SHORT SCIENTIFIC NOTES

A Note on Prehistoric Cultural Evidence from Tirupati, Andhra Pradesh

This study pressents new evidence of prehistoric importance of Tirupati, Chittoor District, based on the author' explorations from early 1973. The western outskrits of Tirupati starting from Sri Venkateswara University campus towards north up to Seven Hills have prehistoric sites with hand axes, cleavers, flakes and a few cores.

Site I is at the rear end of S.V. University Library. Site II is a canal bed on the northern side of S.V.U. Library and the first site. It extends for 12 furlongs in an East-West direction. Here the tools were found at the depth of 4 to 6 feet. Site III is inbetween the second site and the foot of the Seven Hills where a water tank is under construction. All three sites are located within a range of one mile.

It is suggested that this is an evidence of Lower and to a certain extent middle paleolithic cultures in this area. The workmanship and technique of the latter is thought to be 'levellois'. The variety of tools in the three different sites denotes gradual change with improved technology from sites I to III. All the tools are made of Quartzite stone. Its colour varies from reddish brown to grey. The second and third site tools are fresh and original sharpness is retained. Hand axes include different types such as pyriform, conical, cordate, ovate and the like as shown in Table I.

TABLE I

Category of tools	Site I	Site II	Site III	Remarks
Hand axes	5	3	4	Pyriform, Conical, Cordate, and Ovate
Cleavers	2	1	3	Chisel and Rectangular
Flakes	nil	4	6	End and side flakes
Cores	nil	nil	3	••

These are dated back to 50 to 75 thousand years based on prelimanary analysis.

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Spegazzinia sundara from *Datura metel*

During a regular survey of leaf spot diseases of common medicinal plants, the author obtained a species of *Spegazzinia* which closely resembles *S. sundara* Subram. Earlier this fungus was recorded on dead bamboos and dead leaves of *Ananas comosus*[1]. Another species, *i.e.*, *S. ornata*[2] also has been recorded on dead leaves.

The present species of *S. sundara*, however, is peculiar in being associated with leaving leaves of *D. metel* Linn. The fungus makes very luxuriant growth on defoliated leaves. Reports regarding the fungus are however very limited. Available literature shows that the fungus was not obtained earlier from *D. metel.*

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1. Subramanian, C. V., "*S. sundara* Subram.," *J. Indian bot. Soc.*, 1965, 35, 76.
2. Chona, B. L. and Munjal, R. L., "*S. ornata*," *Indian Phytopath.*, 1950, 3, 112.

Induced Polyploidy in Indian Spinach

Indian spinach (*Basella alba*) belonging to the family Basellaceae is a glabrous, succulent herb, mainly used as a green vegetable[1]. Literature on the improvement of this crop to isolate and establish polyploids with enhanced foliage is scanty. Hence an attempt was made to induce polyploidy in this crop and results are summarised in this note.

Growing tips of five day old seedlings of *Basella alba* were treated with 0·25% acqueous colchicine for 72 hours. Out of ten seedlings treated, one plant exhibited distinct gigas characters, characteristic of polyploids and the cytological studies confirmed its autotetraploid nature. Observations on length and breadth of leaves, frequency and size of stomata, size and sterility of pollen grains were gathered from this plant and compared with the normal diploid. The data are presented in Table I.

TABLE I

Type of plant	L/B ratio of leaves	No. of stomata/ unit area	Size of stomata		Diameter of pollen grains (μ)	Pollen sterility (%)
			Length (μ)	Breadth (μ)		
Diploid	1·21	17·16	3·83	2·23	2·70	5 00
Tetraploid	1·10	12·86	4 03	2·25	3·20	11·69

In general, the autotetraploid was characterised by larger, thicker and succulent leaves, larger stomata and pollen grains. But the number of stomata per unit area and mean pollen fertility were lower than the normal diploid.

Meiosis was studied in the polyploid plant by fixing flower buds of appropriate size in 1 : 3 acetic alcohol. Chromosome counts made from anther smear preparations, stained with 2% aceto-carmine, revealed the autotetraploid nature of the plant, with $2n = 96$ chromosomes as against $2n = 48$ in the normal diploid. A total of 41 cells were scored at Metaphase I and Anaphase I, to study the chromosome behaviour. The frequency of quadrivalents and trivalents was much less compared to bivalents and univalents. The mean chromosomal configurations per cell were : quadrivalents 0·31, trivalents 0·052, bivalents 34·84 and univalents 25·21. In spite of large number of univalents observed during Metaphase-I, fairly high degree (68%) normal disjunction of chromosomes to 48 : 48 was noticed during Anaphase-I, resulting in high percentage of fertile pollen. However, laggards were also observed at Anaphase-I.

