

Comparative Physicochemical Ash Study of Some Medicinal Plants Species of Western Himalaya.

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ABSTRACT

Air dried powdered plants material were evaluated for their comparative physicochemical ash content study of *Berberis aristata* (Root), *Toona ciliata* (Bark), *Rhododendron arboreum* (Flower, Bark, Leaves), *Alpinia Speciosa* (Leaves), *Thuja orientalis* (Leaves), *Cedrus deodara* (Bark), *Lantana camara* (Leaves), *Hemidesmus indicus* (Leaves), *Curcuma amada* (Rhizome). The higher extent of Total ash (Physiological ash and Non-physiological ash) were found in *Rhododendron arboreum* Bark (12.224 ± 0.101), while higher extent of Water soluble ash were found in *Toona ciliata* Bark 4.049 ± 0.088 , while higher content of Non-Physiological ash (acid insoluble ash) was found in *Lantana camara* Leaves (2.276 ± 0.186).

Keywords: Medicinal Plants, Physiological and Non-physiological ash.

INTRODUCTION

In a Western Himalaya region various plants species Viz. *Berberis aristata*, *Toona ciliata*, *Rhododendron arboreum*, *Alpinia Speciosa*, *Thuja orientalis*, *Cedrus deodara*, *Lantana camara*, *Hemidesmus indicus*, *Curcuma amada* are commonly found, these plants species are been known for their therapeutic importance²⁻⁹. Quality control methods of medicinal plant materials include Physicochemical ash analysis as a parameter use for Quality, Purity and Safety, define as the ash left after ignition, which helps to determine the physiological ash and Non-Physiological ash content. The Physiological ash is derived from the plant tissue itself and Non-Physiological ash, which is residue of extraneous matter (e.g. Sand and soil) adhering to the plant surface¹⁰. Following study perform in way of their comparative nature of physicochemical ash of some medicinal plants belongs to same habitat.

MATERIALS AND METHODS

Collection and Authentication of Plants Material

Plant materials, *Curcuma amada* (Rhizome), *Toona ciliata* (Bark), *Rhododendron arboreum* (Flower, Bark, Leaves), *Alpinia Speciosa* (Leaves), *Thuja orientalis* (Leaves), *Cedrus deodara* (Deodar bark), *Lantana camara* (Leaves), *Berberis aristata* (Root), *Hemidesmus indicus* (Leaves) was collected in Month of March. Authentication and Preparation of herbarium specimen voucher was done by proper authentication procedure.

Processing of Plants material

Plant parts were allowed to air dry in shade and converted in uniform powder form by using milling machine at room temperature.

Physiological and Non-Physiological ash Include Total ash, Acid Insoluble and Water soluble ash content was done as per reference procedure¹¹.

RESULT AND DISCUSSION

Comparison of Physicochemical ash In the Plant species, Physicochemical ash analysis evaluated by determination of Total Ash, Water soluble ash, Acid insoluble ash.

Berberis aristata (Root); Total ash was found 2.663 ± 0.445 , Water soluble ash 1.426 ± 0.263 , Acid insoluble ash 0.798 ± 0.117 ,

Toona ciliata (Bark); Total ash was found 8.317 ± 0.195 , Water soluble ash 4.049 ± 0.088 , Acid insoluble ash 0.521 ± 0.114 ,

Rhododendron arboreum (Flower, Leaves and Bark); Total ash was found higher in Bark 12.224 ± 0.101 , than leaves 4.359 ± 0.245 and Flower 3.123 ± 0.105 . While water soluble ash was found in higher extent in Flower 1.95 ± 0.078 , Than Bark 1.668 ± 0.131 and leaves 0.926 ± 0.088 , Acid insoluble ash was found in Bark 1.226 ± 0.095 than Flower 0.929 ± 0.021 and Leaves 0.619 ± 0.101 .

Alpinia Speciosa (Leaves); Total ash was found 5.745 ± 0.133 , Water soluble ash 2.718 ± 0.2 , Acid insoluble ash 1.101 ± 0.081 .

Thuja orientalis (Leaves); Total ash was found 5.594 ± 0.275 , Water soluble ash 2.718 ± 0.195 , Acid insoluble ash 1.161 ± 0.146 ,

Cedrus deodara (Deodar bark); Total ash was found 3.278 ± 0.144 , Water soluble ash 2.148 ± 0.203 , Acid insoluble ash 1.601 ± 0.214 .

