INTRODUCTION

During the last few years enormous studies were made to develop protective cultivation in Egypt, the family (*Cucurbitaceae*) contains approximately about 90 Genera, but three only are grown under protected cultivation, *i.e. Citrullus* spp. (watermelon), *Cucumis* spp. (cucumber and melon) and *Cucurbita* spp. (squash & pumpkin).

Cucumber (*Cucumis sativus* L) is one of the most important vegetable crops; in Egypt it is cultivated in three growing season *i.e.* winter under tunnel or in greenhouse, in summer and nily season in the open field. The cultivated area of cucumber under greenhouse during the growing season of 2005 reached to 5,404,924 m^2. The average yield of cucumber fruits from this area was 62249 ton fruits (Reports of Econ. Agric.and Statis. Dept, Ministry of Agriculture, ARE, 2005). Cucumber fruits contain water, protein, fats, mineral, carbohydrates, fibers, vitamin A and vitamin B (95.5, 0.75, 0.04, 2.55, 2.55, 0.36, 0.138 and 0.582 x 10^{-3} %, respectively). The cucumber fruits were recommended for the people they suffer from diabetes because it contains lower contents of calories, 2 calories/10gm (Anonymous, 1974). In addition, cucumber has a great importance as cosmetic (Grieve, 2003).

Cucumber plants attacked by many fungal, bacterial and viral diseases that affect fruit yield. Downy mildew, powdery mildew, wilt and root rot are the most important fungal diseases affecting the crop especially in plastic houses. Cucumber powdery mildew caused by *Sphaerotheca fuliginea* and/or *Erysiphe. cichoracearum* is a major disease, attacking cucumber plants grown in field and greenhouse. Powdery mildew of cucumber has become a serious problem in greenhouse cultivation, especially in grafting cultivation for the production of bloomless fruits. Most of the commercial varieties used in greenhouse cultivation during the period from winter to spring are susceptible to powdery mildew, while most of the present summer

cucumber varieties are resistant to it. Infection of cucumber plants grown in the field, with powdery mildew varies with the seasons. Powdery mildew development in the field is dependent to a large extent on the environmental conditions. Excessively high temperatures limit the development of the disease, whereas cool temperatures and shading enhance it (Masami *et al.*, 2003). There is a general agreement that young leaves of cucubits are more resistant to powdery mildew than the older leaves (Uozumi and Yoshii, 1952). Disease control is generally based on the use of fungicides, but the need for reduced pesticides levels on acceptable resistant cucumber cultivars, dictate the need for alter native methods of disease control. One of these methods is chemicals or biotic inducing agents (Sticher *et al*., 1997 and Ye *et al.*, 1995).

This investigation aimed to:

1- Isolation and identification the causal organism of cucumber powdery mildew.
2- Studying the reaction of different cucumber cultivars to powdery mildew infection
3- Testing the effect of different biotic and abiotic inducers at three different concentrations on powdery mildew disease severity.
4- Select the most effective concentration of biotic and abiotic inducers giving the lowest powdery mildew disease severity under greenhouse conditions.
5- Study the biochemical changes associated with induced resistance.