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Hypouricemic Effect of Moringa Oleifera Leaves and Ginger (*Zingiber Officinale Rosc.*) Powders in Male Albino Rats

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ABSTRACT:

This study aimed to examine the effect of Moringa leaves (M) and ginger (G) powders on Hyperuricemic albino rats. Chemical analyses of powders Moringa leaves and ginger powders were conducted. Forty-eight adult male laboratory rats were used, and their weight was (200 ± 2g). Twelve groups have been divided, including a control group (four rats/group). All groups were injected with Gentamicin (100 mg/kg of body weight) daily for seven days except the control group. The powders at percent (2% and 4%) of M or ginger and their mixtures were added in a ratio ((1:1), (2:1), (1:2)) from the basal diet. After 4 weeks, the mice were slaughtered. Then, body weight, weight of heart, liver, kidney, and spleen, level of glucose in serum, kidney functions, albumin, globulin, and total protein were estimated. Then, statistical analysis was conducted. This study showed that the M or G separately or in combination significantly improves body weight, organ weight, serum glucose, kidney functions, albumin, globulin, and total protein. In contrast, there was significant progress in blood glucose levels in the 2% Moringa-fed group. Also, there were significant improvements in body weight gain, feed efficiency ratio, kidney functions, albumin, globulin, total protein, liver, and kidney weight in the group fed on Ginger 4%. Meanwhile, the mixture at 4% (2M: 1G) has significantly improved all parameters of hyperuricemic albino rats. This review found a statistical significance that a mixture at 4% (2M: 1G) may improve the health status of Hyperuricemic albino rats.

Keywords: Moringa Leaves, Ginger Powder, Hyperuricemia, Rats, Liver Functions, Blood Glucose.

1. INTRODUCTION

Hyperuricemia was found in 5–30% of the population, and now increasing globally (1). Patients of all ages and genders are affected by hyperuricemia, which is a prevalent condition. Gout is the most prevalent sign of hyperuricemia. (2).

Studies on the possible health benefits of M leaves are currently underway. The variety of metabolites found in the leaves

suggested a number of pharmacological actions, and some of these studies indicated that the carbolic acid and bioflavonoids substances in the leaves had antifungal, antibacterial, antidiabetic, and anti-inflammatory properties(3) . Moringa leaves involve terpenoids, sterols, and flavonoids with antiulcer qualities (4,5). While the polyphenols provided antioxidant activity (6, 7). Also, (8, 9) demonstrated that one of M leaves' additional pharmacological characteristics are its ability to suppress enzymes that act as disease-specific receptors. An aqueous Moringa leaves extract has demonstrated a possible protective effect on renal functions as affected by gentamicin (10).

Different dosages of Moringa leaves were able to significantly reduce serum uric acid in Hyperuricemic white rat (11). In order to overcome hyperglycemia in diabetic rats, the aqueous extract of Moringa leaves decreased insulin resistance and increased insulin levels (12).

By preventing xanthine from being converted to uric acid, ginger lowers uric acid levels. The kidneys can excrete less uric acid or produce it in excess, depending on the level (13). Secondary metabolites found in ginger, such as flavonoids and phenolic compounds, can reduce blood serum uric acid levels.(14, 15) showed that ginger powder treatment for two months considerably decreased the dramatic increases in weight of body and fasting blood sugar in diabetic rats fed a diet high in fat. Ginger powder also helps to boost insulin. (16)Mahmoud Saied that for patients experiencing acute renal failure, ginger may be a helpful adjuvant therapy to halt the progression of the illness and postpone the need for renal replacement medication.

The study's goal was to determine the effects of Moringa leaves powder, Ginger (Zingiber Officinale Rosc.) Powder and its mixture on Hyperuricemic male albino rats.

2. Materials and methods

2.1 Materials

Fresh ginger roots (Zingiber officinale Rosc.) were bought from the neighborhood store, and Moringa leaves from the National Research center, Dokki, Giza, Egypt.

The Sprague Dawley strain of rats (n = 48) was purchased from Helwan Farm, Cairo, Egypt.

