I. INTRODUCTION

It seems that since long no proper attention has been focused on the developmental and anatomical aspects of the fruit study. Although, historical account reads, "The Academie des Science (Paris) announced in 1866 a subject for investigation which was - The anatomical structure of the pistil and fruit" (Puri, 1951). Since then the investigational product is only of pistil and not that of fruit!

In the survey of Solanaceous fruit literature, it is found that most of the investigations are made on the cytogenetics and physiology of fruits (Aghion - Prat, 1965; Awasthi and Singh, 1973; Briosi and Gigli, 1889; Gustafson, 1926; Kaiser, 1935; Leopold and Kriedemann, 1964; MacGillivry and Ford,

1928; Muir, 1942; Niethammer, 1930; Ohta, 1962; Sawhney and Greyson, 1972; Winton and Winton, 1935) and only some fruits of dicotyledons are worked out morpheanatomically (Antoni, 1971; Barber, 1909; Chute, 1930; Deshpande and Untawale, 1971; Fahn and Zohary, 1955; Ford, 1942; Kapoor, 1973; Leela, Parabia and Shah, 1972; Oprea, 1969; Patel and Padmanabh, 1975; Perestova, 1970; Reeve, 1954a, 1954b; Shah, Danaiah and Parabia, 1975; Stant, 1972; Winton, 1902). It seems since long no adequate attention has been focused on the detailed developmental and anatomical studies of the fruit and thus the information is scanty in the literature (Dave and Patel, 1975; Dave et al, 1974, 1975; Ibrahim, 1976; Krishnakumar et al, 1975; Mathews, 1974; Neubauer, 1971; Patel, 1974; Patel and Dave, 1976; Patel et al, 1976; Rao, 1976; Shobha, 1974; Swamy, 1976; Sterling, 1953; Zala et al, 1976). In contrast to that of seeds, fruit anatomy is not often used as a taxonomic character (Cutter, 1971). Fruit studies have much to offer in aiding the anatomical knowledge of different taxa. When most of the embryological studies (Chatin, 1974; Deshpande and Singh, 1967; Jos, 1967; Munting, 1974; Murray, 1945; Nagaraj and Fathima, 1971; Khan, 1970; Ram and Kamini, 1964) have also not achieved beyond the structure of the ovary wall in its early stages before or after the fertilization, a thorough investigation in the ovary wall after fertilization and upto the maturity or ripening of the

fruit is very important. Thus the present investigation on the development and structure of the Solanaceous fruits stands its value in the literature and leads into an interesting avenue of morphological studies of the ovary and seed.

The Solanaceae are a family of considerable economic importance (Lawrence, 1960) and are the source of food plants (e.g. Brinjal, Capsicums, Potato and Tomato), the fumitory (e.g. Tobacco), drug plants (e.g. Datura sps.) and ornamentals from many genera including Datura, Solanum sps. and Cestrum etc.

The available literature on the developmental and/or anatomical studies of the fruits of Solanaceae is meagre (Chandra and Murty, 1968; Cetner et al, 1969; Dachyshyn, 1965; Fridvalszky and Nagy, 1966; Houghtaling, 1935; Jackson and Snowdon, 1968; Kaniewski, 1966; Karawya et al, 1973; Khafagy and Sabri, 1970; Konecsni, 1971; Leal, 1973; Matienko and Chebanu, 1970; Mohr and Stein, 1969; Ngô Tru'c Nhã and Danert, 1973; Paál, 1966 (1968); Raud, 1963a, 1963b; Sharma, 1964; Spurr, 1970; Shrivastava, 1969).

Structurally, the fruit consists of the pericarp, placental tissue and the seeds but the present work deals mainly with the developmental and anatomical studies of the pericarp and the placentae. The pericarp consists of an

outer region the epicarp, a middle region the mesocarp and an inner endocarp.

The term 'mesoderm' is used in this thesis to designate the ground tissue interspersed with vascular tissue in the middle of the outer epidermis and the inner epidermis of the ovary wall before ripening. In the ripening ovary or mature fruit the more or less differentiated tissue in the middle region of the pericarp is designated as mesocarp.

According to Esau (1953) the terms applied to the different layers of the pericarp have little value for showing the origin of the various tissues of the fruit wall, but they are useful for the description of mature fruits. In the present work the single or multilayered epicarp, the mesocarp and the endocarp of the fruit are described in relation to their ontogenetic origin. Thus the epicarp or endocarp is the single layered epidermis alone or they may be multilayered when derived from the epidermis and its subepidermal or hypodermal tissue. And the mesocarp is a more or less differentiated multilayered middle region embedding vascular bundles of the pericarp.

The hypodermal layer/s below the outer epidermis are called outer hypodermal layers or outer hypodermis and the hypodermal layer/s next to the inner epidermis are called inner hypodermal layers or inner hypodermis.

This thesis represents the detailed studies in the development of the structural orientation of the fruits of Capsicum frutescens Linn. (var. Long Red), Solanum melongena Linn., S. indicum Linn., S. tuberosum Linn., Lycopersicon esculentum Mill. (var. Benny Best), Withania somnifera Duhal, Datura innoxia Mill. and Nicotiana tabacum Linn. Along with these studies the gross structural designs of the fruits of C. annuum var. acuminata Fingerh., C. annuum var. grossa Sendt., C. frutescens var. baccata Irish, C. annuum var. abbreviata Fingerh., C. annuum var. longum Sendt. and C. annuum Linn. (var. Hungarian Wax) are also described.