# REVIEW ON FAVISM

THESIS

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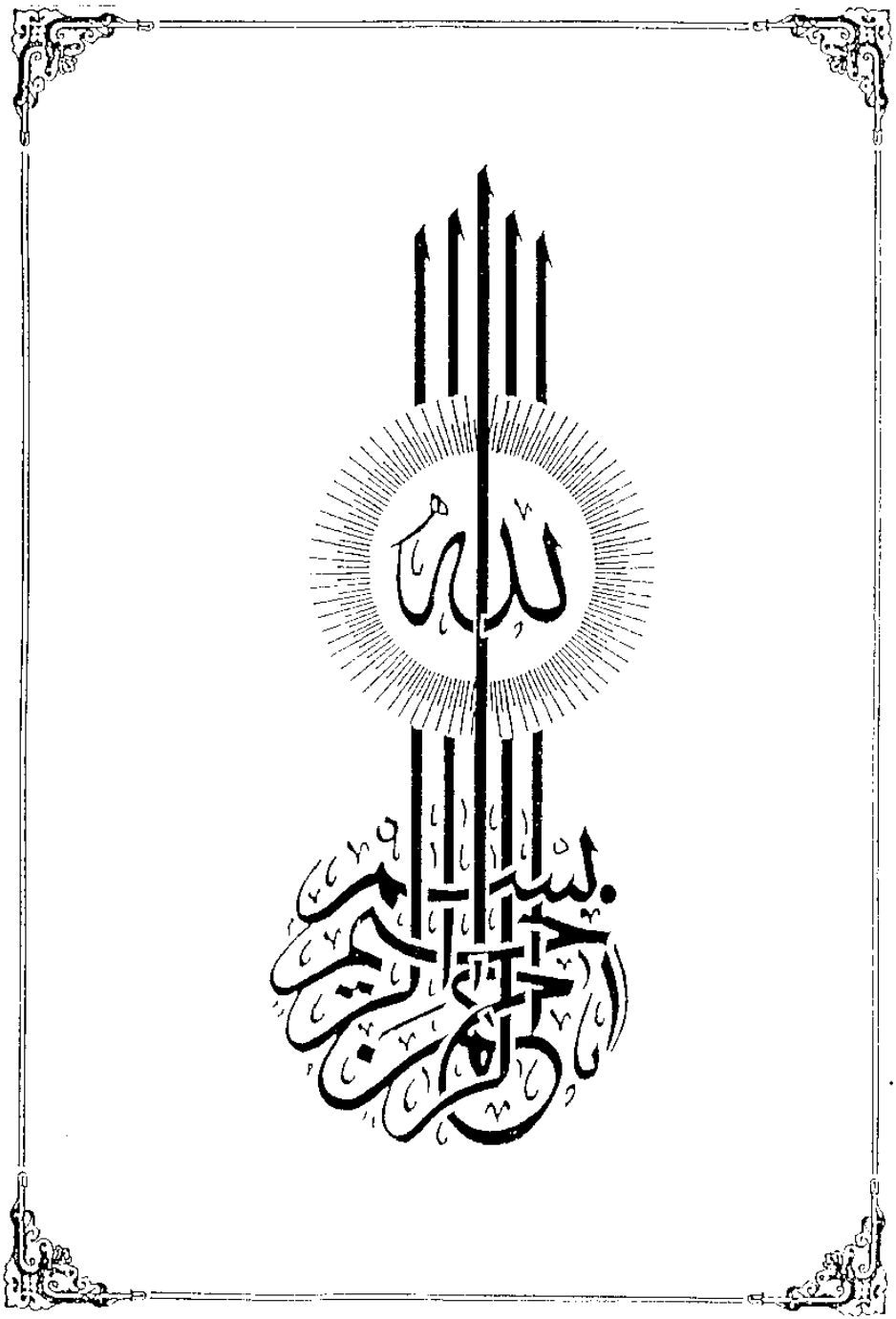
TO THE SOUL
OF MY FATHER



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# INTRODUCTION

# INTRODUCTION

The cultivation of fava beans has been practised since ancient times in countries of the Middle East and of the mediterranean basin, there are many references to its cultivation in Egypt and in Rome (1).

In order to provide an adequate source of protein for infants and children a combination of a cereal grain and broad beans (Ficia beans) has been suggested as weaning food for use in the middle East and North Africa where both wheat and broad beans are grown up extensively. Although the fava bean is low in methionine content, it is rich in lysine and can thus compensate for the low level lysine in wheat.

However, there are potential risks in using the fava bean. some individuals who eat or been exposed to it are reported to develop an acute haemolytic anaemia, favism. Favism therefore must be viewed as a potential obstacle to this solution to the problem of malnutrition in the middle East and North Africa (2). In some areas the disease itself is a major public health problem (3).

# THE EIPDEMIOLOGY OF FAVISM

* World Prevalence of Fevism and G-G-PD deficiency:

G.6.P D deficiency is extremely common (fig. 1) (9).

This genetic abnormality is not limited as was thought intially to Mediterranean and African Countries, but in fact is very widely distributed in tropical, subtropical and also temperate areas. It in estimated that G.6.PD deficiency affects more than 125 million persons world wide (8).

The reported incidence of favism in the middle east varies considerably from on country to another and within each country, and depends on the distribution of the genetic defect, the presence of the fava bean in the local diet and the availability and utilization of medical facilities. An incidence of 5 cases per 1000 population has been estimated in Sardinia (10).

