Evaluation of the Effect of Solanum Melongena on some Coagulation parameter among Sudanese people in khartoum state 2021

Abstract

The eggplant, or aubergine, provides fiber and a range of nutrients. This ~~low calorie~~low-calorie vegetable features in the diet of Mediterranean and other parts of the world ~~diet~~. Many of people ~~us~~ are most familiar with eggplants that are large and dark purple, but the shape, size, and color can vary from small and oblong to long and thin and from shades of purple to white or green. ~~Many of~~ T~~t~~he pests and diseases that afflict the other solanaceous plants, such as tomato, capsicum, and potato, are also troublesome to eggplants. For this reason, it should generally not be planted in areas previously occupied by its close relatives. Eggplant also contains traces of various other compounds of interest. It has some oxalates, which are organic acids that can combine with calcium to form crystalline solids in humand body. People are at typically at risk of ingesting the most solanine if they eat potatoes that have turned green. Eggplants contain small quantities of solanine, and eating low-to-moderate amounts is unlikely to have a significant effect.

Keywords: eggplants, organic acids, wild progenitors, breeding

1.1. Introduction

Eggplant is the fifth most economically important solanaceous crop after potato, tomato, pepper, and tobacco. Apart from the well-known brinjal eggplant (Solanum melongena L.), two other under-utilized eggplant species, the scarlet eggplant (S. aethiopicum L.) and the gboma eggplant (S. macrocarpon L.) are also cultivated. The taxonomy and identification of eggplant wild relatives ~~is~~ are challenging for breeders due to ~~the~~ large number of related species, but recent phenotypic and genetic data and

classification in primary, secondary, and tertiary genepools, as well as information on the domestication process and wild progenitors, facilitates their utilization in breeding. The World Vegetable Center (WorldVeg) holds a large public germplasm collection of eggplant, which includes the three cultivated species and more than 30 eggplant wild relatives, with more than 3,200 accessions collected from 90 countries. Over the last 15 years, more than 10,000 seed samples from the Center's eggplant collection have been shared with public and private sector entities, including other genebanks. An analysis of the global occurrences and genebank holdings of cultivated eggplants and their wild relatives reveals that the WorldVeg genebank holds the world's largest [(1)]

It is a delicate, tropical perennial plant often cultivated as a tender or half-hardy annual in temperate climates. The stem is often spiny. The flowers are white to purple in color, with a five-lobed corolla and yellow stamens. Some common cultivars have fruit that is egg-shaped, glossy, and purple with white flesh and a spongy, "meaty" texture. Some other cultivars are white and longer in shape. The cut surface of the flesh rapidly turns brown when the fruit is cut open (oxidation)

In tropical and subtropical climates, eggplant can be sown in the garden. Eggplant grown in temperate climates fares better when transplanted into the garden after all danger of frost has passed. Eggplant prefers hot weather, and when grown in cold climates or in areas with low humidity,

the plants languish or fail to set and produce mature fruit. Seeds are typically started eight to 10 weeks prior to the anticipated frost-free date. S. melongena is included on a list of low-flammability plants, indicating that it is suitable for growing within a building protection zone

Spacing should be 45 to 60 cm (18 to 24 in) between plants, depending on cultivar, and 60 to 90 cm (24 to 35 in) between rows, depending on the type of cultivation equipment being used. Mulching helps conserve moisture and prevent weeds and fungal diseases and the plants benefit from some shade during the hottest part of the day. Hand pollination by shaking the flowers improves the set of the first blossoms. Growers typically cut fruits from the vine just above the calyx owing to the

somewhat woody stems. Flowers are complete, containing both female and male structures, and may be self- or cross-pollinated.

Many of the pests and diseases that afflict other solanaceous plants, such as tomato, capsicum, and potato, are also troublesome to eggplants. For this reason, it should generally not be planted in areas previously occupied by its close relatives. However, since eggplants can be particularly susceptible to pests such as whiteflies, they are sometimes grown with slightly less susceptible plants, such as chili pepper, as a sacrificial trap crop. Four years should separate successive crops of eggplants to reduce pest pressure.[citation needed]

Common North American pests include the potato beetles, flea beetles, aphids, whiteflies, and spider mites. Good sanitation and crop rotation practices are extremely important for controlling fungal disease, the most serious of which is Verticillium.

