

Histopathological study of the toxic doses of Clove Oil *Syzygium aromaticum* on Ovaries of female rabbits"

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Abstract: A twenty four local rabbits average (1450-1550) gram were divided into three groups, each group was eight rabbits. Group one (G1) was given a daily dose (0.25) gm of Clove oil "Emad vegetable oil company- Mosul-Iraq concentration 100%" for 30 days. Group two (G2) was given a daily dose (0.5) gm. of Natural Clove Oil "Emad vegetable oil company- Mosul-Iraq concentration 100%" for 30 days. While the third group (G3) was the control group given 1cc Tap water. The study revealed a moderate pathological changes. Varies from congestion to inflammatory cells and necrosis in the medullary region as shown in the result.

Keyword: histopathology–Clove oil- Ovaries– female Rabbits.

I. Introduction

Clove oil is an essential oil from the dried flower buds, leaves and stems of the tree "*Syzygium aromaticum*" (Schmid R, 1972). It has many uses in human and veterinary field. It is used in fragrance formulations, flavors in the perfumery and food for its spicy aroma

(Murray, 2000), cosmetics, (www.cosmeticsdatabase.com) and personal care products, antibacterial, antifungal (Kalemba & Kunicka 2003; Chami et al., 2005), antiviral, antitumor, antioxidant and cytotoxic properties (Baratta et al., 1998; Dorman et al., 2000; Gayoso et al., 2005; Prashar et al., 2006; Politeo et al., 2010), insecticidal (Huang et al., 2002), local anesthetic and dental care properties (Cai L, 1996; Chaieb K. et al, 2007). Acute and chronic clove oil toxicity to mammals is acutely toxic. However, oral LD50 values in all species tested were greater than 1,190 mg/kg. In sub chronic toxicity tests, no adverse effects were observed in studies with laboratory animals up to doses of 900 mg/kg-day. It was observed that liver damage caused by a high dose of clove oil (Susan K., et al, 2010). There is some research talk on its carcinogenicity (Zheng GQ., et al., 1992), but not sufficient for a listing as a carcinogen. Acute and chronic clove oil toxicity to mammals is low (Chaieb K, et al, 2007). There are no studies available concerning toxicity of clove oil to the reproductive system (Susan K., et al, 2010).

II. Material & Method

Three groups of local female rabbits, each group was (8) Rabbits in number. G1 group was administered daily oral dose of Clove oil 0.25 gm "Clove oil" (Al Emad oil company- Mosul-Iraq, concentration 100%) for 30 days. The second group G2 were given daily oral dose 0.5 gm "of Clove oil" the same source" for 30 days. While the 3rd group G3 left as a control and was given 1cc tap water. All groups were fed *ad libitum* plus pellets of broiler feed stuffs. Water supplied *ad libitum*. At day (30) all sacrificed female rabbits were necropsied. Collecting the specimens of ovaries and fixed with neutral buffer of formalin 10%. paraffin section (8-9 microns) and stained with Harris eosin haematoxyline stain and then microscopically examined.

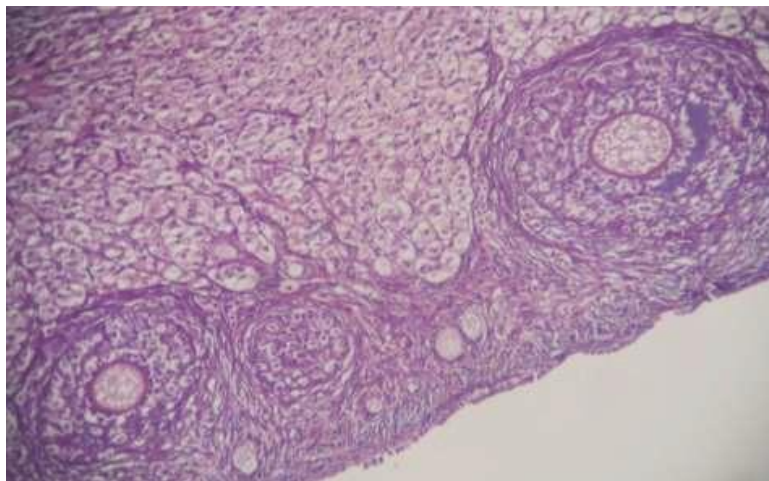
III. Result & Discussion

Clove oil and "eugenol" as an active ingredient "were found to be spermicidal in an *in vitro* study of six male partners of infertile couples" (Buch JG., et al, 1988). Still there is no recent study discussing the effect of clove oil on the female reproductive tract as a whole (Susan K., et al, 2010).

