A Phytopharmacognostical And Ethno Pharmacological Review Study On *Eclipta Alba* Linn.

1Dr. Shivani Sharma, 2Dr. Deepak Verma, 3Dr. Surinder Kumar Sharma, 4Dr. Deeksha Kaul

ABSTRACT
In this modern era, many pharmaceutical companies and researchers are presently running extensive research on medicinal plants due to their potentiality. Medicinal plants are God’s gift that greatly aid in the management of public health. *Eclipta alba* Linn. is a small herbaceous plant of family asteraceae, commonly called *Bhringraj*, found mainly in tropical and subtropical regions of India. *Bhringraj* is utilized in certain ailments from a very long time. Ethnobotanically, this medicinal herb is used in cuts and wounds, itching, diarrhoea, premature hair loss, graying of hair, snake bites, jaundice etc. Its various species are known on the name of *Bhringraj* which possess active phytochemical constituents that have been extracted from the different parts of the herb such as quercitine, ecliptine, wadelolactone, ecalbatin, oleanean, stigmasterol. *Bhringraj* shows numerous pharmacological actions like haemolytic anemia, anti viral, anti tussive, antibacterial, antifungal, diuretic, analgesic, anti inflammatory, hepatoprotective, anti venom, anti oxidant etc. This review article throws light on phytopharmacological evaluation of *Bhringraj* and its species through classical as well as modern studies.

KEYWORDS: *Eclipta alba*, medicinal plants, Ethnobotanical, Drug

AIMS AND OBJECTIVES
To enlist the review study on different types of *Bhringraj* described ethnobotanically i.e. white, yellow and blue varities and phytopharmacological connection of the traditional and scientific knowledge for future studies.

INTRODUCTION
Distribution / Habitat
It spreads as a common weed in several nations, including Thailand, China, India, and Brazil. *Eclipta alba* Linn. is a plant that grows along rivers, lakes and on the foothills of the Himalayas in India. In the nation’s more tropical parts, it is usually found in waste places, marshy areas, hedges, and roadside spots. It may also be found in other eastern nations including Indonesia, Sri Lanka, the Philippines, Nepal, and Malaysia, where it thrives in clay and damp soil, paddy fields, water courses, tanks, and plain and hilly areas up north.1

MATERIALS AND METHODS
Collection of sample - The whole plant including roots of *Eclipta alba* were collected from the Herbal Garden of Dayanand Ayurvedic College, Jalandhar, Punjab. All of the plant parts were cleaned under running water, dried in the shade at room temperature.

Method of study – Transverse section of the root, stem of *Eclipta alba* is studied macroscopically by evaluating its organoleptic features. For macroscopically evaluation, thin section of root and stem is taken using blade and stained with Eosin, placed over a clean glass slide which is covered with a cover slip and observed under microscope. After analysing the sections in different magnifications different cells are identified.

Chemicals- All the chemicals used in the work were from Pharmacognosy laboratory of Dravyaguna department of Dayanand Ayurvedic College, Jalandhar, Punjab.

Botanical description
In *Ayurvedic* classics three varities are described under the name of ‘Bhringraj’. Botanically these varities identifies according to API are Shweta Bhringraj (*Eclipta alba* Linn.) Peeta Bhringraj (*Wedelia chinensis* Merill) and Shweta/Neela Bhringraj (*Tridax procumbens* Linn.)

<table>
<thead>
<tr>
<th>S. no.</th>
<th>PART</th>
<th><em>Shweta bhringraj (Eclipta alba</em> Linn.)</th>
<th><em>Peeta Bhringraj (Wedelia chinensis</em> Merill)</th>
<th><em>Ek dandu/ Shweta/Neela Bhringraj (Tridax procumbens</em> Linn.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Leaves</td>
<td>Sessile to subsessile, opposite, often oblong, lanceolate, sub-entire, acute, strigose with hairs on both surfaces, 2.2–8.5 cm long, 1.2–2.3 cm wide.</td>
<td>Linear, oblong or oblong lanceolate, sharp apex, scratchy from repressed white hairs</td>
<td>simple, opposing, whole, hairy, exstipulate, and short-petioled Lanceolate-ovate leaves have a sharp apex and a base that is wedge-shaped. It has a long, unevenly serrated border and is 3 to 7 centimetres in length.</td>
</tr>
</tbody>
</table>
2. **Roots**
   The main root has a well-developed cylindrical, greyish colour, with secondary branches.
   - lateral rootlets, narrow, elongated, rooted at nodes, and pale cream-colored
   - Taproot system

