#### **CHAPTER-18**

# PHYTOCHEMICAL SCREENING OF *BRICKELLIA CALIFORNICA* PLANT FROM WASHIM DISTRICT OF MAHARASHTRA STATE

## S. K. Arsod<sup>1</sup>, S. V. Satpute<sup>1</sup> and B. P. Uchitkar<sup>2</sup>

<sup>1</sup>Department of Botany, Mahatma Fule Art's commerce and Sitaramji Choudhari Science Mahavidhylaya Warud, Dist- Amravati-444906 India <sup>2</sup>Department of Botany, Rajasthan Aryan Arts, Shri.Mithulal Kacholia Commerce and Shri Satyanarayanji Ramkrishnaji Rathi Science College, Washim-44450 India *Email- skarsod1991@gmail.com* 

## Summary

The phytochemical screening of plants plays a significant role commercially and has great interest in pharmaceutical companies for the manufacture of the new drugs to treat a variety of disorders. The present research work was conducted in order to search the qualitative analysis of the plant material of *Brickellia californica*. Qualitative phytochemical evaluation was carried out to test the presence of alkaloids, Terpenoids flavonoids, carbohydrate, tannin, saponin, amino acid, glycoside and phenol in the methanol, petroleum ether and acetone extracts of plant materials using soxhlet extraction methods. The present effort is targeted on the evaluation of the phytochemicals present in the plant species.

Keyword: Brickellia californica, Soxhlet apparatus, test tubes, methanol, petroleum ether and acetone, phytochemical etc.

## Introduction

India is sitting on a gold mine of well-recorded and traditional well practiced acquaintance of herbal medicine. It deals with plant and plant extracts in treating diseases. These medicines are considered safer because of natural ingredients with lesser side effects. The demands for herbal products are rising exponentially throughout the world (Grover *et al.*, 2002). Finding healing power in plants is a primitive idea. Recently there has been a shift in universal trend from synthetic to herbal medicine, which we can say Return to Nature. The herbal drug products are prepared from renewable resources of raw materials by ecofriendly processes and will bring economic prosperity to the masses growing these raw materials (Scartezzini and Sproni, 2000).World Health Organization (WHO) estimates that 80% of total world's population presently uses medicines of herbal origin for primary health care (Seth and Sharma, 2004). The purpose of

present study is to characterize phytoconstituents in the various part of *Brickellia californica* (Torr.& A. Grey) and so this will help to identify the parts of the plant from which higher quantities of the phytochemicals can be derived. In India, there has been increase of interest in *Brickellia californica* regarding their healing potentials for the management of a number ailment.

The Brickellia californica known by the common name California brickellbush is species of flowering plant in the asteraceae family. California brickellbush is an upright shrub typically growing no more than 60 inches (1.52 meters) from a woody base. Leaves are heart- shaped to oval with inconsistently scalloped margins. As the sprouts are consumed at the beginning of the growing phase, their nutrient concentration remains very high (Abrans and Ferris, 1960). In naturopathy, sprouts have the medicinal benefits; they can be promoting health aspects and safety evaluation. The U.S. Food and Drug Administration have published several recommendations to consumers regarding consumption of sprouts. The Brickellia californica is the core of medicinal values which is used as food and medicine worldwide. Brickellia is a shrub that is native to California. The leaf is used to make medicine (Las Pilitas Nursery, 2003). People use Brickellia for diabetes, arthritis, diarrhea, stomach pain, stomach ulcer and many other conditions. But there is no good scientific evidence to support these uses. Brickellia californica is also called false Boneset, Jepsons Brickellbush, pachaba; (Spanish:Hiebra. (Yerba) de lavaca, prodigiosa) Sometimes only the stems were used, combining them with elderberry flowers. The tea was considerd a potent medicine. For a variety of problems, including fever, skin ailments, respiratory and stomach problems. One curious use was to give a glass of brickellbush tea to a person who appeared to be dying.

*California brickellbush* is a perennial shrub, 2 feet (60cm) or up to 6 feet (200cm) tall, shrub or subshrub, woody branches erect, and or spreading, thickly branched from base, glandular and pubescent. The leaves are green, leaves generally alternate, leaves with supporting stalks (petioles), blades heartshaped or ovate to deltate, leaf edges or margins scalloped (crenate), leaf surface covered with minute soft erect hairs (puberulent) to becoming hairless (glabrous), often gland dotted. Flower color is pale yellow-green with white to pink. Flower season is July to November or December.