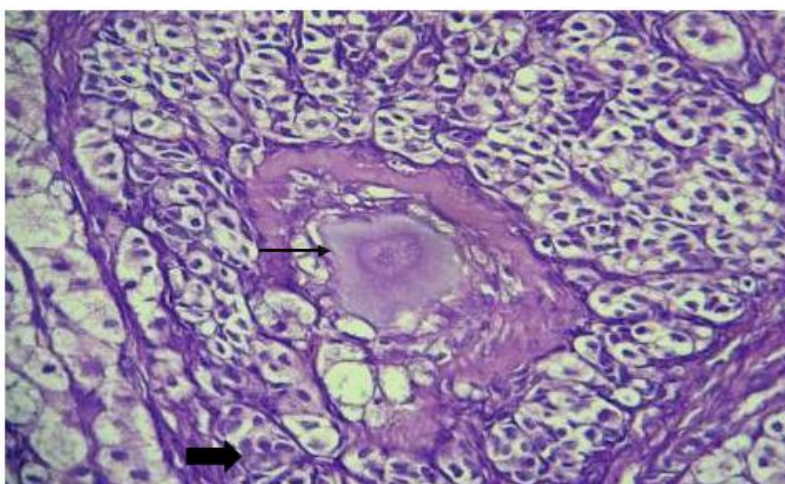
As shown in the figures. In comparison of the lesions seen group 3 (G3) the normal histological structure. In group 1 (G1) which was given oral dose of (0.25) ml clove oil, the ovarian tissue shows retraction of the Oocytes in its distances, with the mononuclear cell infiltration and vacuolation of the cytoplasm. Our result is agreed with (Ho YC., et al., 2006; Prashar A., et al, 2006) as shown in fig 3 with pyknotic of nucleus of some follicular cells. In fig 4 and fig 5 the (G1) show severe dilation and congestion of the blood vessels with vacuolation of the cytoplasm.

While in group (G2), fig 6 shows areas of necrosis and hemorrhages of the ovarian stroma. Our result is agreed with (Hartialet al., 1966). While in fig 7 shows a large ovarian cyst lined by granulosa cells. In fig 8 there is a necrosis in the medullary zone. In fig. 9 a severe suppression of ovulation characterized by few and non-developed ovarian follicles. Fig. 10-11 showed increase number of atretic follicles and failure of ovulation with a severe destruction of ovarian stroma, this agreed with (Buch JG, et al., 1988) when we consider the effect of

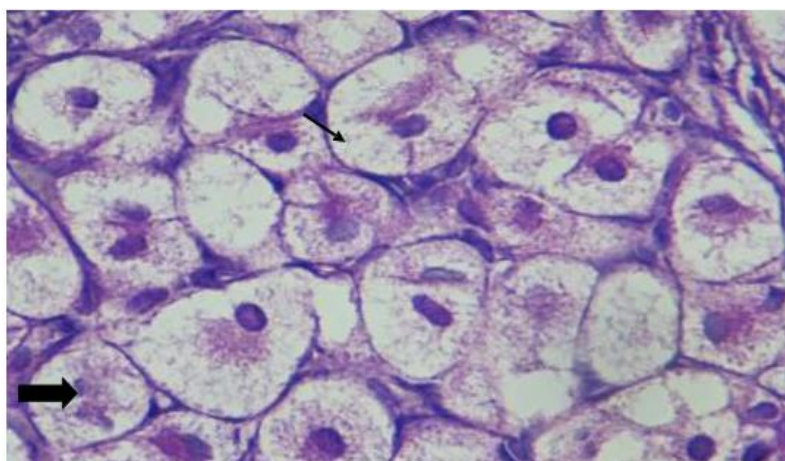
toxicity of Clover oil and its effect on the reproductive tract is the same whether in male or female gonads. Fig. 12 showed a large multiple follicular cyst.