In 1965, the incidence in Iran was 2.23 per 10000 population (10). The disease is frequently encountered in Algeria (12), Bulgaria (13), China (14), and Lebanon (15).

* **Age Distribution:**

Favism is generally a paediatric disease however, even within the paediatric age range there is a variation in the age distribution. In Egypt a greater proportion of cases in children aged 0 - 1 and 1 - 4 years.

In one hospital where 85 cases are seen each year, 50% of the patients were under 1 year and 95% under 5 years of age. The occurrence of disease at these ages probably reflects the consumption pattern of V. fava in Egypt. In Greece 65% of the cases occurred in the 2 - 5 years age group, 7.2% in the 10 - 15 year group, and 5.5% in infants.

Similar patterns have been noted in Bulgaria, Lebanon, Cyprus and parts of Iran (6).

The disease was more frequent in children aged 2 - 5 years, where there were 65% of cases. After the age of 6 years the incidence showed a steady decline which was steeper after the age of 10 years as showed in (fig. 2) (17).

## Mortality:

The mortality from favism varies from area to area. In Sardinia it has been reported to be as high as high as 2 per 10.000 population.

In Tunisia there are few cases and practically no deaths. In kwangtung and Bulgaria the case mortality was 2.3% and 2.1% respectively. In Caspian region the case mortality was reported to be 1.2% (2).

## The Fava bean: Production, Consumption and Toxic Factors:

### Production:

The broad bean is planted throughout the middle east between October and December. Only one crop a year is produced. The plant usually flowers 40 - 50 days after planting, few if any, cases of favism are noted during the months of flowering. The disease is usually directly related in time to the harvesting and availability of fresh beans. (2).

In Egypt approximately 5% of the dried bean crop is stored in such a way that the beans retain to all outward appearances the characteristics of fresh dried beans, from which they are indistinguishable in taste. (2).

Aunique seasonal pattern of disease occurs in Egypt. There are two seasonal peaks, and cases are not frequent in the spring until several weeks after the fresh beans are ripe (19).

Analysis of 30 cases showed that 14 occurred from May to July and 10 from November to January, and the remaining cases are distributing along the rest of year. A similar pattern was noted in Alexandria (20).

The onset of cases in May and June corresponds to the time of harvesting the dry bean, most cases being related to the consumption of stewed dried fava bean, most cases being related to the consumption of stewed dried fava beans (medamass). It is possible that the second seasonal increase in cases in November corresponds to the time of marketing of fava beans from Manuf that have been stored in away peculiar to Egypt (2).

In Egypt, fava bean constitutes 79.6% of the total production of pulses (FAO, 1982 a) (21).

* **Consumption:**

Fava beans are mainly eaten in Middle Eastern countries as a cheap source of dietary proteins.

Consumption is greatest in the urban areas of Egypt where up to 46 g / day may be eaten by pregnant and lactating women and where there is little seasonal variation, the mean daily consumption is 28 g (28).

Different varieties of fava bean are consumed in Egypt, Iran, Tunisia, but in the medical literature the variety associated with cases of favism has never bean specified. One problem in differentiating the species of V. fava is that, among the pulses, V. fava is the only one that cross - pollinates between species. Pure stains may be difficult to find in areas where more than one strain is grown.

In Egypt three different strains are consumed, and they are often eaten together in the dried form in the urban areas (2).

The form in which the bean is eaten varies throughout the Middle East and North Africa. In the clinical description and large series of cases, reference is made only to whether the beans associated with disease were raw or cooked and if the latter were fresh or dried.

The raw bean is consumed with or without the skin and rarely, if even with the pod. In most areas the skin of the raw fava bean is tough and inedible.

Fresh beans whether raw or cooked are not considered an appropriate food for children in Egypt. In rural areas of Iran and Tunisia, raw beans are frequently consumed, particularly by children (2).

The dried are eaten in many forms:

A. Stewed dried beans form a main staple in the Egyptian diet and are often fed to infants, the skins are not removed when the beans are eaten.

B. The dried beans may also be soaked in water overnight, the skins removed, and the beans incorporated into stew - like dishes.

C. Boiled dried beans are frequently purchased from street vendors or in eating places in both Iran and Tunisia.

D. In the Caspian region during winter, dried beans are soaked overnight, the skins are then removed and the beans cooked for a few hours, while in Rasht and the surrounding areas the soaked dried beans may be eater uncooked (without the skin).

E. In much of Iran, wheat flour with added fava bean flour is used (2).

In Egypt, fava beans are consumed in many popular ways:

Fool Akhdar, the green immature seeds or the pods are eaten with bread and cottage cheese "Gibna Arish" if they are sufficiently tender, at breakfast or at lunch, fool matbookh "the green immature pods of broad beans are boiled in water or cooked in tomato sauce", fool medames (Stwed broad beans), Fool nabet, Bisara and Taamia (bean - cakes) which is usually served with wheat bread, tomato slice and green leaf vegetables (29).

Studies done by Hussein (30), showed that four most popular Egyptian dishes were made from fava beans:

Medammis (stewed beans), Falafel (deep fried dough), Bissara (Poured paste) and Nabet soup (boiled germinated beans). The method adapted for these four products are those used in Egyptian homes and by small vendors (fig. 3) (31)