Phytochemical screening is the initial stage in phytochemical research which aims to determine the groups of secondary metabolites found in the plants studied. The phytochemical screening method was carried out by using a reagent that can producecolor to show whether there was a group of secondary metabolites. Therefore, in this study, we determined the content of alkaloids, flavonoids, tannins, saponins, steroids/triterpenoids, and sesquiterpenoids in *Brickellia californica* leaf.

#### Material and Method

#### Collection of plant material

Fresh plant material of *Brickellia califrnica* is collected from different parts of Washim District, Maharashtra, India. It commonly occurs in non cultivated land,

along with road side. Shady moist place plant material washed under tap water for 2-3times to remove soil particles and dust. the plant material was shaded for 18 days. After drying plant material grinded into fine powder and then transfer into airtight container with proper labelling for further use (Devi et al., 2023).



Fig. 1. Habit of Brickellia californica

## Preparation of Solvent Extract

The leaves, stem, and root *Brickellia californica* samples was throughly washed with running tap water 2-3 time and then finally washed with distilled water followed by shade dried for twelve days and grind then dried in an oven below 50°C. The dried plant material was then powdered using mixer and grinder 5 gm of plant powdered was extracted in 200 ml of Methanol, Petrolium ether and Acetone and then test was conducted.

Qualitative phytochemical analysis of leaves, stems and root of Brickellia californica is carried out and result were recorded as present (+) or absent (-) depending on the outcome of the test.

## Test for Alkaloids

**Wagner's' test:** Add 2ml of Wagner's reagents was added into plant extract and the resulting reddish brown precipitate indicates positive test for alkaloids (Wagner, 1993).

**Test for Tannins:** A few drops of 0.1% ferric chloride was added and observed blackish blue or brownish green coloration indicates the presence of tannin.

**Test for Saponins :** Extract was added with 5ml of distilled water in a test tube and then it was shaken and the formation of stable foam indicates presence of saponin (Chen et al., 2006).

**Test for Flavonoids:** A few drop of lead acetate were treated with extract and yellow coloration indicates presence of flavonoid.

**Test for Phenol:** The extract were treated with 3-4 drop of ferric chloride solution bluish black or blue green colour indicates positive test for phenol (Mace.M.D, (1963).

**Test for Terpenoids:** Extract was mixeded in 2 ml of chloroform and concentrated H2SO4 (3ml) was carefully added to form reddish brown colouration in inner face indicates positive test for Terpenoid.

**Test for Amino Acid:** When extract in which few drop of millions reagent added (46) white color ppt is indicates positive test for amino acid (Yasuma. A and Ichikawa (1953).

# Test for Carbohydrates

**Benedict's test:-**Reagent was added with extract and heated on boiling water bath for 2 min reddish brown precipitate indicates the presence of carbohydrates.

**Test for Glycosides:**-To know volume of extract 1ml of distilled water added and aqueous solution of NaOH was added and formation of yellow colour indicates positive.

## **Result and Discussion**

The qualitative analysis of B. californica leaf, stem and root was done in different solvents e.g. methanol, petroleum ether and acetone. The results are presented on table-1.

Secondary	Leaf Extract			Stem Extract			Root Extract		
metabolites	ME	PEE	AE	+	+	+	+	+	+
Alkaloids	-	+	+	+	-	+	-	-	+
Tanin	-	-	-	+	-	+	+	-	+
Saponin	+	+	+	-	-	-	-	+	-
Flavonoids	-	-	-	-	-	-	-	-	-
Terpenoid	-	-	-	-	-	-	-	-	-
Phenol	+	-	+	-	-	-	-	-	-
Carbohydrate	+	-	-	-	-	+	+	+	-
Amino acid	-	-	-	-	-	-	-	-	-
Glycoside	-	-	-	+	+	+			

Table- 1. Qualitative Phytochemistry of Brickellia californica leaf, stem and root



Methanol Extract

Extract Petroleum ether extract A Fig. 2. Qualitative tests of Brickellia Callifornica Leaf Extract



Fig. 3. Qualitative study of Stem extract of Brickellia californica



Fig. 4. Qualitative phytochemistry of Root extracts of Brackellia callifornia

Methanol extract of leaf of Brickelli acalifrnica shows positive test for Saponin, Phenol, carbohydrate and negative test for Alkaloids, Tanin, flavonoids, Terpenoid, Amino acid, glycoside. Petroleum ether extract of leaf of Brickell iacalifrnica shows of positive test for Alkaloids, saponin, and negative test for Tannin, flavonoids, Terpenoid, Phenol, carbohydrate, Amino acid, glycoside. Acetone extract of leaf of Brickellia califrnica shows of positive test for Alkaloids, saponin, phenol and negative test for Tannin, flavonoids, Terpenoid, carbohydrate, Amino acid, glycoside.

