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Elemental Analysis of Tawkyetthun (Herbal Plant) for Treatment of Diabetes

Khin Tint

Abstract

Traditional medical science of Myanmar has emerged with a rich background of cultural heritage and traditions, perfected by studious practising throughout history. It plays a versatile and accepted role in public health care service. However, there, still, are needs for some researches to be done on this highly potential branch of medicine which demonstrates effectiveness in curing a number of chronic and fatal diseases. It still lacks guarantee of sureness and security. In this research work, Tawkyetthun is analyzed by using EDXRF technique to single out its medicinal elements for an effective treatment of the two kinds of diabetes mellitus which are now the major killers today. This work intends to present not only a general description of Tawkyetthun, Myanmar traditional medicinal plant for treatment of diabetes but also a Botanical Description and experimental conditions of EDXRF Spectrometry for this indigenous medicinal plant. The present research work could qualitatively and quantitatively analyse Tawkyetthun which can be used for the treatment of diabetes.

Key words: EDXRF Spectrometry, Tawkyetthun, diabetes.

Introduction

Herbal plants are some kinds of minerals and the most important characteristic of a mineral is possession of a definite chemical composition. Plants can be toxic, but that's not the only reason that consumers should exercise to take caution when selecting herbal remedies. It's important to emphasize that there have been no long-term studies of the safety or effectiveness of herbal preparations.

Myanmar traditional medical science is a medical subject that emerged through own cultures, tradition and national practices with a long history. Meanwhile, traditional medicine practitioners are to conduct researches on potency of traditional medicines of higher standard and new therapies.

Yet, there, still are needs for some researches to be done on this highly potential branch of the traditional medicine. At the same time, it

cures almost everything from common cold to fearsome and fatal illness like cancer and such. This paper aims to express the elemental concentration in the herb (Tawkyetthun) which can be used for treatment of diabetes. By doing further research it may be useful. It may have other properties apart from the results of the research. It could be of enormous benefits to mankind.

Experimental Work

(a) Sample Collection

First of all, these traditional medicinal plants (Tawkyettun) were collected from Pakokku, Mandalay Division, (Upper Myanmar).

(b) Sample Preparation

The guiding lines for specimen preparation techniques are

- (1) Accuracy
- (2) Simplicity
- (3) Low cost and rapid preparation.

(c) Shimadzu EDX-700 Spectrometer

According to the Energy Dispersive X-rays Fluorescence Spectrometer (EDX-700) catalogue, Universities' Research Centre, Yangon University, the EDXRF system is composed of two parts: the x-ray spectrometer and personal computer (PC). The spectrometer contains the x-ray generating elements; x-ray tube (Rh), sample chamber, Si(Li) detector, detector electronics, microprocessor controller, liquid nitrogen (LN₂) cooling system and associated power supplies.

The personal computer (PC) includes the data memory board and other standard PC elements. The collected spectra were analyzed using the EDX-700 Qualitative and Quantitative Analysis software. The Fundamental Parameter (FP) method was used for elemental analysis.

The x-rays from the Rh target were used for the excitation of the sample. The emission of characteristics x rays from each element contained in the sample were detected by the Si (Li) detection system. Then the x-ray spectrum was analyzed with the help of the personal computer to obtain the concentration of each element in the sample. Some data of experimental

measured condition and results in the EDXRF analysis system are given in Table (1).

Table 1. Experimental Conditions of EDXRF Spectrometry for Indigenous Medicinal Plant(Seeds of Tawkyetthun)

Sample Name	- Indigenous Medicinal Plant (Seeds of Tawkyetthun)
Comment	- Need to be dried
Group	- Air- solid
Instrument	- EDX-700
Atmosphere	- Vac
Collimator	- 10(mm)
Spin	- Off
Analyzed element	- Si-U
Target	- Rhodium (Rh)
X-ray tube voltage	- 50 kV
X-ray tube current	- 14 μA (Adjust)
Acquired energy	- 0 – 40 keV
Analyzed energy	- 0.0- 40.0 keV
Irradiation period	- 99 s
Dead time	- 24%

Experimental results

In the research, Tawkyetthun seeds were systematically analyzed in order to find out the contents of them. The experimental work was performed at Universities' Research Centre (URC), Yangon University. The EDXRF spectrum and Data of interest in the herbal plant (Tawkyetthun) is also shown in Figure (1). Botanical Description of the herbal plant (Tawkyetthun) is also shown in Table (2).

