

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.

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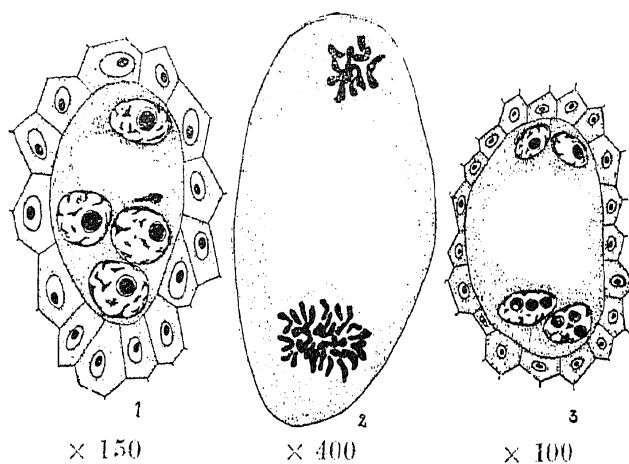
¹ *J. Biol. Chem.*, 1933, 101, 93.

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.

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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

this interesting alga. In the end of November the dried up clods of clay become brick-red in colour due to extensive cyst formation.

Protosiphon botryoides was collected by the present author from fields lying fallow in Hoshiarpore district of the Punjab in October 1929 and a reduced variety of it growing on walls was described by Iyengar from Madras. The interest of the present form lies in the peculiar type of budding seen in some of the specimens. Iyengar could not observe any budding in the samples he collected from Madras and he records as follows: "The budding of the green aerial portion, which Klebs recorded from the European specimens, was never observed in the Indian alga although hundreds of specimens were examined. Nor

The subaerial part of the alga is usually spherical and rhizoidal part unbranched (Fig. 1). However, in some specimens branching was seen in the rhizoidal part (Figs. 2 and 3). It was observed that in some specimens bud-like protuberances were seen arising on one side of the balloon-like subaerial part (Fig. 4). A further stage in budding was seen in some specimens in which the rhizoidal part was seen bearing two globular subaerial vesicles (Figs. 5 and 6). The parent is recognized by the greater diameter in some cases (Fig. 5), while in others it is difficult to distinguish between the parent and the bud, as both are almost of the same size (Fig. 6). Individuals thus budded off usually remain attached with the parent plant for some time (Fig. 7).

It may also be noted that during the vegetative phase of this alga, budding is an important means of reproduction, especially when it grows on heavily manured soil containing plenty of nutrient material. However, when the alga is found growing in fields which are usually not well manured, budding has quite an insignificant role in the life-cycle of the alga.

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A Note on the Algæ Collected by James A. Murray at Karachi

JAMES A. MURRAY has mentioned a few marine algæ collected by him from Manora and Clifton at Karachi in his book on the plants of Sind.¹ Murray being the earliest scientific explorer of these plants his collection is of some importance to the algologists in our country. Amongst other plants Murray has recorded the following species: *Porphyra vulgaris* Ag.; *Fucus vesiculosus* L.; *Fucus distichus* L.; *Fucus nodosus* L.; *Laminaria digitata* Lam.; *Laminaria bulbosa* Ag.; *Laminaria saccharina* Lam.; *Chordaria flagelliformis* Ag.; *Callithamnion plumula* Lyng.; *Callithamnion corymbosum* Ag.; *Chondrus crispus* Lyng. On scanning the whole list of algæ one is surprised to find that no one of his plants has been found by the recent investigators and

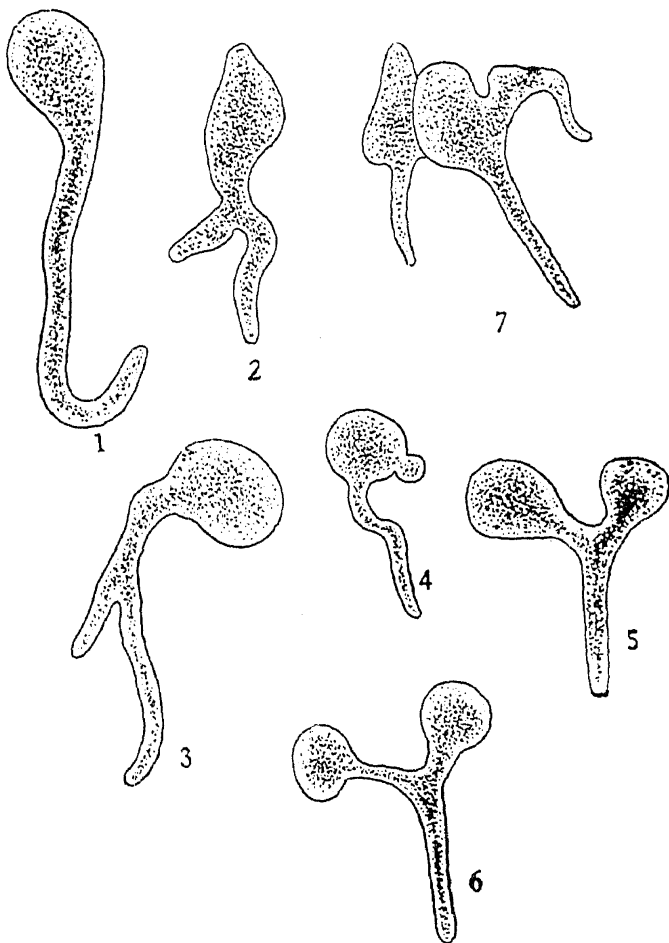


FIG. 1.—*Protosiphon botryoides* Klebs.

1. A typical plant. 2 and 3. Plants with branched rhizoidal parts. 4, 5, 6 and 7. Show different stages in budding. All $\times 120$.

was such budding ever seen in the variety growing on the walls described below." No budding was observed in the specimens collected from Hoshiarpore in 1929.