

**POLYSHEMA CHAMBALENSIS SP. NOV.  
FROM INDIAN SOIL**

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AN interesting dematiaceous fungus was isolated during the ecological studies on the soil fungi of Chambal ravines of Bhind district (MP), India. The identity of the fungus was confirmed by Dr B. C. Sutton, Commonwealth Mycological Institute, Kew, England who placed it in the genus *Polyschema*.

The genus *Polyschema* was established by Upadhyay<sup>1</sup>. Eight species of this genus have been recognised<sup>2-4</sup>. The present isolate differs widely from most of the existing species in having larger and sigmoid conidia with higher number of septa. It shows some resemblance to *P. larviformis* in respect to the conidiogenous cell and conidial shape. The present isolate, however, has smaller conidia with lesser number of septa and produces shorter chains of conidia. The present isolate shows some similarity to *P. variabilis* but differs with regard to shape, size and number of septa in the conidia. Another feature of the

TABLE I

*Comparative morphological characteristics of some closely related species of Polyschema*

Characters	Name of species		
	<i>P. chambalensis</i> Joshi, Chauhan and Saksena sp. nov. (Present isolate)	<i>P. larviformis</i> (Fairman) M. B. Ellis	<i>P. variabilis</i> Tiwari, Agrawal and Sutton
1. Colony	Greyish green with paler margins, becoming brown black at maturity.	Black and velvety.	Greyish green to olivaceous brown, becoming dark brown to black at maturity
2. Mycelium	Coarsely roughened and 2.0-2.8 $\mu\text{m}$ broad.	Smooth or verruculose and 3-4 $\mu\text{m}$ thick.	Verrucose and 2.0-4.0 $\mu\text{m}$ thick.
3. Conidiophores	Micronematous and finely echinulate.	Semi-micromematous and verruculose.	Semi-micromematous and verrucose.
4. Conidiogenous cell			
A-Structure	Monotretic or polytretic; discrete; sometimes in short chains.	Monotretic or polytretic; discrete; and solitary.	Monotretic or polytretic discrete; sometimes in short chains.
B-Shape and size	Spherical to subspherical (4.0-6.0 $\mu\text{m}$ ).	Spherical to subspherical (5.0-9.0 $\mu\text{m}$ ).	Subglobose (4.5-5.5 $\times$ 3.0-4.5 $\mu\text{m}$ ) to clavate (9.5 $\times$ 4.0 $\mu\text{m}$ ).
5. Conidia			
A-Structure	Pale brown, mostly formed singly, sometimes in short chains.	Dark reddish brown; solitary.	Greyish brown to dark brown, mostly solitary or in pairs, sometimes in short chains of 2-3.
B-Shape	Clavate, obclavate, cylindrical to sigmoid.	Clavate, obclavate or ellipsoidal, sometimes sigmoid.	Clavate, straight or curved, rarely sigmoid.
C-Septation	3-9 septate, commonly with 4-6 septa.	4-12 septate, generally with 7-10 septa.	0-5 septate, generally with 2-3 septa.
D-Size	13.5-49.5 $\times$ 6.0-11.5 $\mu\text{m}$ .	30-80 $\times$ 16-20 $\mu\text{m}$ .	9.5-28.5 $\times$ 6.0-11.5 $\mu\text{m}$ .
6. Chlamydospores	Absent	Absent	Numerous, solitary in chains or in dense clusters, globose to oval measuring 12.5-17.5 $\times$ 10.5-14.5 $\mu\text{m}$ .

new isolate is the absence of chlamydospores which are of common occurrence in *P. variabilis* (table 1). Comparative morphological characteristics of the new isolate and other closely related species of *Polyschema* are provided in table 1.

In view of these divergent characters of the present fungus, the authors proposed to give it a new specific name *i.e.*, *Polyschema chambalensis*, after the place of its occurrence.

