Nutritional values and Chemical Constituents of ***Cypraea eglantina*** and ***Turritella communis*** used in Traditional Medicine in Myanmar

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INTRODUCTION

- Myanmar has a long history of health care system by Traditional Medicine as a national heritage.
- In Traditional system of medicine, it is used natural products and these are divided into three categories- animals, plants and minerals.
- Animals provide the raw materials for remedies prescribed clinically and are also used in the form of amulets and charms in magic-religious rituals and ceremonies.
- Zootherapeutic resources were used to treat different diseases in Traditional Medicine. Therefore these crude animal's products were selected for chemical and pharmacological investigation.

LITERATURE REVIEW

Cypraea eglantina

- ***Cypraea eglantina*** is species of Eastern Indian Ocean and Western Pacific Ocean,
- prefers rather shallow waters, lagoon reef habitats and coral rocks at 2–15 m (6 ft 7 in–49 ft 3 in) of depth.
- In the Myanmar costal water it had been recorded from Ngapali, Maungmagan, Kyauk Kalat, Cocos Island

Traditional medicine in Myanmar

- Shell of ***Cypraea eglantina*** (Kjweibo'u) was used by rulers of early Myanmar dynasties.
- In medicinal uses, Kjwei bo'u has three kinds of color.
- Golden yellow color, white color and brown color.
- Golden yellow color is the greatest expensive value,
- White color is second value.
- Brown color is third value.

- Ash of kjweibo'u has been given
- promote digestive power and hot potency .
- Inflammatory effect on conjunctivitis, otorrhoea,
- certain gastric and intestinal disorders, sprue,
- dysentery in Myanmar traditional medicine (Ashin Nagathein, 1972) .

Turritella communis (Kayuziezin)

- Medium-sized sea snails with an operculum,
- Marine gastropod mollusks in the family Turritellidae
- Tall, slender, sharply pointed cone, 20 whorls, each bearing spiral ridges and grooves.
- brownish- yellow to white in color and often with a lilac tinge on the base,
- grows up to 3 cm in length and 1 cm wide.

Traditional Medicine in Myanmar

- shells of Kayuziezin was used by rulers of early Myanmar dynasties.
- the ash of Kayuziezin has been given to remove toxin from the body,
- increased energy power,
- salty and cool in nature.
- It is also used in the treatment of measles

- Acne, skin care,
- sore eye,
- asthma, mouth disease,
- oliguria,
- certain gastric and intestinal disorders,
- colic,
- dysentery in Myanmar traditional medicine (Ashin Nagathein, 1972).

Traditional Medicine Formulae

- The ash of Kjweibou is the ingredients of
- TMF 10 (Hsishwin wan hnou Hsei),
- TMF11 (mou ke Hsei) ,
- TMF12 (Set ku pa la Hsei)and TMF67(Chaun zou jinkja pan na pjau Hsei).
- Kjweibou shells were used in many Traditional Medicine Formulae (TMF)in Myanmar.

- The ash of Kayuziezin is the ingreident of TMF6 (Ha Leik da Sonna Ngan Hsei).
- Though these samples are commonly in Myanmar Traditional Medicine much work has not been reported on the proximate and chemical compositions .
- Therefore these crude animal's products were selected for chemical and pharmacological investigation

OBJECTIVES

- to identify the animal source commonly used in Traditional Medicine in Myanmar
- to investigate the nutritional values and chemical constituents of ***Cypraea eglantina*** and ***Turitella communis*** used in Traditional Medicine in Myanmar

METHODOLOGY

Study Design

- Zoological identification of crude drugs.

Study Area

- **Study Area (A)**

Study Area

- **Study Area (B)**

Study Area (C)

Study Period

- Study period lasts from July 2016 to May 2017.

Materials and Methods

- Extraction of samples is one of the procedure of Association of Official Analytical Chemistry (A .O. A. C).
- Determination of elements by Energy Dispersive X-ray Fluorescence Spectrophotometer (EDXRF).

Statistical Analysis

- One-way analysis of variance (ANOVA) was used to compare element concentrations in percentages.
- The results were expressed as mean ± standard deviation (SD).

Samples Preparation

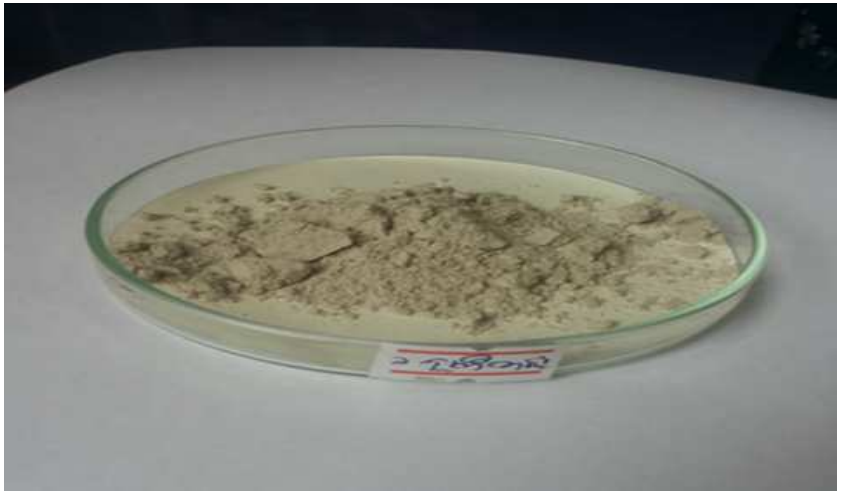
- Shell materials were identified for this study.
- Samples collected
- First washed thoroughly with distilled water.
- Purified with sterile water mixed with 3cclime juice boiled for 3hours
- Next with water for 1hour boiled to remove foreign matters and color of shells,
- then oven dried for three days at 50°C.

Plate 1 Preparation of Powder and Ash of *Cypraea eglantina*

A. Purification with lime juice

B. Boiling with sterile water

C. Powder of *Cypraea eglantina*



D.Ash of *Cypraea eglantina*

Plate 2: Preparation of Powder and Ash of *Turritella communis*

A. Purification with lime juice

B. Boiling with sterile water

C. Powder of *Turritella communis*

D . Ash of *Turritella communis*

- make powder by blender.
- using a stainless steel sieve to get fine powder
- Sterilized for an hour in the oven at 105ºC and stored in bottles prior to analysis.
- Proximate analysis, mineral composition and pharmaceutical product were carried out on dried powder.
- Approximately 1-2 g of samples were weighed in a porcelain dish and placed in a muffle furnace

- to remove toxic substances the temperature was gradually increased up to 550°C for 5hr.
- after which they were taken out and left to cool at room temperature.
- the Proximate analysis were carried out according to the extraction is one of the procedure of Association of official analytical chemistry A.O.A.C, 1990.

