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# Phytochemical Analysis of *Cyathocline purpuria* (Don) O. Ktze. in Different Solvent System- A Specified Medicinal Plant

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**ABSTRACT:** *Cyathocline purpuria (Don) O. Ktze* belonging to Asteraceae family commonly called as Gangotra. This plant is found in marshy places of Maharashtra. The plant is traditionally used to treat different diseases. It is necessary to study phytochemical composition of *Cyathocline purpuria (Don) O. Ktze* because it has some novel compounds which are not yet been investigated. Different plant parts (Leaf, Stem, and Bark) of the plant must have different chemical composition and havea different solubility in different solvent system. So the estimation of phytochemicals was carried out by using different solvent system according to polarity. We used different non polar to polar solvent system like Hexane, Toluene, ethyl acetate, Ethanol & water for analysis. The study shows that different parts of the plant have different chemical composition as presence of alkaloids, tannins, flavonoids, saponins, resins, Coumarin, amino acids & proteins in different solvent system. The results showed that leaf extract has higher amount of alkaloids, glycosides, amino acids, proteins, terpenes, quinone, coumarins, saponin & lower amount of carbohydrates, flavonoids & resins. Tannins and phenols are present in very low amount. Stem extract showed higher amount of alkaloids, glycosides, amino acids and coumarins. It also showed minor amount of flavonoids, proteins, terpenes & quinines. Also very low amount of carbohydrates, tannins, phenols & resins are present. Bark showed higher amount of glycosides, flavonoids, proteins, terpenes, coumarins & saponins. Also it has showed medium amount of alkaloids, carbohydrates, amino acids& very low amount of Quinone and resins. Tannin and phenols are completely absent in bark extract. 

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## INTRODUCTION

Plants are utilized extensively as raw drugs for many formulations in traditional systems of medicine. To check the genuineness of the raw drugs and to detect adulteration of these materials, an authentic pharmacognostic study is needed for each raw drug. Usually the drugs are collected by traditional practitioners who have inherited Ayurveda or other herbal practices. Their identification is mostly based on morphological features or other traditionally known characteristics. In such cases, there is a chance of selecting incorrect raw drugs/adulterants. Therefore phytochemical screening is needed for each raw drug used in the formulation to avoid any ambiguity and such a study will serve also as a reference for further studies **(**Gupta, etal 2008).

Asteraceae family is the well-known for its medicinal properties & its therapeutic activity. Plant species from Asteraceae have a different chemical composition, which work against different diseases (Bihanietal 2014).*Cyathocline purpuria (Don) O. Ktze* belongs to family Asteraceae. It is an erect annual herb, growing to 20-50 cm high. Branched, grooved stem has soft hair covering it. The whole plant is strongly aromatic. Alternately arranged stalkless leaves are toothed, covered with soft hair, and 3-12 cm long. Flowers

occur in corymbs at the end of branches. Flower heads are 5-8 cm across, and purple in color. This plant is widely distributed in widespread in Himalaya (Kashmir to Bhutan), Assam, India, Burma, Thailand, Indo- China and China.**(**Gupta, etal 2008). According to literature it has an antimicrobial, Antifungal, Antibacterial & antioxidant activity. In china *Cyathocline purpuria (Don) O. Ktze* traditionally used to cure different types of cancer (Guoyi Ma · Li Chong · Zuqiang Li et al 2008).

Phytochemical analysis refers to the extraction, separation & identification of the medicinally active compounds present in *Cyathocline purpuria (Don) O. Ktze.* The present study is based on preliminary pharmacognostic and phytochemical investigation of *Cyathocline purpuria (Don) O. Ktze.*

# MATERIALS AND METHODS

**Collection & Extraction of plant material:**

Plant material of *Cyathocline purpuria (Don) O. Ktze* was collected from local regions of Shrigonda & made fine powder of shade dried plant material. The plant pare were air dried at room temperature followed by pulverization to powder from using a mortal & pestle. The powdered were subjected to aqueous extraction as well as extraction of active components from powder was performed with different solvents by using Soxhlet. Polar and Non polar solvent were taken into consideration for extraction. Solvent of each sample was removed by vacuum rotary evaporator at room temperature. The remaining residues were collected and preserved at $4^0$C for further experiment. Preliminary phytochemical was done in different solvent system like Hexane, Toluene, Ethyl acetate, Ethanol & water. Qualitative analysis of different plant parts (Leaf, stem & bark) was done by different phytochemical tests.

**Preliminary Qualitative Phytochemical Screening:**

The preliminary phytochemical analysis of extracts were performed for testing different chemical groups present in plant parts using standard procedures by Sofowora A (2008), Harbone (1973) and Trease Evans (2010).