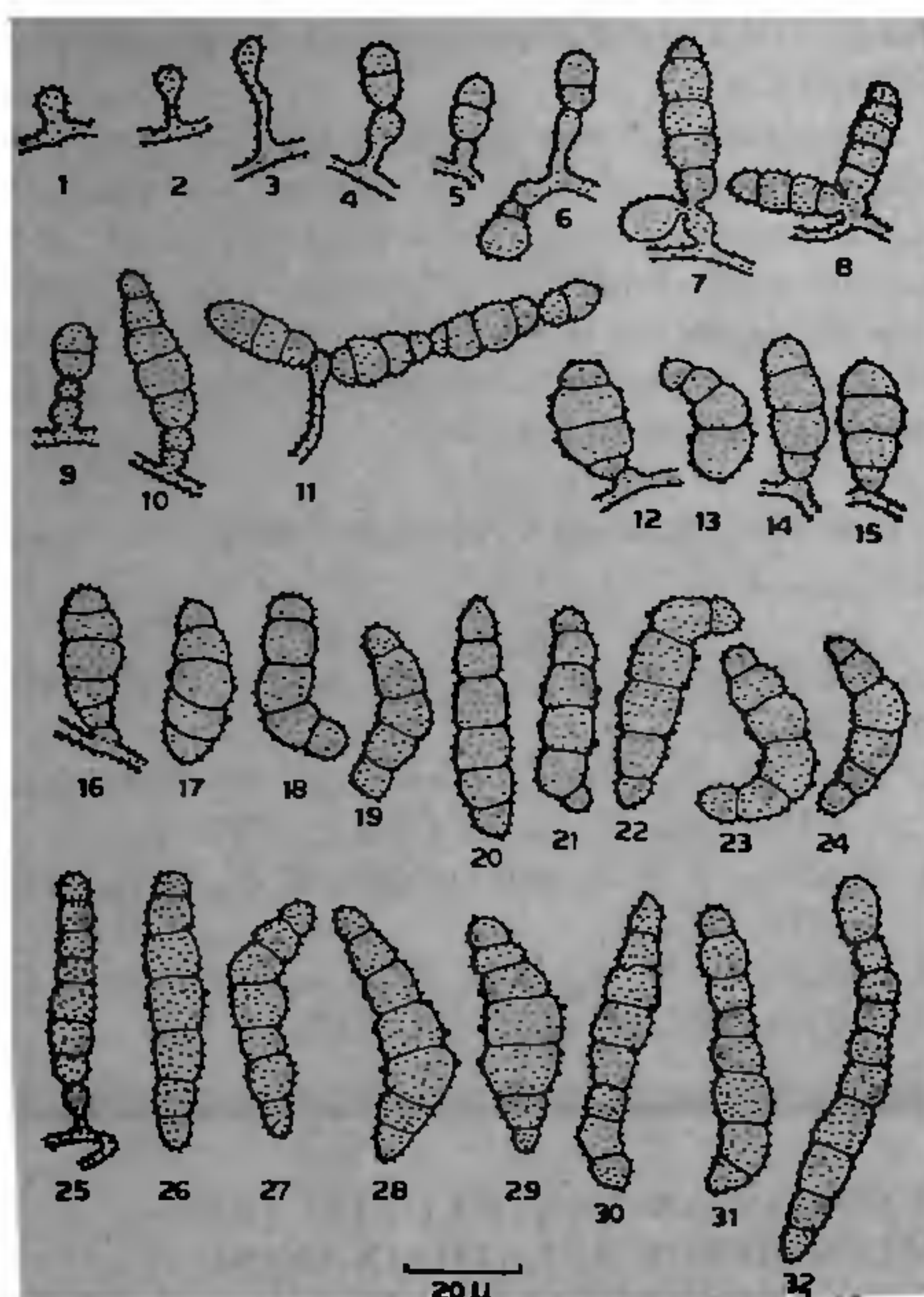
*Polyschema chambalensis* Joshi, Chauhan and Saksena sp. nov.

