Effects of *Acacia Nilotica* Leaf Extract Supplementation on Physiological Parameters and Antioxidant Activity in Growing Rabbits

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ABSTRACT: In the present study the antioxidant activity of *Acacia nilotica* leaf in growing rabbits was performed. Thirty weaned V-line rabbits aged 35 days (5 weeks) weighed 510g±8.30 (mean±SE) used for the study which lasted for 84 days (12 weeks). Animals were divided equally and randomly into three groups (10 in each one). The first group was fed *ad libitum* a commercial pelleted diet, while the other groups (second and third) were fed the same diet plus administration with oral daily *Acacia nilotica* leaf extract at a dose 100 (low dose) and 200 mg /kg body weight (high dose) respectively for 7 weeks. Treatment with aqueous ethanolic leaf extract of *Acacia nilotica* resulted in significant ($p<0.05$) increase in blood plasma total protein, albumin and globulin, while blood plasma aminotransferase (AST) and alanine-aminotransferase (ALT), alkaline phosphatase (ALP), urea, triglyceride (TG) and glucose levels were significantly decreased as compared to untreated group (control). Results showed that the *Acacia nilotica* leaves extract has significant antioxidant effect by increasing blood plasma Glutathione peroxidase (GPx) and catalase and decrease blood plasma thiobarbituric acid-reactive substances (TBARS) activity as compared to control. The effect of *Acacia nilotica* leaves extract showed better response as dose dependent. This potential activity of *Acacia nilotica* leaf might be due to the presence of its phytochemicals or the collective action of many active ingredients. It could be concluded that *Acacia nilotica* leaf extract treatment significantly improved physiological and antioxidant activity of growing rabbit and this improved was dose dependent.
Keywords: (*Acacia nilotica*, growing rabbits, leaf extract, blood physiology, antioxidant)

INTRODUCTION:

Rabbit production is an important branch of animal production. Rabbit meat is of high quality and safety. The susceptibility of rabbits to various infection diseases and high mortality of young rabbits after weaning were studies. Frankič *et al.* (2009) reported that the main scope in animal husbandry to ensure good performance of farm animals and get quality animal products. In this aspect, herbs and spices are not just appetite and digestion stimulants, but can, with impact on other physiological functions, help to ensure good health and welfare of the animals, which could positively affect their performance. The use of phyto-additives and their extracts in rabbit husbandry offers an acceptable way to improve welfare and health (Szaboova, *et al,.* 2008).

Acacia contains variety of bioactive components such as phenolic acids, alkaloids, terpenes, tannins and flavonoids which are responsible for numerous biological and pharmacological properties like hypoglycemic, anti-inflammatory, anti-bacterial, anti-platelet aggregatory, anti-hypertensive, analgesic, anticancer, and anti-atherosclerotic due to their strong antioxidant and free

radical scavenging activities (Sulaiman and Gopalakrishnan, 2011). Similar conclusion was reported by Seigler (2003) who reported that acacia species including amines and alkaloids, cyanogenic glycosides, cyclitols, fatty acids and seed oils, fluoroacetate, gums, non- protein amino acids, terpenes, hydrolysable tannins, flavonoids and condensed tannins.Phenolics are largest group of phytochemicals and accounts for most of the antioxidant activity in plants or plant products (Okpuzar, *et al.,* 2009).

Sharma *et al.* (2014) investigated the antibacterial, antifungal, antiviral, and immunomodulatory potential of hot aqueous extract of Acacia nilotica leaves. They found that on dry matter basis, the filtered acacia nilotica leaves had a good extraction ratio (33.46%) and was found to have carbohydrates, glycosides, phytosterols, phenolic compounds, saponins, and flavonoids as major constituents. and these supports its use and availability in folk medicine. The efficacy of these compounds is already well established for antimicrobial activities (Mustafa, *et al.* 1999). Similar results were found of phytoconstituents of different extracts of Acacia nilotica, namely, aqueous extract (Kalaivani*, et al.* 2011), methanolic, and ethanolic extracts (Solomon-Wisdom and Shittu, 2010). Thus, the present study was planned to study the possibly improvement effects of extract of *Acacia nilotica* leaves on physiological and antioxidant parameters in growing rabbits.

MATERIALS AND METHODS

The present study was carried out at the Rabbit Research Laboratory, in the Animal and Fish Production Department, Faculty of Agriculture (Saba Basha) during breeding season from October to February (winter, 2012).