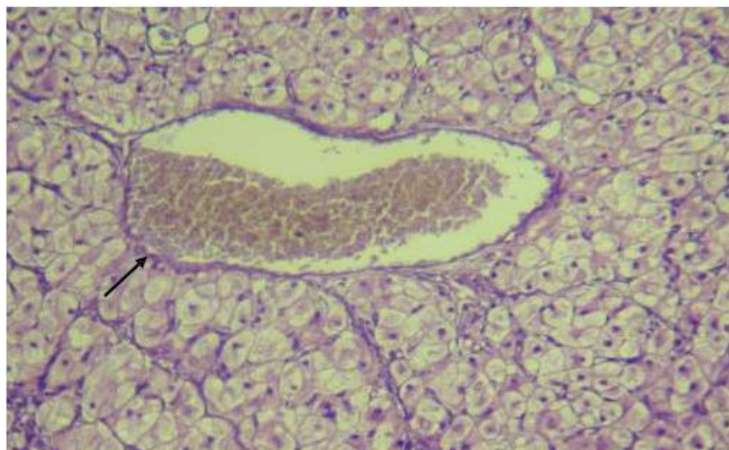
(Figure 1): Histopathological section for control group of rabbit ovary showing the normal histological structure. (H&E400X)



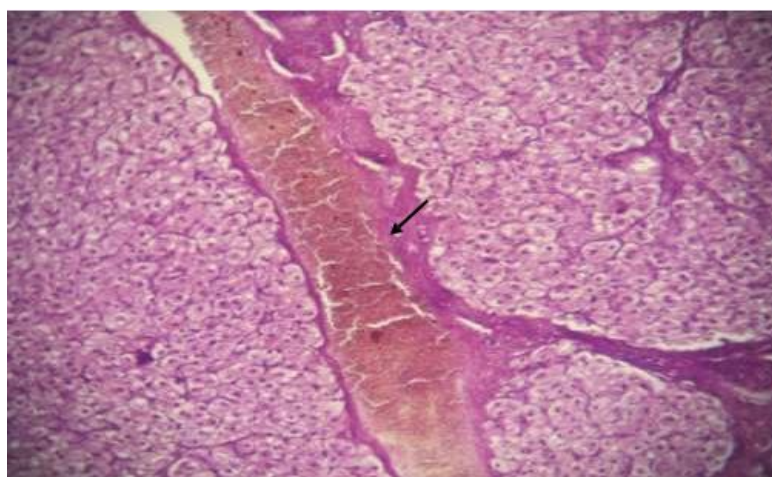
(Figure2): Histopathological section of ovary of rabbit treated with clove for 30 day for G1 of showing retraction of the oocyte and its distance zone (—→) with mononuclear cell infiltration (—→). (H&E400X)



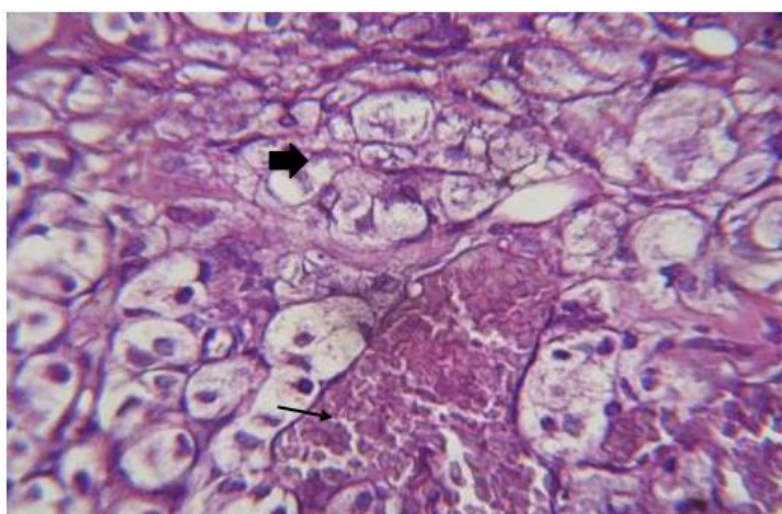
(Figure3): Histopathological section of ovary of rabbit treated with clove for 30 day for G1 of showing vacuolation of cytoplasm (—→) with pyknotic of nucleus of some follicular cells (—→) (H&E400X).