3. **Stem**
   Herbaceous, branching, sporadically roots at nodes, cylindrical or flat, rough from the white hairs, distinct nodes, colour greenish, sporadically brownish.
   - Reddish brown to brown in colour, cylindrical with conspicuous or bulged nodes, and with whitish appressed hairs present.
   - The stem is branching, decumbent, cylindrical and herbaceous.

4. **Flowers**
   This species may easily be recognised in the wild thanks to its tiny white flowers and opposite leaves. The single flower heads have white florets and are 6-8 mm (0.24-0.31 in) in diameter. The achenes are constricted and conformed.
   - have a yellow colour and an axillary head.
   - It produces long peduncled heads of blooms all year long. Flowers are tiny, tubular, and hairy in white yellow. Capitulum is inflorescence

5. **Fruits**
   Brown achenial cypsella with one seed, cuneate shape, narrow wing, and warty excrescences.
   - The fruits have hairs on their roughly oval surfaces.
   - Fruit is a firm achene with stiff hairs covering it, and it has a white pappus that looks like a feather at one end

6. **Seeds**
   It is hairy, dark brown and not endospermic.
   - The approximately cylindric achenes are hairy.
   - Seeds lack endosperm and have a pendulous embryo.

**Table no.01 - Botanical description**

<table>
<thead>
<tr>
<th>Nighantu classification</th>
<th>Classical varieties of Bhringraj</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhavprakashanighantu¹</td>
<td>Shweta bhringraj, peeta bhringraj</td>
</tr>
<tr>
<td>Madanpala nighantu²</td>
<td>Shweta bhringraj</td>
</tr>
<tr>
<td>Raja nighantu³</td>
<td>Shweta bhringraj, peeta bhringraj and neela bhringraj</td>
</tr>
<tr>
<td>Shodhala nighantu⁴</td>
<td>Shweta bhringraj, peeta bhringraj</td>
</tr>
<tr>
<td>Katyadeva nighantu⁵</td>
<td>Shweta bhringraj</td>
</tr>
<tr>
<td>Priya nighantu⁶</td>
<td>Shweta bhringraj, Krishna bhringraj</td>
</tr>
<tr>
<td>Dhanwantri nighantu⁷</td>
<td>Shweta bhringraj</td>
</tr>
</tbody>
</table>

**Table no.02 - Varieties**

<table>
<thead>
<tr>
<th>Medicinal plant</th>
<th>Rasa (taste)</th>
<th>Guna (qualities)</th>
<th>Veerya (potency)</th>
<th>Vipaka (metabolic effect)</th>
<th>Effect on tridosha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shweta¹²</strong></td>
<td>Katu (pungent), Tikta (bitter)</td>
<td>Raksha (dryness), Laghu (Light)</td>
<td>Ushna (hot)</td>
<td>Katu (pungent)</td>
<td>pacifying kapha dosha and pacifies vata dosha</td>
</tr>
<tr>
<td><strong>Peeta¹³</strong></td>
<td>Katu(pungent), Tikta(bitter), Kashaya(astringent)</td>
<td>Teekshna (sharpness)</td>
<td>Ushna(.hot)</td>
<td>Katu (pungent)</td>
<td>pacifying vata and kapha dosha</td>
</tr>
<tr>
<td><strong>Ek dandi¹⁴</strong></td>
<td>Kashaya(astringent), Amla(sour), Tikta(bitter)</td>
<td>Guru(heavy), Snigdha(unctuous)</td>
<td>Sheeta (cold)</td>
<td>Katu (pungent)</td>
<td>Tridoshaghna-pacifying all three Doshas: Vata, Pitta and Kapha</td>
</tr>
</tbody>
</table>
### Table no.03 – Medicinal properties