The autotetraploids of *Basella alba* appears to be interesting in view of its high pollen fertility, more thick and succulent leaves. Besides, it can be propagated vegetatively also. Further studies on breeding behaviour and critical evaluation of autotetraploid are in progress.

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1. Gamble, J. S., *Flora of Presidency of Madras*, 1928, p. 3.

ANNOUNCEMENTS

Award of Research Degrees

Karnatak University, Dharwar, has awarded the Ph.D. degree in Mathematics to Shri Hegde Venkatramana Subraya, for his thesis entitled "Topics in Global Differential Geometry with special reference to Integral Formulae and their applications"; and to Shri Subhas Sangayya Bhusnoormath, for his thesis entitled "Exceptional Values of Meromorphic Functions"; Ph.D. degree in Chemistry to Shri Gurusiddhayya Shivayya Gadaginamath and Shri Muralidhar Gurachar Purohit, for their thesis entitled "Synthetic Studies in the Indole Field" and "Studies in the Indole Field," respectively.

The M. S. University of Baroda has awarded the Ph.D. degree in Geology to Shri Ramachandra Anant Chansarkar, for his thesis entitled "Drainage and Slope Analysis of Kosi Basin in Central Kumaon with Special Reference to the Geological Controls"; Ph.D. degree in Chemistry to Shri Dineshchandra Ochhavlal Shah, for his thesis entitled "Synthesis of Phenanthro Indolizidines and Nitrogen Mustards as Anti Cancer Agents";

Sri Venkateswara University, Tirupati, has awarded the Ph.D. degree in Mathematics to Shri J. Hanumanthachari, for his thesis entitled "Some Contributions to the Theory of Arithmetic functions"; Ph.D. degree in Physics to Shri V. Kesava Reddy, for his thesis entitled "Studies in Solid State Physics Third-order elastic muduli of Carbon and Alloy Steels"; Ph.D. degree in Zoology to Shri P. Murali Mohan, for his thesis entitled "Studies on the Physiological and Bio-chemical aspects of aestivation of a selected gastropod, with special reference to nervous system; Ph D. degree in Botany to Shri K. Subramanya Sastry, for his thesis entitled "Studies on Mosaic Virus Disease of Brinjal incited by a strain of tobacco ring spot virus".

Utkal University, Bhubaneswar, has awarded the Ph.D. degree in Physics to Shri M. K. Parida, for his thesis entitled "Description of High Energy Phenomenan"; Ph.D. degree in Chemistry to Smt. Nivedita Mullick, for her thesis entitled "Reactivity of Co-ordinated Ligands"; Ph.D. degree in Botany to Shri Ch. Narasinga Rao and Shri S. N. Ratho, for their thesis entitled "Physiological studies on Tillering Potential in Rice" and "Cytogenetical studies on African cultivated rice (*Oryza glaberrima* Steud) with special reference to the Exploitation of this germplasm" respectively; Ph.D. degree in Zoology to Shri Bimbadhar Nayak, for his thesis entitled "Studies on the Male Germinal Chromosomes of thirty-one species of moths and butterflies (*Lepidoptera*)".

Tamil Nadu Agricultural University, Coimbatore, has awarded the Ph.D. degree in Agriculture to Shri A. Abdul Kareem, for his thesis entitled "Studies on the Antifeeding effects of two organotin compounds, triphenyltin acetate and triphenyltin hydroxide on *Spodoptera litura F., Periclla ricini* F. and *Spomopteryx subsecivella* Zell (Lepidoptera); to Shri M. Gopalan, for his thesis entitled "Studies on Feeding behaviour of Salivary secretions of ragmus importunitas distant (Hemiptera : Miridae) and its influence of the physiology of Sunnhemp, *Crotolaria juncea* L."; to Shri K. R. Ramaswamy, for his thesis entitled "Studies in the *Genus cenchrus* L.".