RESULTS

Systematic Position of the Study Species

• Phylum	-	Mollusca
• Class	-	Gastropoda
• Order	-	Mesogastropoda
• Superfamily	-	Cypraeoidea
• Family	-	Cypraeidae
• Genus	-	***Mauritia***
• Species	-	***M. eglantina***
• Superfamily	-	Cerithioidea
• Family	-	Turritellidae
• Subfamily	-	Turritellinae
• Genus	-	***Turritella***
• Species	-	***T. communis***

Description of Study Species

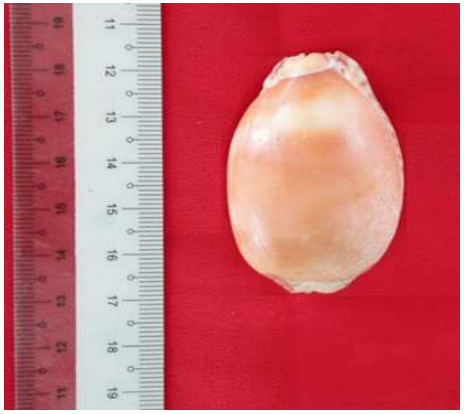
- 1. ***Cypraea eglantina***
- Binomial name - ***Mauritia eglantina*** (Duclos, 1833)
- Synonyms - ***Cypraea eglantina*** (Duclos, 1833)
- Myanmar name - Kjweibo'u
- Common name - Cowries
- Sanskrit name - Varatika
- Guijarathi name - Kowdi
- Hindi name - Kowdi
- Kannada name - Kavadi

Plate 3: Shell of *Cypraea eglantina*

A. Dorsal view

B. Ventral view

C. Lateral view



D. Posterior view

E. ***Cypraea eglantna***

2. ***Turritella communis***

- Binomial name -***Turritella communis*** (Risso, 1826)

  Turitella duplicata (Linne, 1758)

  Turitella triplícate, (Philippi, 1836)

  Turritella terebra, (Linne, 1758)

- Myanmar name - Kayuziezin
- Common Name - Tower

Plate 4: Shell of *Turritella communis*

A . Dorsal view

B. Ventral view

C. Lateral view

D. Posterior view

E. *Turritella communis*

Table 1: Proximate Composition of Powder and Ash of ***Cypraea eglantina***

No/	Parameters	Measuring values of powder (%)	Measuring values of ash(%)	Mean±SD
1.	Moisture (%)	0.20%	0.10%	0.2±0.1
2.	Ash (%)	98.41%	98.41%	-
3.	Water Soluble ash%	63.8%	63.8%	-
4.	Acid Insoluble ash%	18.92%	18.92%	-
5.	Carbohydrate (%)	0.1035%	0.07%	0.1±0.02
6.	Protein (%)	3.69%	- 0.85%	1.42±3.21
7.	Fiber contents (%)	18.33%	82.33%	50.33±45.3
8.	Fat contents (%)	0.57	0.58	0.6±0.01

Fig 1: Proximate Composition of Powder and Ash of *Cypraea eglantina*

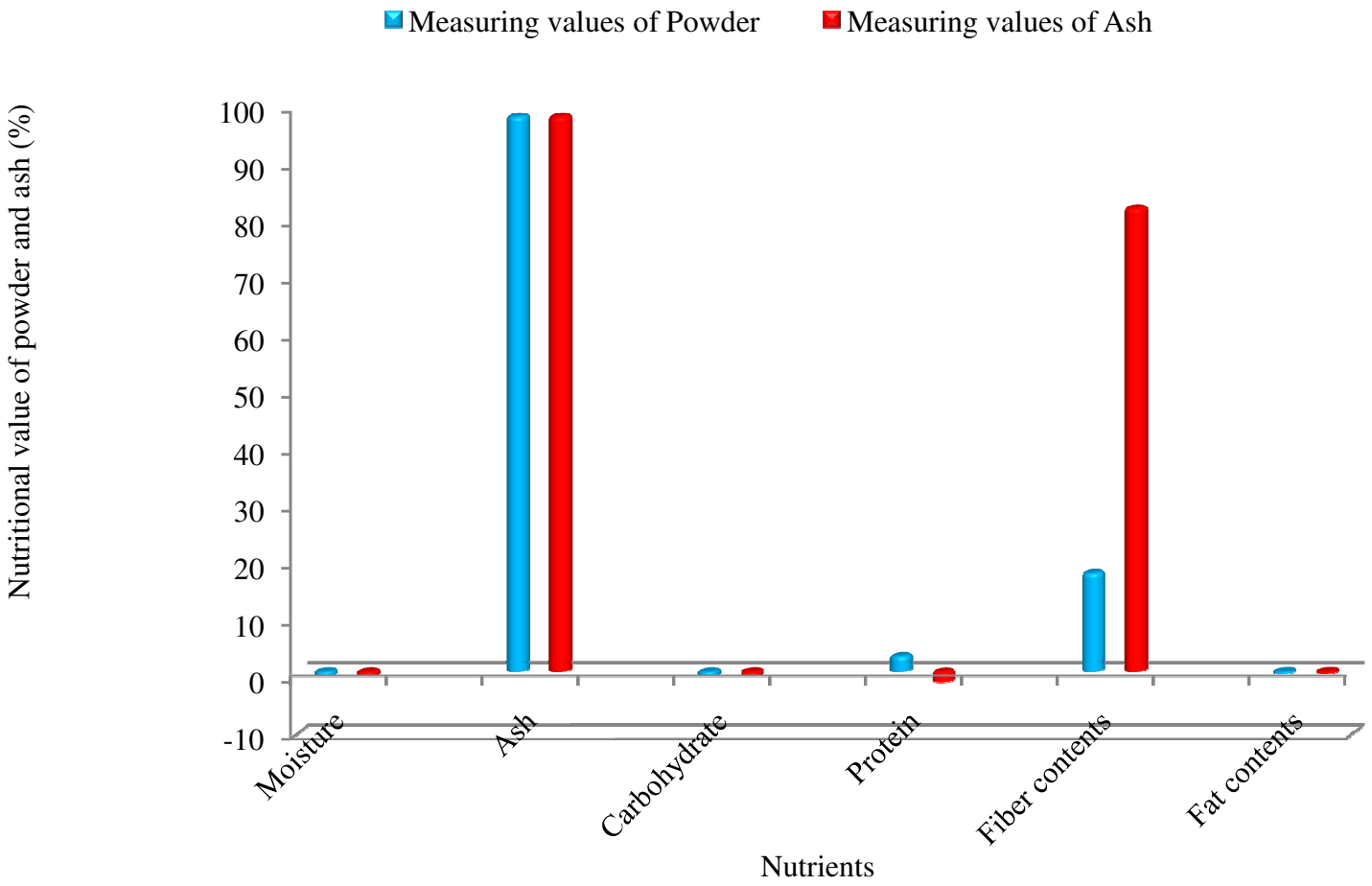


Table 2: Percentage of macroelements involved in Powder and Ash of *Cypraea eglantina*

