

## Ethno-pharmacology of *Sahdevi* (*Vernonia cinerea* Less.) - An important but lesser known drug of Unani System of Medicine

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### ABSTRACT

*Sahdevi* is an Indian herb commonly found in all part of the country in rainy season. It is adopted by Arabs due to its easy availability and various important pharmacological actions and uses. It is known by different vernaculars in different parts of the country such as Mahabala in Marathi, Sadodi in Gujrati, Kukseem in Bengali and in English it is called ash-colour fleabane or purple fleabane. The herb contains  $\beta$ -amyrin, lupeol,  $\beta$ -sitosterol, stigmasterol,  $\alpha$ -spinasterol, phenolic resin and potassium chloride etc. It contains *Dafi'-i Hummiyat* (antipyretic) *Muqawwi-i Badan* (general tonic) and *Musaffi-i-Dam* (blood purifier) actions and used for management of many disease conditions. It has been used for the management of chronic fevers like fever associated with tuberculosis. It is a priceless herb with important pharmacological action and can be used effectively in place of costly drugs.

**Keywords** Antipyretic, Antimalaria, Blood purifier, *Sahdevi*, Tonic, Unani

### INTRODUCTION

*Sahdevi* is an herb *Vernonia cinerea* Less. it is also known as *Conyza cinerea* L. or *Conyza purpurea* Wall. It belongs to a Genus *Vernonia* schrebs of family Asteraceae. This Genus has herbs, shrubs, climbers or small trees (Anonymous, 1998; Hooker, 1982; Kirtikar & Basu, 1996). It has about 380 species, chiefly Tropical, and mostly American. About 58 species are found in India (Anonymous, 1998; Hooker, 1982). It is an erect rarely decumbent annual herb. It is one of the commonest Indian herbs during rainy season (Dymock *et al.*, 1890; Ghani, 1921; Khan, 1280H; Khan, 1313H; Sheerazi, 1038H). Its English name is Ash coloured fleabane and known by various vernacular names in different parts of India and world. It is mentioned in some Persian and Urdu Unani Materia medica books. All the writers described it as Indian plant and it seems to be adopted by Unani practitioner due to its easy availability and usefulness in many diseases (Khan, 1313H). It is an herb, which is nearly half yard in height. It has big, thick and hairy leaves which taper at the end. Leaves looks like Tulsi (*Ocimum spp.*), (Chugtae, 1963; Ghani, 1921; Khan, 1280H; Khan, 1313H; Khan, 1358H). *Sahdevi* is known for its antipyretic activity especially in fevers associated with infection or chronic in nature. It has other important actions such as general body tonic and aphrodisiac action. Its many actions have been verified by pharmacological studies and may be proved in clinical trial for validation of its claim in classical literature.

### Geographical Distribution

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It is found throughout India (Ghani, 1921; Sheerazi, 1038H), Tropical Africa, Asia and Australia (Anonymous, 1998; Caius, 2003; Kirtikar & Basu, 1996). Indigenous to Bengal, East and West coasts and South India (Nadkarni, 2000), ascending to 8000, feet in the Himalayas and in Khasia and Peninsular hills (Anonymous, 1998; Caius, 2003). It a common weed throughout India in the rainy season (Dymock *et al.*, 1890). It grows in rainy season and during this season plant is erect and robust upto 1m tall; after rains when summer starts, it shows reduction in size forming small diffuse habit. It is divided in two types, on the basis of colour of the flower. The flower of the first type is white inside whereas upper part is purple; this type of plant is found in the paddy fields. Second type is found in the forest or deserted places and has flower which are blackish red in colour (Chugtae, 1963; Ghani, 1921; DOMAP, 2016).

