

**PRELIMINARY PHYTOCHEMICAL SCREENING OF *CYCAS CIRCINALIS* (L.) AND *IONIDIUM SUFFRUTICOSUM* (GING.)**

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**ABSTRACT**

India is one of the countries richly endowed with vast species of medicinal plants. The various bioactive phytoconstituents of the medicinal plants were identified and used for many chronic ailments. *Cycas circinalis* L. and *Ionidium suffruticosum* Ging. are the two herbs which were used in Indian medicine (Siddha) for improving the fertility of male. The present study involves the preliminary physicochemical, phytochemical analysis of the above said herbs. Physicochemical analysis involving ash values such as total ash, acid insoluble ash and water soluble ash for Cycas (8.12, 0.64, and 5.2 respectively) and for Ionidium (9.76, 0.94, and 5.6 respectively). The heavy metals such as lead, cadmium, mercury and arsenic were found to be within permissible limits in both the herbs. The powdered plant material of *Cycas* showed presence of alkaloid, flavonoids, amino acids and triterpenoids with percent yield of 40% in ethanolic solvent whereas *Ionidium* showed the presence of alkaloid, flavonoids, saponins, tannins, glycosides, amino acids and triterpenoids with percent yield of 32% in ethanolic solvent.

**Key words** – *Cycas circinalis*, *Ionidium suffruticosum*, Physicochemical, Phytochemical, percent yield

**INTRODUCTION**

*Cycas circinalis* L. is a gymnosperm tree which belongs to the family Cycadaceae, commonly grown in Western Ghats and hilly regions of southern peninsula of India and also in other countries like China, Japan and South Africa.<sup>[1]</sup> It is palm like tree grows to a height of 5 meter in dry/moist deciduous forest and also found along riverside. It produces a sago which was extracted from the trunk of about 7 years old plant and is of two types male sago cone and female sago cone. The male cone has aphrodisiac activity and commonly known as Madana Kaman in Tamilnadu.<sup>[2,3]</sup> *Ionidium suffruticosum* Ging. is a seasonal, sporadic, rare ethno botanical, perennial herb widely distributed in India which belongs to the

family Violaceae.<sup>[4]</sup> Both the plant has medicinal value particularly in improving male fertility. The Physicochemical and phytochemical analysis are very important to know the nature, colour character, ash value, phytoconstituents, moisture and fiber content of an herb. The present study involves these preliminary phytochemical screening of the *Cycas circinalis* and *Ionidium suffruticosum*.

**MATERIALS AND METHODS**

**Collection and authentication of plant materials:** The *Cycas circinalis* dry sago male cones specimen was identified by the authentic sources and collected from 7 year's old plant specimen directly from the

tree. The male cone was chopped into small pieces and air dried in shadow for 10 days and simultaneously the *Ionidium suffruticosum* plant was also identified with the help of authentic sources and collected, washed with distilled water and the whole plant was air dried for 10 days. The dried male cones of *Cycas circinalis* and *Ionidium suffruticosum* (whole plant) was powdered using pulveriser and passed through sieve to get fine powder.<sup>[5]</sup>

**Physicochemical analysis:** The powdered plant material was analyzed for colour character using ordinary and ultraviolet light. The percentage of ash values such as total ash, acid insoluble ash and water soluble ash were calculated as per Indian pharmacopoeia.<sup>[6]</sup> The heavy toxic metals such as lead, cadmium, mercury and arsenic constituents were also tested for the powdered plant material. The moisture content, crude fiber content and foreign organic matter were traced out. The percent yield and pH of ethanolic extract of both *Cycas circinalis* and *Ionidium suffruticosum* were noted.

**Phytochemical analysis:** The powdered plant materials were subjected to different chemical analysis to trace out the phytoconstituents such as alkaloids, flavonoids, saponins, tannins, glycosides, carbohydrates, amino acids and triterpenoids.<sup>[6-10]</sup>

**Tests for alkaloids:** The alkaloids traced out by using Dragendroff's test, Wagner's test, Mayer's test and Hager's test.<sup>[6]</sup>

**Test for flavonoids:** Flavonoids were tested by Shinoda Test.<sup>[7]</sup>

**Test for saponins:** The saponins was traced out by taking 1 ml of extract which is diluted with 20 ml distilled water and then shaken in a graduated cylinder for 15 minutes. A 1 cm layer of foam indicates the presence of saponins.<sup>[6]</sup>