Coloniae in agar cum tuberis Solani et dextroso composito lente crescentes, post 15 diem subtemperatura 29° C cultae 2.5 cm attingentes. Coloniae effusae, juveniles griseo-virides, peripheriam pallidioribus, maturae brunneo-atrae. Mycelium superficiale, septata, pallide brunneis, crasse rugosum, 2.0–2.8  $\mu\text{m}$  diametro. Conidiophora micronemata, mononemata, erecta, non-ramosa, subtiliter echinulata. Cellae conidiogenae monotreticae vel polytreticae, discretae, spherica vel subspherica, aliquando in breviter catenata, pallide vel brunneola, 4.0–6.0  $\mu\text{m}$  diametro. Conidia sicca, brunneola, clavata, obclavata, cylindrica vel sigmoidea, cellulis apicalibus et basalibus rotundatis, cellula basis nonnumquam turbinata. Conidia 3–9 septata, plerumque 4–6 septata, subtiliter echinulata, verrucosae vel tuberculatae, plerumque ad septa constricta, cellulis extimis pallide brunneis, cellulis intermediis brunneis. Conidia plerumque singulata, saepe breve catenata, 13.5–49.5  $\times$  6.0–11.5  $\mu\text{m}$ ; 2-septata 13.5–20.0  $\times$  6.0–7.5  $\mu\text{m}$ ; 3-septata 20.5–24.5  $\times$  6.0–10.0  $\mu\text{m}$ ; 4-septata 24.5–35.5  $\times$  6.5–11.5  $\mu\text{m}$ ; 5-septata 28.5–37.5  $\times$  6.0–10.0  $\mu\text{m}$ ; 6-septata 40.0–47.5  $\times$  6.5–10.0  $\mu\text{m}$ ; 7–9-septata 43.5–49.0  $\times$  6.5–9.0  $\mu\text{m}$  (Figures 1–32).

Hab. in Solo, Bhind, M.P., India, 10.2.1975. Type positum in CMI, Kew, England sub numero IMI No. 206935. Isotypus positum in laboratoria mycologica in Universitate Jiwaji ad Gwalior in India sub numero JUML/J-261.

*Polyschema chambalensis* Joshi, Chauhan & Saksena sp. nov.

Colonies on potato dextrose agar slow growing, reaching 2.5 cm after 15 days of incubation at 29° C. Colonies effuse, grayish green in young stage with paler margins, becoming brown black at maturity. Mycelium superficial, septate, pale brown, coarsely roughened and 2.0–2.8  $\mu\text{m}$  broad. Conidiophores micronematous, mononematous, erect, unbranched and finely echinulate. Conidiogenous cell monotretic to polytretic, discrete, spherical to subspherical, sometimes in short chains, pale to pale brown and



Figures 1–32. *Polyschema chambalensis*. 1–3. Hyphae with conidiogenous cells and conidiophores; 4–6. 1-septate conidium on conidiogenous cell; 7, 8. Development of conidia on polytretic conidiogenous cells; 9, 10. Development of conidiogenous cells in short chain; 11. Development of conidia in short chains; 12–15. 3-septate conidia; 16–19. 4-septate conidia; 20–24. 5-septate conidia; 25–29. 6-septate conidia; 30–32. Conidia with 7- or more septa.

4.0–6.0  $\mu\text{m}$  in diameter. Conidia dry, pale brown, clavate, obclavate, cylindrical to sigmoid with round basal and terminal cells, basal cell sometimes turbinate. Conidia 3–9 septate, commonly with 4–6 septa, finely echinulate, verrucose or tuberculate, mostly constricted at septa with intermediate cells dark brown and paler end cells. Conidia mostly formed singly, sometimes in short chains, measuring 13.5–49.5  $\times$  6.0–11.5  $\mu\text{m}$ ; 2-septate measuring 13.5–20.0  $\times$  6.0–7.5  $\mu\text{m}$ ; 3-septate 20.5–24.5  $\times$  6.0–10.0  $\mu\text{m}$ ; 4-septate 24.5–35.5  $\times$  6.5–11.5  $\mu\text{m}$ ; 5-septate 28.5–37.5  $\times$  6.0–10.0  $\mu\text{m}$ ; 6-septate 40.0–47.5  $\times$  6.5–10.0  $\mu\text{m}$ ; 7–9-septate 43.5–49.0  $\times$  6.5–9.0  $\mu\text{m}$  (Figures 1–32).