### Description

Classification of *Sahdevi* (*V. cinerea* Less.) (USDA, 1996).

| Rank          | Scientific name                    | Common name      |
|---------------|------------------------------------|------------------|
| Kingdom       | Plantae                            | Plants           |
| Subkingdom    | Tracheobionta                      | Vascular plants  |
| Superdivision | Spermatophyta                      | Seed plants      |
| Division      | Magnoliophyta                      | Flowering plants |
| Class         | Magnoliopsida                      | Dicotyledons     |
| Subclass      | Asteridae                          |                  |
| Order         | Asterales                          |                  |
| Family        | Asteraceae / Compositae            | Aster family     |
| Genus         | <i>Vernonia</i>                    | ironweed         |
| Species       | <i>Vernonia cinerea</i> (L.) Less. | little ironweed  |

*Vernonia cinerea* Less. is an erect, rarely decumbent, annual herb growing up to 75 cm in height. Stems are stiff, slender, cylindrical, grooved and ribbed, striate more or less pubescent and slightly branched, upto 17 cm in height, branches are

divaricated. Leaves are simple, alternate, petiole (the upper leaves are smallest) variable in shape, broadly elliptic or lanceolate, obtuse or acute, shortly mucronate, more or less pubescent on both sides, irregularly toothed and shallowly crenate serrate. Fruits are oblong achenes, slightly narrowed at the base, clothed with appressed white hairs and terete (not ribbed). Flowers and fruits appear during August-April. (Anonymous, 1998; Hooker, 1982; Kirtikar & Basu, 1996). Flowers are pinkish and purple, violet, small head borne in terminal corymbs, rounded or flat-topped corymbs. There are about 20 flowers at a time of 6 mm diameter, divaricated corymbs with a minute linear bract beneath each head of flowers and with small bracts in the forks of the peduncle; involucre bracts linear-lanceolate, awned, silky on the back, corolla with pubescent lobes (Anonymous, 1998; Bhattacharjee & De, 2005; Hooker, 1982; Kirtikar & Basu, 1996; Sala, 2004).



Fig.1 Market sample of *V.cinerea* Fig.2 Young plant of *V. cinerea*



Fig.3 Mature plant of *V. cinerea*

#### Selected Vernacular names

The different vernacular names mentioned in various books are given below (Khan, 1313H; Ghani, 1921; Lubhaya, 1977; Chugtae, 1963; Kirtikar & Basu, 1996; Dymock *et al.*, 1890).

|           |  |
|-----------|--|
| Bengali   | Kalajira, kukseem, kukshim, peetpushpi, kukur-songa, vedila.   |
| Ceylon    | Chitiviarchen, kalainir  |
| English   | Ash-colour fleabane, purple fleabane, vernonia ash-coloured fleabane, purple fleabane, yellow barleria                         |
| French    | Ayapanasauvage, vernoniacendre.  |
| Gujrati   | Sadodi, sadardi, shedardi, sadeori, sadori.  |
| Hindi     | Dandotpala, daudotpala, kalgira, kaljiri, sadodi, sadori, sahadevi, sahadeyi, sandri   |
| Hindi     | Dandotpala, sahadevi, sadodi, sahadei, daudotpal, sadori   |
| Indochina | Bacdau.  |
| Kannada   | Dandothpala, gaayadoppalu, gaayathoppalu, kaaduhogesoppu, karehindee, karehindi, karihindisoppu, karivyaaadi, sadodi, sahadevi |

|           |  |
|-----------|--|
| Malayalam | Pirina, puam-curundala, puvamkuruntal, puvankuruntal, puvankurutala, puvvamkurunila, puvvamkuruntala                                       |
| Malyalam  | Puvankuruntal, pirina, puvankurutala   |
| Marathi   | Osari, sadodi, sahadaevi, sahadevi, sahadvei, sayadevi   |
| Marathi   | Osari, sadodi, mahabala  |
| Mauritius | Ayapana, sauvage   |
| Persian   | Danipola, Daankani, Dandkalas  |
| Punjabi   | Sahadevi, kodyali  |
| Sanskrit  | Sahadevi, ardhaprasadana, dandotpala, devasasha, devika, gandhavalli, govandani, saha, keshrupa, vishvadeva, devi, mahabala, keshvardhani  |
| Sinhalese | monarakudumbia, monerakudimbeya, mukuthipundu  |
| Tamil     | Seerachengashuneer, cakatevi, cirilai, cenkalunir, mukuttipuntu, neycatti, puvamkurundal, sagadevi, sahadevi, sirashengalanir, tevakantam, |
| Telugu    | Garitakammi, garitikamma, gharitikamini, gherittekarmina, sahadevi   |
| Tibetan   | Sa de ba, sa ha de ba  |
| Urdu      | Shehdevi buti  |

