ANATOMY OF NORMAL AND TETRACOT SEEDLINGS OF PROSOPIS JULIFLORA DC.

BY M. L. TRIVEDI

[Department of Botany, Birla Institute of Technology and Science, Pilani (Rajasthan)]

Received November 30, 1966

(Communicated by Dr. K. Subramanyam)

ABSTRACT

Anatomy of normal and tetracot seedlings are described. Normal seedling has dimerous and tetracot seedling trimerous root structure. Both seedlings have unilacunar double trace type of cotyledonary node while the foliar node is trilacunar. The root-hypocotyl-cotyledon vasculature and epicotyl vasculature are independent. Polycotyly in this case is due to splitting.

INTRODUCTION

COMPTON (1912), Harris et al. (1921), Gehlen (1929), Me Murrey and Fisk (1936), Yarbough (1949), Kawatake (1955), are among the various workers who have studied the seedling anatomy of the Leguminosae. Occurrence of polycotyly in Angiosperms has attracted the attention of plant anatomists for quite a long time. Polycotyly has been reported for Nuytsia and Loranthus (Compton, 1913), Centranthus and Brassica (Bexon, 1920, 1925), Phaseolus (Harris et al., 1921), Impatiens (Bexon and Wood, 1930), Boerhaavia (Malhotra, 1935), Cosmos and Calendula (Banerji, 1961, 1962) and Withania (Deshpande and Singh, 1966). Besides these, Haskell (1954) has reviewed the various aspects of polycotyly and their evolutionary significance.

MATERIAL AND METHODS

Seedlings at various stages were collected from the Botanical Garden of the Institute and were fixed in F.A.A. Usual procedure of dehydration and paraffin embedding were followed. Microtome sections were cut at 12 microns and sections stained with safranin-fast green combination.

OBSERVATIONS

Normal Seedling.—The root is tetrarch. At a lower region of the hypocotyl the metaxylem diverges and moves laterally (Fig. 1). Higher up the
metaxylem rotates through 90°, but the protoxylem still retains its peripheral position (Fig. 2). The phloem groups increase in size but do not change their position. The diverged metaxylem comes to lie beneath the phloem patch adjacent to it. Each phloem patch receives two xylem fragments from either side and this condition continues throughout the length of the hypocotyl. At the cotyledonary node the four bundles enter the cotyledons, each receiving two bundles from a single gap. During their course in the cotyledons they become endarch. Just at the base of the cotyledonary node the provascular tissue arises from which the shoot vasculature differentiates. The foliar node is trilacunar (Fig. 3).


**Tetracot Seedling.**—The root is hexarch, with six phloem patches *a, b, c, d, e,* and *f* and six xylem strands *A, B, C, D, E, and F* (Fig. 4). As in the normal seedling the metaxylem at the base of the hypocotyl diverges and rotates through 90°. The diverged metaxylem arms are designated as *A'A", B'B", C'C", D'D", E'E", and F"F"*. The protoxylem maintains its peripheral position (Fig. 5). This condition is seen along the length of the hypocotyl. Just below the cotyledonary node two laterally placed phloem patches, *viz.*, *a* and *d* divide into two forming *a'd'a* and *d'd", thus forming eight phloem patches and twelve xylem strands (Fig. 6). At the cotyledonary node vascular supply for four cotyledons differentiates and each cotyledon receives