<table>
<thead>
<tr>
<th>Nighantu classification</th>
<th>Shweta bhringraj (Eclipta alba Linn.)</th>
<th>Peeta bhringraj (Wedelia chinensis Merill)</th>
<th>Ek dandi (Tridax procumbens Linn.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhavprakashanighantu12</td>
<td>Bhringraj, bhringraj, markav, bhring, angarak, keshraj, bhringar, keshranjan</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Madanpalamighantu16</td>
<td>Bhringraj, markav, keshranjan, bhekraj, angark, bhringhav, suryavallabha</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Rajnighantu17</td>
<td>Markav, bhringraj, bhringhav, keshranjan, pitripryio, rangak, keshaya, kantalvardhan</td>
<td>Swarnbhringaro, hariva sa, haripriya, devpriya, vandniya, pavana</td>
<td>Mahaneela, neelak, mah abhringa, neelpushpa, shyamal</td>
</tr>
<tr>
<td>Shodhalanighantu18</td>
<td>Jayavatya, sita bhring, Avanti, laxmipriya, jayanti, shwetapushpika</td>
<td>Peetapushpa, swarnbhringar, harivasa, haripriya, devpriya, vandniya, avanti, avantya, pitripryia</td>
<td>Considered it as white variety of Bhringraj</td>
</tr>
<tr>
<td>Kaiyadevanighantu19</td>
<td>Pankjata, bhringraj, bhringhav, keshranjan, bhringark, keshraj, bhekraj, mahaneela, ravipriya, markav</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Priyanighantu20</td>
<td>Markav, bhringraj, bhringar, keshranjan</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Dhanwantripnighantu21</td>
<td>Bhringraj, bhringraj, markav, bhring, bhringark, bhringrenu</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Table no.04 – Synonyms

<table>
<thead>
<tr>
<th>Medica</th>
<th><strong>BPN</strong>22</th>
<th><strong>MPN</strong>23</th>
<th><strong>DN</strong>24</th>
<th><strong>SN</strong>25</th>
<th><strong>KN</strong>26</th>
<th><strong>RN</strong>27</th>
<th><strong>PN</strong>28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shweta bhringraj (Eclipta alba Linn.)</td>
<td>Keshya( Hair promoting growth), Twachya(Skin complexio n), Krtim(Antimicrobi al), Shwasahara(Anti asthmatic), Kasahara( cough depressing agent), Shotha (Anti inflammatory), Amat(Antio xidant), Pandu (Haemolyti c anemia) Dantya(De ntal health), Rasayana(Im</td>
<td>Dantya(Dental health), Rasayan a (immunomodula tory), Twachya (Skin complexio n), Keshya(Skin disorders), Netra roga (Eye disorders), Shir o arti(Headache)</td>
<td>Shotha (Anti inflammatory ), Amadosha ( Antioxidant), Pandu(Haemolyti c anemia), Tawak vikara (Skin disorders), Hridroga (Cardiovascular effects/Hypotensi ve effects), Vishanashakha(Anti venom)</td>
<td>Keshya( Skin disorders), Pandu (Haemolyti c anemia), Kasahara(Hair promoting growth), Ak shiroga(Ey e disorders)</td>
<td>Dantya(Dental health), Tw achya(skin complexio n), Keshy a(Hair promoting growth), Rasayanaa( Immunomodulatory), Kasaharaa(cough depressing agent), Krtimahara(Anti microbial), Shwasaharaa(Anti asthmatic), Keshtha (Skin disorders), Shotha ( Anti inflammative)</td>
<td>Bhringraj( Hair promoting growth), Twachya (Skin complexio n), Bhringraj (Anti inflammative), Balya(M uscle strength), Rasayanaa(Immunomodulatory)</td>
<td></td>
</tr>
</tbody>
</table>