#### *Sahdevi* (*V. cinerea* Less.) in Unani System of Medicines

It is an herb, which is nearly half yard in height. It has big, thick and hairy leaves which taper at the end. Leaves look like Tulsi (*Ocimum spp.*) and green in colour. Leaves become smaller in summer and winter in comparison to their original size in rainy season. Stems are numerous and thin, having hairs on the surface. Flowers which are 25-30 at a time are whitish blue or reddish blue in colour. Two types of flowers are found in *Sahdevi* on the basis of their place of origin. If it grows in paddy fields it has purple flower which is white inside, if it grows in other places it has blackish red flowers (Chugtae, 1963; Ghani, 1921; Khan, 1313H; Khan, 1358H). It has numerous small seeds which are like Tukhm-e-kahu (*Lactuca sativa* L.) but are smaller than it. Seeds have small hairs like spun cotton. Root is like root of *Resha-e-Khatmi* (*Althea officinalis* L.) (Chugtae, 1963; Dayal, 1933; Ghani, 1921; Khan, 1313H; Khan, 1358H).

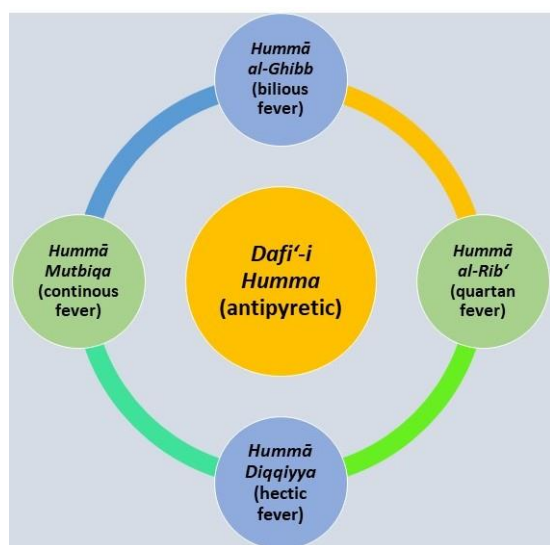
The *Mijāz* (temperament) of *Sahdevi* is *Bārid Ratb* (Cold & Wet) as suggested by majority of the Unani physicians. It is described *Muzir* (harmful) for cold temperament people because of its own cold temperament. The corrective drugs used for its harmful effects are Filfil Siyah (*Piper nigrum* L.) and Shahad (honey). The *Badal* (substitute) of *Sahdevi* is Binola patti (leaves of *Gossypium herbaceum* L.) but it is strongly recommended to use original drug as far as possible. The *Miqdār-i Khurak* (dose) of dry herb is 3-7 gm while in fresh form it may be used upto 12 gm as per classical Unani literature (Chugtae, 1963; Daljeet, 1974; Ghani, 1921; Hakeem, 1343H; Khan, 1280H; Khan, 1313H; Lubhaya, 1977; Sheerazi, 1038H).

