or chromosome mutations and aberrations in meiosis[1]. Sato and Gaul[2] have also indicated cytoplasmic causes to be responsible for sterility. Although causes of pollen sterility in M_1 in rice strains have been evaluated frequently, there are only a very few observations on the course of embryogenesis as related to ovule sterility. In view of the sterility in M_1 being on many occasions a limiting factor of the expression of mutation frequencies, it is necessary also to investigate in detail the causes of ovule sterility in M_1.

With a view to finding the cause for ovule sterility following irradiation with Co_{60} gamma-rays, dry seeds of TKM. 6 (*O. sativa*) were irradiated at 10, 20 and 30 kR doses. There were effects of irradiation in M_1 in reduction of germination, early vigour and height of the seedlings. At maturity, the pollen fertility in M_1 ranged from 92–96, 85–90, 80–83 and 71–73%, in the control, 10, 20 and 30 kR doses respectively.

The young ovules were fixed in formalin-acetic acid-alcohol (1 : 1 :18) in all the doses and longitudinal sections were taken by paraffin method to study the embryo sac. The embryogenesis in control and in M_1 at 10 kR dose exhibited regular formation of embryo sac and development of embryo (Fig. 1). At 20 kR dose, abortion of embryo and scanty development of endosperm throughout the embryo sac were observed. At 30 kR dose, degenerated egg cell and aborted ovules were noticed (Fig. 2). In the matured panicles, there was 80% seed set in the control, whereas M_1 following 10, 20 and 30 kR doses recorded 78, 70 and 58% respectively.

It may be concluded that degeneration of egg nucleus or non-function of eggs, aberration in embryo sac structures, abortion of embryos and instability of endosperm divisions lead to the spikelet sterility in irradiated rice in M_1 generation.

Agricultural College and Research Institute, Coimbatore-641003,
March 1, 1973.

L. D. VIJENDRA DAS.
S. R. SREE RANGASAMY.

1. Gaul, H., *Radiation Bot.*, 1964, **4**, 155.
2. Sato, M. and Gaul, H., *Ibid.*, 1967, **7**, 7.

SHORT SCIENTIFIC NOTES

Diosmetin-7-Glucuronide from the Flowers of *Dombeya calantha*

Dombeya calantha Schum. (Sterculiaceae) is an ornamental shrub with rose flowers[1]. The fresh flower petals of the plant have been reported[2] to contain quercetin-3-glucoside, kaempferol and its 3-glucoside. Fresh as well as the dry petals of the plant have now been re-examined on a larger scale and our results are recorded below :

Dry petals of *D. calantha* collected locally and stored for about six years were first moistened by spraying water to keep the material wet for 12 hr and then extracted with hot 80% alcohol under reflux. The total alcoholic extract was concentrated *in vacuo* and the aqueous concentrate repeatedly shaken with light petroleum, ether, ethyl acetate and ethyl methyl ketone in succession. The petroleum ether and ether fractions did not yield any crystalline solid. The ethyl acetate fraction yielded quercetin-3-glucoside as recorded earlier[2].

The ethyl methyl ketone fraction on concentration and addition of an equal volume of acetone was left in an ice-chest for a week. The light yellow solid that separated out, on crystallisation from MeOH, came out as pale yellow needles, m.p. 210–12°, yield 0·02%, $[\alpha]_D^{28}$ — 93° (*c*, 0·5% Py), λ_{max} 268, 340 nm (MeOH and MeOH + NaOAc). It answered all tests for a flavone glycoside and could not be hydrolysed by alcoholic 7% H_2SO_4. However, on boiling with 10% H_2SO_4 in glacial HOAc medium for 5 hr, it underwent hydrolysis to yield diosmetin, identified by colour reactions, acetate, m.p. 194–96°, R_f and co-chromatography with an authentic sample and D-glucuronic acid (co-PC) in equal proportions. It could also be hydrolysed by β-glucuronidase. The pigment was therefore identified as diosmetin-7-β-D-glucuronide and the identity confirmed by direct comparison with an authentic sample from *Pedalium murex*[3].

Fresh petals of *D. calantha* were also extracted with hot 80% alcohol under reflux and worked up as described above. Quercetin-3-glucoside and diosmetin-7-β-D-glucuronide were isolated.