---

**February 2023 IJSDR | Volume 8 Issue 2**
munionmodulatory), Bal
ya (Muscle
strength), Kushtha
(skin
disorders), Netra roga
(Eye
disorders), Shiroartti
(Headache)

| Peeta bhringraj
(Wedelia
chinensis
Merill) & Ek
dandi
(Tridax
procumbens
Linn.) | Therapeutics
considered
same as
that of
white
variety of
Bhringraj | Therapeutics
considered
same as
that of
white
variety of
Bhringraj | Therapeutics
considered
same as
that of
white
variety of
Bhringraj |

### Table no.05 - Karma of varieties of Bhringraj

<table>
<thead>
<tr>
<th>Chief Phytoconstituents</th>
<th>Shweta Bhrigra (Eclipta alba Linn.)</th>
<th>Peeta Bhringraj (Wedelia chinensis Merill)</th>
<th>Ek dandi (Tridax procumbens Linn.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>Flavonoids</td>
<td>Alkaloids</td>
<td></td>
</tr>
<tr>
<td>Terpenoids</td>
<td>Steroids</td>
<td>Steroids</td>
<td></td>
</tr>
<tr>
<td>Glycosides</td>
<td>Alkaloids</td>
<td>Terpenoids</td>
<td></td>
</tr>
<tr>
<td>Coumestan</td>
<td>Saponins</td>
<td>Flavonoids</td>
<td></td>
</tr>
<tr>
<td>Sterol</td>
<td>Glycosides</td>
<td>Tannins</td>
<td></td>
</tr>
<tr>
<td>Flavonoids</td>
<td>Terpenoids</td>
<td>Glycosides</td>
<td></td>
</tr>
<tr>
<td>Fatty alcohols</td>
<td>Tannins</td>
<td>Saponins</td>
<td></td>
</tr>
<tr>
<td>Volatile oils</td>
<td>Phenols</td>
<td>Phenols</td>
<td></td>
</tr>
<tr>
<td>Saponins</td>
<td></td>
<td>Proteins</td>
<td></td>
</tr>
<tr>
<td>Polyacetylinic compounds</td>
<td></td>
<td></td>
<td>Carbohydrates</td>
</tr>
<tr>
<td>Carotenoids</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table no.06 - Chief phytoconstituents of varieties of Bhringraj

<table>
<thead>
<tr>
<th>Major Chemical constituents structures derived from Eclipta alba (L.)</th>
</tr>
</thead>
</table>

Table no.05- Karma of varieties of Bhringraj

Table no.06- Chief phytoconstituents of varieties of Bhringraj

![Diagram](image-url)
Chemical constituents derived from *Wedellia chinensis* Merill

- Ecliptalbine
- Wadelolactolactone
- Luteolin
- Apigenin

Chemical constituents derived from *Tridax procumbens* (L.)

- Sitosterol
- Wadelolactone
- Luteolin
- Apigenin

**PHARMACOLOGICAL ACTIONS**

*Shweta Bhringraj (Eclipta alba Linn.)*

**Anticancer activity**

Methanolic extract of *Eclipta alba* (L.) exhibits inhibition of proliferation of colon cancer cells in concentration dependent manner.

**Antihyperlipidemic activity**
Oral administration of aqueous leaf extract to the rats in atherogenic diet-induced hyperlipidemic model resulted in a marked reduction in total cholesterol, triglycerides and total protein.

**Analgesic effect**

The ethanol extract and the total alkaloids produce significant analgesic activity in all the different models of analgesia used. However, the total alkaloidal fraction was the most efficacious in all experimental models tested.

**Anti inflammatory**

The methanolic extract administered by the oral route at a concentration of 100 and 200 mg/kg showed the significant dose dependent anti-inflammatory activity in carrageenan and egg white induced hind paw oedema in rats.

**Hair growth and Alopecia**

When applied topically to the shaved, denuded skin of male albino rats, petroleum ether and ethanolic extracts reduced hair growth time by half when compared to untreated control animals. In comparison to the control group, (47 ± 13), the quantitative examination of hair growth with petroleum ether extract (5%) revealed a greater number of hair follicles in the anagenic phase. (69 ± 4).