#### Therapeutic actions (*Afa'al*) and uses of *Sahdevi* (*V. cinerea* Less.)

The different pharmacological action of *Sahdevi* mentioned in Unani literature regarding *Sahdevi* are given here. Some important pharmacological action as mentioned in literatures are *Dafi-i Hummiyat* (antipyretic), *Mudirr-i-Bawl* (diuretic), *Mumsik-i-Mani* (retentive of semen), *Muqawwi-i Badan* (general tonic), *Musaffi-i-Dam* (blood purifier), *Mushtahī* (appetizer), *Musakkin-i Dam* (neutralizing the heat of sanguine), *Musakkin-i Safra* (neutralizing the heat of yellow bile), and *Mufattit-i-Hasāh* (lithotriptic) (Ali, 1860; Ali, 1914; Arshi, 1929; Chugtae, 1963; Ghani, 1921; Hakeem, 1343H; Kabir al-Din 1955; Kabir al-Din 2007; Khan, 1280H; Khan, 1313H; Khan,

1358H; Lubhaya, 1977; Sheerazi, 1038H)

On the basis of its actions mentioned above *Sahdevi* has been used in the management of many disease conditions. It is very useful in the management of various fevers especially chronic or infectious fever. It is used in the management of *Hummā al-Ghibb* (bilious fever), *Hummā al-Rib'* (quartan fever), *Hummā Diqqiyya* (hectic fever) and *Hummā Mutbiqa* (continous fever) (Ali, 1860; Ali, 1914; Arshi, 1929; Chugtae, 1963; Dayal, 1933; Fazlullah, 1877; Ghani, 1921; Hakeem, 1343H; Hasan, 1865; Kabir al-Din, 1955; Khan, 1280H; Khan, 1313H; Khan, 1358H; Lubhaya, 1977; Zaki, 1890). It has special action as *Māni'-i-Nawbat* (prevents episodes in intermittent fevers like Malaria), and it can be used to avoids episodes of fevers in Malaria or other intermittent fevers. It is also very useful in fever associated with tuberculosis (Ghani, 1921; Khan, 1358H; Khan, 1313H; Lubhaya, 1977).



It modulates *Akhlat* (humours) in the body and corrects *Ghalaba-i-Safrā'* (preponderance of yellow bile) (Ali, 1860) and *Josh-i- Khūn* (preponderance of sanguine) (Kabir al-Din 1955; Kabir al-Din 2007). It has been used for the treatment of '*Usr al-Bawl* (dysurea) (Ali, 1914; Fazlullah, 1877; Hasan, 1865; Khan, 1358H; Lubhaya, 1977; Zaki, 1890;), *Hasāh wa Raml al-Kulya* (nephrolithiasis) (Lubhaya, 1977; Khan, 1313H) and *Sozāk* (Gonorrhoea) (Chugtae, 1963; Kabir al-Din 1955; Kabir al-Din 2007; Khan, 1358H; Lubhaya, 1977; ) due to its diuretic actions. It is very effective in *Nazf al-Dam* (haemorrhage/bleeding) and *Nafth al-Dam* (hemoptysis) when used with Misri (crystallized sugar lumps) to stop bleeding (Chugtae, 1963; Ghani, 1921;

Kabir al-Din 1955; Lubhaya, 1977). Application of paste of its root powder with human urine is very effective in treatment of '*Irq Madīnī* (drancunculosis) (Arshi, 1929; Chugtae, 1963; Ghani, 1921; Khan, 1313H; Sheerazi, 1038H).

Application of its root as *Tilā* (liniment) on penis produces *Mumsik* (retentive of semen) action and useful in condition of premature ejaculation (Ali, 1914; Arshi, 1929; Chugtae, 1963; Fazlullah, 1877; Ghani, 1921; Hakeem, 1343H; Hasan, 1865; Khan, 1280H; Khan, 1358H; Khan, 1313H; Sheerazi, 1038H). Its local application on skin increases redness of the skin (7, 8). It is used with Sikanjabeen in *Salas al-Bawl* (urinary incontinence). It is an important ingredient in the process of preparation of *Kushta Seemab* (calx of mercury) (Arshi, 1929; Fazlullah, 1877; Ghani, 1921; Zaki, 1890). It is also useful in treatment of *Bawāsīr* (haemorrhoid) (Ali, 1860). It is also used to cure general debility and sexual debility (Chugtae, 1963; Khan, 1358H).

