PERFORMANCE OF TEN BRINJAL ACCESSIONS AGAINST DIFFERENT SALINITY LEVELS

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ABSTRACT

A pot experiment was conducted at Horticulture Farm, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh during the months of November 2012 to June 2013 to study the performance of ten brinjal accessions against different salinity levels. Ten accessions coded from V_1 to V_{10} were treated under different salinity conditions (S_0: Control; S_1: 12dS/m and S_2: 16 dS/m) following Completely Randomized Design with three replication. From this experiment maximum yield was provided by V_6 (2.6 kg/plant) and minimum in V_4 (1.1 kg/plant). In different salinity levels highest yield of brinjal was found in S_0 (2.7 kg/plant) and minimum yield in S_2 (0.8 kg/plant). In combination highest fruit yield was found in V_6S_0 (4.1 kg/plant) and lowest fruit yield was given by V_4S_2 (0.5 kg/plant). So V_6 was best accession for the both salinity level of 12 dS/m and 16 dS/m.

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LIST OF ABBREVIATED TERMS

ABBREVIATION	FULL NAME
AEZ	Agro-Ecological Zone
et al.	and others
BBS	Bangladesh Bureau of Statistics
Cm	Centimeter
etc	Etectera
g	Gram
ha	Hectare
kg	Kilogram
m	Meter
mm	Millimeter
no.	Number
m^2	Square meter
DAT	Days after transplanting
SRDI	Soil Resources Development Institute
EC	Electrical Conductivity
dS/m	Deci Simens per meter

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CHAPTER I

INTRODUCTION

Solanum melongena L., commonly known as eggplant, aubergine, guinea squash or brinjal, is an economically important vegetable crop of tropical and temperate parts of the world.Eggplant is a native of the Indian sub-continent, with India as probable centre of origin(Gleddie *et al.* and Keller, 1986). Eggplant has been cultivated in Asia for over 1500 years, used in traditional medicines (Khan,1979). It is the second most important vegetable crop next to potato in Bangladesh in respect of acreage and production (BBS, 2005). Different forms, colors, sizes and shapes of brinjal are found throughout the Southest Asia suggesting that this area is an important center of diversity and possibly of origin. Now, the brinjal is of great importance in the warm areas. Brinjal is grown commonly in almost all parts of the country and liked both poor and rich. It is a main vegetable to the plains and is available more or less throughout the year. It is quite high in nutritive value and can compare with tomato (Choudhury, 1976). Brinjal is nutritious vegetable and has got multifarious use as a dish item (Bos and Som, 1986 and Rashid, 1993). It has high calorie, iron, phosphorus and riboflavin contents than tomato (Shaha, 1989). It has been a staple vegetable in our diet since ancient times. It is quite high in nutritive value. It has potential as raw material in pickle making and in dehydration industries (Singh *etal*., 1963). Fried brinjal has some medicinal value to cure liver problem (Chauhan, 1981). Brinjal is a familiar vegetable crop for its easier cooking quality, better taste and lower market price. It is largely cultivated in almost all districts of Bangladesh. It can be grown at homestead area and kitchen garden because of its popularity especially for urban people. About 8 million farm families are involved in brinjal cultivation (Islam, 2005).This gives small, marginal and landless farmers a continuous source of income provides employment facilities for the rural people. Bangladesh is an agro based country. With the sea level rise, a vast land in the southern coastal belt will go under water and salinity will grasp new land areas. This will reduce the exiting crop area severely thereby hampering agricultural productions. Obviously, the densely populated country may face acute food shortage to feed her people.

Salinity is a major threat to crop productivity in the southern and south-western part of Bangladesh, where it is developed due to frequent flood y sea water of the Bay of Bangal and on the other hand introduction of irrigation with saline water.Agricultural land in the southern region of Bangladesh are uncultivated due to high soil salinity which covers almost 29,000 km^2 about 30% of the cultivated lands of the country (Haque, 2006).About one million ha of land of these coastal and offshore areas are affected by varying degrees of salinity(Asib, 2011).These coastal sanile soils are distributed unevenly in 64 thanas of 13 coastal districts covering 8 agroecological zones (AEZ) of the country. The majority of the saline land (0.65 million ha) exists in the districts of Satkhira, Khulna, Bagerhat, Barguna, Patuakhali, Pirojpur and Bhola on the western coast and a smaller portion (0.18 million ha) in the district of Chittagonj, Cox Bazar, Noakhali, Lakshmipur, Feni and Chandpur. According to the report of Soil Resource Development Institute (SRDI, 2007) of Bangladesh, about 0.203 million ha of land is very slightly (2-4 dS/m), 0.492 million ha is slightly (4-8 dS/m), 0.461 million ha is moderately (8-12 dS/m) and 0.490 million ha is strongly (>12 dS/m) salt affected soils in southwestern part of the coastal area of Bangladesh. Large fluctuations in salinity levels over time are also observed at almost all sites in these regions. The common trend is an increase in salinity with time, from November-December to March-April, until the onset of the monsoon rains.

The salinity problem received very little attention in the past, nevertheless the increasing demand for growing more food to feed the booming population of the country. In recent past observation, it is noticed that due to increasing degree of salinity and expansion of affected areas normal agricultural land use practice become more restricted. The affected area of Bangladesh are still increasing rapidly (SRDI, 2010). Salinity in soil or water is one of the major stresses that severely limit crop production (Haque, 2006). The deleterious effect of salinity on plant growth are associated with i) low osmotic potential of soil solution (water stress), ii) nutritional imbalance, iii) specific ion effect, or iv) a combination of these factors (Ashraf, 1994; Sultana *et al*., 1999; Asch *et al*., 2000, Juan *etal*. 2005). Salinity of soil is a major constrains for crop production not only to the southern region but also other parts of the country. The salinity affected area is increasing day by day and spreading all over the country through the infiltration of water. Due to soil salinity, large portion of the cultivable land become uncultivated. Salinity problems can be severe in arid and semi-arid regions since precipitation is not sufficient and water supplies are also scarce as compared to water needs for crop production (Lamsal *etal*., 1999). Salinity can reduce evapotranspiration by making soil water less available for plant and reduces potential energy of soil water solution (Allen *etal*., 1998). Now eggplants are considered one of the most popular vegetable crops in Bangladesh. Though eggplants is classified as a moderately (Maas, 1984) to highly (Bresler *etal*., 1982) sensitive vegetable crop and it has great potentiality to grow in saline soil. Some plant may have the ability to grow on the saline area. Similarly some variety of brinjal can naturally adapted to highly saline area.

Varietal screening can help to find out the salt tolerant brinjal accession. Highly saline affected area in Bangladesh are S_3 (Salinity level 12 dS/m) and S_4 (Salinity level 16 dS/m) region and salinity cause severe problem in Bangladesh. Current research will help to screen out the salt tolerant brinjal accession and that will help to bring the noncultivated land in the southern region under cultivation. Keeping these point in view, the present study conducted to search salt tolerant accession on highly saline affected area.

Objective:

The present work has therefore, been designed and planned to screen out the suitable accessionof brinjal tolerant against different salinity levels.

CHAPTER II

REVIEW OF LITERATURE

In Bangladesh and in many countries of the world brinjal is an important vegetable crop. It is sensitive to salinity stress. The crop has less attention by the researcher on various aspect of growth in saline area. The available literatures related to the present study are reviewed here.

Salinity is one of the major obstacles to increasing production in brinjal. It is one of the important constraints to brinjal production in coastal region of Bangladesh. Salinity of soil and water is caused by the presence of excess amount of soluble salts.

Saline soils have a high concentration of soluble salts. They are classed as saline when the EC> 4 dS/m. This definition of salinity derives from the EC that would reduce yield of most crops. However, many crops are affected by an EC< 4 dS/m. Osmotic and salt specific components inhibit root ans shoot growth EC is the electrical conductivity of the saturated paste extract, and reflects the concentration of salts in saturated soil. A conductivity of 4 dS/m is equivalent to 40 mM NaCl.

An experiment was conducted by Ali*et al*. (2004) to identify salt tolerant rice genotype. Eighteen advanced rice genotypes were studied under an artificially salinized (EC=8.5dSm-1) soil conditions after 90 days of transplanting. The results showed that the yield per plant, chlorophyll concentrations, fertility percentage, number of productive tillers, panicle length and number of primary braches per panicle of all the genotypes were reduced by salinity. When plants are grown under saline conditions, the excess of salts modifies the metabolic activities of the cell wall causing the deposition of various materials which limit the cell wall elasticity. Secondary cell wall sooner, cell walls become rigid and consequently the turgor pressure efficiency in cell enlargement is decreased. The other expected causes of the reduction in yield per plant, leaf area and yield components in rice could be the shrinkage of the cell contents, reduced development and differentiation of tissues, unbalanced nutrition, damage of membrane and disturbed avoidance mechanism. Reduction in chlorophyll concentrations is probably due to the inhibitory effect of the accumulated ions of various salts on the biosynthesis of the different chlorophyll fractions. Salinity affects the strength of the forces bringing the complex pigment protein- liquid, in the chloroplast structure. As the chloroplast in membrane bound its stability is dependent on the membrane stability which under high salinity condition seldom remains intact due to which reduction in chlorophyll was recorded. Salt tolerance is not a function of single organ or plant attribute, but it is the product of all the plant attributes. However, genotypes viz. Jhona-349 x Basmati-370, NR-1, DM-59418, DM-63275, DM-64198 and DM 38-88 showed better salinity tolerance than others.

Allen *et al.*(1998) were reported that salinity can reduced evapotranspiration by making soil water less available for plant and reduces potential energy of soil water solution.

When the salt concentration of the soil solution increase and the water potential decrease, the pressure potential of the plant cell declines and cells ultimately cease to divide and elongate. Underthese water stress condition, in general, stomata close, which results in the reduction of photosynthesis. Protein breakdown is changed and plants ultimately show poor or negative growth and may lose biomass. (Ashraf, 1994).
Asib (2011) reported that the ways of using the land use in coastal area are gradually changed and that is diverse, competitive and alarming. Out of 2.85 million hectares of the coastal and off-shore lands about 1.05 million hectares of arable lands are affected by varying degrees of salinity. Fifty percent of coastal lands are subject to inundation of varying degrees and frequency that limit their effective use. The land use of coastal area is used in different purposes such as shrimp culture, ship breaking yards, industry, salt production and settlements etc.

Amini, F. and Ehsnapour (2006) studied the effect of MS and agar medium containing NaCl and sucrose on germination percentage, seedling growth, chlorophyll content, acid phosphate activity and soluble proteins in different cultivars of *Lycopersicon esculentum* Mill. (Cv. Isfahani, Shirazy, Khozestani and Khorasani). Seeds were germinated under various mediums , MS with sucrose, water agar with and without sucrose with different concentration of NaCl (0, 40, 80, 120 and 160 mM). Increasing salinity decrease the germination percentage and seedling dry weight. The highest germination percentage was found in Cv. Isfahani and lowest in Cv. Shirazy. Chlorophyll content (Chl a, Chl b, and total Chl) were decreased with increasing salinity in both Cv. Isfahani and Shirazy. Acid phosphates activity was decreased in stem leaf while it was increased in roots. Enzyme activity was decreased on stem leaf in Cv. Shirazy but increased in Cv. Isfahani. Soluble proteins in roots of both Cv showed variation.

Adams and Ho (1992) conducted an experiment and find out that increased salinity to 10 dS m^{-1} does not affect fruit set significantly but fruit set was reduced particularly on the upper trusses at higher salinity (15dsm^{-1}). The tomato cultivars Counter, Calypso and Spectra were grown in NFT at a range of salinities 5, 10 and 15 mS cm^{-1}. The incidence of the blossom end rot (BER) was higher in high salinity and thus reduced the fruit number.

Bresler *et al*. (1982) were reported that eggplant is highly sensitive vegetable crop and it has great potentiality to grow in saline soil.

