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EFFECT OF EXTRACTS OF *ARTABOTRYS UNCINATUS* AND *ALLIUM SATIVUM* ON *XANTHOMONAS CAMPESTRIS* PV. *ORYZAE*

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AQUEOUS extracts of several plants were tested for activity against *Xanthomonas campestris* pv. *oryzae* the causative agent of bacterial leaf blight, a serious disease of rice in South and South-East Asia. Extracts from the cloves of *Allium sativum* (garlic) and from the leaves of *Artabotrys uncinatus* (ylang ylang) were obtained using a Carver press and subjecting the plant material to 10,000–15,000 lb/in^2 pressure. The liquid obtained was filtered through a Whatman #1 filter and then filter sterilized using 0.22 micrometer filters.

The pathogen was streaked onto tetrazolium chloride agar[1] plates using cotton swabs dipped into 24 hr cultures of luria broth. Sterile water at pH 5 and pH 7 was used in place of the plant extracts as controls. Eight replications were used.

After 2–3 days the inhibition zones were recorded. The two plant extracts that produced the largest inhibition zones were those of *A. sativum* (68 mm) and *A. uncinatus* (64 mm). The pH of the extract was 5.8 for *A. sativum* and 5.3 for *A. uncinatus*. No inhibition zones were produced on the control plates.

Garlic is a well known bactericide, but in a recent review of the literature on pest control materials from 1600 plants, *A. uncinatus* was not listed as possessing bactericidal properties[2]. However, this plant belongs to the family *Annonaceae* which has several *Annona* spp. known to possess pest control properties[3]. The leaves of *A. uncinatus* have also been found to possess antifungal activity against several plant pathogenic fungi[4, 5].

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SOME NEW PTERIDOPHYTIC REMAINS FROM THE LOWER GONDWANA ROCKS OF HINJRIDA GHATI, ORISSA

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THE first report of pteridophytic plant fossils from Hinjrida Ghati section near Handappa made by Khan[1] included *Phyllotheca indica, Schizoneura gondwanensis, Sphenophyllum speciosum, Sphenopteris polymorpha* and *S. hughesii* but lately Chandra and Rigby[2,3] have added a few lycopsid, sphenopsid forms besides some ferns including *Pantopteris gracilis* to the previously reported forms from this bed. However, during a recent visit to this locality the authors discovered the impressions of a pinna with fertile pinnules of a fern and a whorl of a new species of *Sphenophyllum* Koenig[4] which are described hereunder.

Sphenophyllum utkalensis sp. nov.

Diagnosis: Node showing an almost symmetrical whorl of six leaves; leaves sessile, triangular with pointed angular shoulders, distal margin of each leaf showing a deep apical notch, veins repeatedly dichotomised, median veins proceeding straight to distal margins but lateral ones arched sideways; internodes not seen.

Holotype No. 90066 of Divya Darshan Plant Collection at present located in Botany Department of Allahabad University.

Locality and Horizon: Hinjrida Ghati Section, Dhenkanal, Orissa, Kamthi Formation, Lower Gondwana.

Sphenophyllum utkalensis differs clearly from all other lower Gondwana species of the genus but comes closest to *Parasphenophyllum crenulatum* Maithy[5] reported from Raniganj Stage of Raniganj Coalfield in having sessile leaves with smooth sides and median apical notches (figure 1). However, *S. utkalensis* can be easily distinguished from *P. crenulatum* in having smooth apical margins and pointed shoulders (*P. crenulatum* has crenulate apical margins and rounded shoulders).

S. utkalensis may however be compared with some northern species of *Sphenophyllum* in having apically notched leaves with smooth sides like *S. longifolium*, *S. majus*, *S. oblongifolium*, *S. orbicularis*, *S. sarrensis*, *S. saxonicum* and *S. sewardii*[6] but all these species also differ from it in having variously toothed apical margins.

Asansolia cf. *phegopteroides*

The species described here looks just like *Asansolia phegopteroides* Pant & Misra[7] in having pecopterid pinnules with marginal synangium-like depressions on the vein endings (figure 2) but further comparison is not possible since our specimen lacks structural details.

The occurrence of *Asansolia* cf. *phegopteroides*, a characteristic form of the Raniganj Stage, among the Hinjrida fossils adds one more Raniganj element to previously described fossils and suggests that the fossiliferous bed in this locality belongs to the Raniganj Stage or Kamthis[8] which too is regarded as syntaxial with the Raniganj Formation. However,