### *Sahdevi* (*V. cinerea* Less.) in other complementary System of Medicines

*Sahdevi* is commonly used in Ayurveda and other folk medicines in different countries. Its actions are mentioned as antidote, antibacterial, antifungal, anti-inflammatory, antiviral, anodyne, diuretic, lithotriptic, anthelmintic, anticancer, diaphoretic, stomachic, astringent and tonic (Anonymous, 1998; Bhattacharjee & De, 2005; Caius, 2003; Dymock *et al.*, 1890; Kirtikar & Basu, 1996; Nadkarni, 2000; Sala, 2004; Trivedi, 2002;).

The decoction or infusion of the whole herb is used to manage strangury and spasm of bladder, fever and to heal wounds and sores. Whole herb with quinine is used to treat Malaria. Juice of whole herb is used in incontinence of urine, colic and piles. Its root is used in sunstroke and dropsy. Its leaves have been used in scorpion stings, amoebiasis and cough. Poultice of the leaves is used in herpes, eczema, ringworm and guinea worm. The paste of the whole herb with little ghee is effective in leucorrhoea. Oil prepared by boiling with the juice of the leaves have showed beneficial effects on elephantiasis when applied locally. Its flowers are useful in conjunctivitis and rheumatism. Its seeds are used in flatulence, dysuria, leucoderma, psoriasis and leprosy. *Sahdevi* is also used in asthma and bronchitis and constipation (Anonymous, 1998; Bhattacharjee & De, 2005; Caius, 2003; Khare, 2007; Kirtikar & Basu, 1996; Nadkarni, 2000; Sala, 2004; Singh & Khan, 1990; Trivedi, 2002).

### Chemical Constituents of *Sahdevi* (*V. cinerea* Less.)

Many pharmacological active chemical constituents have been isolated from *V. cinerea*. The leaves of *V. cinerea* showed 64 flavonoids, 13 saponins, 36 alkaloids, and 108 terpenoids present in it (Alara *et al.*, 2018). Different pharmacological action can be attributed to these active constituents.

| S.No. | Chemical   | References   |
|-------|--|--|
| 1.    | (-)-clovane-2,9-diol                                     | Zhu <i>et al.</i> , 2009                                 |
| 2.    | 24-hydroxytaraxer-14-ene (triterpene)                    | Rastogi <i>et al.</i> , 1995                             |
| 3.    | 3β-acetoxyurs-19-ene (triterpenoid)                      | Rastogi <i>et al.</i> , 1998; Misra <i>et al.</i> , 1993 |
| 4.    | 8α-(4-hydroxymethacryloyloxy)-hirsutinolide-13-O-acetate | Chea <i>et al.</i> , 2006                                |
| 5.    | 8α-epoxymethacryloyloxy-hirsutinolide-13-O-acetate       | Chea <i>et al.</i> , 2006                                |
| 6.    | 8α-tigloyloxy-hirsutinolide                              | Chea <i>et al.</i> , 2006                                |
| 7.    | 8α-tigloyloxy-hirsutinolide-13-O-acetate                 | Chea <i>et al.</i> , 2006                                |
| 8.    | 8α-(2-methylacryloyloxy)-hirsutinolide                   | Chen <i>et al.</i> , 2006                                |