Lantana camara (Leaves); Total ash was found 10.507 ± 0.589 , Water soluble ash 1.363 ± 0.123 , Acid insoluble ash 2.276 ± 0.186 .

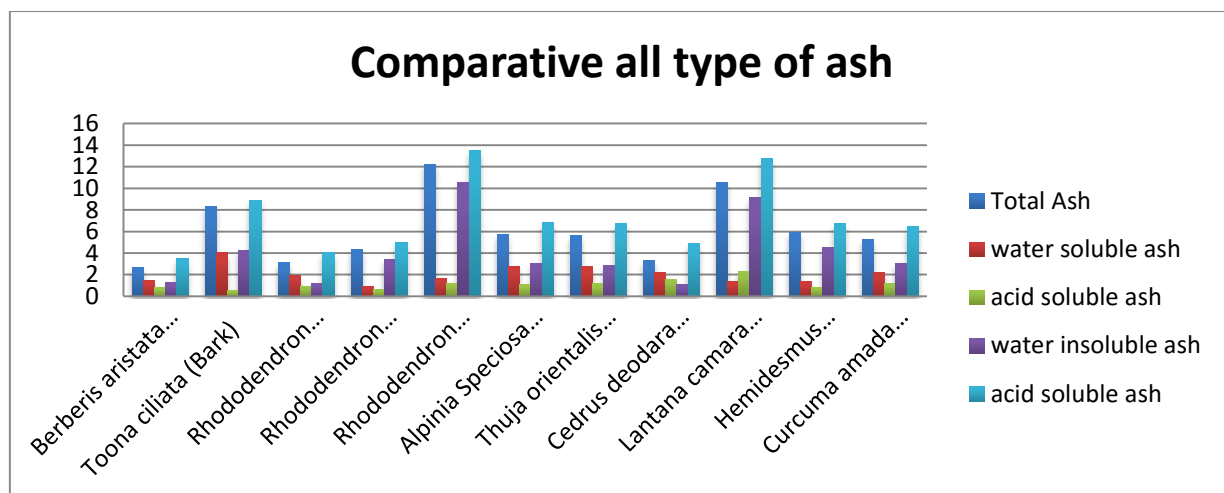


Figure 1: shows the comparative analysis of Total ash, Water soluble ash and Alcohol insoluble ash, in the species and in between the species.

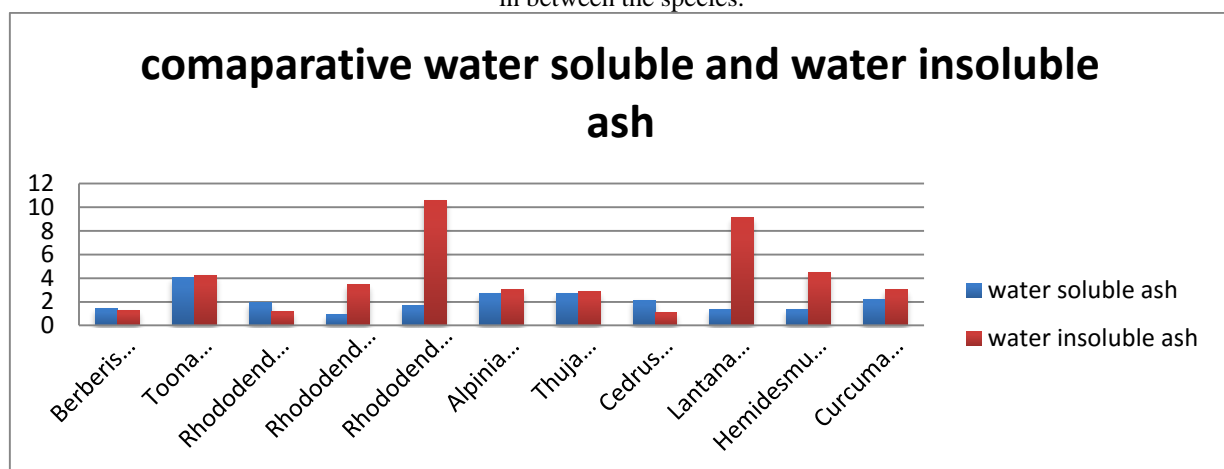


Figure 2: shows the comparative analysis of Water-soluble ash and Water Insoluble ash, in the species and in between the species.