The co-occurrence of quercetin and diosmetin glycosides seems to be rare. It is interesting that

there is no loss of flavonoid due to long storage of the petals.

Dept. of Chemistry, S. SANKARA SUBRAMANIAN.
J.I.P.M.E.R., A. G. R. NAIR.
Pondicherry-605006, S. NAGARAJAN.
February 23, 1973.

1. Bailey, L. H., *The Manual of Cultivated Plants*, Macmillan Co., New York, 1949, p. 669.
2. Nair, A. G. R. and Subramanian, S. S., *Curr. Sci.*, 1962, 31, 504.

On the Occurrence of *Lagurus ovatus* Linn. in India

Lagurus ovatus is a monotypic genus and belongs to the tribe Agrostideae, subfamily Pooideae and family Gramineae. It is a low, tufted, annual grass with a dense hairy, ovate or oblong panicle of one flowered spikelets—the characteristic of the tribe Agrostideae. Due to its beautiful flowering head it is cultivated in several countries as an ornamental.

Tribe Agrostideae is very well represented in the temperate regions of India like Kashmir, Himachal Pradesh, etc. In the plains only a single genus of this tribe, *Polypogon* is met with frequently. As far as Kashmir is concerned this tribe constitutes 12·9% of the total grass flora of the valley[2].

All the works on regional floras or grasses of India earlier to Bor[1] do not mention the occurrence of *Lagurus ovatus* Linn. in India. Bor[1], however, has mentioned the occurrence of this grass in India on the basis of a single collection of this plant which is located at Kew and is said to be made by Dharam Paul Bhandari from Pahalgam, Kashmir. Stewart[5] also includes this grass in his check list of Kashmir grasses, again on the basis of the same collection at Kew. But he points to a possible error about the grass.

The author has been investigating on an I.C.A.R. project on the grasses of Kashmir for the last three years and has collected grasses from almost every part of the valley. The grass under discussion drew his attention right from the beginning of this project and collections were made particularly from and around Pahalgam with much care and labour during all the seasons of the year. 4–5 collection trips were made to Pahalgam every season. But this grass was not found anywhere. Not to speak of Pahalgam alone, even all other places in the valley were scanned for this grass. But all the efforts to find this grass were unsuccessful. In recent years, besides the author, many other collectors (Javeid[3], Singh[4], etc.) have made extensive collections from Kashmir, but they too have been unable to find this grass growing in Kashmir. Even Stewart[5] himself has made collections of grasses from Pahalgam and other places in the valley but he too does not seem to have come across this grass.

Keeping these facts in view the author confirms the statement of Stewart[5] that there is some error with Bhandari's collection of *Lagurus ovatus* from Pahalgam and believes that this grass does not occur in India. The only explanation for Bhandari's collection can be that it may have been added to the collection from Kashmir by mistake.

Botany Department, BIMAL MISRI.
University of Kashmir,
Srinagar, Kashmir, *May* 10, 1973.

1. Bor, N. L., *The Grasses of Burma, Ceylon, India and Pakistan*, (Excluding Bambuseae), Pergamon Press, Oxford, 1960.
2. Hartley, "The global distribution of tribes of the Gramineae in relation to historical and environmental factors," *Aust. Jour. Agric. Res.*, 1950, 1, 355.
3. Javeid, G. N., *Flora of Srinagar*, Ph.D. Thesis, Kashmir University, 1970.
4. Singh, G., *Floristic Composition of Harwan Woodland Phytosociological Study*, Ph.D. Thesis, Kashmir University, 1973.
5. Stewart, R. R., "The grasses of Kashmir," *Bull. Bot. Sur. Ind.*, 1967, 9 (1–4), 114.

A Natural Tetraploid of *Urginea coromandeliana* Hk. f.

The genus *Urginea* Steinh. is known to occur in India with about 5–6 species. So far the chromosome numbers of four species are known. The basic number for the genus is $X = 5$ (Darlington and Wylie, 1955) and species with $2n = 10$ (*U. maritima*), $2n = 20$ (*U. maritima, indica, polyphylla, coromandeliana* and *govindappensis*) as well as $2n = 40$ (*U. maritima* and *U. scilla*) have been reported earlier. All the Indian species known so far have $2n = 20$ and they have been considered to be at diploid level.

