

longitudinal ribbing on their surface were interpreted as excreta of Chelonia which have longitudinal rugae on the inner surface of their lower intestine. The larger ones without ribbing were considered to be excreta of large Titanosaurian dinosaurs, the smaller ones being of smaller reptiles. Among the unribbed coprolites Matley had indicated presence of corno-saurian excreta even though this group of reptiles was not known to occur at Pisdura when he studied this material. Smaller Pisdura coprolites are about 20 mm–25 mm long, the medium ones about 50 mm–55 mm, and some of the larger ones as much as 160 mm–170 mm long. Some of the coprolites with shrinkage cracks and one side flattish, were considered to have been laid on dry land.

Some of the Maleri coprolites studied by Sohn and Chatterjee¹¹ are reported to have contained some freshwater ostracodes, e.g., *Darwinula*, which those reptiles, probably rhynchosaurids, must have swallowed along with their herbaceous food from the marsh.

Chatterjee¹² has reported from Maleri–Chinnur area in Godavari valley two broad groups of coprolites, the one from the Middle Triassic Yerrapalli formation easily distinguishable by their general shape and size from those from the Upper Triassic Maleri formation, probably implying that they belonged to different groups of animals.

Among the coprolites till now recorded from marine environment, Patwardhan and Ahluwalia¹³ have reported micro-coprolites associated with phosphorite from the Triassic Krol–Tal transition sequence near Mussooree. Chiplonkar and Badve¹⁴ and Haentzschel¹⁵ have noticed faecal discoid flakes in the burrow *Discotomaculum* in the oyster bed in Nimar Sandstone (Bagh Beds) at Mongra in Narmada valley. Chiplonkar and Tapaswi¹⁶ have mentioned faecal pellets approximately 2 mm long, more or less transversely disposed in the tunnels of *Chondrites* from the Gray Shales horizon of Dalmiapuram. In the Shiala formation of the Tethyan sediments in Malla Johar area Kumar *et al.*¹⁷ have found faecal pellets in the burrow *Tomaculum*. Minute coprolites 0.5 mm to 1.00 mm long fill the burrow *Tubicotomaculum* described by Chiplonkar and Ghare¹⁸ from the matrix of a cymatonautiloid shell from the Utatur beds at Utatur.

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IN VITRO INACTIVATION OF RICE TUNGRO VIRUS BY PLANT GROWTH REGULATORS

In recent years, several plant growth regulators have been reported to possess virus inhibitory activity. Some of these reduce the virus concentration of infected plants^{1,2}, while others are shown to be potent inhibitors of viral infectivity^{3,4}. However, till now, no report seems to be available on the inhibitory effect of plant growth regulators on rice tungro virus.

During a recent search for antiviral compounds against rice tungro virus (RTV), the authors have attempted to study the effect of gibberellic acid (GA) and indole-3-acetic acid (IAA) on the infectivity of the virus. Leaves collected from tungro infected rice plants were cut into 8 cm long strips and kept immersed in solutions of GA and IAA at 100, 200, 300 and 400 ppm concentrations for 24 hrs. Similarly, infected leaf strips treated with water served as the control. After the treatment, infectivity was assessed by transmission tests with green leafhoppers (*Nephotettix virescens* Distant). Twentyfive non-viruliferous green leafhoppers were allowed to feed on each of the treated samples for 24 hrs for virus acquisition and then they were transferred to 15 day old healthy seedlings

of rice cv. Taichung Native 1. Insects were removed after 24 hrs inoculation feeding. Observations on disease development and back inoculations from inoculated plants were periodically made. The number of infected plants per treatment was taken for assessing the percentage of virus transmission.

Results presented in Table 1 show that both GA and IAA inactivated rice tungro virus *in vitro*. Infectivity of leaves treated with 100 ppm of GA and IAA did not differ much from that of the control leaves suggesting that no virus inactivation occurred at this concentration. Inhibitory effect was more significant at higher concentrations (200 ppm and above) and at 400 ppm of IAA, the inactivation was almost complete. IAA was more effective in inactivating RTV than GA.

TABLE I
In vitro effect of GA and IAA on the infectivity of rice tungro virus

Treatments	Concentration ppm	No. of inoculated plants	Suppression of infection %
Control	..	50	0.0
GA	100	50	9.0
	200	50	17.4
	300	50	27.7
	400	50	31.5
IAA	100	50	8.0
	200	50	82.7
	300	50	89.4
	400	50	98.0

The infectivity per cent decreased with increasing concentration of IAA and at 400 ppm, no virus could be recovered. This suggests that the inhibitory effect results in the total loss of infectivity of the virus rather than a temporary masking of the symptoms. High concentrations of plant growth regulators were reported to inhibit virus multiplication⁴⁻⁹.

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ANEUSOMATY IN *PLATANThERA SUSANNAE* (LINN.) LINDL.

NATURALLY occurring polyploids in Orchidaceae were first reported by Pace¹⁰. Later, such occurrence of polyploids and their usefulness has been repeatedly emphasized by a number of workers^{2,5,6,8,9}. Both eu- and aneuploidy are of frequent occurrence in orchids. Intraspecific variation in number also has been noted in many genera and species. The occurrence of aneusomaty is not well established in this plant group, though polysomaty in monocots in general has been described by Sharma¹². Later, in orchids Chatterji has observed polysomic condition in *Paphiopedilum venustum* of Cyripedidae and *Otochilos alba* of Coelogyninae¹. Sharma and Chatterji also noted 38 and 77 chromosomes in two adjoining cells of the same root tip in *Vanda* sp¹⁴. The chromosome number variation by supernumeraries in *Epipactis latifolia*³ and *Listera ovata*⁷ has been interpreted to be perhaps leading to the polysomic condition. In earlier studies on the other plant groups, it is inferred that both non-disjunction and partial endomitotic duplication have played a role in polysomaty¹¹.

While working on a research problem on orchids, the aneusomic condition has been noted by the authors. In *Platanthera susannae* Lindl., the cells in metaphase plate showed the diploid somatic chromosome number as 42 (Fig. 1) but, a cell from the same root tip also showed the number to be $2n = 36$ (Fig. 2). This decrease in chromosome number may be either due to centric fusion as demonstrated by Jones⁴ or by the loss of chromosomes due to unequal translocation described by Stebbins¹⁶. The karyomorphology of the aneusomic cell (Fig. 4) is also found to differ from the normal karyotype (Fig. 3), the significance of such variation in origin of new genotype needs no clarification. It has been emphasized that structural alterations have more chances of survival compared to numerical variations in the species reproducing profusely through vegetative means^{13,15}.

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