The eggplant, or aubergine, provides fiber and a range of nutrients. This low calorie vegetable features in the Mediterranean diet. Most people~~Many of us~~ are most familiar with eggplants that are large and dark purple, but the shape, size, and color can vary from small and oblong to long and thin and from shades of purple to white or green[2].

Type of eggplant

1. African Garden Egg Eggplant

These eggplants are very bitter and very small~~-~~. more than not, they are yellow in color~~-~~. They are also very nutritious with very ~~vew~~ few calories and high amounts of Vitamin C, beta-carotene, and many other nutrients.

2.Bianca Eggplant

With a sweet and creamy taste and texture, these eggplants are large and round with a thin, purple-and-white skin.

3.Chinese Round Mauve Eggplant

A Chinese heirloom variety with fruit that is small-to medium-sized, this eggplant is lavender in color and has subtle patterns of purple throughtout once it gets to the size of a tennis ball, it is ready to eat; since it very soft skin, there is usually no need to peel it,

4.Graffiti Eggplant

With delicate and attractive striped markings, these eggplants can be small or large and are perfect for eating whole, thier seeds are small and thier skin very thin so you dont' want to.

5.Indian eggplant

This type of eggplant is small and has a reddish-purple color. Great stuffed or roasted,it is also called the Baby eggplant and it is used ~~frequentaly~~frequently in indian dishes that use curry, among other dishes

6.Italian eggplant

The Italin eggplant resembles a standard Globe eggplant but has certain distinguishing characteristics. It is small but still fat and it has Introduction flesh.

7.Japanese white egg eggplant

This is a very hardy and productive type of eggplant and it has thin skin, a nice sweet flavor, and a small egg - like shape and size.

With a slender shape and colors that can include not only white but also green, lavender, pink, or purple, the Japanese white egg has a stem that is usually dark purple in color. It is not the same thing as the regular Japanese white eggplant because the latter is closer to a common purple eggplant when it comes to its shape and size.

8.Little Green Eggplant

This eggplant is plump and round and it has a pale green color.

9.Ping tung Eggplant

Long and dark purple in color—.The ping tung eggplant also has several unique characteristics-. it does not have to be peeled-,isn't bitter in taste-, dose well in all zones in the Uunited states, and turns darker in color as it matures-. prefect for stir-fry dishes, this type of eggplant grows to roughly 11 inches in length and is very thin, marking it perfect for a variety of dishes.

10. Santana Eggplant

If you are into large eggplant, this is the one for you. It is an Italian variety that is teardrop-shaped and dark purple in color.

11. Tango Eggplant

The tango eggplant is a type of white eggplant and can be either pear- or egg- shaped. You have- to peel these eggplants because they have a thick skin but they also offer a creamier and firmer texturecr than the purple varieties of eggplant.

12. Thai Eggplant

As its name suggests, this type of eggplant comes from Thailand and is consumed more than any other type of eggplant in that country. It is the size of a golf ball and has a slightly bitter taste. In fact, the seeds themselves are so bitter that they are always removed before cooking. Thai eggplant comes in many different colors but most of them are green with either white or yellow stripes.

Because of their unique taste, Thai eggplant arreis usually diced or cubed and added to hot curry dishes. Varieties include the yellow Egg eggplant, which is a solid yellow color, and the long gGreen eggplant, which is light green in color and very long in size. They can also come in white and purple[3].

Components of Eggplant:

Although eggplant is technically the fruit of the plant of the same name, it is more often considered as a vegetable. It is in the family of nightshade

vegetables and so is related to tomatoes and potatoes. Eggplant has been cultivated for thousands of years and contains a wide variety of healthy nutrients.

Main Components

One cup of cooked eggplants (weighing 99 grams) will contain mostly water; about 91 grams. The next highest component is 6.6 grams of carbohydrates. Carbohydrates are organic chemicals containing only carbon, hydrogen and oxygen and are usually a combination of starches and sugars. About 4 grams of the eggplant carbohydrates are sugars. Other major components are fiber (2.5 grams) and protein (0.8 grams) and fat (0.2 grams).

Vitamins

Eggplant contains a very wide variety of both vitamins and minerals. Vitamins in eggplant include A, B1, B2, B3, B6, C, and E as well as folate and pantothenic acid.

Elements and minerals

The elements and minerals found in eggplant are boron, copper, calcium, iron, magnesium, manganese, phosphorous, potassium, sodium, selenium and zinc.