Preparation of extract

Acacia nilotica Leaves (10g) were soaked and washed with plenty of water. The *Acacia nilotica* leaves extract was prepared in 100 ml of 80% aqueous methanol after crushing and macerating *Acacia nilotica* leaves (Alharbi and Azmat, 2011). After 3 days, the supernatant was completely removed by a boiling water bath at 45^{o}C. The obtained residue was kept in the refrigerator for further use. The extract was made up to a known volume with distilled water just before oral administration.

Diets and animals

Thirty weaned V-line rabbits aged 35 days (5 weeks) and weighed 510g±8.30 (mean±SE) used for the study which lasted for 84 days (12 weeks) and were divided equally and randomly into three groups (10 in each one). The first group was fed *ad libitum* a commercial pelleted diet according to NRC (1977) recommendations and kept untreated and served as a control. The other groups (second and third) were fed the same diet plus administration with oral daily *Acacia nilotica* leaf extract at a dose 100 (Low dose) and 200 mg /kg body weight (High dose) respectively for 7 weeks. All the experimental animals were healthy and clinically free from internal and external parasites and were kept under the same management and hygienic conditions.

Experimental procedure

Blood samples were collected from the marginal ear vein every other week from five rabbits from each group. Plasma was separated by centrifugation at 4000 rpm for 20 minutes and kept -20^{o}C until blood analysis. Stored plasma samples were analyzed for total proteins, albumin, activity asparate-aminotransferase (AST) and alanine- aminotransferase (ALT), alkaline phosphatase (ALP), urea, triglyceride (TG), and glucose using commercial kits.

Blood plasma Thiobarbituric acid-reactive substances (TBARS) were measured in by using the method of Tappel and Zalkin (1959). Catalase (CAT) activity was determined using the Luck method involving the decomposition of hydrogen peroxide (Luck, 1974). Glutathione peroxidase (GPx) activity was assayed using the method of Chiu *et al.* (1976).

Data were analyzed as a completely randomized design (Steel and Torrie, 1981) using the general linear model procedure of SAS (1986). Means were statistically compared using least significant difference (LSD) test at 0.05 significance level (Steel and Torrie, 1981).

The following model was used:
Yijk = μ + ai + bj + abij + eijk
where Yijk, experimental observation; μ, overall mean; ai, treatment effect; bj, week effect; abij, interaction effect of treatment and week; eijk, random error.

RESULTS AND DISSECTION

Effects of acacia extract on physiological parameters:

Blood plasma total protein, albumin and globulin:

The data in Table (1) found that oral supplementation with low and high doses of *Acacia nilotica* extract cause significant increase in plasma total protein, albumin and globulin compared with unsupplemented group. The effect of weeks on pervious parameters was not significant.

The data in Table (1) showed that there was significant interaction between treatment and weeks in plasma TP, Alb and globulin (Glb). The highly significant values of plasma TP, Alb and Glb were obtained in the group supplemented with low dose of acacia extract at the eighth of week. *Acacia nilotica* leaves are very digestible and have high levels of protein (Fagg, 2001). Kannan *et al.* (2013) found that *Acacia nilotica* elevated plasma total protein in Wistar rats.

Wu and Tsai (2006) showed that mice fed chitosan (isolated from papaya latex), at the dose of 2.5 g/kg body weight increased serum immunoglobulin amounts. The increase of total protein in blood rabbits fed papaya latex may be associated with improvement of crude protein digestibility (El-Kholy *et al.,* 2008).

Table (1): Overall means (mean ±SE) and the interaction of blood plasma total protein (TP), albumin (Alb) and globulin (Glb) of growing rabbits as affected by aqueous extract *acacia nilotica* leaves supplementation