Today, there is a wide variety of Myanmar traditional medicine such as *chantha*, *Anandathukha*, *Chin Hill Natural*, and *Phyu Sin Myit ta* that is famous among people for its effective usefulness in curing diabetes as well as giving relief from suffering from this disease, or preventing from the complications that follow. Figure (2) shows comparison of elemental concentrations in Tawkyetthun and four of Myanmar traditional medicine for treatment of diabetes.

By this research it can be seen that seeds of Tawkyetthun contain eight elements. Among these elements relative concentration (%W) of calcium is the highest the contains in Myanmar traditional medicines for treatment of diabetes. According to the results obtained, it was found that were no toxic elements such as mercury (Hg), lead (Pb), arsenic (As) and so on.

Table 2. Botanical Description of the herbal plant (Tawkyetthun)

Myanmar Name	-	Tawkyetthun
English Name	-	Wild onion
Scientific Name	-	Asphodelus tenuifolius, Cav
Genus	-	Asphodelus
Species	-	tenuifolius
Family	-	Liliaceae
Habit	-	herb
Part uses	-	seeds
Medical uses	-	Diabetes
Distribution	-	Upper Myanmar

Conclusion

This paper is a brief description of one of the Myanmar traditional medicinal plant, Tawkyetthun. The purposes of this paper mention the detailed information of the plant under the research such as its appearance; and to report the systematic elemental analysis of the plant.

In this research procedure, the different compositions of the traditional medicinal plant (Tawkyetthun) used for treatment of diabetes were measured by using Energy Dispersive X-Ray Fluorescence (EDXRF) Spectrometer. From the results of the qualitative and quantitative analysis of the contained elements in Tawkyetthun, potassium, calcium and iron have been observed as major elements. And hence, these elements are found to be useful for curing diabetes.

According to the research, what has been found out is that the basic elements containing in Tawkyetthun are more or less the same with the constituents of other Myanmar traditional medicines in common use. It is shown in the spectrum and the data recorded by using EDXRF method in URC.

No one uses Tawkyetthun seeds as they are wastes. Tawkyetthun contains calcium (Ca), phosphorus (P), sulphur (S) and potassium (K). Calcium is the most concentrating element in Tawkyetthun. By doing further research it may be useful for treatment of diabetes. It may have other properties apart from the elements that have already been discovered from the research. To conclude it could be of enormous benefits to mankind.

