SHORT SCIENTIFIC NOTES

Tea Rose 'Yellow Mosaic'—A New Virus Disease of Tea in Darjeeling (West Bangal)

During September, 1971, a single plant of tea rose (*Camellia japonica* L.) was found naturally diseased with symptoms of yellow mosaic. The disease was characterized by marked yellowing of leaf tissue adjacent to veins. The irregular vein-banding stood in marked contrast to the dark yellow interveinal areas. Since tea rose and cultivated tea belonged to the same genus it was thought fit to study the pathogenicity of tea rose disease and its significance, if any, to tea disease syndrome.

Leaves from infected tea rose plants were grafted on to healthy tea (china clone) and tea rose plants in insect-proof cages (1 or 2 leaflets per source plant into 1 test plant). Symptoms of TRYMV appeared in 7 out of 8 tea plants in 38–40 (avg. 39) days. Symptoms in one tea rose plant appeared in 106 days out of 6 grafted. The virus from experimentally infected tea plants could be recovered by grafting on to healthy tea plants.

Epidemiologically, tea rose, which is a common flowering shrub in this region, may act as the principal source of virus/viruses from which tea is infected. It appears that the tea rose virus is unlikely to reach high proportions except where large concentrations of virus infected tea rose are found in nature or in plant nurseries which are common in Darjeeling District.

Surveys for virus diseases of tea (*Camellia sinensis* O. Ktze.) in Darjeeling and Jalpaiguri Districts of West Bengal were intiated by the second author as early as 1956. During 1969–71 and earlier, several virus-like disorders showing symptoms of 'mosaic', 'yellow mosaic', 'variegation' and 'little leaf' were met with in Singell, Happy Valley, Sam Singh and Chamong Tea Estates. The virus nature of the samples collected is under test. It is now for the first time that TRYMV which is pathogenic to tea has been brought into culture. The great point of interest is that tea which is cultivated on a wide-scale in the Darjeeling District is likely to get infected with this virus.

In literature tea rose is neither known to harbour any virus in nature nor to contract virus infection under experimental conditions.

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Larval Ecdysis in Five Pests of Stored Grains

During our observations on the ecology of five pests of stored grains, *viz.*, *Callosobruchus maculatus* (F.) (Fam. Bruchidae), *Trogoderma granarium* Everts (Fam. Dermastidae), *Alphitobius diaperinus* Panz. (Fam. Tenebrionidae), *Oryzaephilus surinamensis* Linn. (Fam. Cucujidae) and *Corcyra cephalonica* Staint. (Galleriidae; Lepidoptera), we have come across different types of larval ecdyses. The difference in the moulting behaviour mostly relates to the appearance of the dorsal split in the different regions of the larva. The larvae of all the species become motionless and stop feeding before moulting. At the time of moulting, their bodies show movements of expansion and contraction as a result of which a mid-dorsal split appears in the covering cuticle in some parts of the body. Out of the Coleopterous species, the larvae of *C. maculatus*, *T. granarium*, and *A. diaperinus* show a more or less similar behaviour as the dorsal split in all of them appears in the head, thorax and abdomen of the larva, although its extent in the abdominal region varies in the three species. In *A. diaperinus* the longitudinal split extends upto the first abdominal segment, in *T. granarium* it goes upto the fourth abdominal segment whereas in *C. maculatus* it covers all the abdominal segments. Whereas in *C. maculatus* and *A. diaperinus* the dorsal split first appears in the head region and slowly extends backwards, in *T. granarium* it is the thoracic cuticle which splits first and the split

later extends both anteriorly and posteriorly. In the case of *O. surinamensis*, on the other hand, the dorsal split appears only in the thoracic region of the larva. The thorax of the hatching larva is the first to come out and is followed by the abdomen and the head. The cuticular coverings of the cephalic and abdominal regions, however, do not split. The non-appearance of the cephalic dorsal split in this beetle is correlated with the absence of the ecdysial line (Snodgrass, 1947) in its larva, along which the cephalic split in the larvae in general appears.

An extraordinary moulting behaviour is however witnessed in the caterpillars of *C. cephalonica* in which there is a complete absence of any dorsal split whatsoever. Surprisingly the cuticle of the head also does not split although a distinct epicranial suture is present.

The moulting procedure met with in *C. cephalonica* thus helps to distinguish between the true "ecdysial line" (Snodgrass, 1947; Duporte, 1946) along which cuticle of head splits and the "epicranial suture" of other authors which has nothing to do with the splitting of the cephalic cuticle. In *C. cephalonica*, the repeated contractions and expansions of the body result in loosening the entire cuticle of the head capsule and breaking it off the thorax, exposing the head of the hatching larva. The thorax and the abdomen of the hatching caterpillar come out with the help of wriggling movements of the body.

