INHERITANCE OF NEMATODE RESISTANCE IN SOME CUCUMBER CULTIVARS

By

EMAN BASSUNY ABD EL-SALAM EL-REMALY
B.Sc. Agric. Sci. (Vegetable Crops), Fac. Agric., Cairo Univ., 2003

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APPROVAL SHEET

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Title of Thesis: Inheritance of nematode resistance in some cucumber cultivars
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ABSTRACT

This work was done during the period from 2005 to 2008 to study the inheritance of resistance to root-knot nematode disease and some horticultural characters in some cucumber (*Cucumis sativus* L.) and horned cucumber (*Cucumis metuliferus*) cross. The experiments included the evaluation of nine cucumber genotypes and commercial variety Beit alpha in addition to their crosses.

Depending on the evaluation of resistance to *Meloidogyne spp.* experiments were done on the parental genotypes Mineu (Lines 3 and 6), PI 482452 (Line 7 and Line 8) , Southern pickler (Line 9 **)** were resistant and Beit alpha was susceptible .Five F_1 hybrids (Beit alpha × Mineu L_3, Beit alpha × Mineu L_6, Beit alpha × PI 482452 L_7, Beit alpha × PI 482452 L_8, Beit alpha × Southern pickler L_9) were evaluated for root-knot nematode resistance in addition to vegetative characters, fruit characters, yield component and Genetic studies.

The results showed that Beit alpha × PI 482452 L_7 F_1 hybrids had high significant values in most studied horticulture characters, in addition to nematode resistance.

Key words: *Cucumis sativus*, Cucumber, *Meloidogyne incognita*, Root knot nematodes, Resistance, Inheritance, and Horticultural characters.

DEDICATION

I dedicate this work to whom my heart felt thanks; to my Friends for their patience and help, as well as to my parents ,brothers and sister for all the support they lovely offered along the period of my post graduation.

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INTRODU CTION

Cucumber, *Cucumis sativus* L. is a member of the *Cucurbitaceae;* it is considered one of the most important vegetable crops in Egypt and world wide.

Since cucumber is one of the oldest cultivated vegetable crops, it has been known in history for over five thousand years and probably originated in India (wehner *et al*., 1991).

The common use of cucumber is as food. The fruits of cucumber are eaten as fresh and as pickles in the immature stage. Products derived from cucumber are being widely used in cosmetics and medical concern.

Cucumber is usually grown in open fields, under polyethylene low tunnels and greenhouses. the total production in open fields was 448521 tons produced from 47246 fed, which yielded about (productivity) 9.49ton/fed[1] while the production in greenhouse was 43764 tons produced from 3442067 m^2, productivity, 12.71 kg/m^2 in 2006. Cucumber is cultivated in greenhouses as well as in open fields, under diversity of climates (temperate and tropical area).

Cucumber grown under different cultivation circumstances are subjected to attack by many pathogens (Bacteria, fungi, viruses and parasitic nematodes).

1.Department of Agriculture and Economics and Statistics, Ministry of Agriculture A.R.E. 2008.

The important role of plant-parasitic nematodes as pests of world crops has been clearly established over the last fifty years. It has been estimated that some 10 % of world crop production is lost as a result of plant nematode damage.

Root-knot nematodes, *Meloidogyne ssp.* are among the most destructive nematodes, indigenous in tropical and sub tropical areas including Egypt, causing serious noticeable threat to vegetables and field crops resulting in yield losses in quality and quantity.

The commonest four species are *Meloidogyne incognita, M. javanica, M. arenaria* and *M. hapla* attacking world wide crop plants belonging to many different plant families. The wide –host range of these nematodes and compatibility to warm environment makes the practical control with the conventional methods too difficult.

This genus significantly damages the horticultural crops and reduced the total production in several areas of the world as well. The impact of these organisms on global agriculture is becoming more important with an increased need for greater crop yield to feed the populations of both developing and developed countries.

At present, control of plant-parasitic nematodes relies on application of non fumigant nematicides to nematode-infested fields before or during planting, or crop rotation methods, or on use of resistant or tolerant plant varieties bred by conventional genetic methods.

Although each of these management strategies has some positive features, there are negative aspects that reduce their effectiveness and value.