**Tests for tannins:** The tannins were tested by Ferric chloride test.<sup>[8]</sup>

**Tests for glycosides:** Tests like Legal test were used for the analysis of glycosides.<sup>[6,9]</sup>

**Tests for carbohydrates:** The carbohydrates were tested by using Fehling's test and Barfoed's test.<sup>[6]</sup>

**Tests for proteins and amino acids:** Tests like Biuret test and Ninhydrin test were used for the analysis of proteins and amino acids.<sup>[7]</sup>

**Test for triterpenoids:** Chloroform and concentrated sulphuric acid was added to 0.5 ml of extract. The formation of red brown colour indicates the presence of triterpenoids.<sup>[10]</sup>

## RESULTS AND DISCUSSION

The colour character of powdered plant material of *Cycas circinalis* was brown in colour under ordinary light as well in ultraviolet light where as for *Ionidium suffruticosum* was light green under ordinary light and green under ultra violet light. The percentage of ash value, moisture content, crude fiber content, foreign organic matter and alcohol soluble extractive and of *Ionidium* was found to be more when compared to *Cycas* where as the water soluble extractive percent was high in *Cycas* than that of *Ionidium*. The percentage value of both herbs was given in table1. The heavy metals such as lead, cadmium, mercury and arsenic were found to be within the permissible limits (BDL) in both the herbs. The percent yield colour of ethanolic extract of *Cycas* was 40% than the *Ionidium* 32%. The pH of both the extracts was in a range of 7.1 to 7.5.

The thin layer chromatography peaks and nature of ethanolic extract of *Cycas* and *Ionidium* were given in Table 2. *Cycas* showed the presence of secondary metabolites such as alkaloids, flavonoids, triterpenoids and amino acids. *Ionidium* showed the presence of alkaloid, flavonoids, saponins, tannins, glycosides, amino acids and triterpenoids. The Phytochemical screening of *Cycas* and *Ionidium* showed the presence of certain phytoconstituents given in the table 3. All these secondary metabolites were known to have some medicinal and physiological activity.<sup>[11]</sup> Satheesh kumar et al (2012) reported the Coumarin derivative from *Ionidium suffruticosum* and its hypolipidemic activity in rats fed with high fat diet.<sup>[12]</sup> The qualitative chemical tests of the petroleum ether, chloroform, methanol and aqueous extracts of plant material revealed the presence of alkaloids, steroids, triterpenoids, flavonoids and carbohydrates in *Ionidium suffruticosum*.<sup>[13]</sup> *Cycas circinalis* related to phytochemical analysis, no work was reported so far. Both the herbs has quite number of biologically active phytoconstituents which may be responsible for many pharmacological actions of the herbs.<sup>[14]</sup> The *Cycas circinalis* and *Ionidium suffruticosum* are the two herbs used for years together in Traditional system of Medicine for enhancing male fertility.<sup>[2]</sup> This study will be a source of baseline data covering the preliminary phytochemical screening of the two unrevealed herbs.

**CONCLUSION**

*Cycas circinalis* and *Ionidium suffruticosum* are the herbs analyzed in this present study for its phytoconstituents and reported. The biologically

active phytoconstituents has to be further analyzed and isolated to find out the responsible active compounds that enhance the male sexual activity which is under process.

**Table-1: Physicochemical Analysis of Powdered Plant Material**

S No.	Parameters	Cycas powder Values obtained (%w/w)	Ionidium powder Values obtained (%w/w)
1	Total ash value	8.12	9.76
2	Acid insoluble ash	0.64	0.94
3	Water soluble ash	5.2	5.6
4	Moisture content	8.5	8.75
5	Foreign organic matter	8.4	8.6
6	Crude fiber content	28	32
7	Alcohol soluble extractive	5.9	6.4
8	Water soluble extractive	11.33	10.33

**Table-2: Colour, nature and percent yields of extracts of Cycas and Ionidium.**

Plant	Extract Solvents	Colour	TLC (PEAKS)	Nature	% Yield(w/w)	pH
Cycas	Ethanol	Brown	5	Solid	40	7.1-7.4
Ionidium	Ethanol	Light green	8	Solid	32	7.1-7.5

**Table-3: Preliminary phytochemical analysis**

S.no	Phytoconstituents	Cycas Extract	Ionidium Extract
1	Alkaloids	+	+
2	Flavonoids	+	+
3	Saponins	-	+
4	Tannins	-	+
5	Glycosides	-	+
6	Carbohydrates	-	-
7	Amino acids	+	+
8	Triterpenoids	+	+

+ = Present, - = Absent.

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