2.1.1 Experimental design:

The experiment was approved by the institutional Animal Care and Use Committee - Agricultural Research Center (ARC-IACUC), Egypt (Approval No. ARC/APRI/23/29).

2.2 Methods

2.2.1 Preparation of ginger roots and Moringa leaves:

The ginger roots (Zingiber officinale) were well sorted, washed with clean water, peeled, cut, and prepared for drying.

Ginger roots after being dried in the oven at 40c, it was ground into powder

using an electric blender in Agriculture Research Center and then stored under refrigeration in an airtight container tell used.

At the National Research Center, Moringa leaves were dried using solar energy, ground into a fine powder, and preserved and refrigerated at 40c until further use.

2.2.2 Chemical analysis:

Ash, fat, protein, moisture, vitamin and mineral of Moringa oleifera leaves and Zingiber officinale Rosc. Fine powders were measured independently using (17) methodology, whereas total carbohydrate was calculated using the following differences:

Carbohydrates % = 100 – (Moisture % + Protein % + Fat % + Ash %).

Using the procedure outlined by (18, 19), the total flavonoids and total phenolic components of ginger powder and Moringa oleifera leaves were determined.

Diet: The basal diet Formulated using (20) . The mineral mixtures were prepared by (21). The experiment's vitamin mixtures were prepared by (22).

2.2.3 Induction of hyperuricemia in rats:

All Rats were fed on basal diet with inducted intraperitoneally with Gentamicin (GEN) (100 mg/Kg of BW) daily for 7 days (23). To cause hyperuricemia, except control negative.

2.2.4 Biological experiment:

The study employed 48 Adult male Sprague Dawley rats, weighing 200 ± 2g, and kept them in wire cages with adequate ventilation. For one week, in order to help the animals become used to the biological research. All rats were housed in normal, healthy conditions and provided a basal diet. Following the period of adaption, the rats were split up into twelve groups, consisting of four rats each. Group1: (control negative) was continuing fed on basal diet (BD) only, group2 (control positive) Hyperuricemic rats was fed on BD only, group3 was fed on BD and 2% of Moringa leaves powder. Groups 4 was fed on BD and 4% of Moringa leaves powder, groups 5 was fed on BD and 2% of Ginger Rosc. Powder, group6 was fed on basal diet and 4% of Ginger Rosc. Powder, group7 was fed on BD and 2 % mix of Moringa leaves powder and Ginger Rosc. Powders (1:1), group8 was fed on BD and 2 % mixture of Moringa leaves powder and Ginger Rosc. Powders (1:2), the ninth groups was fed on BD and 2 % mixture of Moringa leaves powder and Ginger Rosc. Powders (2:1), group 10 was fed on basal diet and 4 % mix of Moringa leaves powder and Ginger Rosc. Powders (1:1), group11 was fed on BD and 4 % mix of Moringa leaves powder and Ginger Rosc. Powders (1:2), group12 was fed on basal diet and 4 % mix of Moringa leaves powder and Ginger Rosc. Powder (2:1).

2.2.5 Biological effects:

Throughout the experiment, the feed efficiency ratio (FER), organ weight as a percentage of total body weight, body weight (BW) and feed intake (FI) were calculated weekly and daily respectively.

Additionally, the overall behavior of the rats was examined.

Feed efficiency ratio was calculated using (24).

Using these equations:

Feed intake = Initial weight diet (gm) – Loss weight diet (gm).

Body weight gain = (Final weight (gm)- Initial weight (gm))/ (Initial weight (gm)) ×100.

Feed efficiency ratio = (Gain in body weight (gm))/ (Feed intake (gm)).

2.2.6 Biochemical analysis of serum:

Rats were fasted for the entire night prior to sacrifice at the end of the experiment, and blood samples were taken into dry clean centrifuges and centrifuged for 10 minutes at 4000 rpm to separate the serum. The serum was carefully drawn out and placed into sterile, tight-fitting plastic tubes. It was then frozen at -20°C until the analytical stage, which involved determining the glucose level in accordance with (25), Determination of serum urea the method described by(26), Determination of serum Creatinine by (27), Determination of serum uric acid by(28), Determination of Total protein according to(29), Determination of Albumin by (30), Determination of Globulin by (31).

