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Determination of Tannin Content of Seeds of Acacia Nilotica with concentration different solvents

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Abstract
The aim of present study was to determinate the levels of tannins in seeds of acacia nilotica using a variation of the concentration of different solvents. The method used for qualitative analysis with the tannins are formed by the intensity of the color is blackish green $FeCl_3$compounds. While the principle of quantitative determination of tannins is acid standard curve at a wavelength of 300nm. In the quantitative analysis of tannins used variations of different solvents (distilled water, ethanol 99%and acetone%). Levels of tannins in the sample solution was calculated with Taninates Acid Equivalent (EAT). The results showed levels of tannins in seeds of acacia nilotica with distilled water, ethanol99% and acetone% whichis0.85mg/g , 0.76 mg/g, and 0.99mg/grespectively.

Keywords: *Acacia seeds ,Determination , Tannins , Solvents.*

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I. Introduction

Lean Manufacturing is a systematic approach by which the wastes i.e. non-value added activities are identified and eliminated in the process through continuous improvement. Simultaneously it helps to maximize productivity and fulfilling the customer‟s desire of maximum value at the lowest price. (Parthiban et al., 2017) shown on his work that many companies have realized the advantage of producing high-quality products economically even at low volume by doing a fraction amount of work in process inventory. Companies may have different approach but they all have one thing common: the aspiration to produce as efficiently, quickly, flexibly and leanly as possible to be capable of following the changing needs of the customers cost-effectively and competitively at all times.To retain the customers in this competitive environment, Lean Manufacturing has proved to be a very well established management appr Plants produce a wide range of active compounds that provide pharmacological effect. Generally, the active compounds do not play an important role in the metabolism of plants, so it is often referred to as secondary metabolites [1,2]. Secondary metabolites have long been known as a source of effective medical therapies and important, such as anti-bacterial and anti-cancer [3]. This compound is continuously being the main source of many essential efficacious drugs [4]. In the practice of traditional medicine, people have made use of the active compounds from various plants in the form of medicine, to cure diseases. Active compounds in the plant has been a source of inspiration for disease therapy difficult or expensive treatment [5]. Active compounds of plants can be grouped into four categories, namely: phenols, alkaloids, terpenoids, and non-protein amino acids. The classification is based on the precursor, the basic structure and biosynthetic pathway [6,7] These compounds have a wide variation in chemical diversity, distribution and function [7]. Phenol group is characterized by the presence of an aromatic ring with one or two hydroxyl groups. Phenol group consists of thousands of compounds, including flavonoids, phenylpropanoid, phenolic acids, anthocyanins, quinones pigment, melanin, lignin, and tannins, which are widely distributed in various plant species [8].Tannins are generally defined as polyphenolic compounds have high molecular weight (over 1000) and can form a complex with the protein. Based on the structure, tannins can be divided into two classes, namely taninterkondensasi (condensed tannins) and tannin-terhidrolisiskan (hydrolysable tannins) [8,9].One of the best sources of tannins is Acacia species which belong to family of Leguminosae in plant kingdom. There are about 800 speciesof the genus Acacia. They are abundantin savannas and arid regions [10].The commercial wattle grown in Kenya (Acacia mearnsii) is a well-known tannin-rich species and tannin-based adhesive [11,12]. Tannins are complexed with the proteins of the hide and become an integral part of the final product. Theabilityoftanninstocomplexwithproteinsislargelyresponsibleforthepro ductionofleatherfromhide [13].

II. Material And Methods

1. Equipment and Materials

The tools used in this study include analytical scales, blenders, sieves, desiccator, petridish, stir bar, beaker, beakers, pipettes, Erlenmeyer flask, evaporator, filter paper,UV-Vis spectrophotometer. Materials used in this Study is the acacia seeds, distilled water, technical ethanol 99%, technical acetone. FolinCiocalteu reagent, Na_2CO_3 7%, 1% $FeCl_3$.

2. Research procedures:

2.1 Preparation of sample extract:

1- Dried acacia seeds for 1 week. Once driedavocado seed blend to a powder and sieved usingasieve.

2- Weighed 10 g of acacia seeds, soaked in soxhlet apparatus in 150 mL of distilled water, ethanol (99%) and acetone (%) for 24 hours and then filtered to obtain a filtrate. Treatment was for 3 days. Filtrate obtained together then evaporated to obtain ethanol and acetone extracts. The evaporated extract was cooled in a desiccator before furtheranalysis.

2.2 Qualitative Determination of Tannin: The homogenous sample of each of the samples of the acacia seedswas subjected to phytochemical analysis for qualitative determination of tannin according to the methods described by [14]. The performed qualitative tests were brieflydescribed as:

Test for Tannins: To 0.5g of prepared extract, 1ml of distilled water and few drops of ferric chloridewereaddedrespectively.Ablue-black,greenorblue-greenprecipitateindicatesthe presence of tannins.

2.3.Determinationof tannin content: 0.5 ml of each sample of acacia seeds extracts of distilled water, Ethanol (99%) and acetone(%) were made up to 7ml with distilled water 8mM potassium ferric cyanide and 20 mM ferric chloride prepared in 0.1M hydrochloric acid were added respectively. The contents were mixed and optical density was measured at 300 nmTannin acid was used as standard . Tannin content was expressed as mg of tannin per gram of plant tissue (mg TA/g).

