nuclear envelope in various species[6,7]. Moreover, the convergence and attachment of chromatin fibers to the annuli of nuclear membrane have been reported for mammalian, avian and insect cells[8,9]. On the light of these data, it seems reasonable to assume that rays of the wheel-like structure observed in interphase nuclei treated with trypsin represent the orderly attachment of g-bands to the nuclear envelope. Furthermore, the network of filaments and the perinucleolar masses which occupy the inner part of the nucleoplasm probably correspond to other g-bands not directly connected with the nuclear envelope.

Information regarding the mechanism of g-band production is still incomplete. However, several experiments strongly suggest that g-bands are the result of disruptions in the molecular structure of DNA-non-histone complexes[1,10]. Such being the case, it is possible to assume that some of these complexes may be specifically involved in the attachment of chromatin to the nuclear membrane[11].

Resumen. En las preparaciones cromosómicas sometidas a digestion con tripsina se observa que la mayor parte de los nucleos celulares muestran una serie de rayos oscuros que parten de la membrana celular y convergen formando un anillo. Esta imagen se hace presente en aquellos preparados que muestran bandas cromosómicas G y no se observa en aquellos casos con déficit o exceso de digestión enzimática. Estos hallazgos probablemente indican que las bandas G se hallan conectadas, ordenadamente, a la membrana nuclear durante la interfase.

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Aflatoxin Production in some Varieties of Soybeans (*Glycine max* L.)

Aflatoxin contamination has been extensively studied on peanuts[1]. Soybean (*Glycine max* (L) Merr.) is one of the next best sources of edible oil, and its meal is also useful as a source of proteins for consumption by humans and poultry. But information on the susceptibility of soybeans to aflatoxin contamination appears to be rather meagre, and also conflicting. Studies on aflatoxin production in several agricultural commodities such as rice, wheat, corn, sorghum, peanuts and soybeans showed that soybeans were a poor substrate for toxin production by toxigenic strains of *Aspergillus flavus*[2,3]. It was therefore interesting to investigate the toxin production in soybeans and also to examine varietal differences, if any, in toxin production. Such a study seemed important in view of the crash programme currently in operation in India to boost the production of new and promising varieties of soybeans.

Methods. Five authentic varieties of soybeans (Lee, Bragg, Semmes, Punjab-1, and JS-2) were obtained from the production units of the Agricultural Universities at Pantnagar (Uttar Pradesh) and Jabbalpore (Madhya Pradesh) in this country. The toxin production in these varieties was assessed using 2 toxigenic isolates of *A. flavus* Link (NIN 25, NIN 169) and 2 toxigenic isolates of *A. parasiticus* Speare (NRRL 2999, RIB 4002). The toxin production of these fungal isolates were first graded by growing them on a synthetic medium described by ADYE and MATELES[4]. 20 g lots of each variety of soybeans were rehydrated with just enough water, sterilized by autoclaving at 15 lbs pressure inch^2 for 15 min. The flasks were then inoculated with a uniform spore suspension of the fungal isolates and incubated at 28 °C for 7 days. At the end of this incubation period, the samples were sprayed with alcohol and dried overnight at 80 °C. The dried samples were first defatted with n-hexane and then extracted with methanol. The aqueous methanolic extracts were extracted with chloroform and chloroform extracts were processed appropriately for thin layer chromatography using chloroform: methanol (95:5) as developing system. The aflatoxin B_1 content was quantified by the method described by PONS et al.[5]. Confirmation of the chemical nature of aflatoxin B_1 was made by the method of CRISAN[6].

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Aflatoxin (B_1) production (in ppm) in synthetic medium and in Soybean varieties

Species/isolate	Synthetic medium	Soybean varieties				
		Lee	Semmes	Punjab-1	Bragg	JS-2
A. flavus, NIN 25	+[a]	0.125	0.125	0.125	0.5	3.125
A. flavus, NIN 169	++	0.125	1.55	0.78	0.25	1.25
A. parasiticus[b], RIB 4002	++++++	12.5	12.5	12.5	15.63	31.25
A. parasiticus, NRRL 2999	++++++	19.53	19.5	31.25	20.83	31.25

[a] + is approximately equal to 250 µg of B_1 per 100 ml medium. [b] Designated as *A. toxicarius* by MURAKAMI[15].