Methanol extract of stem of *Brickellia califrnica* shows of positive test for Alkaloids, Tanin, Saponin and negative test for flavonoid, Terpenoid, Phenol, carbohydrate, Amino acid, glycoside. Petroleum ether extract of stem of *Brickellia califrnica* shows of positive test for Alkaloids and negative test for Tannin, saponin, flavonoid, Terpenoid, Phenol, carbohydrate, Amino acid, glycoside. Acetone extract of stem of *Brickellia califrnica* shows positive test for Alkaloids, Tanin, Saponin, Amino acid, and negative test for flavonoid, Terpenoid, Phenol, carbohydrate, for flavonoid, Terpenoid, and negative test for flavonoid, Terpenoid, Phenol, carbohydrate, glycoside.

Methanol extract of root of *Brickellia califrnicas*hows positive test for Alkaloids, saponin, Amino acid and negative test for Tannin, flavonoids, Terpenoid, Phenol, carbohydrate, glycoside. Petroleum ether extract of root of *Brickelliacalifornicas*hows positive test for Alkaloids, flavonoid and Amino acid

Acetone Extract

and negative test for Tannin, saponin, Terpenoid, Phenol, carbohydrate, glycoside. Acetone extract of root of *Brickelliac alifornica*shows of positive test for Alkaloids, Tanin, Saponin and negative test for flavonoid, Terpenoid, Phenol, carbohydrate, Amino acid, glycoside.

## Conclusions

The results revealed the presence of medicinally important constituents in the wild plants studied. Many evidences gathered in earlier studies which confirmed the identified phytochemicals to be bioactive. Several studies confirmed the presence of these phytochemicals contribute medicinal as well as physiological properties to the plants studied in the treatment of different ailments. Therefore, extracts from these plants could be seen as a good source for useful drugs. The traditional medicine practice is recommended strongly for the plant as well as it is suggested that further work should be carried out to isolate, purify and characterize the active constituents responsible for the activity of plant. Also additional work is encouraged to elucidate the possible mechanism of action of extracts. The *Brickellia californica* this plants are source of secondary metabolites and the solvent choice is very important for extraction of phytochemical from plant.

## References

- Abrams, L., and R.S. Ferris. (1960). Illustrated flora of the Pacific States. Stanford University Press, Stanford, CA. 732 p
- [2] Chen, F.W., Shieh, P., Kuo, D. and Hsieh, C. (2006). Evaluation of the antioxidant activity of Ruelliatuberosa. *Food Chemistry*. 94: 14-18.
- [3] Grover, J. K., Yadav, S., and Vats V. (2002). Medicinal plants of India with antidiabetic potential. J. Ethnopharmacol.;81:81–100.
- [4] Las Pilitas Nursery. (2003). Brickellia californica. http://www.laspilitas.com/plants/123.htm
- [5] Mace M. D. (1963). Histichemical localization of phenols in healthy and diseased tomato roots, Phytopathology, 16:915-925.
- [6] Scartezzini P. and Sproni E. (2000). Review on some plants of Indian traditional medicine with antioxidant activity. *J. Ethnopharmacol.* 71:23–43.
- [7] Seth, S. D. and Sharma, B. (2004). Medicinal plants of India. Indian J. Med. Res. 2004;120:9-11.
- [8] Wagner, .H, (1993). Pharmazeutische Biologic", 5 th Edition, AUFI.15 BN 3-437-20 498-X.
- [9] Yasuma. A and Ichikawa (1953). "Ninhydrin-Schiff and alloxan- Schiff staining. A new histochemical staining methods for proteins", J. Lab clin Med, 1953, 41:296-299.
- [10] Devi R. S, Bihari, S. K. and Kumar S. (2023). Validation of tribal claims for formulation of future drugs for through evaluation of ethno pharmacological values of Ludwigiaa dscendens. Medicinal plants. 15 (4):691-697.