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A NEW SYSTEM FOR PLANT TISSUE CULTURE

THE growth and metabolism of a tissue culture is influenced by the conditions inherent in the chemical composition and physical nature of the medium. Attempts have been made to use chemically defined media in both solid and liquid culture conditions. Many cultures will grow more successfully as a callus on agar medium than as a cell suspension in liquid-culture, but liquid media are more easily standardised and maintained in a standard condition than the traditional agar form.

A possible optimum situation would be to grow a callus suported over a standard liquid medium, allowing for medium replacement without physically disturbing the callus. The "Millipore Sterifil Filtration" (manufactured by Millipore Corporation, U.S.A.) apparatus appears to provide a convenient assembly for such a system. This consists of a funnel, plastic filter holder and receiver flask designed as a closed system for sterilising fluids by filtration. The funnel acts as a growth chamber, and the receiver flask as the nutrient medium reservoir; these are connected through the filter holder containing a sintered glass disc supporting a bacterial filter. The units can be teflon tube linked to produce a multichamber arrangement in which the sterifil units are connected in pairs and in parallel to a continuous circulating medium supply line fed from a single large reservoir. The assembled apparatus can be autocalved with a cellulose filter in position. A levelling device is incorporated into the system to keep sinters in continuous contact with the medium and each unit contains a magnetic stirrer to ensure continued movement of the media over the sintered surface. Luer-taper slip ports in the growth chamber cover and nutrient medium reservoir make it possible to introduce fluids aseptically, and to vent the growth chamber funnel and reservoir flask with filtered air.

The system permits the undisturbed growth of callus for extended culture periods. Comparative growth experiments with callus cultures of *Parthenocissus*, *Rheum* and *Cassia* in sterifil units and agar based medium has indicated that the cultures retain a pattern of vigorous growth, for periods up to seven months in the growth chamber compared with a rate reduction after two months on the normal agar medium. Experimental conditions can be controlled more precisely in the growth chambers, and nutrient additives and chemo-precursors can be added to a part or the whole system. The use of bacterial filter prevents cross contamination from a single infected flask.

