

Proteaceæ, the carpel has similarly five strands derived independently from the stele of the receptacle. Such a vascular condition of the carpel is regarded by Eames⁹ as probably representing a somewhat specialized case derived from an original three-trace carpel, "chiefly through branching of the midrib, and by a working back of this branching tendency to the stele."

The further behaviour of the five strands of the gynoecium in the style and stigmatic regions in *Macadamia* has already been fully described in the previous paper and some of the figures in the series of transverse sections from the base upwards are reproduced here for the sake of completeness of the present account.

In conclusion the floral structure in *Macadamia ternifolia* F. Muell., may be briefly stated as follows: The flowers are probably derived from a dichlamydeous ancestry, the modern perianth representing the whorl of calyx with the usual vascular connections as in most other angiosperms and the nectar-secreting disc constituting a much reduced inner whorl of floral leaves, namely, the corolla. The vascular tissues in the disc are feebly developed, or they may be entirely lost as in some members of the family, for instance, *Grevillea robusta*. Adnation of the whorl of stamens and perianth has occurred followed by a fusion of the two sets of traces and consequent on the reduction of the corolla. The simplicity of floral construction in *Macadamia ternifolia*, which may well be true of the other members also, as revealed by a study of vascular anatomy seems

best, therefore, to be regarded as a derived condition through reduction of floral parts.

S. B. KAUSIK.

Department of Botany,
Central College,
Bangalore,
December 27, 1939.

¹ Kausik, S. B., *Proc. Ind. Acad. Sci.*, 1938, 8, 45.

² Joshi, A. C., and Rao, V. S., *J. Ind. Bot. Soc.*, 1934, 13, 169.

³ Eames, A. J., and MacDaniels, L. H., *An Introduction to Plant Anatomy*, New York, 1925.

⁴ Brough, P., *Proc. Linn. Soc., N.S.W.*, 1933, 58, 33.

⁵ Arber, A., *New Phytol.*, 1933, 32, 231.

⁶ Wilson, C. S., and Just, T., *Bot. Rev.*, 1939, 5, 97.

⁷ Joshi, A. C., *J. Ind. Bot. Soc.*, 1936, 15, 77.

⁸ Hutchinson, J., *Families of Flowering Plants*, Vol. I, London, 1926.

⁹ Eames, A. J., *Amer. J. Bot.*, 1931, 18, 147.

Serum Phosphatase in Pulmonary Tuberculosis

THE serum phosphatase of normal persons and of persons affected with pulmonary tuberculosis has been determined (S. K. R.) by the method of Bodansky.¹ The serum phosphatase of persons with pulmonary tuberculosis is, on the average, higher than normal. Oral administration of 200 to 250 mgm. of vitamin C in the form of 10 g. of sun-dried *Emblia officinalis* pulp for ten days lowered the serum phosphatase content in more than 71 per cent. of pulmonary tuberculosis cases as compared with a decrease in 14 per cent. only in controls receiving no additional vitamin C in the form of *Emblia officinalis*.

Description	Phosphatase units (av.)	Description	Phosphatase units (av.)		Remarks
			Before exp.	After exp.	
Normal	1.63 (0.68-2.28)	Control (P.T.)	2.82 (1.56-4.96)	3.54 (1.52-5.04)	Phosphatase lowered in 14.3% cases
Pulmonary tuberculosis	3.95 (1.32-9.96)	200-250 mg. 'C' for 10 days (P.T.)	4.53 (1.32-9.96)	2.41 (0.92-9.36)	Phosphatase lowered in 71.4% cases

Figures within brackets indicate limits.

It is claimed that the lowered phosphatase is wholly due to the vitamin C (and/or vitamin P?) content of the *Emblica officinalis* powder which makes an improvement in the clinical condition of the P. T. patient by increased vascular resistance and other adjuvant effects. It is suggested that the determination of serum (or plasma) phosphatase be made one of the routine tests for evaluating the clinical progress of tuberculosis patients. The investigation is being continued.

M. N. RUDRA.
S. K. ROY.

Department of Medical Chemistry,
The Prince of Wales Medical College,
Patna,
December 12, 1939.

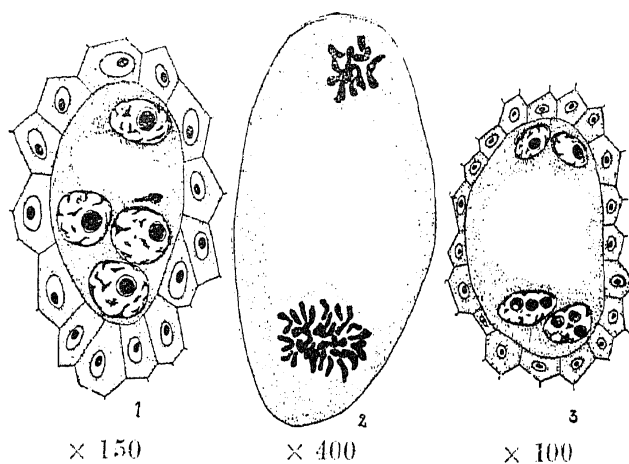
¹ *J. Biol. Chem.*, 1933, 101, 93.

Evidence for the Fritillaria-Type of Embryo Sac in *Tamarix ericoides* Rottl.

THE writer has recently published a detailed account of the embryo-sac of *Tamarix ericoides* Rottl., and has pointed out that it takes place according to the *Fritillaria*-type. Since then some further observations have been made and the critical stage in the establishment of the *Fritillaria*-type, which was not then available has now been met with in the preparations.

Succeeding the development of the embryo-sac showing the 1 + 3 arrangement (Fig. 1) there follows the simultaneous division of all these four nuclei and the formation of two groups of chromosomes, one at the micropylar end and the other at the chalazal end. In the micropylar group twelve chromosomes which represents the reduced number can be clearly counted. In the chalazal group a much larger number which approaches thrice that found at the micropylar end is seen. This evidently means that the group of three nuclei at the chalazal end have come together so near one another that their spindle fibres have fused and the chromosomes of the three nuclei have become indistinguishably grouped together (Fig. 2). This condition has been reported by Zabban in *Myricaria germanica*, while Mauritzon and

other succeeding workers, namely, Joshi and Kajale, and Puri have not observed this stage in the several species they have worked.



Mauritzon who described the *Adoxa*-type of development in *Tamarix tetrandra* and five other species of the same genus (*T. aestivalis*, *A. africana*, *T. gallica*, *T. odessana* and *T. pentandra*) has also evidently not been able to follow the entire sequence of changes that accompanies the final development of the embryo-sac. After the division is over a secondary four-nucleate embryo-sac arises which has two micropylar nuclei, each with one nucleolus, and two large chalazal nuclei each of which again has three nucleoli (Fig. 3). This establishes beyond any doubt that the development of the embryo-sac in *Tamarix ericoides* Rottl. is of the *Fritillaria*-type.

I am grateful to Dr. M. A. Sampathkumaran, M.A., Ph.D., for his encouragement and guidance in the above investigation.

Y. M. L. SHARMA.

Department of Botany,
Central College,
Bangalore,
January 12, 1940.

¹ Sharma, Y. M. L., *Ann. Bot.*, 1939, 3, 861.

Budding in *Protosiphon botryoides* Klebs

Protosiphon botryoides grows plentifully in heavily manured Canna beds of Guptar Park, Fyzabad, in the months of October and November. In early October the oval plots of this park become carpeted with a rich green growth of