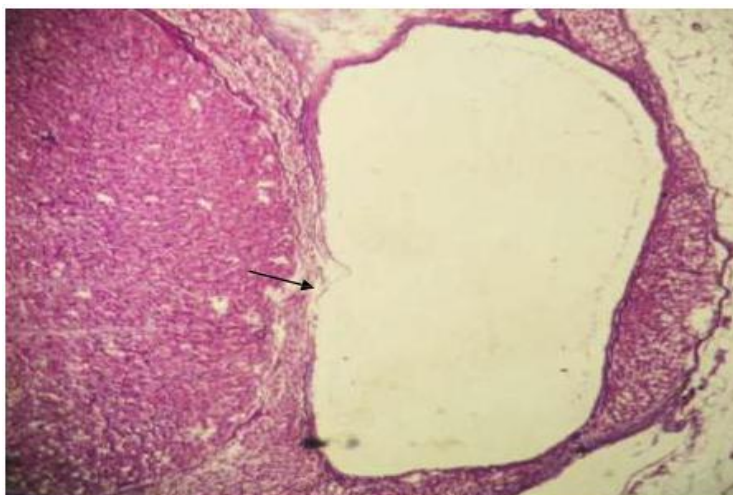
(Figure4): Histopathological section of ovary of rabbit treated with clove for 30 day for G1 of showing dilation and congestion of blood vessels (→) (H&E400X).



(Figure5): Histopathological section of ovary of rabbit treated with clove for 30 day for G2 of showing severe dilation and congestion of blood vessels (→) (H&E400X).



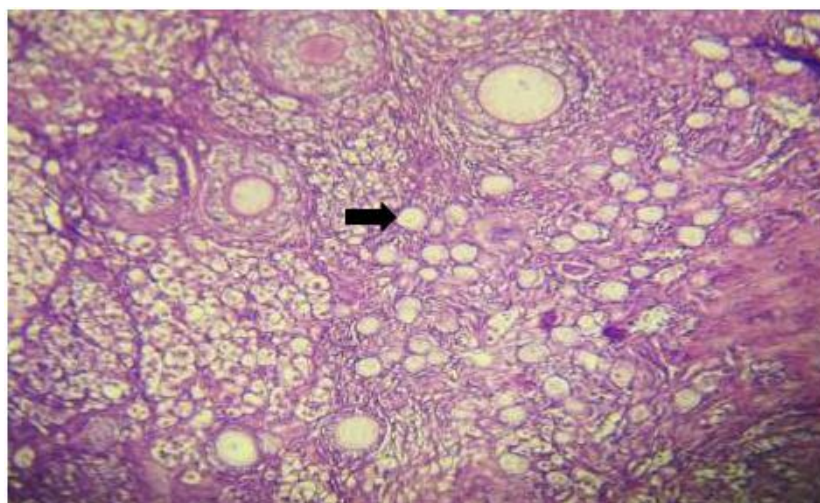
(Figure6): Histopathological section of ovary of rabbit treated with clove for 30 day for G2 show in necrosis (→) hemorrhage in ovarian stroma (→) (H&E400X).



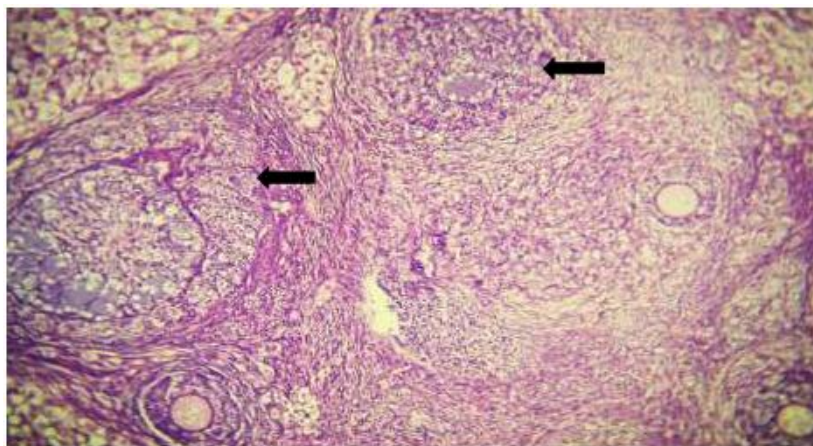
(Figure7): Histopathological section of ovary of rabbit treated with clove for 30 day for G1 of showing large ovarian cyst lined by granulosa cell (→) (H&E100X).