No.	Percentages	Measuring values of powder (%)	Measuring values of ash (%)	Mean±SD
1	Magnesium(Mg)	0.09%	0.09%	0.1±0.001
2	Sodium(Na)	0.49%	0.43%	0.5±0.04
3	Calcium(Ca)	36.29%	36.64%	36.5±0.3
4	Chlorine(Cl)	0.11%	0.18%	0.1439±0.1
5	Potassium(k)	<0.0010%	<0.00030%	-
6	Sulfur(S)	0.01%	0.01%	0.01±0.01

Fig. 2 Compare percentage of macroelements involved in powder and ash of *Cypraea eglantina*

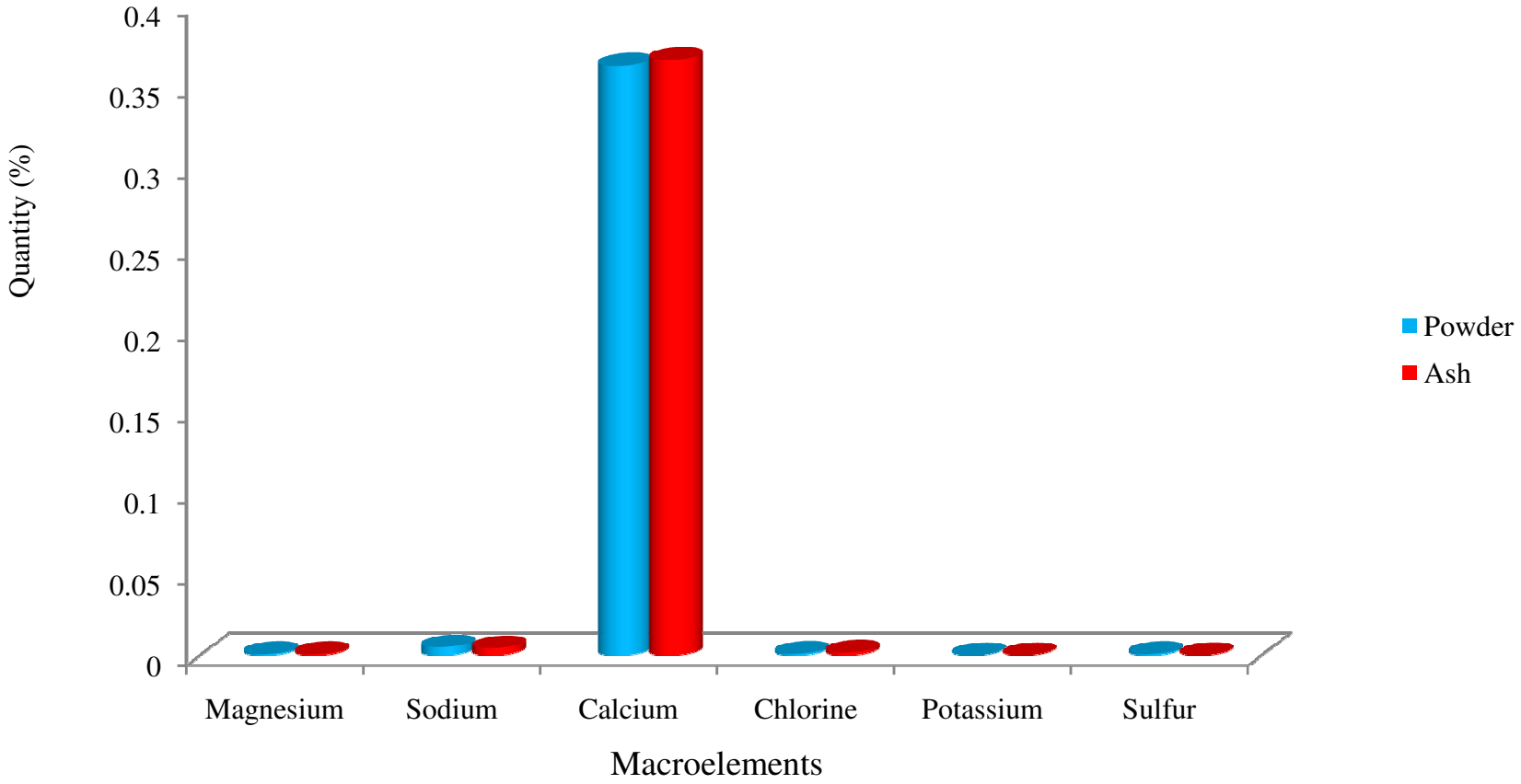


Table 3: Percentage of microelements involved in Powder and Ash of *Cypraea eglantina*

No.	Percentage	Measuring values of powder %	Measuring values of ash %	Mean±SD
1.	Aluminum(Al)	0.0246%	0.0433%	0.03±0.01
2.	Silicon(Si)	0.0525%	0.1234%	0.1±0.1
3.	Manganese(Mn)	0.00359%	0.00515%	0.004±0.00
4.	Iron(Fe)	0.2016%	0.4012%	0.3±0.1
5.	Copper(Cu)	0.00050%	0.00134%	0.001±0.001
6.	Zinc(Zn)	0.00057%	0.00054%	0.001±2.12

Fig 3: Compare Percentage of microelements involved in Powder and Ash of *Cypraea eglantina*