Item	TP (g/100ml)	Alb (g/100ml)	Glb (g/100ml)
Effect of Treatment (T)			
Control	6.12 ± 0.15^{b}	4.01 ± 0.09^{b}	2.11 ± 0.15^{b}
Acacia LD (T1)	7.40 ± 0.17^{a}	4.46 ± 0.10^{a}	2.94 ± 0.13^{a}
Acacia HD (T2)	7.08 ± 0.14^{a}	4.48 ± 0.06^{a}	2.60 ± 0.15^{a}
P value	0.0001	0.0001	0.0004
Effect of Weeks (W)			
Week1	6.61 ± 0.10	4.15 ± 0.07	2.45 ± 0.11
Week3	6.92 ± 0.17	4.33 ± 0.04	2.58 ± 0.17
Week5	6.95 ± 0.22	4.43 ± 0.12	2.52 ± 0.23
Week7	6.99 ± 0.35	4.34 ± 0.16	2.65 ± 0.23
P value	0.2685	0.1783	0.8408
Interaction (T*W)			
T1*W1	6.30 ± 0.17^{e}	3.93 ± 0.16^{de}	2.37 ± 0.30^{cd}
T1*W3	6.23 ± 0.24^{e}	4.26 ± 0.02^{bcd}	1.98 ± 0.23^{cd}
T1*W5	6.52 ± 0.40^{ed}	4.18 ± 0.15^{cd}	2.34 ± 0.43^{cd}
T1*W7	5.41 ± 0.13^{f}	3.66 ± 0.20^{e}	1.75 ± 0.19^{d}
T2*W1	6.66 ± 0.16^{cde}	4.22 ± 0.04^{bcde}	2.44 ± 0.19^{cd}
T2*W3	7.57 ± 0.17^{ab}	4.24 ± 0.07^{bcd}	3.33 ± 0.10^{ab}
T2*W5	7.20 ± 0.17^{bcd}	4.64 ± 0.26^{ab}	2.56 ± 0.21^{c}
T2*W7	8.19 ± 0.40^{a}	4.75 ± 0.26^{a}	3.44 ± 0.20^{a}
T3*W1	6.86 ± 0.08^{bcde}	4.31 ± 0.08^{abcd}	2.54 ± 0.03^{c}
T3*W3	6.94 ± 0.05^{bcde}	4.50 ± 0.05^{abc}	2.44 ± 0.08^{cd}
T3*W5	7.14 ± 0.50^{bcd}	4.47 ± 0.21^{abc}	2.67 ± 0.55^{abc}
T3*W7	7.37 ± 0.26^{bc}	4.62 ± 0.05^{abc}	2.75 ± 0.31^{abc}
P value	0.0014	0.0323	0.0460

^{a,b,c,d,e,f} Means within a column not sharing similar superscripts are significantly different (P<0.05). W1,3,5,7 represent the weeks of treatment.

As *Acacia nilotica* leaves contains flavonoides, polyphenolic compounds, tannins, glycosides, organic acids and coumains (El-Shanawany, 1996), the anti-microbial activity of plant leaves might responsible for the anti-bactrial activity of plants. Increased globulin concentration may be an indication of increased immunity in the rabbits since the liver will be to synthesize enough globulins for immunologic action as mentioned by Summonu and Oloyede (2007).

Blood plasma ALT, AST and ALP

The data in Table (2) reported that supplemented growing rabbits with *Acacia nilotica* leave extract caused significant decreased in blood plasma AST, ALT and ALP compared with control group.

Table (2): Overall means (mean ±SE) and the interaction of blood plasma ALT, AST and ALP of growing rabbits as affected by aqueous extract *acacia nilotica* leaves supplementation

Item	ALT (mg/dl)	AST (mg/dl)	ALP (mg/dl)
Effect of Treatment (T)			
Control	29.3 ± 0.40^{a}	57.1 ± 1.79^{a}	144.3 ± 3.52^{a}
Acacia LD	26.5 ± 0.43^{b}	50.1 ± 1.77^{b}	116.4 ± 4.58^{b}
Acacia HD	24.4 ± 1.02^{c}	48.3 ± 1.44^{b}	113.2 ± 6.12^{b}
P value	0.0001	0.0001	0.0001
Effect of Weeks (W)			
Week1	28.5 ± 0.52^{a}	56.6 ± 1.66^{a}	143.4 ± 5.97^{a}
Week3	27.6 ± 0.63^{a}	53.2 ± 2.06^{ab}	125.5 ± 5.36^{b}
Week5	25.7 ± 1.10^{b}	51.1 ± 2.02^{bc}	117.8 ± 4.16^{bc}
Week7	25.0 ± 1.11^{b}	46.5 ± 2.10^{c}	111.8 ± 7.85^{c}
P value	0.0004	0.0008	0.0001
Interaction (T*W)			
T1*W1	28.4 ± 0.82^{ab}	56.9 ± 3.66^{a}	146.0 ± 3.96^{a}
T1*W3	29.4 ± 0.75^{a}	57.3 ± 4.90^{a}	150.3 ± 2.50^{a}
T1*W5	29.7 ± 1.08^{a}	58.3 ± 3.61^{a}	131.4 ± 8.68^{ab}
T1*W7	29.8 ± 0.61^{a}	56.0 ± 3.18^{a}	149.3 ± 9.02^{a}
T2*W1	28.5 ± 0.42^{ab}	57.5 ± 2.66^{a}	141.7 ± 9.05^{a}
T2*W3	27.3 ± 0.29^{abc}	51.6 ± 3.59^{ab}	115.9 ± 5.98^{bc}
T2*W5	25.2 ± 0.58^{c}	50.4 ± 2.04^{abc}	109.7 ± 2.73^{c}
T2*W7	24.9 ± 0.86^{cd}	41.0 ± 0.55^{d}	98.4 ± 4.41^{cd}
T3*W1	28.8 ± 1.40^{ab}	55.4 ± 2.78^{a}	142.5 ± 6.55^{b}
T3*W3	26.0 ± 1.44^{bc}	50.8 ± 1.16^{ab}	110.4 ± 5.22^{bc}
T3*W5	22.2 ± 2.05^{ed}	44.7 ± 1.63^{bcd}	112.2 ± 5.32^{bc}
T3*W7	20.4 ± 0.85^{e}	42.3 ± 1.18^{cd}	87.8 ± 2.21^{d}
P value	0.0013	0.0064	0.0097