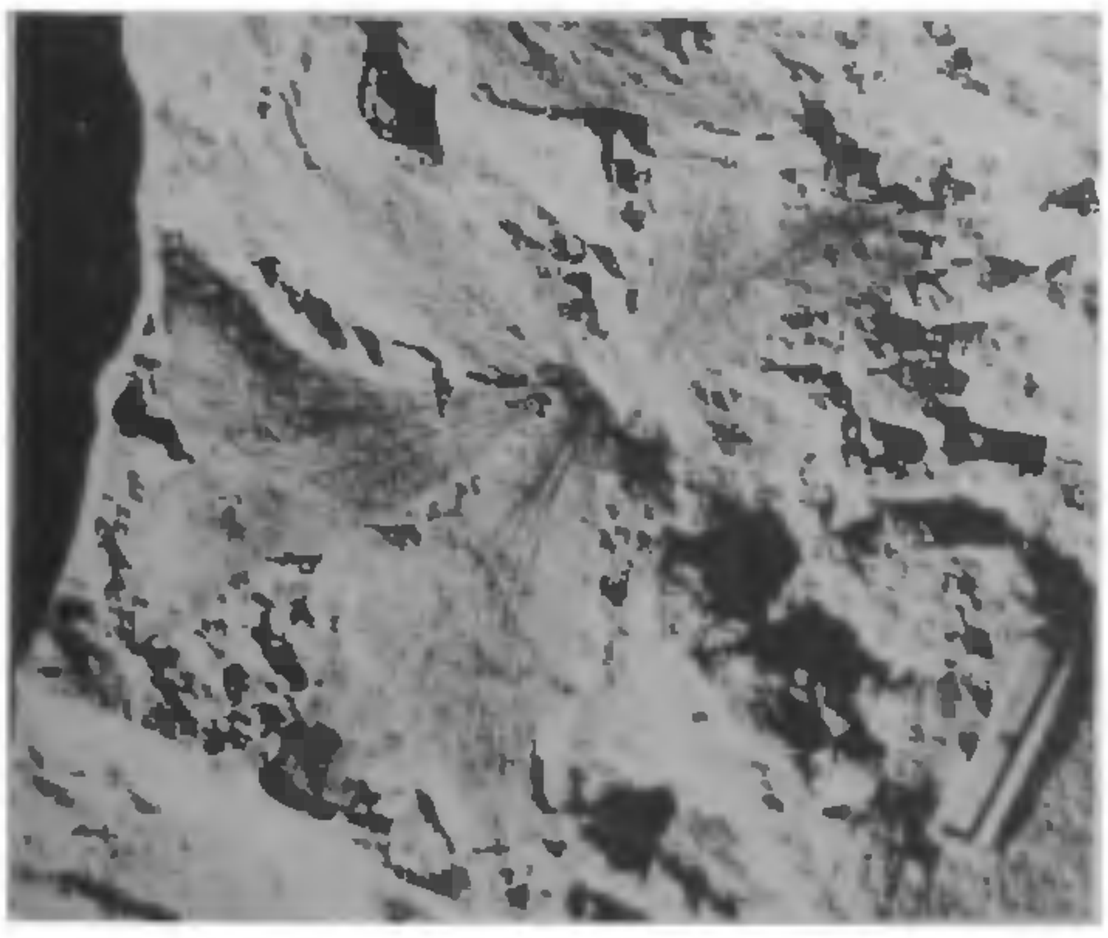

Figure 1. *Sphenophyllum utkalensis*: A whorl of six leaves (Specimen No. 90056 × 1.5).

Figure 2. *Asansolia* cf. *phegopteroides*: A pinna showing several pinnules with marginal depressions of signangia at vein endings. (Specimen No. 90051(a) × 3).

since *Sphenophyllum utkalensis* is so far unreported from any other locality it is useful only in suggesting that the variety of sphenophyllums in Gondwanaland is greater than what has been recognized by earlier authors[9-11]. Indeed the situation presents a sharp contrast with that which existed in the early years of the 20th century when only *S. speciosum* was known from India[12].

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VITELLOGENIN OF ALFALFA POLLINATING BEE *MEGACHILE FLAVIPES*

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PROTEIN metabolism plays an important role in the reproductive development in insects. The haemolymph protein concentration is a reflection of changes occurring during the ovarian development. Many mature females contain proteins that are not detected or are not readily detected in the haemolymph of males[1-10]. These proteins form the bulk of egg protein[1, 11]. And in view of their function they were termed as vitellogenin(s)[6], where vitellogenins are defined as precursors for protein of the yolk as they are produced by extra ovarian tissue[6, 12], and are taken up at the oocyte surface by pinocytosis[13, 14]. Once inside the ovarian wall, these proteins may turn complex into relatively larger aggregates which are too large to diffuse out through the membrane[12, 15-17]. They are selectively incorporated into the yolk of the developing oocytes and eventually comprise 70–90% of the total yolk protein[18, 19]. Because these proteins are essential for yolk formation, and are characteristic of only egg-maturing females, they have been termed as 'vitellogenin(s), vitellogenic protein(s) or 'female specific' protein(s)[6, 20]. The present paper enlists the characterization and age-dependent changing pattern in the vitellogenin of an alfalfa pollinating bee *Megachile flavipes* Spinola.

Material for this study was an alfalfa pollinating sub-tropical megachilid bee *M. flavipes* (Megachilidae, Hymenoptera). Haemolymph from the female and male bees was collected with the help of micropipette by clipping off antenna. Soluble proteins were fractionated on polyacrylamide gels in an anionic system by directly applying haemolymph of the bees in the space above gels in the gel tubes following method of Davis[21] and Ornstein[22]. For characterization of vitellogenin(s), extract of newly laid egg, prepared in phosphate buffer of 6.8 pH was subjected to the above qualitative analysis and vitellogenin was identified by comparing the mobility of different protein-fractions in the electropherograms of haemolymph of male and female bees and of egg homogenate. The fractionated gels were subjected to spectrophotometric scanning with the help of 'Beckman spectrophotometer Model 50' and the pattern of buildup of vitellogenin was studied.

The female fractions showed 8 bands (figure 1a). Mobility of band 5 of female electropherogram was identical to fraction 5 of egg-homogenate electropherogram and it was absent in the male electropherogram (figure 1 b, c). Then band 5 of female electropherogram seemed to represent vitellogenin fraction. The pattern of its build-up is shown in figure 2. This fraction was absent in the newly emerged females and appeared in one-day old females feeding on natural diet of pollen and nectar. It increased in 2-day old bees and showed a