Other Components

Eggplant also contains traces of various other compounds of interest. It has some oxalates, which are organic acids that can combine with calcium to form crystalline solids. For this reason, there could be concerns regarding the consumption of large amount of eggplant by people with kidney or gal lbladder ailments.

As well, eggplant has high levels of the potent antioxidant chlorogenic acid and also contains the chemical nasunin, another antioxidant which has shown promise in promoting cardiovascular health[4]

Advantages and disadvantages of eating eggplant

We usually eat eggplant is more of a vegetable, the color purple or purplish black, mostly, there are pale green or wholesale designer sunglasses white varieties, shapes are round, oval, pear and so on. Eggplant is rich in vitamin A, vitamin B1, vitamin C, vitamin D and protein and calcium, blood vessels can become soft.

Advantages-:

1-reduce the risk of blood clots.

2- The elderly due to aging and hardening of blood vessels,

3-prevent hemorrhagic disease

4-Purple eggplant is rich in Vitamin P, can improve capillary fragility, small blood vessels to prevent bleeding, high blood pressure, arteriosclerosis, hemoptysis, purpura and so have some preventive effect.

5-cheap wholesale jordan sneakers Can prevent hypercholesterolemia.

6-Eggplant fibers contained in the saponin cholesterol-lowering effect-.

7-Cancer prevention.

8-Eggplant contains solanine, which can inhibit the proliferation of gastrointestinal tumor cells, especially gastric cancer, colorectal cancer was inhibited.

9-prevent hemorrhoids blood in the stool[5].

Uses of Eggplant:

The skin of eggplant has a number of nutritional benefits. Eggplant is ranked among the top 10 vegetables in oxygen radical absorbance capacity. This is because it is rich in phenols which help to eliminate the free radicals in our body. It could be consume in many ways such as making sauce and medicinal purposes.[6 and 7]

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1.5.Risks:

Some people should not consume too much eggplant.

Nasunin and iron absorption:

Nasunin is, a phytochemical in eggplants, binds with iron and removes it from cells. This process, known as iron chelation, may be useful for people who have too much iron in theana.

Meanwhile, people with low levels of iron should not consume large amounts of foods that contain nasunin.

Solanine poisoning

Eggplants are part of the nightshade family. Nightshades contain alkaloids, including solanine, which can be toxic. Solanine protects these plants while they are still developing.

Eating the leaves or tubers of these plants can lead to symptoms such as burning in the throat, nausea and vomiting, and heart arrhythmias. The reaction can be fatal.

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People are at typically at risk of ingesting the most solanine if they eat potatoes that have turned green. Eggplants contain small quantities of solanine, and eating low-to-moderate amounts is unlikely to have a significant effect.

Eggplant allergy

In rare cases, one or more compounds triggers an allergic reaction. The primary cause appears to be a lipid transfer protein in the plant.

Symptoms of a reaction can include hives, swelling, and difficulty breathing. Anyone who experiences these symptoms should receive urgent medical help, as they may have anaphylaxis, a life-threatening allergic reaction.

Oxalates and kidney stones

Eggplants contain oxalates, though they have fewer than most fruits and vegetables. Oxalates can contribute Trusted Source to kidney stone formation in some people who are more prone to absorbing oxalates. Without treatment, kidney stones can lead to acute kidney injury or kidney death.

Foods containing oxalates, such as eggplant, may not be suitable for people prone to kidney stones. Anyone with this condition should limit their intake of oxalate-containing foods.

Find out more about the causes and treatment of kidney stones.

Eggplant can be a healthful addition to a varied diet that contains plenty of fruits and vegetables.

Its polyphenols can give eggplant a bitter flavor that some people do not like. Sweating eggplant and varying seasonings and cooking methods can help. Many people enjoy eggplant, and consuming it comes with few risks[86]

Blood coagulation

Primary Haemostasis Primary haemostasis results from complex interactions between platelets, vessel wall and adhesive proteins leading to the formation of initial 'platelet plug'. The endothelial cells lining the vascular wall exhibit the antithrombotic properties due to multiple factors viz: negatively charged heparin-like glycosaminoglycans, neutral phospholipids, synthesis and secretion of platelet inhibitors, coagulation inhibitors and fibrinolysis activators. In contrast, subendothelial layer is highly thrombogenic and contains collagen, Von Willebrand factor (vWF) and other proteins like laminin, thrombospondin and vitronectin that are involved in platelet adhesion.