A greenhouse experiment was carried out by Colla *et al*.(2006) to determine growth, yield, fruit quality, gas exchange and mineral composition of watermelon plants (Citrullus LanatusL. ‘Tex’), either ungrafted or grafted onto two commercial rootstocks ‘Macis’ [Lagenariasiceraria(Mol.) Standl.] and ‘Ercole’ (Cucurbita maxima Duchesne× Cucurbita moschata Duchesne) and cultured in NFT. Plants were supplied with a nutrient solution having an electrical conductivity (EC) of 2.0 or 5.2 $dS \cdot m^{-1}$. The saline nutrient solution had the same basic composition, plus an additional of 29 mMof NaCl.The reduction in total yield in saline treatments compared to control was due to a reduction in the fruit mean mass and not to the number of fruit per plant. However salinity improved fruit quality in all grafting combinations by increasing dry matter (DM), glucose, fructose, sucrose, and total soluble solid (TSS) content in fruit.

Ep heuvelink (2005) said in his book Tomatoes (Crop Production Science in Horticulture**)**salinity can reduce the fruit growth rate and final fruit size by an osmotic effect. High salinity lower water potential in the plant which was reduce the water flow in the fruit and that therefore the rate of fruit expansion. ECs of 4.6-8 ds/m reduced fruit yield because reduction of fruit size whereas ECs Of 12ds/m reduced number and size of fruit.

A basic nutrient solution contain 10mM NaCl reduce the number of leaves,number of flowers per cluster. A 50% reduction occurred on flowers per plant than the controls and when the pollen count was only about 30% of that of the control plants. However the pollen fertilities of both control and salt treated were same. Reduction in the number of fruits per plant produced by saline conditions was probably due to a decrease in the number of flowers per plant, and not to lowering of pollen fertilityGrunberg *et al.* (1995).

Hao *et al*. (2000) found higher salinity reduced total marketable yield and fruit size, but improved tomato fruit quality.Tomato cv. Trust plants were grown with Nutrient Film Technique (NFT). The EC of nutrient solution was increased to 40 or 80% above the standard, with either all major macronutrients, NaCl or NaCl/KCl following a seasonal EC schedule, in which target EC changed with plant age and ambient solar radiation.

The area of Bangladesh is 147,570 km^2. The coastal region covers almost 29,000 km^2 or about 20% of the country. Again, the coastal areas of Bangladesh cover more than 30% of the cultivable lands of the country. About 53% of the coastal areas are affected by salinity. Agricultural land use in these areas is very poor, which is much lower than country's average cropping intensity. The severity of salinity problem in Bangladesh increases with the desiccation of the soil. The organic matter content of the soils is also pretty low (1.0-1.5%). Nutrient deficiencies of N and P are quite dominant in saline soils. Micro-nutrients, such as Cu and Zn are widespread. During the wet monsoon the severity of salt injury is reduced due to dilution of the salt in the root-zone of the standing crops. Salinity causes unfavorable environment and hydrological situation that restrict the normal crop production throughout the year Haque(2006).

Islam (2005) reported that brinjal can be grown at homestead area and kitchen garden because of its popularity especially for urban people. About 8 million farm families are involved in brinjal cultivation.

Jamil *et al*. (2005) observed the germination, germination rate, shoot and root length, shoot and root fresh weight, leaf area and number of leaves of canola (*Brassicanapus)*, cabbage (*Brassica oleracea capitata*), and cauliflower (*Brassica oleracea botrytis*) were reduced significantly with increasing salinity. The treatment were 0.0 (control), 4.7, 9.4 and 14.1 dS m-1 NaCl. In case of germination percentage cabbage and canola showed more tolerant to salinity than cauliflower. Fresh shoot and root weight, leaf area and number of leaves were severely affected at all salinity treatments.

Jamil *et al*. (2007) found dry root and shoot weight, fresh leaf weight and leaf area of sugar beet (*Beta vulgaris* L.) and cabbage (*Brassicaoleracea capitata*L.)decreased significantly with increasing salt concentration whereas there were no changes in dry leaf weight and leaf water content. Seedlings ofsugar beet and were grown in sand culture at salinities of 0 (control), 50, 100 and 150 mM NaCl. Salinity induced no effects in both species on the maximal efficiency of PSII (Fv/Fm) photochemistry, efficiency of excitation energy capture by open PSII reaction canters, electron transport rate (ETR), photochemical quenching coefficient (qP), non-photochemical quenching coefficient (qN) and physiological state of the photosynthetic apparatus(Fo/Fm).

Johnson *et al*. (1992) reported that low stem water potentials have an immediate and direct effect on phloem turgor, reducing the driving force for sap flow into the fruit. Fruit diameter increased when the apoplasmic water potential gradient favoured solution flow into the fruit and fruit shrinkage occurred only when the water potential gradient was inverted.Since fruit water potential remained relatively constant, the diurnal variation in stem water potential was sufficient to account for the correlation with changes in fruit diameter. An automated psychrometer was used to measure fruit and stem water potentials of tomato plants.

Karim *et al*. (1990) were noticed that due to increasing degree of salinity and expansion of affected areas normal agricultural land use practice become more restricted.

Karen*et al*. (2002) conducted an experiment to determine the effects of ozone and salinity, singly and in combination, on the growth and ion contents of two chickpea (*Cicer arietinum* L.) varieties.Salinity at a concentration of 30 mM NaCl caused a substantial reduction in plant height, number of leaves and the dry weights of the leaves, stems and roots.Ozone at a concentration of 85 nmol mol(-1) for 6 h per day for 25 days reduced plant height and dry weights but had no effect on leaf number. Salinity and ozone have substantial effects on chickpea growth and ion concentrations.

Lacerda *et al*. (2003) conducted an experiment to evaluate the performance of two forage sorghum genotypes (*Sorghum bicolor* (L.) Moench) under 0 and 100 mM NaCl solution in terms of shoot development, leaf elongation, and organic and inorganic solutes contents in leave. Salinity causes accumulation of toxic ions (Na^+ and Cl^-), organic solutes (carbohydrates, amino acids and proline), and reduction of K^+ content in leaf blades. These were the causes of reduction of shoot development and leaf elongation and enhanced leaf senescence and injury. The accumulation of organic solutes in leaves did not appear to be related to salt tolerance.

Lamsal *etal*. (1999) were reported that salinity problems can be severe in arid and semi-arid regions since precipitation is not sufficient and water supplies are also scarce as compared to water needs for crop production.

Melon (*Cucumis melo L. Cv* Parnon) plant grown in high salinity (50 mM NaCl) and higher concentrations of CO_2(200 μmol mol^{-1}) reduces shoot fresh weight, plant height, leaf surface area, Chlorophyll content and fruit yield (Mavrogianopoulos, 1999). Plants were grown in rockwool culture in the greenhouse was CO_2 enriched, for 5 h every morning, at 400, 800 and 1200 μmol mol^{-1} and trickle-irrigated with nutrient solutions amended with 0, 25 and 50 mM NaCl. At 25 mM NaCl, the decrease in yield resulted mainly from the smaller fruit size, but at 50 mM yield reduction was due both to smaller fruit size and to fewer fruits per plant. High CO_2 level increased fruit yield, the increase being greater in unsalinated plants than in salinated. With total shoot fresh weight, the increase was greater in salinated plants. Measurements of gas exchange showed that, for the above mentioned CO_2 and NaCl concentrations, net assimilation was affected by CO_2 to a greater degree than by salinity. Stomatal conductance was most affected by salinity at a concentration of 50 mM NaCl.

Magan *et al*. (2008) conducted an experiment to evaluate the effect of salinity on fruit yield, yield components and fruit quality of tomato grown in soil-less culture in plastic greenhouses in Mediterranean climate condition. Two spring growing periods (experiments 1 and 2) and one long season, autumn to spring growing period (experiment 3) studies were conducted with two cultivars, ‘Daniela’ (experiment 1) and ‘Boludo’ (experiments 2 and 3). Seven levels of electrical conductivity (EC) in the nutrient solution were compared in experiment 1 (2.5–8.0 dS m^{-1}) and five levels in experiments 2 and 3 (2.5–8.5 dS m^{-1}).Total and marketable yield decreased linearly with increasing salinity above a threshold EC value (EC_t).Average threshold EC values for total and marketable fruit yield were, respectively, 3.2 and 3.3 dS m^{-1}.Increasing salinity improved various aspects of fruit quality, such as: (i) proportion of ‘Extra’ fruits (high visual quality), (ii) soluble solids content, and (iii) titratable acidity content.However, salinity decreased fruit size, which is a major determinant of price.

An experiment was conducted to identify the threshold level that is intuitively a critical parameter for establishing plant salt tolerance by focused on physiological modifications that may occur in the plant at saline water. Hydroponically grown tomato plants to eight different salinity levels (EC = 2.5 (non-salinized control); 4.2; 6.0; 7.8; 9.6; 11.4; 13.2; 15.0 dS m^{-1}) were examined. Salinity causes several damages such as growth inhibition, metabolic disturbance and quality losses.Crop salt tolerance is generally assessed as the relative yield response to increasing root zone salinity, expressed as soil (EC_e) or irrigation water (EC_w) electrical conductivity. Alternatively, the dynamic process of salt accumulation into the shoot relative to the shoot biomass has also been considered as a tolerance index. These relationships are graphically represented by two intersecting linear regions, which identify (1) a specific threshold tolerance, at which yield begins to decrease, and (2) a declining region, which defines the yield reduction rate. Based on biomass production, water relations, leaf ions accumulation, leaf and root abscisic acid and stomatal conductance measurements, we were able to identify a specific EC value (approximately 9.6 dS m^{-1}) at which a sharp increase of the shoot and root ABA levels coincided with (1) a decreased sensitivity of stomatal response to ABA; (2) a different partitioning of Na^+ ions between young and mature leaves; (3) a remarkable increase of the root-to-shoot ratio (Maggio *et al.* 2007).

Salinity reduces the ability of plants to take up water, and this quickly causes reductions in plant growth rate. When excessive amounts of salt enter the plant, salt will eventually rise to toxic levels in the older transpiring leaves, causing premature senescence, and reduce the photosynthetic leaf area of the plant to a level that cannot sustain growth. Higher amount of Na^+ and Cl^- accumulation in plant was the cause of salt toxicity. Salt-tolerant plants differ from salt-sensitive ones in having a low rate of Na^+ and Cl^- transport to leaves, and the ability to compartmentalize these ions in vacuoles to prevent their build-up in cytoplasm or cell walls and thus avoid salt toxicity (Munns, 2002).

Munns and Termat (1986) explained that even at low salinity levels, external salt concentration is much greater than that of nutrient ions, so that a considerable concentration of ions may reach the xylem. Being the actively transpiring parts of the plant, the leaves accumulated salt, which leads to their premature death.

Olympios *et al*. (2003) found that salinity negatively affects the size of the plant and total weight of fruits: the higher the concentration, the lower the growth and yield. Four levels of salinity in the irrigation water (I: 1.7dS/m (control), II: 3.7dS/m, III: 5.7dS/m and IV: 8.7dS/m) were applied to tomato plants at various stages of growth and for different time duration. The number of fruits and the average weight of fruit were reduced at the highest salinity especially when applied at an early stage of growth. When good quality water was applied at the beginning of growth, followed later by salinity, the negative effect on plant height, fresh and dry weight of shoots, leaf area, yield, average weight of fruits and the percentage of fruit with blossom-end-rot was less severe.

A two-factor experiment was conducted by Rashid*et al*. (2010) at the Agricultural Research Station, Rumais, Oman to evaluate the performance of yield and quality of tomato (Lycopersicon esculentum L.) with three levels of saline water (3, 6 and 9 dS m-1) and three types of fertilizers *viz*, inorganic NPK, organic (cow manure), and a mixed fertilizer of both. Results indicated that growing tomatoes under 3 and 6 dS/m irrigation water produced the highest yield whereas irrigating with 9 dS/m significantly reduced the final fruit number and fruit weight. Tomatoes grown using cow manure produced the least amount of yield compared to those with inorganic and mixed fertilizers. Fruit quality attributes were not significantly affected by salinity or fertilizer treatments.