**Hepatoprotective effect**

Aqueous leaf extract of *Eclipta alba* (L.) has been reported to possess the restorative potential so as to suppress the hepatotoxicity in the male albino rats.

**PEETA BHRINGRAJ (WEDELIA CHINENSIS) Merill**

**Antibacterial activity**

Wedelia chinensis leaves methanol extracts have a great potential as antibacterial agent to treat infectious diseases caused by a range of pathogenic bacteria.

**Analgesic and anti inflammatory activity**

The additive and synergistic antioxidiant activity of phytochemicals such as flavonoids, triterpenoids, steroids etc, present in Wedelia chinensis Merill are responsible for the analgesic and anti-inflammatory activity.

**Anticancer activity**

*Wedelia chinensis* Merill extract's biological effects on prostate cancer in vivo studies revealed three active chemicals that inhibit the androgen receptor signalling pathway to be responsible for the anti-cancer action, and oral treatment of the extract prevented cancer tumour development. (SaiT CH et al 2009)

**Wound healing activity**

The period of epithelialization was found to be shorter, the rate of wound contraction increased, the skin's breaking strength increased, and the dry weight and breaking strength of the granulation tissue all showed considerable wound healing activity. (Verma N et al 2008)

**Ek dandi (Tridax procumbens Linn.)**

**Hepatoprotective activity**

The ethanolic extract and chloroform insoluble fraction of *Tridax procumbens* (L.) demonstrated antihepatotoxic action justifying its use in liver affection by exhibited hepatoprotective activity . (Saraf S. Dixit VK. Hepatoprotective activity of Tridax procumbens part II. Fitoterapia. 1991; 62:534-536.)

**Anti microbial activity**

Methanolic extracts of leaves shows antibacterial activity by disc diffusion method revealed that there is a broad spectrum activity on gram positive, negative organisms respectively. The highest activity was shown in S. Typphi S. flexneri and least activity on E.coli.

**Anti-arthritic activity**

Property similar to indomethacin, *Tridax procumbens* (L.) shows anti-arthritic activity at doses of 250 and 500 mg/kg. In female SD rats given FCA-induced arthritis, the ethanolic extract drastically changed the pathogenesis and had antiarthritic action. R. Ramesh Petchi, C. Vijaya & S Parasuraman: Anti arthritic activity of ethanolic extract of Tridax procumbens in Sprague Dawley rats.

**Anticancerous Property**


**Immunomodulatory activity**

The impact of extract and fraction on cellular and hormonal immunity was examined in vitro and in vivo. The findings addressed the phytoconstituents responsible for *Tridax procumbens* Linn. immunomodulatory capability and show the ability of the flavonoidal and saponin fraction to affect both cell-mediated and hormonal components of the immune system. (Agarwal S, Khadese S, Talele G. Bioactive immunomodulatory fraction from Tridax procumbens. Science Alert. 2010; 3:120-127)
Fig. 1 Image of whole bhringraj plant

Fig. 2 Image of root of bhringraj plant

Fig. 3 a) Periderm  b) Secondary cortex  c) Air spaces

Fig. 4 a) Medullary rays

Fig. 5 a) Xylem  b) Phloem  c) Stone cells

T.S of root of Eclipta alba Linn. at magnification SP 4X.10 Fig. 3 and SP10X.25 Fig. 4,5 respectively
Fig. 6 T.S. of stem of *Eclipta Alba* Linn. at magnification SP4X.10 respectively

a) Glandular trichomes  
b) Epidermis  
c) Cortex  
d) Pericyclic fibres  
e) Vascular bundles  
f) Pith  
g) Covered trichomes  
h) Air spaces