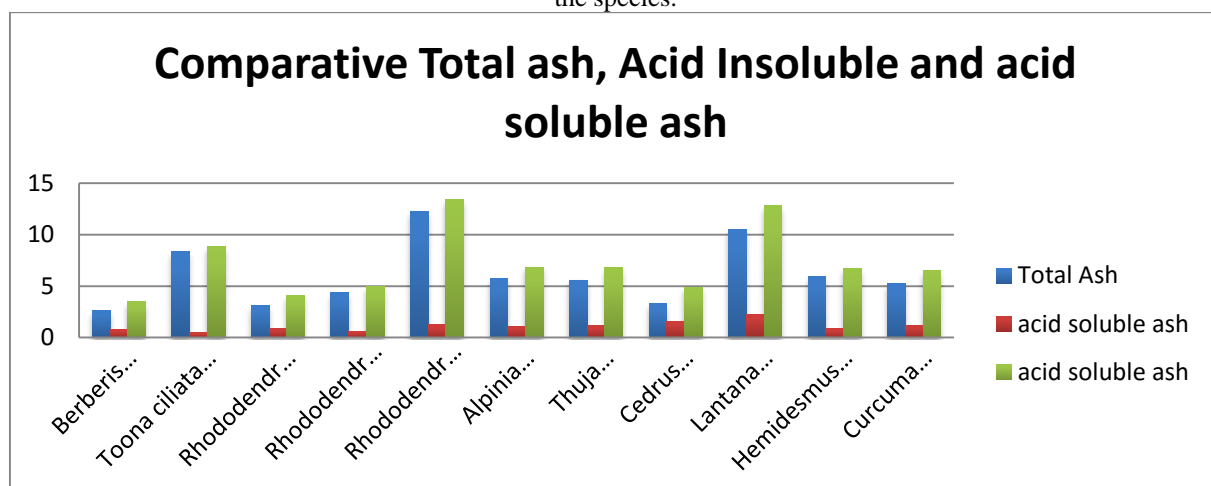


Figure 3: Shows the comparative analysis of Acid insoluble ash and Acid soluble ash, in the species and in between the species.

Hemidesmus indicus (Leaves); Total ash was found 5.885 ± 0.971 , Water soluble ash 1.368 ± 0.123 , Acid insoluble ash 0.854 ± 0.065 .

Curcuma amada (Rhizome); Total ash was found 5.279 ± 0.859 , Water soluble ash 2.233 ± 0.146 , Acid insoluble ash 1.191 ± 0.275 .

Comparison of Physicochemical ash In the Plant species, Total ash was found as a decreasing order as *Rhododendron arboreum* Bark (12.224 ± 0.101), *Lantana camara* (10.507 ± 0.589) *Toona ciliata* (8.317 ± 0.195), *Hemidesmus indicus* Leaves (5.885 ± 0.971), *Alpinia Speciosa* Leaves (5.745 ± 0.133), *Thuja orientalis* Leaves

Table 1: shows the Total ash, Water soluble ash, acid insoluble ash.

S. No.	Plant Name	Total ash (w/w)	Water soluble ash (w/w)	Alcohol insoluble ash (w/w)
1	<i>Berberis aristata</i> (Root)	2.663± 0.445	1.426±0.263	0.798±0.117
2	<i>Toona ciliata</i> (Bark)	8.317± 0.195	4.049± 0.088	0.521±0.114
3	<i>Rhododendron arboreum</i> (Flower)	3.123± 0.105	1.95± 0.078	0.929±0.021
4	<i>Rhododendron arboreum</i> (Leaves)	4.359± 0.245	0.926± 0.088	0.619±0.101
5	<i>Rhododendron arboreum</i> (Bark)	12.224± 0.101	1.668± 0.131	1.226± 0.095
6	<i>Alpinia Speciosa</i> (Leaves)	5.745± 0.133	2.718± 0.2	1.101± 0.081
7	<i>Thuja orientalis</i> (Leaves)	5.594± 0.275	2.718± 0.195	1.161± 0.146
8	<i>Cedrus deodara</i> (Deodar bark)	3.278± 0.144	2.148± 0.203	1.601± 0.214
9	<i>Lantana camara</i> (Leaves)	10.507± 0.589	1.363± 0.123	2.276± 0.186
10	<i>Hemidesmus indicus</i> (Leaves)	5.885± 0.971	1.368± 0.123	0.854± 0.065
11	<i>Curcuma amada</i> (Rhizome)	5.279± 0.859	2.233± 0.146	1.191± 0.275

