# BIOCHEMICAL STUDIES ON CANOLA PLANT UNDER SALINE CONDITIONS

**BY**
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**B.Sc. Agric. Sc. (Agricultural Biochemistry), Zagazig University, 1993**
**M.Sc. Agric. Sc. (Agricultural Biochemistry), Zagazig University, 1999**

**A thesis submitted in partial fulfillment**
**of**
**the requirements for the degree of**
**DOCTOR OF PHILOSOPHY**

**In**
**Agricultural Science**
**(Agricultural Biochemistry)**

**Department of Agricultural Biochemistry**
**Faculty of Agriculture**
**Ain shams University**

**2005**

## Approval Sheet

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# ABSTRACT

**Mohamed Hamed Hendawy Aly Al-Bana. Biochemical studies on Canola plant under saline conditions. Unpuplished Ph.D. Dissertation, Ain Shams Univ., Faculty of Agricultural Biochemistry, 2005.**

Two field experiments were carried out during 2000/2001 and 2001/2002 seasons in Agricultural Experimental Station of Desert Research Center at Wadi Sudr, to study the effects of different saline water irrigation (3607, 4602 and 9089 ppm) and foliar application of Cycocel (250, 500 and 1000 ppm) at prebranching and preflowering stages on growth characters, some chemical constituents and seed yield as well as quantity and quality seed oil of two canola cultivars grown under salt-affected calcareous soils.

There was a general trend of decreasing chlorophylls for tested canola cultivars with increasing salinity levels. While, soluble sugars and free proline in shoot of two canola cultivars tended to increase under salt stress. Also, it is evident from these results that chlorophylls and soluble sugars and free proline were increased, when canola plants treated with foliar application of Cycocel. Salt stress induced a detectable change in number of bands and intensities of proteins pattern. Also, plants sprayed with 1000 ppm CCC under moderate level of salinity showed increased of band intensities at 51000 and 66000 Dalton for Pactol cultivar.

However, GA3 and IAA contents in shoots of Pactol and Serw4 cultivars decreased when applied cycocel at rate 1000 ppm under high level of salinity. The maximum value of ABA was obtained from Pactol and Serw4 cultivar by spraying dose of 1000 ppm CCC under low level of salinity. Seed and oil yield (Kg/fed) for Pactol and Serw4 cultivars were significantly decreased with increasing salinity levels. The highest value of seed and oil yield for two canola cultivar were produced by spraying doses of 500 and

1000 ppm CCC. However, total glucosinolates tended to increase in seeds of Pactol and Serw4 cultivars with increasing salinity levels. Also, spraying of 250 and 500 ppm CCC decreased total glucosinolate in seeds of Serw4 cultivar.

Also, Amino acid composition of canola indicated the presence of at least 16 amino acid including the most essential amino acids. The spraying of CCC levels under high level of salinity tended to decrease the aspartic, arginine, proline, methionine and tyrosine acids in seeds of two-canola cultivars.

Acid, peroxide and saponification value were increased in oil of Pactol and serw4 cultivars (produced by hexane and pre-pressing method) under high level of salinity at 0 and 6 month of storage. Caproic, lauric, myristic, palmitic, stearic, oleic, linoleic, linolenic, arachidic, Cis-11-eicosenoic and behenic acids were detected in most samples of canola oil produced by two method under study. Also, the predominant saturated fatty acid in two canola cultivars (Pactol and Serw4) was palmitic acid. The major constituents of unsaturated fatty acids in oil extracted from two canola cultivars were oleic, linoleic and linolenic acids.

Erucic acid content in oil of two canola cultivars (produced by hexane method) was increased under high level of salinity. Spraying of Cycocel under low level of salinity tended to increase the erucic acid in oil of serw4 cultivar, when applied at rate 1000 ppm CCC. Also, erucic acid for Pactol cultivar under high level of salinity was increased with increasing cycocel levels. Concerning the erucic acid content (produced by prepressing method), it was absent in oil extracted from Pactol cultivar under low and high levels of salinity.

**Key Words:** Canola, saline conditions, Cycocel, Chemical constituents, Fatty acids.

# Acknowledgment

**(Firstly, my unlimited thanks to the Almighty Allah )**

The author wishes to express his deepest gratitude and indebtedness to the supervisor of present work **Prof. Dr. Mohamed Abd El-Rahman Shatla,** Professor of Biochemistry, Department of Biochemistry, Faculty of Agriculture, Ain Shams University, for his constructive supervision, valuable advice, kind guidance and for his help in putting thesis in its final form.

My deep thanks and gratitude to **Prof. Dr. Ragy Riad Francis** Professor of Biochemistry and Head of Biochemistry Department, Faculty of Agriculture, Ain Shams University, for his supervision and continuous help throughout the course of this investigation, suggesting the point and helpful discussion and help in writing the thesis.

I wish to express my deepest appreciation to **Prof. Dr. Hosny Abo El-ez Sallam** Professor of Biochemistry and Head of Genetic Resources Department, Desert Research Center, for support and continuos encouragement, and help during the preparation of the present work, laboratory work and preparation of the manuscript.

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