|     |   |  |
|-----|---|--|
| 9.  | 8 $\alpha$ -(2-methylacryloyloxy)-hirsutinolide-13-O-acetate  | Chen <i>et al.</i> , 2006  |
| 10. | 8 $\alpha$ -(4-hydroxy tigloyloxy)-hirsutinolide-13-O-acetate   | Chen <i>et al.</i> , 2006  |
| 11. | 8 $\alpha$ -tigloyloxyhirsutinolide   | Chen <i>et al.</i> , 2006  |
| 12. | 8 $\alpha$ -tigloyloxy hirsutinolide-13-O-acetate   | Chen <i>et al.</i> , 2006  |
| 13. | 8 $\alpha$ -(2-methylacryloyloxy)-1 $\beta$ ,4 $\beta$ -epoxy-1 $\alpha$ -methoxy-10 $\beta$ H-germacra-5E,7(11)-dien-12,6-olide              | Chen <i>et al.</i> , 2006  |
| 14. | 8 $\alpha$ -(2-methylacryloyloxy)-1 $\beta$ ,4 $\beta$ -epoxy-1 $\alpha$ -methoxy-13-O-acetate-10 $\beta$ H-germacra-5E,7(11)-dien-12,6-olide | Chen <i>et al.</i> , 2006  |
| 15. | 8 $\alpha$ -(4-hydroxy tigloyloxy)-10 $\alpha$ -hydroxy hirsutinolide-13-O-acetate  | Chen <i>et al.</i> , 2006  |
| 16. | 8 $\beta$ -(3-chloro-2-hydroxy-2-methylpropanoyloxy)-4 $\beta$ ,6 $\alpha$ ,10 $\beta$ -trihydroxyl-13-ethoxy-7(11)-guaiaen-12,6-olide        | Chen <i>et al.</i> , 2006  |
| 17. | Alpha spinasterol   | Duke, 1996; Dhar <i>et al.</i> , 1968; Venkateswara, 1962; Rastogi, <i>et al.</i> , 1995; Khare, 2007                        |
| 18. | Apigenin  | Zhu <i>et al.</i> , 2009   |
| 19. | Apigenin-4'-O-beta-D-glucoside  | Zhu <i>et al.</i> , 2009   |
| 20. | Arachidic acid (seed)   | Duke, 1996   |
| 21. | Behenic acid  | Duke, 1996   |
| 22. | Beta amyirin (triterpene)   | Duke, 1996; Dhar <i>et al.</i> , 1968; Venkateswara, 1962; Khare, 2007   |
| 23. | Beta amyirin acetate (triterpene)   | DOMAP, 2016; Khare, 2007; Duke, 1996; Zhu <i>et al.</i> , 2009   |
| 24. | Beta amyirin benzoate   | DOMAP, 2016  |
| 25. | Beta sitosterol (sterols)   | Duke, 1996; Dhar <i>et al.</i> , 1968; Venkateswara, 1962; Khare, 2007   |
| 26. | Campesterol   | Rastogi <i>et al.</i> , 1995   |
| 27. | Caryolane-1,9beta-diol  | Zhu <i>et al.</i> , 2009   |
| 28. | Chrysoeriol   | Zhu <i>et al.</i> , 2009   |
| 29. | Fat   | Duke, 1996   |
| 30. | HCN   | Duke, 1996   |
| 31. | Hirsutinolide-13-O-acetate  | Chea <i>et al.</i> , 2006  |
| 32. | Hyperin   | Zhu H, 2009  |
| 33. | Linoleic acid   | Duke, 1996   |
| 34. | Lupeol (triterpene)   | Duke, 1996; Dhar <i>et al.</i> , 1968; Venkateswara, 1962; Khare, 2007   |
| 35. | Lupeol acetate (triterpene)   | Duke, 1996; Dhar <i>et al.</i> , 1968; Venkateswara, 1962; Khare, 2007; Misra <i>et al.</i> , 1993; Zhu <i>et al.</i> , 2009 |
| 36. | Luteolin  | Zhu <i>et al.</i> , 2009   |
| 37. | Luteolin-7-mono beta-D-glucoside (seed)   | Duke, 1996; Zhu <i>et al.</i> , 2009   |
| 38. | Luteolin-7-monobeta- D-glucopyranoside (aerial part)  | Khare, 2007  |
| 39. | Myristic acid   | Duke, 1996   |
| 40. | Oleic acid  | Duke, 1996   |
| 41. | Palmitic acid   | Duke, 1996   |
| 42. | Pentaynene (flower)   | Duke, 1996   |
| 43. | Phenolic resin  | Dhar <i>et al.</i> , 1968; Venkateswara, 1962; Khare, 2007   |
| 44. | Piptocarphin D  | Chea <i>et al.</i> , 2006  |
| 45. | Potassium chloride  | Dhar <i>et al.</i> , 1968; Venkateswara, 1962; Khare, 2007   |
| 46. | Quercetin   | Zhu <i>et al.</i> , 2009   |
| 47. | Sesquiterpenoid (10 in numbers)   | Chen <i>et al.</i> , 2006  |
| 48. | Stigmasterol  | Duke, 1996; Dhar <i>et al.</i> , 1968; Venkateswara, 1962, Khare, 2007   |
| 49. | Thermopsoside   | Zhu <i>et al.</i> , 2009   |
| 50. | Vernocinolide A (sesquiterpenoid)   | Chen <i>et al.</i> , 2006  |
| 51. | Vernolic acid (seed)  | Duke, 1996   |
| 52. | Vernolide-A (sesquiterpene lactones)  | Kuo <i>et al.</i> , 2003; Chen <i>et al.</i> , 2006  |
| 53. | Vernolide-B (sesquiterpene lactones)  | Kuo <i>et al.</i> , 2003; Chen <i>et al.</i> , 2006  |
| 54. | Vernolides C (sesquiterpene lactones)   | Chea <i>et al.</i> , 2006  |
| 55. | Vernolides D (sesquiterpene lactones)   | Chea <i>et al.</i> , 2006  |