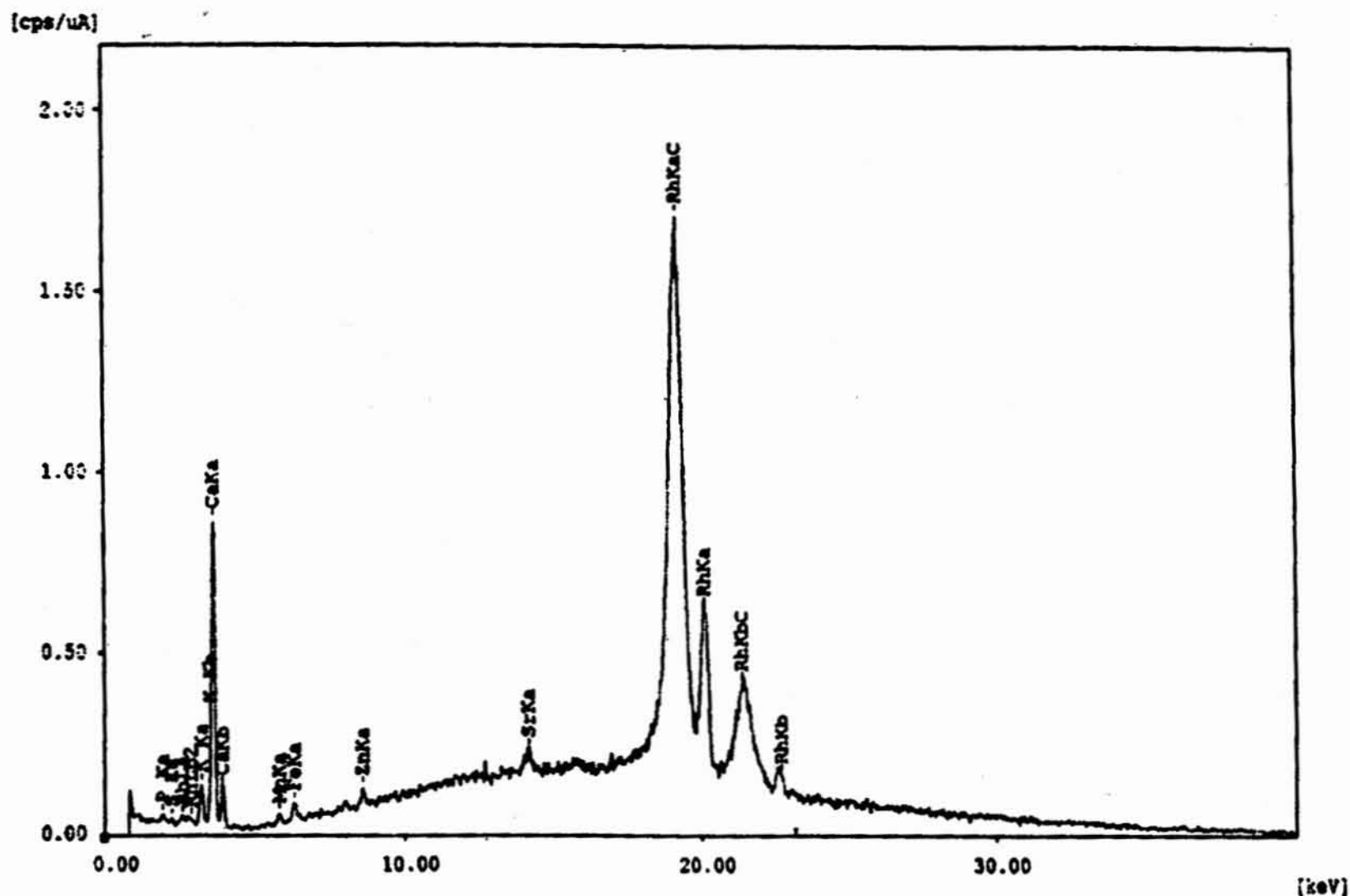
Sample : K9
 Operator: OW
 Comment : Solid sample (without cell) / Air
 Group : solid_air
 Date : 2005-04-06 12:35:30

Measurement Condition

 Instrument: EDX-700 Atmosphere: Air Collimator: 10(mm) Spin: Off

 Analyte TG kV uA FI Acq.(keV) Anal.(keV) Time(sec) D.T.(%)