Saito *et al*. (2008) was conducted an experiment to investigate the effects of 50mM NaCl in ahydroponic solution on the levels of various metabolites,including soluble sugars, amino acids, and organic acids,and on the expression levels of salinity-responsive genes during fruit development. Results indicate that under salinity, brix (%),surface color density, and flesh firmness of the fruit were significantly enhanced, whereas fruit enlargement wassuppressed. Salinity stress strongly promoted the accumulation of sucrose, citrate, malate, and glutamate, andslightly promoted glucose and γ-amino butyric acid.t the transcriptional level, up-regulation ofethylene-synthetic 1-aminocyclopropane-1-carboxylate oxidaseand down-regulation of photosynthetic chlorophylla/b binding protein Cab-1Boccurred earlier in stressed fruit than in control fruit. Additionally, the carotenoid-biosynthesis regulatory gene, Phytoene synthase 1, and phosphoenolpyruvate carboxykinase(PEPCK) were up-regulated under moderate salinity in the red stage. The expression profiles of these genes in stress-treated fruitwere consistent with the changes in fruit quality, including earlier ripeningand a deeper red color. Furthermore,the up-regulation of PEPCKsuggested that gluconeogenesis is involved in the accumulation of sugars in salinity-stressed fruit.

Siddiky *et al*. (2012) reported that different salinity level (2, 4, 8 and12ds/m) significantly affects on tomato plant height, leaf area, plant growth, yield, dry matter plant, Na^+ and Cl^- accumulation in tomato tissues. Under saline condition, all plant parameters of tomato varieties werereducedcompared to the control. Plant growth and yield was decreased gradually with the increase of salinity levels.

SRDI (2007) reported that about 0.203 million ha of land is very slightly (2-4 dS/m), 0.492 million ha is slightly (4-8 dS/m), 0.461 million ha is moderately (8-12 dS/m) and 0.490 million ha is strongly (>12 dS/m) salt affected soils in southwestern part of the coastal area of Bangladesh.

Yasar*etal.*(2006) conducted an experiment to developed different mechanisms to be protected against toxic effects of Na^+ion. Salt-tolerant Gevas Sirik 57 (GS57) genotypes and salt-sensitive 4F-89 French variety of green bean were exposed in 100mM NaCl. Under saline condition the excess of Na^+, Cl^- and other ions modifies the metabolic activities of cell wall, which causes deposition of several materials on cell wall and limits the cell wall elasticity.Salt-sensitive 4F-89 French variety let Na^+accumulates in all organs. On the contrary, salt-tolerant GS57 did not avoid salt and acted selectively among ions; the majority of toxic ion Na^+accumulated in old leaves and shoots and the plants did not transport them into young leaves. K^+accumulation was high in organs in which N^+concentrations were low, and vice versa; Na^+con-tent was low in young and high in old leaves of GS57, but K^+content was opposite.

CHAPTER III

METHODOLOGY

This chapter includes the information regarding methodology that was used in execution of the experiment. It contains a short description of location of the experimental site, climatic condition, materials used for the experiment, treatments of the experiment,data collection procedure and statistical analysis etc.

3.1. Experimental site

The experiment was conducted at the Horticulture Farm, Sher-e-Bangla Agricultural University, Dhaka-1207, during the period from November, 2012to June, 2013. Location of the site is 23º 74$^{/}$ N latitude and 90º 35$^{/}$ E longitudes with an elevation of 8 meter from sea level (UNDP, 1988) in Agro-Ecological Zone of Madhupur Tract (AEZ. 28).

3.2. Climatic condition

The experimental site was situated in the subtropical monsoon climatic zone, which is characterized by scantly rainfall during rabi season.

3.3. Brinjal plant preparation for the experiment

Seeds of brinjal accessions EP-1, EP-2, EP-3, EP-4, EP-5, BR-3, BR-4, BR-5, MONI, JUMBO were collected from Advanced Seed Research and Biotech Centre (ASRBC), ACI Limited.

From each brinjal accession 90 plants were selected. Transplanted brinjal seedlings were provided sufficient moisture for seedlings establishment. After establishment, among 90 brinjal plants thirty plants were treated by Control, thirty plants were treated by 12dS/m salinity treatment and another thirty plants were as 16dS/msalinity treatment.

3.4. Treatments of the experiment

Treatments were as follows:

Factor A: Brinjal accessions

Symbol used	Accessions
V_1	EP-1
V_2	EP-2
V_3	EP-3
V_4	EP-4
V_5	EP-5
V_6	BR-3
V_7	BR-4
V_8	BR-5
V_9	MONI
V_{10}	JUMBO

Factor B:Salinity level

Symbol used	Treatment
S_0	Control (Normal soil)
S_1	12 dS/m
S_2	16 dS/m

3.5. Application of the treatments

The different salinity levels were obtained by dissolving commercial salt NaCl at the rate of 640mg per litre water for 1 dS/m salinity level maintained by EC meter. Plants in control treatments were not exposed to salinity; whereas plants were treated with 12 dS/m (6.6 g ACI salt/L of water) and 16 dS/m (8.8 ACI salt/L of water) salinity level respectively. A plastic bowl was placed under each pot and saline water (prepared) was given to the bowl from 20 days before transplanting of seedlings in pot to attain desire salinity level in the soil. Electrical conductivity of different salinity levels in bowl and soil was adjusted by a direct reading conductivity meter/EC meter (Plate 1). Electrical conductivity measured daily and added salt solution (calculated) in the bowl to maintain the exact salinity level in the soil. Saline water was given after soil reached near in dried conditions (visual observation).

3.6. Design and layout of the experiment

Two factors experiment was carried out in a Completely Randomized Design (CRD) with tenbrinjal accessions and three levels of NaCl salinity following three replications. Three pots for each levels of treatment and 90 (30 × 3) pots were used in this experiment. Each pot was 35 cm (14 inches) in diameter and 30 cm (12 inches) in height.

3.7.1. Pot preparation

Soil was well pulverized and dried in the sun and decomposed cow dung was mixed with the soil. Pots were filled up 15 days before transplanting. Loamy soils were used for pot preparation.Weeds and stubbles were completely removed from the soil. The soil was dried in the sun, crushed carefully and thoroughly mixedand soil was treated with little amount of lime (5g/pot) to keep soil free from pathogen.

3.7.2. Transplanting of seedlings

Thirty days aged seedlings were transplanted in the pot. Total 90 pots were used and each pot contains one seedling. According to the treatments plants were tagged 30 DAT by using card.

3.7.3. Intercultural operations

Weeding was done for all pots when required, to keep the plant free from weeds, diseases and pests that can be a major factor to limiting brinjal production. Experimental brinjal plants were treated with Dithane M45 @ 0.5 ml/L and 2 gm/L to prevent unwanted disease problems. On the other hand, Leaf feeder is one of the important pests during the growing stage. Leaf feeder was controlled by Tufgor @ 1.5 ml/L. Those fungicides and insecticide were sprayed two times, first at vegetatively growing stage and next to early flowering stage to manage diseases and pests.

Precautionary measures against disease infection especially phomopsis fruit rot of brinjal was taken by spraying Bavistin fortnightly at the rate of 2 g/L.

3.7.4. Harvesting of fruits

Harvesting of fruits was done after the fruits reached at maturity stage. Brinjal fruits were harvested when they attained full maturity indicating deep violet in color and hard in consistency. Harvesting was started78 DAT and was continued until 150 DAT as economic production.

3.8. Parameters

Pertinent data were collected from each pot in respect of the following parameters:

i.Growth related parameters

a) Plant height (cm)
b) Leaf number
c) Leaf area (cm^2)
d) Chlorophyll content(%)

ii. Duration related parameters

e) Days to first flower bud initiation from transplanting (visual observation)
f) Days to 1st flowering
g) Days to 1st fruit setting
h) Days to 1st fruit harvesting

iii. Yield related parameters

i) No. of flower buds / plant
j) No. of flowers / plant
k) No. of fruits / plant
l) Average fruit weight (gm)
m) Average fruit length (cm)
n) Average diameter of fruit (mm)
o) Yield per plant
p) Yield per ha (Calculated)

3.9. Data Collection

3.9.1.Plant height

Plant height of each plant of each pot was measured in cm by using meter scale and the mean was calculated.

3.9.2. Number of leaves, flower buds, flowers and fruits per plant

Number of leaves, flower buds, flowers and fruits per plant was recorded by counting all the leaves, flower buds, flowers and fruits from each plant of pot and the mean was calculated.

3.9.3 Leaf area

Leaf area was measured by non-destructive method using CL-202 Leaf Area Meter, (USA). Mature leaf were measured first at 40 DAT and expressed in cm^2.

3.9.4 Days to flower bud initiation, flowering, fruit setting and harvesting

Days to inflorescence initiation (visual observation), flowering, fruiting and harvesting was counted the days from date of brinjal plants transplanting.

3.9.5. Chlorophyll content

Leaf chloroplyll content was measured by using SPAD-502. The chlorophyll content was measured from 4 different portion of the leaf and then averaged for analysis**.**

3.9.6. Fruit weight

Fruit weight was measured by Electric balance in gram. Total fruit weight of each pot was obtained by addition the weight of total fruit and average fruit weight was obtained from division of the total fruit weight by total number of fruit.

3.9.7. Fruit length and diameter measurement

Fruit length was measured with a scale from the neck of the fruit to the bottom and average was calculated and expressed in cm. Diameter of fruit was measured at the middle portion of selected marketable fruit from each plant with a slide calipers and their average was calculated and expressed in mm.

3.9.8. Yield per plant

Electric balance was used to take the weight of fruits per plant. It was measured by the summation of all harvested fruit weight per plant and finally data were recorded in kilogram (kg).

3.9.9. Yield per hectare (Calculated)

The calculated number of plant in one hectare of land approx. 20408.0; when spacing was 70cm x 70cm spacing (Mondal *et al*. 2011). Calculated yield per hectare of brinjal fruits was recorded by multiplying the yield per plant and the number of plant per ha and data were recorded in ton.

3.10. Statistical analysis

Collected data were statistically analyzed using MSTAT-C computer package programme. Mean for every treatments were calculated and the analysis of variance for each one of the characters was performed by F–test (Variance Ratio). Difference between treatments was evaluated by Duncan’s Multiple Range (DMRT) test at 5% level of significance (Gomez and Gomez, 1984).

CHAPTER IV
RESULT AND DISCUSSION

The research work was conducted to identify the suitable brinjal accessionsfor commercial production in saline prone areas of Bangladesh under saline conditionand in this chapter the findings of the research work have been presented and discussed. Some of the data have been presented in table (s)for ease of discussion, comprehension and understanding. A summary of the analysis of variances in respect of all the parameters have been shown in appendices.Resultshave been presented and discussed, and possible interpretations are given under the following heads.

4.1 Plant height (cm)

Plant height of different brinjal accessionsvaried significantly at 35, 45, 55, 65, 75, 85 and 95 DAT. At 95 DAT,the tallest plant was found from V_2(57.2 cm) while the shortest plant from V_6(29.8 cm) . (Table 1)

Plant height of brinjal showed statistically significant differences among different salinity levels at different DAT. The tallest plant was found fromcontrolS_0 (46.6 cm) whereas the shortest from S_2 (31.1 cm) at 95 DAT (Table 2). Study referred that plant height was found to decrease gradually an increase of salinity level (Siddiky *et al*. 2012). The suppression of plant growth under saline conditions may either be due to decreased availability of water or to the toxicity of sodium chloride (Munns, 2002). Subsequently, excessive accumulation of salts can lead to death of tissues, organs and whole plants (Munns and Termaat, 1986). Brinjal accessions and different levels of salinity combinedly showed a statistically significant variation at different days after transplanting. The tallest plant was found from V_2S_0 (70.5 cm) whereas V_6S_2(15.5 cm) provided the shortest one at 95 DAT(Table 3).

