

The present study suggests that the amino-acid contents are greatly changed in plant organs under the influence of pathogen due to the changed metabolism of infected host. It is evident from the present investigation that arginine in the peduncle, proline in the bud and cystine, D-L aspartic acid, tyrosine, proline and valine from the flowers are unaffected due to the infection and do not enter into the metabolic pathway (Table I). It has been suggested that the infection causes the breakdown of plant proteins releasing small quantity of tryptophan which reacts with endogenic phenolic acid to produce IAA, which is responsible for hypertrophied growth.¹ Production of tryptophan in the hypertrophied peduncle and the disappearance of tryptophan from normal flower when excited to hypertrophied growth perhaps adduce additional support to this concept. It is possible that in the former the tryptophan is formed during hypertrophied growth and utilized for synthesis of IAA and in the latter tryptophan already present is utilized for synthesis of IAA which induces exaggerated growth. The absence of tryptophan both in normal as well as abnormal flower-bud suggests that the mechanism of hypertrophied growth may be different in this organ (Table I).

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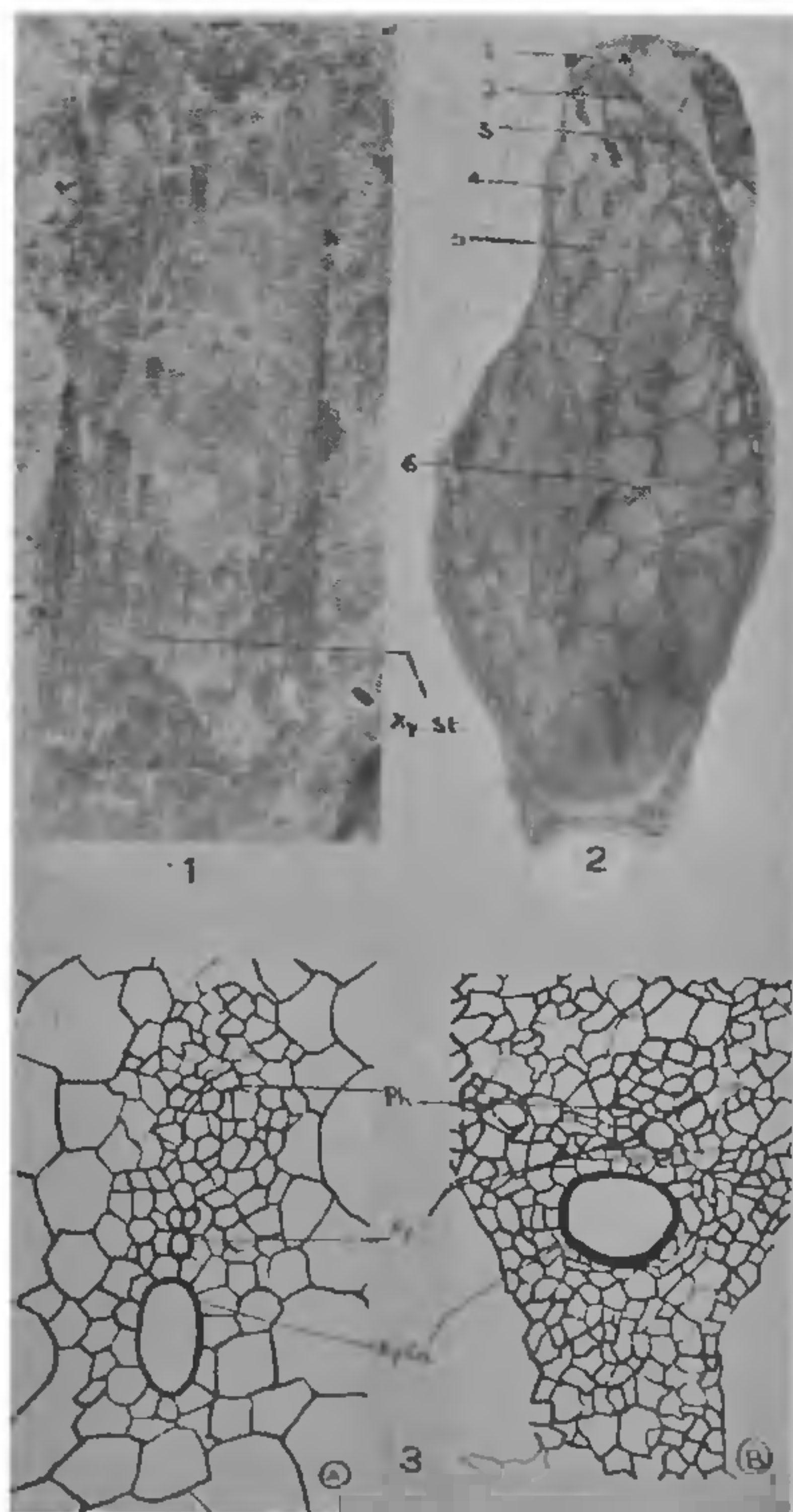
OCCURRENCE OF A FOSSIL AXIS (NYMPHAECEAE) FROM THE DECCAN INTERTRAPPEAN SERIES OF MOHGAON-KALAN, M.P., INDIA

THE petrified fossil axis described here was collected by the first two authors in December, 1967 from Mohgaon-Kalan (M.P.). The axis is about 5 cm. long and 1.5 cm. in diameter (Fig. 1).