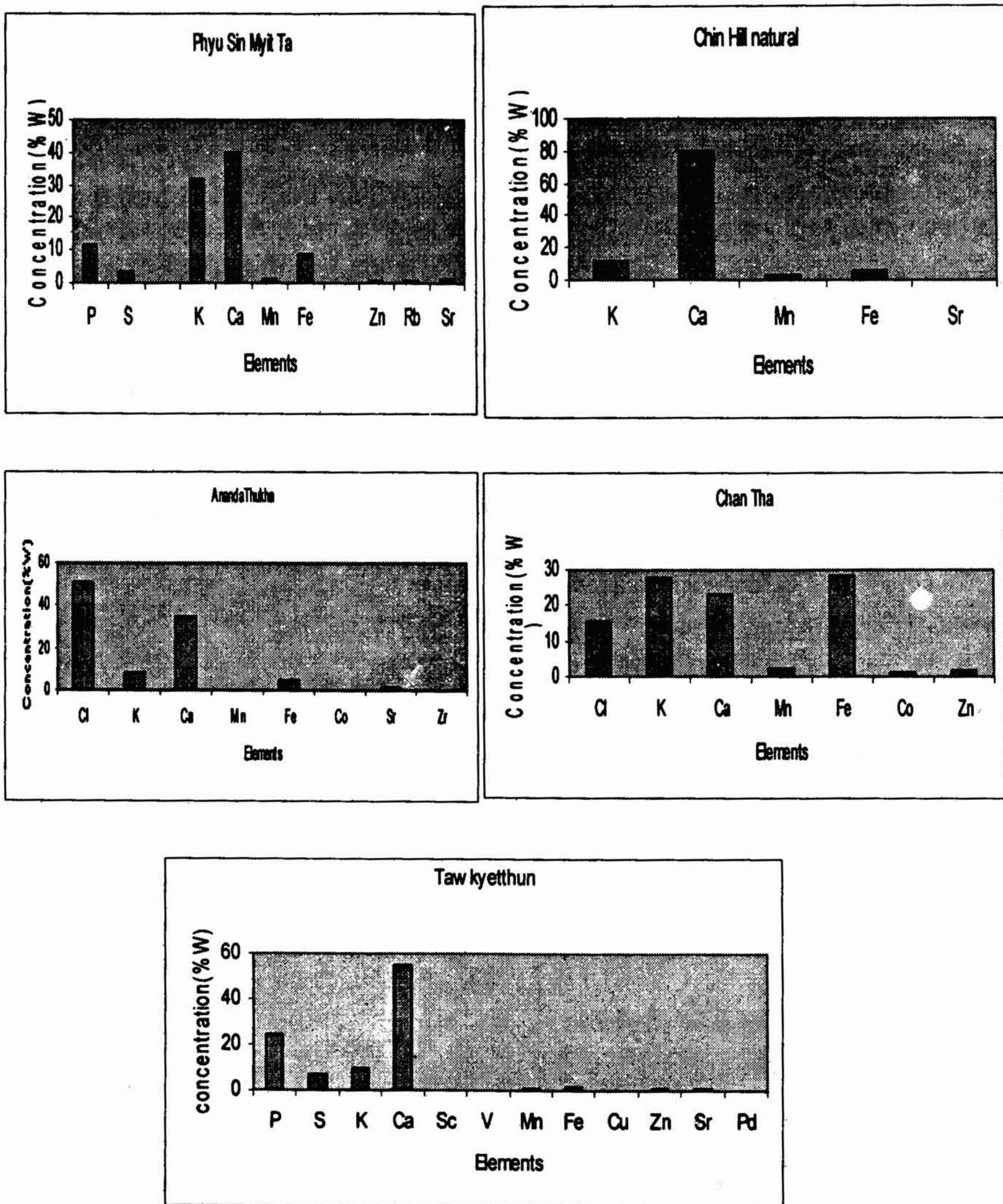
 Si- U Rh 50 14-Auto -- 0 - 40 0.0 - 40.0 Real - 99 24



Quantitative Result

Analyte	Result	Std.Dev.	Proc.-Calc.	Line	Int.(cps/uA)
Ca	55.124 %	0.697	Quan-FP	CaKa	5.928
P	24.610 %	1.636	Quan-FP	P Ka	0.214
K	9.556 %	0.346	Quan-FP	K Ka	0.724
S	6.890 %	0.570	Quan-FP	S Ka	0.139
Fe	1.507 %	0.061	Quan-FP	FeKa	0.569
Mn	1.094 %	0.061	Quan-FP	MnKa	0.306
Zn	0.715 %	0.029	Quan-FP	ZnKa	0.591
Sr	0.504 %	0.015	Quan-FP	SrKa	1.068

Figure(1) The EDXRF spectrum and Data of Interest in the herbal plant (Tawkyetthun)



Figure(2) Comparison of elemental concentrations in Tawkyetthun and four of Myanmar traditional medicine for treatment of diabetes.

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