**Phytochemical Screening:** The chemical tests were performed for testing different chemical groups present in extracts.

1. **Test for alkaloids**
   - **Mayer's test:** To 2-3 ml of filtrate, few drops of the Mayer's reagent was added. Formation of cream precipitate indicatedthe presence of alkaloids.
   - **Dragendorff's test:** To 2-3 ml of filtrate, few drops of the Dragendorff's reagent was added. Formation of orange brown precipitate indicated the presence of alkaloids.
2. **Flavonoids**
   - **Ferric-chloride test:** Test solution with few drops of ferric chloride solution shows intense green colour.
   - **Alkaline reagent test:** To 2 ml of test solution add 2 ml alkali, gives yellow color, which disappears on addition of dil. HCl it disappears, which indicates presence of flavonoids.
3. **Proteins**
   - **Biuret's test**(General test): To 1 ml of test extract, 4% of sodium hydroxide solution and few drops of 1% copper Sulphate solution were added. Formation of a violet red colour indicated the presence of proteins.
   - **Millons Reagent Test:** 5 ml plant extract was taken in test tube + Add few drops of Millons reagent. The solution was boiled –Brick red color.
4. **Test for Amino acids:** 5 ml Plant extract + 2to3 ml of Ninhydrin solution was added and kept in boiling water bath for 1 to 2 minutes formation of purple color indicates Amino acids Is present.
5. **Saponins**
   - **Foam test:** The extract was shaken vigorously with water in a test tube. Formation of persistent foam indicated the presence of saponins.
   - **Haemolytic test:** Few drop of extract solution was mixed with Blood, which indicates haemolysis, shows presence of saponin.
   - **Salkowaski test:** Concentrated Sulphuric acid (2 ml) was added to 2 ml of test solution. The solution was shaken and allowed to stand. The colour of lower layer changed to yellow indicating presence of triterpenoids.
6. **Tannins**
   - **Ferric chloride test:** Extract solutions were treated with 5% ferric chloride solution. Formation of blue colors indicated the presence of hydrolysable tannins and formation of green colour indicated the presence of condensed tannins
7. **Triterpenoids**
   - Salkowski test- 1 ml of extract was dissolved in chloroform and few drops of concentrated Sulphuric acid were added to it. Formation of reddish brown colour on the inner face suggested the presence of Terpanoids.

8. **Test for Glycosides:**
   - Keller Kiliani test: 1 ml of extract + 3 drops of ferric Chloride + 1ml glacial acetic acid + 1ml concentrated Sulphuric acid.
9. **Test for Quinone:** In 5 ml of plant extract 3 ml of concentrated HCl added yellow precipitation is occurred.
10. **Test for Resins:** Turbidity observed on addition of 5ml water in 10ml of plant extract.
11. **Test for Coumarin:** 10% NaOH added in 5 ml of plant extract, Yellow color observed.

# RESULTS & DISCUSSION

The results of leaf extract shows that higher amount of alkaloids, glycosides, amino acids, proteins, terpenes, quinone, coumarins, saponin & lower amount of carbohydrates, flavonoids & resins. Tannins and phenols are present in very low amount. Stem extract showed higher amount of alkaloids, glycosides, amino acids and coumarins. It also showed minor amount of flavonoids, proteins, terpins & quinines. Also very low amount of carbohydrates, tannins, phenols & resins are present. Bark showed higher amount of glycosides, flavonoids, proteins, terpenes, coumarins & saponins. Also it has showed medium amount of alkaloids, carbohydrates, amino acids & very low amount of Quinone and resins. Tannin and phenols are completely absent in bark extract. Comparative study indicates that alkaloids, glycosides, amino acids, proteins, Terpenes are present with higher concentration in overall plant parts; there are variations in chemical composition according to different solvent system in different plant parts.