Table 1. Performance of brinjal accessions to plant height at different DAT[Y]

Accessions[X]	Days after transplanting (DAT)													
	35		45		55		65		75		85		95	
V_1	6.7	f	7.8	f	16.7	e	31.8	a	34.8	c	37.2	d	41.2	d
V_2	5.0	i	7.8	f	16.2	f	30.2	c	38.8	b	54.2	a	57.2	a
V_3	5.8	g	8.3	e	20.5	b	31.5	b	40.2	a	42.2	b	48.8	b
V_4	5.7	h	7.0	h	10.0	i	25.5	f	25.5	g	29.8	g	32.2	g
V_5	4.8	j	6.7	i	16.2	f	17.8	i	25.5	g	27.5	i	31.5	h
V_6	9.2	d	11.3	d	18.0	d	21.5	h	23.8	h	26.8	j	29.8	j
V_7	12.2	a	14.7	a	21.0	a	30.2	c	31.2	d	30.8	f	32.5	f
V_8	11.8	b	12.5	c	19.5	c	29.8	d	34.8	c	36.2	e	37.5	e
V_9	10.2	c	14.5	b	14.8	g	26.5	e	29.8	e	29.5	h	31.2	i
V_{10}	6.8	e	7.7	g	13.0	h	25.2	g	27.2	f	37.5	c	41.5	c
LSD0.05	0.1		0.1		0.2		0.2		0.1		0.1		0.2	
CV%	3.2		4.4		3.8		2.9		5.7		8.7		13.4	

[X] V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4, EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Table 2. Performance of brinjal accessions under different salinity levels to plant height at different DAT[Y]

Salinity levels[X]	Days after transplanting (DAT)													
	35		45		55		65		75		85		95	
S_0	9.5	a	11.4	a	20.5	a	35.1	a	37.6	a	43.2	a	46.6	a
S_1	7.9	b	10.5	b	17.3	b	27.0	b	31.1	b	34.4	b	37.3	b
S_2	6.1	c	7.7	c	12.1	c	18.9	c	24.8	c	27.9	c	31.1	c
LSD0.05	0.7		0.9		1.2		1.5		2.6		3.3		3.7	
CV%	3.2		4.4		3.8		2.9		5.7		8.7		13.4	

[X] S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Table 3. Combined effect of brinjal accessionsand different salinity levels to plant height[Y]

Treatment combinations[X]	Plant height (cm)						
	Days after transplanting (DAT)						
	35	45	55	65	75	85	95
V_1S_0	9.0 f	9.0 j	20.5 g	43.5 a	44.5 d	46.5 d	55.5 b
V_1S_1	7.5 g	9.0 j	19.0 h	32.5 f	30.5 g	32.5 j	32.5 j
V_1S_2	3.5 l	5.5 q	10.5 t	19.5 q	29.5 h	32.5 j	35.5 h
V_2S_0	5.5 i	7.0 n	18.0 j	39.5 d	50.5 a	70.5 a	70.5 a
V_2S_1	4.5 k	8.0 l	16.5 l	28.5 h	35.5 e	47.5 c	50.5 c
V_2S_2	5.0 j	8.5 k	14.0 o	22.5 n	30.5 g	44.5 f	50.5 c
V_3S_0	5.5 i	7.5 m	24.5 d	40.5 c	47.5 c	47.5 c	55.5 b
V_3S_1	7.5 g	12.5 f	25.5 b	28.5 h	44.5 d	45.5 e	45.5 e
V_3S_2	4.5 k	5.0 r	11.5 r	25.5 k	28.5 i	33.5 i	45.5 e
V_4S_0	7.5 g	9.5 i	13.0 q	30.5 g	30.5 g	32.5 j	32.5 j
V_4S_1	6.5 h	7.0 n	11.0 s	35.5 e	30.5 g	31.5 k	33.5 i
V_4S_2	3.0 m	4.5 s	6.0 v	10.5 t	15.5 m	25.5 n	30.5 k
V_5S_0	4.5 k	6.0 p	24.0 e	27.5 i	30.5 g	33.5 i	35.5 h
V_5S_1	5.5 i	8.5 k	16.0 m	14.5 r	30.5 g	32.5 j	40.5 f
V_5S_2	4.5 k	5.5 q	8.5 u	11.5 s	15.5 m	16.5 p	18.5 n
V_6S_0	10.5 e	12.5 f	27.0 a	30.5 g	30.5 g	32.5 j	40.5 f
V_6S_1	11.5 d	15.0 e	18.5 i	23.5 m	28.5 i	32.5 j	33.5 i
V_6S_2	5.5 i	6.5 o	8.5 u	10.5 t	12.5 n	15.5 q	15.5 o
V_7S_0	17.5 a	18.5 b	25.0 c	41.5 b	32.5 f	34.5 h	36.5 g
V_7S_1	7.5 g	10.5 h	17.5 k	24.5 l	28.5 i	27.5 m	30.5 k
V_7S_2	11.5 d	15.0 e	20.5 g	24.5 l	32.5 f	30.5 l	30.5 k
V_8S_0	14.5 b	16.5 c	23.5 f	40.5 c	48.5 b	49.5 b	50.5 c
V_8S_1	10.5 e	12.0 g	19.0 h	26.5 j	30.5 g	31.5 k	33.5 i
V_8S_2	10.5 e	9.0 j	16.0 m	22.5 n	25.5 k	27.5 m	28.5 l
V_9S_0	12.5 c	19.0 a	14.5 n	30.5 g	30.5 g	37.5 g	40.5 f
V_9S_1	12.5 c	15.5 d	18.5 i	28.5 h	28.5 i	30.5 l	32.5 j
V_9S_2	5.5 i	9.0 j	11.5 r	20.5 p	30.5 g	20.5 o	20.5 m
$V_{10}S_0$	7.5 g	8.0 l	14.5 n	26.5 j	30.5 g	47.5 c	48.5 d
$V_{10}S_1$	5.5 i	6.5 o	11.0 s	27.5 i	23.5 l	32.5 j	40.5 f
$V_{10}S_2$	7.5 g	8.5 k	13.5 p	21.5 o	27.5 j	32.5 j	35.5 h
LSD0.05	0.1	0.1	0.2	0.1	0.1	0.1	0.2
CV%	3.2	4.4	3.8	2.9	5.7	8.7	13.4

[X] V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO; S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

s4.2Number of leaf per plant

Significant variation was found among the accessions performance in terms of leaf number (Appendix II). Leaf number of brinjal showed statistically significant differences among different accessionsat 35, 45, 55, 65, 75, 85 and 95 DAT.The highest number of leaf at 95 DAT (32.2) was recorded from V_1while the lowest number of leaf (19.8) from V_4 (Tabla 4).

Leaf number of brinjal accessionsshowed statistically significant differences among different salinity levels such as control, 12 dS/m and 16 dS/m. At 95 DAT,the highest leaf number(39.1) was observed in control treated plants and the lowest leaf number(15.1)from S_2 (16 dS/m) (Table 5). Reduction in number of leaves due to the increase of salinity levels were also found by Karen *et*al. (2002), Jamil *et*al. (2005). The decrease of leaf numbers may be due to the accumulation of sodium chloride in the cell walls and cytoplasm of the leaves. This leads to their quick death and cut down of leaves (Munns, 2002).

Combined effect of different brinjal accessions and different salinity treatments in terms of leaf number also showed significant variation (Table 6). Leaf number of brinjal accessions showed statistically significant differences among treatments. At 95 DAT, the highest number of leaf (58.5) was recorded from V_1S_0 treatment, while the lowest number of leaf (6.5) from V_8S_2 treatment (Table 6).

Table 4. Performance of brinjal accessions to leaf number at different DAT[Y]

Accessions[X]	Different days after transplanting(DAT)													
	35		45		55		65		75		85		95	
V_1	7.2	c	7.8	e	11.2	d	15.2	b	21.2	a	21.5	c	32.2	a
V_2	6.2	f	6.8	h	9.8	f	13.2	e	20.2	c	23.8	a	31.5	b
V_3	5.8	g	6.8	e	9.8	f	12.2	f	17.2	f	13.5	i	21.5	g
V_4	6.5	e	6.8	f	10.2	e	9.2	h	13.8	i	15.8	h	19.8	j
V_5	6.5	e	6.8	g	10.2	e	14.2	c	19.8	d	20.5	d	20.2	i
V_6	6.8	d	6.8	c	13.8	c	11.5	g	14.5	h	18.8	f	23.2	f
V_7	13.2	a	6.8	a	18.2	a	16.2	a	20.5	b	19.2	e	25.8	d
V_8	6.5	e	6.8	f	8.5	g	11.5	g	15.2	g	16.8	g	20.5	h
V_9	9.2	b	6.8	b	14.8	b	13.8	d	19.2	e	20.5	d	24.5	e
V_{10}	7.2	c	6.8	d	7.8	h	12.2	f	17.2	f	22.8	b	28.5	c
LSD0.05	0.1		6.8		0.1		0.1		0.2		0.2		0.2	
CV%	4.7		6.8		7.2		9.1		13.4		16.2		18.2	

[X] V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6 ; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO
[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Table 5.Performance of brinjal accessionsunder different salinity levels to leaf number[Y]

Salinity levels[X]	Leaf number (DAT)													
	35		45		55		65		75		85		95	
S_0	9.8	a	13.9	a	13.6	a	16.4	a	21.5	a	32.6	a	39.1	a
S_1	6.8	b	9.7	b	11.7	b	12.5	b	17.6	b	14.9	b	20.1	b
S_2	5.9	c	6.8	c	9.0	c	9.8	c	14.5	c	10.5	c	15.1	c
LSD0.05	0.1		1.1		1.3		1.4		1.6		2.3		3.4	
CV%	4.7		5.6		7.2		9.1		13.4		16.2		18.2	

[X] S_0: control; S_1: 12 dS/m; S_2: 16 dS/m
[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Table 6. Combined performance of brinjal accessions and different salinity levels to number of leaf[Y]

Treatmentcombinations[X]	Leaf number (DAT)													
	35		45		55		65		75		85		95	
V_1S_0	8.5	e	9.5	i	13.5	g	22.5	b	27.5	b	42.5	a	58.5	a
V_1S_1	6.5	g	7.5	k	12.5	h	12.5	g	19.5	h	11.5	m	23.5	i
V_1S_2	6.5	g	6.5	l	7.5	m	10.5	i	16.5	k	10.5	n	14.5	n
V_2S_0	7.5	f	8.5	j	10.5	j	12.5	g	20.5	g	33.5	d	38.5	d
V_2S_1	5.5	h	6.5	l	10.5	j	16.5	d	24.5	d	20.5	f	30.5	g
V_2S_2	5.5	h	5.5	m	8.5	l	10.5	i	15.5	l	17.5	h	25.5	h
V_3S_0	5.5	h	9.5	i	9.5	k	13.5	f	16.5	k	17.5	h	31.5	f
V_3S_1	6.5	g	7.5	k	11.5	i	14.5	e	16.5	k	13.5	l	17.5	l
V_3S_2	5.5	h	6.5	l	8.5	l	8.5	k	18.5	i	9.5	o	15.5	m
V_4S_0	8.5	e	10.5	h	18.5	c	13.5	f	16.5	k	20.5	f	25.5	h
V_4S_1	6.5	g	8.5	j	5.5	o	8.5	k	17.5	j	13.5	l	13.5	o
V_4S_2	4.5	i	3.5	n	6.5	n	5.5	m	7.5	p	13.5	l	20.5	k
V_5S_0	6.5	g	8.5	j	12.5	h	24.5	a	33.5	a	37.5	b	35.5	e
V_5S_1	6.5	g	7.5	k	10.5	j	12.5	g	15.5	l	15.5	j	12.5	p
V_5S_2	6.5	g	5.5	m	7.5	m	5.5	m	10.5	o	8.5	p	12.5	p
V_6S_0	8.5	e	17.5	c	12.5	h	13.5	f	11.5	n	30.5	e	35.5	e
V_6S_1	6.5	g	13.5	f	21.5	b	12.5	g	19.5	h	19.5	g	25.5	h
V_6S_2	5.5	h	6.5	l	7.5	m	8.5	k	12.5	m	6.5	q	8.5	q
V_7S_0	22.5	a	30.5	a	25.5	a	22.5	b	26.5	c	35.5	c	42.5	b
V_7S_1	10.5	c	16.5	d	13.5	g	13.5	f	18.5	i	13.5	l	20.5	k
V_7S_2	6.5	g	11.5	g	15.5	e	12.5	g	16.5	k	8.5	p	14.5	n
V_8S_0	7.5	f	9.5	i	10.5	j	17.5	c	22.5	e	35.5	c	40.5	c
V_8S_1	6.5	g	6.5	l	8.5	l	9.5	j	12.5	m	8.5	p	14.5	n
V_8S_2	5.5	h	6.5	l	6.5	n	7.5	l	10.5	o	6.5	q	6.5	r
V_9S_0	13.5	b	24.5	b	14.5	f	12.5	g	18.5	i	35.5	c	40.5	c
V_9S_1	7.5	f	14.5	e	16.5	d	16.5	d	19.5	h	16.5	i	20.5	k
V_9S_2	6.5	g	9.5	i	13.5	g	12.5	g	19.5	h	9.5	o	12.5	p
$V_{10}S_0$	9.5	d	10.5	h	8.5	l	11.5	h	21.5	f	37.5	b	42.5	b
$V_{10}S_1$	5.5	h	8.5	j	6.5	n	8.5	k	12.5	m	16.5	i	22.5	j
$V_{10}S_2$	6.5	g	6.5	l	8.5	l	16.5	d	17.5	j	14.5	k	20.5	k
LSD0.05	0.1		0.1		0.1		0.2		0.2		0.1		0.1	
CV%	4.7		5.6		7.2		9.1		13.4		16.2		18.2	

[X]V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO; S_0: control; S_1: 12 dS/m; S_2: 16 dS/m
[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

4.3Leaf area(cm^2)

Leaf area was measured at 40 days after transplanting and showed significant differences among the accessions**.**At 40 DAT, the highest leaf area (66.6 cm) was recorded from V_5, while the lowest (25.9 cm) from V_2 (Table 7).

