Biochemical studies on cryopreservation of ram semen

By

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SUPERVISION SHEET

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List of abbreviations

Abbreviation	
AI	Artificial insemination
ARRI	Animal Reproduction Research Institute
ARC	Agriculture Research Center
AR	Acrosome reaction
ANOVA	Analysis of variance
ATP	Adenosine Triphosphate
AGs	Accessory sex glands
ACP	Acid phosphatase
ALP	Alkaline phosphatase
AMI	Acrosomal membrane integrity
AV	Artificial Vagina
BW	Body weight
CAT	Catalase
DNA	Deoxyribo Nucleic Acid
EV	Ejaculate volume
GPx	Glutathione peroxidase
GRD	Glutathione reductase
GSSG	Oxidized glutathione
GSH	Reduced glutathione
HOST	Hypo Osmotic Swelling Test
i.m	Intra muscular
LDH	Lactate Dehydrogenase
LH	Luteinizing Hormone
LPO	Lipid Peroxidase
MDA	Malondialdehyde
MOLE	Moringa oleifera leave extract
ODF	Outer Dense Fibres
PM	Plasma Membrane
PMI	Plasma Membrane Integrity
PUFA	Polyunsaturated Fatty Acid
ROS	Reactive oxygen species
r.p.m.	Revolution per minute
SP	Seminal plasma
S.E.	Standard error
SOD	Superoxide dismutase
TAC	Total Antioxidant Capacity
TP	Total Proteins
TCA	Trichloroacetic acid

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ABSTRACT

This study was carried out to evaluate the efficacy of *Moringa oleifera* leaves extract (MOLE) in improving the characters of fresh and cryopreserved semen compared to vitamin E and Selenium combination. Twenty-four mature Barki rams (50-70 Kg) were randomly assigned into three groups, eight rams each. The first group was given distilled water orally. The second group was given MOLE orally daily at a dose of 40 mg/kg. The third group was injected with a combination of vitamin E and selenium at a dose of 3 ml (4.5 mg sodium selenite and 204 mg vitamin E)/ head i.m twice a week for 64 days. MOLE increased semen volume, sperm concentration, activities of seminal plasma catalase, glutathione peroxidase (GPx), glutathione reductase (GR), superoxide dismutase (SOD), alkaline phosphatase (ALP), acid phosphatase (ACP), levels of ascorbic acid and total antioxidant capacity (TAC). In addition, it significantly increased post thawing sperms motility, viability index, membrane integrity, and the activities of post thawing semen antioxidant enzymes. While, it decreased seminal plasma concentration of malondialdehyde (MDA) and acrosomal defects and DNA fragmentation of sperm in cryopreserved semen. Vitamin E and selenium decreased semen volume, sperm concentration, seminal plasma ascorbic acid, TAC concentrations and activities of antioxidant enzymes while its increased sperm abnormalities, DNA fragmentation and MDA concentration in seminal plasma. This study indicated that MOLE improved the characters of the fresh and cryopreserved ram semen via improving seminal plasma antioxidant defense mechanism.

Keywords: *Moringa oleifera*, Rams, Antioxidant, Cryopreservation