I. INTRODUCTION

Faba bean *(Vicia faba L.)* is one the most important legume crops grown in Egypt for local consumption. The total area planted during 2001 on Egypt was 333,693 feddans produced approximately 2,835,358 Ardabs with an average of 8.5 Ardab /feddan (Ardab = 140 Kg.)

It plays an important role in human nutrition as a cheap source of proteins, vitamins and minerals. Dry seeds of faba bean contain high levels of the essential amino acids. Moreover, it plays an essential role in restoring soil fertility through nitrogen fixation by ***(Rhizobium leguminosarum)*** which has a symbiotic relationship with faba bean plants. Grain faba beans are widely recognized as an important source of food elements especially proteins.

In many regions of the world especially in the poor countries, legume seeds are the unique supply of protein in the diet and very often they represent the necessary supplement to other protein sources. The plant proteins can now be regarded as the versatile functional ingredients or as biologically active components more than as essential nutrients.

This evolution towards health and functionality is mainly driven by the demands of consumers and health professionals as well as the needs of the food industry, respectively **(Guillon and Champ, 1996).** Proteins are the major seed component in all grain faba beans, and are reason for their relevant nutritional and

socio -economical impact new research approaches which rely strongly on biotechnology to improve growth and utilization of grown legumes have had significant impacts on the nutritional quality of legumes.

In General, breeding for quality characters has always been more complicated than breeding for other traits, because quality consists of a number of characteristics that are often difficult to measure and are subjected to frequent variations depending on market preferences.

The improvement of faba bean quality traits has been preformed both for human and animal food production; the important traits are seed protein content, amino acid composition (especially sulfur - containing amino acid) and antinutritive factors *(trypsien inhibitors and tannin).*

Mutations *(Ethylmethane sulphonate)* offer to the plant breeding and geneticist several choices for enhancing the improvement of specific traits in crop plant. This includes the direct multiplication of selectable mutants as new varieties, use of mutated in plants crosses; transfer of specific chromosomal segments from alien genomes, use of mutants in developing molecular maps, as well as understanding gene expression and plant development. Besides use of heterosis, and gene tagging, framshift mutations and insertional mutations .

This investigation aimed to determine the different responses of mutagen EMS on several varieties of faba bean as

well as the changes of protein quality, protein content and antinutritional factors features in M_2 and resulted Mutants in M_3. Such mautagen may be produce-several genotypes having suitable characters for improving protein quality and yield components.