

MICROSCOPICAL AND PRELIMINARY PHYTOCHEMICAL STUDIES ON LEAVES OF *BRYOPHYLLUM CALYGINUM* SALISB

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ABSTRACT

The plant *Bryophyllum calycinum* salisb (crassulaceae), has potent medicinal values. The present study deals with pharmacognostic examination of morphological and microscopical characters of *Bryophyllum calycinum* including leaf constant, ash values, extractive values and phytochemical screening of the extracts revealed that the plant contains alkaloids, glycoside, carbohydrates, tannins, phenolic compound, steroids, gums, mucilage and lignins.

Key words: *Bryophyllum calycinum* salisb, Pharmacognostic study, Phytochemical screening

INTRODUCTION

India is one of the richest floristic regions of the world and has been a source of plants and their products, since antiquity, man uses them in different way according to his needs, particularly as food and medicine. Among the entire flora, 35000 to 70000 species have been used for medicinal purpose [1]. The name *Bryophyllum* comes from 'I sprout' and 'leaf', the plant, classified as a weed is notorious for its growth potential. Shortly after a leaf falls to the grounds, a whole garland of new little plants develops from the notches along the leaf margin [2-4]. *Bryophyllum calycinum* salisb commonly known as panfuti (Hindi), life plant, love plant, air plant (Mexican), Good luck or resurrection plant is a crassulenscent herb of about one meter in height, with opposite, glabrous leaves (with 3-5 deeply crenulated, fleshy leaflet). They widely grow in hot and humid areas, around the dwelling places, along road sides and in abandoned farm and fields. They are widely used in folk

medicine of its indigenous region (Madagascar, Tropical Africa, India, China, Australia, Hawaii and Tropical America, it remain relatively researched [5-6].

Bryophyllum calycinum salisb leaves are frequently used as an herbal remedy for an array of human disorders including hypertension, *diabetes mellitus*, bruises, wounds, boils, abscesses, insect bites, arthritis, rheumatism, joint pains, headaches, antifungal and antibacterial and body pains. The leaves are also used for lymphadenitis and ear disease [5]. In the form of poultice and powder they are applied to sloughing ulcer. The main constituents of this the plant are alkaloids, flavonoids, glycosides, steroids, bufadinolide and organic acid are reported [3,7-9].

MATERIAL AND METHODS

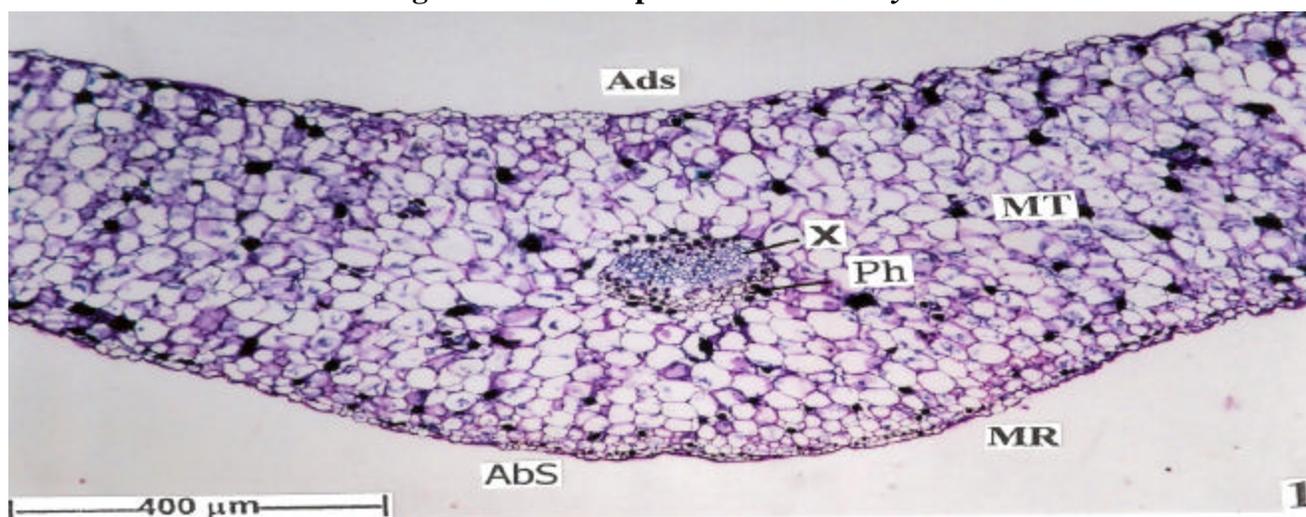
Collection and Identification

The leaves of *Bryophyllum calycinum* Salisb were identified by Dr. Mino H. Parabia, Botanist, Department of Bioscience, Veer Narmad South Gujarat University,