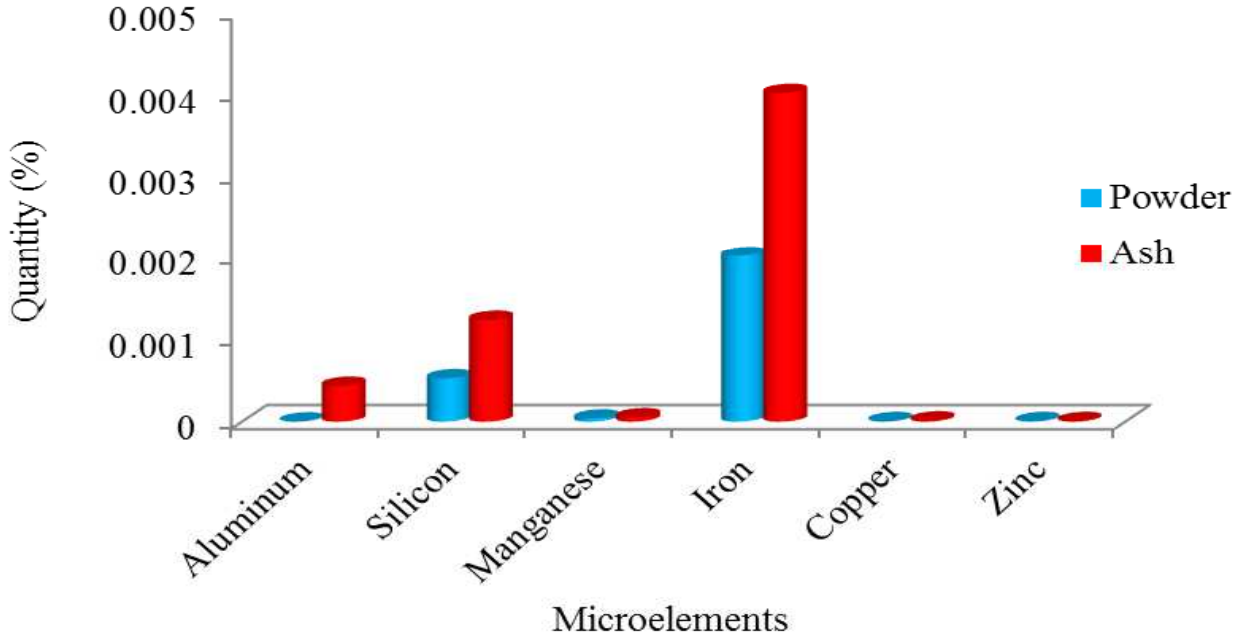


Table 4: Percentage of heavy metal involved in Powder and Ash of *Cypraea eglantina*

No.	Percentage	Measuring values of powder	Measuring values of ash	Mean±SD
1.	Arsenic(As)	< 0.00005%	< 0.00005%	-
2.	Cadmium(Cd)	< 0.00020%	< 0.00020%	-
3.	Mercury(Hg)	0.00039%	0.00032%	-
4.	Lead(Pb)	0.00051%	0.00078%	0.001±0.00

Fig 4 : Compare Percentage of Heavy metals involved in Powder and Ash of *Cypraea eglantina*

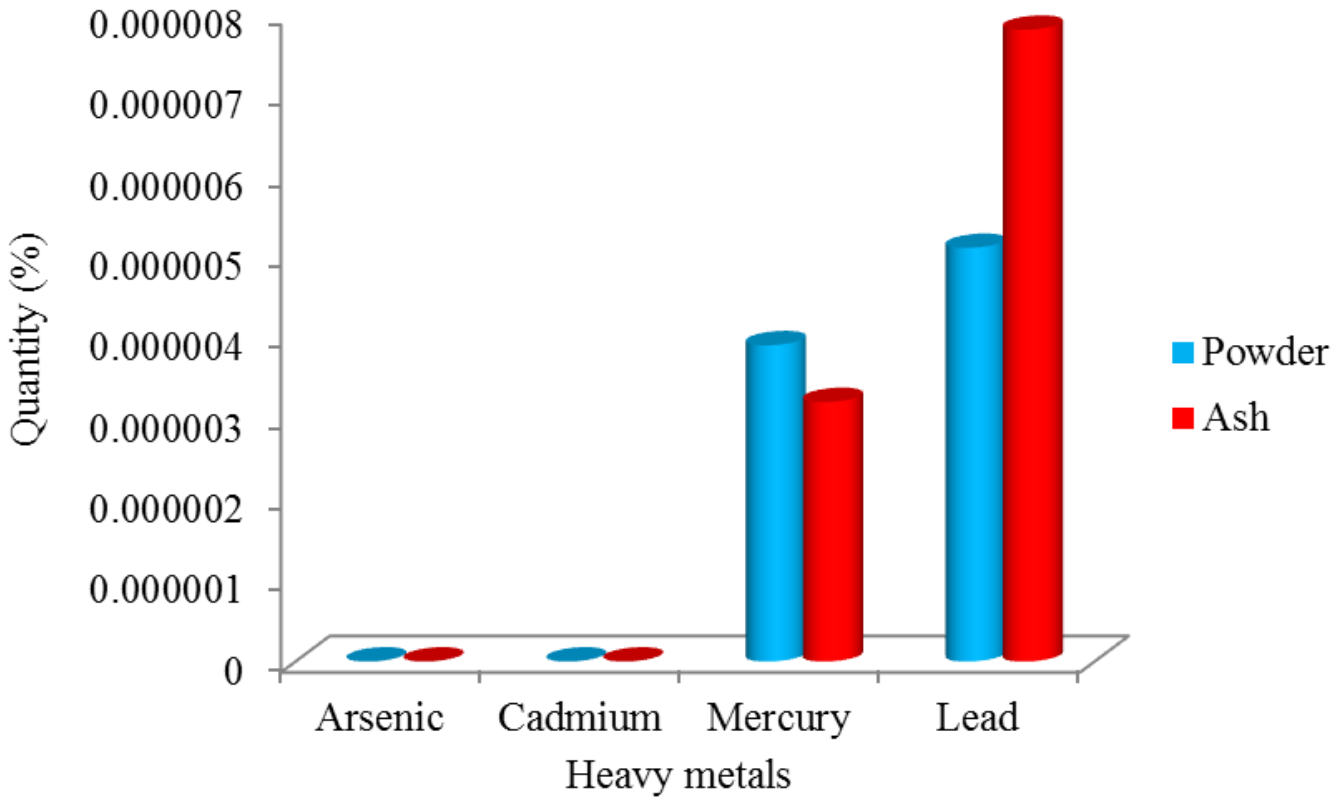


Table 5: Determination of Total ash, water soluble ash and acid-insoluble ash content of *Cypraea eglantina*

No.	Parameter	Quantity
1	Total ash	98.41%
2	Water soluble	63.8%
3	Acid insoluble	18.92%

Fig; 5 Total ash, water soluble ash and acid insoluble ash contents of *Cypraea eglantina*

