strength to seed instead of being of any value in the nutrition of the developing seed, but Shah[7] believed that hypostase served as the tannin diffusing centre for the seed coat layers. The present author believes that hypostase in Cyperaceae with tannin packed cells had only a mechanical role. Further histochemical studies would help to explain its significance.

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DEVELOPMENT OF FEMALE GAMETOPHYTE IN *OUGENIA OOJEINENSIS* (ROXB.) HOCHREAT

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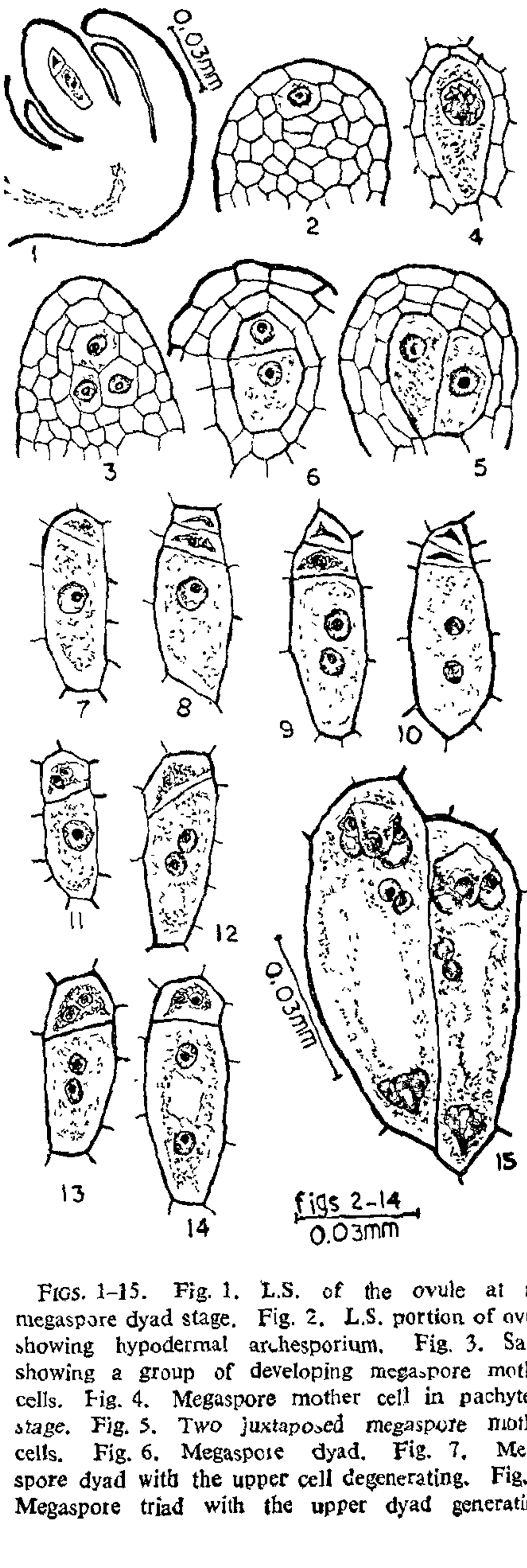
Ougenia oojeinensis is a medium sized tree belonging to the tribe Hedysareae of Papilionoideae and exhibits cauliflory. The ovule is anatropous, crasinucellate and bitegmic with the vascular supply ending near the chalaza (Fig. 1). The archesporium in the ovule is hypodermal, represented by a single cell or a plate of three or four cells (Figs. 2, 3). The archesporium cuts off a parietal cell; the fully developed megaspore mother cell has dense contents and is very conspicuous (Figs. 4, 5). Meiosis I produces a dyad with the upper cell being much smaller than the lower (Fig. 6). The second meiotic division in the dyad cells is variable and results in the development of both bisporic and monosporic types of embryo sac.

Among the ovules showing the Polygonum type of development, the upper dyad cell degenerates without



FIGS. 1–15. Fig. 1. L.S. of the ovule at the megaspore dyad stage. Fig. 2. L.S. portion of ovule showing hypodermal archesporium. Fig. 3. Same showing a group of developing megaspore mother cells. Fig. 4. Megaspore mother cell in pachytene stage. Fig. 5. Two juxtaposed megaspore mother cells. Fig. 6. Megaspore dyad. Fig. 7. Megaspore dyad with the upper cell degenerating. Fig. 8. Megaspore triad with the upper dyad generating.

Figs. 9, 10. Megaspore triads with the lower functional megaspore forming a 2-nucleate embryo sac. Figs. 11–14. Megaspore dyads with the lower dyad directly developing into a 2-nucleate embryo sac with a uni or bi-nucleate upper dyad. Fig. 15. Twin mature embryo sacs.

any nuclear division (Fig. 7). The division of the lower dyad results in the formation of a small middle cell and a large lower cell (Fig. 8). The middle cell degenerates and the lower functional megaspore develops into an 8-nucleate embryo sac (Figs. 9, 10, 15). Thus only a 'triad' is formed and no instance of tetrad formation was noticed in such ovules.

In the ovules undergoing Allium type of embryo sac development, the nuclear division in the lower dyad is not followed by wall formation and the two nuclei lie close together surrounded by dense cytoplasm (Figs. 11, 12). The upper dyad may degenerate as such (Fig. 12) or its nucleus may show a division (Fig. 13). Further development results in a 2-nucleate embryo sac (Fig. 14) and ultimately a 8-nucleate embryo sac. The latter organizes itself into an egg apparatus, two polar nuclei and three antipodal cells. The antipodal cells are ephemeral and degenerate prior to fertilisation. Twin embryo sacs occurring side by side have also been frequently observed (Fig. 15).

Variation in the embryo sac development with the co-existence of the Polygonum and Allium types reported here has also been observed in *Pueraria lobata*[1], *Wisteria sinensis*[2] amongst the Papilionoideae and in *Benincasa cerifera*[3], *Cassiope martensiana*[4], *Erigeron* sp.[5], *Ethretia laevis*[6], *Sanvitalia procumbens*[7], *Tridax trilobata*[8], and *Euphorbia characias*[9].

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A MODIFIED TECHNIQUE FOR THE CLARIFICATION OF SOMATIC CHROMOSOMES

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Several modified techniques for root tip squashes have been presented from time to time by different workers[1–3]. Due to the difficulties encountered in hydrolysing the middle lamella of the root tip cells of *Physalis minima* L. (family Solanaceae), the conventional N. HCl was replaced by digestive fluid of *Pila globosa* (water-snail). The method of extraction is the same as was employed earlier in the case of *Helix pomatia* (land-snail[2]).

The healthy root tips of *P. minima* were excised between 10·30–11·00 A.M. and immersed in a saturated solution of *p*-dichlorobenzene at 4°C for 5 minutes and then changed to 18±2°C for 2·30 hr. The pre-treated root tips were washed with running water and then fixed overnight in a mixture 1:3 acetic-alcohol. The root tips were then rinsed with water and dipped in the freshly collected snail-stomach-juice for 5 min at room temperature (26±2°C). After the enzyme (stomach-juice) treatment the roots were washed and returned to freshly prepared fixative (1:3) for 1 hr. The squashes were then made with 1% acetic-orcein mixture. The well-separated and properly flattened somatic cells revealed $2n=48$ (Fig. 1). The acetic-butanol method was applied to make the slides permanent[4].

Fig. 1. Root tip cell, showing 48 chromosomes × 1600.