^{a,b,c,d,e,f} Means within a column not sharing similar superscripts are significantly different ($P<0.05$). W1,3,5,7 represent the weeks of treatment.

The results in Table (2) showed that the lowest significant values of the pervious parameters were obtained at the end of experimental period compared with the binging of treatment. The interaction between the treatment and time

was shown in blood plasma ALT, AST and ALP where the lowest significant values was obtained in group three at the eighth week.

Aspartate transaminase (AST) and alanine transaminase (ALT) are enzymes associated with the conversion of amino acids to ketoacids. They are pathophysiological marker enzymes used to assess tissue damage (Sriram and Subramanian, 2011). Interestingly, *Acacia nilotica* did not show any such side effects. There was a decrease in plasma AST and ALT levels compared to control group in *Acacia nilotica* extract treated groups which indicated non-toxic and tissue protective nature of *Acacia nilotica*.

Blood plasma urea, TG and glucose

The data in Table (3) reported that supplemented growing rabbits with water *Acacia nilotica* leaves extract caused significant decreased in blood plasma TG and glucose levels compared with control group. No significant difference was found for blood plasma urea concentration. The results in Table (3) showed that the lowest significant values of blood plasma glucose and the highest blood plasma urea level was shown at the weeks7, compared with the binging of treatment. The significant interaction between the treatment and time was shown in blood plasma urea, TG and glucose, where the lowest significant values was obtained in group three at the eighth week for plasma TG and glucose.

Glucose is not only a necessary nutrient for the development and growth of food-producing animals, but also a potent signal molecular that regulates protein synthesis (Goichon *et al.,* 2011). Therefore, the lower level of circulating glucose suggests a high efficiency of glucose and protein use for a healthy animal through nutritional perspectives (Yin and Cheng, 2003), which at least partially contributes to the improvement of growth performance and feed efficiency in poultry.

Effects of acacia extract on antioxidant parameters:

Data in Table (4) showed that administration with *Acacia nilotica* extract caused a significant decrease in blood plasma TBARS and significant increase in blood plasma GPx and CAT levels. The effect of *Acacia nilotica* extract was dose dependent. *Acacia nilotica* leaves extract for 8 weeks resulted in significant change in pervious parameters during experimental period.

The significant interaction between treatments and weeks was shown in blood plasma TBARS, GPx and CAT levels. The lowest significant interaction in TBARS and the highest significant interaction in GPx and CAT were obtained at weeks eight in high *Acacia nilotica* leaves extract dose treatment group. The results of the present study clearly indicated that aqueous extract of *Acacia nilotica* leaves exhibited higher antioxidant and free radical scavenging potentials.