Organs weight: The organs (kidney, liver, spleen and heart) were removed and washed in saline solution, dried and then weighed. Organs relative weight was calculated (32).

2.2.7 Statistical analysis: Data were expressed as (Mean±SD). Differences between control and treated groups were tasted for significance using a one-way analysis of variance (ANOVA test) according to (33) .Duncan's multiple range tests come next. Using the computer program SPSS (version 20.0), differences were deemed significant at the p≤0.05 level.

3. Results and Discussion

The information indicated that Antioxidant, vit B1, vit B2 ,folic acid, Ash, Protein, Crude Fiber, Ca , Phosphorous (P) , Fe , Potassium(K) and Mg ,in Moringa (Oleifera) Leaves higher than Ginger Powder, while Ginger Powder higher than Moringa in Moisture, Carbohydrate, Crude lipid, Zn and Copper (Cu).In nearly similar study who declared that the powdered leaves of Moringa included a significant level of fiber, ash, and protein. Furthermore, the increased content of polyphenols in Moringa leaves resulted in enhanced antioxidant activity (34). The current outcomes are consistent with (35,36). Powdered Moringa leaves contain a significant amount of polyphenol chemicals (37).

The mean value of feed intake, body weight gain and FER with injection by Gentamicin caused significant decrease in FI, BWG% and FER at the +ve group as compared to the -ve group. The best improvement was at the group was fed on Ginger 4%, except in FI Ginger2%, 4% the same result.

Table (1): The chemical composition chemical of Moringa (Oleifera) Leaves and Ginger Powders

chemical composition	Moringa Leaves Powder (100 g)	Ginger Powder(100g)
Antioxidant		
Total Phenolic mg GAE/g DW	45.76	13.34
Total flavonoids (mg QE/ g DW)	27.92	7.5
Total Carotenoid Contents (mg/100 g powder)	94.85	46.69
Proximate analysis % DW		
*Moisture	7.46	8.8
*Ash	6.49	4.92
*Protein	31.65	10.55
*Crude Fiber	18.12	8.62
*Crude lipid	3.835	4.00
Carbohydrate by difference	32.445	63.11
Vitamins		
Vit B1 mg /100g of DW	0.058	0.03
Vit B2 mg /100g of DW	0.680	0.034
Folic acid µg /100g of DW	1.45	0.45
Minerals mg/100 g DW		
*Ca	154.68	104.94
* Phosphorous (P)	251.08	29.96
*Fe	22.96	8.32
*Zn	4.49	12.06
*Potassium(K)	1604.83	373.9
*Sodium (Na)	112.01	18.45
*Mg	370.88	84.17
*Copper (Cu)	0.59	0.80

DW= Dry Weight, mg Quercetin Equivalents (QE)/ g , mg Gallic Acid Equivalents (GAE)/g.

However, the highest improvement is clearly observed at the group was fed on a mix at 4% (2M: 1G) as compared to the other treated groups. These results are in agreement with (35, 36) who reported that in comparison to (-) control group, the rats fed with Moringa leaves displayed an increase in body weight.(38) reported that Body weight increased progressively in both the extract group (rats given only 500 mg/kg of body weight of Moringa oleifera extract) and the normal control group. Rats given PHZ at doses of (300, 600) mg/kg of an ethanolic extract from M. oleifera experienced a raise in body weight in comparison to the negative control. Conversely, (39) showed that when compared to the (-) or (+) controls, ginger did not show a statistically significant difference in food consumption or body weight.

The injection with Gentamicin caused significant reduce in weight of Heart, Spleen, Liver and Kidney at the (+) control group as compared to the -ve control group.

Table (2): Effect of Moringa and Ginger powder and their mixtures on body weight status of Hyperuricemic rats.