In salinity levels the highest leaf area (78.2cm) was recorded from S_0, while the lowest (28.9 cm) from S_2 (Table 8). From the current study it was observed that leaf area of brinjal plant was dramatically reduced with the increases of saline stress. At higher EC levels such as 6.1 dS/m and 8.1 dS/m the leaf area of plant was restricted. Reduction in leaf area due to the increase of salinity levels was also found by Jamil *et al*. (2007), Siddiky *et al*. (2012). Under saline condition as soon as new cell starts its elongation process, the excess of Na+, Cl- and other ions modifies the metabolic activities of cell wall, which causes deposition of several materials on cell wall and limits the cell wall elasticity Yasar *et al*. (2006). Excessive amounts of salt in plants can become toxic in older leaves, causing premature senescence and a reduction intotal photosynthetic leaf area (Munns, 2002).

Interaction effect of brinjal accessions and different salinity levels showed statistically significant variation in leaf area per plant (Appendix III). At 40 DAT, the highest leaf area (113.8 cm) was recorded from V_7S_0 while the lowest leaf area (7.7 cm) from V_4S_2 (Table 9).

4.4 Chlorophyll content (%)

Due to different brinjal accessions chlorophyll content per plant varied significantly. At 40 DAT, the maximum chlorophyll content (52.3) was recorded from V_6, while the lowest (43.4) from V_8 (Table 7).

In different sanility levels the highest chlorophyll content (52.7) was recorded from S_0, while the lowest chlorophyll content (41.0) from S_2 (Table 8). Reduction in chlorophyll content due to the increase of salinity levels were also found by Amini and Ehsnapour (2006) and Ali *et al*. (2004).The Ca^{2+} deficiency in salt stress had been associated to a decreased transpiration rate rather than competition effects with Na^+, additionally Ca^{2+} may ameliorate plant response to salinity (Maggio *et al.* 2006).

Interaction effect of brinjal accessions and different salinity levels showed significant variation. At 40 DAT, the highest chlorophyll content (59.2) was recorded from V_6S_0, while the lowest chlorophyll content (37.5) from $V_{10}S_2$ (Table 9 and Appendix III).

4.5 Days to first flower bud initiation (Visual observation)

Significant variation in respect of days to flower bud initiation was obtained due to the different varieties (Appendix IV). Flower bud initiation in V_3 required the longest period (81.1 days) and the shortest period (48.1 days) was V_1 (Table **7**). This result shows that $V_1$is the earliest accessionwhereas V_3accessionis the late one.

Days to frist flower bud initiation was significantly affected by different salinity levels (Appendix IV). Flower bud initiation was earliest (56.3 days) in S_0 (control) treatment and delayed (70.7) days in S_2treatment(Table 8).

Brinjal accessionsand different salinity levels combinely affects on days required to flower bud initiation from transplantation of seedling (Appendix IV). V_6S_0 treatment required minimum days (41.4 days) for first flower bud initiation, where the maximum days (89.4 days) required for V_3S_2 treatment. (Table 9).

4.6 Days to first flower bloom (Visual observation)

Significant variation was found for days required to flower bloom from flower bud initiation (Appendix IV). Lowest days (50.7 days) required to flower bloom was in V_1 and maximum days (87.7 days) required for V_3(Table 7).

Variation was also found in different salinity levels for days to first flower bloom. Days taken to first flowering was earlier in S_0 (control) and the maximum days (74.7) was required for S_2(Table 8).

Significant variation was found for days required to flower bloom from flower bud initiation in terms of accessions and different salinity levels (Appendix IV). The minimum days (44.4 days) were required for flowering in V_1S_0 treatment and the maximum (93.4 days) were required for V_3S_2(Table 9).

4.7 Days to first fruit setting

Significant difference was observed for days to first fruit setting with different brinjal accessions(Appendix IV).The longest period (97.07 days) were required for fruit setting in $V_3$where as V_1requiredthe shortest period (55.4 days) (Table 7).

Significant variation was found for days required to fruit set from flower bloom in different salinity levels. The longest period (79.1 days) was required for fruit setting in S_2 where asthe shortest period (67.6 days) in S_0(Table 8).

Combined effect of different brinjal accessions and different salinity levels also showed significant difference for days required to fruit setting (Appendix IV and Table 9). V_1S_0 treatment was found as superior combination (49.4 days) for days to frutting whereas $V_3S_2$was performed as inferior combination (100.4 days) required (Table 9).

Table 7.Performance of brinjal accessionssto different attributes[Y]

Accessions[X]	Leaf area at 40 DAT		Chlorophyll Content (%) at 40 DAT		Days to first flower bud initiation		Days to first flower blooming		Days to first fruit set	
V_1	62.1	b	50.1	b	48.1	j	50.7	j	55.4	j
V_2	25.9	j	48.7	c	62.1	e	69.1	e	78.4	d
V_3	45.9	h	48.7	c	81.1	a	87.7	a	97.7	a
V_4	26.6	i	44.8	g	53.1	h	59.1	h	64.1	h
V_5	66.6	a	47.5	d	79.4	b	82.7	b	86.4	b
V_6	61.0	c	52.3	a	49.1	i	54.7	i	59.4	i
V_7	57.4	d	47.5	e	59.7	f	63.7	f	68.4	f
V_8	54.6	e	43.4	h	67.7	d	73.4	c	80.1	c
V_9	54.0	f	44.9	g	58.1	g	61.1	g	65.1	g
V_{10}	53.8	g	45.8	f	68.1	c	69.7	d	75.1	e
LSD0.05	0.5		0.2		0.3		0.6		0.9	
CV%	11.4		13.2		9.2		5.6		6.9	

Salinity levels[X]	Leaf area at 40 DAT		Chlorophyll Content (%) at 40 DAT		Days to first flower bud initiation		Days to first flower blooming		Days to first fruit set	
S_0	78.2	a	52.7	a	56.3	c	61.1	c	67.6	c

[X]V_1; EP-1, V_2; EP-2, V_3; EP-3), V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

S_1	45.3	b	48.4	b	60.9	b	65.8	b	72.3	b
S_2	28.9	c	41.0	c	70.7	a	74.7	a	79.1	a
LSD0.05	6.7		3.9		3.1		3.8		4.4	
CV%	11.4		13.2		9.2		5.6		6.9	

Table 8. Performance of brinjal accessions to different salinity levels to different attribute[Y]

[X]S_0: control; S_1: 12 dS/m; S_2: 16 dS/m
[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Treatment combinations[X]	Leaf area at 40 DAT		Chlorophyll Content (%) at 40 DAT		Days to first flower bud initiation		Days to first flower blooming		Days to first fruit set	
V_1S_0	91.4	d	54.5	b	42.4	u	44.4	z	49.4	x
V_1S_1	54.5	i	51.6	e	47.4	s	49.4	x	54.4	v
V_1S_2	40.5	n	44.2	j	54.4	p	58.4	s	62.4	r
V_2S_0	37.5	o	54.3	b	58.4	m	65.4	o	75.4	j
V_2S_1	24.5	s	49.5	f	63.4	k	68.4	m	79.4	i
V_2S_2	15.8	u	42.2	l	64.4	j	73.4	h	80.4	h
V_3S_0	67.3	g	55.0	b	75.4	e	83.4	d	94.4	c
V_3S_1	47.7	k	49.5	f	78.4	c	86.4	c	98.4	b
V_3S_2	22.7	t	41.6	m	89.4	a	93.4	a	100.4	a
V_4S_0	44.1	m	48.9	g	45.4	t	53.4	u	59.4	s
V_4S_1	28.0	r	46.0	h	52.4	q	58.4	s	63.4	q
V_4S_2	7.7	v	39.4	o	61.4	l	65.4	o	69.4	m
V_5S_0	97.5	c	53.6	c	74.4	f	76.4	g	82.4	g
V_5S_1	58.6	h	49.1	f	77.4	d	83.4	d	86.4	e
V_5S_2	43.6	m	39.9	o	86.4	b	88.4	b	90.4	d
V_6S_0	106.5	b	59.2	a	41.4	v	48.4	y	52.4	w
V_6S_1	45.9	l	53.5	c	47.4	s	51.4	w	57.4	u
V_6S_2	30.6	q	44.3	j	58.4	m	64.4	p	68.4	n
V_7S_0	113.8	a	52.7	d	52.4	q	57.4	t	62.4	r
V_7S_1	32.8	p	48.1	g	56.4	n	61.4	q	67.4	o
V_7S_2	25.7	s	41.7	m	70.4	g	72.4	i	75.4	j
V_8S_0	73.9	f	46.4	h	61.4	l	69.4	l	75.4	j
V_8S_1	53.4	i	43.5	k	66.4	i	71.4	j	80.4	h
V_8S_2	36.6	o	40.3	n	75.4	e	79.4	f	84.4	f
V_9S_0	72.0	f	51.1	e	50.4	r	52.4	v	58.4	t

V_9S_1	56.7	h	45.0	i	55.4	o	60.4	r	63.4	q
V_9S_2	33.2	p	38.5	p	68.4	h	70.4	k	73.4	k
$V_{10}S_0$	78.2	e	51.7	e	61.4	l	60.4	r	66.4	p
$V_{10}S_1$	50.7	j	48.3	g	64.4	j	67.4	n	72.4	l
$V_{10}S_2$	32.4	p	37.5	q	78.4	c	81.4	e	86.4	e
LSD0.05	1.1		1.0		0.1		0.1		0.1	
CV%	11.4		13.2		9.2		5.6		6.9	

Table 9.Combined effect of brinjal accessions and different salinity levels to different attribute[Y]

[X]V_1; EP-1,V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO; S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

4.8 Days to first fruit harvest

Days to fruit maturity from fruit set showed significant variation with different accessions of brinjal (Appendix IV). Differences in time required for fruit maturity with brinjal accessions.V_3required maximum days (132.1days) for fruit maturity where as V_1required minimum days (81.1 days) for fruit maturity from fruit set (Table 10).

Different salinity levels showed significant variation in terms of days to fruit harvest from fruit set of brinjal (Appendix IV). The maximum days to fruit harvest from fruit set (119.9 days) were recorded from S_2 and the minimum days (98.5 days) were found from S_0 treatment (Table 11).

Combined effect of brinjal varieties along with various salinity levels also showed significant difference for days to fruit maturity (Appendix IV).The maximum days (138.4 days) to fruit maturity from fruit set were found from V_3S_2 and the minimum days (77.4 days) were recorded from $V_1S_0$and V_6S_0 (77.4 days) (Table 12).

4.9 Number of flower bud/ plant

Number of flower bud/plant showed significant variation with different accessions of brinjal (Appendix III). V_9produced the highest number of flower bud (67.7)where as lowest number were producedby the accession V_1(55.1) (Table 10).

Differentsalinity levels showed significant variation in terms flower bud number per plant (Appendix III). The maximum flower bud (69.8) were recorded from $S_0$and the minimum (50.4) were found from S_2 treatment (Table 11).

Combined effect of brinjal accessions and different salinity levels also showed significant difference for flower bud numbers per plant (Appendix IV). The maximum flower bud (80.4)were found from $V_9S_0$and the minimum flower bud (45.4) were recorded from V_1S_2(Table 12).