Transections of the material reveal a single-celled epidermis which superficially bears a few scattered hairs. The epidermis is followed by about ten-celled deep collenchymatous hypodermal zone. The tissue next to hypodermis is constituted by parenchymatous cells which have numerous large intercellular spaces. Furthermore, this zone is traversed longitudinally by numerous lysigenous air canals and vascular bundles.¹ The cells surrounding

the air canals are smaller than those present between the canal region and collenchyma.

The vascular bundles are arranged in two more or less concentric whorls. A series of slightly smaller bundles are present at the peripheral region while somewhat larger bundles are present at points where the septa constituted by parenchymatous cells join one another. Rarely, vascular bundles may also be found on the arms of the septa away from the place of their confluence. Two simple vascular bundles can be seen nearly in the centre of the axis (Fig. 2).



FIGS. 1-3. Fig 1. Photograph of the petrified axis, $\times 1\frac{1}{2}$. Fig. 2. T.S. of the same, $\times 5\frac{1}{2}$. (Xy. st, xylem strand; 1, hair; 2, epidermis; 3, hypodermis; 4, air chamber; 5, septum; 6, vascular bundle.) Fig. 3. A. Structure of V.B. of *Nymphaea nouchali* Burm f. (white lily); B. Structure of V.B. of fossil axis. (Ph, phloem; xy, xylem; xy.ca, xylem cavity.)

The vascular bundles as in the living genus *Nymphaea*² are simple in construction. They are without cambium and bear only xylem and phloem elements collaterally. Primary

xylem has disorganised and has probably given rise to schizogenous cavities. Each mature bundle consists of a few phloem cells, some xylem elements and a large xylem cavity. This compares quite closely to the structure of the V.B. of the peduncle of *Nymphaea nouchali* Burm. f. (= *N. lotus* Hook. f. and Thoms.) (Fig. 3, A and B). Sclerenchymatous cells are altogether absent from the bundles.³ Well-preserved xylem elements show spiral thickenings, having a diameter of about $59.4\ \mu$, the distance between two spiral bands varies from $9.9\ \mu$ to $15.5\ \mu$.

Abundance of air spaces along with poorly lignified tissue lends support to the fact that the axis belongs to a hydrophyte.

The presence of epidermal hairs, collenchymatous hypodermis, air chambers and the characteristic structure of the vascular bundles go to show that this axis probably belonged to some member of the Nymphaeaceae.

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REVIEWS AND NOTICES OF BOOKS

Degradation of Herbicides. Edited by P. C. Kearney and D. D. Kaufman. (Marcel Dekker, Inc., 95, Madison Avenue, New York, U.S.A.), 1969. Pp. xi + 394. Price \$ 18.75 or £ 8-18 sh. 0 d.

Herbicides are making an ever-increasing contribution to modern agriculture, and constitute one of the most economically significant groups of pesticides on the commercial market. The fate of the herbicides, and in a larger sense, of all organic pesticides in our environment, is a subject of intense investigation and some controversy. This is a comprehensive book on the chemistry of organic herbicide degradation.

The contents of this book are: Phenoxyalkanoic Acids, by M. A. Loos; s-Triazines, by Enrico Knuesli, Dagmar Berrer, Gerard Dupuis, and Herbert Esser; The Substituted Ureas, by Hans Geissbuhler; Methyl- and Phenylcarbamates, by Richard A. Herrett; Thiocarbamates, by S. C. Fang; Chloroacetamides, by Ernest G. Jaworski; Amitrole, by Mason C. Carter; The Chlorinated Aliphatic Acids, by C. L. Foy; Trifluralin and Related Compounds, by G. W. Probst and J. B. Tepe; Diquat and Paraquat, by H. H. Funderburk, Jr.; The Benzoic Acid Herbicides, by C. R. Swanson; and Herbicide Photodecomposition, by Donald G. Crosby and Ming-Yu Li.

The contributors to this volume are international authorities who have compiled the most significant results from 20 years of research

on the metabolic and chemical transformations of the herbicides; they have made liberal use of chemical formulas to characterize degradation reactions.

Biochemists, chemists, plant physiologists, microbiologists, and ecologists interested in the transformations and effects of foreign substances on biological systems will find many intriguing discussions in this book. C. V. R.

Annual Review of Genetics (Vol. 3). Edited by H. L. Roman. (Annual Reviews, Inc., 4139, El Camino Way, Palo Alto, California 94306, U.S.A.), 1969. Pp. vii + 585. Price: U.S.A. \$ 8.50 and elsewhere \$ 9.00.

Volume 3 of this well-known series contains the following articles: Inborn Errors of Metabolism, by Alfred G. Knudson, Jr.; Globulin Polymorphisms in Man, by Arthur G. Steinberg; Human Population Structure, by N. E. Morton; Chromosomal Rearrangements and Speciation in Animals, by M. J. D. White; Experimental Polyploidy in Animals, by B. L. Astaurov; Developmental Genetics, by Donald D. Brown and Igor B. Dawid; Histones and the Control of Gene Expression, by Robert G. Martin; Some Aspects of the Competent State in Genetic Transformation, by Alexander Tomaz; Replication of the Bacterial Chromosome, by Friedrich Bonhoeffer and Walter Messer; Mutagenic Mechanisms, by John W. Drake; Some Aspects of Normal and Abnormal Cell Surface Genetics, by Edward A. Boyse and