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New Records of Offshore Scorpaenid Fishes, *Pontinus tentacularis* (Fowler) *Ocosia vespa* Jordan and Starks and *Setarches longimanus* (Alcock) from the Arabian Sea

While collecting the marine animals on 3rd and 4th March, 1971 from the otter trawl hauls made on a rocky bottomed continental slope off Quilon coast at depths ranging from 135-150 fathoms by the "Blue Fin" trawler, three interesting scorpion fishes, *Pontinus tentacularis* (Fowler), *Ocosia vespa* Jordan and Starks and *Setarches longimanus* (Alcock) were noticed. *P. tentacularis* (Fowler, 1938)[1] and *Ocosia vespa* Jordan and Starks, 1904[2], known from the Pacific, and *S. longimanus* (Alcock, 1894)[3] known from the Eastern Indian Ocean and Pacific (Eschmeyer and Collette, 1966)[4] are thus new records to the Western Indian Ocean and the Arabian Sea.

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Resting and Locomotory Behaviour of *Clarias batrachus* (Linn.)

Though exhaustive information is available on the biology of the cat-fish, *Clarias batrachus*, no reports are found on its behaviour.[1-3]

Observations made in aquarium tanks revealed that the fish of all sizes can rest in two positions. The fish resting at bottom remain at angles ranging from 20° to 90° by touching their caudal fins to the bottom. The fish resting at the surface remain in vertical positions. In both the cases the fish can stay standstill in these positions from a few seconds to several minutes. Vertical upward movements up to the surface of water were noticed without body undulations more often in fry and fingerlings than in adults. However, the downward movements are accomplished by regular body undulations. The fishes were also found to uproot the aquatic plants in aquaria and when the plants float on the water surface the fish were seen either lying somewhat horizontally on the leaves of the plants or clustering in groups around the plant roots by tucking in their heads. These habits of fish are taken advantage of by local fishermen who scoop 5 to 10 fish in an hour with a simple hand net from open wells in paddy fields during monsoon season.

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Leaf Shredding Stage in Maize Incited by *Sclerospora sorghi*

Uppal and Desai[3] reported that although *Sclerospora sorghi* produced symptoms on maize similar to that produced on *Sorghum* the leaf shredding stage was not reached. Patel[1,2] observed the production of conidia and oospore by *Sclerospora sorghi* on maize and found oospores only in the Kashmir Sweet variety.

During the Kharif season of 1970-71 and 1971-72 two maize entries, Ganga 3 and Ganga 5, in the International Downy Mildew Nursery in Dharwar, manifested typical chlorotic streaks starting from the base of the leaves, with downy growth on the undersurface of the leaves bearing conidia. While sealing the entries, powdered shredded leaves of *Sorghum*, containing oospores of *Sclerospora sorghi* were incorporated into the furrows. The percentage of infection was found to be higher during 1971-72 in both the entries (Table I).

TABLE I
Incidence of downy mildew of maize

Entries	Per cent systemic infection	
	Kharif 1970-71	Kharif 1971-72
Ganga 3 ..	3·5	10·4
Ganga 5 ..	1·5	9·5

During the advanced stage of infection, shredding of leaves similar to that of *Sorghum* was observed in both Ganga 3 and Ganga 5. Microscopic examination of shredded leaves revealed the presence of oospores arranged at random unlike the linear arrangement of oospores found in shredded *Sorghum* leaves. The present report on the shredding of downy mildew infected maize leaves appears to be the first record. It may also be suggested that linear arrangement of oospores need not be the factor responsible for shredding and that the cell wall degrading enzymes elaborated by *Sclerospora sorghi* may be playing a significant part in dissolving the parenchymatous tissue between the veins.

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10-Celled Stone of *Elaeocarpus ganitrus* Roxb.

The genus *Elaeocarpus* Linn. belonging to the family Elaeocarpaceae consists of about 200 species distributed throughout the South and East Asia, Indomalayan regions, Australia and Pacific Islands. The drupe of *Elaeocarpus* is characterised by a single bony tuberculate stone divided into 1-5 1-seeded cells (by suppression/abortion 1-celled).

E. ganitrus Roxb. is found in Nepal, Bihar, Bengal, Assam, Meghalaya, NEFA, Manipur, Tripura, Madhya Pradesh and Bombay. Maxwell T. Masters, F.R.S., treating this taxon in Hooker's *Flora of British India* 1: 400, 1874, recorded the drupe as having 5-celled stone. Since then the writers of our popular floras, who mention the drupes of this plant, state that the stones are 1-5-celled. The stones are *normally* 5-celled, and on numerous occasions the author has noted it to be so. However, during the year 1971, he found several 10-celled stones in Darjeeling. This has not been recorded in our floras.

The stones of the species, popularly known as 'Rudraksh', are utilised as beads for rosaries and bracelets.

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