4.10 Number of flowers per plant

Number of flowers per plant was significantly varied with brinjal accessions (Appendix III). Number of flowers was highest (62.1/plant) in $V_3$and V_1 accessioncarried the lowest number of flowers (50.1/plant) (Table 10). This result showed that V_3has the potentiality to bear maximum number of flowers.

Different salinity levels significantly influenced the production of flowers per plant (Appendix III). The treatment S_0 in where no NaCl was used produced maximum number of flowers (63.8/plant) while minimum number of flowers per plant (44.6/plant) was obtained from the S_2 (16 dS/m) treatment (Table 11). This result indicated that the plants of control treatment(S_0) bear more flowers. Reduction in number of flowers per plant due to the increase of salinity levels were also found by Grunberg *etal*. (1995). Reduction in flower number in salinity stress may be due to the restriction of water supply before and during inflorescence initiation (Saito and Ito, 1974).

Combined effectof different brinjal accessions and different salinity levels showed statistically significant variation in number of flowers per plant (Appendix III). Maximum number of flowers per plant (74.4/plant) was recorded from V_9S_0 and minimum number of flowers per plant (39.4/plant) was recorded from V_1S_2treatments (Table12).

4.11 Number of fruits per plant

Brinjal accessions showed significant variation regarding number of fruits per plant (Appendix III). Maximum number of fruits per plant (34.1/plant) was recorded from V_1 while minimum number of fruit per plant (28.1/plant) was recorded from V_{10}varieties (Table 10). This result clearly showed that V_1 has potentiality to bear maximum number of fruits.

Effect of different salinity levels on the number of fruits per plant was found significant (Appendix III). Maximum number of fruits (42/plant) was recorded from S_0 treatment and the minimum number of fruits (20.7/plant) was obtained from S_2(Table 11). Reduction in fruit number may be due to the increase of salinity levels which was also reported by Rashid *etal*. (2010) and Siddiky *et al*. (2012). The number of fruits per plant was restricted when the level of salinity in the root zone was 8 dS/m or higher Olympios *etal*. (2003). Number of pollen grain/flower was decrease in higher salinity level and this increasing salinity reduces the fruit setting on tissues (Adams and Ho, 1992).

Brinjal accessions along with different salinity levels showed statistically significant variation in number of fruits per plant (Appendix III) combinely. Maximum number of fruits per plant (47.4/plant) was recorded from V_1S_0 and minimum number of fruits per plant (17.4/ plant) was recorded from $V_{10}S_2$treatments (Table 12).

Table 10.Performance of brinjal accessions to different attributes[Y]

[X]V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO;

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ

Accessions[X]	Days to first fruit harvest		No. of flower buds/plant		Number of flowers/plant		Number of fruits/plant	
V_1	81.1	j	55.1	i	50.1	j	34.1	a
V_2	109.1	d	58.1	g	51.4	i	30.7	e
V_3	132.1	a	57.7	h	52.7	f	30.4	f
V_4	102.7	f	57.7	h	51.7	h	31.1	d
V_5	119.7	b	60.7	e	55.4	e	30.4	f
V_6	84.7	i	58.7	f	52.4	g	32.4	b
V_7	96.7	h	67.1	b	62.1	a	29.1	h
V_8	113.4	c	63.1	d	56.1	d	31.4	c
V_9	99.1	g	67.7	a	61.7	b	29.4	g
V_{10}	108.4	e	64.7	c	58.4	c	28.1	i
LSD0.05	0.6		0.5		0.2		0.1	
CV%	4.2		8.7		3.1		3.7	

significantly as per 0.05 level of probability

Table 11.Performance of brinjal accessions with different salinity levels to different attributes[Y]

Salinity levels[X]	Days to first fruit harvest		Number of flower buds/plant		Number of flowers/plant		Number of fruits/plant	
S_0	98.5	c	69.8	a	63.8	a	42.0	a
S_1	103.7	b	63.0	b	57.2	b	29.4	b
S_2	111.9	a	50.4	c	44.6	c	20.7	c
LSD0.05	5.1		6.3		5.7		8.4	
CV%	4.2		8.7		3.1		3.7	

[X] S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Table 12. Combined effect of brinjal accessions and different salinity levels to different attributes[Y]

Treatment combinations[X]	Days to first fruit harvest		Number of flower buds/plant		Number of flowers/plant		Number of fruits/plant	
V_1S_0	77.4	w	61.4	l	56.4	l	47.4	a
V_1S_1	80.4	v	58.4	o	54.4	n	34.4	f
V_1S_2	85.4	u	45.4	v	39.4	v	20.4	o

V_2S_0	104.4	m	64.4	j	57.4	k	40.4	d
V_2S_1	106.4	l	59.4	n	52.4	p	29.4	h
V_2S_2	116.4	h	50.4	s	44.4	t	22.4	m
V_3S_0	126.4	c	64.4	j	59.4	i	41.4	c
V_3S_1	131.4	b	58.4	o	53.4	o	28.4	i
V_3S_2	138.4	a	50.4	s	45.4	s	21.4	n
V_4S_0	96.4	q	65.4	i	58.4	j	39.4	e
V_4S_1	103.4	n	60.4	m	55.4	m	30.4	g
V_4S_2	108.4	j	47.4	u	41.4	u	23.4	l
V_5S_0	112.4	i	68.4	g	63.4	f	40.4	d
V_5S_1	124.4	d	62.4	k	57.4	k	29.4	h
V_5S_2	122.4	e	51.4	r	45.4	s	21.4	n
V_6S_0	77.4	w	66.4	h	59.4	i	44.4	b
V_6S_1	80.4	v	60.4	m	53.4	o	30.4	g
V_6S_2	96.4	q	49.4	t	44.4	t	22.4	m
V_7S_0	89.4	t	78.4	b	73.4	b	40.4	d
V_7S_1	94.4	r	70.4	e	65.4	e	27.4	j
V_7S_2	106.4	l	52.4	q	47.4	r	19.4	p
V_8S_0	108.4	j	73.4	d	66.4	d	44.4	b
V_8S_1	112.4	i	64.4	j	57.4	k	29.4	h
V_8S_2	119.4	f	51.4	r	44.4	t	20.4	o
V_9S_0	92.4	s	80.4	a	74.4	a	41.4	c
V_9S_1	97.4	p	69.4	f	62.4	g	28.4	i
V_9S_2	107.4	k	53.4	p	48.4	q	18.4	q
$V_{10}S_0$	100.4	o	75.4	c	69.4	c	40.4	d
$V_{10}S_1$	106.4	l	66.4	h	60.4	h	26.4	k
$V_{10}S_2$	118.4	g	52.4	q	45.4	s	17.4	r
LSD0.05	0.1		0.2		0.2		0.1	
CV%	4.2		8.7		3.1		3.7	

[X] V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-; V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO; S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

4.12 Fruit length(cm)

Length of fruit showed statistically significant variation due to different accessions. The maximum length of fruit(11.2 cm)was recorded from V_1while the minimum length was found from accession V_8- JUMBO (4.3 cm) (Table 13).

Significant variation was recorded due to different salinity levels on fruit length. The maximum length of fruit was recorded from S_0 (8.4 cm) while the minimum fruit length was found from S_2 (6.2 cm)(Table 14). Reduction in fruit length may be due to the increase of salinity levels which was also reported by Magan *etal*. (2008). Supply of water into the fruit under saline conditions is restricted by a lower water potential in the plant (Johnson *et al*., 1992). Higher levels of salinity reduced fruit size and marketable yield (Hao *etal*.,2000).

Combined effect of brinjal accessions and different salinity levelswere found to be significant with length of fruit (Appendix V). The longest fruit (12.9 cm) was found in V_1S_0 treatment and the shortest fruit (3.4cm) was found in V_8S_2 treatment (Table 15).

4.13 Fruit diameter(mm)

Diameter of fruit was influenced significantly by different brinjal accessions (Appendix V). Maximum diameter of fruit (51.4 mm) were obtained from $V_6$and the lowest diameter of fruit (25.6 mm) was recorded from V_{10}(Table 13). Different salinity levels on the diameter of fruit was also found to be significant (Appendix V). Maximum diameter of fruit (42.4 mm) was found in S_0treatment and the minimum diameter of fruit (31.0 mm) was found in S_2 treatment (Table 14). Reduction in fruit diameter due to the increase of salinity levels was also found by Mavrogianopoulos (1999) on melon. High salinity induces lower water potential in the plant which reduces the water flow in the fruit and therefore the rate of fruit expansion is restricted Heuvelink (2005).

Combined effect of brinjal accessions along with different salinity levels effect was found to be significant on diameter of fruit (Appendix V). Maximum diameter of fruit (57.7 mm) was found in V_6S_0 treatment and the minimum (20.7 mm) was found in $V_{10}S_2$ treatment (Table 15).

4.14 Fruit weightperplant (g)

Fruit weight ofbrinjal per plant was influenced significantly bybrinjalaccessions (Appendix V). V_6accessiongave themaximum fruit weight (71.7 g/plant) and minimum fruit weight (29.3g/plant) was obtained from V_4(Table 13).

Fruit weight varied significantly with the different salinity levels (Appendix V). Maximum fruit weight of brinjal(60.7g/plant) was found in S_0treatment and lowest fruit weight (32.3 g/plant) was found inS_2 treatment(Table 14).In saline area the plants are affected by excessive amount of salt mainly NaCl. Excessive amount of soluble salts in the root environment causes osmotic stress, which may result in disturbance of the water relations,in the uptake and utilization of essential nutrients, and also in toxic ion accumulation (Munns, 2002 and Lacerda *etal*. 2003). Supply of water into the fruit under saline conditions is restricted by a lower water potential in the plant **(**Johnson *et al*.1992).

Combination of accessions along with different salinity levels influenced fruit weight of brinjal (Appendix V). The maximum fruit weight (88.7g/plant) was obtained from the treatment $V_6S_0$and the minimum fruit weight (18.1 g/plant) was given by V_4S_2treatment (Table 15).

4.15 Yield per plant

Fruit yield ofbrinjal per plant was influenced significantly bybrinjalaccessions (Appendix V). V_6accessiongave the maximum yield (2.6k**g**/plant) and minimumfruit yield (1.1kg/plant) was obtained from V_4(Table 13**)**.

Fruityieldvaried significantly with the application of differentsalinity levels(Appendix VI).Highest yieldof brinjal(2.7kg/plant) was found in S_0treatment and the lowest fruit weight (0.8kg/plant) was found inS_2 treatment(Table 14).Salinity stress reduces the yield/plant. In this experiment the fruit number and average fruit weight per plant was reduced in case of high salinity and thus the total fruit weight per plant was reduced. Such findings were also reported by **(**Colla *et al*.(2006).

Combination of accessions along with different salinity levels influenced fruityield of brinjal (Appendix V).Highest fruit yield(4.1kg/plant) was obtained from the treatment V_6S_0andlowestfruityield (0.5kg/plant) was given by V_4S_2 and V_5S_2 treatment(Table 15).

4.16 Yield per hectare (Calculated)

Calculated yield ofbrinjal was influenced significantly bybrinjalaccssions (Appendix V). V_6accessiongave the maximum calculated yield (51.5 t/ha) and minimumcalculated yield (20.6 t/ha) was obtained from V_4(Table 13**)**.

Calculatedyieldvaried significantly with the differentsalinity levels (Appendix V).Thehighest calculated yieldof brinjal(53.8 t/ha) was found in S_0treatment and the lowest calculated yield(14.4 t/ha) was found inS_2 treatment(Table 14). Combination of accessions along with different salinity levels influenced fruityield of brinjal (Appendix V).Highestcalculated yield(82.1 t/ha) was obtained from the treatment V_6S_0andlowestcalculatedyield (8.6 t/ha) was given by V_5S_2 treatment (Table 15).