## Pharmacological and Clinical activities of *Sahdevi* (*V. cinerea* Less.)

### Antipyretic, analgesic and anti-inflammatory activities

The methanolic extract of the complete plant of *V. cinerea* was found equally effective at the dose of 500 mg/kg as standard drug paracetamol (Gupta *et al.*, 2003). Significant analgesic activity was showed by Chloroform extract (CE), Methanol extract (ME) and Petroleum Ether extract (PEE) in acetic acid-induced writhing test and mechanical induced pains. A potent and significant suppressant activity showed by CE, ME and PEE in carrageenin-induced paw oedema model in rats. The antipyretic activity also showed by ME and CE in a yeast suspension-induced hyperthermia (Iwalewa *et al.*, 2003). The antipyretic, analgesic and anti-inflammatory activities were also proved in mice model by methanolic extract of *V. cinerea* (Bashar, 2014).

The methanol extract in a dose of 250 and 500 mg/kg has demonstrated significant anti-inflammatory activity in carrageenin, histamine and serotonin induced rat paw edema and cotton pouch induced granuloma (Mazumder *et al.*, 2003). The flower extract of *V. cinerea* showed beneficial effect in adjuvant induced arthritic rats and ameliorated arthritic effects so confirming its anti-inflammatory activity (Latha *et al.*, 1998 Kumar 2009). Ethanolic extract of *V. Cinerea* exhibited favorable effects in vincristine-induced peripheral neuropathic pain. These effects may be due to its antioxidative, neuroprotective and calcium channel inhibitory actions (Thiagarajan, 2012). These studies have proved and validated the Unani claims of actions and uses of *V. Cinerea* mentioned in literature. Its antipyretic activities are well documented in Unani literature and can be verified by animal studies and clinical trial in chronic fevers.

### Antimalarial activity

Complete plant and root of *V. Cinerea* has showed anti-malarial activity by having anti-plasmodium activity (Simonsen, 2001). Three major sesquiterpene lactones i.e. 8 $\alpha$ -tigloyloxy-hirsutinolide-13-O-acetate, 8 $\alpha$ -(4-hydroxymethacryloyloxy)-hirsutinolide-13-O-acetate and vernolides D exhibited significant antiplasmodial activity on chloroquine resistant Plasmodium falciparum strain (Chea A, 2006). This activity has validated the claim of Unani medicine where it is prescribed in malarial fever. It is effective even against chloroquine resistant strain so proving that natural form of drugs is more effective and no resistance develops in it.