Parameters Groups	FI (g/d/rat)	BWG% (Means ±SD)	FER (Means ±SD)
Control (-ve)	22.50	31.81±1.46ab	0.062 ± 0.005ab
Control (+ve)	16.00	4.57 ± 0.90 h	0.012 ± 0.005f
Moringa powder 2%	17.50	7.39 ± 1.58h	0.018 ± 0.005f
Moringa powder 4%	18.30	11.93 ± 4.14g	0.030 ± 0.008e
Ginger powder 2%	18.50	13.51 ± 2.48g	0.030 ± 0.008 e
Ginger powder 4%	18.50	18.23 ± 1.29f	0.045 ±0 .006d
Mix 2% (1 M: 1G)	19	21.91 ± 3.25e	0.050 ± 0.008cd
Mix 2% (1 M: 2G)	19	24.32 ± 1.79de	0.057 ± 0.005abc
Mix 2% (2 M: 1G)	19	23.54 ± 1.18e	0.053 ± 0.005bcd
Mix 4% (1M: 1G)	22	27.39 ± 3.48cd	0.057 ± 0.005abc
Mix 4% (1M: 2G)	22	29.32 ± 2.81bc	0.060 ± 0.008abc
Mix 4% (2M: 1G)	22.30	33.22 ± 0.57a	0.068 ±0 .005a

Data are expressed as Means ± standard deviation, Values at the same column with different superscript letters are significantly different at (p<0.05), M: Moringa. G=Ginger.

Moringa leaves or ginger separately or in combination at two levels 2 and 4% significantly improve the weight of Heart, Liver, Kidney and Spleen as compared to the +ve control group, The weight of Liver and Kidney were improved in rats was fed on Ginger at 4% but the same result in weight Heart in rats fed on Ginger2%and 4%, in the weight of Spleen the same improvement was at the group fed Ginger and Moringa 4%.

Table 3: The effect of Moringa and Ginger powder and their mixtures on relative organs weight of Hyperuricemic rats.

Parameters Groups	Heart (g %)	Liver (g %)	Kidney (g %)	Spleen (g %)
Control Group(-ve)	0.46±0.02a	3.10±0.11a	0.88±0.04a	0.36±0.03a
Control Group(+ve)	0.26±0.03e	1.51±0.13f	0.50±0.04e	0.18±0.02e
Moringa powder 2%	0.30±0.04d	2.09±0.15e	0.58±0.02d	0.20±0.02de
Moringa powder 4%	0.31±0.03d	2.10±0.21e	0.61±0.07d	0.22±0.02cd
Ginger powder 2%	0.37±0.02c	2.36±0.15d	0.69±0.03c	0.21±0.02d
Ginger powder 4%	0.37±0.02c	2.37±0.14d	0.71±0.02c	0.22±0.02cd
Mix 2% (1 M: 1G)	0.38±0.02bc	2.55±0.11cd	0.74±0.03bc	0.21±0.02d
Mix 2% (1 M: 2G)	0.38±0.02bc	2.56±0.19cd	0.75±0.05bc	0.21±0.02d
Mix 2% (2 M: 1G)	0.37±0.03c	2.56±0.23cd	0.74±0.03bc	0.21±0.03d
Mix 4% (1M: 1G)	0.43±0.02a	2.76±0.16bc	0.79±0.02b	0.26±0.02b
Mix 4% (1M: 2G)	0.42±0.03ab	2.80±0.12b	0.85±0.04a	0.25±0.02bc
Mix 4% (2M: 1G)	0.43±0.03a	2.85±0.07b	0.87±0.06a	0.27±0.02b

Data are expressed as Means ± standard deviation, Values at the same column with different superscript letters are significantly different at (p<0.05), M: Moringa. G=Ginger.

The highest improvement is clearly observed at the group fed on a mixture at 4% (2M: 1G) These results was agreed also with that of (40) they that the increased the weight of liver, lungs, heart, kidney, and spleen increased (P<0.05) with high levels of Moringa oleifera leaf in diets . On the other hand, these results were in the similar to (41).