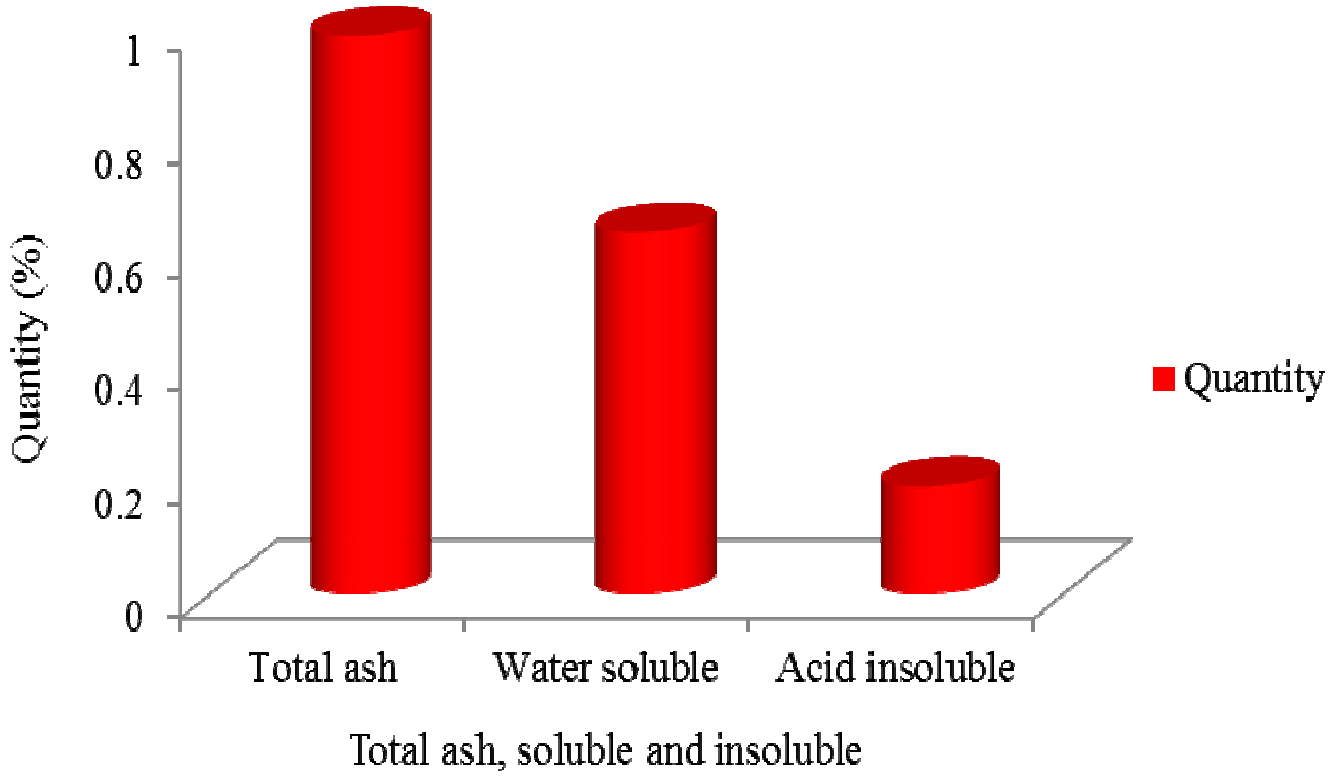


Table 6: Proximate Composition of Powder and Ash of *Turritella communis*

No.	Parameters	Measuring values of powder (%)	Measuring values of ash	Mean±SD
1.	Moisture(%)	0.20%	0.10%	0.2±0.1
2.	Ash%	98.55%	98.55%	98.55±0
3.	Water soluble ash	64.96%	64.96%	64.96±0
4.	Acid insoluble ash	10.8%	10.8%	10.8±0
5.	Carbohydrate(%)	0.0745%	0.05%	0.1±0.02
6.	Protein(%)	1.93%	- 0.68%	0.6±2
7.	Fiber contents(%)	18.45%	79.63%	49.04±43.3
8.	Fat contents(%)	0.90%	0.46%	0.7±0.31113

Fig 6: Proximate Composition of Powder and Ash of *Turritella communis*

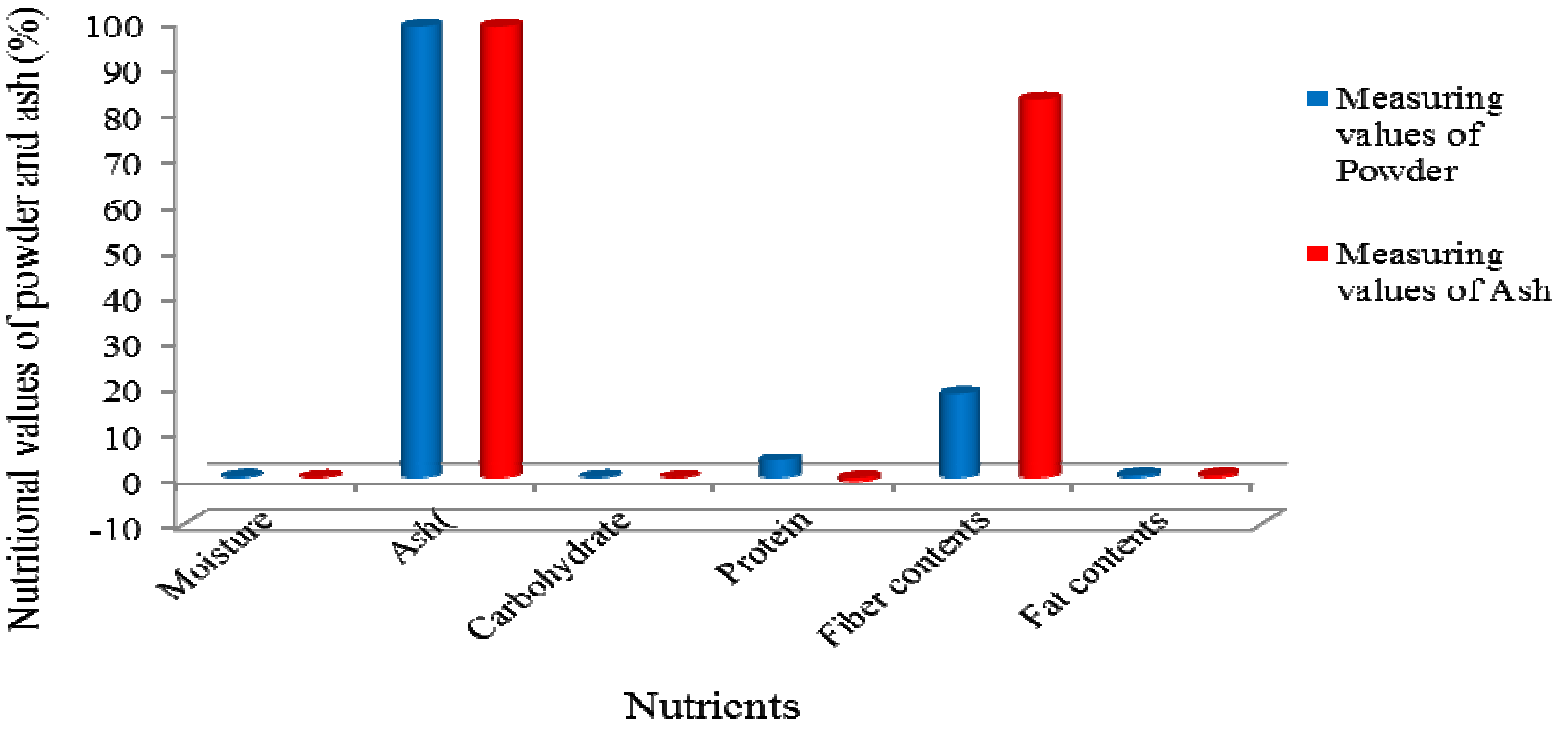


Table 7: Percentage of macroelements involved in Powder and Ash of *Turritella communis*