Recently, some specimens of *U. coromandeliana* were collected from Aurangabad and surrounding areas. They have bulbs about 4 cm in diam. and scapes about 20–30 cm long emerging before the leaves in the early summer.

Root tips were prefixed in 0·01% colchicine solution for few hours and fixed in acetic-alcohol (1 : 3). 1% aceto-orcein was used as a stain.

The root tip squashes showed 40 chromosomes with 4 morphologically similar sets. The karyotype is asymmetrical with 4 very long (12 μ each), 12 long (8·6–6 μ each), 20 medium sized (4·6–3 μ each) and 4 short chromosomes (2·6 μ each). All have subterminal centromeres. Absolute size of

the karyotype is 221·2 μ. There are no satellites. Most of the nuclei have 4 nucleoli.

The plants flower very irregularly and are highly sterile. Although flowering material has been collected for a number of times from the area, fruits have not been observed so far.

High degree of sterility and four homologous sets of chromosomes are indicative of its autotetraploid nature. Four nucleoli are also suggestive of polyploidy.

So far as the author is aware this is the first report of the natural tetraploidy in *U. coromandeliana* Hk. f.

Department of Botany, V. N. NAIK.
Marathwada University,
Aurangabad, Maharashtra,
April 9, 1973.

Seedling Blight of Cashew (*Anacardium occidentale* L.) Due to *Cylindrocladium scoparium*

A species of *Cylindrocladium* was isolated from 4 months old cashew seedlings collected from Kottarakkara, Kerala. The characteristic symptoms of infection were wilting and withering of the seedlings and rotting of the underground portion of the stem. During the rainy season there was severe incidence of this disease.

The fungus was isolated, purified by single spore isolation and its pathogenicity was established by artificial inoculations. The fungus produced identical symptoms within 14–25 days. The pathogen was reisolated from artificially inoculated plants which was identical with the original isolate.

The fungus grew well on Potato dextrose agar and Czapek's medium with peptone. On both media the fungus produced a brown, tawny, ochraceous mycelium with a number of narrow concentric zones and radially arranged darker fibres. Conidiophores were erect, 400–500 μ long, 6–7·5 μ wide and dichotomously branched near the apex. From the point of branching, the main axis of the conidiophore continued to grow and terminated in a club-shaped structure measuring 20–25 × 5–8 μ. The primary branches were 20–40 × 5–7 μ. Secondary branches were 15–30 × 4–6 μ and tertiary branches were 8–12 × 3–5 μ. On tertiary branches the phialids were borne, 2–4 on each branch and measured 5–10 × 3–4 μ. Conidia were borne on the phialids, cylindrical with rounded poles, 1-septate, 50–60 × 5 μ and germinated from the poles.

On the basis of the morphological characters the fungus was identified as *Cylindrocladium scoparium* which is a new record on *Anacardium occidentale* L.

The author is thankful to Dr. J. Sam Raj and to Dr. M. Ramanatha Menon for their help in this work.

Division of Plant Pathology, SUSAMMA PHILIP.
Agric. College,
Vellayani. Kerala, *May* 10, 1973.

Occurrence of Reniform Nematode on Merigold Plant

During the survey of nematode infestation of economic crops, *Rotylenchulas reniformis* the reniform nematode was observed associated with the roots of *Tagetes patula* growing in residential gardens at Bihar Sharif (India) during the month of April 1970.

A maximum of 25,000 larvae with a minimum of 13,000 per 500 g of the soil around the rhizosphere and 18 to 42 attached females per 5 g of the roots were obtained from plants showing stunted growth and poor flowering. Plants with 1,150 to 5,000 larvae per 500 g of the soil around the rhizosphere and with females from 2 to 9 per 5 g of roots showed no apparent symptoms. The females were of typical shape provided with egg sac. Each egg sac contained 5 to 25 eggs. 59% of the eggs hatched in tap water at 25° C. On cross-inoculation young females infected *Lycopersicum esculentum* plants.

P.G. Department of Botany, R. P. NATH.
University of Bihar, S. S. PRASAD.
Muzaffarpur,
April 25, 1973.

