



## **The Effects of Ethanolic Extracts Roots of *Zingiber officinale* and Leaves of *Eruca sativa* Extract on reproduction as compare with Tadalafil on Male Rats**

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### **Abstract**

Two ethanolic extracts of *Eruca Sativa* (Rocket) and *Zingiber officinale* (Ginger) were studied after 42 days of treatment with effective dose (ED), as 200 mg per kg of B.W. for rocket and 400 mg per kg of B.W. for ginger, the results were 100% for fertility index(FI) for the two extracts , and , 60% for Tadalafil and 80% for control group. While, the result of pregnancy index(PI)was 100%, that give life babies after successful mating.

### **Introduction:**

All civilizations have always had traditions of using herbs to promote healing. Plants still remain the basis for development of modern drugs and medical plants have been used for years in daily life to treat diseases all over the world [Ates and Erdogru, 2003]. Ginger has been reported to bind testosterone, raising concerns about possible consequences for the developing embryo(Marcus and Snodgrass, 2005). Also, Amir Amin et al., (2006) that both ethanolic and aqueous extracts of ginger increases serum testosterone level, testicular cholesterol level and activity of testicular antioxidant enzymes. Rocket is also considered a medical plant with many reported properties, including its strong aphrodisiac effect known since Roman times [Padulosi, and Pignone, 1997; Font et al., 2003], in addition , Zena, (2013) results exhibited that rocket leaves extract caused a

significant increase in testosterone level, sperm activity; moreover a significant decrease in sperm mortality and abnormalities was recorder.

### **Materials & methods:**

Extract preparation:

Ginger was obtained from commercial source from Najaf city ,and voucher specimen of the plant to be identified and authenticated at the National Herbarium of Iraq Botany directorate in Abu Graib-Baghdad , under certificate name *Zingiber Officinale* belongs to family Zingiberaceae, the root powder of Z.O. was put in thimbles that used in multi-units of Soxhlet apparatus to method described by Harborne (1984), with 70% ethanol for 24 hours(Complete circulation) .The combined ethanolic extract was filtered , and the filtrate was concentrated by a rotary evaporator under a temperature not exceeding 40 C and a speed 80 rpm .

The leaves of *Eruca Sativa* was purchase from local planter ,that cultivation in Najaf city .The plant classification was done at the Ministry of Agriculture of Iraq/State board of seeds testing and certificate, the powder of ES was prepared by the same procedure which followed with ZO.

#### **Administration of ZOE, ESE and tadalafil:**

After 42 days of treatment with ZOE, ESE, and tadalafil , that dissolved in DMSO as vehicle . The control group was treated with DMSO only, five groups were used for each treatment, each group one male was put with 3 non-treated females , the groups were observed within periodic examination for 3 weeks, until parturition.

#### **Reproductive parameters:**

Male rats that were treated with the two ethanolic extracts and tadalafil for pregnancy index was 100% for all groups ( table 2) as the following:  
Table1:Fertility index(FI).

Group	Control	ESE	ZOE	Tadalafil
No. of female mating successfully	5	5	5	5
No. of pregnant female	4	5	5	3
No. of non pregnant female	1	0	0	2
Fertility Index percentage	80%	100%	100 %	60%

Table2:Pregnancy index(PI).

Group	Control	E.S.E.	Z.O.E.	Tadalafil
No. of pregnant female	4	5	5	3
No. of pregnant female that gives life babies	4	5	5	3
Pregnancy Index percentage	100 %	100 %	100%	100 %

were put with untreated females rats for mating and the following parameters were considered :

Fertility index = number of pregnancy female rats / number of female mating  $\times$  100.

Pregnancy index = number of female that give live fetus / total pregnancy rats  $\times$  100.

Statistical analysis:

All data were expressed as mean  $\pm$  SE . Student's t-test was performed by Statistical Package for the Social Science (SPSS Inc. Chicago, IL,USA) software (version 15.0) with level of significance set at  $P < 0.05$ .

#### **Results:**

The results of fertility index was 100% for the two ethanolic extracts , however, but 60% for tadalafil as compare with 80% for control group( table 1). While, the results

**Discussion:**

The fertility index, showed decrease in percentage in the tadalafil group as compare with the control group, this may be due to decrease in motility of sperm caused by long use of tadalafil, but high percentage in fertility index was observed with the two groups (ZOE and ESE) as compare with the control group, this may be due to good sperm motility, that results from active ingredients of ginger and rocket on sperm mitochondria.

For ESE this result corroborate with Salem and Moustafa, (2001) and Zena, (2013), who concluded that *Eruca sativa* may be capable in improving healthy sperm parameters and fertility. In addition, it is known that ZOE possess an androgenic property (Kamtchouing et al, 2002), also, Kamtchouing et al., (2000) who observed an increase in the testicular weight of rats treated with *Zingiber Officinale* for 8 days with a concomitant increase in testosterone level. Another explanation for these improved testicular/sperm function in this study is the reduction in level of malondialdehyde, the most abundant individual aldehyde resulting from lipid peroxidation breakdown in biological systems. Malondialdehyde is an indirect indicator of reactive oxygen species, ROS, which has potential toxic effects on sperm quality and function (Sharma and Agarwal, 1996; Sikka et al, 1995).

While, the pregnancy index, showed good ratio in pregnancy index for all groups compare with the control group, that indicate the adverse effects of tadalafil and the active ingredients of the two extracts on female that give life babies. For ZOE, this result is in agreement with Wilkinson, (2000) who stated that recent literatures survey have reported that the most

commonly used natural drugs for the treatment of morning sickness is ginger. For ESE in pregnancy index the result is in have agreement with Said et al., (2002) who stated that, improvement of antioxidant activity, and increasing of mitochondrial oxidative phosphorylation take place.

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