Table 13.Performance of brinjal accessions to different attributes[Y]

Accession[X]	Fruit length (cm)		Fruit diameter (mm)		Fruit weight (g)		Yield/ plant(kg)		Calculated yield/ha (ton)	
V_1	11.2	a	44.6	c	64.0	b	2.5	b	48.2	b
V_2	7.9	e	33.4	h	46.9	e	1.6	e	31.9	e
V_3	10.0	b	37.0	d	40.7	g	1.4	h	27.8	g
V_4	8.1	d	33.6	g	29.3	j	1.1	j	20.6	i
V_5	5.3	g	35.9	e	31.1	i	1.2	i	21.8	h
V_6	7.1	f	51.4	a	71.7	a	2.6	a	51.5	a
V_7	5.1	h	45.6	b	48.7	d	1.7	d	32.0	d
V_8	4.3	j	29.7	i	40.3	h	1.5	g	29.6	f
V_9	9.4	c	34.4	f	49.6	c	1.7	c	33.2	c
V_{10}	4.7	i	25.6	j	45.5	f	1.6	f	29.6	f
LSD0.05	0.1		0.1		0.3		0.1		0.1	
CV%	5.4		5.9		6.2		4.9		11.5	

[X]V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, $V_{8;}$ BR-5), V_9; MONI), V_{10}; JUMBO

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Table 14. Performance of brinjal accessions with different salinity levels to different attribute[Y]

Salinity levels[X]	Fruit length (cm)		Fruit diameter (mm)		Fruit weight (g)		Yield/ plant (kg)		Yield/ha (calculated) (ton)	
S_0	8.4	a	42.4	a	60.7	a	2.7	a	53.8	a
S_1	7.3	b	38.1	b	47.4	b	1.5	b	29.7	b
S_2	6.2	c	31.0	c	32.3	c	0.8	c	14.4	c
LSD0.05	1.0		4.2		11.8		0.5		12.7	
CV%	5.4		5.9		6.2		4.9		11.5	

[X]S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Table 15. Combined effect of brinjal accessionsand different salinity levels to different attributes

Treatment combinations[X]	Fruit length (cm)	Fruit diameter (mm)	Fruit weight (g)	Yield/ plant (kg)	Calculated yield/ha (ton)
V_1S_0	12.9 a	50.6 d	76.8 b	3.8 b	75.9 b
V_1S_1	11.4 b	43.6 f	64.6 d	2.4 f	46.7 f
V_1S_2	9.2 f	39.6 j	50.6 j	1.2 l	22.0 l
V_2S_0	9.2 f	36.7 l	58.7 f	2.5 e	49.7 e
V_2S_1	7.9 j	33.7 n	47.7 k	1.5 j	29.7 j
V_2S_2	6.6 m	29.8 q	34.2 p	0.9 n	16.4 n
V_3S_0	11.4 b	42.1 g	52.6 h	2.3 g	45.7 g
V_3S_1	10.3 d	37.2 k	40.6 m	1.3 k	24.5 k
V_3S_2	8.2 h	31.6 o	28.8 s	0.7 p	13.3 o
V_4S_0	9.2 f	36.7 l	39.6 n	1.7 i	32.9 i
V_4S_1	8.1 i	35.2 m	30.3 r	1.1 m	19.6 m
V_4S_2	7.0 k	29.0 q	18.1 u	0.5 r	9.3 r
V_5S_0	6.3 n	40.8 h	43.5 l	1.9 h	37.0 h
V_5S_1	5.2 r	36.7 l	31.5 qr	1.1 m	19.8 m
V_5S_2	4.3 t	30.3 p	18.3 u	0.5 r	8.6 s
V_6S_0	8.1 i	57.7 a	88.7 a	4.1 a	82.1 a
V_6S_1	6.9 l	54.1 b	74.8 c	2.4 f	47.8 ef
V_6S_2	6.2 o	42.5 g	51.7 hi	1.3 k	24.6 k
V_7S_0	5.9 p	52.6 c	62.8 e	2.7 d	53.1 d
V_7S_1	5.2 r	46.8 e	51.1 i	1.5 j	29.6 j
V_7S_2	4.3 t	37.5 k	32.1 q	0.8 o	13.4 o
V_8S_0	5.2 r	36.3 l	57.1 g	2.7 d	53.1 d
V_8S_1	4.3 t	30.6 p	40.2 m	1.3 k	25.1 k
V_8S_2	3.4 v	22.3 s	23.6 t	0.6 q	10.5 q
V_9S_0	10.4 c	40.6 i	64.6 d	2.8 c	56.0 c
V_9S_1	9.3 e	36.3 l	49.0 j	1.5 j	29.5 j
V_9S_2	8.4 g	26.3 r	35.2 o	0.8 o	14.0 o
$V_{10}S_0$	5.4 q	29.5 q	62.1 e	2.7 d	52.6 d
$V_{10}S_1$	4.7 s	26.7 r	43.9 l	1.3 k	24.6 k
$V_{10}S_2$	4.1 u	20.7 t	30.6 r	0.7 p	11.6 p
LSD0.05	0.1	0.5	0.9	0.1	0.9
CV%	5.4	5.9	6.2	4.9	11.5

[X] V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10} ; JUMBO; S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y] In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

4.17 Comparison among the accessions at differentsalinity levels in yield contributing characters:

4.17.1 Number of flowersand fruits per plant

Number of flowers/plantand fruits/plant varied significantly among the accessions in different salinity levels (Table 16). Maximum number of flower was found from V_9 (74.4/plant at control, 48.4/plant at 16 dS/m) and V_7 (65.4/plant at) 12 dS/m while minimum was in V_1 (56.4/plant at control and 39.4/plant at 16 dS/m) and V_2 (52.4/plant at 12 dS/m).

The maximum number of fruit was found from V_1 (47.4/plant at control and 34.4/plant at 12 dS/m) and V_4 (23.4/plant at 16 dS/m) while the minimum was found from V_{10} (40.4/plant at control) which was similar in V_2, V_5, V_7 at control, 26.4/plant at 12 dS/m and 17.4/plant at 16 dS/m)(Table 16).

From the result of the current study (Table 16) it was observed that V_9 provided the maximum number of flowers at control and 16 dS/m and V_7 at 12 dS/m but maximum number of fruits was found from V_1 at control and 12 dS/m and V_4 at 16 dS/m. Through V_9 and V_7 were able to produce maximum flowers at control, 16 dS/m and 12 dS/m respectively but they were not able to set maximum number of fruits not only in salinity stress but also in control condition.

Table 16. Number of flowersand fruits per plant of brinjal accessions at differentsalinity level^Y

Accessions^X	No. of flower/plant						No. of fruit/plant					
	Control		12 dS/m		16 dS/m		Control		12 dS/m		16 dS/m	
V_1	56.4	i	54.4	f	39.4	f	47.4	a	34.4	a	20.4	d
V_2	57.4	h	52.4	h	44.4	d	40.4	d	29.4	c	22.4	b
V_3	59.4	f	53.4	g	45.4	c	41.4	c	28.4	d	21.4	c
V_4	58.4	g	55.4	e	41.4	e	39.4	e	30.4	b	23.4	a
V_5	63.4	e	57.4	d	45.4	c	40.4	d	29.4	c	21.4	c
V_6	59.4	f	53.4	g	44.4	d	44.4	b	30.4	b	22.4	b
V_7	73.4	b	65.4	a	47.4	b	40.4	d	27.4	e	19.4	e
V_8	66.4	d	57.4	d	44.4	d	44.4	b	29.4	c	20.4	d

V_9	74.4	a	62.4	b	48.4	a	41.4	c	28.4	d	18.4	f
V_{10}	69.4	c	60.4	c	45.4	c	40.4	d	26.4	f	17.4	g
LSD 0.01	0.7		0..5		0.5		0.9		0.5		0.5	
CV%	4.3		2.8		2.3		3.3		3.1		3.1	

[X]V_1; EP-1, V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI), V_{10}; JUMBO; S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y]In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

4.17.2 Fruit weight and yield per plant

Fruit weight and yield per plant showed significant variation among the accessions at different salinity levels. Maximum fruit weight was found from V_6 accession(88.7 g) at control, (74.8 g) at 12 dS/m and (51.7 g) at 16 dS/m as well as maximum yield per plant was also recorded from V_6accession(4.1 kg) at control, (2.4 kg) at 12 dS/m and (1.3 kg) at 16 dS/m. (Table 17).

Table 17. Fruit weight and yield per plant of brinjal accessions at different salinity levels[Y]

Accessions[X]	Fruit weight (g)						Yield/plant (kg)					
	Control		12 dS/m		16 dS/m		Control		12 dS/m		16 dS/m	
V_1	76.8	b	64.6	b	50.6	b	3.8	b	2.4	a	1.2	b
V_2	58.7	f	47.7	e	34.2	d	2.5	e	1.5	b	0.9	c
V_3	52.6	h	40.6	g	28.8	g	2.3	f	1.3	c	0.7	e
V_4	39.6	j	30.3	j	18.1	j	1.7	h	1.1	d	0.5	g
V_5	43.5	i	31.5	i	18.3	i	1.9	g	1.1	d	0.5	g
V_6	88.7	a	74.8	a	51.7	a	4.1	a	2.4	a	1.3	a
V_7	62.8	d	51.1	c	32.1	e	2.7	d	1.5	b	0.8	d
V_8	57.1	g	40.2	h	23.6	h	2.7	d	1.3	c	0.6	f
V_9	64.6	c	49.0	d	35.2	c	2.8	c	1.5	b	0.8	d
V_{10}	62.1	e	43.9	f	30.6	f	2.7	d	1.3	c	0.7	e
LSD0.01	0.6		0.3		0.1		0.02		0.02		0.02	
CV%	7.9		7.1		6.8		0.5		0.3		0.3	

[X]V_1; EP-1), V_2; EP-2, V_3; EP-3, V_4; EP-4, V_5; EP-5, V_6; BR-3, V_7; BR-4, V_8; BR-5, V_9; MONI, V_{10}; JUMBO; S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y]In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

Table 18. Performance of best Brinjal accession under salinity in yield related attributes[Y]

At 12 dS/m

Accessions[X]	No. of fruits/plant	Accessions[X]	Single fruit weight(g)	Accessions[X]	Yield/plant (kg)
V_1	34.4 a	V_6	74.8 a	V_6 and V_1	2.4 a
V_4 and V_6	30.4 b	V_1	64.6 b	V_2	1.5 b

At 16 dS/m

Accessions[X]	No. of fruits/plant	Varieties[X]	Single fruit weight (g)	Accessions[X]	Yield/plant (kg)
V_4	23.4 a	V_6	51.7 a	V_6	1.3 a
V_2 and V_6	22.4 b	V_1	50.6 b	V_1	1.2 b

[X]$V_{1;}$ EP-1), $V_{2;}$ EP-2, $V_{3;}$ EP-3, $V_{4;}$ EP-4, $V_{5;}$ EP-5, $V_{6;}$ BR-3, $V_{7;}$ BR-4, $V_{8;}$ BR-5, $V_{9;}$ MONI, $V_{10;}$ JUMBO; S_0: control; S_1: 12 dS/m; S_2: 16 dS/m

[Y]In a column means having similar letter (s) are statistically identical and those having dissimilar letter (s) differ significantly as per 0.05 level of probability

4.18Suitable accessions at 12 dS/m and 16 dS/msalinity level

At 12 dS/m salinity level, it was found that V_1 provided maximum no. of fruit (34.4) followed by V_4 and V_6 (30.4) (Table 16). Maximum single fruit weight was provided by V_6 (74.8 g) which was followed by V_1 (64.6 g) (Table 18). On the other hand, maximum yield per plant was provided by V_6 and V_1 (2.4 kg) which was followed V_2 (1.5 kg) (Table 18).

At 16 dS/m salinity level, it was found that V_4 provided maximum no. of fruit (23.4) followed by V_2 and V_6 (22.4) (Table 16). Maximum single fruit weight was provided by V_6 (51.7 g) which was followed by V_1 (50.6 g) (Table 18). On the other hand, maximum yield per plant was provided by V_6 (1.3 kg) which was followed by V_1 (1.2 kg) (Table 18).

CHAPTER V
SUMMARY AND CONCLUSION

5.1 Summery

An experiment was conducted at the horticulturefarm, Sher-e-Bangla Agrcultural University, Dhaka-1207 under pot-culture during the month ofNovember 2012- June2013 to **s**earchfor salt tolerant accessions of brinjal. The experiment was completed using ten accessionsEP-1, EP-2, EP-3**,** EP-4, EP-5, BR-3,BR-4, BR-5, MONI and JUMBOand three salinity levels viz, Control- S_0, 12 dS/m-S_1, 16dS/m- S_2 were outlined in Completely Randomized Design (CRD) with three replications.