Table (3): Overall means (mean ±SE) and the interaction of blood plasma urea, TG and glucose of growing rabbits as affected by aqueous extract of *Acacia nilotica* leaves supplementation

Item	Urea (mg/dl)	TG (mg/dl)	Glucose (mg/dl)
Effect of Treatment (T)			
Control	53.7 ± 1.32	67.5 ± 1.80^{a}	133.0 ± 2.9^{a}
Acacia LD	53.1 ± 1.52	59.2 ± 1.53^{b}	109.9 ± 2.7^{b}
Acacia HD	53.2 ± 0.62	48.5 ± 2.39^{c}	108.3 ± 3.4^{b}
P value	0.8766	0.0001	0.0001
Effect of Weeks (W)			
Week1	48.1 ± 1.34^{c}	61.9 ± 1.84	123.9 ± 3.6^{a}
Week3	50.5 ± 0.99^{c}	59.9 ± 2.68	118.3 ± 3.7^{ab}
Week5	53.7 ± 1.18^{b}	53.3 ± 3.68	113.2 ± 4.8^{b}
Week7	61.1 ± 1.01^{a}	58.4 ± 4.59	112.9 ± 5.5^{b}
P value	0.0001	0.0905	0.0340
Interaction (T*W)			
T1*W1	46.3 ± 1.22^{g}	63.4 ± 2.98^{abc}	124.2 ± 8.16^{abc}
T1*W3	48.9 ± 1.96^{gf}	68.6 ± 4.12^{ab}	135.0 ± 5.00^{ab}
T1*W5	57.5 ± 2.06^{bc}	64.1 ± 5.66^{abc}	134.0 ± 5.34^{ab}
T1*W7	62.0 ± 1.15^{ab}	73.8 ± 4.10^{a}	138.6 ± 3.46^{a}
T2*W1	48.9 ± 4.06^{fg}	60.8 ± 2.67^{bc}	122.8 ± 3.84^{bcd}
T2*W3	48.1 ± 0.14^{fg}	58.2 ± 3.64^{bc}	110.5 ± 2.05^{cde}
T2*W5	50.9 ± 1.79^{efg}	55.2 ± 4.51^{c}	102.6 ± 3.45^{e}
T2*W7	64.7 ± 0.72^{a}	62.6 ± 4.31^{abc}	103.9 ± 6.19^{e}
T3*W1	49.0 ± 1.08^{fg}	61.4 ± 4.32^{bc}	124.7 ± 7.25^{abc}
T3*W3	54.5 ± 0.40^{cde}	53.0 ± 3.73^{c}	109.5 ± 3.15^{de}
T3*W5	52.6 ± 1.16^{def}	40.6 ± 4.40^{d}	103.0 ± 6.26^{e}
T3*W7	56.6 ± 0.71^{cd}	38.8 ± 5.06^{d}	96.1 ± 2.53^{e}
P value	0.0003	0.0131	0.0042

^{a,b,c,d,e,f,g} Means within a column not sharing similar superscripts are significantly different (P<0.05). W1,3,5,7 represent the weeks of treatment.

Table (4): Overall means (mean±SE) and the interaction of blood plasma TBARS, GPx and CAT of growing rabbits as affected by aqueous extract *Acacia nilotica* leaves supplementation

Item	TBARS (nmol/ml)	GPx (U/ml)	CAT (U/ml)
Effect of Treatment (T)			
Control	1.643 ± 0.04^{a}	0.882 ± 0.01^{c}	1.275 ± 0.01^{c}
Acacia LD	1.218 ± 0.02^{b}	1.011 ± 0.02^{b}	1.395 ± 0.02^{b}
Acacia HD	1.177 ± 0.02^{c}	1.134 ± 0.03^{a}	1.507 ± 0.03^{a}
P value	0.0001	0.0001	0.0001
Effect of Weeks (W)			
Week1	1.325 ± 0.01^{b}	0.938 ± 0.01^{c}	1.280 ± 0.02^{c}
Week3	1.416 ± 0.06^{a}	1.014 ± 0.03^{b}	1.416 ± 0.04^{a}
Week5	1.326 ± 0.07^{b}	1.065 ± 0.05^{a}	1.425 ± 0.04^{a}
Week7	1.317 ± 0.10^{b}	1.020 ± 0.05^{b}	1.448 ± 0.04^{a}
P value	0.0001	0.0001	0.0001
Interaction (T*W)			
T1*W1	1.314 ± 0.01^{c}	0.934 ± 0.03^{cd}	1.286 ± 0.02^{de}
T1*W3	1.746 ± 0.02^{b}	0.924 ± 0.01^{d}	1.304 ± 0.04^{de}
T1*W5	1.674 ± 0.07^{b}	0.833 ± 0.02^{e}	1.253 ± 0.02^{e}
T1*W7	1.839 ± 0.01^{a}	0.838 ± 0.03^{e}	1.258 ± 0.03^{e}
T2*W1	1.337 ± 0.03^{c}	0.946 ± 0.02^{cd}	1.289 ± 0.04^{de}
T2*W3	1.299 ± 0.01^{c}	0.995 ± 0.04^{c}	1.384 ± 0.03^{cd}
T2*W5	1.204 ± 0.02^{d}	1.122 ± 0.01^{b}	1.453 ± 0.07^{bc}
T2*W7	1.032 ± 0.02^{e}	0.983 ± 0.01^{cd}	1.454 ± 0.03^{bc}
T3*W1	1.326 ± 0.01^{c}	0.935 ± 0.02^{cd}	1.265 ± 0.05^{e}
T3*W3	1.201 ± 0.01^{d}	1.122 ± 0.03^{b}	1.562 ± 0.05^{ab}
T3*W5	1.100 ± 0.01^{e}	1.240 ± 0.02^{a}	1.570 ± 0.05^{a}
T3*W7	1.079 ± 0.03^{e}	1.240 ± 0.03^{a}	1.632 ± 0.02^{a}
P value	0.0001	0.0001	0.0004

