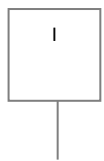


DEDICATION

*I dedicate this work to
my parents, my brother and my sisters ..*



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Thanks and praise is to Allah the Almighty who gave me health, strength and patience to complete this study.

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ABSTRACT

This study was carried out during the period of 10/2015-2/2016 at the Tissue Culture Laboratory complex, Department of Horticulture, College of Agricultural Studies, Sudan University of Science and Technology, Shambat, with the objective of determining salinity tolerance of garden rocket (*Eruca sativa* Mill.). The effect of different concentrations of sodium chloride (NaCl) on germination of seeds and vegetative and reproductive growth of garden rocket plants was evaluated. The treatments were NaCl concentrations: 0.00, 0.02, 0.03, 0.10 and 0.13 molar (M). The final germination percentage, the germination rate index (GRI) and the corrected germination rate index (CGRI) were not affected by the salt concentrations tested. The final germination percentages were very high (above 85%), likewise the seed germination rate, evaluated by GRI and CGRI, was very high. The elongation of the radicle as well as the plumule was negatively affected by increasing salt concentrations. Leaves formation was not affected by all salt concentrations tested but leaves length was reduced with increasing salt concentrations. The results also indicated that the elongation of the stem was less affected by the two lowest salt concentrations (0.02, 0.03 M), but was drastically reduced by the two highest salt concentrations (0.10M and 0.13M). Flower formation was detrimentally affected by increasing NaCl concentration. The highest concentration inhibited flower formation completely. The number of fruits per plant followed almost the same trend, with the two highest concentrations inhibited fruit set completely. It is apparent from this study that both flower number and fruit set are the most sensitive parameters to salt stress. In general, the highest two concentrations of the salt tested, (0.10M and 0.13M), were inhibitory to all growth parameters measured. It is not apparent from this study whether the detrimental effects were due to osmotic or toxicity effects or due to both.

الملخص العربي

أجريت هذه الدراسة خلال الفترة من 10 / 2015 إلى 2 / 2016 في مجمع معمل زراعة الأنسجة بقسم البساتين بكلية الدراسات الزراعية بجامعة السودان للعلوم والتكنولوجيا، شمبات، بهدف تحديد مدى تحمل نبات الجرجير للملوحة. تم تقييم تأثير تركيزات مختلفة من كلوريد الصوديوم (NaCl) على إنبات البذور والنمو الخضري والزهرى لنباتات الجرجير. وكانت المعاملات تركيزات (NaCl): 0.00، 0.02، 0.03، 0.10 و 0.13 مولار. نسبة الإنبات النهائية، ومؤشر معدل الإنبات (GRI) ومؤشر تصحيح معدل الإنبات (CGRI) لم تتأثر بالتركيزات الملحية التي تم اختبارها. كانت نسبة الإنبات النهائية عالية جدا (فوق 85%)، وبالمثل معدل إنبات البذور، حسب مؤشري GRI و CGRI، كان مرتفعا جدا. استطالة الجذير وكذلك الريشة تأثرا سلبا بزيادة تركيز الملح. لم يتأثر تكوين الأوراق بالتركيزات الملحية ولكن انخفض طول الأوراق مع زيادة تركيز الملح. أيضا أشارت النتائج إلى أن استطالة الساق كان أقل تأثرا عند تركيزي الملح 0.02 و 0.03 مولار، ولكن انخفض كثيرا في أعلى تركيزي للملح (0.10 و 0.13 مولار). تكون الأزهار تأثر تأثيرا ضارا بزيادة تركيز كلوريد الصوديوم. أعلى تركيز ثبط تكون الأزهار تماما. تأثر عدد الثمار بنفس القدر، وكذلك أعلى تركيزيين منعا عقد الثمار تماما. من الواضح من هذه الدراسة أن كلا من عدد الأزهار والثمار هو العامل الأكثر حساسية للإجهاد الملحي. بشكل عام، أعلى تركيزيين للملح (0.10 و 0.13 مولار)، كانا ألمنبط الرئيس لجميع قياسات النمو. ليس من الواضح من هذه الدراسة إذا كانت الآثار الضارة ترجع إلى الاسموزية أو سمية الملح أو السببين معا.

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Abbreviations and Signs

cm	Centimeter
CGRI	Corrected Germination Rate Index
DS/M	Decisiemens Per Meter
EC	Electrical Conductivity
GRI	Germination Rate Index
M	Molar
mmohs/cm	Millimohs Per Centmeter
%	Percent/Percentage
NaCl	Sodium Chloride
SAR	Sodium Adsorption Ratio
T/fed	Tons Per Feddans