No.	Elements	Powder	Ash	Mean ±SD
1	Magnesium(Mg)	0.14%	0.13%	0.14±0.01
2	Sodium(Na)	0.50%	0.45%	0.5±0.0004
3	Calcium(Ca)	35.88%	36.29%	36.1±0.3
4	Chlorine(Cl)	0.11%	0.12%	0.11±0.01
5	Potassium(K)	<0.00030	<0.000030	-
6	Sulfur(S)	0.01%	0.01%	0.01±0.003

Fig 7: Compare Percentage of macroelements involved in Powder and Ash of *Turritella communis*

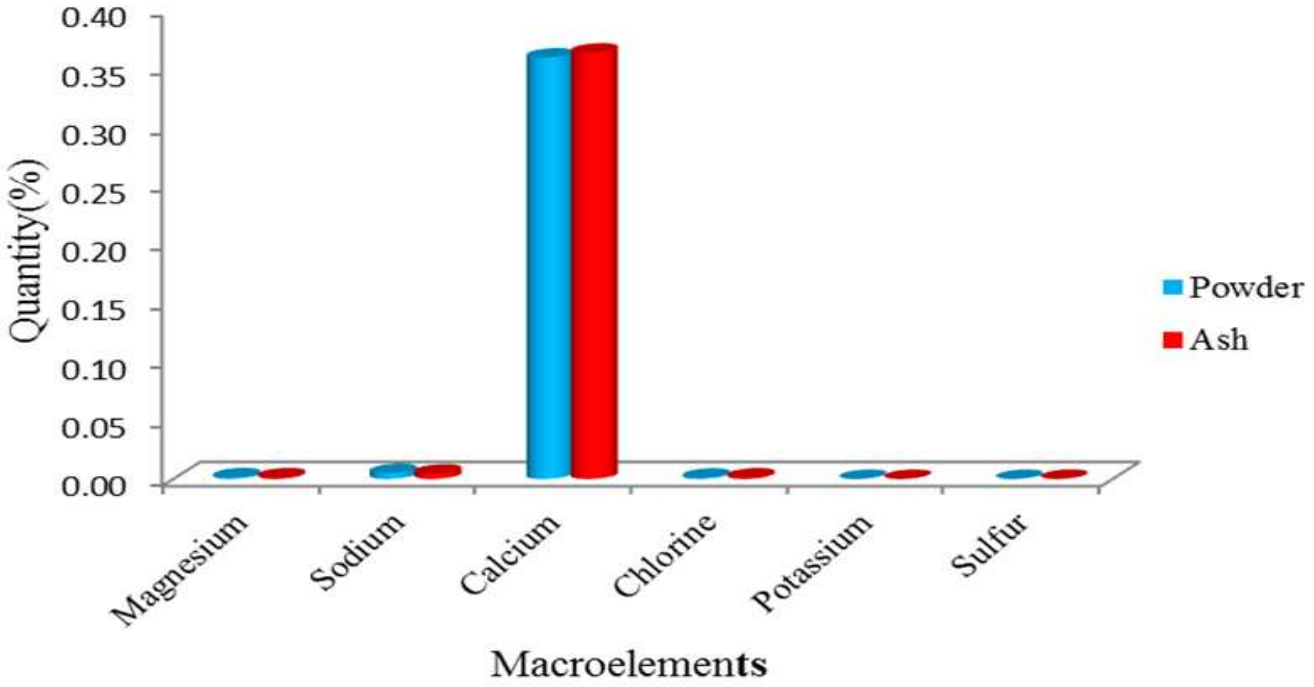


Table 8: Percentage of microelements involved in Powder and Ash of *Turritella communis*

No.	Percentage	Measuring values of powder	Measuring values of ash	Mean±SD
1.	Aluminum(Al)	0.0171%	0.0754%	0.1±0.04
2.	Silicon(Si)	0.0042%	0.2447%	0.12±0.2
3.	Manganese(Mn)	0.00277	0.00643%	0.14±0.00
4.	Iron(Fe)	0.1286%	0.4010%	0.3±0.2
5.	Copper(Cu)	0.00064%	0.00115%	0.001±0.001
6.	Zinc(Zn)	0.00054%	0.00073%	0.001±0.000

Fig 8: Compare Percentage of microelements involved in Powder and Ash of *Turritella communis*