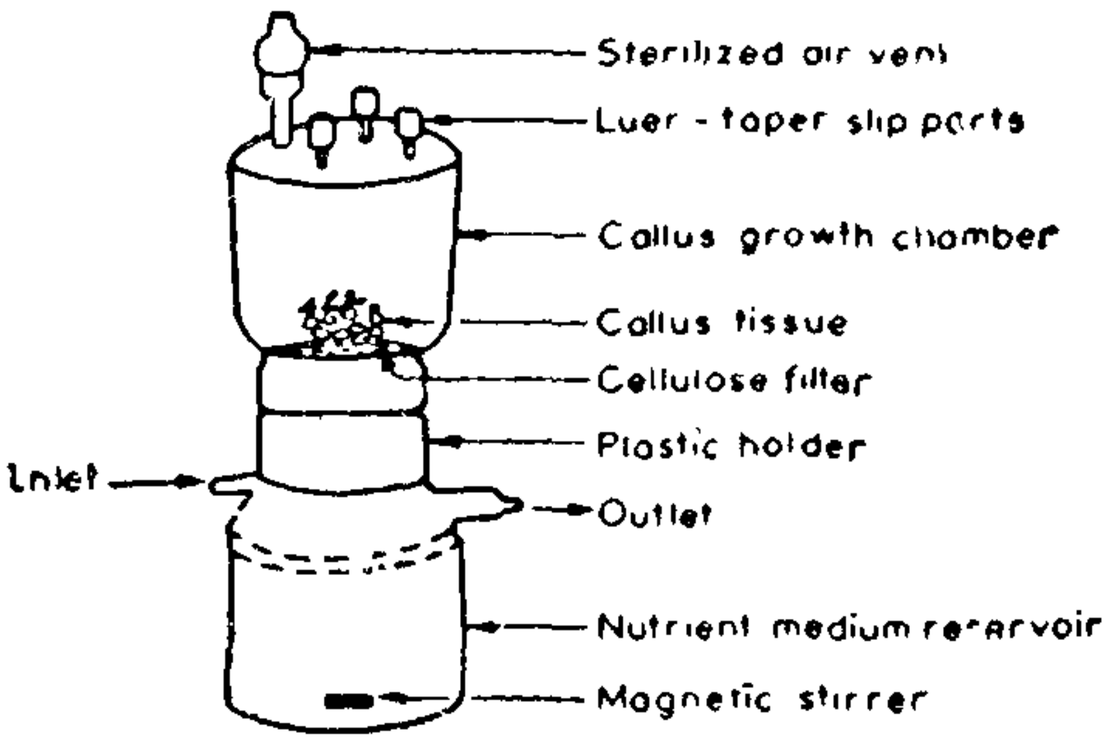

FIG. 1

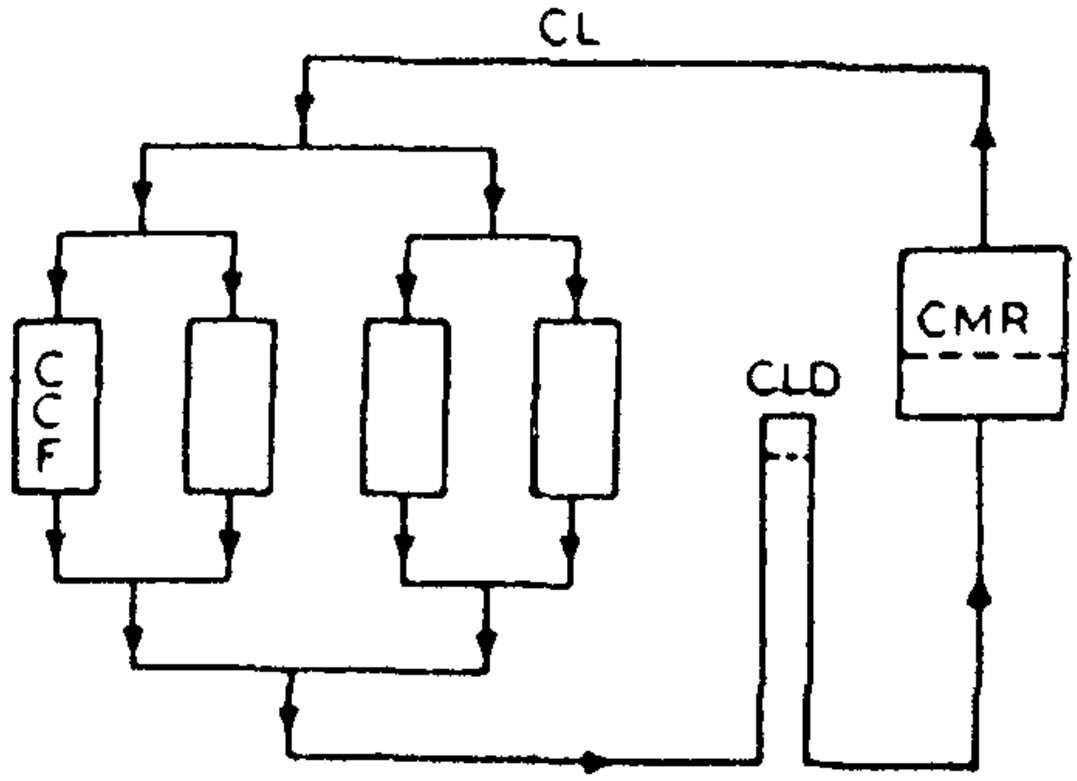

FIG. 2

The apparatus is simple to assemble and offers a continued callus culture growth for up to seven months, thus saving the need for frequent subculturing. In addition, it also help control the growth conditions more precisely. So far, no attempt has been made to introduce a chemostat, a turbidostat and a fermentor into this system[1].

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NODAL ORGANIZATION IN THE FAMILY ACANTHACEAE

NODAL anatomy of the family Acanthaceae belonging to the two subfamilies, *viz.*, Thunbergioideae and Acanthoideae has been investigated. The opposite, decussate phyllotaxy observable in the majority of the taxa of the family can be confirmed by the transection of the node of *Thunbergia erecta* of Thunbergioideae which shows a *unilacunar, unitrace condition* (*Fig.* 1 A). As illustrated in Fig. 1 B–J, the representatives of the subfamily Acanthoideae which include