### Anti-oxidant activity

Antioxidant activity of hydroalcoholic extract of *V. Cinerea* was confirmed by inhibiting DPPH in dose dependent manner (Mehta J, 2019). Scavenging of the hydroxyl radical, superoxide and nitric oxide by methanolic extract of *V. Cinerea* was proved in a study. *V. Cinerea* was also found to inhibit the Phorbol-12-myristate-13-acetate (PMA) induced Superoxide generation in mice (Kumar, 2009).

### Anti-diabetic and reproductive performance activity

*V. Cinerea* has shown promising action of significantly restoring the testicular function and testosterone concentration in diabetic male rats. In high dose it has showed anti-diabetic activity and significantly improved the sperm count (Pomjunya A, 2017). The carbon tetrachloride fraction of methanolic stem, bark and leaves extract of *V. Cinerea* has shown antidiabetic activity by significantly reducing the blood glucose levels in alloxan-induced diabetic rats (Haque MA, 2013). The Unani claim of its

aphrodisiac activity has been confirmed by improving sperm count.

### Anti-ulcer activity

*V. Cinerea* has shown moderate anti *H. pylori* activity, suggesting its anti-ulcer activities because *H. pylorus* is strongly associated with duodenal and gastric ulcers (Wang YC, 2005).

### Anti-diuretic activity

The chloroform extract of the leaf of *V. Cinerea* has shown hypernatraemic, hyperkalaemic and hyperchloraemic diuretic action. Methanolic and aqueous extracts showed effective antidiuretic effects which supports the Unani claim that the plant can be used to cure urinary incontinence (Adeboye JO, 1997).

### Anti-microbial activity

The broad spectrum of antibacterial activity has shown by benzene extract of *V. Cinerea* (Gupta, *et al.*, 2003). The methanolic extract of *V. Cinerea* showed antimicrobial activity against *C. by* completely inhibiting *Candida albicans* growth and also exhibited prolonged anti-yeast activity (Latha, 2011). The hydroalcoholic extract of *V. Cinerea* showed good antimicrobial activity against gram positive bacteria (Mehta J, 2019). In a study it was shown that *V. Cinerea* does not exhibit any apparent toxicity and may be used as an antimicrobial agent in known dosages (Latha, 2010).

## CONCLUSION

*Sahdevi* is an Indian drug and probably adopted by Unani practitioners due to its easy availability and large numbers of pharmacological actions. It contains more than fifty chemical compounds the important compounds are flavonoids, terpenoids and saponins along with alkaloids. It is very useful drug for fever especially in intermittent fevers like fever in Malaria. It is reported that if used before episodes of fever it prevents fever to appear which is unique quality of any drug. It has proved by many studies that it has antimicrobial activity against various microbes as well as fungi. Its antimicrobial activity proves its effectiveness in fevers of different origins. It has shown antiulcer activity which is also unique as most modern drugs used for fever produces ulcer as adverse effects. Various animal studies prove its analgesic, antipyretic and anti-inflammatory activities therefore confirming its classical use against different fevers. It may be used in arthritis which is confirmed by animal study but not mentioned in classical literature. It has proven anti-malarial activity even against chloroquine resistant Plasmodium falciparum strains, proves its use in malaria as per literature. It improves sexual performance by improving sperm count in diabetic patients thus proves its importance in sexual debility due to diabetes.

It is a priceless herb commonly found everywhere but have important pharmacological actions. Its easy availability makes it important drug for management of various ailments and it can be used in place of costly drugs or endangered herbs. Its other activities mentioned in Unani literature such as lithotriptic activity, blood purifier activity, general tonic activity and appetizer activity may be explored in animal as well as in human being to confirm the claim mentioned in Unani literature. In last it can be concluded that *V. Cinerea* is an important herb of Unani medicine and it should be used frequently by physicians according to its vast pharmacological actions as per classical literature for safe effective and cost-effective treatment.

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## CONFLICT OF INTEREST

The authors have no conflicting financial interests.

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