SUMMARY

The present investigation was undertaken at the Faculty of Agriculture of Moshtohor (Zagazig University Benha Branch). The objective of this investigation was concerned with genetic and cytological studies on Oenothera spp found in Egypt compared on with some exotics frome Germany.

Studies included four species of the genus Oenothera; i.e., O. nissensis var fiedleri, O. biennis L. var. grandiflora, O. coronifera renner and O. odorata jacy. Karyotype studies were carried out on these species at the mitotic metaphase stage. All species studied had the same chromosome basic number (x = 7) in the smoatic cell. These chromosomes were metacentric, sub-metacentric, acrocentric and subacrocentric.

This study included :

Genetic study :

The following characters were studied :

1- Earliness.
2- Plant height
3- Number of fruits per plant
4- Number of seeds per fruit
5- Weight of seeds per plant
6- 1000- seeds weight

Results showed that :

(A): Additive genetic variances were more important than dominance in the inheritance of Earlines. Dominance genetic variances were more important than additive in the inheretance of plant height, and number of fruit/ plant In the inheritance of weight seed per plant and weight of 100 seeds The additive and dominance types, of gene action. were important in the inheritance of these traits.

(B): The average degree of dominance showed over dominance for plant height s * Earliness showed complete dominance whil- number of fruit/ plant. showed partial dominanc

(C): The negative and positive alleles were equally distributed among the parental populations for most of the studied characters.

(D): The dominant genes were in excess in the parents in case of plant height and number of fruit/plant and weight of seed/plant and weight of 1000-seeds. The values of narrow sense heritability in all characters indicated that the traits were highly influenced by the genetic factors. There were positive genotypic correlations between earliness and plant height and weight of seed/ plant and weight of 1000 seeds and number of fruits/plant. There were positive genotypic correlation between plant height and the number of seeds/ fruit.

Cytological studies :

First: Mitotic behaviour: studies included the Karyotype and Karyotype analysis for four parents .

The following description summarizs the characteristics of the studied material :

1- O. nissensis: 2n = 14. The average total length of the hoploid complement in the five cells studied was 29.10 ± 0.41 µ. The mean length of the chromosemes ranged from 0.95 to 5.84 µ. The idiogram showed that the 6th and 7th chromosomes were subacrocentric.

2- O. biennis: 2n= 14. The average total length of the haploid complement was 25.45 ± 0.12 µ. The mean length of the chromosomes ranged from 1.25 to 7.06 µ. The idiogram showed that the 3ed chromosome was acrocentic with a small satellite attached to its short arm.

3- O. coronifera: 2n= 14. The average total length of the haploid complement was 30.22 ± 0.06 µ. The mean length of the chromosomes ranged from 2.06 to 7.00µ. The idio gram showed that the 6th chromosome was subacrocentric.

4- O. odorata: 2n= 14. The average length of the haploid complement was 19.00 + 0.08 µ. The mean length of the chromosomes ranged from 1.51 to 4.49 µ. The idiogram showed that the 5th, 6th and 7th chromosomes were subacrocentric.

Second : Miotic behaviour : These studies included the abnormalities of parenties and the hybrids produced by dialle crosses, it was noticed that there are some casces of rings and Zigzage which may indicate the vresence of certen Chromosome translocations,

In these studies the pollen grain mother cells were examined in the stage of metaphase two (diakinases). The Study showed the following :

a- The chromosomes appeared as circles consisting of four - five or sex chromosomes.

b- There were group consisting of two or three or four five chromosomes in a zigzag shape.

c- There were chromosomes in star shape or a linear shape or in bivalents.

d- There were obend rings of chromosomes.

e- There were bridges chromosomes, and laging chromosomes in some cases of parentes and hybrids. which may indicate the presence of some acrocentric chromosomes arising from translocations.

3) Pollen grain viability was high in some hybrids and low in others this strility also could be attributed to certain chromosomal aberrations incloding heterozygous tranlocation