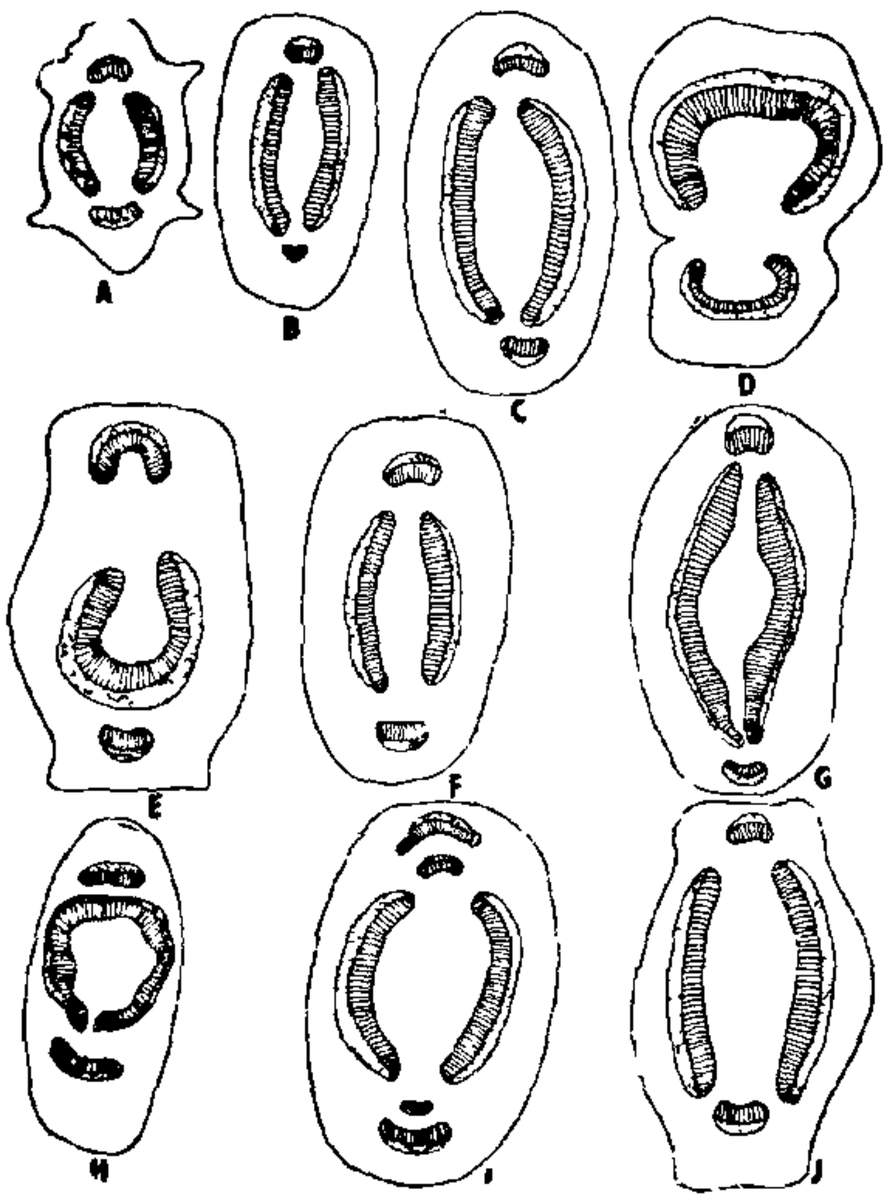

FIG. 1 A–J. Acanthaceae—Nodal Organization. Illustrations of transverse sections of the stems at the nodal regions of the members of the subfamilies Thunbergioideae (A) and Acanthoideae (B–J) exhibiting the distribution of vascular tissues. A, *Thunbergia erecta*; B, *Hygrophila polysperma*; C, *Daedalacanthus nervosus*; D, *Barleria prionitis*; E, *Crossandra infundibuliformis*; F, *Andrographis echioideas*; G. *Adhatoda vasica*; H, *Justicia betonica*; I, *J. gendarussa*; J, *Peristrophe bicalyculata*. All × 40.

Hygrophila polysperma (tribe Hygrophilae), *Daedalacanthus nervosus* (Ruellieae), *Barleria prionitis* (Barlerieae), *Crossandra infundibuliformis* (Andrographideae), *Adhatoda vasica, Justicia betonica, J. gendarussa*, and *Peristrophe bicalyculata*, possess uniformly unilacunar condition. This single trace enters the petiole, thus giving rise to single-stranded condition in the leaf. The marked similarity of the nodal type also gives the clue to the uniformity of the characters of the family.

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SOME CYTOCHEMICAL OBSERVATIONS ON THE GIANT CELLS IN HUMAN PLACENTA

ALTHOUGH placental giant cells have eenb observed in a wide variety of mammals, such as bats, primates, carnivores and ungulates, their functions have not been clearly understood so far. They have been assigned various functions such as glycogen storage[1], transport of iron from mother to foetus[2,3], enzyme action on capillary walls[4] phagocytic activity[5] and endocrine function[6,7].

During the course of a detailed histochemical study of the human placenta at different stages of pregnancy the present authors noted a sudden and enormous increase in the population of giant cells in the human placenta during early pregnancy after which their number dropped equally suddenly.. This spectacular rise and fall in the number of these cells prompted the present authors to undertake a detailed cytochemical examination of the giant cells of the human placenta with a view to understanding their possible functions.

Human placenta at different stages of gestation was obtained from normal pregnant women either after medical termination of pregnancy or after full term delivery. Each placenta was cut into numerous small pieces and fixed in neutral formaln, calcium acetate-formalin, Rossman's fixative and Carnoy's fixative. The tissues were processed in the usual manner and sectioned at 5 to 8 μ thickness after embedding in paraffin. Apart from routine staining by Ehrlich's haematoxylne and eosin, selected sections of suitably fixed pieces of each placenta were stained by periodic acid-Schiff procedure[8] (PAS), Heidenhain's azan[9], Cason's modifications of Mallory azan procedure[10], aldehyde fuchsin–PAS–orange G (AF–PAS–OG)[11], methylene blue[12], methyl green-pyronin[13], Bauer-Feulgen technique[8]. Some sections in each series were subjected to staining procedures for the detec-