Figure.1 Photograph of *B. calycinum* Salisb leaves



Figure. 2 Microscopic section of *B. calycinum* Salisb leaf.



Ads-Adaxial side, X- Xylem, Ph- Phloem, MT- Mesophyll tissue, MR- Midrib, Abs- Abaxial side

Surat. The voucher specimen (no. VCJ/03/25032005) was submitted to the Department of Pharmacognosy, C. K. Pithawalla Institute of Pharmaceutical Education and Research, Surat.

Pharmacognostic study

The morphological studies such as type, size, shape, apex, margin, venation, base, petiole, surface, phyllotaxy, color, odour and taste of *Bryophyllum calycinum* Salisb leaf, were studied [10]. The leaf of *Bryophyllum calycinum* Salisb were examined microscopically [11]. The paraffin embedded specimens were sectioned with the help of Rotary Microtome and dewaxing of the sections was customary procedure as given by Johnson [12]. The sections were stained with Toluidine blue (TB) [13]. Where ever necessary sections were also stained with Saffranin and Fast green and Iodine solution (I-KI) for starch. Photographs of different magnifications were taken with Nikon Labphot 2 Microscopic unit and magnifi-

cations of the figures are indicated by the scale-bars [14].

Physicochemical analysis

Ash values were determine as per the procedure given in Indian Pharmacopoeia [15].

Phytochemical analysis

The leaves were collected, washed with water, dried in sunlight and stored properly. The dried leaves were powdered with mechanical grinder and were passed through the sieve no. 60. Coarse powder was used for pharmacognostic work. The dried powder material was extracted with alcohol (95%) and water. The extracts were filtered while hot and concentrated under reduced pressure. The extractive values were calculated. The extracts of the leaves were subjected to qualitative chemical test for the identification of various active constituents [16-19].

RESULTS AND DISCUSSION

The distinctive macroscopic features of the leaves are highlighted in fig.1 reflecting that the leaves are opposite, simple or compound, 8-12 cm and 6-8 cm in size, apex is obtuse, ovate or elliptic in shape, crenate or serrate margin, asymmetric base, reticulate venation, petiole is long, surface is glabrous, upper epidermis dark green in color, lower epidermis lighter in color and with a characteristic odor and bitter taste. Figure 2 demonstrate the microscopic section of leaf of *B. calycinum* Salisb. It is broadly shallow on the adaxial side and convex on the abaxial side. It has a thin adaxial epidermal layer of small, less prominent cells. The abaxial epidermis is also very thin and less distinct. The ground tissue of the midrib is parenchymatous and homogenous. The cells are circular or angular and compact. The vascular strand is single, small, collateral and hemispherical in shape. It consists of a thick horizontal band of xylem and fairly wide band of phloem. Xylem elements are narrow, angular, thin walled and somewhat diffuse. The vascular bundle is 100µm in vertical plane and 170µm in horizontal plane. The lamina is uniformly flat with even surface. The mesophyll tissue is not differentiated into palisade and spongy parenchyma. The epidermal layer appears as flat polygonal mat of cells are variable in shape and size. Stomata are abundant, these are 18 -20 stomata per mm². The stomata are anisocytic type. Physicochemical parameters like total ash (19.0 %), acid insoluble ash (11.33 %), water soluble ash (1.06 %) and sulphated ash (14.0 %). Loss on drying, loss ratio and % retain was found to be 5.72, 6.07 and 94.28%, respectively. Alcohol soluble extractive value and aqueous extractive value was 22.48 & 15.60% w/w, respectively. The extractive values of alcohol and aqueous extracts were found to be 25.00 and 20.00% w/w, respectively.

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