Data were taken on plant height, leaf number, chlorophyll content, leaf area**,** days to first flower bud initiation, days to first flower blooming, number of flower per plant, number of fruit per plant, days to first fruitsetting, days to first fruit harvest, length of fruit, weight of fruit,diameterof fruit, yield per plantandcalculated yield per plant**.**

Collected data were statistically analysed for the evaluation of treatments for the searching of suitable brinjal variety in high salinity level. Summary of the result have been describe in this chapter.

In case of plant height the tallest plant was found from V_2(57.2 cm) while the shortest plant from V_6(29.8 cm) at mature stage. In salinity treatments tallest plant was found fromcontrolS_0 (46.6 cm) whereas the shortest from S_2(31.1 cm) at mature stage. In combination of brinjal accessionsand different salinity levels tallest plant was found from V_2S_0 (70.5 cm) whereas V_6S_2(15.5 cm) provided shortest one at mature stage.

In case of number of leaves the maximum number was found from V_2(57.2 cm) while the minimum number from V_6(29.8 cm) at mature stage. In salinity treatments maximum leaf number was found fromcontrolS_0 (46.6 cm) whereas the minimum from S_2(31.1 cm) at mature stage. In combination of brinjal accessions and different salinity levels maximum leaf number was found from V_2S_0 (70.5 cm) whereas V_6S_2(15.5 cm) provided the minimum at mature stage.

In term of leaf area the maximum leaf area (66.6 cm) was recorded from V_5, while the minimum (25.9 cm) from V_2 at mature stage.In saline condition the highest leaf area (78.2cm) was recorded from S_0, while the lowest (28.9 cm) from S_2 at mature stage. Interacting effect of brinjal accessions and saline condition the highest leaf area (113.8 cm) was recorded from V_7S_0 while the lowest leaf area (7.7 cm) from V_4S_2 at mature stage.

In case of chlorophyll content the maximum chlorophyll content (52.3%) was recorded from V_6, while the lowest (43.4%) from V_8. In saline condition the highest chlorophyll content (52.7%) was recorded from S_0, while the lowest chlorophyll content (41.0%) from S_2.Interaction effect of brinjal accessions and saline condition the highest chlorophyll content (59.2%) was recorded from V_4S_0, while the lowest chlorophyll content (37.5%) from $V_{10}S_2$.

In bringal accessionsV_3 required longest period (81.1 days) for flowerbud initiation whereas shortest period (48.1 days) was V_1**.** Flower bud initiation was earliest (56.3 days) in S_0 (control) treatment and delayed (70.7) days in S_2treatment.Incombination of bringal accessionsand different salinity levels, V_6S_0 treatment required minimum days (41.4 days) for flower bud initiation, where the maximum days (89.4 days) required for V_3S_2 treatment.

In bringal accessions lowest days (50.7 days) required to flower bloom was in V_1 and maximum days (87.7 days) required for V_3.Variation was also found in saline condition where first flowering was earlier in S_0 (control) and delayed (74.7 days) on S_2. In combination of bringal accessions and salinity levels minimum days (44.4 days) were required for flowering in V_1S_0 treatment and maximum (93.4 days) were required for V_3S_2.

Considering the brinjal accessions longest period (97.07 days) were required for fruit setting in V_3 where as V_1 required shortest period (55.4 days). In saline condition early frutting was occurred in S_0 (67.6 days) and delayed in S_2 (79.1 days). In combination V_1S_2 treatment was found as superior combination (49.4 days) for days to frutting whereas $V_3S_2$was performed as inferior combination (100.4 days required).

In case of days taken to fruit harvest in brinjal accessionsV3required maximum days (132.1days) where as the V1required minimum days (81.1 day. In different salinity levels maximum days to fruit harvest (119.9 days) were recorded from S_2 and the minimum days (98.5 days) were found from S_0

treatment.In combination maximum days (138.4 days) to fruit harvest was found from V_3S_2 and the minimum days (77.4 days) was recorded from V_1S_0 which was followed by V_6S_0 (77.4days).

Among the brinjal accessionsV_6gave the maximum fruit weight (71.7 g/plant) and minimum fruit weight (29.3g/plant) was obtained from V_4.In different salinity level**s**, maximum fruit weight of brinjal(60.7g/plant) was found in S_0treatment and lowest fruit weight (32.3 g/plant) was found inS_2 treatment **.** In combination of accessions and differentsalinity levels, maximum fruit weight (88.7g/plant) was obtained from the treatment $V_6S_0$and minimum fruit weight (18.1 g/plant) was given by V_4S_2treatment**.**

In case of fruit yield ofbrinjal per plant V_6accessionsgave the maximum yield (2.6k**g**/plant) and minimumfruit yield (1.1kg/plant) was obtained from V_4.In different salinity level highest yieldof brinjal(2.7kg/plant) was found in S_0treatment and lowest fruit yield(0.8kg/plant) was found inS_2 treatment**.** In combination of accessions and differentsalinity levels,highest fruit yield(4.1kg/plant) was obtained from the treatment V_6S_0andlowestfruityield (0.5kg/plant) was given by V_4S_2 treatment which was followed by V_5S_2 treatment.

In case of calculated yield ofbrinjalV_6accessionsgave the maximum calculated yield (51.5 t/ha) and minimumcalculated yield (20.6 t/ha) was obtained from V_4. In different NaCl salinity levels,highest calculated yieldof brinjal(53.8 ton/hac) was found in S_0treatment and lowest calculated yield(14.4 ton/hac) was found inS_2 treatment**.** In combination of varieties and different NaCl salinity levels,highestcalculated yield(82.1 ton/hac) was obtained from the treatment V_6S_0andlowestcalculatedyield (8.6 ton/hac) was given by V_5S_2 treatment**.**

Maximum number of flower was found from V_9 (74.4/plant at control, 48.4/plant at 16 dS/m) and V_7 (65.4/plant at) 12 dS/m while minimum was in V_1 (56.4/plant at control and 39.4/plant at 16 dS/m) and V_2 (52.4/plant)at 12 dS/m.

Maximum number of fruit was found from V_1 (47.4/plant at control and 34.4/plant at 12 dS/m) and V_4 (23.4/plant) at 16 dS/m while minimum was found from V_{10} (40.4/plant at control which was similar in V_2, V_5, V_7 at control, 26.4/plant at 12 dS/m and 17.4/plant at 16 dS/m).

Maximum fruit weight was found from V_6 accessions(88.7 g) at control, (74.8 g) at 12 dS/m and (51.7 g) at 16 dS/m as well as maximum yield/plant was also recorded from V_6 accessions (4.1 kg) at control, (2.4 kg) at 12 dS/m and (1.3 kg) at 16 dS/m.

At 12 dS/m salinity level, it was found that V_1 provided maximum no. of fruit (34.4) followed by V_4 and V_6 (30.4). Maximum single fruit weight was provided by V_6 (74.8 g) which was followed by V_1 (64.6 g). On the other hand, maximum yield per plant was provided by V_6 and V_1 (2.4 kg) which was followed V_2 (1.5 kg).

At 16 dS/m salinity level, it was found that V_4 provided maximum no. of fruit (23.4) followed by V_2 and V_6 (22.4). Maximum single fruit weight was provided by V_6 (51.7 g) which was followed by V_1 (50.6 g). On the other hand, maximum yield per plant was provided by V_6 (1.3 kg) which was followed by V_1 (1.2 kg).

5.2 Conclusion

Agriculture is a major sector of Bangladesd's economy and over thirty percent of the net cultivable land is in the coastal area. In salinity stress brinjal plant growth and yield contributing characters were reduced by increasing salinity. It is concluded that plant growth and yield contributing characteristics were changed according to genetical factors of the responsible cultivars. V_6 was best accession for the both the level of 12 dS/m and 16 dS/m saline affected area that was closely followed to the V_1 concerning yield and yield contributing characters.

5.3 Recommendation:

I. After consecutive trial, best brinjal accession could be proposed for commercial cultivation in high salinity affected areas of Bangladesh.

5.4 Suggestions: Findings and Judging of present research, further study in the subsequent areas may be suggested:

i. Further research could be accomplished using V_6 and V_1 accessions as check.

ii. It should be better to identify the salt resistance gene for the betterment of the development of salt resistance variety.

CHAPTER VI
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APPENDICES

Appendix I: Analysis of variance of the data on plant height at different DAT of brinjal accessions

Source of Variation	Degrees of freedom (df)	Mean square of plant height (cm) at						
		35 DAT	45 DAT	65 DAT	65 DAT	75 DAT	85 DAT	95 DAT
Factor A (variety)	9	70.1*	87.5*	104.9*	191.8*	302.4*	628.0*	726.1*
Factor B (salinity)	2	84.3*	108.5*	539.2*	1968.3*	1228.9*	1768.9*	1825.9*
AB	18	15.7*	22.7*	39.1*	66.6*	95.3*	78.2*	101.8*
Error	58	1.9	2.1	14.3	23.4	19.6	11.7	16.7

* : Significant at 0.05 level of probability

Appendix II: Analysis of variance of the data on leaves number at different DAT of brinjal accessions

Source of Variation	Degrees of freedom (df)	Mean square of leaves number at						
		35 DAT	45 DAT	65 DAT	65 DAT	75 DAT	85 DAT	95 DAT
Factor A (variety)	9	43.1*	176.5*	92.6*	37.3*	64.5*	92.7*	192.2*
Factor B (salinity)	2	125.1*	382.3*	160.3*	330.3*	369.1*	4105.3*	4810.0*
AB	18	18.9*	29.4*	39.5*	48.9*	72.2*	84.2*	114.8*
Error	58	14.4	10.7	9.6	3.2	5.8	7.3	2.9

* : Significant at 0.05 level of probability

Appendix III: Analysis of variance of the data on growth and fruit related attributes of brinjal accessions

Source of Variation	Degrees of freedom (df)	Mean square of				
		Leaf area (cm^2)	Chlorophyll content (%)	Number of flower bud/plant	Number of flower/plant	Number of fruit/plant
Factor A (variety)	9	1786.6*	66.7*	170.7*	167.6*	26.3*
Factor B (salinity)	2	18942.2*	2130.2*	2906.8*	2854.8*	3440.7*
AB	18	457.3*	115.0*	18.8*	22.1*	8.9*
Error	58	19.4	8.6	5.5	9.2	7.1

* : Significant at 0.05 level of probability

Appendix IV: Analysis of variance of the data on performance of brinjal accessions related to duration

Source of Variation	Degrees of freedom (df)	Mean square of			
		Days to bud initiation	Days to flowering	Days to fruiting	Days to fruit harvesting
Factor A (variety)	9	1193.8*	1253.6*	1533.3*	2139.7*
Factor B (salinity)	2	1622.8*	1431.3*	1002.9*	1369.2*
AB	18	15.4*	15.0*	520.1*	23.1*
Error	58	3.3	4.8	2.7	1.9

* : Significant at 0.05 level of probability

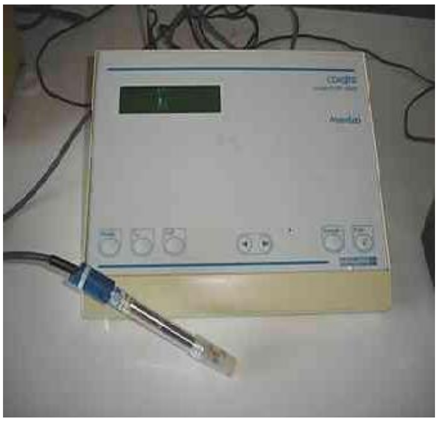
Appendix V: Analysis of variance of the data on yield related attributes of brinjal accessions

Source of Variation	Degrees of freedom (df)	Mean square of				
		Fruit length (cm)	Fruit diameter (mm)	Single fruit weight (g)	Yield (kg)/plant	Calculated yield (kg)/plant
Factor A (variety)	9	51.8*	554.6*	1561.9*	2.2*	903.2*
Factor B (salinity)	2	37.3*	995.1*	6027.2*	28.1*	11859.9*
AB	18	0.458*	9.4*	22.2*	0.2*	88.4*
Error	58	0.6	1.3	8.4	0.3	21.3*

* : Significant at 0.05 level of probability

(a)

(b)



(c)

Plate 1. (a) Experimental plot (b) Measurement of leaf chlorophyll content by using SPAD 502 (c) EC meter