**Table No 1. Qualitative screening of phytochemicals from leaf of *Cyathocline purpuria (Don) O. Ktze.***

| Sr. No | Test for Leaf Extract | Hexane | Toluene | Ethyl Acetate | Ethanol | Aqueous |
|---|---|---|---|---|---|---|
| **1.** | **Test For Alkaloids** | | | | | |
| | Mayer's Test | + | - | - | + | - |
| | Dragendorff's Test | + | - | + | + | - |
| **2.** | **Test for Carbohydrates** | | | | | |
| | Iodine Test | - | - | + | + | - |
| **3.** | **Test for glycosides** | | | | | |
| | Keller Kiliani Test | + | + | + | + | - |
| **4.** | **Test for Flavonoid** | | | | | |
| | Ferric Chloride Test | - | - | + | + | - |
| | Alkaline reagent Test | - | - | - | + | + |
| **5.** | **Test for Amino Acids** | | | | | |
| | Ninhydrin Test | + | - | - | + | + |
| **6.** | **Test for Proteins** | | | | | |
| | Biuret Test | + | - | - | - | - |
| | Millons Test | - | - | + | + | + |
| **7.** | **Test for Tannin & Phenol** | | | | | |
| | Ferric Chloride Test | - | - | + | - | - |
| **8.** | **Test for Terpenes** | | | | | |
| | Salkowski Test | - | + | + | + | + |
| **9.** | **Test for Quinones** | + | + | + | + | - |
| **10.** | **Test for Resins** | - | - | - | + | + |
| **11.** | **Test for Coumarin** | + | - | + | + | + |
| **12.** | **Test for Saponin** | | | | | |
| | Foam Test | + | + | + | - | + |
| | Salkowski Test | + | + | + | - | + |

**Table No 2. Qualitative screening of phytochemicals from stem of *Cyathocline purpuria (Don) O. Ktze.***

| Sr. No | Test for Stem Extract | Hexane | Toluene | Ethyl Acetate | Ethanol | Aqueous |
|---|---|---|---|---|---|---|
| **1.** | **Test For Alkaloids** | | | | | |
| | Mayer's Test | - | - | - | - | + |
| | Dragendorff's Test | + | - | + | + | - |
| **2.** | **Test for Carbohydrates** | | | | | |
| | Iodine Test | - | - | - | + | - |
| **3.** | **Test for glycosides** | | | | | |
| | Keller Kiliani Test | + | + | + | + | + |
| **4.** | **Test for Flavonoid** | | | | | |
| | Ferric Chloride Test | - | - | + | - | - |
| | Alkaline reagent Test | - | - | - | + | + |
| **5.** | **Test for Amino Acids** | | | | | |
| | Ninhydrin Test | - | + | + | + | - |
| **6.** | **Test for Proteins** | | | | | |
| | Biuret Test | - | + | + | - | - |
| | Millons Test | - | - | - | - | + |
| **7.** | **Test for Tannin & Phenol** | | | | | |
| | Ferric Chloride Test | - | - | + | - | - |
| **8.** | **Test for Terpenes** | | | | | |
| | Salkowski Test | - | + | + | - | - |
| **9.** | **Test for Quinones** | - | + | + | - | - |
| **10.** | **Test for Resins** | - | - | - | + | - |
| **11.** | **Test for Coumarin** | - | + | + | + | + |
| **12.** | **Test for Saponin** | | | | | |
| | Foam Test | + | + | + | - | + |
| | Salkowski Test | + | + | + | - | + |

**Table No 3. Qualitative screening of phytochemicals from Bark of *Cyathocline purpuria (Don) O. Ktze.***

| Sr. No | Test for Bark Extract | Hexane | Toluene | Ethyl Acetate | Ethanol | Aqueous |
|---|---|---|---|---|---|---|
| **1.** | **Test For Alkaloids** | | | | | |
| | Mayer's Test | - | - | - | + | - |
| | Dragendorff's Test | - | + | - | + | - |
| **2.** | **Test for Carbohydrate** | | | | | |
| | Iodine Test | - | - | - | + | + |
| **3.** | **Test for glycosides** | | | | | |
| | Keller Kiliani Test | + | - | + | + | + |
| **4.** | **Test for Flavonoid** | | | | | |
| | Ferric Chloride Test | - | - | + | - | - |
| | Alkaline reagent Test | - | - | + | + | + |
| **5.** | **Test for Amino Acids** | | | | | |
| | Ninhydrin Test | - | + | + | - | - |
| **6.** | **Test for Proteins** | | | | | |
| | Biuret Test | + | + | - | - | - |
| | Millons Test | - | - | + | + | + |
| **7.** | **Test for Tannin & Phenol** | | | | | |
| | Ferric Chloride Test | - | - | - | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| **8.** | **Test for Terpenes** | | | | | |
| | Salkowski Test | - | - | + | + | + |
| **9.** | **Test for Quinones** | - | - | - | + | - |
| **10.** | **Test for Resins** | - | - | - | + | - |
| **11.** | **Test for Coumarin** | - | + | + | + | + |
| **12.** | **Test for Saponin** | | | | | |
| | Foam Test | + | + | + | - | - |
| | Salkowski Test | + | - | + | + | + |

## FUTURE PROSPECTIVE

Phytochemical results indicate that *Cyathocline purpuria (Don) O. Ktze.* have different type of Alkaloids, Terpenes, Carbohydrates, Proteins & amino acids in various concentrations in different plant parts. These different compounds may have Anti cancerous activity. Our future prospective is to check activity of this compound against Cancer cell line.

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