Results and discussion. The aflatoxin B_1 production by different fungal isolates on synthetic medium and the different varieties of soybeans is indicated in the Table. There were wide variations in aflatoxin production in different varieties of soybeans. The amount of the toxin produced was closely related to the toxin-producing potential of the fungal isolate used and the genotype of the soybean employed as natural substrate. The toxin production by the isolates of *A. flavus* was markedly lower than that compared to the production by *A. parasiticus*. The variety 'Lee' produced the lowest and the variety 'JS-2' generally resulted in the highest production of the toxin by *A. flavus* or *A. parasiticus*. The extent of difference in toxin production between less susceptible variety (Lee) and relatively more susceptible variety (JS-2) is of a higher degree in *A. flavus* series (0.125 to 1.55 or 3.125 ppm). Such a wide variation was, however, not demonstrable in the series using *A. parasiticus*.

It is generally believed that soybeans are a very poor substrate for aflatoxin production[2,3,7]. In a field study involving a survey of 866 samples of soybeans, SHOTWELL et al.[8] could observe only 0.8% incidence of aflatoxin positive, though 50% of samples showed evidence of contamination with *A. flavus*. The toxin level in the 2 positive samples was as low as 7 to 10 ppb. Again, CHONG et al.[9] failed to demonstrate the presence of aflatoxin in moldy soybeans contaminated with toxigenic isolates of *A. flavus*. However, they could demonstrate measurable amounts of toxin production using another isolate of *A. flavus* (Weybridge V. 3734/-10) which is in fact *A. parasiticus* (NRRL 2999).

Under optimal laboratory conditions, HESSELTINE et al.[2] obtained very low toxin production (0.03 to 0.08 ppm) on pearled soybeans (Hawkeye) using 3 isolates of *A. flavus*. Two of these isolates were later designated as *A. parasiticus* (NRRL 2999 and NRRL 3000). On the other hand, DAVIS and DIENER[10] obtained fairly good amounts of toxin (41 to 138 ppm) on Bragg variety of soybean after 21 days of incubation, using *A. parasiticus* (Ala-6). The results of the present series showed toxin yields ranging from 0.12 to 31.25 ppm using different varieties of soybeans infected with different isolates of *A. flavus* and *A. parasiticus*. It is interesting to note that HESSELTINE et al.[2] could get very low production (0.08 ppm) with *A. parasiticus* (NRRL 2999) using pearled soybeans (Hawkeye). It could be that this latter variety is highly resistant to toxin production, even when using one of the most virulently toxigenic isolates. The higher production of toxin in the series by DAVIS and DIENER[10] might be due to the higher toxigenic potential of the isolate used and also probably due to longer period of incubation for 21 days.

From the present series, it is obvious that soybeans do support the production of aflatoxin under optimal conditions, but the extent of toxin production is dependent on the variety of the soybeans and the toxigenic potential of the fungal isolate used. From the limited studies reported here, it is apparent that Lee variety, which supports minimal toxin production, would be suitable for extensive cultivation. This variety, nevertheless, produces appreciable quantity of the toxin when infected with *A. parasiticus*. But all available evidence appears to suggest that prevalence of *A. parasiticus* contamination is rarely encountered in India[11,12]. It is pertinent to note that the agroeconomic factors, such as yield, oil and protein contents of the Lee variety compared quite favourably with the other varieties of soybeans[13,14].

Zusammenfassung. Es wurden 5 Varietäten von *Glycine max.* mit 2 toxinerzeugenden Aspergillusstämmen beimpft und auf ihre Aflatoxinbildung untersucht. Alle Varietäten lieferten Substrate, die zur Biosynthese messbarer Aflatoxinmengen durch beide Aspergillusstämme führten.

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Improved Visualization of Wall Ultrastructure in *Saccharomyces cerevisiae*

Recently, *tris*-1 aziridinyl-phosphine oxide (TAPO) has been successfully used as a chemical fixative for biological electron microscopy[1-3]. A prefixation with a mixture of TAPO and acrolein followed by aqueous osmium postfixation produced a significant amount of new information on the ultrastructure of *Candida albicans* wall[2,4]. The results obtained in this organism cannot however be, extrapolated to the generality of yeast and yeast-like forms owing to the differences in wall chemistry and organization existing between them[5]. In particular, it was of interest to see whether the fixation procedure described for *C. albicans* could be usefully applied to *Saccharomyces cerevisiae*, a yeast 'paradigmatic' as far as wall structure is concerned.

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