particles within the nucleus. Although the extended  $SU(6)$  theory (see *Curr. Sci.*, May 20, 1965, p. 330) has been a notable achievement it still suffers from one fundamental and important disadvantage: it does not take into account the enormous speeds at which particles move about within the atomic nucleus. Consequently any exact theory of fundamental particles must also include the effect of Einstein's special theory of relativity. This is what has now been included by Salam and his colleagues in their  $\tilde{U}$  (12)—"U-twelve-twiddle"—theory which is a logical extension of  $SU(3)$ . Although much work remains to be done to solve the dynamical

predictions of  $\tilde{U}$  (12), its immediate appeal is that it offers for the first time an exact and coherent theory for the classification of elementary particles.—(*Science Journal*, March 1965.)

#### Fine Structure of the Light Organ in Glow-Worm

Electron microscopical studies of the light organ of the glow-worm (*Lampyris noctiluca*) have revealed new information regarding the fine structure of the light organ which may help to correlate the fine structure with known biochemical reactions in light production by the organ. The studies were made on stained cut sections prepared from pieces of the abdominal segments 5 and 6 in female animals, fixed in potassium permanganate or osmium tetroxide solution. (Light organs in males are considerably smaller and inconvenient for use in this investigation.)

The light organ of *L. noctiluca* consists of four main parts, a transparent cuticle, a hypodermis, a photocyte layer several cells thick, and a single layer of cells comprising the reflector layer. Photocyte cells contain photocyte granules and a vesiculated reticulum. The reticulum is invaginated, forming vesicles of varying size and shape. Some of these vesicles contain structures that have the appearance of photocyte granules in the course of formation.

A hypothesis is that the photocyte granules are produced by the reticulum and then released into the general cell cytoplasm. The granules then release their own contents in some way and light production occurs. What the photocyte granules contain is purely conjectural; for example, it could be a luciferin-luciferase complex.

The circumstantial evidence for the association of the reticulum with granule production, and hence light production, is that neither the granules nor the vesiculated reticulum are present in the reflector layer (dorsal cell layer), although there is a normal endoplasmic reticulum. It is possible that this unusual reticulum is peculiar to glow-worm light organs.—(*Nature*, 1965, 205, 1183.)