Effect of Moringa leaves and ginger separately or in combination at two levels on serum Glucose. The mean value of serum of Glucose of Injected rats with Gentamicin caused significant raise in at the +ve control group as compared to the -ve control group. There is a significant decrease in serum of Glucose for the rats were fed on M at 2%, 4% as compared to the rats fed on Ginger at 2% and 4%. And there was a significant difference between ginger 4% and 2% in the lowering of serum Glucose, The best improvement was at the group fed on Moringa 2%, the highest improvement is clearly observed at the group was fed on a mix at 4% (2M: 1G) as compared to the other groups. In a related study, male Goto-Kakizaki rats with diabetes and male Wister rats without diabetes who received treatment with Moringa leaf extract showed better glucose intolerance.(42) The scientists demonstrated how administering Moringa to diabetic rats resulted in lower blood glucose levels, elevated serum of insulin, elevated levels of protein, and enhanced anti-oxidant capacity. The rats in the same research that received Moringa treatment showed comparable outcomes when treated with glibenclamide, a sulfonylurea that is frequently used to treat diabetic mellitus in persons. These findings were replicated in a recent study, which obtained similar outcomes from diabetic Sprague-Dawley mice was treated with MO and those treated with glibenclamide (43). As was previously indicated, these effects on glycemia could be explained by a number of Moringa components. For instance, it has been demonstrated that the flavonoid kaempferol enhances GLUT-4 expression, glycolysis, glycogen synthesis, and glucose absorption (44).

Table (4): Effect of Moringa powder, Ginger powder and their mixture on serum Glucose of Hyperuricemic rats.

Parameters Groups	Glucose(mg/dl) (Means ±SD)
Control Group(-ve)	82.62±3.75h
Control Group(+ve)	167.31±2.45a
Moringa powder 2%	133.94±2.04d
Moringa powder 4%	133.98±3.14d
Ginger powder 2%	150.67±3.30b
Ginger powder 4%	145.00±0.82c
Mix 2% (1 M: 1G)	142.00 ±0.82c
Mix 2% (1 M: 2G)	141.67±3.86c
Mix 2% (2 M: 1G)	127.01±1.68e
Mix 4% (1M: 1G)	128.30±3.59e
Mix 4% (1M: 2G)	119.46±2.13f
Mix 4% (2M: 1G)	114.06±3.28g

Data are expressed as Means ± standard deviation, Values at the same column with different superscript letters are significantly different at (p<0.05), M: Moringa. G=Ginger.

The injection with Gentamicin caused increase significant in Creatinine (CR), Urea and Uric Acid at the +ve control group as compared to the -ve control group. Moringa leaves or ginger separately or in combination at two levels 2 and 4% significantly improve the Uric

Acid, Urea and Creatinine as compared to the +ve control group, but still higher than the normal level of the -ve group. Creatinine, Uric Acid and Urea were improved in rats fed on Ginger at 2%, 4% compared to the rats fed on Moringa 2%,4% .but the best improvement was at the group was fed on Ginger 4%. On the other hand, the combination between Moringa and ginger is more effective in improvement of kidney functions when compared to ginger or moringa when given separately. The highest improvement is clearly observed at the group was fed on a mixture at 4% (2M: 1G) as compared to the other the groups that were treated. While CR is created from Creatinine following the breakdown of muscle protein, urea is the byproduct of protein metabolism generated in the liver. Both substances are eliminated by the kidneys, and elevated levels of either signify impaired renal function. Conversely, high serum levels of uric acid, the last breakdown metabolite of purine metabolism, indicate renal dysfunction. Increased levels of Urea and Creatinine, as well as disturbances in the concentration of P and Ca, are examples of electrolyte imbalance disturbances that are thought to be sensitive indications of renal dysfunction. According to the current investigation, all rats given toxicants had higher levels of all plasma renal indicators, which is in line with past findings (45).However, MO and ginger supplementation significantly restored renal biomarkers. Essential oils from the rhizome of ginger (Zingiber Officinale Rosc.) have been shown to provide Nephroprotective measures to rats against cadmium (46). Others have also reported the similar antioxidant qualities of ginger against cadmium renal toxicity (47). It has also been shown that the oils from ginger can lessen the harm that cadmium and acetaminophen can do to the kidneys(48,49) revealed that, Serum of Creatinine levels were little affected ($P < 0.05$) by the M. oleifera treatment in comparison to the obese group that did not receive therapy.(50) discovered that administering the M. Oleifera ethanolic extract to the diabetic rats significantly reduced their urea and Creatinine levels, putting them closer to those of the metformin-treated diabetic animals and the control group. Similar, (51) observed that when compared to the (+) control group, M. oleifera leaves at the tested amounts significantly lowered blood urea, Creatinine, and uric acid.