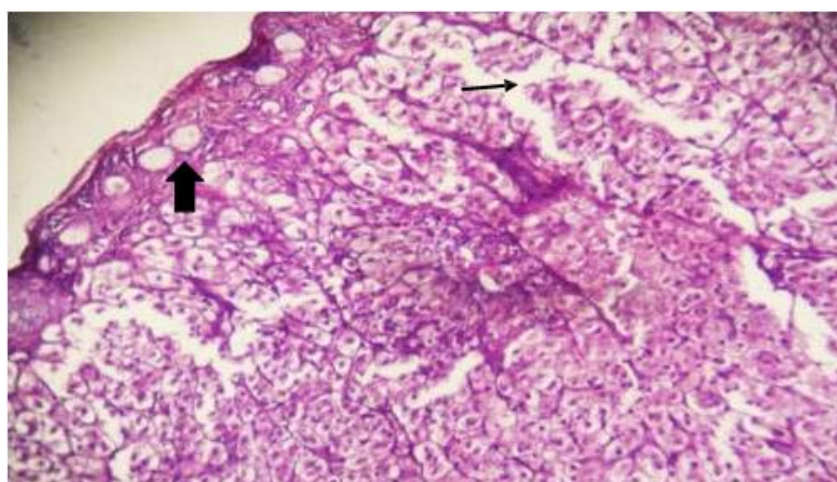
(Figure8): Histopathological section of ovary of rabbit treated with clove for 30 day for G2 of showing necrosis in medullary region (→) (H&E400X).



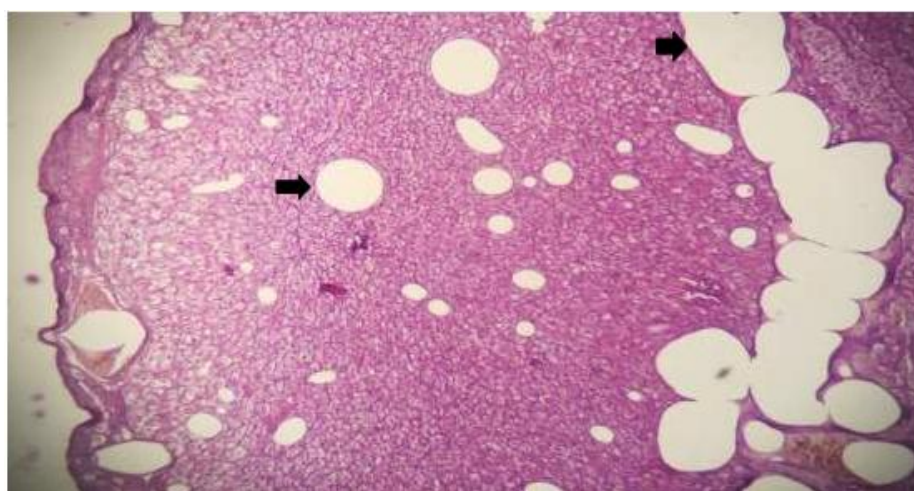
(Figure9): Histopathological section of ovary of rabbit treated with clove for 30 day for G2 showing severe suppression in ovulation characterized by few and non-developed ovarian follicle (→) (H&E400X).



(Figure10): Histopathological section of ovary of rabbit treated with clove for 30 day for G2 showing increase in number of atretic follicles (→) (H&E400X).



(Figure11): Histopathological section of ovary of rabbit treated with clove for 30 day for G1 showing failure of ovulation (→) and severe destruction in ovarian stroma (→) (H&E 400X).



(Figure12): Histopathological section of ovary of rabbit treated with clove for 30 day for G2 showing multiple large rounded follicular cysts (→) (H&E100X).

IV. Conclusion

The study showed that the toxic doses of clove will leads to a serious cellular damage to ovarian tissue. the higher and long dose of clove oil the more lesions were found in the ovarian tissues. More studies are needed on reproductive tractsupported by biochemical andsex hormones assay.

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