INTRODUCTION

Vegetables constitute a large and varied group of considerable importance in the world's commerce. The importance of vegetables as an important part of human diet and their essentiality for a balanced diet and maintenance of good health has been recognized all over the world. Though the vegetables are seasonal and highly perishable, they are the cheapest source of many vitamins and minerals in human diet. Vegetables are cultivated in all seasons and in a variety of ecological habitats, but they are more common in winter. On the basis of plant parts consumed, the vegetables are classified as root, bulb, stem, leaf, flower, fruit and seed vegetables etc. The digestible contents in vegetables are generally water systems of carbohydrates, protein and fats, so they are readily digested. Proteins are in colloidal state in water system and fats are held in an emulsion. The vegetables rank next to cereals as sources of carbohydrate food. Vegetables play a relatively minor role in the total carolific content of the diet, except potato, sweet potato, and banana which supply an appreciable amount in low cost diets, however, the nutritive value of vegetables is tremendous because of the presence of indispensable mineral salts and vitamins. Generally the protein content of vegetables varies from 1-2 percent except leguminous vegetables which are very rich in it. The small
quantity of protein present in leafy vegetables is of a very high biological value. In addition to being a rich source of vitamins and minerals, the vegetables also serve as the main supplier of bulk or fibres to the diet, which until recently had been an ignored component of human diet. Chemically the fibre consists of pectin, cellulose, hemicellulose and lignin, which are not broken up by digestive enzymes of human system. The bulk of the fibrous frame work of leaves, stems and even bulbs, tubers and roots of vegetables yield a spongy mass, which not only helps to satisfy our appetite but also assist in pushing the food through digestive canal, thus preventing constipation. Deficiency of fibre in human diet causes a number of disorders like diverticular diseases, appendicitis and colon cancer. Vegetables play an important role in neutralizing the acids produced during the digestion of meat and other fatty foods. Mineral salts and their mild acid juices and compounds further help in the intestinal activity with their laxative effect.

According to the latest information available, the area under vegetable cultivation in our country is in the order of 2.5 per cent of the total cropped area (about 16 lakh hectares under vegetables and tuber crops), but in our country the yield per hectare is very low in comparison to developed countries.
Many diseases including fungal, bacterial, viral and physiological disorders cause a lot of reduction in the yield of vegetables. Virus diseases are quite important as they not only affect the quality of vegetables but generally render the whole crop unmarketable.

The carrot (*Daucus carota* - family Umbelliferae) is a very popular root vegetable, grown throughout the world. In India, it has probably been in cultivation from a very remote period. At present carrots are grown nearly throughout India on a commercial scale, as well as in kitchen gardens. The carrot is important as it has three-fold utility, being used as food, fodder and drug. Its importance is increasing due to the fact that its value in the diet is now better understood. It is especially desirable for children and its use is advocated by doctors and dieticians. The root is nutritious and tasty, and is eaten raw as well as in many cooked forms. The carrot is valued as food because of high carotene content, which is the precursor of vitamin A. It also contains appreciable quantities of thiamine, riboflavin and vitamin C. The fruits hold a place among our stimulated diuretics, the action being apparently due to the volatile oil which they contain, acting locally upon the vessels, or nervous structures of the kidney, during its excretion.

Carrot is attacked by a large number of diseases including fungal (*Jenkins et al.*, 1986; Soteros, 1979a,b; Sharman and Heale, 1979; Taylor, 1970) bacterial (*Perry and Harrison*, 1979;
Pfleger et al., 1974) nematode (Sasser, 1984; Jones, 1950; Sprau, 1960; Kuiper, 1963), mycoplasma (Maramorosch, et al., 1970) and viral (Chod, 1965; 1984; Costa et al., 1975; Dijk and Bos, 1985; Douine, 1976; Heinze, 1968; Howell and Mink, 1976a; Hull, 1969; Iwaki and Komuro, 1970; Murant, 1972, 1974, 1975; Ohki et al., 1978; Stubbs, 1948, 1952, 1956; Waterhouse, 1985; Watson et al., 1964; Wolf and Schmelzer, 1973). A review of literature has shown that there are at least fourteen virus disease causing heavy losses to this important vegetable crop, but there is no reported occurrence of a virus disease of carrot from India. A survey was carried out in the year 1981-82 for the viruses infecting carrot crop in Aligarh (U.P., India). The investigation revealed the presence of a severe virus disease, characterized by yellow mosaic symptoms, prevalent in Kasimpur area of Aligarh. The present investigation was taken up to characterize the virus causing yellow mosaic disease in carrot.
Fig. 1 Naturally infected plants of carrot showing yellow mosaic and slight curling in leaves.