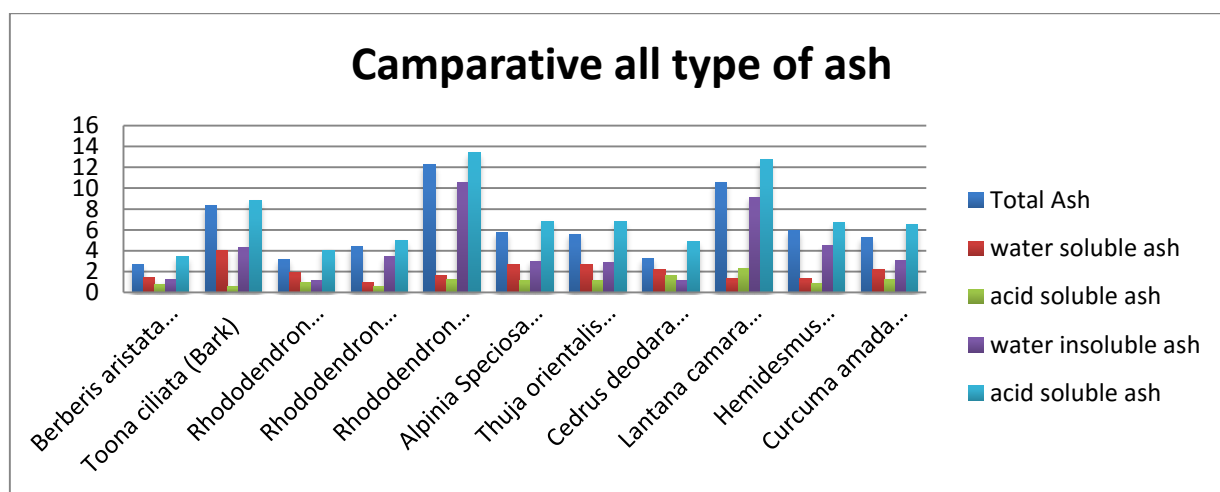
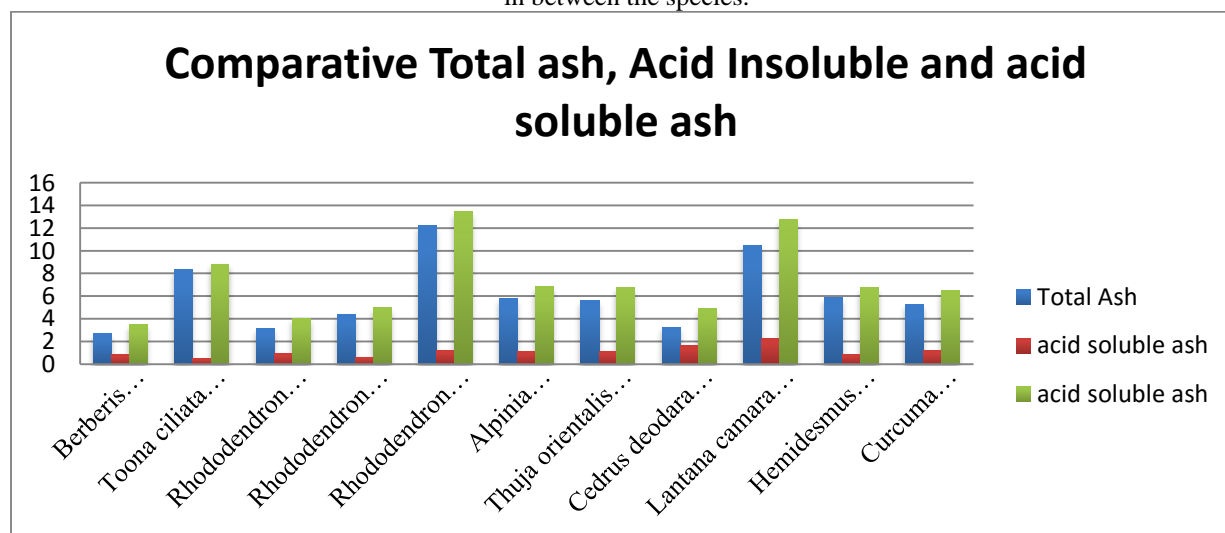


Figure 4: Shows the comparative analysis of Total ash, Water soluble ash and Alcohol insoluble ash, in the species and in between the species.