^{a,b,c,d,e} Means within a column not sharing similar superscripts are significantly different (P<0.05). W1,3,5,7 represent the weeks of treatment.

Natarajan and Srinivasan (2015) reported that *Acacia nilotica* leaves for 6 weeks resulted in a marked decrease in plasma TBARS and marked increase in superoxide dismutase (SOD), CAT and GPx activities as compared to alloxan induced diabetic rats. They added that *Acacia nilotica* leaf treatment increased the antioxidants and may there by help to control free radicals, as *Acacia nilotica* leaf has been reported to be rich in flavonoids and phenolic compounds, well-known antioxidants and also to possess *in vitro* free radical scavenging and antioxidant activity (Kalaivani and Mathew, 2010).

In conclusion, *Acacia nilotica* leaf extract treatment significantly improved physiological parameters and antioxidant activity of growing rabbit and this improvement was dose dependent.

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الملخص العربي

تأثير اضافة مستخلص اوراق نبات الاكاسيا نيولتيكا علي الصفات الفسيولوجية ونشاط مضادات الاكسدة للارانب النامية

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هدفت الدراسة في البحث في استخدام مستخلاصات النباتات الرعوية في تحسين الوظائف الفسيولوجية للارانب النامية. في هذه الدراسة تم البحث في دراسة تاثير مستخلص اوراق نبات الاكاسيا نولتيكا كمضاد للاكسدة علي الارانب النامية. استخدمت في التجربة عدد ثلاثين من الارانب النامية عمر ٥ اسابيع قسمت الي ثلاث مجاميع كل مجموعة عددها ١٠ ارانب. المجموعة الاولي كانت المجموعة المقارنة والمجموعتين الثانية والثالثة اخذت جرعات من مستخلص نبات الاكاسيا بكمية ١٠٠ و٢٠٠ملجرام لكل كيلوجرام وزن جسم حتي عمر ١٢ اسبوع (مدة التجربة ٧ اسابيع). اظهرت المعاملة اليومية زيادة معنوية في بلازما الدم البروتين الكلي والالبيومين والجلوبيولين، بينما الاسبرتيت ترانس امينيز واللانين ترانس امينيز والالكلين فوسفاتيز واليوريا والجلسريدات الثلاثية والجلوكوز قد انخفضت معنويا مقارنة بالمجموعة الغير معاملة. وكان التحسن في الصفات الفسيولوجية معتمده علي الجرعة المعطاه حيث كلما زادت الجرعة المقدمه للارانب كلما كانت الاستجابة الفسيولوجية احسن.

اوضحت الدراسة ان مستخلص اوراق نبات الاكاسيا كان لها نشاط مضاد للاكسدة من خلال زيادة مستوي بلازما الدم الجلوتاثيون بيروكسويديز والكاتاليز وانخفاض الـ TBARS مقارنة بالمجموعة المقارنه وربما يرجع ذلك الي وجود المركبات الكميائية النباتية الفعالة او احتواءها علي العديد من المركبات الكميائيه النشطه.

والخلاصة ان استخدام مستخلاصات النباتات الرعوية مثل نبات الاكاسيا نولتيكا في الارانب النامية حسنت من الصفات الفسيولوجية وحسنت من قدرة الجسم في زيادة محتواه من مضادات الاكسدة وخفضت من التاثير الضار للشوارد الحرة بالجسم خلال مرحلة نمو الارانب النامية وحتي عمر التسويق.