Green Island in the Rust Infection of *Sorghum*

The term "green island" has been applied to a ring or spot of green tissue which is centered on an infection site and surrounded by an yellow or chlorotic tissue. Such green tissues were delineated for the first time by Cornu[1] (1881). Stakman[2] (1914) used the term "green island" for the green zone that was produced in the case of certain incompatible host parasite combinations in the case of stem rust of wheat.

In Dharwar during the *Kharif* seasons of 1970–71, 1971–72 and 1972–73, some lines of *Sorghum* infected with the rust *Puccinia purpurea* showed clear "green islands" around the pustules. The lines which showed 'green islands' were BH 4–1–4, GM 2–3–1, CSH–1 CSH–2 and CSH–3. Green islands were common in older leaves.

Perusal of records shows that formation of "green islands" as a result of rust attack in *Sorghum* has not been reported. It is possible that a deeper probe

into the "green island" formation may reveal the nature of compatibility of various lines of *Sorghum* to *Puccinia purpurea*.

Sorghum Research Project,
University of Agricultural Sciences,
Dharwar-5, Mysore State,
April 14, 1973.

K. A. BALASUBRAMANIAN.

1. Cornu, M., *Compt. Rend. Acad. Sci. (Paris)*, 1881, 93, 1162,
2. Stakman, E. C., *Univ. Minnesota, Agr. Expt. Sta. Bull.*, 1914, 138, 56.

A New Leaf Disease of *Canthium*

During a recent disease survey in Khandala region, *Canthium dicoccum* (Gaertn.) Merrill (F. Rubiaceae), was found to be infected with an unusual leaf spot disease, incited by ascomycetous fungus. It was identified as *Guignardia bidwellii* (Ellis) Viala L. Ravaz. This genus was established by Viala L. Ravaz with *G. bidwellii* as the type species. In India the genus is represented by five species and so far no species is reported on any species of *Canthium*. This note records *Canthium dicoccum* as a new host for *G. bidwellii*.

The infection spots are well marked circular, scattered and white. The black ascostromata that are restricted to the spots only are globose, unilocular, *innate*, ostiolate, 100–135 μ in diam, with wall about 8–12 μ thick. Asci clavate, bitunicate, pedicillate, octosporous, in basal layers, 45–55 $\times$ 10–14 μ. Ascospores spindle-shaped, biseriate, one-celled, *hyaline*, 14–18 $\times$ 3–5 μ. Interthecial tissue lacking.

The material is deposited in the C.M.I., Kew, England, under No. IMI. 172603.

Department of Botany,
D. G. Ruparel College,
Bombay-400016, *April* 12, 1973.

S. B. THAKUR.

Distribution of *Heterodera avenae* Wollen-Weber, Cereal Cyst Nematode in the Punjab

The existence of *Heterodera avenae*, cereal cyst nematode infesting wheat in the Punjab was reported by Singh *et al.* (1969). Since this is a serious pest and a cause of 'Molya' disease of wheat, a survey of the wheat fields for its infestation was carried out during 1972–73 in the Punjab. The soil samples were collected from 5 different sites of each field and the composite samples were processed through 60-mesh sieve and the cyst counts were made from 250 cc of soil.

The infestation of this nematode was recorded from Faridkot, Hoshiarpur, Jullundur, Kapurthala, Ludhiana, Patiala and Sangrur Districts. However, heavy infestation was observed at Hoshiarpur and Ludhiana. The cyst population ranged from 6 to 620 per 250 cc soil, *i.e.*, 15 million to 1·5 billion approximately per acre in the top 15 cm of soil. It was noticed that sandy soils contained high population. The general symptoms in the infested fields were stunting, yellowing and patchy growth of the crop. Tillering was also very low in the heavily infested areas.

The author is thankful to Dr. O. S. Bindra, for providing the facilities for this survey.

Assistant Nematologist,
Department of Entomology,
Punjab Agricultural University,
Ludhiana, *May* 7, 1973.

H. K. CHHABRA.

1. Singh, N., Chahal, D. S. and Chohan, J. S., *Progve. Fmg.*, 1969, 6 (1), 21.