Any vascular insult results in arteriolar vasospasm, mediated by reflex neurogenic mechanisms and release of local mediators like endothelin and platelet-derived thromboxane A2 (TxA2).[97]

• Platelet adhesion and shape change:

Initial step is adhesion of platelets to sub-endothelial structures at the site of injury.The link is mainly through receptor sites (GpIb-IX) on the platelet with subendothelialvon Willebrand factor (vWF). vWF is synthesized by both endothelial cells and mega karyocytes**.** Platelets change their shape from round to spherical to stellate, thereby markedly increasing the surface area.™

Platelet secretion (release reaction)

Soon after adhesion, platelets release granule contents which contain pro-aggregatory substances like ADP, serotonin (5-hydroxytryptamine), fibrinogen and vWF. Calcium is also released and is required for the coagulation.

Platelet aggregation

The secreted products recruit additional platelets and cause aggregation to each other through the receptor sites (Gp IIb-IIIa) using fibrinogen as an intercellular bridge.These clumps of platelets so formed quickly stop bleeding from the site of injury and are known as primary hemostatic plug. The process of primary hemostatic plug formation iRationalas primary hemostasis[98]

Coagulation Cascade

Extrinsic and intrinsic pathways

The terms intrinsic and extrinsic have traditionally been usedin describing the clotting process in the classical blood coagulation theory. It is now known that the intrinsic pathwayinvolving factor XII and) kallikrein) is of importance in the invitro process (laboratory tests), but is less significant in the in.vivo (in the body) clotting process

The intrinsic pathway in vivo begins with the activation offactor IX by factor VIIa. Factor XI in vivo is activated bythrombin, calcium and the

co-factor HMWK (high molecular ,weight kininogencollectiontest tube the initiation of clotting via the intrinsic system begins with the activation of factor XII]when it is exposed to the glass ssurface [119]

Extrinsic pathway

It is considered as the first step in plasma mediated haemostasis. It is activated by TF, which is expressed in the subendothelial tissue. Under normal physiological conditions, normal vascular endothelium minimises contact between TF and plasma procoagulants, but vascular insult expose TF which binds with factor VIIa and calcium to promote the conversion of factor X to Xa.

Common pathway

Activated factor X along with its cofactor (factor V), tissue phospholipids, platelet phospholipids and calcium forms the prothrombinase complex which converts prothrombin to thrombin. This thrombin further cleaves circulating fibrinogen to insoluble fibrin and activates factor XIII, which covalently crosslinks fibrin polymers incorporated in the platelet plug. This creates a fibrin network which stabilises the clot and forms a definitive secondary haemostatic plug [12~~7~~]

Prothrombin time (PT) test

The PT is a screening test for the extrinsic clotting system, i.e. factor VII. It will also detect deficiencies of factors, prothrombin, V, X, and fibrinogen. It is mainly used to monitor patients receiving warfarin anticoagulation.

1.2Literature Review

No previous studies were founded concerning the current study.

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2.0.Objectives:

2.1.General objectives

Evaluation the effect of solanum melongena on some coagluation parameters among Sudanese people in Khartoum state.

2.2. Specific objectives

1. Perform PT & aPTT among study group.
2. Perform PT & aPTT among control group.
3. Compare the result of the study group with the control group

2.3.Rationale

Because ~~egg plant~~eggplant considered to be cheap and nutritional sudanese people are eating the solanum melongena by large amount~~-~~ but without Knowing if there are side effect of the chronic eating of it. (it may effect the body without ~~knwon~~known the ~~scintific~~scientific benefit). ~~So~~So, by the end of this ~~study~~study, we ambition to obtain result that can resolve the gap of ties information and study the effect of this valuable plant.

Materials and methods

3.1.Study design:

Non expirmental cross sectional descripitive.

3.2.Study population

Sudanuse adult eating solanum melongena

3.3.Study area

At khartoum state

3.4.Study period

During period from April to August (2021)

3.5.Sample size

100 sample according to equation for finite sample size

3.6.Inclusion and exclusion criteria

3.6.1.Inclusion

1.Sudanuse

2.Live in khartoum state

3.Adlut

4.Eating solanum melongena at regular period

5.Not suffering from any heamatological diseases

3.6.2.Exclusion

Any criteria that not match Inclusion criteria

3.7.Data collection

The data will be collected from Study group and control group using questionnaire

3.8.Data analysis

The data analysed be using spss version

3.9.Data presentation

The data presented as form of table and figre

3.10.Methodology

3.10.1.Sample collection

Venous blood samples —should be collected without a pressure cuff, allowing the blood to enter the syringe by continuous free flow or by the negative pressure from an evacuated tube in trisodium citrate anticoagulants, The blood is thoroughly mixed with the anticoagulant by inverting the container several times.