Isolated from soil, Bhind (M.P.), India, 10.2.1975. Type culture has been deposited at CMI, Kew, England as IMI No. 206935. Isotype has been deposited at



Jiwaji University, Mycological Laboratory as JUML/J-261.

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#### A SIMPLE AND RAPID DETECTION METHOD FOR AFLATOXIN USING POLYTHENE MINICOLUMN

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AFLATOXINS, the naturally occurring food toxicants produced by *Aspergillus flavus* Link and *Aspergillus parasiticus*. Speare have been reported to occur in a wide range of agricultural commodities<sup>1</sup>. Several outbreaks of the disease in animals and men due to aflatoxins have been reported from India<sup>2</sup> and elsewhere. The methods that are in wide use currently for detecting and quantitating aflatoxins are expensive and time consuming. To overcome this, several minicolumn methods have been developed during the last decade<sup>3</sup>. Jemmali<sup>5</sup> suggested the use of disposable cellulose tubing and a confirmatory test using 50% H<sub>2</sub>SO<sub>4</sub>. However, the cellulose tubing material is not always readily available and further it dissolves readily in 50% H<sub>2</sub>SO<sub>4</sub>. Hence, an attempt has been made to use minicolumn prepared out of locally available material for the detection and confirmation of aflatoxins.

Polythene tubing (12cm × 1cm) was prepared from an ordinary polythene sheet of 0.2 mm thickness. One end of the column was plugged with a small piece of cotton. Anhydrous sodium sulphate was poured into the column to a height of one cm and it was covered

with neutral alumina (one cm.) activated at 110° C for 2 hr. Silica gel (column chromatography grade, 60-120 mesh, activated at 110° C for 1 hr) was added to a height 1 cm above alumina followed by thin layer chromatography grade silicagel to a height 6 cm. The top of the column was plugged with a piece of cotton. After a number of combinations tested in initial trials, the above described column materials were found to be most satisfactory.

Fifty gm lot of contaminated wheat sample was extracted with 100 ml acetone + water (85:15 v/v); 10 ml of the filtered extract was mixed with 10 ml of 20% aq. lead acetate solution to remove interfering fluorescent materials. The mixture was filtered and the filtrate was shaken vigorously with 3 ml of benzene (3 minutes) and allowed to stand and one ml from benzene layer was taken in a test tube and the packed column was inserted into the test tube and the ascending solution was allowed to reach TLC grade silicagel zone. The column was developed for 3 min in 5 ml. chloroform, acetonitrile, isopropanol mixture (93:5:2 v/v/v). The developed column was observed under long wave UV light. A blue fluorescent band just above the neutral alumina zone indicated the presence of aflatoxins. Aflatoxin contaminated rice and groundnut cake samples were also screened with this technique.

For confirmation of aflatoxin, the column was dipped in one ml of 20% H<sub>2</sub>SO<sub>4</sub> in methanol or 10% HCl in ethanol for about a minute. The blue fluorescence turned to yellow confirming the presence of aflatoxins. Semiquantitation can also be done by comparing the column developed in sample extract with standard columns of different concentrations as described by Cucullu *et al.*<sup>3</sup> With this procedure aflatoxin could be detected upto 10 ppb level. The entire process of development and detection requires about five minutes.

However, aflatoxin has been shown to be absorbed to the extent of 7% after 15 min when it is in direct contact with polythene tube<sup>6</sup>. But, in the present method the aflatoxin does not come into direct contact with tubing as it passes through adsorbents and development is completed within 5 min. Thus this simple and rapid technique can be used conveniently at the source.

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