EMBRYOLOGICAL STUDY OF SOME SPECIES OF FABACEACE.

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Fabaceace includes subfamily *Caesalpinioideae*. Considerable number of species of the subfamily was introduced in Uzhgorod. The most widespread are *Gleditschia triacanthos* L., the species of the genus *Cercis* (*C. siliquastrum* L., *C. chinensis* Bunge) and *Gymnocladus dioica* C. Koch.

The embryology of the subfamily *Caesalpinioideae* was studied very little. The embryology of some *Cercis* species was studied in more details (GUIGNARD 1881, GOURSAT 1963, REMBERT 1969, CHUBIRKO1982, 1988, KOSTRIKOVA 1985). The embryological data of the other species of the subfamily are very fragmentary.

For determination of the acclimatization degree of these species we have carried out its investigation. Of particular interest from the point of view of their embryology are *Gymnocladus dioica* and *Gldeditshia triacanthos*. Their home is North America. The material for the study was gathered in Uzhgorod in 1986-89 and was fixed in Navashin's fixative.

As a result of the investigation carried out by us, it was established that the anthers of all species are bilobed and tetrasporangiate. The archesporium in the anther is limited to one row of hypodermal cells in each lobe. Simultaneous cytikinesis in the microspore mother cells follows meiosis and microspore tetrads are tetrahedral or decussate. Microspore develops according to the dicotyledonous type. The pollen grains are bi-celled, tricolpate.

The anther wall at the mother cell stage consists of the epidermis, endothecium, two middle layers and a secretory tepetum. The tapetal cells contain from two to four nuclei. Deposition of fibrous bands in the endothecium coincides with the initiation of tapetal cells degeneration. The two middle layers are ephemeral. The anther wall at the time of dehiscence is represented by a somewhat flattened epidermis and a prominent endothecium (Fig.1.).

The ovules are bitegmic crassinucellate anatropous in the species of the genus *Ceris* and anacampylotropous in *Gymnocladus dioica* and *Gleditshia tricanthos*. They are formed in monocarpellary ovary.

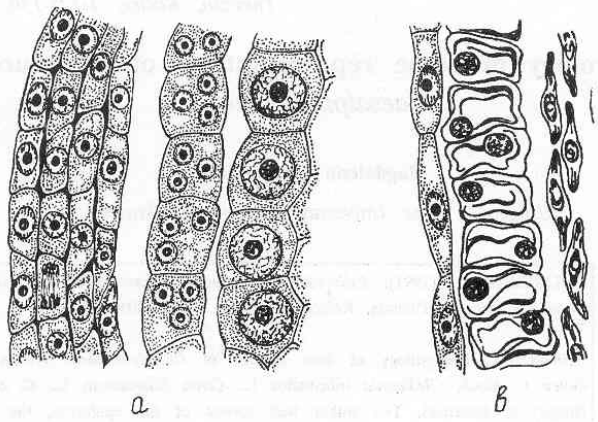

Fig. 1 Portion of longitudial section of anthers showing the anther wall and microsporocytes (a) and mature anther wall (b) of *Cercis siliquastrum* L.

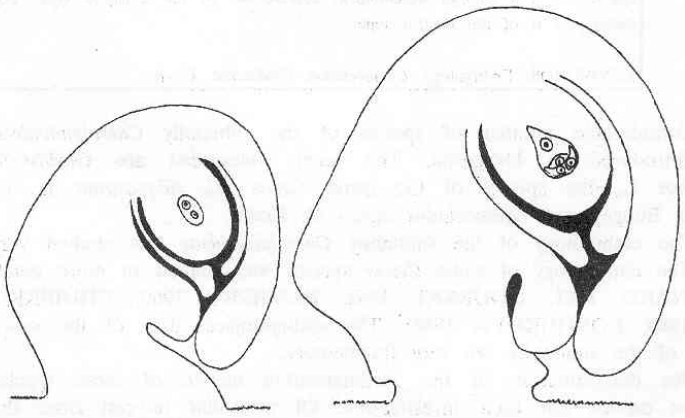

Fig. 2 Stages of development of the ovule of *Gymnocladus dioica* C. Koch.

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The ovular primordium is dome-shaped with two basal swelling representing the incipient integuments. The outher integument develops faster and as it covers the nucellus the ovule undergoes curvature towards the apex of the ovary. At the mature embryo sac stage, inner integument has two cell layers and the outer integument in the micropylar part consist of several layers. The micropyle is zig-zag in young seeds but at the time of fertilization it is merely formed by the outer integument (Fig.2.).