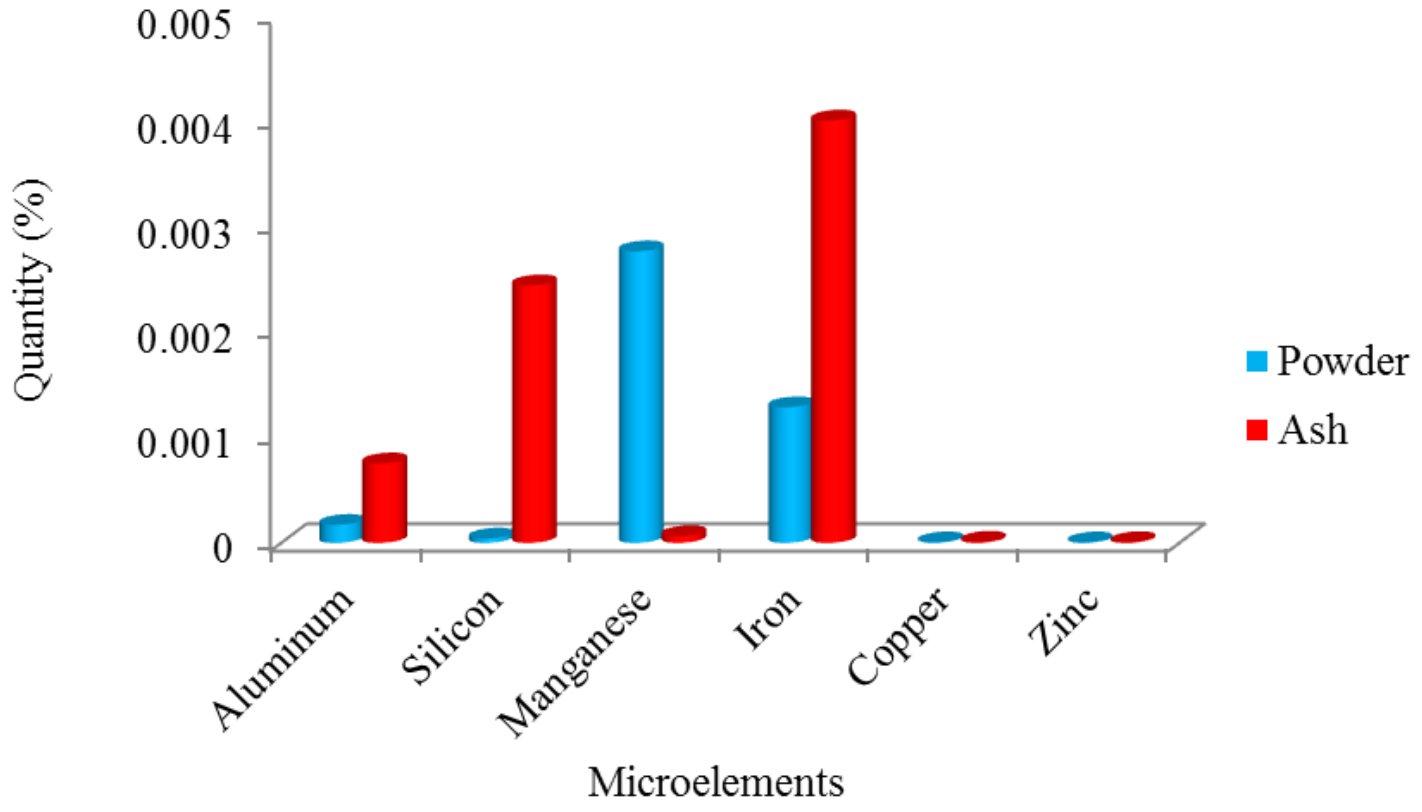


Table 9: Percentage of heavy metals involved in Powder and Ash of *Turritella commnis*

No.	Percentage	Measuring values of powder	Measuring values of ash	Mean±SD
1.	Arsenic(As)	< 0.00005%	< 0.00005%	-
2.	Cadmium(Cd)	< 0.00020%	< 0.00020%	-
3.	Mercury(Hg)	0.00046%	0.00053	-
4.	Lead(Pb)	0.00050%	0.00090	0.001±0.000

Fig 9: Compare Percentage of Heavy metals involved in Powder and Ash of *Turritella communis*

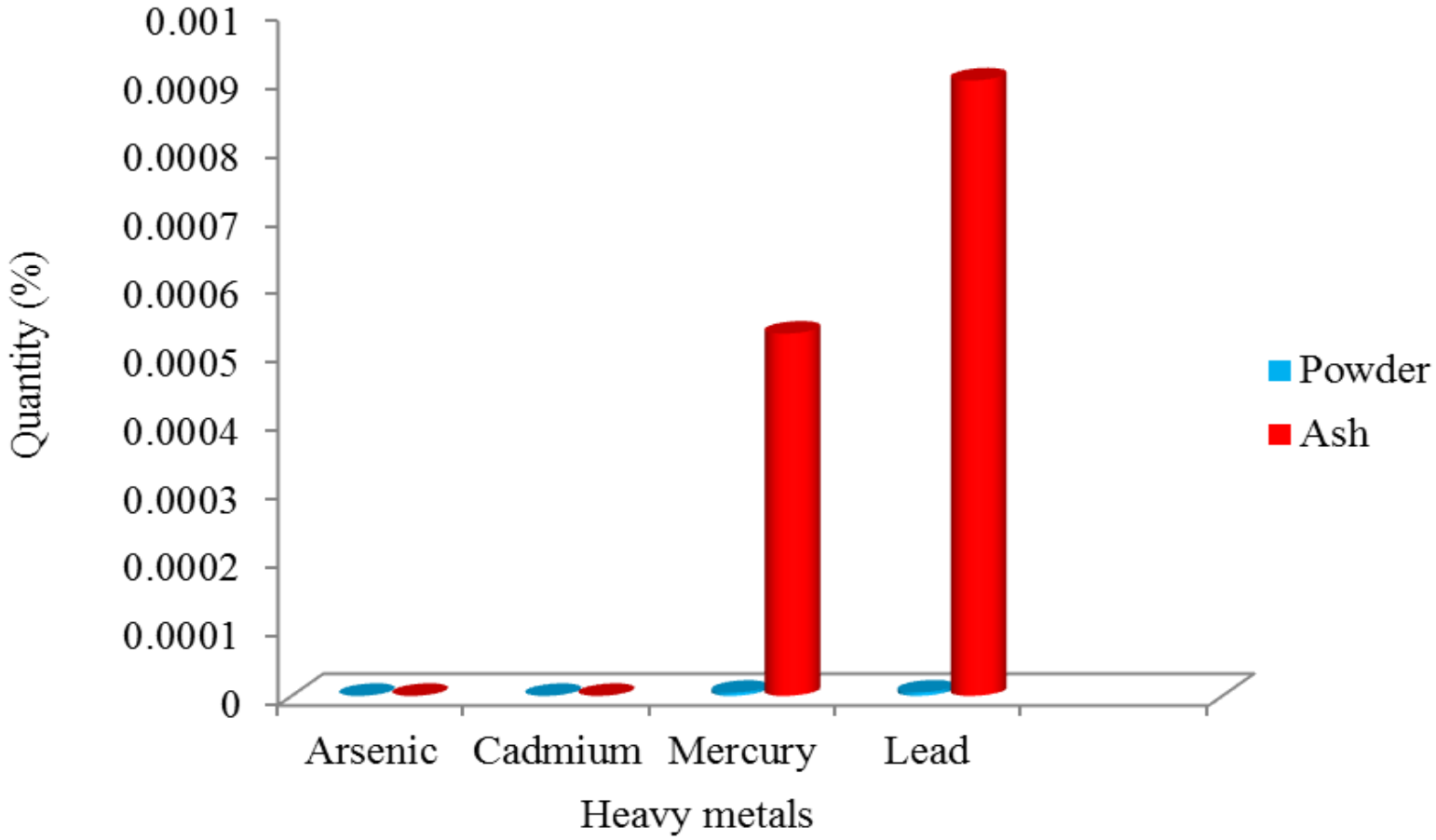
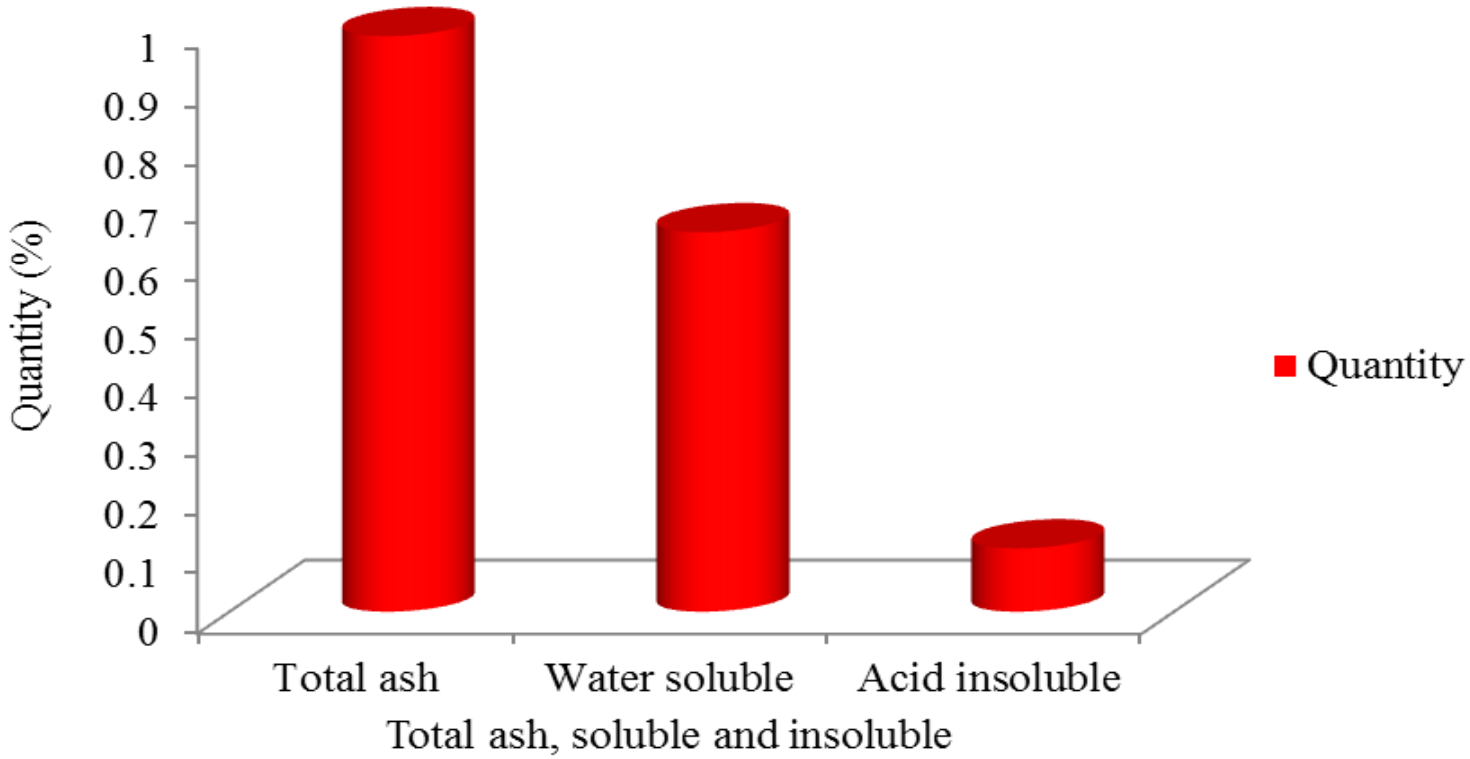