**DISCUSSION**

In the pharmaceutical sector, the white form of *Bhringraj* (*Eclipta alba* Linn.) is well-known for encouraging hair development. Locally known as "peeta Bhangaara," the yellow species of *bhringraj* is scientifically known as *Sphagneticola calendulacea*, family:
Asteraceae (family of sunflowers), synonyms: Wedelia chinensis Merill, Complaya chinensis, and Solidago chinensis. In several Ayurvedic books, including Sodhal Nighantu, Raj Nighantu, and Nighantu Adarsh another form of Bhringraj, known botanically as Tridax procumbens Linn., was also recorded. All varieties are used in a similar manner in ethnobotany. Ethnobotanically, Bhringraj is beneficial for conditions like Pandu (haemolytic anaemia), Netra roga (eye disorders), Hridroga (cardiovascular effect), Dantya (dental health), Skandan (blood coagulant), Shotha (anti-inflammatory) and Rasayana (immunomodulatory). Each variety is a member of the Asteraceae family. When we compare the phytochemistry on the basis of chief Chemical constituents derived from varieties looks similar i.e.Wadelolactone, Luteolin, Apigenin, Beta-sitosterol, Luteolin, Quercitin, Lupeol, Oleanolic acid, Beta-amyrone, Stigmasterol.

CONCLUSION

Bhringraj and its varieties grow naturally and are widely available. The medicinal plant is described as having wonderful therapeutic properties in ethnobotanical and Ayurvedic literature. Apart from them, it is mostly used for hair growth globally and also has medicinal potential for treating liver, skin, cardiac, dental, and anaemia diseases. Other Bhringraj types can be substituted in the pharmaceutical or cosmetic sectors. In comparison to Eclipta alba Linn., Wedelia chinensis Merill and Tridax procumbens Linn. produce more in less time and have greater rates of survival in the wild.

REFERENCES

1. kumar Paliwal N. World Journal of Pharmaceutical and Life Sciences WJPLS.
4. A comprehensive review of a healing herb: Tridax procumbens linn.
5. Commentary by Padmshri Prof. Krishna Chandra Chunekar, Edited by Dr. G.S. Pandey, Bhavprakash nighantu, Guduchyadi varga, Bhringraj, shlok no.-239, Chaukhambha bhartiya academy, Varanasi, Edition 2010, page no.414
10. Acharya Priyavrata Sharma, Priya nighantu Editor Chaukhambha Surbharti Parkashan, Shatpushpadi Varga, bhringraj, shlok no.144-146, page no. 102-103, Edition 2018
12. Medicinal use of Bhringraj (Eclipta alba hassk.): a review article, Dr. Vikram Siddh and Dr. Omprakash Sharma, wipmr, 2019,5(7), 39-40, ISSN 2455-3301.
15. Commentary by Padmshri Prof. Krishna Chandra Chunekar, Edited by Dr. G.S. Pandey, Bhavprakash nighantu, Guduchyadi varga, Bhringraj, shlok no.-239, Chaukhambha bhartiya academy, Varanasi, Edition 2010, page no.415

Edited by acharya Priyavrata Sharma and translated by Dr. Guruprasada Sharma, Kawaiyadeva nighantu, Aushadhi varga, Bhringraj, shlok no. 1575, Chaukhamba orientalia, Edition 1979, page no. 637.

Acharya Priyavrata Sharma, Priya nighantu, Shatpushpadi Varga, Bhringraj, shlok no. 145, page no. 102, Editor Chaukhambha Surbharti Parkashan, Edition 2018

Edited by acharya Priyavrata Sharma and translated by Dr. Guruprasada Sharma, Dhanwantri nighantu, karveeradi varga, Bhringraj, shlok no. 11, page no. 123, Chaukhamba orientalia. First edition 1982


Dr. S. G. Pawar and A.M. Patil Department of Botany Research Centre, Yashwantrao Mohite College of Arts, Science and Commerce. A review and preliminary phytochemical screening of Tridax procumbens as important medicinal plants, International journal of scientific research.


Darah I, Lim SH, Nithianantham K. Effects of methanol extract of Wedelia chinensis osbeck (asteraceae) leaves against pathogenic bacteria with emphasise on Bacillus cereus. Indian journal of pharmaceutical sciences. 2013 Sep;75(5):533.


