STUDIES ON PHARMACOGNOSTICAL FEATURES OF
Zizyphus mauritiana LINN. ROOT (FAMILY: RHAMNACEAE)

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ABSTRACT:
Description of the root of the plant, Zizyphus mauritiana Linn. the microscopical characters of the powdered root, its behavior on treatment with different chemical reagents, and the fluorescence character under ultraviolet light after treatment were studied to fix some pharmacognostical parameters. Preliminary phytochemical screening on the various extracts of the root of the plant was also performed. These studies were carried out to identify this plant for further research work.

INTRODUCTION
Zizyphus mauritiana Linn. (Family: Rhamnaceae) Sin (Chinese species)-Zizyphus jujube Linn. is a low, branched, deciduous tree with spreading crown, dark greenish black bark having irregular crack and strong reddish hardwood. Leaves are oblong and elliptic; flowers are greenish yellow in axillary dense, fascicles or sessile or short peduncle cymes. It is known as Ber (Hindi), Indian jujube (English), Bore (Kannada), Illanta (Malayalam), Badarh (Sanskrit). It is found throughout India, in dry deciduous forests up to 1500 m. Unripe fruits are used to pacify “vata” and it aggravates “Kapha” according to Ayurveda. Roots are used for fever, wound, ulcer, as a purgative, in promotion of menstruation, diarrhea, gout and rheumatism. Bark cures boil and is used in the treatment of diarrhea and dysentery it is also used as animal fodder and in treatment of asthma. Whole plant is used for cooling, as aphrodisiac and tonic (1). Considering the various therapeutic efficacy and usage in traditional practice, it was though desirable to investigate some pharmacognostical parameters for further identification of the active plant material. The present investigation deals with studies on some important pharmacognostical profiles of the root in its powdered form.

MATERIALS AND METHODS

Plant material
Zizyphus mauritiana Linn. Roots were collected from the forest land of Jharkhand in the month of October, 2003, and were identified by the Central National Herbarium, Botanical Survey of India, Botanical Garden, Howrah-711103, West Bengal.
Bengal. A voucher specimen [Ref No. CH/I (62)/2003 – Tech II /3423] of the plant herbarium has been preserved in the laboratory for further reference. After collection, the roots were cut into small pieces and dried properly. The dried roots were then ground to coarse powder by passing through the 40–mesh sieve.

**Reagents**

All the reagents were of analytical grade and obtained from S.D. Fine Chemicals Ltd., Mumbai.

**Methods**

The macroscopic characters (color, size, shape, odour, surface, texture, taste) of the root of the plant were observed (2). The microscopical characters of the powdered root were also observed under 40x10 magnifications following the standard method (3). The physical constant values of the plant were determined by standard pharmacopoeial methods (4). The behaviour of the powdered root with different chemical reagents and its fluorescence characteristics under UV light are presented in Table 3 and Table 4 respectively. Phytochemical screening of the plant reveals the presence of the active constituents as reported in Table 5. The methanol extract of the root of the plant is found to be brown in colour and its yield value is 19.9% w/w.

**RESULTS AND DISCUSSION**

The macroscopical characters of the root are shown in Table 1. The microscopical characters as observed in the powdered root show the presence of lignified phloem fibres and cork cells. The various physical constant values of the plant are reported in Table 2. The behavior of the powdered root on treatment with different chemical reagents admits fluorescence characters under UV light are presented in Table 3 and Table 4 respectively. Phytochemical screening of the plant reveals the presence of the active constituents as reported in Table 5. The methanol extract of the root of the plant is found to be brown in colour and its yield value is 19.9% w/w.

**CONCLUSION**

The various studies on *Z. mauritiana* Linn. Root including its microscopical and macroscopical characters, physical constant values, behavioral studies of the powdered plant root with different chemical reagents, its fluorescence analysis, preliminary phytochemical screening of the various extractives of the plant and the extractive values of its methanol extract will obviously help in proper identification and authentification of plant part and its powder form for further studies.

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Table – 1 Macroscopic Characters Of The Root Zizyphus mauritiana Linn.

| COLOR      | : Dark brown in color. |
| SHAPE      | : Tuberous, cylindrical with tapering towards end. |
| SIZE       | : About 100cm in length. |
| TEXTURE    | : Smooth and fibrous. |
| TASTE      | : Slightly astringent. |

Table – 2 Physical Constant Values Of Root Zizyphus mauritiana Linn.

| CONSTANT                        | YIELD IN PERCENTAGE (W/W) |
|---------------------------------|---------------------------|
| Total ash                       | 14.2                      |
| Acid insoluble ash              | 7.6                       |
| Water soluble ash               | 11.3                      |
Table - 3 Behavioral Pattern Of The Powdered Sample Of Zizyphus mauritiana Root On Treatment With Different Reagents

| CHEMICAL REAGENT                          | COLOR DEVELOPED               |
|-------------------------------------------|-------------------------------|
| Powder as such                            | Light brown in color          |
| Picric acid (saturated aqueous solution)   | Yellowish in color            |
| Concentrated Nitric acid                  | Reddish brown in color        |
| Dilute Nitric acid                        | Reddish brown in color        |
| Concentrated Hydrochloric acid            | Dark brown in color           |
| Dilute Hydrochloric acid                  | Dark brown in color           |
| Sulphuric acid                            | Dark brown in color           |
| Glacial acetic acid                       | Dark brown in color           |
| Ferric chloride                           | Black brown in color          |
| Aqueous iodine solution                    | Reddish brown in color        |
| Dilute sodium hydroxide                   | Reddish brown in color        |
| Antimony trichloride                      | Reddish brown in color        |

Table – 4
Fluorescence Analysis Of Powdered Drug (254 nm)

| TREATMENT                                      | COLOR DEVELOPED UNDER UV LIGHT | COLOR DEVELOPED UNDER VISIBLE LIGHT |
|------------------------------------------------|-------------------------------|-------------------------------------|
| 1. Powder as such                             | Black                         | Green                               |
| 2. Powder mounted with nitrocellulose         | Black                         | Green                               |
| 3. Powder treated with sodium hydroxide in    | Black                         | Green                               |
methanol

4. Powder treated with sodium hydroxide in methanol, dried and mounted with nitrocellulose

5. Powder treated with sodium hydroxide in water

6. Powder treated with sodium hydroxide in water, dried and mounted with nitrocellulose

7. Powder treated with sodium hydroxide acid

8. Powder treated with sodium hydroxide acid dried and mounted with nitrocellulose

9. Powder treated with nitric acid diluted with equal volume of water.

| Extract            | Alkaloid | Reducing sugar | Tannin | Flavanoid | Steroid | Saponin | Anthraquinone |
|--------------------|----------|----------------|--------|-----------|---------|---------|---------------|
| Petroleum Ether (60 – 80) | -        | -              | -      | -         | -       | -       | -             |
| Benzene            | -        | -              | -      | -         | -       | -       | -             |
| Chloroform         | -        | +              | -      | -         | -       | -       | -             |
| Methanol           | +        | -              | -      | -         | -       | -       | -             |
| Water              | -        | -              | -      | -         | -       | -       | -             |

"+" = Present; ‘-‘=Absent