(5.594±0.275), *Curcuma amada* Rhizome (5.279±0.859) *Rhododendron arboreum* Leaves (4.359± 0.245), *Cedrus deodara* bark (3.278± 0.144), *Rhododendron arboreum* Flower (3.123± 0.105), *Berberis aristata* Root (2.663±0.445), Comparison between Total ash, Water soluble ash, and acid insoluble ash was shown graphically (Fig1). The total ash method is designed to measure the total amount of material remaining after ignition. This

includes both "physiological ash", which is derived from the plant tissue itself, and "non-physiological" ash.² Water soluble ash as *Toona ciliata* Bark (4.049+ 0.088), *Rhododendron arboreum* Flower (3.123+0.105), *Alpinia Speciosa* Leaves (2.718+ 0.2), *Thuja orientalis* Leaves (2.718+ 0.195), *Curcuma amada* Rhizome (2.233+0.146), *Cedrus deodara* Bark (2.148+0.203), *Rhododendron arboreum* Bark (1.668+0.131), *Barberis aristata* Root

(1.426± 0.263), *Hemidesmus indicus* Leaves (1.368± 0.123), *Lantana camara* Leaves (1.363± 0.123), *Rhododendron arboreum* Leaves (0.926± 0.088), Water-soluble ash is the part of total ash soluble in water¹. Comparison between Water soluble ash and water insoluble ash showed graphically (Fig2). Acid insoluble ash as *Lantana camara* (Leaves) 2.276± 0.186, *Cedrus deodara* Bark) 1.601± 0.214, *Rhododendron arboreum* Bark 1.226± 0.095, *Curcuma amada* Rhizome 1.191± 0.275, *Thuja orientalis* (Leaves) 1.161± 0.146, *Alpinia Speciosa* Leaves (1.101± 0.081), *Rhododendron arboreum* Flower (0.929± 0.021), *Hemidesmus indicus* Leaves (0.854± 0.065), *Berberis aristata* (Root) 0.798± 0.117, *Rhododendron arboreum* (Leaves) 0.619± 0.101, *Toona ciliata* (Bark) 0.521± 0.114, Acid-insoluble ash is the residue obtained after boiling the total ash with dilute hydrochloric acid, and igniting the remaining insoluble matter. This measures the amount of silica present, especially as sand and siliceous earth¹. Comparison between acid insoluble and Acid soluble ash was shown graphically (Fig3). Total ash represents the total content of Physiological ash and Non-Physiological ash, Water soluble ash represents the content of Total ash soluble in hot water, Acid insoluble represents the Non-physiological ash specially Sand and Soil.¹ Now it is clear that Physiological ash should be the part of ash which apart from acid insoluble, comparison between Total ash, Water soluble ash, Water insoluble ash, Acid Insoluble ash and Alcohol soluble ash was shown graphically (Fig4).

CONCLUSION

Physiochemical ash analysis of Medicinal plants is a parameter of Quality control, Total ash content revealed with the Physiological and Non- Physiological ash, which was found to be higher in *Rhododendron arboreum* Bark (1.224± 0.101), and Acid insoluble ash revealed with the extraneous matter Non-physiological content generally for siliceous earth (Sand and Soil) was found to be higher in *Lantana camara* (Leaves) 2.276± 0.186, Water soluble ash revealed with the part of Total ash which is soluble in water was found in higher extent in *Toona ciliata* (Bark) 4.049± 0.088. In a general the order of higher Non- physiological ash content as *Lantana camara* (Leaves) 2.276± 0.186, *Cedrus deodara* Bark) 1.601± 0.214, *Rhododendron arboreum* Bark 1.226± 0.095, *Curcuma caesia* Rhizome 1.191± 0.275, *Thuja orientalis* (Leaves) 1.161± 0.146, *Alpinia Speciosa* Leaves (1.101± 0.081), *Rhododendron arboreum* Flower (0.929± 0.021), *Hemidesmus indicus* Leaves (0.854± 0.065), *Berberis aristata* (Root) 0.798± 0.117, *Rhododendron arboreum* (Leaves) 0.619± 0.101, *Toona ciliata* (Bark) 0.521± 0.114, and the extant of water soluble ash content was found to be higher in *Toona ciliata* Bark (4.049± 0.088), Alcohol soluble ash was found to higher in *Rhododendron arboreum* Bark, studies

concludes that's following study helps to check Quality, and Purity in the plants species, and it also helps for future studies related with Plants character, effect of environmental changes in the plants species.

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