There usually is only one archesporium formed by several cells. (Fig.3.) One ore more of these cells cut off parietal cells and differentiate in sporogenuous cells. The parietal cells may divide to form a 3- or 5-layered parietal tissue.

Sporogenuous cells enlarge and form megasporocytes. Meiosis I and trensverse division of this cell lead to a dyad stage. While the lower cell of the dyad invariably divides transversely, the division in the upper cell may be transverse or longitudinal resulting in linear

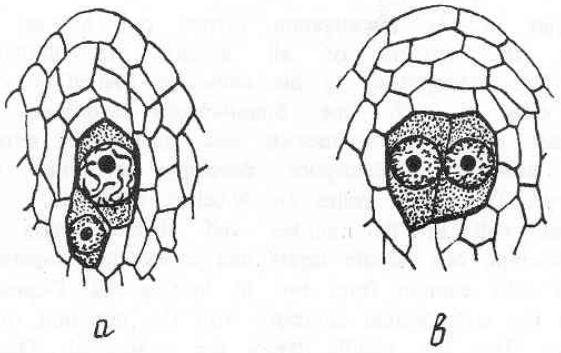

Fig. 3 Two-celled archesporium in the nucellus of *Cercis chinensis* Bunge (a) and *Gymnocladus dioica* C. Koch (b).

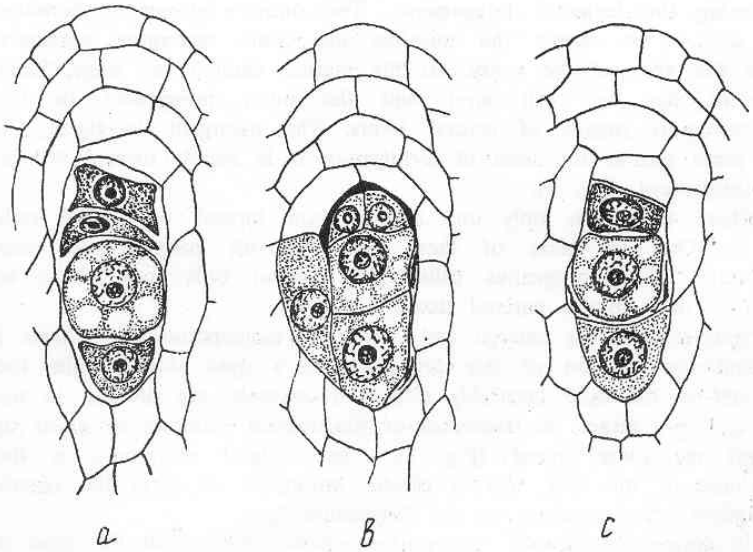

Fig. 4 Linear (a), T-shaped (b) megaspore tetrads and megaspore triad (c) of *Gymnocladus dioica* C. Koch.

or T-shaped megaspore tetrad. (Fig.4.)The chalazal megaspore is the largest one of the four, and it divides mitotically to form the female gametophyte which conform to the Polygonum type.

In *Gymnocladus dioica* the second meiotic division in the dyad is variable and results in the development of both bisporic and monosporic types of embryo sac. If the second meiotic division in the lower dayd was not accompanied by wall formation, the development of two-nucleate embryo sac (bisporic of Allium type) take place.

The mature megametophyte is 8-nucleate with an egg apparatus, two polar nuclei and three antipodal cells at the chalazal end of embryo sac. The polar nuclei fuse before the pollen tube enters and constitute the secondary nucleus. The antipodal cells are ephemeral and degenerate prior to fertilization.

The endosperm is of the nuclei type. The primary endosperm nucleus devides earlier than the zygote and at the 2-celled proembryo stage the endosperm is 8-nucleate. Cell formation in the endosperm commences when the proembryo is globular and proceeds gradually from the micopylar to the chalazal end. At the chalazal region the tubular free nuclear part of the endosperm assumes a haustorial role.

The pattern of embryo development answers to the Onagrand-type: the zygote by transverse division gives rise to a 2-celled proembryo. Division of the basal cells results in cells which constitute the suspensor.

All stages of embryological development of the representatives of the introduced species of *Caesalpinioideae* occur normally, which provides evidence about good acclimatization of these species in the Transcarpathian region.

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