The injection with Gentamicin caused significant ($P<0.05$) decrease in Total Protein, Globulin and Albumin at the + ve control group as compared to the -ve control group. Moringa leaves or ginger separately or in combination at two levels 2 and 4% improve the Globulin, Albumin and Total Protein in contrast to the +ve control group, but still lower than the normal level of the -ve control group except the group fed on a mixture at 4% (2M: 1G). The serum of globulin, albumin and total protein were improved in rats

fed on ginger at 4% in contrast to the rats fed on Moringa 2% and 4% and ginger at 2% but the highest improvement is clearly.

Table (5): Effect of Moringa powder, Ginger powder and their mixture on kidney functions of Hyperuricemic rats.

Parameters Groups	Creatinine mg/dl (Means ±SD)	Urea	Uric Acid
Control Group(-ve)	0.41±0.03j	19.95±.96h	1.60±0.05h
Control Group(+ve)	1.82±0.10a	65.59±4.68a	7.15±0.07a
Moringa powder 2%	0.97±0.01b	52.69±1.44b	6.52±0.25b
Moringa powder 4%	0.93±0.01bc	45.86±2.82c	6.09±0.52c
Ginger powder 2%	0.91±0.02cd	41.90±1.74d	5.72±0.06d
Ginger powder 4%	0.87±0.01de	36.76±3.51e	5.66±0.01d
Mix 2% (1 M: 1G)	0.82±0.01ef	32.30±1.22f	5.44±0.16d
Mix 2% (1 M: 2G)	0.82±0.02ef	31.95±2.03f	5.43±0.22d
Mix 2% (2 M: 1G)	0.77±0.02fg	27.66±1.48g	4.870±0.13e
Mix 4% (1M: 1G)	0.75±0.02gh	27.19±1.68g	4.89±0.14e
Mix 4% (1M: 2G)	0.70±0.02hi	26.46±1.57g	4.02±0.10f
Mix 4% (2M: 1G)	0.66±0.01i	22.87±1.44h	3.58±0.33g

Data are expressed as Means ± standard deviation, Values at the same column with different superscript letters are significantly different at ($p<0.05$), M: Moringa. G=Ginger.

It has been noted that the group fed on a mixture at 4% (2M: 1G) in contrast to the additional treatment groups to the other treated groups. These results are in concurring with (52) who showed that the groups who were administered ginger had significantly higher serum levels of total proteins, albumin, and globulin. During the fourth week of feeding, the groups treated with 3% ginger (Zingiber Officinale) showed the greatest rise in serum total protein. Additionally, the groups fed with 3% ginger saw a substantial increase in serum albumin values at the first, third, and fourth weeks of feeding. Additionally, the results showed that the group fed 3% ginger (Zingiber Officinale) had the highest amount of serum globulin at the third week after feeding began. On the other hand (53) showed that there was a negligible increase in protein at the 250 mg/kg and 500 mg/kg doses of Moringa. While the globulin level was found to decrease, there was also a tiny and negligible increase in the serum albumin level at both doses. This result reinforced by the results of (54,55). After feeding ginger to Asian sea bass for fifteen days, nearly same results were seen (56).

Table (6): The effect of moringa, ginger powders and their mixture on serum globulin, albumin and total protein of hyperuricemic rats.

Parameters Groups	Globulin mg/dl (Means ±SD)	Albumin	Total Protein
Control Group(-ve)	3.86±0.25a	7.63±0.25a	11.49±0.38a
Control Group(+ve)	0.38 ±0.06d	3.73±0.15g	4.11±0.20h
Moringa powder 2%	2.36 ±0.25c	4.53±0.01f	6.89±0.25g
Moringa powder 4%	2.89 ±0.14bc	4.55±0.01f	7.44±0.15fg
Ginger powder 2%	2.71 ±0.06bc	4.78±0.16ef	7.49±0.20efg
Ginger powder 4%	2.94 ±0.32bc	4.88±0.22ef	7.82±0.17ef
Mix 2% (1 M: 1G)	2.615±0.34bc	5.22±0.19de	7.83±0.22ef
Mix 2% (1 M: 2G)	3.47 ±0.82ab	4.89±0.38ef	8.30±0.81de
Mix 2% (2 M: 1G)	3.33 ± 0.29ab	5.36±0.54d	8.68±0.70d
Mix 4% (1M: 1G)	3.08 ±1.43abc	5.60±0.29d	8.68±1.15d
Mix 4% (1M2G)	3.52 ±0.52ab	6.10±0.48c	9.62±0.41c
Mix 4% (2M: 1G)	3.96 ±0.44a	6.732±0.21b	10.69±0.53b