3.10.2. Sample preparation:

Preparation of Platelet-Poor Plasma (ppp)-:

which is prepared by centrifugation at 2000 g for 15 min at 4C (approx. 4000 rev/minin a standard bench cooling centrifuge~~). The~~). The sample should be kept at room temperature if it is to be use for PT tests, the testing should preferably be completed within 2 h of collection Care must be taken not to disturb the buffy coat layer when removing the PPP.

Prothrombin time(PT)

Method: Deliver 0.1 ml of plasma into a glass tube placed in a water bath and add 0.1 ml of thromboplastin.wait 1–3 min to allow the mixture to warm Then add 0.1 ml of warmed CaCl2 and start the stopwatch. Mix the contents of the tube and record the endpoint. Carry out the test in duplicate on the patielarge plasma and the control plasma.When a number of samples a Rationale

tested as abatch, the samples and controls must be suitably staggered to eliminate the time bias Some thromboplastin contain calcium chloride, in

which case 0.2 ml of thromboplastin is added to 0.1 ml plasma and timing is started immediately.

Activated Partial Thromboplastin Time

Method: Mix equal volumes of the phospholipid reagent and the kaolin suspension and leave in a glass tube in the water bath at 37C**.**Place 0.1 ml of plasma into a second glass tube. Add 0.2 ml of the kaolin–phospholipid solution to the plasma, mix the contents and start the stopwatch simultaneously. Leave at 37C for 10 min with occasional shaking. At exactly 10 min, add 0.1 ml of prewarmed CaCl2 and start a second stopwatch. Record the time taken for the mixture to clot. Repeat the test at least once on both the patient's plasma and the control plasma. It is possible to do four tests at 2-min intervals if sufficient stopwatches are available(10) .

3.11.Quality control :

the sample must be platelet- poor plasma ,venous samples was collected without a pressure cuff ,collected in trisodium citrate , waterbath at 37c° ,For clotting tests, 75 - 10 mm glass rimless test tubes should be used. Plastic tubes were used for sample dilutions, storage and reagent preparation, adjust the time by stopwatch and controlled rapidly

Result

The study showed that there is no significant differences in mean of PT in study group compared to the mean of the normal control (p value =.0493) as seen in(Table 1& figure 1) .

	eat eggplant	Mean	Std. Deviation	P value
PT	Yeas	14.3727	2.54698	0.493
	No	14.4600	2.98764	

Table (1) : Mean difference of PT in study group

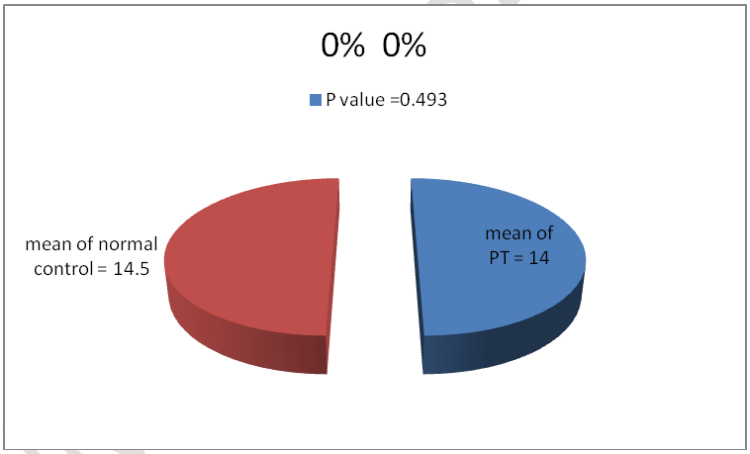

Figure 1: Mean difference of PT in study group

The mean of INR is not significantly decreased (P value = 0.691) in the study group compared to the mean of normal value (-mean = 1) as seen in (table 2& figure 2).