III. Results And Discussion

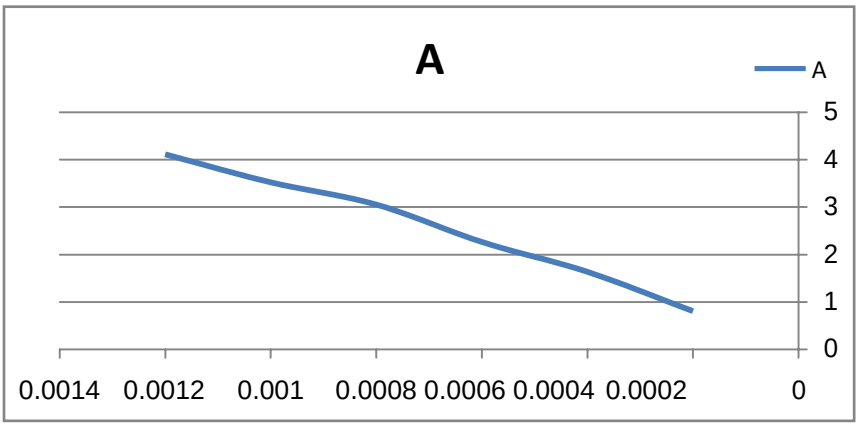
Plants have been used as drugs and remedies for various diseases. The preliminary phytochemical analysis revealed the presence of various phytoconstituents such as aminoacids, cardiac glycosides, alkaloids, steroids, flavonoids and tannins.The biological activities such as antimicrobial and anthelmintic activities exhibited by plants are due to the presence of phytoconstituents tannins and flavonoids. Many therapeutic actions of tannin have been reported. Report by [15] showed that tannin could be used for healing of wounds and inflamed mucous membranes. Tannins are reported to exhibit anti-diuretic [16], anti-inflammatory and anti-bacterial [17,18], antiulcer [19,20,21], antidiarrheal [22,23,24,25], antiviral and anti-tumor activities. It is also reported to be able to inhibit HIV replication selectively [26].

Qualitative test tannins using $FeCl_3$phytochemical test conducted in this study that adding Crude extract of acacia seeds with 1% FeCl3 reagent. results indicate a change in the color of blackish green. determination of total content of tannins in seeds of acacia using total phenol method using FolinCiocalteu reagent and standardtanat acid. Determination of total phenol is used to determine the content of tannin contained in each sample. Folin method does not distinguish between types of phenolic components. The more the number of phenolic hydroxyl group, the greater the concentration of phenolic components were detected [27]. The determination of tannin content was measured using a standard curve tanat acid (g / l) as shown in Table (1).

Table (1): Acid Standard Tannates

Concentration (g /l)	Absorbance (300nm)
0.0012	4.12
0.0010	3.53
0.0008	3.06
0.0006	2.27
0.0004	1.64
0.0002	0.81

The tannin content was measured using a standard curve showed in figure (1):

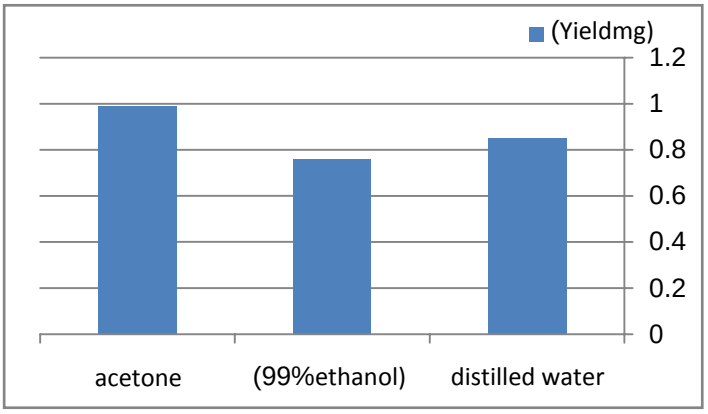


There is no single protocol for extracting tannins from all plant material. The procedures used for tannins are widely variable.[28] It may be that acetone in the extraction solvent increases the total yield by inhibiting interactions between tannins and proteins during extraction[28] or even by breaking hydrogen bonds between tannin-protein complexes.[29]Total tannin content of acaciaseedsextract can be seen in Table 2.The content of total tannins expressed in mg / l of acid tannin. Table (2) shows that the highest content of total tannins contained in theacetoneextract tannin higher levels compared with the otherextracts.

Table (2): Tannin content in the acacia seeds which extracted with different Solvents

Solvent	Yield(mg)	%Of Tannin
distilled water	0.85	0.0085
ethanol(99%)	0.76	0.0076
acetone	0.99	0.0099

The tannin content was measured using the acacia seeds which extracted with different Solvents showed in figure (2):



The quantitative determination of tannin content in theacacia seeds of the plant showed the presence of varying concentrations 0.76 to 0.99 mg foracacia extract seeds. acetoneextract possess highest concentration of tannin 0.99 mg for acacia extract seeds. The ethanolextract contains less amount of tannin content 0.76 mg.

IV. Conclusion

We can conclude that, among the three Acacia species studied, Acacia nilotica is the richest in tannins content, and within the Acacia nilotica parts, mature and immature fruits were the highest in tannins content, while the barks of the three Acacia species were the least. Folin-Denis method for total phenolic materials, followed by precipitation of tannins by hide-powder, is a suitable procedure for evaluation of tannins content.

v.References

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