Data are expressed as Means ± standard deviation, Values at the same column with different superscript letters are significantly different at (p<0.05), M: Moringa. G=Ginger.

5. Conclusion

It can be inferred from the current study's results that Moringa (Oleifera) leaves powder, Ginger (Zingiber Officinale Rosc.) Powder and their mixture are a promising Nephroprotective agent and improve hyperuricemia this protective activity of Moringa leaves powder, because of its anti-inflammatory and antioxidant effects, This research therefore advise using it as a functional food to improve hyperuricemia in conjunction with other treatments.

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التغذية وعلوم الاطعمة

تأثير مسحوق أوراق المورينجا و الزنجبيل الخافض لحمض اليوريك في ذكور الفئران

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الاستشهاد الي:

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الملخص العربى:

هدفت هذه الدراسة إلى التحقق من تأثيرمسحوق أوراق المورينجا و الزنجبيل على الفئران المصابة بفرط حمض يوريك الدم. تم إجراء التحاليل الكيميائية لمساحيق المورينجا أوليفيرا و الزنجبيل. تم استخدام 48 ذكراً بالغاً من فئران التجارب بوزن (200 ± 2 جرام). تم تقسيم اثنتي عشرة مجموعة (أربعة فئران/مجموعة)تشمل المجموعة الضابطه السالبه. تم حقن جميع المجموعات بالجنتامايسين (100 ملجم/كجم من وزن الجسم) يومياً لمدة سبعة أيام ما عدا المجموعة الضابطة السالبة. تمت إضافة المساحيق بنسبة (2%، 4%) من أوراق المورينجا و الزنجبيل ومخاليطها بنسبة ((1 :1), (2:1), (1:2)) لكل منها من الوجبة الأساسية بعد 4 أسابيع تم ذبح الفئران وتم تقدير وزن الجسم ، وزن القلب، الكبد، الكلى والطحال، مستوى الجلوكوز في الدم، وظائف الكلى، الألبومين، الجلوبيولين، البروتين الكلي. ومن ثم تم إجراء التحليل الإحصائي. وأظهرت النتائج ان المورينجا أو الزنجبيل بشكل منفصل أو مجتمعة يحسن بشكل كبير وزن الجسم، وزن الأعضاء، الجلوكوز في الدم، وظائف الكلى، الألبومين، الجلوبيولين والبروتين الكلى. بينما كان هناك تحسن ملحوظ في مستويات الجلوكوز في الدم لدى المجموعة التي تتغذى على المورينجا بنسبة 2%. كما كان هناك تحسن ملحوظ في زيادة وزن الجسم ونسبة التغذية الأساسية ووظائف الكلى والألبومين والجلوبيولين والبروتين الكلي ووزن الكبد والكلى في المجموعة التي تم تغذيتها على الزنجبيل 4%. في حين أن المجموعة التى تتغذى على مخلوط بنسبة 4% (2 مورينجا: 1 زنجبيل) قد تحسن بشكل ملحوظ في جميع التقديرات التى تمت للفئران البيضاء المصابة. تلخص الدراسة إلى دلاله إحصائية على أن المجموعة التى تتغذى على مخلوط م،ز بنسبة 4% (2 مورينجا: 1 زنجبيل) قد يحسن الحالة الصحية للفئران البيضاء التي تعاني من فرط حمض اليوريك فى الدم.

الكلمات المفتاحية: اوراق المورينجا ، مسحوق الزنجبيل، إرتفاع مستوى حامض اليوريك فى الدم، فئران،وظائف الكبد ، جلوكوز الدم .