Table 10: Total ash, water soluble ash and acid insoluble ash contents of *Turritella communis*

No.	Parameter	Quantity
1	Total ash	98.55%
2	Water soluble	64.96%
3	Acid insoluble	10.8%

Fig; 10 Total ash, water soluble ash and acid insoluble ash contents of *Turritella communis*



- According to the findings of this study on four types of samples, higher concentration of fiber were investigated in ash samples than the powder samples (Table 1, 6 and Fig 1,6).
- Arsenic, cadmium and mercury were not found in these samples.
- Lead was found to contain below levels of heavy metal (Table 4, 9 and Fig 4,9). (Heavy metal analysis and limits in herbal dietary supplement, 2009).
- Macroelement and microelement contents were also examined with more reasonable concentration in ash form of samples than crude powders samples (Table ,2,3,7,8 and Fig 2.3,7,8).

DISCUSSION

- The Proximate composition of powder and ash of ***Cypraea eglantina*** and ***Turritella communis*** revealed that these contained moisture, carbohydrate, protein and fat contents were found to be very low.
- These confirm that samples are not a good source of fat.
- Fiber contents were found to be high considerable amount in the ash form of ***Cypraea eglantina*** and ***Turritella communis***.
- Mixtures of soluble and insoluble fibers to improve diabetic glucose control and lower serum triglycerides (Anderson 1990).

- The content of ash was found to be highest in these samples.
- It is a reflection of total inorganic matter present in these samples and also indicates that they possess the most abundant mineral like calcium, which are essential for good health (Oloyede, 2008).

- In this study arsenic, mercury and cadmium were not found in these samples.
- lead were found to contain below levels of heavy metal.
- Thus these samples have been found to be as harmless to use as medicine.

ACKNOWLEDGEMENT

- I would like to express my heart felt gratitude to Dr Thant Zin Professor and Head, Department of Zoology, University of Mandalay for his permission to conduct this research, and providing the departmental facilities and for his numerous invaluable advice.
- I would like to express my deep gratitude to Dr Naw Dolly Wibur, Professor, Department of Zoology, University of Mandalay, for rendering suggestions during the course of this research work.
- I am also grateful to Dr Soe Soe Aye, Professor, Department of Zoology, University of Mandalay for her advice and suggestions during the course of this work.

- I am greatly indebted to my supervisor, Dr Khin Mya Mya, Professor, Department of Zoology, University of Mandalay, her patient guidance, kind supervision and constant encouragement in my research work.
- I am also thank to Dr Theim Kyaw, Rector, University of Traditional Medicine ,Mandalay, for allowing me to this research work.
- I am gratefully indebted to Dr Hla Swe, Head, Department of Academic Affairs, University of Yangon for his invaluable advice in my research work.
- I am also thank to Dr. Moe Kyaw Myint, Deputy Director/Head, Parasitology Research Division, Department of Medicinal Research, Pyin OoLwin Branch.
- I am gratefully indebted to my parents U Ye Naing and Daw Khin Saw Yi for their kindness and encouragement in my research work.

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THANK YOU