	eat eggplant	Mean	Std. Deviation	P value
INR	Yeas	.9213	.20867	0.691
	No	.9227	.21027	

Table 2 *:Mean difference of APTT in study group.*

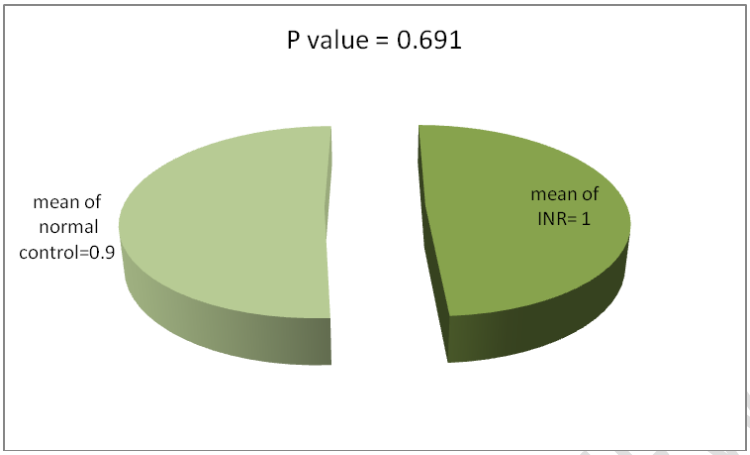

***Figure 2**: Mean difference of APTT in study group.*

The mean of aPTT was not significantly differences in study group compared to the maen of normal value (P value= 0.195) (-mean = 32)as seen in(table 3 & figure 3).

	eat eggplant	Mean	Std. Deviation	P value
aPTT	Yeas	31.2327	4.79811	0.195
	No	32.3623	7.94907	

***Table 3:** Mean difference of INR in study group*

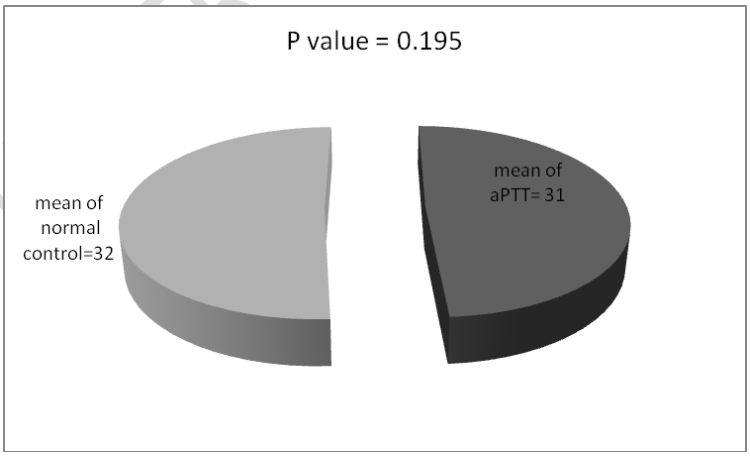

***Figure 3**: Mean difference of INR in study group*

Parameters	Age	Mean	P value
PT	15-20	15.3150	0.447
	20-25	14.0312	
APTT	15-20	0.9644	0.622
	20-25	0.9038	
INR	15-20	30.8339	0.500
	20-25	32.2105	

Table 4*: The mean differences in PT, APTT, and INR in age group.*

Discussion

This~~We have~~ study on~~ied~~ the effect of eggplant on coagulation parameter PT and aPTT was carried out~~in~~ during the period from April to ~~september~~September ,and we conducted the study on 60 individuals 30 eat eggplant and 30 not eat eggplant in the age group (15-25) male and female in khartoum state in at Dar El Oloum College for Science and ~~Technology.There~~Technology. There is no previous studies were founded concerning the current study. Up to our knowledge, the result showed that there is no significant differences in mean of PTand aPTT in study group compared to the mean normal control.

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6.1. Ceonclusion

The ~~eat~~ eating of Solanum melongena had no effect on PT and aPTT.

6.2. Recommendations

1.No previous studies were founded concerning the current study.
2. more studies should be done about the effect of Ss~~s~~olanum melanogena on coagulation ~~paramete~~parameter involve large sample size and ~~differente~~different ethnic groups.
3.increase the duration of ~~eat~~ eating Ss~~s~~olanum melanogena (eggplant).
4.we recommend doing study about effect of other plant on coagulation parameter eg:(potato, tomato and pepper).

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Appendix: